Safety Regulation Group

Civil Aviation Authority

CAA PAPER 2003/5

On Track - A Confidential Airspace Infringement Project

www.caa.co.uk

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11 July 2003

This report is the result of CAA-sponsored independent research. The views expressed in it are those of the authors and participating members of the GA community, and do not necessarily reflect CAA opinion or policy. Following an assessment of the report's recommendations, the joint General Aviation Department/Directorate of Airspace Policy Airspace Infringement Working Group will carry forward the report's findings for possible implementation. Detailed conclusions will be published in due course.

Membership of the Airspace Infringement Working Group includes representatives of the GA community. This includes the General Aviation Safety Council, which has agreed to maintain the 'On Track' website on behalf of the CAA in order to sustain the valuable direct input from the GA community that was established during the 'ON TRACK' project.

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Contents

Executive Summary

Infringements of Controlled Airspace (CAS) are a potentially serious aviation hazard and occur when an aircraft enters CAS without permission. In recognition of this potential hazard, especially around the Stansted area, the CAA commissioned a project called "On Track" to take a fresh look at infringements by General Aviation (GA) aircraft. The Airspace Infringement Steering Group (AISG), comprising representatives from Safety Regulation Group (SRG) and Directorate of Airspace Policy (DAP), was established to focus the project and review progress.

This report presents the work and recommendations of the "On Track" project. The project ran from June 2001 to January 2003, with the aim **'To identify the causal factors behind airspace infringements, and to make recommendations for safety improvements.'** To achieve this, a non-CAA project team was appointed to collect in-depth confidential data, not only on **what** happened but on **why** infringements occurred, and to make recommendations to the AISG based on comments and suggestions directly from pilots and controllers.

The AISG would pass the project report to the Airspace Infringement Working Group (AIWG) for review and action.

The project team investigated 165 infringement reports during the 18 Month data collection period (July 2001 to December 2002). Additionally, the team collected over 2,500 comments and suggestions for evaluation via an innovative website forum, e-mail, freepost and telephone.

The significant findings of the project are summarised in section 7 of the report under the following headings:

a) Airspace and ATC Issues.

b) Lower Airspace Radar Service.

c) Maps and Charts.

d) Aeronautical Information Circulars.

e) NOTAMS.

f) GPS.

g) GPS Training.

h) R/T Training.

i) Navigation Training.

j) GA use of Transponders.

k) Licensing Issues.

l) Communication.

m) CAA Investigation and Follow-up Procedure.

Due to the complex nature of the project and the diverse range of suggestions received, recommendations contained in section 7 are repeated within the section 8 Conclusions.

The project confirmed the advantages of short-term in-depth confidential data collection, which had previously been successfully employed on the "On The Level" Project (CAP 710). The CAA did not have to commit permanent resources to the data

collection task, but was able to focus on a specific problem. This was further enhanced by the use of modern technology in the shape of an open forum website managed at arms length from Authority. For each of the 13 subject areas identified above, the project team identified specific problems and made associated recommendations.

1   Introduction

The safety of all aircraft operations in UK controlled airspace is continuously monitored by the UK Civil Aviation Authority's Safety Regulation Group (SRG) as part of its safety regulation management system. The processes in this system aim to identify significant safety issues so that both short and long-term safety improvement strategies can be developed by SRG, in conjunction with industry. The aim of these processes is to maintain or where possible improve aviation safety.

One of the significant safety risks to the UK air transport system is believed to be the inadvertent or unauthorised penetration of controlled airspace by general aviation aircraft. This operational hazard, commonly called an 'infringement', may result in serious harm either from an actual mid-air collision or from a rapid avoidance manoeuvre. Infringements also result in increased costs through delayed departures, go-arounds and extended routings. By the year 2000, the number of infringements reached a level which had increased concern within the CAA.

In recognition of this hazard, the CAA commissioned a project called "On Track" to take a fresh look at infringements by general aviation aircraft. The Airspace Infringement Steering Group (AISG), comprising representatives from SRG and Directorate of Airspace Policy (DAP), was established to focus the project and review progress. The AISG first met in June 2001 and agreed a programme of action.

This report presents the summary and conclusions of "On Track". This innovative project took a completely fresh look at the problem of infringements by using direct contact with pilots and controllers to provide ideas for consideration and data for analysis.

Its main purpose was to identify problem areas and to recommend possible solutions to the AISG for onward transmission to the AIWG for action. Therefore, this report does not detail follow-on actions arising from these recommendations.

All recommendations will be reviewed by the AIWG and appropriate actions will be taken or continue to be progressed and monitored by the Group as long as necessary. In view of this changing picture, any requests for updates on progress should be made to:

Head of General Aviation Department
Safety Regulation Group
Aviation House
Gatwick
West Sussex
RH6 0YR
UK

2   "On Track" Project – Background

Infringements of all areas of UK controlled airspace by GA had been giving concern for some time and had been particularly bad in the South East especially in the Stansted area. A working group had attempted a limited analysis in 1998/1999 but the information obtained was inconsistent; Pilot groups had not been identified and neither had any causal factors. Statistically, 1,362 Class D Airspace infringements had been logged over the past 10 years with 204 in Danger Areas.

It was apparent to AISG members at the start of the programme that there was a general lack of in-depth information on UK infringements. Although many reports

were received by SRG through its Mandatory Occurrence Reporting Scheme (MORS), these reports only provided general information on **what** happened in an infringement event. Mandatory Occurrence Reports (MORs) rarely provided information on **why** infringements occurred and **what** might be done to mitigate the risk of reoccurrence.

To develop safety strategies and reduce infringements, it was essential to obtain more information directly from pilots and controllers on why infringements occur and to encourage any remedial suggestions. Following the success of "On the Level"[1] it was decided that the "On Track" Project would employ similar techniques, using the same team of external pilots, including an additional pilot with extensive GA experience, to conduct this research under a confidentiality guarantee.

The On Track Team members and authors of this report were:

Captain David Esson   -   a current professional pilot - On Track Project Manager

Captain Mike Nash   -   a retired professional pilot

Captain Chris Gould   -   a current professional GA instructor and examiner

From the outset, it was recognised that pilots cause most infringements. The solution must therefore include pilot input, which may demand radical rethinking of existing views or procedures. If the safety benefits of the project are to be realised, it is essential that the recommendations and suggestions should be viewed with an open mind, without automatically restating existing procedures which may not be delivering the required safety standards.

In early 2001, a business case was agreed for a research project and, in June "On Track" was commenced in time for an official launch in August 2001 with the principal aim:

'To identify the causal factors behind airspace infringements, and to make recommendations for safety improvements.'

3   "On Track" Project - Description

Prior to launching the data gathering part of the project, it was necessary to agree the publicity and reporting framework with all parties involved.

3.1   **Reporting Arrangements for "On Track"**

It was essential that reporting arrangements created by the "On Track" project should have a high degree of trust and integrity and would gather as much information as possible. SRG made it clear through a letter from its Group Director (see Attachment 1) that confidentiality was guaranteed and any reporting would be an overlay on current procedures.

As most infringements result from pilot related problems, it was important to commission a project team of non-CAA active pilots, to discuss infringements in-confidence with pilots and controllers, without fear of punitive action. The selection of suitable team members was critical to the success of the project. It was essential they had collective experience of both GA pilot and controller operational issues and also had inter-personal skills that would encourage reporters to feel comfortable when discussing sensitive events.

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1.   "On the Level" a confidential level bust information project – see CAP 710 dated December 2000.

The "On Track" team operated remotely from the CAA and were not employees. They were, however, subject to the confidentiality constraints of the MORS system, which did not permit disclosure of personal details to outside agencies.

A statement from CAA's Chairman[1] made it clear that CAA would not disclose the name of the person submitting an MOR or of a person to whom it related unless required to do so by law or unless in either case the person concerned authorised disclosure. If any flight safety follow-up action arising from the MOR was necessary, CAA would take reasonable steps to avoid disclosing the identity of the reporter or of those individuals involved in the occurrence.

Therefore, as part of the normal follow up procedure when an infringement was reported to the CAA, General Aviation Department (GAD) would invite infringing pilots to voluntarily contact the project team for an informal debrief of the event. The letter of invitation contained further guarantees of anonymity and confidentiality, signed by the Head of GAD, together with a Project Flyer (see Attachment 2) which outlined a variety of contact methods.

The letter of invitation and the Flyer were repeated on the project website, together with a downloadable questionnaire (see Attachment 3) which the project team devised to capture maximum detail of each incident. The reporter could either complete the questionnaire in private and dispatch to the project, or contact the team direct for a telephone debrief.

The tone of the website, questionnaire and debrief was positive in nature and pitched to reflect a no-blame culture to encourage an easy flow of information and suggestions from the reporter.

Additional reporting provisions were made for pilots and controllers to detail infringements that had not been officially reported to the CAA.

Where a reporter had not infringed, but wished to make a comment or suggestion to improve the system, an anonymous open forum facility ("Your Say") was provided on the website. Additionally, Freephone, Freepost, Fax and e-mail were made available to receive reports and comments.

These arrangements provided a free flow of information on a strictly confidential basis with virtually no CAA involvement.

Once the team had collected the data, details were dis-identified to maintain confidentiality and entered into a dedicated Microsoft Access database, for use by the SRG Strategic Safety and Analysis Unit (SSAU).

In order for a report to be 'dis-identified' the following information was removed: the day of the month on which the event occurred, the reporter's name and in certain cases the specific aircraft type. In these cases, the aircraft type was modified to a generic form (for example, "light twin").

In addition to infringements, the project team recorded those incidents where the pilot or controller prevented an infringement at the last minute through timely intervention. These were known as 'almost infringements' and their causal factors were invariably the same as the real events.

3.2 Project Promotion

Although the structured nature of ATC would enable direct controller contact by the project team, the disparate background of the GA pilot community, ranging from hang glider to corporate jet, demanded an equally diverse range of reporting arrangements

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1. Page vii, CAP 382, The Mandatory Occurrence Reporting Scheme, January 1993.

for "On Track", to ensure maximum involvement. Accordingly, all 33,000 PPL holders on the CAA database received a personal letter from Group Director Safety Regulation (GDSR) (see Attachment 1) promoting the project, outlining the procedure and encouraging their direct participation.

An Aviation Press briefing announced the project launch, which was also publicised through GASIL, GASCo, AOPA, UK FSC, GACC, PFA, Flying Farmers Association, GATCO ('Transmit'), BALPA ('The Log'), IPA ('Skypointer'), and CHIRP, together with direct contact with clubs, operators, schools and ATC Managers. The UK Airprox Board (UKAB) were also consulted at an early stage.

Posters (see Attachments 4 and 5) advertising the project aim and contact methods were given wide distribution throughout the project period. Regular sponsored articles also appeared in the Aviation Press. The 3 day PFA Rally was targeted by the team with a comprehensive flyer distribution to all visiting pilots encouraging participation.

A Team member visited several clubs and PFA Struts and supported several CAA Safety Evenings throughout the project.

A project website (www.flyontrack.co.uk) was established, which quickly attracted useful feedback and generated additional publicity. All promotional material was available for download from the website.

4 Confidentiality

A major challenge for the "On Track" project was to establish initial contact with individuals who had experienced an infringement and were willing to discuss the details. The existing CAA confidentiality arrangements of the UK MOR Scheme prevented the team from contacting infringers direct, relying instead on their voluntary response to the GAD letters of invitation.

Obtaining such confidential safety information from the start was not expected to be easy, especially when this information might imply that pilots or controllers may have made mistakes, omitted to do things, adopted the wrong procedure or were simply distracted.

It was therefore imperative that any reporters contacting "On Track" should be assured that their details would remain totally confidential.

The following confidentiality measures were employed:

a) The team were non CAA employees operating from a remote site.

b) The CAA had no access to sensitive project information.

c) Access to identified report details restricted to Team members.

d) All contact methods were direct to the Team.

e) Website downloads and computer data using variable password control.

f) All reports and data dis-identified.

g) No provision within the reporting system for recording names.

h) Reports shredded following database input.

i) Variety of contact method options.

j) Team profiles and personal contact details included on the Website.

k) Confidentiality measures clearly detailed on the Website.

l) Anonymous reports were welcome.

In spite of these measures, it was evident that there was a genuine fear amongst some pilots of disclosing information to anyone remotely associated with the CAA. Perhaps more surprising, was that many pilots were unaware of the existing UK confidential reporting schemes.

In contrast, others were keen and willing to discuss their experiences, together with possible solutions. This specific information, which until now had not been collected, was only available to the project team members and proved to be invaluable in formulating recommendations.

5   The GA Response

The initial response from the GA community was predictably cautious, with some cynicism. However, once the project publicity began to take effect, the project team was able to achieve and maintain an excellent rapport with a steadily increasing number of pilots and controllers.

Although the cynicism largely dissipated at an early stage, it was nevertheless obvious that the Aviation Press and GA pilots would actively monitor project progress, and it's success would be judged solely on the results achieved.

Many pilots and controllers expressed the view that such a project was long overdue, were pleased with the initiative, and offered practical assistance. This was reinforced at GA meetings and events throughout the term where high expectations from the audience were apparent. The team were invited to give several presentations and had a good response at the 3 day PFA Rally.

The early introduction of the project website proved to be very successful. The site included team profiles and photographs; many contributors were therefore able to relate to the team, and declared that they were comfortable discussing their incident or viewpoint. Although the team traded heavily on their independence from the CAA to gain maximum feedback, it was generally viewed that this was a direct feed to the Authority. The "Your Say" page therefore provided the first open forum discussion facility for the CAA's pilot customers.

Steady feedback was initially received from pilots who had an infringement, but more encouraging were the numerous reports received from those who had an almost infringement. Comment from the latter was most useful as the underlying reasons were the same as for actual events.

The rate of infringement reporting gradually reduced as the project progressed following the initial surge. Unfortunately, the follow up invitation from GAD to infringing pilots failed to produce the anticipated steady response to carry out a debrief with the team. This was due in part to the confidentiality constraints of the MOR system which prevented the team from contacting pilots directly. However, the underlying reluctance to speak to authority or even put a "head above the parapet" undoubtedly played a part.

Relying on infringing pilots to contact the team proved to be a system generated handicap.

However, there was a corresponding increase in the response rate on the website, which was becoming increasingly popular with GA pilots providing a wide variety of comments and suggestions on the prevention of infringements. This rich flow of information, together with anecdotal "almost infringements" more than compensated for the lack of direct live reports. As would be expected from such a

forum, the on-line public contact promoted valuable inter-pilot and controller dialogue and the team were able to glean useful opinion, often from quiet observation.

In view of the high quality and volume of the website discussion and associated e-mail traffic, a tactical decision was taken to concentrate resources on these aspects which were producing excellent material.

Advertising was adjusted to promote this revised emphasis in favour of comment and suggestion, although receiving infringement reports would continue to be an important source of information.

165 confidential reports were processed into the database. Data extracts are summarised at section 6. More than 2,500 comments were received via the website, with additional feedback by phone, Fax and e-mail. From the high standard of input it was clear that GA pilots were keen to seize this unique opportunity to have their ideas considered by Authority and not summarily dismissed. In addition to the response from pilots, there was valuable feedback from controllers, particularly those who had flying licences. It was evident that they wanted to present a balanced view on infringements.

The team provided regular summaries to the CAA with a digest to NATS as the project progressed. These reports were enthusiastically received.

Many GA pilots were very impressed with the proactive work carried out by DAP Aeronautical Charts & Data (AC&D) Section. DAP had been enthusiastically tracking a discussion on the project website which centred on free downloadable Australian VFR charts, and quickly embarked upon a UK version for the obvious infringement hotspots. These charts were trialled at the PFA Rally, made freely available on-line and have proved very popular, with other chart developments already in the pipeline.

6   Analysis of Airspace Infringements

6.1   Infringements Reported to CAA through MORS

There is a requirement to report incidents and occurrences to the CAA in accordance with CAP 382 'The Mandatory Occurrence Reporting Scheme'. Pilots or controllers alike may submit infringement related MORs, but in practice nearly 90% originate from controllers.

Over the last 10 years the annual number of airspace infringements **reported** as MORs has fluctuated around an average of 330. The true number is likely to be significantly greater (for a number of reasons not every infringement is reported). Approximately 10% of all infringements involved a loss of separation, 5% resulted in an Airprox and just over 1% resulted in a risk bearing Airprox[1]. Figure 1 shows an annual breakdown of airspace infringements reported as MORs from 1993 to 2002. It should be noted that the number of infringements resulting in a risk bearing Airprox for 2002 is not complete (United Kingdom Airpox Board (UKAB) have yet to allocate their risk grading for some occurrences).

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1. Risk bearing is a term used by UKAB to denote that an actual risk of collision existed or the safety of the aircraft was compromised.

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
■ Infringement and risk bearing Airprox	2	1	0	2	5	8	12	11	2	4
□ Infringement and Airprox	12	11	12	8	13	19	31	27	18	19
■ Infringement and loss of separation	36	21	24	28	37	30	49	37	32	26
■ All infringements reported to CAA	283	287	286	323	381	314	413	344	314	388

* Note: there are 9 infringements that resulted in Airprox, from 2002, for which UKAB have yet to allocate a risk category.

Figure 1   Annual breakdown of airspace infringements reported as MORs.

The annual number of infringements had shown a decreasing trend from 1999 to 2001. However, it should be noted that the effects of the foot and mouth epidemic and heightened awareness of infringements post 'September 11' could have contributed to the relatively low total in 2001. The increase in 2002 was most likely due to more diligent reporting as a result of awareness associated with the "On Track" project.

Figure 2 shows a six-month moving average of all infringements reported as MORs from 2000 to 2002. The cyclical nature of these events is evident with peaks during the summer and troughs in the winter.
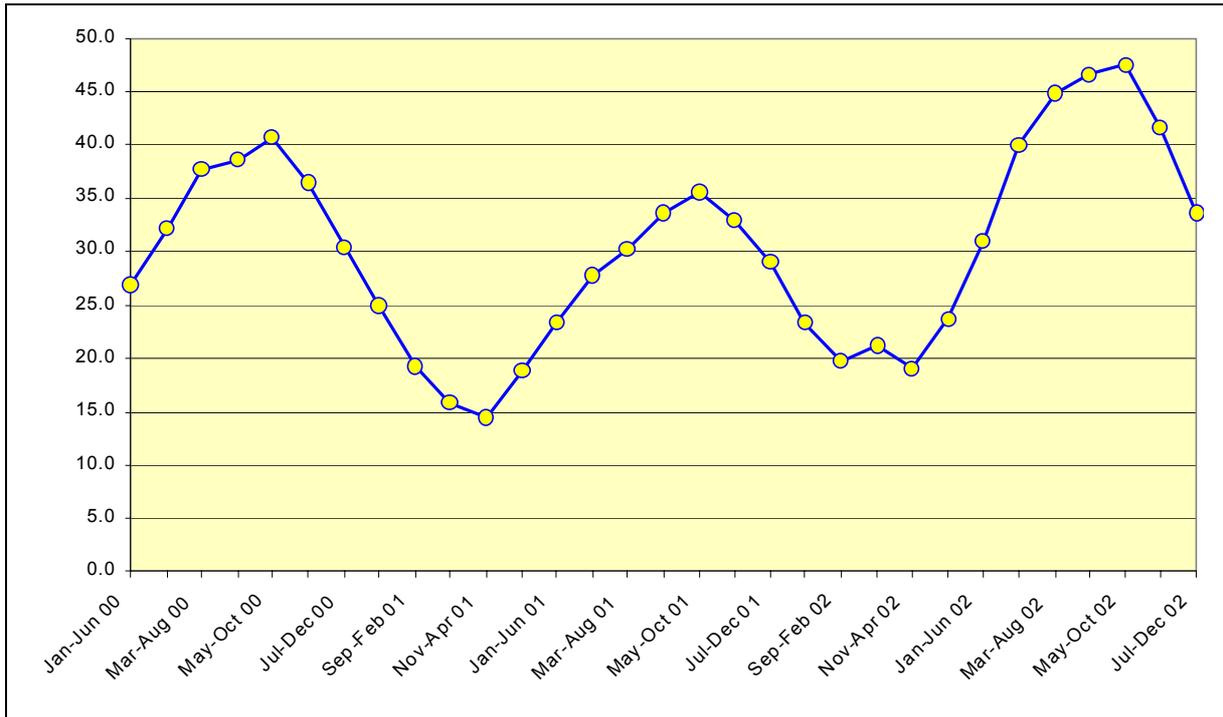
Figure 2　　Six-month moving average of all airspace infringements reported as MORs.

Figure 3 shows a breakdown for the last three years, of the broad types of airspace infringed.
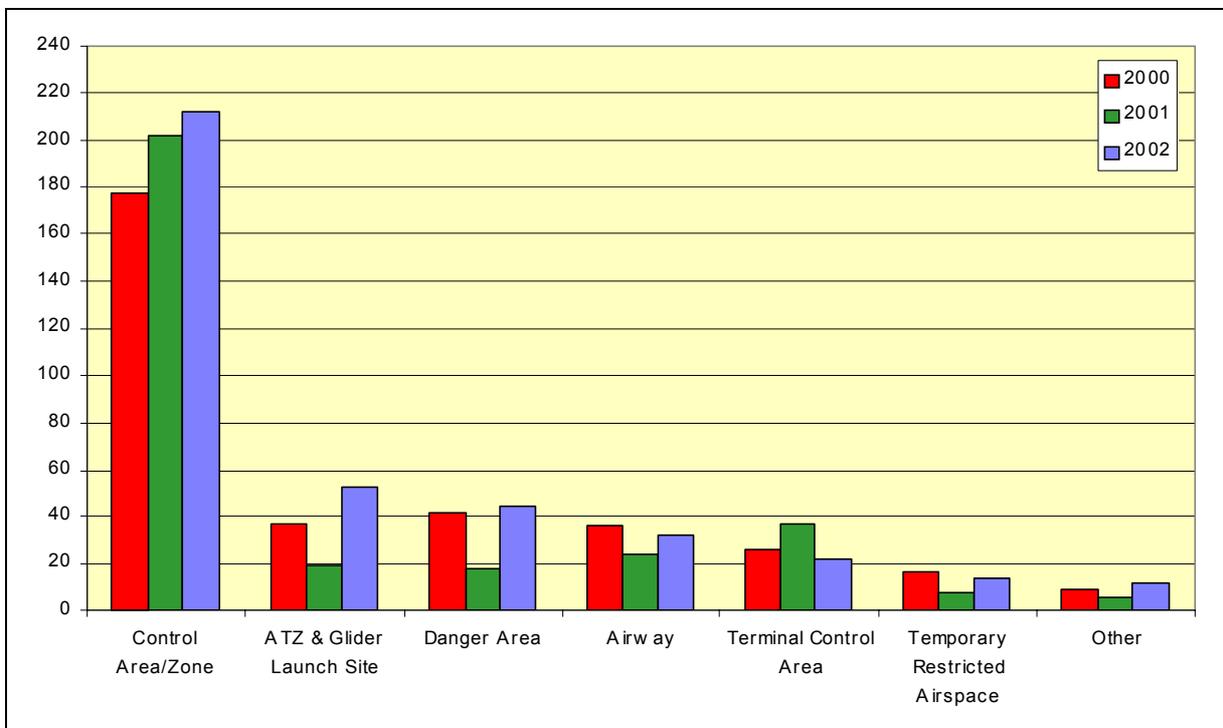
Figure 3　　Breakdown of airspace infringements reported as MORs by type of airspace.

Infringements of control areas and control zones contributed to some 55% of the total. The reductions in ATZ, Danger Area and Temporary Restricted Airspace (TRA) infringements in 2001 were probably due to the effects of the foot and mouth epidemic (less flying in general, cancellation of fly-ins, airshows, etc.).

Figure 4 shows a breakdown for the last three years, of the top 15 locations for the control area and control zone infringements. The chart order is based on the number of infringements reported in 2002.
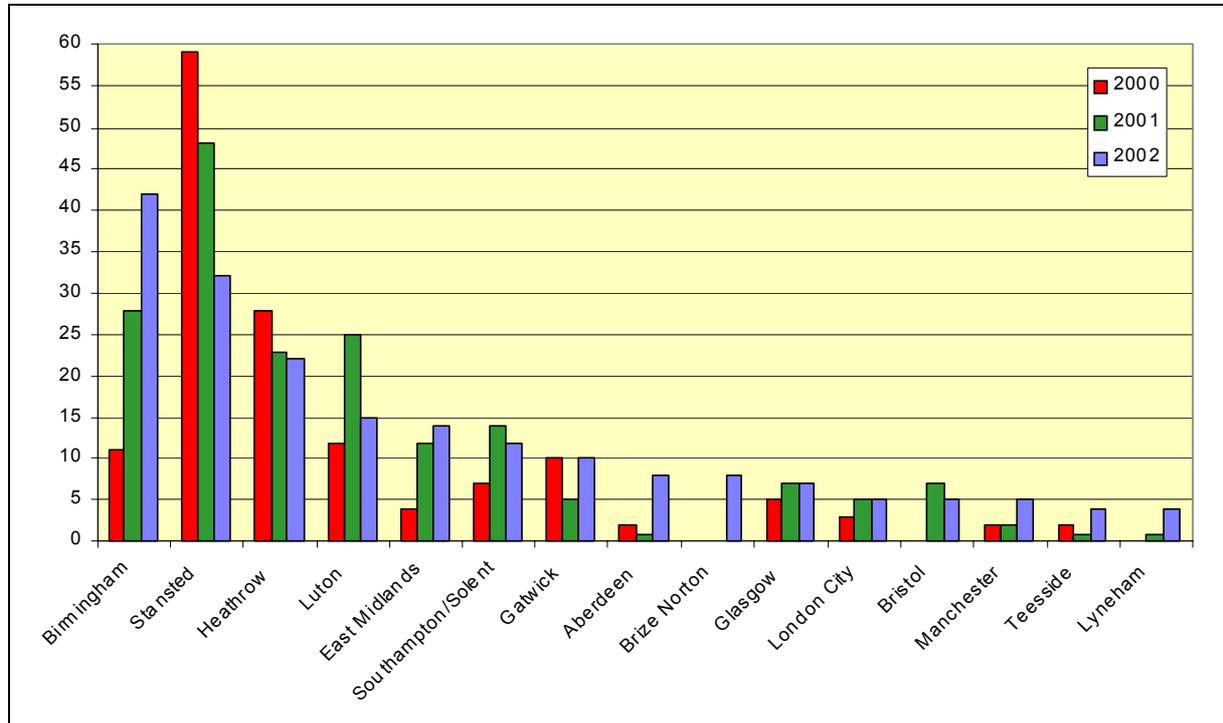
Figure 4   Breakdown of top 15 locations for control area/zone infringements.

Over the three-year period Stansted was by far the most common location for infringements, although a decreasing trend was evident. However, the number of reported infringements at Birmingham has steadily increased such that it was the most common location in 2002. This increase can be attributed to a more thorough reporting regime rather than a greater number of actual infringements.

6.2   **Analysis of Responses to "On Track" Questionnaire**

In order to elicit the best possible information on each infringement/almost infringement, a questionnaire was developed (see Attachment 3). This was made available on the "On Track" website for direct input by contributors and also used by the "On Track" pilots as a guide when debriefing contributors over the telephone. This section summarises the results of responses to the questionnaire.

6.2.1   **Overview**

During the 18-month data collection period from July 2001 to December 2002, 165 infringement questionnaires were received. Of these, 144 involved an actual airspace infringement and 21 were 'almost infringements'. Approximately 34% of all the reports were formally reported to CAA as an MOR. In 17% of cases the pilot did not know if a report had been filed. This left 81 reports, nearly half of the total, for which no MOR was submitted and for which CAA would not have any information.

6.2.2 **Pilot Experience**

Nearly two-thirds of the reports came from pilots with less than 500 hours total flying experience (see table 1 for full breakdown). Over 80% of pilots were qualified to PPL standard and nearly half of these had some form of instrument qualification (see table 2 for breakdown of pilot qualification).

Table 1   Breakdown of pilot experience

Experience (hrs)	Count	%
< 100	29	17.6
100 – 499	72	43.6
500 – 999	28	17.0
1,000 – 9,999	13	7.9
> 10,000	4	2.4
Unknown	19	11.5

Table 2   Breakdown of pilot qualification

Qualification	Count	%
Student pilot	8	4.8
Private pilot	133	80.6
(PPL with IMC/IR)	(61)	(37.0)
Commercial pilot	20	12.1
Other	3	1.8
Unknown	1	0.7

6.2.3 **Nature of Flight and Flight Conditions**

Nearly 90% of reports involved private flights. Training accounted for a little over 7%. Virtually all flights were made under visual flight rules and in VMC conditions. In terms of aircraft source, about half were hired from flying clubs and 40% were owned or part of a syndicate group.

Nearly a third of all reporters cited weather as a factor in their infringements. Weather factors included a mixture of poor visibility due to cloud and flight towards the sun, turbulence and strong winds.

Over 60% of reporters judged their workload to be moderate or heavy at the time of their infringement (see table 3 for a full breakdown). Some form of distraction (for example: non-pilot passengers, equipment unserviceability, worsening weather, etc.) was cited in over half of all reports received.

Table 3　　Breakdown of pilot workload

Workload	Count	%
Heavy	40	24.2
Moderate	63	38.2
Light	52	31.5
Unknown	10	6.1

6.2.4　**ATC Service**

Three-quarters of reporters (128 reports) specified that they required some form of ATC service and of these, a further three-quarter (99 reports) received a service. For the 29 reporters that did not receive a service, 11 were due to point blank refusals.

Table 4 shows a breakdown of the types of ATC service received:

Table 4　　Breakdown of ATC service received

ATC service	Count	%
Flight Information (FIS)	73	73.7
Radar Information (RIS)	17	17.2
Radar Advisory (RAS)	5	5.1
Radar Control	4	4.0

Of the 99 cases where an ATC service was received, 59 (or 60%) reporters judged the service to be adequate. Reasons given for inadequate service included: late clearances, busy R/T frequency, unclear messages and FIS given instead of requested RIS.

The "On Track" questionnaire included a section on the pilot's assessment of their R/T during the infringement flight. Nearly two-thirds considered their R/T to be adequate or good. Approximately 13% (21 reports) considered it to be poor. Lack of confidence, poor training and equipment problems were reasons cited for poor R/T performance.

6.2.5　**Equipment, Navigation and Planning**

Table 5 shows a breakdown of equipment fitted to aircraft involved in the infringement reports. Note that an aircraft can have more than one item of equipment fitted, so the percentages will not add up to 100 (this also applies for tables 6 – 8).

Table 5　　Breakdown of aircraft equipment (note: items are not mutually exclusive)

Aircraft equipment	Count	%
Radio	162	98.2
Transponder	145	87.9
Mode C	121	73.3
GPS	79	47.9
Auto-pilot	31	18.8

Of the 121 aircraft equipped with Mode C, 93 had it switched on. Reasons given for not using it included: unserviceability, simply forgetting and being taught not to use it unless specifically asked by ATC. Auto-pilots were used in 12 of the 31 aircraft that had them fitted.

Table 6 shows a breakdown of the methods of navigation used:

Table 6   Breakdown of methods of navigation used (note: items are not mutually exclusive)

Methods of navigation	Count	%
Visual with map	138	83.6
Navaids	72	43.6
GPS	67	40.6
Moving map	29	17.6

Of the reporters that navigated visually, 132 used an up-to-date map and of these, 124 used a 1:500,000 scale map. 78% of reporters considered their maps to be easy to use. Reasons for charts not being easy to use included: cluttered presentation (for example, around the Luton/Stansted zones), poor depiction of base levels of controlled airspace, difficulties in differentiating between features (such as roads and motorways) and the large amount of information relating to higher airspace (which some reporters argued is seldom used by the majority of PPL holders). Only three reporters that used GPS stated that they had received formal tuition on the use of their GPS equipment.

The questionnaire included a section on the pilot's assessment of their navigation training. Most considered their training to be adequate or good. 18 reporters (or 11%) considered it to be poor and reasons included: not enough time spent on navigation, little or no instruction on zone crossings and instruction given in the air rather than in the classroom.

Pre-flight planning was carried out at a flying club in approximately half of the reports submitted. There were 3 reports which stated that no flight planning had been carried out.

95 reporters (or 58%) stated that they were sure of their position at the time of their infringement, yet 56 of them did not know that they were infringing airspace.

6.2.6   **Factors behind the Infringements**

Up to five key-phrases were assigned to each infringement report and their purpose was to highlight factors behind why the infringement occurred (or nearly occurred in the case of almost infringements). See table 7 for a list of key-phrases:

Table 7   Breakdown of key-phrases (note: each report can have up to five key-phrases)

Key-phrase:	Count	%
Airfield procedures - non-standard	1	0.6
Airspace – allocation	2	1.2
Altimeter setting – QNH not set	4	2.4

Table 7   Breakdown of key-phrases (note: each report can have up to five key-phrases)

Key-phrase:	Count	%
Altimeter setting – uncertainty	1	0.6
ATC – attitude	10	6.1
ATC – busy frequency	17	10.3
ATC – dispute with	5	3.0
ATC – late clearance	1	0.6
ATC – provision of service	28	17.0
ATC clearance – misunderstood	7	4.2
ATC clearance – not understood	1	0.6
Charts – clarity	18	10.9
Charts – inaccurate	1	0.6
Charts – lack of detail	3	1.8
Cockpit Resource Management	8	4.8
Deliberate non-adherence to procedures	1	0.6
Distraction – equipment unfamiliarity	2	1.2
Distraction – equipment unserviceability	7	4.2
Distraction – flight handling	1	0.6
Distraction – instructing	3	1.8
Distraction – passenger	7	4.2
Distraction – traffic	3	1.8
Equipment inadequacy	2	1.2
Equipment unserviceability	5	3.0
Fatigue	2	1.2
Flight handling – altitude control	2	1.2
Flight handling – rate of climb	1	0.6
Glider site	1	0.6
GPS – database accuracy	3	1.8
GPS – lack of detail	3	1.8
GPS – reliance on	25	15.2
High workload	11	6.7
Inexperience – currency	2	1.2
Inexperience – equipment	2	1.2
Inexperience – general	22	13.3

Table 7 Breakdown of key-phrases (note: each report can have up to five key-phrases)

Key-phrase:	Count	%
Inexperience – location	5	3.0
Inexperience – type of flight	2	1.2
LARS – discontinued service	1	0.6
LARS – service unavailable	2	1.2
Navaids – location	1	0.6
Navigation – general	31	18.8
Navigation – map crosscheck	1	0.6
Navigation – map reading	14	8.5
Navigation – misidentified landmark	12	7.3
Navigation – misread flight plan	3	1.8
Navigation – navaid incorrectly set	9	5.5
Navigation – planned route close to CAS	10	6.1
Navigation – unsure of position	22	13.3
Navigation – visual crosscheck	12	7.3
Planning – inadequate	16	9.7
Pressing on without clearance	12	7.3
Safety information – inadequate	3	1.8
Training – flying abroad	1	0.6
Training – foreign syllabus	2	1.2
Training – interaction with ATC	7	4.2
Training – navigation	26	15.8
Training – R/T	9	5.5
Weather – general	14	8.5
Weather – icing	2	1.2
Weather – visibility	8	4.8

Table 8 shows a simplified list of key-phrases where the ATC, Navigation, Training, etc. key-phrases have been grouped together.

Table 8 Breakdown of simplified key-phrases

Keywords:	Count	%
Navigation	114	69.1
ATC	69	41.8
Training	45	27.3
Inexperience	33	20.0
GPS	31	18.8
Weather	24	14.5
Distraction	23	13.9
Charts	22	13.3
Planning	16	9.7
Pressing on	12	7.3
Workload	11	6.7
CRM	8	4.8
Equipment	7	4.2
Altimeter setting	5	3.0
Other	17	10.3

Figure 5 shows a graphical breakdown of the simplified key-phrases. Clearly, navigation was the major factor behind most infringements.
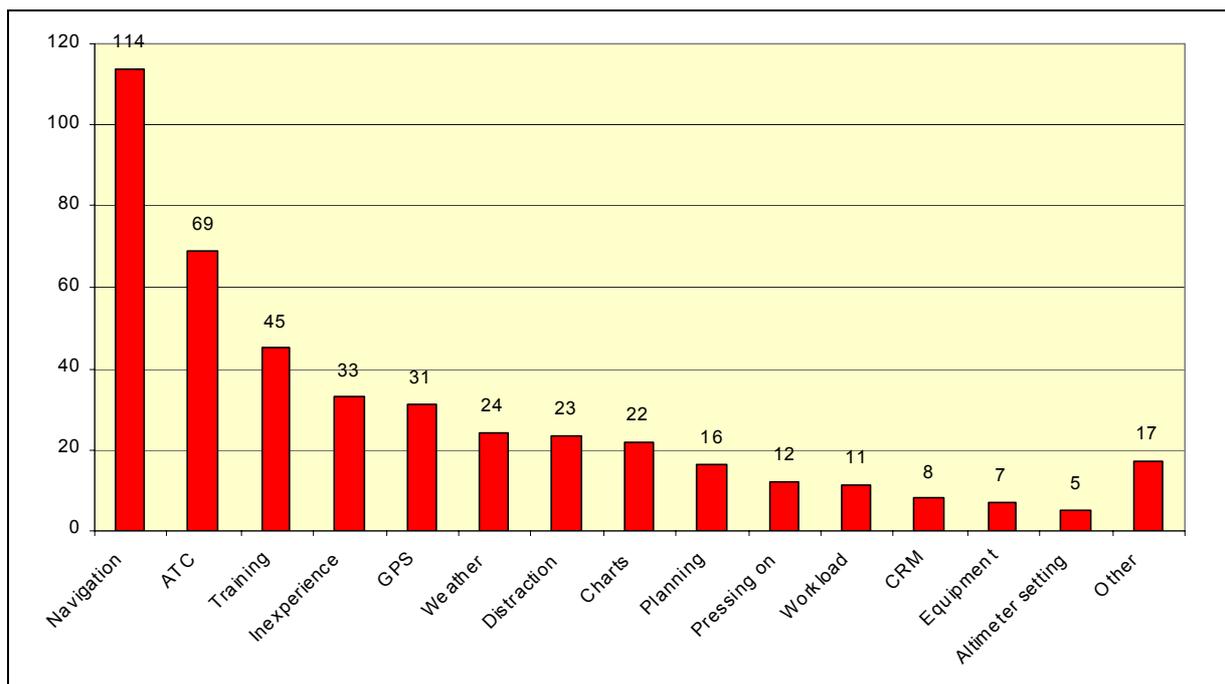
Figure 5 Breakdown of simplified key-phrases.

Figure 6 shows a graphical breakdown of the full key-phrases (for those key-phrases that were allocated at least 10 times).
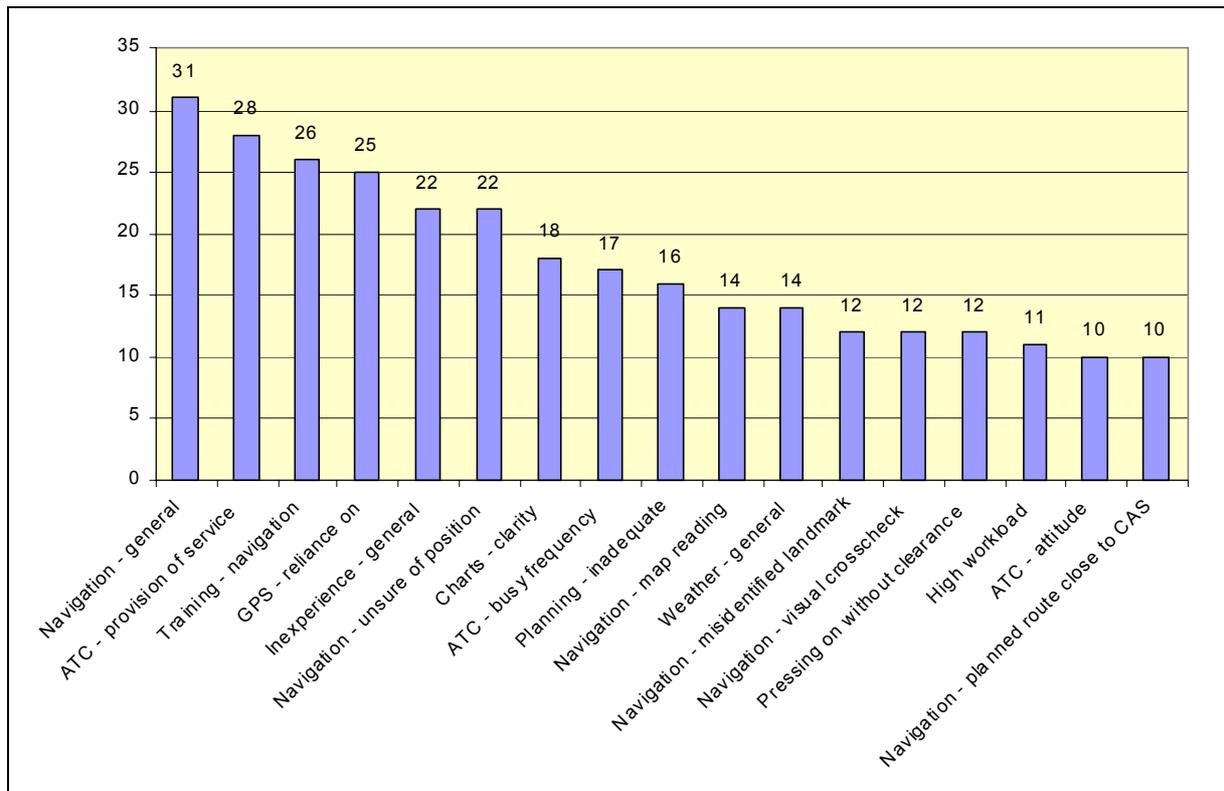
Figure 6   Breakdown of full key-phrases (for those key-phrases allocated at least 10 times).

7   Recommendations

Background

This section examines problems identified by pilots and controllers as contributing to infringements. The Project Team has formulated recommendations based on the many comments and suggestion received. Suggestions that are obviously impractical have not been included, but where rational opposing views on a topic have been received they have been included for balance.

The project has received input from a wide experience range of GA pilot, from the PPL, flying just a few "hobby hours" per year, to the professional corporate pilot or instructor. The inexperienced pilot is more likely to infringe, yet is unlikely to have a ready grasp of procedures or documentation; this pilot must therefore be given every assistance possible.

Historically, the UK Integrated Aeronautical Information Package (UK AIP) and associated documents undoubtedly provide many of the answers to some of the issues, but are rarely seen by the average inexperienced PPL, and cannot be relied upon in isolation. It is essential to recognise that a more enlightened, radical approach to customer communication, using modern technology is now required.

When considering the recommendations, it is important to keep this inexperienced pilot in mind, even to the extent of "spoon feeding" if necessary.

Undoubtedly some GA pilots should do more to improve their level of expertise on a self-help basis. However, they need all the help they can get from "the system" if

infringements are to be reduced. These recommendations highlight areas where Authority could provide that help.

7.1   **Airspace and ATC Issues**

Airspace Allocation and Policy should be re-examined. It has proved a very emotive subject with controllers and GA pilots expressing entrenched views; civil controllers would like more Controlled Airspace (CAS), whereas GA pilots believe there is too much already. The lack of communication between the two disparate groups has led to little appreciation of each other's problems.

The "On Track" website provided the first open forum for mature discussion of the airspace problem, with direct communication between pilots and controllers.

It is clear from the comments received that although many pilots are aware of the various consultation groups available to them, they have little confidence in the group's ability to achieve change. Pilots would be encouraged to join these associations if tangible results were more evident and widely publicised. Although it is theoretically possible for any pilot to propose an airspace change, in practice this is unknown and requires the pressure of an effective grouping.

Undoubtedly, website forums provide a valuable facility for direct pilot input on all airspace matters.

Many reporters felt that some Class A airspace could be converted to Class D with no consequential risk or inconvenience. It has been mentioned that work is being undertaken in Europe to look at the issue of airspace classifications.

Much comment received from visitors to the website indicated a perception that existing CAS was often inefficiently allocated and under utilised. Manchester, Birmingham and the London area, particularly around Stapleford, present ample infringement opportunities with a number of horizontal and vertical choke points produced by current CAS allocation. These restrictions would be alleviated by relatively small local adjustments to CAS, especially where actual utilisation is known to be low. Understandably, controllers avoid using those sections of CAS which are often infringed by GA, indicating that some relief may be possible in those unused areas without reducing safety margins. Historic radar replays may support any proposals for CAS reduction.

The existing Note 8 corridor route (Stansted – Stapleford – North Weald) is an example of vertical and horizontal restriction. It depicts conflicting flow arrows around a triangle, which is reportedly confusing and is not followed by many GA pilots. Procedures in this notoriously busy area need to be clear and unambiguous to avoid infringements. Moreover, it would be much safer if the base of the Stansted stub could be raised to 2000ft and local airspace boundaries trimmed where possible.

Several pilots commented that although the level of military activity had reduced in recent years, there has been no corresponding reduction in the allocation of military airspace and danger areas. The restricting extent of the Brize Norton CTR attracted particular criticism, although Brize Radar received considerable praise for their assistance on those occasions when a crossing was possible.

Aircraft which operate under a permit to fly are further restricted where Danger or Prohibited areas are adjacent to built up areas, which they may not overfly, obliging them to make a wide detour, or take a risk. The proximity of D136 and the Southend complex are an example of this problem, which could be alleviated by trimming the extent of D136.

There is a shortage of low-level VFR corridors to assist a safe passage. Corridors would benefit from a series of ground markers or unidirectional lights, which are known to work well in Australia and some European countries, are simple to install and require little maintenance.

VFR corridor procedures are not well known; they should be clearly explained with details shown on the map border or separate card. Australian VFR charts are a good example of clear corridor procedures and navigation detail depicted in the chart margin.

Many contributors supported the idea of aligning airspace boundaries and low-level corridors with prominent ground features wherever possible, with an allowance for any line feature to be offset to the left in accordance with rules of the air.

The great majority of contributors felt that base heights of CAS could be increased in many instances without impinging on commercial operations. This measure would help enlarge VFR corridors between zones, reducing choke points and associated infringements.

Some existing gaps between the ground and low utilised CAS were considered inadequate and dangerous for GA operation, especially in poor visibility when pilots report infringing as a result of climbing above safety altitude. An often-quoted example was between Ottringham and Manchester.

Several pilots complained about the illogical low base level of Airway N866 which overlies the very busy GA route between Southampton and the Channel Islands. This severely restricts the safe reception of navaids, and the Airway is regularly infringed. Pilots believe the levels could be raised to give better GA utilisation without adversely affecting the very few commercial aircraft involved. One London controller suggested, and many others agreed, that Lower Airspace Radar Service (LARS) could be provided to cover the area without difficulty using existing facilities.

Infringements of N866 would be reduced if more publicity were given to the use of the recommended GA VFR route from the Isle of Wight to Cherbourg. Many GA pilots are not aware of this route, which involves a longer overall distance to Jersey, but a shorter sea track to France and can be used up to FL100.

Issues surrounding N866 have been acknowledged and are subject to on-going discussion. DAP, in particular, has been examining N866 arrangements.

A VOR/DME at Alderney would be of great assistance to GA navigation and reduce infringements approaching the Jersey Zone. Cost effectiveness of such a measure would need examination.

A frequent complaint from GA pilots concerns the difficulty in obtaining Zone crossing clearances. Most complaints were about Stansted, but all zones were mentioned to a greater or lesser degree. The direct causes were a combination of poor communication and understanding between controllers and pilots, high controller workload together with a lack of usable airspace in the immediate vicinity of some zones. Although a post flight telephone explanation might promote a better understanding of the system, there is currently no formal procedure in place for pilots to record or follow-up refusals of service, highlighting the problem.

The use of Regional Pressure Settings (RPS) needs urgent review and justification for it's continued use. Several examples were quoted where RPS had led to vertical infringement of CAS; the use of a local QNH would have been safer.

Problem Statements and Recommendations:

1 Problem Statement   The views of individual GA pilots are not always represented by the GA groups which participate in the airspace consultative processes.

Recommendations   a) Pilots should be encouraged to join representative groups to enable their collective voice to be heard.

b) Tangible results achieved by GA groups through consultation should be widely publicised to promote their credibility.

c) GA groups should be encouraged to use website forums to gain maximum pilot input and increase membership.

2 Problem Statement   CAS allocation restricts the area of free airspace between zones available for GA operations, creating traffic choke points and increasing infringement risk.

Recommendations   a) Allocation of all CAS should be re-examined with the specific aim of identifying those areas which could prudently be released to provide more airspace for GA aircraft to operate in safety and to reduce choke points.

b) Radar replays should be made available to identify low utilisation of CAS.

c) GA pilots should be consulted to identify individual areas which are unnecessarily restricted by CAS and which could be eased by trimming boundaries.

3 Problem Statement   Airspace boundaries are not always visually identifiable to VFR traffic due to lack of associated ground features.

Recommendation   Airspace boundaries and low-level corridors should be aligned with prominent ground features wherever possible, with an allowance for any line feature to be offset to the left in accordance with rules of the air.

4 Problem Statement   Low base levels of under utilised CAS restricts GA operations, especially over high ground and on longer over-water transits.

Recommendation   CAA should consult with GA operators to identify all the "Base level problem areas", and take action to raise CAS levels where possible to permit safer GA operations underneath.

5 Problem Statement   VFR corridors and their procedures are not well understood, in particular the Note 8 example near Stapleford.

Recommendation   a) Corridors should be more clearly shown on the chart and procedures detailed on the map border or a separate card in easily readable font size.

	b)	Low-level corridors should be marked by unidirectional ground lights or markers where practical.
6 Problem Statement		Pilots often have difficulty understanding why a zone crossing has been refused and have no formal method of registering the refusal.
Recommendation	a)	Controllers should give a clear reason for refusal of service at the time of the request, or by arranged post flight telephone contact.
	b)	A formal procedure should be introduced to enable pilots to record refusals of ATC service to highlight and quantify the problem. Feedback to the pilot could also promote better understanding of service limitations.
7 Problem Statement		Use of RPS produces vertical infringements.
Recommendation		Withdraw the use of RPS in favour of Local QNH.
8 Problem Statement		The low base level of Airway N866 is too restrictive and has led to infringements on the GA Channel Islands route.
Recommendations	a)	Review the current commercial utilisation of N866, raise the base level and provide LARS coverage to the Channel Islands.
	b)	Install a VOR/DME at Alderney if cost effectiveness allows.

7.2 Lower Airspace Radar Service (LARS)

Lack of a comprehensive LARS was a circumstantial factor in many infringement reports, and where LARS was available it was often cited as the reason why an infringement was avoided.

GA aircraft are viewed as non-revenue customers by ATC providers. However, GA pilots perceive the VAT on AVGAS as their substantial contribution towards the cost of ATC service, whereas in reality the tax element is absorbed by the Treasury General Fund.

There is overwhelming support for LARS, especially in the areas around London, Manchester and Birmingham airports. The congested airspace around the Stansted / Luton / Stapleford area was singled out for the priority allocation of a specific GA radar facility. This measure was very well supported and quickly attracted the nickname "Rat Run Radar", which accurately portrays its proposed function.

Some pilots expressed concern that two of the most popular GA routes - Channel Islands and Cross Channel - had very limited radar cover. Additionally, most military LARS units close at the weekend, when GA activity is usually busiest.

Controllers report that some areas are overlapped by adjacent LARS units, which could be rationalised to provide improved service elsewhere.

They also indicate that decisions are often taken at local ATC management level not to provide a LARS service, as they are not established to do so, even though the capacity to provide a service exists on the day. Financial and establishment implications were cited as the reason for this policy, which may appear to manifest itself as a "quiet frequency", yet no service for the pilot.

The policy regarding provision, funding and availability of LARS units is not fully understood by many GA pilots.

The current lack of LARS appears to encourage over dependence on GPS, resulting in some pilots planning to fly very close to TMA boundaries, often with no planned R/T contact.

Many pilots suggest that a "Flight Following" or "Listening Out/Monitoring" service would enhance safety when a full LARS may not be required by the pilot or available from ATC, perhaps due to workload, etc. A nominated transponder code matched with an R/T frequency would provide a minimal monitoring facility by indicating the aircraft and frequency being monitored. This would not require additional or dedicated codes or frequencies. Pilots are keen to speak to ATC when transiting close to a CAS boundary; they would rather contribute to the controller's situational awareness and avoid an infringement than remain unidentified and unpredictable.

Furthermore, when pilots who are not receiving any ATC service infringe airspace, more traffic disruption and increased risk occurs when the pilot cannot be contacted by R/T. Controllers are then obliged to track the aircraft to its landing airfield for follow-up action, further increasing their workload. The use of basic "Listening out on this frequency" related transponder codes would help prevent such situations developing. Any controller would thus be able to observe the squawk and immediately be able to contact the pilot on the associated frequency should the need arise.

The procedure could be extended to include VFR corridors and other instances where aircraft may not wish to speak to ATC but would like to indicate the frequency being monitored.

Many GA pilots use London Information, often as an apparent substitute for a basic LARS, although there is no radar facility. One London Information Controller helpfully pointed out that they could liase between the pilot and the local LARS controller to arrange a service. This provoked some discussion, which revealed a lack of knowledge of the range of service available. Suggestions often centred on enhancing London Information to include a UK radar capability.

Some ATC units have arrangements in place with local GA airfields, encouraging pilots to call by telephone before departure. Other units have pre-arranged procedures for identifying and coordinating aircraft on departure from local strips. These proactive ATC measures show a commendable level of support and flexibility, and should be promoted whenever possible. ATC units and their local clubs and airstrips should be encouraged to set up focus groups to achieve any benefits which could be gained from coordinated procedures.

The poor standard of R/T and unfamiliarity with LARS procedures displayed by some GA pilots was perceived to discourage controllers from granting a service, with reports of inappropriate, discourteous comment by ATC. This problem is highlighted in the Training section 7.8.

Other reports detail occasions where a controller instructs the pilot to "standby and remain clear of CAS" and then either fails to return to the waiting pilot within a reasonable time, or refuses to provide a radar service. Pilots who had assumed a service would be available are then faced with a short notice re-route, which often results in an infringement.

Many infringements occur when an inexperienced pilot mistakenly assumes clearance to enter CAS has been given simply by establishing contact with ATC, often at a late stage and very close to the airspace boundary. The pilot continues on track

whilst awaiting a reply and is invariably surprised when informed of the infringement. Improved publicity and better understanding of the correct procedure would guard against this error.

There is also a perceived attitude of mistrust between GA pilots and controllers, which is almost totally absent at the professional level. Some GA pilots believe that controllers often appear unhelpful, especially when zone crossing clearances are requested. A sharp R/T response from ATC often precipitates a downturn in pilot confidence, rapidly destroying any rapport with the controller and increasing risk of infringement.

In turn, some controllers regard GA pilots as poorly trained, lacking in competence and an embarrassing risk to a safe, commercial operation. These negative viewpoints result in a reluctance to request or grant a service. However, several positive measures have been suggested to improve interactivity between pilots and controllers to overcome this problem.

Case Study: (Pilot Reported)

I ran into un-forecast IMC near the Stansted Zone. Cockpit workload was high but with the benefit of a very friendly RAS from Luton vectoring me away from some of the worst weather I managed perfectly well. Might this have become another infringement if anxieties had grown as a result of not being on radar? Surely in some of the most congested airspace in Europe light aviation needs a more comprehensive and full time LARS, especially if we are all going to have to stump up for the high cost of mode S.

Problem Statements and Recommendations:

1 Problem Statement   There is Insufficient LARS coverage for GA requirements.

Recommendations   a) Increase the number of LARS ATC units, especially in known Hotspots and choke points, with adequate weekend coverage.

b) Provide a specific LARS in Stansted/Luton/Stapleford area.

c) Improve LARS coverage in areas where cover is limited (Kent and Channel Islands transit routes).

d) Rationalise LARS more efficiently to prevent overlapping.

e) Re-instate Gatwick LARS trial, interrupted in the late 1990s.

f) Upgrade London Information to provide a UK radar service.

g) Introduce a US-style Flight Following or Listening Out/ Monitoring service, with allocated R/T frequencies and transponder codes to readily identify and provide access to aircraft operating nearby.

h) Allocate transponder codes for use in VFR transit areas and when operating close to CAS.

2 Problem Statement   LARS and zone crossing procedures are not fully understood by many GA pilots.

Recommendations	a)	Introduce pilots to LARS at an early stage in the PPL training syllabus. (See Section 7.9)
	b)	Encourage pilots to visit their local LARS provider.
	c)	Produce a training video and booklet illustrating the correct LARS procedures and how to benefit from the system.

3 Problem Statement   GA pilots often feel excluded from the ATC system.

Recommendations	a)	Controllers should be alerted to the damaging effect of disparaging remarks made to GA pilots on the R/T, increasing risk of infringement.
	b)	CAA and NATS should mount a joint education programme by promoting seminars, safety evenings and the use of videos to bring pilots and controllers into greater face to face contact. This works well at a commercial level and would deliver improvements for GA and ATC.
	c)	ATC units and local clubs should be encouraged to implement mutually beneficial coordination procedures.
	d)	Controllers should be invited to visit and fly with local clubs as part of a formal GA orientation programme.
	e)	Local LARS controllers should be invited to participate in GAD Safety Evenings at user airfields where any perceived issues of ATC shortcomings should be addressed.
	f)	Publicity should be given to clarify the funding, provision, availability and priority of LARS.
	g)	NATS should be invited to openly define the policy on LARS provision by ATC units not established to do so, when capacity exists on the day.

7.3 Maps and Charts

Maps and Charts proved to be a fruitful area for infringement reducing ideas. Most pilots prefer the ½ million charts, with only a minority choosing the ¼ million scale, usually due to their own instructor's preference or the low speed flown by their aircraft.

Infringement problems associated with maps and charts stem from lack of clarity, failure to understand the presentation, map currency and availability.

The project team were most impressed by the proactive response generated by DAP (AC&D) who actively monitored the project website, quickly evaluating and implementing suitable measures.

Several chart presentations were evaluated at the PFA Rally with mixed response.

Existing VFR charts received many favourable comments following recent improvements, although a steady flow of suggestions continued throughout the project and were being evaluated by the VFR chart editor. Problems continue to be experienced where the changing vertical limits of CAS are misread, usually confined to busier areas of the chart.

Early suggestions for computer generated, on-line charts to be freely available from the Internet were noted. This in turn resulted in a direct input from the Australian CAA who dispatched CD-ROM charts and accompanying paper VFR guides now in use when flying around their major cities. The CD-ROM included slant photographs of Visual Reference Points (VRPs) and other features with animated commentary on procedural aspects. These products were also available for free download and local printing. The Australian VFR guides and CD-ROMs received high acclaim from all those UK GA pilots who viewed them, with a strong request for a similar product to be made available in the UK.

Again, DAP displayed commendable resourcefulness by producing on line charts of the areas around Manchester and London, showing the low level VFR corridors and associated airspace restrictions. Although slant photographs are possibly more effective, VRP overhead photographs are currently being used in the prototype version. AIP information is also selectable when viewing the chart. Any images may then be printed from a computer.

The UK on line charts, trialled on the CAA website, were met with universal approval and are now freely available for use. Additional areas will be included to cover known hot spots around Southampton, Birmingham and the Edinburgh / Glasgow concentration.

The technology theme was developed on the project website with several suggestions urging an interactive CD-ROM based fully printable UK VFR chart, in addition to the current paper version, at a suitable retail price. The facility to select an appropriate level of CAS information should be included. For example, pilots planning to fly below FL50 could print a map only showing CAS detail relevant to their requirements. A minimum level of CAS information should be provided to guard against insufficient safe data being presented. This would enable individual areas to be printed as required, and would be ideal for Flying Schools and clubs with repetitive routes. Generally, large ½ million maps were regarded as unwieldy in a small cockpit, but A4 sections would be more acceptable and assist navigation.

Further suggestions promoted the publishing of reduced area VFR charts, covering "the London area", concentrating on improved clarity and presentation, possibly using an enlarged scale.

A review of local VRPs is already being undertaken in response to many suggestions that some VRPs were being used by ATC which did not appear on the chart. The use of aerial photography would further enhance the identification of VRPs.

Problem Statements and Recommendations:

1 Problem Statement	The present system of paper maps and charts does not make full use of available technology.
Recommendations	a) Introduce a range of low cost interactive CD-ROM based maps and charts, where the pilot may select individual areas for printing using a variety of scales, information and CAS presentations.
	b) Develop the use of slant photographs for VRP recognition.
	c) Produce a free downloadable VFR guide based on the Australian model. This guide should include coverage of the VFR corridors and infringement hotspots. A ring bound paper version should be available for purchase.

2 Problem Statement   Pilots experience problems with chart presentation and clarity.

Recommendations   a) Produce single London area maps below FL100 or FL55.

b) Standard maps unwieldy – consider downloadable A4.

c) Include low level route guidance notes in the map margin.

d) Better selection of corridor VRPs.

e) Give wider publicity to the application procedure for showing individual farm strips and disused airfields on charts.

f) Produce farm strip GPS co-ordinates with Lat/Long on a chart card.

g) Use more distinct colours for road designators on ¼ mill chart.

h) Show runway layout on every active airfield.

i) Show ICAO airfield codes and frequencies on ½ mill chart.

j) Include GPS coordinates wherever practical to assist the use of VFR transit corridors and other suitable areas.

k) Show Morse Code ident adjacent to navaids.

7.4 Aeronautical Information Circulars (AICs)

Infringements in this category were the result of misunderstanding the content of an AIC or failing to read an AIC, particularly where a Temporary Restricted Area (TRA) is established.

Although most AICs have limited association with infringements, those which detail Fly-in and Rally procedures attracted much criticism. More reference should be made to the availability of on line information where applicable, using banner style promotion in addition to any references within the text. For example, the 2002 PFA Rally AIC had a good quality colour downloadable map available which few pilots managed to access on line as it was not effectively publicised. Instead, the smaller monotone map contained within the paper version of the AIC was used by many pilots despite the displayed warning "not to be used for navigation".

There were reported difficulties gaining access to AICs, particularly by those pilots not associated with club flying.

The standard of pre-flight briefing varies considerably depending upon available facilities and the willingness of the pilot to persevere with the current system.

Case Study: (Controller Reported)

So far during the operation of the Farnborough TRA I have probably averaged three out of four inbound aircraft to XXX (airfield) who have called for joining instructions from a position that would obviously take them through the TRA controlled airspace. I have asked all these to immediately call Farnborough first and then get back to me. Many have thanked me on arrival because they would have otherwise violated the TRA. All admitted that they had no knowledge of it at all and many

admitted that they did not bother with NOTAMs because they were too difficult to get or to understand. Not everyone has a PC to get them easily.

Problem Statements and Recommendations:

1 Problem Statement   The complexity of AIC presentation means that there is a high chance of misunderstanding by inexperienced pilots.

Recommendations   a) Emphasis should be placed on common English presentation, avoiding abbreviations where plain language would be more easily understood.

b) AIC authors should actively seek user feedback to identify and avoid areas of misunderstanding.

c) On-line versions of AICs should be widely publicised, especially on the paper version where the website download is currently given no mention. The use of effective banner style headlines on the AIC in addition to text references should promote on line information.

d) On line AICs should take full advantage of expanded presentation, colour and font sizes to enhance readability.

e) High quality colour maps should be freely available and downloadable on-line to assist navigation specific to each event, fly-in or Rally.

2 Problem Statement   AICs are not readily available for those pilots who do not visit a flying club before flight or have no computer access.

Recommendations   a) Consider the use of Teletext to publicise a timely list of AICs and associated TRAs in a basic format, which could alert the pilot.

b) Encourage airfields to alert pilots to the presence of any local airspace restrictions by the use of prominently displayed posters or other suitable method.

c) Ensure that important AICs include a reference to the availability of a simple colour downloadable A4 size poster version for display at airfield and club dispatch facilities. Some ingenuity would be required to ensure eye-catching effectiveness.

7.5   **NOTAMs**

NOTAMs attracted similar comment to AICs regarding clarity of presentation and ease of understanding. Inexperienced pilots report that the present style and content of NOTAMs renders them difficult to decipher, to such an extent that many pilots give up and accept the risk of flying with inadequate preparation. Whereas commercial organisations present their pilots with sifted and readily digestible information, GA pilots rely more on individual interpretation, and make the valid point that NOTAMs should therefore be aimed specifically towards GA use. There is clear demand for the use of plain English wherever possible, avoiding abbreviations and other specialist or complex terminology. An effective customer feedback facility would be vital to ensure continued improvement in this area.

The urgent requirement for an easy to use, internet based NOTAM facility was identified at an early stage, and this would have been an important "On Track" recommendation.

It therefore came as welcome news when AIS announced the launch of their new AIS Dynamic Information Management System (ADIMS) on19 August 2002.

Unfortunately, ADIMS was not at all well received by GA pilots, and the "On Track" website rapidly gathered much adverse comment. In fact the NOTAM thread provided the largest input by far to the' Your Say' forum.

The main concerns with ADIMS were:

a) Inadequate pre launch publicity.

b) Insufficient consultation with the GA customer before and after launch.

c) Inflexible and complex user input format based on IFR flight plan requirements.

d) Inadequate output format that failed to meet normal GA NOTAM requirements.

e) No pre launch trial. Obvious difficulties were not identified until too late.

f) The system 'crashed' regularly, and lacked an effective backup facility.

g) User registration caused difficulty, with slow and irregular access.

h) The provision of the old A1/A8 NOTAM was withdrawn immediately.

i) Excess of irrelevant information. A full FIR brief ran to 40+ pages.

j) Poor customer interface. An open forum facility was required instead of a usually aloof, mute response to feedback or suggestions.

As a result of these shortcomings, most of which remain to be resolved, many GA pilots report flying without a pre-flight NOTAM brief, significantly increasing the risk of infringements.

Eventually, in November 2002 DAP, the designated regulator for AIS, called a meeting of AIS and GA representatives to discuss the ADIMS problem and identify improvements. An "On Track" team member attended as an observer.

Problem Statements and Recommendations:

1 Problem Statement		Inexperienced GA pilots find NOTAMs difficult to understand.
Recommendations	a)	NOTAMs style and presentation should be reviewed to ensure that plain English is used wherever possible, avoiding technical abbreviations and other terms likely to confuse GA pilots. A GA extension, using plain English and geographical position references, could be added to the standard NOTAM to promote better understanding.
	b)	GA pilots should be acknowledged as the major direct user of raw NOTAM information.
	c)	An effective NOTAM feedback facility should be devised to develop a more customer-driven system.
2 Problem Statement		ADIMS site does not operate effectively.
Recommendations	a)	The Site should be split over two servers to reduce the load on the current server, to improve reliability and to ensure that updates are more easily handled.

b) Input and results pages should to be presented in a user-friendly format.

c) Sign-in registration procedure requires simplification with prompts.

3 Problem Statement   Displays on briefing boards at flying agencies are not standardised.

Recommendations   a) Instructions for use of bulletins should be available as a printable download from AIS.

b) Bulletin validity should be from 0600 UTC on day of issue to 1200 UTC the following day, allowing a 6 hour window for aerodrome operators to download and display a new briefing with no data loss.

c) Two en-route bulletins should be made available. One covering flights up to FL120, and the other for all flight levels. Both VFR and IFR information would be included.

d) Bulletins should be in format to allow printing by the widest range of users without unduly increasing download time.

4 Problem Statement   No download of raw UK NOTAM data available for users to devise their own systems for selecting, sorting and display of data to cover activities not met by the current site design. For example FTOs need a graphical presentation (possibly using circular coverage based on their home airfield).

Recommendations   a) A file for each of the three UK FIRs containing raw NOTAM data should be made available for daily download by registered users.

b) The AIS website should contain downloadable and printable description of the file format. Each data item in the ICAO NOTAM message should be automatically placed in a separate field.

c) The file should be made available for download by 0600UTC each day.

d) The file should include all NOTAM affecting the selected FIR valid from 0600UTC on the day of issue to 2359UTC on the eighth day following, thus allowing users to plan activity up to 7 days ahead.

7.6   **GPS**

GPS is used by a large number of GA pilots and they report with enthusiasm that its accuracy, performance and reliability are excellent. As GPS was clearly an early issue, the Project Team established contact with a major GPS manufacturer to establish common areas of concern. Unfortunately there is little official recognition of GPS in the UK, unlike the US where the training and operation of the equipment is formally approved within the GA community.

It is therefore not surprising that with this informal use of a wide variety of GPS equipment, its potential benefits have not yet been fully realised within the infringement context. However, it is important to remember that GPS should only be used as an aid to other forms of navigation, unless specifically approved otherwise.

The following areas of concern were highlighted:

a) Battery failure, unintentional aerial disconnection and poor internal aerial reception were cited as the causes of poor reliability and performance. These difficulties are absent when the equipment is correctly installed. GPS may be subject to random error from loss of signal, satellite availability, unintentional interference and multi-path reflections, but no reports of these problems were received.

b) Poor GPS programming standards. The system relies on correct data input, with effective cross checking against a map position to verify accuracy. Many pilots employ strict cross checking procedures before using GPS for navigation, whereas others accept the result without question. Manual data input without verification may produce wildly inaccurate navigation, which may remain undetected until an infringement occurs. The formal publication of GPS data whenever possible in support of other information would help reduce these errors. For example, a list of farm strip positions should be provided in GPS programmable format.

c) Inappropriate pilot operating procedures, especially use of the "go to" function. This is liable to occur following an off track deviation with a subsequent request to "go to" the original fix which may produce an infringement on the revised track.

d) Poor database accuracy. This is either due to incorrect depiction or the absence of some CAS boundaries. American databases do not appear to cater for every UK airspace category. Moreover, the onus is on the pilot to maintain database currency by purchasing updates from the manufacturer. Manufacturers are reportedly reluctant to reveal detail of their updates, and no open forum exists to publicise any shortcomings. Formal CAA equipment and database compliance would eradicate these problems.

e) GPS instruction manuals are often complex and difficult to understand. In the absence of any formal training, this results in ineffective use of GPS by the inexperienced pilot and navigation errors occur.

f) Lookout is compromised as there is too much time spent with 'heads in cockpit' programming GPS.

g) Excessive reliance on GPS where it is used as the sole navigation aid with limited or no augmentation from map or other radio aids.

h) Because of the known accuracy of GPS, pilots report a greater willingness to "press on" in adverse weather, where previously they would have diverted when map reading was their main source of navigation. Pilots also plan to fly very close to CAS boundaries in the belief that GPS will deliver exceptional accuracy. In these circumstances, previous factors are compounded with little room for error.

GA pilots now have a greater dependency on GPS and there are clearly several training and operational implications with the introduction and use of this equipment. These are covered in detail in the Training section.

Case Study: (Pilot Reported)

Around midnight I'm programming the route for my flight next day into my GPS.

With the moving map, it's simple, just pan west, set up way points ...Stroud....Severn bridges....down the coast to Weston Super Mare. Then pan south looking for Dunkeswell....ah EGDW there it is. Done!

En route, feeling quite pleased with myself, weather calm, passenger happy,

controllers friendly. I'll freecall Dunkeswell when South of Weston Super Mare.

Not far to go now, GPS tells me I've ten miles to run, so I call in and receive a clear reply. No traffic to affect me. Runway 23. Now I can see the field and elect to make a straight in approach to 23. But wait a minute, I'm on a bearing of 23 now, but that looks more like 21. Yes, I can just make out the numbers now, 21. Damn, I'm lined up on the wrong runway. Still, no traffic to affect, so I head south for the approach to the next runway round. Stranger still, that is 27! I must have miss-heard him. Never mind, the wind is straight down 27 so I line up.....At which point a military helicopter flies directly underneath me and up the runway. Jesus Christ! I thought he said no traffic to affect me! "(Callsign) going around to avoid helicopter wash"....Christ, there's another one!

At this point, the controller asks me if I can see helicopter landing circles on the runway. I reply that I can. There is a moments pause before he informs me that he believes I am at Merryfield Military airfield and should call them immediately on 127.35.

What the? ...How?

I quickly change frequencies and blurt out an apology to the very calm local controller who tells me that all the choppers are visual with me and that I am clear to exit the zone. Two minutes later I am informed that my apology has been accepted and that no further action will be taken.

Maybe you spotted the error right at the start? EGDW is not Dunkeswell but Merryfield. Dunkeswell is EGTU. GPS Lessons learned!

Problem Statements and Recommendations:

1	**Problem Statement**	Some GPS databases are inaccurate and lack details of updating.
	Recommendations	a) CAA should implement a Compliance Certificate procedure to ensure GPS databases include accurate depiction of UK CAS limits.
		b) As part of the compliance procedure, GPS manufacturers should be required to provide details of amendment action for pilots to confirm database currency and accuracy.
		c) Publish list of compliant equipment and databases on CAA website and in GASIL, etc.
		d) Publish list of latest database updates on CAA website and in GASIL or similar publications.

2 Problem Statement   Installation of GPS equipment to meet acceptable standards to enable satisfactory performance.

Recommendations   a) Issue CAA Mod guidance and approval to cover specific installation of GPS equipment.

b) Include provision for backup power source for GPS.

3 Problem Statement   GPS instruction manuals are complex and difficult to understand.

Recommendations   a) GPS manufacturers should be required to produce more user friendly instruction manuals and seek customer feedback.

b) The compliance procedure should include this aspect.

4 Problem Statement   The risk of GPS programming errors is increased by the lack of readily available GPS co-ordinate information, and guidance on the correct verification procedure following manual data entry.

Recommendations   a) Safety information containing position details (NOTAMS / AICs, etc.) should be published with the GPS user firmly in mind, and include GPS co-ordinates wherever possible.

b) The correct GPS verification procedure, following manual input of position information should be widely publicised.

7.7 GPS Training

In addition to the items raised in the GPS section, there is major concern that GPS training should be formally recognised with an approved course of instruction. It is clear that many GA pilots use the equipment incorrectly and do not integrate GPS with their other navigational aids or map. There have been many examples of infringements where pilots have planned to fly a direct track using GPS, were not given clearance through controlled airspace and infringed while trying to re-route. There have even been reports that a few pilots fly with GPS without carrying a map!

There is some informal GPS training in the UK but the majority of pilots learn about GPS solely through their instruction manual.

Known areas of concern highlighted in the GPS section are not practically addressed by the varied range of instruction manuals, resulting in poor operating techniques and the greater risk of error. Formal GPS training would promote correct techniques and reduce infringements.

Informed opinion is that GPS training should be given after issue of the PPL licence, possibly combined with the IMC training module. Additionally, there is a need to give guidance to those current GPS users who may not attend informal or formal training.

Problem statements and Recommendations:

1 Problem Statement   There is no formal guidance or training in the correct use of GPS.

Recommendations   a) CAA should issue training schools with a formal GPS initial training syllabus and issue course approval to FTOs[1].

1. CAA have produced a Safety Sense leaflet (SSL), also available in LASORS (Licensing, Administration, Standardisation, Operating Requirements and Safety) containing only informal guidance for Flying Training Organisations (FTOs) who wish to conduct GPS training.

b) A supplementary refresher syllabus should be designed to cater for those pilots already using GPS.

2 Problem Statement   Many pilots are unaware of the most effective GPS navigation techniques.

Recommendations   a) Training and refresher syllabus will partly address this issue.

b) Publicity should promote the use of correct GPS operating techniques, integrated with other navaids.

c) CAA should invite GPS industry to assist production of a free video/CDROM guide to safe GPS operating procedures.

d) Reinforce the legal requirement to carry a map at all times.

7.8   **R/T Training**

GA operators were asked to recall the effectiveness of their R/T training and to highlight areas of concern.

It was reported that R/T training does not have a high enough profile at Flying Training Organisations (FTOs) for the following reasons:

a) The training is viewed as an unnecessary chore and is given less priority.

b) The majority of current Flying Instructors (FIs) were also poorly trained and lack confidence; their students suffer accordingly.

c) The use of R/T is not always introduced at the very earliest stages of training, thus reducing student confidence and R/T capability.

As a result, pilots and controllers report that UK R/T standards are unsatisfactory, particularly when a low-hours pilot is attempting to communicate with an ATC agency. The problem is compounded when crossing controlled airspace, when the pilot's under confidence or lack of knowledge becomes evident to the controller, and results in refusal of service leading to an infringement.

It was reported that a significant number of very light aircraft pilots operate their radios with no R/T licence at all. They view the R/T Manual as too complex for their basic VFR flying requirement, and choose to opt out of the licence altogether.

The contents of CAP 413, which is the reference manual for the PPL R/T examination, are considered too comprehensive for the average GA pilot holding a PPL. An R/T Safety Sense Leaflet (SSL) provides limited information on the use of basic R/T.

Most pilots and controllers support the provision of a new modular R/T manual, more appropriate for GA PPL, micro light and glider operators, removing the detailed knowledge required by commercial pilots. The reduced volume of required knowledge would encourage more pilots to acquire a revised basic R/T licence.

N-PPL licence holders feel strongly they should only have to sit a national exam tailored to their limited R/T usage.

The requirement for a full R/T licence has been regularly challenged. A restricted modular R/T rating has been suggested for those limited airspace users such as balloon, glider and micro-light pilots. There is no doubt that pilots would be more likely to accept an initial reduced R/T licence appropriate to their VFR operation.

An important point raised by controllers was that all pilots should use only the initial message on first contact e.g. call-sign and request. This would increase the likelihood of receiving a service. The subsequent long message is considered too long and the CAP 413 Phraseology Committee has been asked to review its content.

Problem statements and Recommendations:

1 Problem Statement		R/T training syllabus is not a formal part of PPL training.
Recommendations		R/T syllabus should be included in PPL training with a recommended minimum of 16 hrs of formal ground instruction.
2 Problem Statement		R/T training is given a low priority within FTOs.
Recommendations	a)	Record all R/T exercises in training records.
	b)	A minimum number of MATZ/CAS crossings to be flown or simulated during training.
	c)	Interactive R/T aids which are now available should be used by FTOs.
	d)	Students should use the R/T at the earliest opportunity.
3 Problem Statement		A significant proportion of the current generation of FIs were themselves poorly trained in use of R/T.
Recommendations	a)	Flying Instructor Course (FIC) providers should enhance profile of R/T training for new instructors.
	b)	FI seminar providers should include a mandatory R/T update package to improve ability and confidence during the instructor renewal programme.
	c)	Flight instructor examiners (FIEs) should closely monitor instructor candidates for practical R/T usage and instructional ability.
4 Problem Statement		Incorrect use of initial and long R/T messages.
Recommendations	a)	Publicity should be given to encourage pilots to always use the initial R/T message on first contact with ATC.
	b)	The content of the long R/T message should be reduced by the CAP 413 Phraseology Committee.
5 Problem Statement		Some GA pilots R/T standards are poor.
Recommendation		GA pilots should receive periodic follow up training to improve R/T standards and confidence. Examples are:
	•	Club/FTO and CAA safety evenings.
	•	Biennial check or short review/update course.
	•	Review and simplify current R/T SSL.
6 Problem Statement		The current R/T licence is too complex for VFR pilots.
Recommendation	a)	Introduce a new GA restricted modular R/T rating designed for Balloon pilots, glider and micro-light pilots and other VFR pilots up to PPL and NPPL level.

b) Rewrite CAP 413, divided into separate sections in line with the requirements of a new modular R/T rating.

c) Introduce a more complex R/T rating to cater for the IMC/IR pilot.

7.9   **Navigation Training**

GA pilots were asked to assess the effectiveness of their navigation training and most thought that the basic training was barely adequate and in need of revision. For example, some pilots were simply handed a navigation manual to read, with minimal face-to-face instruction. PPL FIs reported that the current syllabus was only a basic list of exercises which gave little or no guidance to the instructor. A previous manual (CAP 528) gave good detailed information on all aspects of navigation training, but was written prior to JAR and was for commercial instructors only.

Only a few FTOs gave effective navigation instruction for flying close to, or crossing CAS. Many airspace infringements would have been avoided if pilots had been given a good basic education in operating near CAS. A disturbing factor is the lack of knowledge of some of the current generation of flying instructors. The level of instructor training also appears to have fallen short of an acceptable standard in this area.

Thus many pilots, particularly those who have recently gained their PPL, have problems trying to operate in this environment. Some FTOs have a geographical problem if not sited close to CAS; other training alternatives or simulation should be employed.

Some glider pilots were concerned at the lack of navigation training, although GPS is in widespread use. "Lead and follow" procedures should be encouraged at an early stage, especially when planning to fly close to CAS.

FIs were also concerned at the low number of hours allocated to navigation training, particularly in the N-PPL syllabus, which contains only 4 ½ hours dual navigation instruction out of a course total of 32 hours.

A lot of comment was received concerning the lack of any standardisation of navigational training and an urgent need for more emphasis on teaching the basic navigational skills. Many ex RAF and some current RAF pilots with PPL licences suggested that in the absence of any formal guide to navigation training, some RAF material could be introduced.

In essence, the potential for airspace infringements as a result of the low standard of basic navigation skills displayed by some GA pilots is significant enough to warrant a substantial review of their training. GPS (see the GPS section) is a complicating factor but there was strong feedback that the basics of navigation should be taught thoroughly at the PPL training stage.

Finally, some controllers commented on the CAA sponsored air experience during their ATC training. It was felt that some navigational training to include CAS transits should be included in their flying, to improve controller appreciation of the problems faced by the GA pilot.

Problem Statements and Recommendations:

1 Problem Statement   Navigation training within the PPL syllabus is inadequate.

Recommendations

a) Introduce a comprehensive PPL navigation training syllabus and detailed instructor guide for each exercise based on the CAP 528 format.

b) If CAA is unable to produce a syllabus and instructor guide then industry should be asked to provide.

c) RAF training manuals should be scrutinised to identify areas which could be adopted to improve the quality of GA navigation training.

2 Problem Statement   There are insufficient hours allocated for navigation training in JAR PPL and N-PPL syllabi.

Recommendation   Review both syllabi to allocate more hours to navigation training.

3 Problem Statement   Navigation teaching methods are not standardised.

Recommendations

a) CAA should introduce an effective standardisation system for navigation instruction.

b) FIC providers should standardise FI teaching in line with the proposed new syllabus and instructor guide.

c) Teaching guidelines should be published to include the problems associated with flying near CAS and anti-infringement measures.

d) FI seminar providers should align standardisation of current FIs.

e) FI examiners (FIE) should be required to include a navigation element in the FI skill test.

4 Problem Statement   Navigation training close to, or crossing CAS is minimal.

Recommendations

a) A minimum number of CAS/MATZ crossings should be included during training as a mandatory item.

b) Ensure students have sufficient R/T skills before navigation training commences.

c) Training should include practical application of LARS procedures and back-up measures to be taken when service is refused.

d) Gliding clubs should be encouraged to use "Lead and Follow" procedures during the initial training stages.

5 Problem Statement   GPS training is likely to complicate basic navigation training.

Recommendations

a) Only basic navigation techniques should be taught during PPL training.

b) GPS training should be introduced after PPL issue.

6 Problem Statement   Controller air experience flying does not give sufficient insight into GA navigation problems, especially near CAS.

Recommendations a) Air experience flying for trainee controllers should be tailored to illustrate the problems associated with navigation, CAS and LARS.

b) Air experience should include at least two CAS transits.

7.10 **A Use of Transponders**

The carriage and use of transponders provoked considerable discussion. Although many GA aircraft do not carry transponders, it was acknowledged that they would become more widespread in future, and many positive suggestions were put forward.

Many pilots, especially those with dual commercial or ATC experience, expressed surprise that so little ingenuity existed in the use of transponder codes within the GA operation. Moreover, there is a perceived reluctance on the part of authority to allow GA operators access to a greater range of transponder codes.

It was suggested by pilots and controllers that the application of more extensive codes would improve the service to GA, whilst delivering enhanced situational awareness to co-operating ATC units. Pre-allocated squawks associated with assigned frequencies, especially in known "hot-spots", were frequently suggested in support of a varied LARS or Flight Following/Monitoring service. As a minimum benefit, controllers would then be able to contact an aircraft on the listening out frequency allied with its squawk. This theme was developed to include event codes for Fly-Ins and Rallies, which would further improve safety. However, it is noteworthy that the 2003 PFA Rally application for a single event code was refused.

Locally agreed transponder procedures where GA pilots operate from strips inside or underneath CAS work well, and should be encouraged using local liaison groups. Unfortunately, there is a perception that ATC may not welcome an approach from GA, and such initiatives may require promotion from the local ATC unit, perhaps as part of a Safety Evening.

Much conflicting advice was reported on the correct use of transponders, particularly Mode C. Even flying instructors were unsure of the correct procedure. Some pilots are unaware of the TCAS safety benefits associated with Mode C, whilst others regard Mode C as a form of "spy-in-the-cockpit".

Following a GA user consultation process, a clear policy statement on the best use of transponders should be made as soon as possible, and given the widest publicity using booklets, press articles, etc.

Case Study: (Pilot Reported)

Navigating using VOR backed up by GPS, en route to Duxford. I had been receiving a FIS from Luton and was still using their squawk but was speaking to Duxford at the time of the infringement. Having crossed BKY I set course roughly east to intersect the M11 intending to follow it for a left base join at Duxford.

This 'digression' to the east was done purely visually. I greatly underestimated the wind and was blown into Stansted CTR. They contacted Luton who contacted Duxford who contacted me and told me of the infringement. I spoke by phone to Stansted ATC on the ground who were very friendly about the matter. This incident was basically an erosion of dead reckoning skills as a result of navigating by VOR and GPS and not thinking about the wind. Had I known enough about my GPS I could have

had it set to warn me of the proximity of controlled airspace as it has this feature.

However, the infringement was communicated to me and thus prevented from becoming worse by having just been in receipt of an FIS from Luton and retaining their squawk.

Problem Statements and Recommendations:

1 Problem Statement		Conflicting advice exists on the practical use of transponders.
Recommendations	a)	Clear guidance and publicity (booklet / video / Safety Evenings, etc.) should be given on the correct use of transponders, including Mode C, in the modern ATC environment.
	b)	Publicity including CDROM / Video should be used to promote the benefits of using Mode C, especially in relation to TCAS.
2 Problem Statement		The use of transponders by GA could be more effective in reducing infringements.
Recommendations	a)	Transponder policy should be revised to include more widespread use of codes by GA aircraft in designated areas, for example to compliment a LARS/Flight Following/ Monitoring service by indicating the listening out frequency in use.
	b)	Organisers of GA events, Fly-ins and Rallies should be actively encouraged to use allocated single event codes to improve safety.
	c)	Introduce dedicated squawks for VFR corridors, known hot spots and choke points.

7.11   **Licensing Issues**

There was agreement that infringements would be reduced if more pilots had some form of Instrument Rating (IR) beyond the Instrument Meteorological Conditions (IMC) Rating. This is due to the more comprehensive use of radio navaids and the higher level of experience and flying accuracy demanded when gaining an IR.

Acquisition of an IR by PPL holders is viewed as unnecessarily difficult, mainly due to the emphasis on commercial pilot (CPL) operations. This discourages many pilots from gaining an IR. Some suggestions were put forward to reduce the content of the PPL/IR syllabus and to increase its relevance to modern GA flying. A reduced version of the IR would be more attractive to PPL holders and likely to encourage upgrade beyond the IMC Rating.

Many pilots gain their IR abroad, typically in the USA, due to the higher cost of an IR course in the UK. Unfortunately, subsequent conversion to a UK IR requires almost all the syllabus to be repeated with very little credit given in recognition of foreign training. Greater credit for foreign IR qualifications would encourage participation and increase levels of expertise and safety.

Problem Statements and Recommendations:

1 Problem Statement   UK CPL/IR syllabus is too extensive for PPL requirements.

Recommendations   a) Review the current IR syllabus to produce a more GA orientated version for PPL holders.

                                    b) Review the IR ground syllabus for practicality and relevance to modern GA flying.

2 Problem Statement   Insufficient credit is given for foreign IR training.

Recommendations   a) Review the use of foreign IRs currently not recognised on UK registered aircraft within UK airspace.

                                    b) Provide a comprehensive credit system in recognition of foreign IR training and usage when converting to a UK IR.

7.12 Communication

Lack of knowledge and poor understanding of procedures contributes to infringements. Improved levels of communication could reduce some aspects of this problem.

Many pilots expressed the view that the CAA has yet to fully grasp advances in technology to improve communication with GA at all levels. Although the CAA website is seen as a step forward, some major improvements have been suggested.

Pilots perceive the general level of communication with the CAA to be poor. More resources and ingenuity are required to identify and implement practical means of disseminating useful, relevant safety information, which could help reduce infringements.

A friendly welcoming pack, specifically designed to get newly qualified pilots "on side" should be issued free when collecting their PPL, promoting an open style of communication and safety awareness from the outset. Although LASORS is a useful development and available to purchase cheaply, it is seen as essentially a licensing reference document by the new PPL. The smaller, more useful ORS section could be developed separately as a larger, free, stand-alone guide containing additional useful information.

Some aspects of communication, notably GASIL and GA Safety Evenings are very well received, but the need for an open review of policy and methods was clearly identified, as it is felt that more ingenuity could be used to get the safety message across. For example, the inclusion of a current LARS controller to speak at Safety Evenings would improve credibility and interest. However, the speaker should possess proven communication and diplomacy skills, as reports were received of one aggressive controller at a Safety Evening who succeeded in creating the wrong impression and alienating his audience.

The use of an independent "open forum" style website employed by the "On Track" Pilots to encourage free, direct discussion of infringement reducing measures was universally viewed as a very significant, inclusive move forward. However, current CAA policy does not permit an open forum facility for direct discussion between the CAA and its customer base.

Considerable disquiet was voiced at the prospect of losing this facility when the project ceased operation; the clear GA view was in favour of widening the forum as opposed to its closure.

Case Study: (Pilot Reported)

I called XXX (International Airport) ATC on take-off from a private strip located under their CTA and only 5 miles from their runway. I asked them to activate my Flight Plan with all the usual information. ATC advised that my Flight Plan had been activated. I assumed ATC had noted my position as I was squawking 7000 (no Mode C Fitted), and continued on track through their CTR in accordance with my Flight Plan. I was not told to remain clear. I continued passing 2.5 miles East of XXX looking out and listening to ATC in contact with other aircraft. I saw no other aircraft. (GPS working satis). I called XXX as I was leaving their CTR. They expressed amazement and told me I would be reported. I received a call from another aircraft saying I had caused him to divert.

Problem Statements and Recommendations:

1 Problem Statement		Information is difficult to locate on the CAA and NATS websites. On-line trial maps were promoted in the GA press and made available on the CAA website for download and feedback, but many pilots were unable to find them. The NATS website attracted similar comment when, for example, "no match" could be found for "NOTAM" or "ADIMS" in the search facility.
Recommendations	a)	Initiate an open review of both websites to provide easier access to information through improved search engines.
	b)	Encourage direct customer feedback to indicate areas of difficulty when locating information, and to improve site content.
2 Problem Statement		The CAA website is perceived to be more regulatory than safety orientated, with only a limited amount of practical information available for GA pilots.
Recommendations	a)	Consult the GA community to determine what they would like the GA element of the CAA website to provide.
	b)	Expand the GA section of the website to encourage GA pilots to use it as a starting point when seeking any safety information, by including practical detail and advice, whilst also focussing on areas which are known to cause infringements.
	c)	Incorporate hyperlinks to useful GA websites, including commercial safety information ventures. The inclusion of normal industry disclaimers would neutralise the issue of commercial endorsement by the CAA.
	d)	Provide a facility for downloading GA orientated safety posters and other infringement reducing information.
	e)	Attach a "GA suggestions box" facility – with an anonymous option to gain maximum benefit.

3 Problem Statement   Following completion of "On Track", there will be no "Open Forum" website for GA pilots to put forward valuable suggestions and ideas. It would be unfortunate if this unique opportunity for the CAA to continue direct communication with its customer was missed.

Recommendations   a) The CAA should urgently consider continuing the website facility to benefit from open discussion of safety related GA issues, along the proven lines established by "On Track".

b) The website should have the facility to contain an on-line questionnaire to cover infringement feedback, and any other issue required.

4 Problem Statement   Inexperienced pilots often have difficulty orientating themselves within the GA system when their initial training is complete.

Recommendations   a) A comprehensive, free information and welcome pack should be issued with every new PPL with an introductory letter and mission statement signed by GDSR. This should be viewed as a golden opportunity to deliver safety awareness and "burning issues" material to the new PPL holder. The pack should also provide useful information, contact addresses, telephone numbers and websites whilst promoting awareness of infringements and the MOR system.

b) A downloadable/ CD-ROM version of the welcome pack would keep it updated and available for wider access.

c) The ORS section of LASORS should be separately developed to provide a free stand-alone guide containing additional practical information.

5 Problem Statement   The CAA misses opportunities to publicise infringement-causing issues and to gain feedback.

Recommendations   a) Every direct contact situation should be evaluated for possible exposure to infringement reducing initiatives.

b) Most GA pilots visit FCL at SRG where the waiting area could be equipped with a non-intrusive continuous running safety video and other infringement reducing information. An infringement comments and suggestions facility would gather valuable feedback.

c) The "On Track" report should be examined to identify those recommendations which could be promoted by video/DVD distribution to clubs and organisations.

d) The availability of a comprehensive database of all GA clubs, operators and organisations would assist dissemination of safety information by the CAA.

7.13 CAA Investigation and Follow-up Procedure

Infringement reports are categorised upon receipt by SRG. Serious reports, particularly those which affect civil air transport, are passed to Aviation Regulation

Enforcement (ARE) for investigation and possible prosecution. The remainder are either closed on receipt or investigated by GAD or Flight Operations for possible follow-up action.

Infringement follow-up action by the CAA is perceived by GA pilots as over aggressive. Although pilots believe many infringers are subject to legal action, actual prosecution figures are very low (8 GA airspace infringement related prosecutions for 2001/2). However, the consequential fear of vigorous investigation and prosecution effectively counters any willingness of GA pilots to support open incident reporting of infringements.

ARE investigations are not regarded by GA pilots as positive safety contributors. Clearly, the ARE remit is to investigate breaches of Air Law, and to prosecute those pilots guilty of serious transgression. However, there is no safety feedback from their investigations, as the sole aim is to secure criminal prosecution rather than highlighting any safety issues.

Paradoxically, the most serious infringements that should attract the highest level of safety scrutiny and comment are then lost to any safety follow up system when they are passed to ARE for investigation.

Historically, all details of an infringement have been withheld where prosecution is likely, due to perceived legal constraints. However, given that it is possible to read detailed accounts of most court proceedings in the daily press, it appears unlikely that such secrecy is necessary, especially after the event. Specialised legal advice may deliver significant safety improvements as a result of a more transparent procedure.

Safety expertise should be included at the earliest stage of every ARE investigation, with the specific aim of identifying safety issues. Where applicable, lessons could then be learnt and published to help prevent a re-occurrence.

Pilots confirm that a more constructive attitude towards the GA community would facilitate the free exchange of information and ideas required to reduce infringements. An on-line facility for direct input of safety suggestions would be invaluable.

There should therefore be a change of emphasis to identify causal factors and provide solutions for the benefit of all pilots, rather than focussing upon each infringement as an individual lesson to be learnt.

There appears to be only limited infringement data available within the CAA. Whenever possible, causal factors should be identified and effectively recorded to promote safety analysis. Moreover, infringers should be actively encouraged to contribute preventative suggestions whenever possible, as part of a "no blame" culture when closing reports.

An "On Track" style of questionnaire covering all aspects of infringements, should be introduced as part of the normal CAA follow-up system and made available on-line for anonymous reports. This would improve data collection and provide the essential direct input from the cockpit.

Several pilots suggested the introduction of an appropriate graduated response to infringements by the use of a "card or points system". This should be similar to a driver's licence endorsement which would issue warnings to an infringer or licence suspension for fixed periods allied to the severity of the offence. An alternative option might be to allocate further "signed-off" training as a form of rehabilitation.

Surprisingly, there was strong support for heavy fines where blatant, irresponsible infringements had occurred; publicity of all such awards should be included in GASIL for deterrence, without revealing identities.

There is keen interest in gaining further information about the causes of infringements, especially "case history" reports with safety analysis, which would be useful examples for training organisations to illustrate the infringement problem to trainees. Such detail is currently unavailable, although a very basic précis of some events appears in GASIL. Disappointingly one highly reputable training company reported that their request for dis-identified infringement illustrations did not even receive a reply. The present GA feedback situation is in stark contrast to the publicity afforded to Airprox reports.

Periodic detailed feedback in safety publications would promote safety awareness and "lessons learnt" with appropriate expert discussion and comment. This could be developed to include video / DVDs available for distribution to clubs etc showing different infringement situations and the variety of follow up actions taken.

Problem Statements and Recommendations:

1 Problem Statement		The current CAA infringement follow-up procedure is seen by GA pilots as over aggressive and unhelpful.
Recommendations	a)	A more constructive attitude should be adopted towards GA pilots to facilitate a free exchange of safety information and ideas.
	b)	An on-line facility should be available for direct input of pilot and controller ideas, either on the SRG website or elsewhere.
	c)	There should be a change of emphasis to focus on causal factors and provide benefit for all, rather than address each infringement as an individual lesson learnt or punishment awarded.
	d)	Effective publicity should accompany any change of emphasis to encourage participation.
	e)	CAA should employ questionnaires to gain maximum safety feedback during each investigation. A questionnaire should also be sent following closure of an infringement, on a "no blame" basis. An on-line version of the questionnaire should be freely available.
	f)	CAA should publish prosecution details and fines regularly.
	g)	A card or points graduated warning system or variable term licence suspension should be considered. As an alternative deterrent, further "signed off" training should be awarded.
2 Problem Statement		ARE investigations provide no safety feedback, emphasizing prosecution rather than safety solution.
Recommendation	a)	Legal advice should be sought to clarify the degree of safety follow-up permitted during or after criminal investigation or prosecution.

b) Whenever legally permitted, a safety expert should be included from the outset of every ARE investigation to identify any safety issues and take beneficial follow-up reporting action.

3 Problem Statement   There is insufficient detailed information available about infringements.

Recommendations   a) CAA should publish regular detailed reports of infringements, including safety analysis and any follow up action taken. Videos / CDROM versions should be distributed to clubs, FTOs and other organisations.

b) CAA should pass details of classic infringement reports to the aviation press in order to illustrate safety lessons learnt.

c) A series of publicity posters should be devised to keep up the momentum on infringement awareness.

8   Conclusions

Airspace Infringements are a potentially serious aviation hazard and occur when an aircraft enters CAS without clearance. An infringement can result from problems or combinations of problems associated with the pilot, the aircraft or the air traffic controller. In recognition of this potential hazard in relation to GA aircraft, CAA established the Airspace Infringement Steering Group (AISG) in 2001 which comprised representatives from SRG and DAP. The AISG coordinated the "On Track" project.

This report presents the work and recommendations of the "On Track" project which commenced early in 2001 with the aim: **'To identify the causal factors behind airspace infringements, and to make recommendations for safety improvements.'** A non-CAA project team of three pilots was appointed to collect detailed confidential data on **why** infringements occurred and to make recommendations to the AISG, based on comments and suggestions gleaned directly from pilots and controllers.

The initial 2 months of the project were spent preparing publicity, establishing a website and the method of data collection. The various GA and ATC organisations likely to have a view on infringements were invited to embrace the initiative. All 33,000 PPL holders on the CAA register received a personal letter from GDSR introducing the project, inviting support and guaranteeing confidentiality. A Press launch in August 2001 completed the preparation phase.

To achieve confidentiality, a number of assurances were given by the CAA who would only have access to dis-identified data. Other effective confidentiality arrangements were put in place by the project team and widely publicised. As a result, many reporters were keen and willing to discuss an incident, voice their concerns and offer possible solutions.

However, a significant number of pilots retained a genuine fear that any information disclosed might be used against them. Perhaps more surprising was that many were unaware of existing confidential reporting schemes. To counter this, the team encouraged anonymous reporting both directly and via the website forum.

"On Track" represented a completely fresh approach to the infringement problem, by directly inviting Pilots and Controllers to give their individual views. The GA community, Aviation Press and many controllers welcomed this approach as long overdue, but cautioned that its success would be judged solely on tangible results, and that the follow-up process would be closely monitored.

Despite the fears of many who cautioned against the use of internet open forums, the interactive website proved to be very popular for open discussion and advancing suggestions. The anonymous facility produced a commendably mature, frank exchange of views throughout the project with no hint of aggression. The aviation press were particularly helpful in promoting the website.

During the 18 month data collection period from July 2001 to December 2002, 165 infringement reports were researched by the project. Of these, 144 were 'infringements' and 21 were 'almost infringements'. Approximately half the reports were not formally reported to the CAA. In addition, the project team gathered further detail from pilots who had no infringement to discuss but wished to contribute their views.

The project received input from a wide experience range of GA pilot, from the bare PPL to the professional corporate pilot or instructor. The inexperienced pilot with less than 500 flying hours is more likely to infringe, yet is unlikely to have a ready grasp of procedures or documentation; this pilot must therefore be given every assistance possible. When considering the recommendations, it is important to keep this inexperienced pilot in mind, even to the extent of "spoon feeding" if necessary.

Historically, the AIP and associated documents undoubtedly provide many of the answers to some of the issues, but are rarely seen by the average inexperienced PPL, and cannot be relied upon in isolation. It is essential to recognise that a more enlightened, radical approach to customer communication, using modern technology is now required.

Undoubtedly some GA pilots should do more to improve their level of expertise on a self-help basis. However, they need all the help they can get from "the system" if infringements are to be reduced. The Section 7 Recommendations should be read in addition to these conclusions, as they detail the problems and recommend areas where Authority could provide that help.

If the safety benefits of this project are to be realised, it is vital that recommendations are viewed with an open mind, without automatically restating existing procedures which may not be delivering the required safety standards.

The significant findings from the project are:

- **Airspace Issues and LARS**

   Infringements often occur in areas where the amount of free airspace available to GA aircraft is restricted as a result of CAS Allocation. Airspace constrictions or "choke points", for example the Stapleford and Stansted areas are particularly prone to infringement. Although a number of consultation processes are underway, they do not reflect the strong concerns voiced by most GA pilots concerning the allocation of CAS against its effective use by commercial aircraft.

   GA pilots should be better represented and invited to participate in a further review of CAS allocation on a more balanced basis, taking into account the actual utilisation of the airspace concerned. Minor adjustments to CAS would produce significant benefits for all users.

There is overwhelming support for LARS, especially in the areas around London, Birmingham and Manchester. The congested airspace around the Stansted / Luton / Stapleford area was singled out for the priority allocation of a specific GA radar facility, and early action should be taken to achieve this aim.

Pilots reported difficulty in understanding why zone crossings clearances were so often refused without explanation. A formal procedure for pilots to register a refusal of service would quantify this problem, and provide feedback.

An additional level of service – Flight Following or Listening Out / Monitoring – based on the US model, would enhance safety when a full LARS may not be required by the pilot or available from ATC. This would employ nominated transponder codes matched to R/T frequencies, contributing to controller awareness and communication.

Many pilots gave examples where LARS had prevented an infringement. Others cited an over reliance on GPS when LARS was unavailable.

ATC providers view GA aircraft as non-revenue customers. However, GA pilots perceive the VAT on AVGAS as their substantial contribution towards the cost of ATC service, whereas in reality the Treasury General Fund absorbs the tax element.

There is a perceived attitude of mistrust between GA pilots and controllers, which is almost totally absent at the professional level. Airspace policy and procedures are not well understood by GA pilots who would benefit from a focussed education programme and improved publicity.

- **Maps and Charts**

  GA pilots were generally very satisfied with the current Maps and Charts following recent improvements, although problems still arise from misreading CAS boundaries. A significant number of modifications were proposed.

  The advances of modern technology now being employed by DAP AC&D in their production of downloadable on-line charts for the more congested areas was very impressive. Further opportunities are available to produce low cost interactive CD-ROM based charts, which could be marketed for individual printing of selectable data on a home PC.

- **AICs and NOTAMS**

  Infringements in this category were the result of misunderstanding or failing to read an AIC or NOTAM, particularly where a Temporary Restricted Area (TRA) is established.

  Emphasis should be placed on the use of common English and clarity of presentation, avoiding the use of abbreviations where plain language would be more easily understood.

  On-line versions should be widely publicised and make full use of the improved graphics and presentation available. Downloadable full colour maps and publicity material should be available on-line where applicable, with selectable customer options to cater for varied requirements.

  Although an on-line NOTAM facility was seen as a positive improvement, the launch of ADIMS was universally viewed as an inadequate product, poorly conceived and executed. The Open Forum provided a focal point for discussion of the problem, in contrast to the muted official response.

Urgent remedial action is required to bring this commendable initiative up to a standard acceptable for GA pilot use.

- **GPS**

    GPS is used by a large number of GA pilots who report with enthusiasm that its accuracy, performance and reliability are excellent. Unfortunately there is little official recognition of GPS use by GA within UK Airspace, and no compliance requirements exist.

    The potential benefits of GPS have not been realised within the infringement context. This is due to the informal use of a variety of equipment and incorrect programming techniques, coupled with some databases which inaccurately depict UK CAS. A wide-ranging UK formal compliance procedure would reduce infringements by improving the effectiveness and application of GPS.

    Formal recognition of GPS use would further enhance the benefits for GA pilots, for example, by including GPS co-ordinates whenever possible in navigation information.

- **Training**

    Poor training contributes to infringements, and the specific areas of Navigation, GPS and R/T training attracted particular criticism.

    Navigation training lacks any form of detailed instructional guidance or standardisation, and relies instead on instructor interpretation of the limited training syllabus. Unfortunately, Instructor training in navigation techniques is often poor, which results in a level of pilot instruction ranging from "read the book" to valuable effective teaching.

    A comprehensive review of all aspects of navigation training is required to produce a well-structured syllabus, detailed instructor guidance and an effective standardisation scheme.

    There is currently no formal guidance or training in the use of GPS, and many pilots are unaware of the most effective GPS navigation techniques. In view of the widespread and increasing use of GPS, there is an urgent requirement for a formal training syllabus with course approval to FTOs.

    There was widespread concern at the poor standard of R/T which is directly traceable to inadequate R/T training. Although controllers reported that a high standard of pilot R/T was more likely to produce a service, it was noticeable that R/T training had a low priority with FTOs. The majority of FIs were themselves poorly trained and lacked confidence; their students suffer accordingly.

    Some pilots operate their radios with no R/T licence at all. They view the R/T Manual (CAP 413) as too complex for their basic VFR flying requirement, and choose to opt out of the licence altogether.

    CAP 413 should be rewritten in sections to provide a selective modular R/T rating more suited to the varied requirements of GA pilots, ranging from VFR flight to full Instrument Rating.

- **Transponders**

    Many pilots, especially those with dual commercial or ATC experience, expressed surprise that so little ingenuity existed in the application of transponder codes within the GA operation. Moreover, there is a perceived reluctance on the part of authority to allow GA access to a greater range of transponder codes.

Pre-allocated squawks associated with assigned frequencies, especially in known "hot-spots", in support of a varied LARS or Flight Following/Monitoring service should be introduced. As a minimum benefit, controllers would then be able to contact an aircraft on the listening out frequency allied with its squawk. Event codes for Fly-Ins and Rallies would further improve safety. It is noteworthy that the 2003 PFA Rally application for a single event code was refused.

Much conflicting advice was reported on the correct use of transponders, particularly Mode C. Even flying instructors were unsure of the correct procedure. Some pilots are unaware of the TCAS safety benefits associated with Mode C, whilst others regard Mode C as a form of "spy-in-the-cockpit".

An education and publicity programme should issue clear guidance on the most effective use of transponders in the modern ATC environment.

- **Licensing Issues**

  There was agreement that infringements would be reduced if more pilots had some form of I/R. The more comprehensive use of radio navaids would confer a higher level of navigation accuracy.

  However, the present I/R syllabus has remained unchanged for many years and contains many aspects that GA pilots would never require. They are therefore discouraged from investing unnecessary expense in a full I/R.

  A modular I/R should be introduced to focus on GA requirements.

  Many pilots gain their I/R abroad, typically in the USA, due to the lower cost. Unfortunately, subsequent conversion to a UK I/R requires most of the training to be repeated with very little credit given.

  Greater credit for foreign I/R training and qualification should be given to encourage participation and increase levels of expertise.

- **Communication**

  Lack of knowledge and poor understanding of procedures contributes to infringements.

  Many pilots expressed the view that the CAA has yet to fully grasp advances in technology to improve communication with GA at all levels.

  More resources and ingenuity are required to identify and implement practical means of disseminating useful, relevant safety information, which could help reduce infringements.

  A friendly welcoming pack should be issued free to newly qualified pilots when collecting their PPL, promoting an open style of communication and safety awareness from the outset. Although LASORS is a useful development, it is seen as essentially a licensing reference document.

  Some aspects of communication, notably GASIL and GA Safety Evenings are very well received, but the need for an open review of policy and methods was clearly identified, as it is felt that more ingenuity could be used to get the safety message across.

  The CAA website is perceived to be more regulatory than safety orientated, with only a limited amount of practical information available to GA pilots. The GA section should be updated to include more practical detail and advice in an open style, including links to other useful GA sites.

The use of an independent "open forum" style website by "On Track" was universally viewed as a very significant, inclusive move forward. However, current CAA policy does not permit an open forum facility for direct discussion with its customer base.

Considerable disquiet was voiced at the prospect of losing this facility when the project ceased operation; the clear GA view was in favour of widening the forum as opposed to its closure.

- CAA Investigation and Follow-up Procedure

CAA Infringement follow-up action is perceived as over aggressive by GA pilots, although actual prosecution figures are low. The fear of prosecution effectively counters any willingness of GA pilots to support open reporting of infringements. A more constructive attitude towards the GA community would facilitate the free exchange of information and ideas required to reduce infringements.

ARE investigations are not regarded by GA pilots as positive safety contributors. The ARE remit is to investigate breaches of Air Law, and to prosecute those pilots guilty of serious transgression. However, there is no safety feedback from their investigations or highlighting of safety issues.

Paradoxically, the most serious infringements that should attract the highest level of safety scrutiny and comment are then lost to any safety follow up system when they are passed to ARE for investigation. Historically, all details of an infringement have been withheld where prosecution is likely, due to legal constraints. However, it is unlikely that such secrecy is necessary after the event. Specialised legal advice may deliver significant safety improvements as a result of a more transparent procedure.

Safety expertise should be included at the earliest stage of every ARE investigation, with the specific aim of identifying infringement safety issues.

Only limited infringement data is currently available. Whenever possible, causal factors should be identified and effectively recorded to promote safety analysis. Infringers should be encouraged to contribute preventative suggestions as part of a "no blame" culture when closing reports.

A questionnaire covering all aspects of infringements, should be introduced as part of the normal CAA follow-up system and made available on-line for anonymous reports.

CAA should assess graduated responses and penalties to infringements by the use of a "card or points system" leading to licence endorsement or suspension for fixed periods.

There was strong support for heavy fines where blatant, irresponsible infringements had occurred; publicity should be given to all such awards.

Case history reports with safety analysis are currently unavailable, although a very basic précis of some events appears in GASIL. The present GA feedback situation is in stark contrast to the publicity afforded to Airprox reports.

Periodic detailed feedback should be available to promote infringement awareness and "lessons learnt" with appropriate expert discussion and comment.

All recommendations made by the project team will be reviewed by the AIWG and appropriate action will be taken or continue to be progressed and monitored by the Group as long as necessary. Any requests for updates on progress should be made through the Head of General Aviation Department, Safety Regulation Group, Aviation House, Gatwick, West Sussex, RH6 0YR, UK.

Attachment 1

Safety Regulation Group
Group Director Safety Regulation

Dear Licence holder

'ON TRACK' - A CONFIDENTIAL AIRSPACE INFRINGEMENT PROJECT

You may be aware of CAA safety initiatives to increase awareness of airspace infringements, particularly by General Aviation aircraft. We have circulated posters, published articles in the aviation press and issued advice to reduce the likelihood of these incidents.

Although we have considerable infringement information through our MOR system, we have less detail on *why* they happen. An infringement report on its own is clearly a useful statistic, but of far greater importance is *why* it happened in the first place. It is only after we know *why* infringements occur that we can develop preventive strategies.

To improve our knowledge in this area, we have commissioned a team of three independent professional pilots to manage a data gathering and analysis project called 'On Track'. This non-CAA team will follow-up incidents by carrying out informal, <u>confidential</u> discussion with pilots and controllers who may have been involved. This will not in any way affect the current normal reporting arrangements. Additionally, the team will encourage any other direct, confidential reports and suggestions which may help GA pilots and improve controlled airspace integrity.

Regardless of how the Team receives its information, only dis-identified detail will be recorded. Because the sole aim of this project is to develop preventive strategies, and not to apportion blame, CAA access will be restricted to the dis-identified information.

Absolutely no personal details will be available to the CAA or to the reporter's organisation; anonymity is assured*.*

The success of this project will depend on the number and quality of reports received and I cannot over emphasise the importance of every pilot and controller being as open as possible. As the aim is to avoid infringements in the future, it is clearly in the interest of us all to support this safety project.

Yours faithfully

[signature]
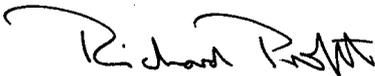
G R Profit

**For more detail visit the website at: <u>www.flyontrack.co.uk</u>
or contact the team on: 0800 328 0792**

Civil Aviation Authority
Aviation House 3W   Gatwick Airport South   Crawley   West Sussex   England   RH6 0YR   www.caa.co.uk

Attachment 2

Dear Fellow Pilot,

We are a team of three independent (non CAA) pilots, who have been asked by the CAA to have a fresh look at the whole subject of Airspace Infringements from the pilot's perspective, under a project entitled "On Track".

Although there is considerable information through the normal reporting system, less detail is available on *why* infringements happen. It is only after we know *why* they occur that improvements to "the system" can be made. "On Track" aims to collect as much of this detail as possible, to identify causes and promote suggested improvements.

How can we achieve this revolutionary approach? Well, for the first time, by listening to your recollection of the event and how it happened "off the record". We are writing to you directly as we understand that you may have possibly been involved in a recent infringement. Even if you did not actually infringe airspace, we are especially keen to hear **your** personal views and any recommendations **you** may have on the subject.

As all CAA follow-up action is now complete and the incident declared closed, we now invite your help. Please contact us at:

- **0800 328 0792**   Freephone or fax
- **www.flyontrack.co.uk**   Website – why not visit "Your Say" and join the debate!
- **flyontrack@onetel.net.uk** e-mail address
- **"Freepost Fly On Track"** No stamp required
- **www.chirp.co.uk**   Chirp will forward your info to us

When contact is established, one of us will constructively discuss the event with you.

Alternatively, you can still help by completing the enclosed questionnaire and send it directly to us in the freepost envelope. If you wish, please ignore any question you find uncomfortable or irrelevant. Even if you only complete the recommendations it will help.

The questionnaire is also available on our website for on line submission if you prefer.

Remember - we only record disidentified information and suggested remedies, not the "Who, Where or When". **Your identity is not recorded, and confidentiality is assured.**

Yes! Anonymous notes by freepost or e-mail are very welcome.

Yes! You can have a good idea without having any incidents – all inputs are appreciated.

We look forward to hearing from you.

Thank you

The Team Pilots

Attachment 3

PILOTS CONFIDENTIAL QUESTIONNAIRE

Please give as much detail as possible by ticking the boxes, adding any notes you wish. Include more information which may help us to understand why the event happened and, particularly, any suggestions for improvements. Please use additional sheets and attach diagrams/charts, etc. for clarification. If you are uncomfortable with any question, or it's relevance, just leave it blank.

Your report will be disidentified to preserve anonymity - your confidentiality is assured.

1. Month & year of event: ☐

2. Reporter: Pilot - Private ☐   Pilot - Commercial ☐   Other (state) ☐

    Pilot experience (approx) - total hours: ☐

    Licence & ratings held - please list: ☐

3. Aircraft type: ☐   Hired ☐   Owned/Group ☐   Other (state) ☐

4. The Flight was: Private ☐   Training ☐   Charter ☐   Schedule ☐   Other (state) ☐

5. Flight conducted (please tick all that apply):

    Under VFR ☐   IFR ☐   In VMC ☐   IMC ☐   Day ☐   Night ☐

6. Was weather a factor? Yes (detail) ☐   No ☐

7. Cockpit workload was: Heavy ☐   Moderate ☐   Light ☐

8. Did you require an ATC service?   Yes ☐   No ☐

9. Were you receiving an ATC service? Yes ☐   No ☐ Elaborate by ticking all that apply:

    Service refused ☐   Radar Control ☐   Radar Advisory ☐   Radar Information ☐

    Flight Information ☐

10. Was the ATC service you received adequate for your needs?   Yes ☐   No ☐

    If not - why not? Please comment on <u>any</u> ATC aspect:

11. Describe any distraction (e.g. training, passengers, unserviceability, weather, etc.):

12. How do you assess your own use of R/T during the event? Good ☐ Adequate ☐ Poor ☐

    If Poor, why was this? Lack of confidence ☐ Poor training ☐ Equipment problems ☐

    Other (please elaborate) ☐

13. Aircraft equipment (please tick all that apply):

    Radio ☐   Transponder ☐   Mode C ☐   Auto-pilot ☐   GPS ☐

14. Was Mode C switched on? Yes ☐ No (give reason) ☐

    Was Auto-pilot in use?   Yes ☐   No ☐   Not fitted ☐   Not working ☐

15. What method of navigation was in use at the time? (please tick all that apply)

    Visual with map ☐   GPS ☐   Navaids (VOR/DME/ADF) ☐   Moving map ☐   Other ☐

    Please give more details:

16. If GPS/Navaid/Moving map fitted, was it: Working ☐   Not working ☐   Switched off ☐

17. What training had you received in operation of GPS/Navaid/Moving map?

    Self taught ☐   Formally taught ☐   None ☐   Please give details:

18. My GPS training/instruction manual was: Adequate ☐   Inadequate (say why) ☐

    Give type/model of GPS:

19. Did the GPS show controlled airspace accurately?   Yes ☐   No (give detail) ☐

20. If map reading, what map was used? ½ Mil ☐ ¼ Mil ☐ State other:

21. Were map/charts current & accurate?   Yes ☐   No (give detail) ☐

22. Are your maps & charts easy to use?   Yes ☐   No ☐

    Please comment further:

23. Do you consider your basic navigation training: Good ☐   Adequate ☐   Poor ☐

    Please identify any inadequacies (syllabus content, quality, relevance, etc.):

24. Were you sure of your position at the time of the event?   Yes ☐   No ☐

25. Were you aware that you were infringing controlled airspace at the time of the event?

     Yes ☐   No ☐   Don't know ☐   It was almost infringed ☐

26. Was a report filed by you or ATC?   Yes ☐   No ☐   Don't know ☐

27. Where was flight planning carried-out?   Company ☐ Club ☐ School ☐ Home (internet) ☐

28. Was a Flight Plan filed?   Yes ☐   No ☐

29. Please give a brief, concise description of the event including route & approximate position:

30. What recommendations would you make to improve the system or to reduce the chance of it happening again - not only based on this event?

We also welcome any comments, suggestions or anecdotal notes you believe may be of help.

Thank you for completing the questionnaire and for your positive contribution to this Flight Safety project. If you agree to be available for further confidential discussion (if required and <u>only</u> with one of the Project Team Pilots) please enter <u>any</u> form of contact details here, including via someone else if you prefer:

Now please Fax this (free) to 0800 328 0792 or simply send to "Freepost Fly On Track" (no stamp required).

ON TRACK is a confidential airspace infringement project - listening to Pilots and Controllers, identifying the causes of infringements and suggesting possible solutions.

Website: **www.flyontrack.co.uk**   e-mail: **flyontrack@onetel.net.uk**   Freephone/fax: 0800 328 0792
                                                         Freepost: "Freepost Fly on Track"

Attachment 4

Attachment 5