

Safety Regulation Group
General Aviation Department

See Distribution List

19 May 2004
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Dear Colleague

**LETTER OF INTENT AND REGULATORY IMPACT ASSESSMENT CONCERNING
THE PROPOSAL TO AMEND THE UNITED KINGDOM RULES OF THE AIR REGULATIONS
1996 – RULE 5 LOW FLYING FOLLOWING THE SECOND STAGE OF CONSULTATION
DATED 25 JUNE 2003**

1. Introduction

In recent years, the CAA has become increasingly aware of a need to revise the Low Flying Rule (Rule 5) contained in the United Kingdom Rules of the Air Regulations 1996. Firstly, there is a general view that the current rule is long, complex and, potentially, difficult to understand and, secondly, it is at variance with the parameters used in the international rules of the air contained in ICAO Annex 2.

2. Consultation

Because of the complexity of the task, the Civil Aviation Authority conducted two rounds of consultation. The first letter of consultation dated 11 November 2002 was sent to over 1,000 interested parties and was also made available on the CAA website. 267 replies were received from interested parties which, after analysis, led to the issue of a second letter of consultation on 25 June 2003 in answer to which a further 43 comments were received.

3. Analysis

Following the end of the second period of consultation, the latest 43 responses have been analysed in the attached Regulatory Impact Assessment and the proposal has been modified accordingly.

4. Intention to Proceed

The CAA is satisfied that it has given due consideration to the views expressed by interested parties, and these have been incorporated providing that the coherence of the rule could be maintained. It is now recommended to the Secretary of State that amendment of Rule 5, as shown in the attached Regulatory Impact Assessment, should be put in train.

Yours sincerely

J Hills
Head of General Aviation Department

Attachment A: External Interested Parties Circulation List - Rule 5 Amendment

Attachment B: Regulatory Impact Assessment

**GENERAL AVIATION DEPARTMENT
EXTERNAL INTERESTED PARTIES DISTRIBUTION LIST**

CAA Flight Operations Department Listing
CAA Personal Licensing Department Listing
CAA ATSSD Listing

AAC Holders
AOC Holders – Aeroplanes, Helicopters & Balloons
DAE Holders
Flying Training Organisations
Air Traffic Service Providers

Aeroplane Monthly (Editor)
Aerosuperbatics Ltd (Managing Director)
Air Accidents Investigation Branch (Chief Inspector)
Air Display Association Europe (Chairman)
Air Displays International Ltd (Managing Director)
Air Safety Group (Chairman)
Air Safety Support International (Chief Executive)
Aircraft Owners and Pilots Association (Executive Chairman)
Aircraft Restoration Company
Airport Operators Association (Chief Executive)
Army Air Corps (HQ Director)
Army Parachute Association
Association of Microlight Professionals (Chairman)
Atlantic Airlines/Air Atlantique (Chairman)
Aviation Environment Federation (Managing Director)
B17 Preservation Ltd (Mrs E Salingboe)
BAA plc (Director of Operations)
Babcock Defence Services (Managing Director)
British Aerobatic Association (Chairman)
British Aerospace (Warton)
British Air Line Pilots Association (Chairman)
British Air Transport Association (Chairman)
British Association of Aviation Consultants (Chairman)
British Association of Balloon Operators (Chairman)
British Association of Radio Controlled Soarers (Mr C Moynihan)
British Balloon and Airship Club (Chairman, Flying Committee)
British Balloon and Airship Club (Technical Office)
British Gliding Association (Chairman)
British Hang Gliding and Paragliding Association (Chairman)
British Helicopter Advisory Board (Chief Executive)
British Kite Flying Association
British Microlight Aircraft Association (Chief Executive)
British Model Flying Association (Chairman)
British Parachute Association (Chairman)
Business Aircraft Users Association (Chief Executive)
Cameron Balloons Ltd (Managing Director)
Defence Aviation Safety Centre (Director) (RAF Bentley Priory)
Department for Transport (Head Civil Aviation Division)
Department for Transport (Head Legal - Aviation Division)
Department for Transport (Head Multilateral Division)
DH Moth Club (Secretary)
Dravidian Air Services Limited
Europe Airsports (c/o The Royal Aero Club)
Europe Airsports (UK Rep)
Fighter Collection
Firebird Aerobatics Ltd (Managing Director)

Flight International (Editor)
Flight Safety Bulletin (Editor)
Flyer Magazine (Editor)
Flying Farmers Association
Flying Pictures (Balloons) Ltd (Chief Executive)
Flypast Magazine (Editor)
Formula Air Racing Association (Mr A Chadwick)
General Aviation Awareness Council (Chairman)
General Aviation Magazine (Editor)
General Aviation Manufacturers and Traders Association (Chief Executive)
General Aviation Safety Council (Chairman)
Guild of Air Pilots and Air Navigators
Helicopter Club of Great Britain (Honorary Secretary)
Historic Aircraft Association (Chairman)
Hovercam (Mr P V George)
Imperial War Museum (Director)
Independent Pilots Association (Chairman)
Irvin-GQ Ltd (Parachute Trials Department)
JAA HQ
Kite and Balloon Company
Kite Society
Large Model Association (Chairman)
Lawyers Flying Association (c/o Mr T Scorer)
Lindstrand Balloons (Managing Director)
Met Office (Mr D Underwood, Head of Civil Aviation)
Ministry of Defence, Director of Air Staff
Model Pilots Association (National Administrator)
National Association of Agricultural Contractors (Chairman)
National Farmers' Union
Newbould & Ritchie Ltd
Old Flying Machine Company, The (Managing Director)
Parliamentary Advisory Council for Transport Safety (Mr R Gifford)
Personal Plane Services (Managing Director)
Pilot Magazine (Editor)
Police Aviation Adviser (Home Office)
Popular Flying Association (Chairman)
PPL/IR Network (Chairman)
QinetiQ Ltd (formally DERA) (Mr J H Simpson, Project Manager, Airborne Forces Equipment)
RAF HQ 2 Group (Parachute Department) (RAF High Wycombe)
RAF HQ Strike Command (RAF High Wycombe)
RAF Model Aircraft Association (c/o RAF Innsworth)
RAF Personnel & Training Command (RAF Innsworth)
RAF Sport Parachute Association (c/o Station Commander, RAF Brize Norton)
Real Aeroplane Company Ltd, The
Richard Goode Aerobatics (Mr R Goode)
Royal Aero Club (General Secretary)
Royal Aero Club Records Racing and Rally Association (Chairman)
Royal Aeronautical Society (Airlaw Group) (Chairman)
Royal Aeronautical Society (Director)
Royal Aeronautical Society (Light Aviation Group) (Chairman)
Royal International Air Tattoo (Chief Executive/Director)
Royal Navy Aviation (Director of Naval Operations)
Scottish Aeromodellers Association (Mr D Dickie)
Shuttleworth Collection
Society of British Aerospace Companies Ltd (Director General)
Tiger Club 1990, The (Chairman)
Today's Pilot (Editor)
UK Flight Safety Committee (Chairman)
UK Guild of Air Traffic Control Officers (Secretary)
UK Representative on ICAO Council
Unmanned Aerial Vehicle Systems Association (Chairman)
Virgin Airship and Balloon Company (Lightship Group)

REGULATORY IMPACT ASSESSMENT

PROPOSAL TO AMEND THE UNITED KINGDOM RULES OF THE AIR REGULATIONS 1996 - RULE 5 LOW FLYING

1. Preamble

1.1 This paper lays out the proposal to amend Rule 5 - Low Flying - of the United Kingdom Rules of the Air Regulations 1996 following the second of two planned rounds of consultation. The initial consultation sought opinions on proposals for closer alignment with the ICAO Rules of the Air and the second sought opinions on the preferred options when placed in the context of a rule format which had been modified to accommodate the changes.

1.2 This paper contains the following annexes:

- Annex A: Proposed Amendment of Rule 5 of the UK Rules of the Air 1996
- Annex B: Proposed Addition to the Air Navigation (Restriction of Flying) Regulations - (Central London)
- Annex C: Proposed Amendment of Article 43 of the Air Navigation Order United Kingdom Rules of the Air 1996:
- Annex D: ICAO Rules of the Air
- Annex E: Existing Rule 5
- Annex F: Tabular Comparison - Existing v Proposed Low Flying Rule
- Annex G: Analysis of Comments Received After the Second Round of Consultation dated 25 June 2003
- Annex H: Analysis of the Environmental Effect v the Safety Benefit of Aligning the Minimum Height Permitted Over Congested Areas with the ICAO Standard of 1,000 feet

2. Purpose and Intended Effect of the Measure

2.1 The Issue

2.1.1 In December 1999, the Civil Aviation Authority Safety Regulation Group Policy Committee, responding to a rising trend in the numbers of accidents involving small helicopters, approved the Small Helicopter Safety Improvement Action Plan in which the need to review Rule 5 - Low Flying - of the United Kingdom Rules of the Air Regulations 1996 had been identified. It was considered that two of the primary aims of the review should be, firstly, a simplification of the text in order to make the rule easier to understand and, secondly, consideration of a closer alignment of the rule with the ICAO Standards.

- 2.1.2 The existing United Kingdom low flying rule (see Annex E) is much longer than its equivalent in the ICAO Rules of the Air (see Annex D). Much of the length of the current Rule 5 comes from the inclusion of separate yet similar sections catering for circumstances which are only very slightly different from one another. The rule also includes specific detail relating to the restriction of operations by single engine helicopters over the congested area of Central London, which it is considered are out of place in the primary national rule.
- 2.1.3 Most of the European states use national low flying rules that claim to be compliant with the ICAO Rules of the Air in which the minimum heights specified are of 1,000 ft over congested areas, and 500 ft elsewhere. However, several of the states still allow aircraft to fly routinely below 500 ft for the purpose of engine failure training. The United Kingdom, on the other hand, has filed differences with ICAO in respect of a minimum height of 1,500 ft over congested areas and a minimum separation distance of 500 ft (rather than a minimum height) in the open countryside. It follows that these subtly different concepts and different parameters have the potential to lead to operational and regulatory confusion and may have an adverse effect on safety, especially, where international flying is involved.
- 2.1.4 Finally, the style in which the current United Kingdom Low Flying Rule is written requires extensive cross-referencing backwards and forwards within the text, and several aspects of the rules are embedded such that their significance is often overlooked (e.g. Rule 5 (1)(d), which deals with open air assemblies, appears to be concerned with the minimum height for over flight, but it also includes a subtly embedded prohibition on landings by helicopters at race meetings and agricultural shows). The overall result is a complex document that is both difficult to read and difficult to understand.

2.2 The Objective of the Change

- 2.2.1 The existing low flying rules for helicopters flying over cities, towns and settlements are laid out separately from the section dealing with all other types of aircraft operating in these circumstances. Because these are so similar, it is proposed to combine the two sections in a single set of rules which will be applicable to all aircraft and to deal with the minor differences applying to helicopters by an alleviation in a later paragraph.
- 2.2.2 The minimum heights under the current rule which are permitted over the congested areas of cities towns and settlements and, also in the vicinity of gatherings of more than 1,000 persons, are not aligned with the ICAO Rules of the Air. Following comments received in answer to the first letter of consultation it is now proposed to rationalise the existing UK parameters of 1,500 ft over congested areas and 3,300 ft over assemblies in the open air with the ICAO minimum of 1,000 ft, throughout the rule.
- 2.2.3 The restriction on flying by single engine helicopters over the Specified Area of central London is an isolated example of what is a particular application of the 'glide clear rule' and it is out of place in the primary national rule. Consequently, it is proposed that the Specified Area should be withdrawn from Rule 5 and be placed, instead, in the Air Navigation (Restriction of Flying) Regulations (see CAP 393 Section 5). To this end, Annex E contains a proposed amendment of the Air Navigation (Restriction of Flying) Regulations.
- 2.2.4 The existing UK low flying rule which sets out a minimum linear distance of 500 ft that an aircraft in flight may approach a person, vessel, vehicle or structure, is not aligned with the 500 ft minimum height requirement contained in the ICAO Rules of the Air. This was considered to be an area worthy of review. However, following the first round of consultation, the proposal is that the existing variant of the rule used in the UK should be retained.

- 2.2.5 The current provisions relating to open air assemblies of more than 1,000 persons which are contained in the existing Rule 5 (1)(d)) are ambiguous, but are usually interpreted as involving a minimum height for over flight of 1,000 metres (3,300 ft) and a restriction on flying within a horizontal distance of 1,000 metres. It is proposed that the safety aspects should be addressed by the earlier proposal to align the minimum height with the ICAO parameter of 1,000 ft and the restriction of flying within the horizontal dimension of 1,000 metres by notifying, separately, procedures for aircraft landing and taking off within 1,000 metres of the gathering.
- 2.2.6 The existing UK rule contains a requirement to the effect that a helicopter must always fly at such a height as to be able to alight in the event of a power unit failure without danger to persons or property on the surface (see Annex E - Rule 5 (1)(b)). During the first round of consultation this was retained as a stand-alone paragraph. However, it unbalances the rule, because there is not a corresponding, overtly stated, rule applying to aeroplanes; although, the requirement is subtly embedded in the current Rule 5 at paragraph (1)(a)(i). This is, actually, a fundamental safety rule which applies to all powered aircraft. Consequently, to avoid misunderstanding, it is proposed that, it should be made applicable to all aircraft and that it should become the initial paragraph in the low flying rule.
- 2.2.7 The existing UK rule contains an alleviation from compliance with any of the rules of the air if this is necessary for the purpose of saving life (see Annex E – Rule 5 (3)). However, because this subject is covered by Article 84 of the ANO, and the precise meaning of this alleviation in Rule 5(3) is unclear, it has been deleted from this proposal.
- 2.2.8 The remainder of the current UK low flying rule is concerned with numbers of exemptions from the primary rules and these have been re-referenced and placed in the second section of the rule containing standing exemptions from the low flying prohibitions. Two new exemptions have been introduced:
- (i) the first, to permit a balloon that is becalmed to make a landing within a congested area, and
 - (ii) the second, to reflect Exemption 328 contained in the Official Record Series 4 which relates to prolonged hovering flight by helicopters at aerodromes and landing sites.

3. Risk Assessment

- 3.1 As the proposal at Annex A now stands, the text of the low flying rules has been revised and rearranged but, with a very few exceptions, the existing provisions have been retained.
- 3.1.1 The fundamental requirement that persons and property on the surface shall be protected from the danger associated with an aircraft which has suffered a power unit failure has been restated and takes its place as the first paragraph in the rule.
- 3.1.2 The requirements relating to the protection of persons and property in congested areas have been largely retained, except that the minimum height permitted over these areas has been aligned with the ICAO standard of 1,000 ft. This has been proposed because the powerful safety argument has been identified that, by increasing the depth of the layer of airspace available to over-flying aircraft operating beneath controlled airspace, or beneath the average cloud bases found in the UK, the traffic density can be reduced and with it the risk of a mid-air collision occurring over a residential area. It will be appreciated that the use of a higher minimum height will not protect those on the surface from falling debris and does not in itself improve safety. There will, however, be an environmental effect, and this is analysed at Annex H.

- 3.1.3 The Specified Area of central London protects the city from the hazards associated with engine failure in a single engine helicopter. However, it is considered that this detailed information should be removed from the primary national rule for low flying and, instead, be promulgated in the Air Navigation (Restriction of Flying) Regulations, (Permanent Restriction of Flying Regulations are contained in Section 5 of CAP 393).
- 3.1.4 In the case of flight over an open air assembly of more than 1,000 persons, the present rule is not easy to understand because safety aspects have been combined with social and environmental considerations, and a degree of exclusion has been provided which is much greater than that afforded to even a major city. However, from the point of view of safety, there should be no difference. Consequently, the proposal aligns the minimum height with the ICAO Rules of the Air. The environmental considerations are a separate matter which can be addressed under the terms of Article 85 of the Air Navigation Order 2000 if restriction of flying activities in the vicinity of such events is considered necessary.
- 3.2 The ICAO form of the 500-foot rule prohibits en-route flight at inappropriately low heights, which, under the current UK rule, can be attempted in conditions of low cloud and poor visibility. This was the primary concern identified in the Small Helicopter Action Plan. However, there are several types of operation, which involve flight at heights below 500 feet, (e.g. pipeline inspection, training in practice forced landings and low-level reconnaissance of unlicensed landing strips etc). Consequently, many of the states, which claim to use the ICAO form of the rule, find it necessary to issue exemptions and permissions in order to allow flight at less than 500 feet. The UK form of the rule makes no claim to being ICAO compliant but it allows flight below 500 feet in appropriate circumstances, gives protection to third parties, and is, arguably, a simpler and more elegant solution. During the first round of consultation 97% of respondents advocated retention of the existing UK form of the rule. The point was also made that the original concern identified in the Small Helicopter Action Plan could be better addressed by introducing weather limitations in the helicopter private pilots' licence similar to those already contained in the aeroplane private pilots' licence and, thereby, prevent helicopter pilots from attempting flight in unsuitable conditions of low cloud and poor visibility.
- 3.3 There will still be circumstances where it is not possible to operate aircraft in compliance with the basic rules which have been placed in the first section of the proposal entitled, "Prohibitions on low flying" and the CAA may grant permissions or exemptions on the basis that safety can be maintained by requiring additional safeguards. Exemptions to the basic rules that are of a permanent and of a general nature have been listed together in the second section entitled, "Exemptions from the low flying prohibitions" and, apart from one, reflect existing exceptions to the primary rules contained in the current Rule 5.
- 3.4 The new exemption (see Annex A – Rule 5(2)(e)(i)) concerns the minimum height over congested areas rule. It has been introduced to allow balloons that have been becalmed over a congested area to land. This, it is considered, should be permitted, because in these circumstances balloons can be landed in small clear spaces without compromising safety. Nevertheless, a balloon flight must not be deliberately planned to a destination within a congested area and, therefore, it follows that a balloon flight cannot pre-plan to take advantage of this exemption. Consequently, an amendment to ANO Article 43 is proposed at Annex C.

4. Options

4.1 There are three options available concerning the low flying rule:

Option 1 To leave the UK low flying rule in its present form.

Option 2 To redraft the UK low flying rule so that it is completely aligned with the ICAO Rules of the Air.

Option 3 To redraft the low flying rule to make it readily understood by operational pilots, and, where possible, to align it more closely in style and content with the ICAO Rules of the Air, but allowing, where appropriate, retention of existing parameters contained in the current Rule 5.

4.2 The first option is not an adequate response to the lack of understanding of the current Rule 5. It is difficult to interpret and it is not in compliance with ICAO. There is evidence, especially following the first round of consultation, that the rule is frequently not followed through misunderstanding of its requirements, and that the safety benefits associated with compliance are often compromised. Furthermore, under this option, consideration of compliance with ICAO, as required under the SRG Business Plan, would not be undertaken.

4.3 The second option, total alignment with ICAO, is thought to be too simple a revision to cater for the needs of the densely populated United Kingdom where specific requirements concerning the low flying of aircraft have been identified over a great many years.

4.4 Given that the first two options appear to be less than satisfactory, the third option is thought to be worth pursuing. The proposal has been put forward, therefore, on the basis that the intent of the revised rule is clearer than in the existing form, that it addresses the requirements of aviation in the UK and that it is as closely aligned with the ICAO Rules of the Air as the UK wishes it to be.

4.5 The responses to the second round of consultation have been analysed at Annex G and the revised proposal itself is at Annex A.

5. Benefits

Amendment of the low flying rule in accordance with the preferred option identified in paragraph 4.4 above, is considered likely to:

- improve understanding and interpretation of the rule and compliance with its provisions;
- provide a rule whose provisions will be met by an aircraft complying with the Standards relating to minimum heights contained in the ICAO Rules of the Air, and
- provide a rule which caters for present day aviation safety requirements in the United Kingdom.

6. Compliance Costs

It is not anticipated that the revision of Rule 5 - Low Flying will incur any additional costs for any section of the population. On the contrary, it may be that the more transparent and simpler presentation of the rule will result in a reduction in the costs associated with authorisation and compliance and the avoidance of costs to pilots, operators and the CAA, which are liable to arise in the case of non-compliance.

7. Competition Assessment

There are no competitive aspects associated with the proposed amendment.

8. Effects on Small Business

8.1 It is anticipated that the net effect upon small businesses associated with aviation will be a reduction in the effort required to comply with the regulations and an associated improvement in the safety of operations.

8.2 It is inevitable that small businesses providing a service involving the dissemination of aeronautical information will have to amend manuals and alter the contents of training courses to accommodate the detailed changes in Rule 5. However, this is an essential part of these services for which the vendor charges the subscription or fee in the first place.

9. Environmental Impact v Safety Benefit of the Proposal

The likely safety benefits and environmental effects associated with the new proposals have been subjected to the theoretical analysis contained in Annex H which indicates that a significant improvement in safety may be achieved in return for a small increase in the perceived noise of some aircraft.

10. Recommendation

In view of the comments received during two rounds of consultation and their resolution, it is now intended that a Letter of Intent should be issued.

ANNEX A Proposed Amendment of Rule 5 of the UK Rules of the Air 1996

Low flying

5 (1) Prohibitions to be observed

(a) An aircraft shall comply with the low flying prohibitions set out in paragraph (2) subject to the low flying exemptions set out in paragraph (3).

(b) Where an aircraft is flying in circumstances such that more than one of the low flying prohibitions apply it must fly at the greatest height required by any of the applicable prohibitions.

(2) The low flying prohibitions

(a) Failure of power unit

An aircraft shall not be flown below such height as would enable it, in the event of a power unit failure, to make an emergency landing without causing danger to persons or property on the surface.

(b) The 500 feet rule

Except with the permission in writing of the CAA, an aircraft shall not be flown closer than 500 feet to any person, vessel, vehicle or structure.

(c) The 1000 feet rule

Except with the permission in writing of the CAA, an aircraft flying over a congested area of a city town or settlement shall not fly below a height of 1,000 feet above the highest fixed obstacle within a horizontal radius of 600 metres of the aircraft.

(d) The land clear rule

An aircraft flying over a congested area of a city town or settlement shall not fly below such height as will permit, in the event of a power unit failure, the aircraft to land clear of the congested area.

(e) *Flying over open air assemblies*

Except with the permission in writing of the CAA, an aircraft shall not fly over an organised open-air assembly of more than 1,000 persons below:

- (i) a height of 1,000 feet, or
- (ii) such height as will permit, in the event of a power unit failure, the aircraft to alight clear of the assembly,

whichever is the higher.

(f) *Landing and taking off near open air assemblies*

An aircraft shall not land or take-off within 1,000 metres of an organised open-air assembly of more than 1,000 persons, except

- (i) at an aerodrome, in accordance with procedures notified by the CAA, or
- (ii) at a landing site other than an aerodrome, in accordance with procedures notified by the CAA and with the written permission of the organiser of the assembly.

(3) Exemptions from the low flying prohibitions

(a) *Landing and taking off*

- (i) Any aircraft shall be exempt from any low flying prohibition in so far as it is flying in accordance with normal aviation practice for the purpose of taking off from, landing at or practising approaches to landing at or checking navigational aids or procedures at a Government or licensed aerodrome.
- (ii) Any aircraft shall be exempt from the 500 feet rule when landing and taking-off in accordance with normal aviation practice.

(b) *Captive balloons and kites*

None of the low flying prohibitions shall apply to any captive balloon or kite.

(c) *Special VFR clearance and notified routes*

- (i) Any aircraft shall be exempt from the 1000 feet rule when flying in a control zone under a special VFR clearance issued by the appropriate air traffic service unit, or when operating in accordance with the procedures notified for the route being flown.
- (ii) When flying in accordance with this exemption landings may not be made at other than a licensed or Government aerodrome, unless the permission of the CAA has been obtained.

(d) *Balloons and helicopters over congested areas*

- (i) A balloon shall be exempt from the 1000 feet rule when landing because it is becalmed.
- (ii) Any helicopter flying shall be exempt from the land clear rule.

(e) *Police air operator's certificate*

Any aircraft flying in accordance with the terms of a police air operator's certificate shall be exempt from the 500 feet rule, the 1000 feet rule, the prohibition on flying over open air assemblies and the prohibition on landing and taking off near open air assemblies.

(f) *Flying displays etc*

An aircraft taking part in a flying display, air race or contest shall be exempt from the 500 feet rule when within a horizontal distance of 1,000 metres of the gathering of persons assembled to witness the event.

(g) *Glider hill soaring*

A glider when hill-soaring shall be exempt from the 500 feet rule.

(h) *Picking up and dropping at an aerodrome*

Any aircraft picking up or dropping tow ropes, banners or similar articles at an aerodrome shall be exempt from the 500 feet rule.

(i) *Manoeuvring helicopters*

(i) A helicopter shall be exempt from the 500 feet rule when conducting manoeuvres in accordance with normal aviation practice, within the boundaries of a licensed or Government aerodrome, or at other sites with the permission of the CAA.

(ii) When flying in accordance with this exemption the helicopter must not be operated closer than 60 metres to persons, vessels, vehicles or structures located outside the aerodrome or site.

(j) *Dropping articles with CAA permission*

(i) Any aircraft shall be exempt from the 500 feet rule when flying in accordance with article 56(3)(f) of the Order, and

(ii) Any aircraft shall be exempt from the 500 feet rule when flying in accordance with an aerial application certificate issued by the CAA under article 58 of the Order.

STATUTORY INSTRUMENTS

2003 No.

CIVIL AVIATION

The Air Navigation (Restriction of Flying)

(Specified Area) Regulations 2003

Made 2003

Coming into force 2003

Whereas the Secretary of State deems it necessary in the public interest to restrict flying by helicopters within the area specified Schedule hereto:

Now, therefore, the Secretary of State, in the exercise of the powers conferred by Article 85 of the Air Navigation Order 2000(a), hereby makes the following Regulations:

1. These Regulations may be cited as the Air Navigation (Restriction of Flying) (Specified Area) Regulations 2003 and shall come into force on 2003.
2. Except with the permission in writing of the Civil Aviation Authority and in accordance with any conditions therein specified a helicopter shall not fly over the area specified in the Schedule below such height as would enable it to alight clear of the area in the event of failure of a power unit.

Signed by authority of the Secretary
of State for Transport

Head of Civil Aviation Division
Department for Transport

2003

(a) S.I. 2000/1562, to which there are amendments not relevant to these Regulations

THE SCHEDULE

Regulation 2

The area bounded by straight lines joining successively the following points:

Kew Bridge (N5129.18 W00017.17).

The Eastern extremity of Brent Reservoir (N5134.30 W00014.02).

Gospel Oak Station (N5133.27 W00008.97).

The South East corner of Springfield Park (N5134.12 W00003.20).

Bromley-by-Bow Station (N5131.47 W00000.65).

The South West corner of Hither Green (N5126.72 W00000.63).

Herne Hill Station (N5127.18 W00006.07).

Wimbledon Station (N5125.23 W00012.27).

The North West corner of Castelnau Reservoir (N5128.87 W00014.03).

Kew Bridge (N5129.18 W00017.17):

excluding so much of the bed of the River Thames as lies within that area between the ordinary high water marks on each of its banks;

EXPLANATORY NOTE

(This note is not part of the Regulations)

ANNEX C Proposed Amendment of Article 43 of the Air Navigation Order

Pre-flight action by the commander of aircraft

- 43 The commander of an aircraft registered in the United Kingdom shall reasonably satisfy himself before the aircraft takes off:
- (a) (i) that the flight can safely be made, taking into account the latest information available as to the route and aerodrome to be used, the weather reports and forecasts available and any alternative course of action which can be adopted in case the flight cannot be completed as planned, **and**
 - (ii) **in the case of a balloon, that the balloon will be able to land clear of any congested area;**

ANNEX D ICAO Rules of the Air

ICAO Annex 2 Chapter 3 Paragraph 3.1.2 - Minimum heights

Except when necessary for take-off or landing, or except by permission from the appropriate authority, aircraft shall not be flown over the congested areas of cities, towns or settlements or over an open-air assembly of persons, unless at such a height as will permit, in the event of an emergency arising, a landing to be made without undue hazard to persons or property on the surface.

ICAO Annex 2 Chapter 4 Paragraph 4.6

Except when necessary for take-off or landing, or except by permission from the appropriate authority, a VFR flight shall not be flown:

- a) over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height less than 300 m (1,000 ft) above the highest obstacle within a radius of 600 m from the aircraft;
- b) elsewhere than as specified in 4.6 a), at a height less than 150 m (500 ft) above the ground or water.

ANNEX E United Kingdom Rules of the Air 1996: Rule 5

Low flying

- 5** (1) Subject to the provisions of paragraphs (2) and (3):
- (a) An aircraft other than a helicopter shall not fly over any congested area of a city, town or settlement below:
 - (i) such height as would enable the aircraft to alight clear of the area and without danger to persons or property on the surface, in the event of failure of a power unit and if such an aircraft is towing a banner such height shall be calculated on the basis that the banner shall not be dropped within the congested area; or
 - (ii) a height of 1500 feet above the highest fixed object within 600 metres of the aircraft:whichever is the higher;
 - (b) A helicopter shall not fly below such height as would enable it to alight without danger to persons or property on the surface, in the event of failure of a power unit;
 - (c) Except with the permission in writing of the Authority and in accordance with any conditions therein specified a helicopter shall not fly:
 - (i) over a congested area of a city, town or settlement below a height of 1500 feet above the highest fixed object within 600 metres of the helicopter; or
 - (ii) over the area hereinafter specified, below such height as would enable it to alight clear of the area in the event of failure of a power unit, that is to say the area bounded by straight lines joining successively the following points:
 - Kew Bridge (N5129.18 W00017.17).
 - The Eastern extremity of Brent Reservoir (N5134.30 W00014.02).
 - Gospel Oak Station (N5133.27 W00008.97).
 - The South East corner of Springfield Park (N5134.12 W00003.20).
 - Bromley-by-Bow Station (N5131.47 W00000.65).
 - The South West corner of Hither Green (N5126.72 W00000.63).
 - Herne Hill Station (N5127.18 W00006.07).
 - Wimbledon Station (N5125.23 W00012.27).
 - The North West corner of Castelnau Reservoir (N5128.87 W00014.03).
 - Kew Bridge (N5129.18 W00017.17):
excluding so much of the bed of the River Thames as lies within that area between the ordinary high water marks on each of its banks;

- (d) (i) Subject to paragraph (ii) an aircraft shall not fly:
 - (aa) over, or within 1000 metres of, any assembly in the open air of more than 1000 persons assembled for the purpose of witnessing or participating in any organised event, except with the permission in writing of the Authority and in accordance with any conditions therein specified and with the consent in writing of the organisers of the event; or
 - (bb) below such height as would enable it to alight clear of the assembly in the event of the failure of a power unit and if such an aircraft is towing a banner such height shall be calculated on the basis that the banner shall not be dropped within 1000 metres of the assembly;
- (ii) Where a person is charged with an offence under the Order by reason of a contravention of sub-paragraph (d)(i), it shall be a good defence to prove that the flight of the aircraft over, or within 1000 metres of, the assembly was made at a reasonable height and for a reason not connected with the assembly or with the event which was the occasion for the assembly;
- (e) An aircraft shall not fly closer than 500 feet to any person, vessel, vehicle or structure.
- (2) (a) The provisions of paragraphs (1)(a)(ii) and (1)(c)(i) shall not apply to an aircraft flying:
 - (i) on a route notified for the purposes of this rule; or
 - (ii) on a special VFR flight;
 unless the aircraft is landing or taking off.
- (b) Paragraphs (1)(a)(ii), (1)(c), (1)(d) and (1)(e) shall not apply to an aircraft flying under and in accordance with the terms of a police air operator's certificate.
- (c) Paragraphs (1)(d)(i)(aa) and (1)(e) shall not apply to the flight of an aircraft over or within 1000 metres of an assembly of persons gathered for the purposes of witnessing or participating in an event which consists:
 - (i) wholly or partly of an aircraft race or contest if the aircraft is taking part in such race or contest or is engaged on a flight arranged by, or made with the consent in writing of, the organisers of the event;
 - (ii) wholly or partly of a flying display for which a permission under article 61 of the Order is required, if the aircraft is taking part in such display or is engaged on a flight arranged by or made with the consent of the organisers of the event and the flight is made:
 - (aa) in accordance with the terms of a permission granted to the flying display director under article 61 of the Order; and
 - (bb) in accordance with the conditions of a pilot display authorisation granted to the pilot under article 61 of the Order; or

- (iii) wholly or principally of a flying display for which a permission under article 61 of the Order is not required, if the aircraft is taking part in such display or is engaged on a flight arranged by or made with the consent of the organisers of the event.
- (d) Paragraph (1)(e) shall not apply to:
 - (i) any aircraft while it is landing or taking off in accordance with normal aviation practice;
 - (ii) any glider while it is hill-soaring;
 - (iii) any aircraft while it is flying in accordance with article 48(3)(f) of the Order;
 - (iv) any aircraft while it is flying under and in accordance with the terms of an aerial application certificate granted to the operator thereof under article 50 of the Order; or
 - (v) any aircraft while it is flying for the purpose of picking up or dropping tow ropes, banners or similar articles at an aerodrome in accordance with article 47(2) or article 48(3)(e) of the Order.
- (3) Nothing in this rule shall prohibit an aircraft from flying in such a manner as is necessary for the purpose of saving life.
- (4) (a) Subject to sub-paragraph (b), nothing in this rule shall prohibit any aircraft from flying in accordance with normal aviation practice, for the purpose of taking off from, landing at or practising approaches to landing at, or checking navigational aids or procedures at, a Government aerodrome, an aerodrome owned or managed by the Authority or a licensed aerodrome in the United Kingdom or at any aerodrome in any other country.
- (b) The practising of approaches to landing shall be confined to the airspace customarily used by aircraft when landing or taking off in accordance with normal aviation practice at the aerodrome concerned.
- (5) Nothing in this rule shall apply to any captive balloon or kite.

ANNEX F Tabular Comparison - Existing v Proposed Low Flying Rule

Existing Rule 5 (R of A 1996)	Proposed New Low Flying Rule	Remarks Concerning Proposed Changes
Sub-paragraphs	Sub-paragraphs	
(1)(a)	(1)(d) & (1)(c)	The provisions of this paragraph have been enlarged to encompass all types of aircraft.
(1)(a)(i)	(1)(a)	Direct reference to the dropping of banners outside a congested area has not been included, but has been catered for by introducing a requirement that, following a power unit failure, the subsequent landing shall not cause danger to persons or property on the surface, as would be the case if a banner were to be jettisoned within a congested area.
(1)(a)(ii)	(1)(c)	The minimum height of 1500 ft (UK) has been changed to 1000 ft to align the rule with ICAO.
(1)(b)	(1)(a)	This has been changed to a fundamental statement which applies to all types of aircraft.
(1)(c)(i)	(1)(c)	The minimum height of 1500 ft (UK) has been changed to 1000 ft to align the rule with ICAO.
(1)(c)(ii)	(-)	Removed - the restrictions on flight by single engine helicopters in the "Specified Area" of central London should be removed to The Air Navigation (Restriction of Flying) Regulations - see Annex E.
(1)(d)(i)(aa)	(1)(e)(i) & (1)(f)	Aircraft operations may be further restricted in the airspace surrounding an organised event in the open air under the provisions of Article 85.
(1)(d)(i)(bb)	(1)(a) & (1)(e)(ii)	Nil
(1)(d)(ii)	(-)	Deleted - situation clarified rendering this sub-paragraph redundant.
(1)(e)	(1)(b)	The existing form of the UK rule has been retained.
(2)(a)	(2)(c)	Nil - SVFR.
(2)(b)	(2)(e)	Nil - PAOC.
(2)(c)(i)	(2)(f)	Flying displays require CAA permission, or are under the jurisdiction of the Ministry of Defence, and air races and contests do not require permission. Flight below and closer than 500 ft is permitted at all of these events within 1,000 metres of the spectators. However, the CAA does not intend to permit over-flight of the crowd below 1000 ft.
(2)(c)(ii)	(2)(f)	As above
(2)(c)(iii)	(2)(f)	As above
(2)(d)(i)	(2)(a)(ii)	Nil - take-off & landing
(2)(d)(ii)	(2)(g)	Nil - glider hill-soaring
(2)(d)(iii)	(2)(j)(h)	Nil - Article 56(3)(f)
(2)(d)(iv)	(2)(j)(ii)	Nil - Aerial Applications Certificate.
(2)(d)(v)	(2)(h)	Nil - banners & tow-ropes
(3)	(-)	Deleted
(4)(a)	(2)(a)(i)	There are no aerodromes owned or managed by the CAA. If there were, it would probably represent a conflict of interests if they were also regulated by the CAA. The statement concerning foreign aerodromes has been deleted because it is covered by Rule No 2 of the Rules of the Air.
(4)(b)	(2)(a)(i)	Nil
(5)	(2)(b)	Nil - captive balloons & kites.
(-)	(2)(d)(i)	New exemption – when they are becalmed, balloons may need to land within a congested area – see consequential amendment of ANO Article 43 at Annex F.
(-)	(2)(i)	Clarification of the status of helicopters conducting ground cushion manoeuvres is currently contained in Official Record Series 4, Exemption No. 328.

ANNEX G Analysis of Comments Received After the Second Round of Consultation dated 25 June 2003

1 INTRODUCTION

1.1 Approximately 1,000 individual letters were sent to persons and organisations representing the aviation industry and the Consultation Letter and the associated discussion paper were also made available to the general public on the CAA website. All those with a view to express were invited to reply to the CAA by e-mail or surface mail by 22 August 2003 and, in total, 43 replies were received.

2. ANALYSIS

2.1.

Rule	Comment			Reply	
5(1)(a)	43	T. Gill	GAPAN	-rule would be a new imposition on aeroplanes and should be deleted. - “without causing danger” does not adequately reflect the prohibition on the jettisoning of articles.	<u>Not Accepted</u> - this is considered to be a fundamental principle applicable to all aircraft. <u>Not Accepted</u> – towing and jettisoning of articles is covered by articles 55 & 56 of the ANO. It is a fundamental point that in the event of engine failure, persons and property on the ground should not be subjected to any undue hazard (for this or any other reason).
	2	T. Thomas	SBAC	- combine with 5(1)(d) and re-number as 5(1)(c)	<u>Not Accepted</u> - the rule would then not apply to aircraft out with congested areas and the fundamental nature of 5(1)(a) would be lost
5(1)(b)	1	R. Dean	CAA International Services	- add ‘with permission of the CAA’	<u>Accepted</u> - occasional operations at low level are a routine matter where ‘permission’ is more appropriate than ‘exemption’

Rule	Comment				Reply
5(1)(c)	1	R. Dean	CAA International Services	- combine with 5(1)(d)	<u>Noted</u> - editorial style: for reasons of clarity two separate paragraphs are preferred.
	43	T. Gill	GAPAN	- rule should relate to avoidance of nuisance not safety. -1,500 ft already complies with 1,000 ft of ICAO	<u>Not Accepted</u> - safety is the prime consideration. Catering primarily for nuisance can unbalance the rule and compromise safety. <u>Not Accepted</u> - foreign aircraft following the ICAO rule would be in breach of a 1,500 ft rule.
	8	I. Brown	Sussex Police	- reserve airspace over congested areas below 1,500 ft for police ops.	<u>Not Accepted</u> - this rule should not be used to reserve airspace.
	9	A. Shanks	West Midlands Police	- as above	- as above
	19	C. Collins	DART Aviation	- concern that police helicopters routinely operate over congested areas at low level	<u>No Comment</u>
5(1)(d)	43	T. Gill	GAPAN	- rule should not be made applicable to all aircraft if exemption for helicopters is to be automatically given in 5(2)(d)	<u>Not Accepted</u> - Rule 5 has been drafted primarily to apply to all aircraft because helicopter and aeroplane operations are considered, in principle, to have a high degree of commonality.
	7	J. Lyons	ATPL/H	- as above	- as above

Rule	Comment			Reply	
5(2)(a)	14	A. Wang	CFI Fair Oaks	- is checking of lighting included?	- yes, it is a 'navigational' aid.
	17	B. Smith	PPL/A	- meaning of "normal aviation practice" is unclear	<u>Noted</u> - it is not possible to define all aspects of the meaning, however, it is considered that the exemptions in the rule should be reasonably applied.
	24	D. Blickley	Southend School of Flying	- as above	- as above
	12	D. Venman	PPL/H	- as above - do "normal aviation practice" exemptions from the low flying rules apply to all aspects of mountain flying training.	- as above - no
	20	C. Evans	BALPA	- EFATO & PFL training should be exempt from compliance with the 500 ft and 1,000 ft rules.	<u>Not Accepted</u> - it would not be acceptable to subject thirds parties to undue hazard in order to accommodate the particular interests of flying training.
	43	T. Gill	GAPAN	- as above	- as above
	36	J. Temple	RAF CFS	- EFATO & PFL can be problematic	- as above
	35	P. Kynsey	Tiger Club	- exemption from 1,000 ft rule desirable at unlicensed aerodromes	<u>Not Accepted</u> - if an aerodrome is of significance, consideration should be given to applying for an aerodrome licence. Otherwise, the 1,000 ft rule should be observed.
	41	P. Wells	ATPL/A	- exemption from 500 ft rule desirable for inspection of farm strips	<u>Not Accepted</u> - if an aerodrome cannot be adequately inspected from 500 ft then a ground inspection is probably needed. However, a go-around from an unsatisfactory approach to land is always allowed.
	34	J. James	HCGB	- "normal aviation practice" should include hover taxiing at an aerodrome.	<u>Noted</u> - the test to be applied will be one of reasonableness in the circumstances.

Rule	Comment				Reply
5(2)(e)	4	D. Nockels	Met. Police Air Unit	- rule should include 'flying over open air assemblies'.	<u>Accepted</u>
	5	K. Sturgess	West Counties Police	- as above	- as above
	8	I. Brown	Sussex Police	- as above	- as above
	13	J. Carr	Merseyside Police	- as above	- as above

2.2 Thirty two respondents expressed high degrees of satisfaction with the revised rule. One respondent expressed dissatisfaction and the remaining ten gave no indication of their overall opinion.

3. CONCLUSION

3.1 On the basis of the comments and arguments received, a revised proposal has been prepared at Annex A.

ATTACHMENT: Rule 5 - Summary of Responses to Second Consultation 25 June 2003

ATTACHMENT: Rule 5 - Summary of Responses to Second Consultation 25 June 2003

Index	Name	Organisation/ Status	Approval Rating	Remarks
1	R. Dean	CAA International Services	*****	(1) Make 5(1)(b) “with permission of CAA” – then issue ‘permissions’ instead of ‘exemptions’ (2) Combine 5(1)(c) & (d) as in (e) + use ‘feet’ not ‘ft’
2	T. Thomas	SBAC	*****	Combine 5(1)(a) & (d) and place as 5(1)(c) then renumber rest
3	A. Ross	Insch Flying Group	*****	No comments for change
4	D. Nockels	ATPL/H Met Police Air Unit	*****	Exemption of PAOC operations from the “Flying over open air assemblies “ rule is missing [options are to add this rule (FOD preference & Nockels), or to delete PAOC exemption completely and put in individual Operations Manuals].
5	K. Sturgess	West Counties PAOC	*****	PAOC Ops require exemption to open air assemblies rule – see above.
6	P. Fleming	CAA ASD	****	ASD satisfied with the proposal as it stands.
7	J. Lyons	ATPL/H	*****	Comma missing in 5(1)(c); make 5(1)(d) applicable to aircraft other than helicopters and delete helicopters from 5(2)(d) - [review details in item 7]
8	I. Brown	Sussex PAOC	*****	(1) Suggests 1,500 ft over congested areas to reserve space for PAOC ops at 800 ft – 900 ft and below; (2) PAOC exemption required over open air assemblies.
9	A. Shanks	West Midlands PAOC	****	Suggests airspace over congested areas below 1,500 ft should be reserved for PAOC Ops.
10	D. Roome	Delta Jets	*****	Comment: “great improvement”
11	R. Barlow	Arena Aviation	*****	Comment: “excellent and useful piece of work”
12	D. Venman	Helicopter pilot	*****	Comment: (1) Is there a time-scale for introducing weather limits on PPL/H & AIC for ops at large assemblies? (2) Does ‘normal aviation practice’ extend to training for mountain flying which does not involve landing & take-off? – (Ed. No).
13	J. Carr	Merseyside PAOC		Exemption of PAOC operations required from “Flying over open air assemblies “ rule.

ATTACHMENT: Rule 5 - Summary of Responses to Second Consultation 25 June 2003

Index	Name	Organisation/ Status	Approval Rating	Remarks
14	A. Wang	CFI Fairoaks	*****	Is checking of lighting covered by 5(2)(a)(i)? [Ed. - "that is the intention".]
15	-	-	-	-
16	G. Newby	Ch. Exec. PFA	*****	"...PFA fully supports the proposed amendments..."
17	B. Smith	PPL/A	**	Comment: The meaning of "normal aviation practice" is unclear in relation to the alleviation from the 500 ft rule when operating at unlicensed aerodromes.
18	R. Whidbourne	Ch. Exec. BHAB	*****	Comment: " It is to be hoped that any unwelcome complexity or obscurity of language is not reintroduced as a result of the Legal Secretary's scrutiny of the revised rules."
19	C. Collins	DART Aviation		Comment: concerned that police helicopters routinely fly over congested areas at low levels
20	C. Evans	BALPA		Comment: EFATO & PFL training should be exempt from the 500 ft and proposed 1,000ft rules over congested areas.
21	M. Jenkins	Oxford Avn. Training		Supports the comments at 18 above and use of 1,000 ft minimum height over congested areas.
22	A. Young	Belfast City Airport		"Nil Comment".
23	F. Chughtai	DfT		<p>Comments:</p> <p>(1) Environmental effects should be analysed and taken into account + unsubstantiated statement that 1500 ft over congested areas would be 'safer'</p> <p>(2) Should give guidance on circuit heights.</p> <p>(3) Concerned by effect of environmental noise caused by helicopters hovering within the boundaries of aerodromes.</p> <p>(4) Concerned that open air assemblies which have not been notified to the authorities are given only the same protection from over-flying aircraft as cities towns or settlements.</p> <p>(5) Suggests more use of metric units – (Ed. No, units are in accordance with ICAO Annex 5.)</p> <p>(6) Meaning of "congested area" is unclear.</p> <p>(7) It is not clear if EFATO is "normal aviation practice", or when EFATO is allowed – (Ed. EFATO cannot be allowed to cause undue hazard to third parties located out-with an aerodrome).</p> <p>(8) There should be other areas similar to the 'Specified Area' in cities other than London – (Ed. This does not specifically concern Rule 5).</p>
24	D. Bickley	Southend School of		Meaning of "in accordance with normal aviation practice" ambiguous. From comments, proposed rewording of the low flying rule has apparently made its intent clearer.

ATTACHMENT: Rule 5 - Summary of Responses to Second Consultation 25 June 2003

		Flying		
25	P. Adams	Army Aviation Association	*****	Comment: [proposal] ...”the most sensible and pragmatic option...”
26	P. Adams	DASC	*****	Comment: “...supports the proposal...”
27	R. Young	Scottish Aero Club	*****	Comment: “revised wording is a great step forward, being much clearer and comprehensive than the present text.”
28	M. Collet	Light Airlines Rep NATMAC	*****	Comment: “...the proposal is absolutely right as far as we are concerned.”
29	M. Collet	Chairman Air Atlantique	*****	Comment: “We fully support the proposals.”
30	B. Tempest	Armageddon Aviation	*****	Comment: “...a practical result and support your proposed text...”
31	C. MacMahon	NATS Policy & Performance (Airports)	*****	Comments: “...welcomes the rationalisation of the low flying rule.” “... accepts that revised rule is more closely aligned with ICAO rules of the air” Coordinated NATS view: “...no objection to the revised proposals.” NATS accepts that mixture of metric and imperial units in accordance with ICAO Annex 5
32	J. Ree	ATPL/A	*****	Comment: “...applaud any efforts to simplify and condense this rule.” Supports proposal for 1,000 ft minimum over congested areas as this will reduce traffic density and improve ability to remain clear of cloud when overflying congested areas.
33	M. Turner	ATPL/A	*****	Comment: “... agree with the proposal both with regard to flight still being allowed below 500 ft and to the lowering of the minimum height to cross built up areas.”
34	J. James	HCGB	*****	Suggests: “...normal aviation practice to include, in the case of a helicopter, associated hover taxi manoeuvres.”
35	P. Kynsey	Tiger Club	*****	Comment: would like to see exemption of 1,000 ft rule at unlicensed aerodromes.
36	J. Temple	RAF Central Flying School	*****	Comment: “significant improvement” Meaning of “structure” could be made clearer. Legality of EFATO & PFL training can still be problematic.
37	D. Heather-Hayes	CAA Examiners Office		Proposes changing in wording: “alight” instead of “land” + “will permit” instead of “would enable” + “undue hazard” instead of “without causing danger”
38	D. Scouller	CFI Old Sarum	*****	Comment: content with the revised formula of Rule 5 .
39	C. Pittaway	Queen’s Helicopter Flight	*****	Comment: “...very much support the retention of the existing 500 ft rule.” “...change to 1500 ft rule very welcomebelieve will make a contribution to reducing the risk of mid-air collision.”
40	E. Paintin	UK FSF	*****	Comment: “The UK Flight Safety Committee supports the proposal...”
41	P. Wells	ATPL/A		Comment: would like an exemption from the 500 ft rule for the purpose of inspecting farm

ATTACHMENT: Rule 5 - Summary of Responses to Second Consultation 25 June 2003

				strips (unlicensed aerodromes).
42	R. Wilder	MOD DAS LA Ops + (No 1 EFTS & HQ TGDA)	*****	Comment commending simplification of text and elimination of cross referencing + concerns for EFATO training satisfied.
43	T. Gill	GAPAN		<p>Comment:</p> <p>(1) Para 1(a) - would be a new imposition on aircraft other than helicopters rather than a fundamental starting point for the low flying rule.</p> <p>(2) Does not accept that the principle of not causing danger would be understood as applying to the jettisoning of items which would be likely to cause danger to persons or property in a congested area.</p> <p>(3) Para 1(c) - considers that the present rule relating to minimum height over congested areas is intended to relate to nuisance and not to safety, and that 1500 ft complies with the ICAO Rule.</p> <p>(4) Does not agree with the deletion of the clause in the present rule which allows aircraft to disregard the restriction on flight over open air assemblies.</p> <p>(5) Para 1(d) - does not agree with the text which requires all aircraft to land clear of a congested area and then, subsequently, alleviates certain aircraft from the requirement at para 2(d).</p> <p>(6) Would like to see EFATO included in the list of activities exempted from compliance at licensed aerodromes.</p> <p>(7) Asks if glide, asymmetric, and flapless approaches are normal aviation practice for the purpose of the exemptions applying at licensed aerodromes and, if so, suggests that there should be a note to this effect in the rule.</p> <p>(8) Disagrees with removal of the present exemption from the low flying rules if it is for the purpose of saving life.</p> <p>(9) Proposes changing the heading for para 1(a) to "Protection of Persons and Property".</p> <p>(10) Considers that helicopters are different to most other aircraft and that a separate low flying rule should be written for helicopters so as to address only the original concerns of the Helicopter Action Plan.</p>

ANNEX H Analysis of the Environmental Effect v the Safety Benefit of Aligning the Minimum Height Permitted Over Congested Areas with the ICAO Standard of 1,000 feet

1. Aircraft in visual flight and over flying a congested area must fly at a level which lies between:
 - (i) a maximum, equal to the cloud ceiling or the base of controlled airspace, whichever is the lower, and
 - (ii) the minimum required to complete a forced landing in a suitably clear area, or the current minimum statutory height of 1,500 ft above the highest fixed obstacle within 600 metres of the aircraft's track, whichever is the higher.

The intensity of sound is usually measured on a logarithmic scale and an increase of 10 decibels (dBA) is heard as an approximate doubling in loudness. The following analysis endeavours to quantify:

- (i) The increase in loudness of aircraft caused by reducing their minimum height^a when over flying a city town or settlement, from 1,500 ft to 1,000 ft.
- (ii) The reduction in risk of mid-air collision associated with this change in minimum height.

Example 1

Consider Case (A) where the cloud ceiling is at a height of 2,500 ft agl and the minimum cruising level is at a height of 1,600^b ft agl:

The median of the available levels within this layer will be at a height of 2050 ft agl. Aircraft flying at this level are considered in this example to produce a reference level of sound at the surface. Those flying higher than this median will cause a lesser intensity of sound than the reference and those flying lower will create a level of sound which is greater than the reference.

If the minimum cruising level is reduced, in Case (B), to 1,100^b ft agl, the median of the available levels will be at a height of 1,800 ft agl. The increase in noise associated with an aircraft flying directly overhead at this lower median level will then be given by

$$26.575^c \times \log_{10} 2050/1800 = +1.5 \text{ dBA}$$

It can also be shown that if ten aircraft, approximately evenly spaced in the vertical dimension, simultaneously over fly an observer in the height band 1600 ft – 2500 ft and then again in the height band 1100 ft – 2500 ft, the noise will increase as follows:

^a The rules of the air require that an aircraft must always be able, in the event of an engine failure, to glide clear of a congested area. Therefore, aircraft may often have to fly higher than the minimum height.

^b 100 ft has been added to cater for the highest obstacle within 600 metres.

^c In the lower atmosphere, sound is attenuated by approximately 8 dBA when the distance from the source is doubled.

Height	DBA (Difference from nominal noise level caused by a/c at 2000 ft)	Acoustic Energy (Arriving at surface)	Height	dBA (Difference from nominal noise level caused by a/c at 2000 ft)	Acoustic Energy (Arriving at surface)
2500	-2.58	0.55 x n	2500	-2.58	0.55 x n
2400	-2.10	0.62 x n	2375	-1.98	0.63 x n
2300	-1.61	0.69 x n	2250	-1.36	0.73 x n
2200	-1.10	0.78 x n	2125	-0.70	0.85 x n
2100	-0.56	0.88 x n	2000	+0.00	nominal = n
2000	+0.00	nominal = n	1820	+1.09	1.29 x n
1900	+0.59	1.15 x n	1640	+2.29	1.69 x n
1800	+1.22	1.32 x n	1460	+3.63	2.31 x n
1700	+1.88	1.54 x n	1280	+5.15	3.27 x n
1600	+2.58	1.81 x n	1100	+6.90	4.90 x n
-	-	10.34n	-	-	17.22n

The increase in noise on the surface will be given by:

$$10 \times \log_{10} 17.22n/10.34n = 2.2 \text{ dBA}$$

It would seem, therefore, that in Example 1, the increase in noise could be expected to be of the order of 1.5 dBA to 2.2 dBA.

This should be viewed in the context that an increase of between 0.5 dBA and 1 dBA is required before any change in the noise level is likely to be detected, and that +10 dBA is generally heard as an approximate doubling in the loudness of the sound.

Considering now, aircraft with a vertical dimension of 20 ft:

45 separate levels will be possible in Case (A), giving the probability of two aircraft being at the same level of 1: 2025, and

70 separate levels will be possible in Case (B) giving the probability of two aircraft being at the same level of 1: 4900.

This equates to a possible reduction in risk of collision by 142 %

Example 2

Consider Case (C) where the base of controlled airspace is at a height of 2,000 ft agl and the minimum cruising level is at a height of 1,600 ft agl:

The median of the available levels will be at a height of 1800 ft agl. Aircraft flying at this level will produce a reference level of sound at the surface. Those flying higher than the median will cause less noise than the reference and those flying lower will cause more noise than the reference.

If the minimum cruising level is reduced, in Case (D), to 1,100 ft agl, the median of the available levels will be at a height of 1,550 ft agl. The noise associated with this lower median level will be:

$$26.575 \times \log_{10} 1800/1550 = +1.7 \text{ dBA}$$

It can also be shown that if ten aircraft approximately evenly spaced in the vertical dimension simultaneously over fly an observer in the height band 1600 ft – 2000 ft and then again in the height band 1100 ft – 2000 ft, the noise will increase as follows:

Height	dBA (Difference from nominal noise level caused by a/c at 2000 ft)	Acoustic Energy (Arriving at surface)	Height	dBA (Difference from nominal noise level caused by a/c at 2000 ft)	Acoustic Energy (Arriving at surface)
2000	0.00	nominal = n	2000	0.00	nominal = n
1956	0.26	1.06 x n	1900	0.59	1.15 x n
1911	0.52	1.13 x n	1800	1.21	1.32 x n
1867	0.79	1.20 x n	1700	1.87	1.54 x n
1822	1.07	1.28 x n	1600	2.57	1.81 x n
1778	1.36	1.37 x n	1500	3.32	2.15 x n
1733	1.65	1.46 x n	1400	4.12	2.58 x n
1689	1.95	1.57 x n	1300	4.97	3.14 x n
1644	2.26	1.68 x n	1200	5.89	3.88 x n
1600	2.57	1.81 x n	1100	6.89	4.89 x n
-	-	13.56n	-	-	23.46n

The increase in noise on the surface will be given by:

$$10 \times \log_{10} 23.46n/13.56n = 2.4 \text{ dBA}$$

It would seem, therefore, that in Example 2, the increase in noise could be expected to be in the order of 1.7 dBA to 2.4 dBA.

This should be viewed in the context that an increase of between 0.5 dBA and 1 dBA is required before any change in the noise level is likely to be detected and that +10 dBA is generally heard as an approximate doubling in the loudness of the sound.

Considering now, aircraft with a vertical dimension of 20 ft:

20 separate levels will be possible in Case (C), giving the probability of two aircraft being at the same level of 1: 400, and

45 separate levels will be possible in Case (D) giving the probability of two aircraft being at the same level of 1: 2025.

This equates to a reduction in risk of collision by 406 %

Conclusion

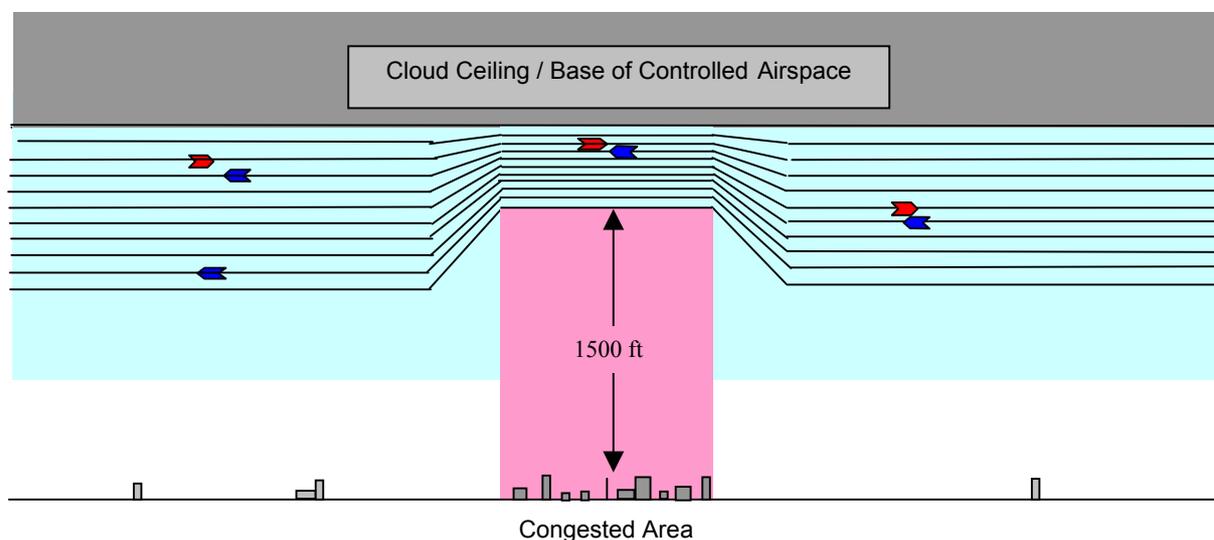
In both examples, alignment in the UK with the international standard would result in an increase in noise heard on the ground, which on average will be of the order of 2 dBA. In the particular case of a given aircraft directly overhead, a reduction in height from 1600 ft to 1100 ft would result in an increase in the sound by 4.3 dBA, which is comparable to the existing variation in sound levels across the range of different types of aircraft in the light aircraft class.

It should be borne in mind that noise in the vicinity of aerodromes and airports will not be affected by changing the minimum height permitted over a congested area. Nor, would noise under the London helicopter lanes be affected, as the heights of helicopters on these routes will not be changed. The proposals are, therefore, much more concerned with light aircraft engaged in random flight paths across the United Kingdom, where flight over persons and property lying outside congested areas has historically taken place at heights as low as 500 ft.

It is against these comparisons of sound intensity that a reduction in the risk of mid-air collision should be viewed, and the examples shown above indicate that adoption of the international standard could result in the risk of this occurring over congested areas (when persons on the ground would be put at risk) being reduced by several hundred percent.

The figures shown below are a representation of the effects on traffic densities over congested areas caused by the UK minimum of 1,500 ft versus the ICAO minimum of 1,000 ft.

Current UK Rule



International Standard

