

Manual of Air Traffic Services – Part 1

CAP 493



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Explanatory Note

Edition 11 comprises:

Section	Chapter	Paragraph	Subject	Origin
1	9	2A	SI 2022/06 – Royal Flights in Fixed-Wing Aircraft	CAA
		2B		
2	3	5.4	SI 2022/07 – Lasers, Searchlights and Fireworks Displays	CAA
		5.5		
1	3	8D.1	SI 2022/08 – Alternative Departure Separations	CAA
1	7	4	SI 2022/09 – Regional Pressure Setting	CAA
1	6	22	SI 2022/10 – Use of Co-operative Surveillance Systems In Flight Information Service Provision	CAA
		23		
1	4	10C.1 Table 2	SI 2023/01 – Flight Priorities Table	CAA
1	2	4.1 Notes 4 & 5	SI 2023/02 – Replacement of ORS4 Nos. 1343 & 1344	CAA
		8B.2 Notes 3 & 4		
2	1	6A.2 Notes 2 & 3		
3	1	8.6 Notes 2 & 3		
1	2	4.1 Note 7	SI 2023/03 – Compliance with Cruising Level Requirements	CAA
		5.2(2)		
1	4	6B.1		
2	1	24	SI 2023/04 – Global Action Plan on the Prevention of Runway Excursions	ICAO
1	4	21	SI 2023/05 – Police, HEMS and SAR Callsigns	CAA
		22		
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Editorial Changes

No	Location	Editorial changes
1	Forward, paragraph 9.1	Hyperlink to ATS forms updated and URL inserted in full.
2	<p>Section 1, chapter 2, paragraph 4.1, note 3</p> <p>Section 1, chapter 2, paragraph 8B.2, Note 2</p> <p>Section 2, chapter 1, paragraph 6A.2, Note 1</p> <p>Section 3, chapter 1, paragraph 8.6, Note 1</p>	Text amended read: UK General Permission ORS4 No. 1477 permits VFR flight at night.
3	Section 1, chapter 2, paragraph 3B.4	Cross reference to section 1, chapter 13 changed to section 1, chapter 12.
4	Section 1, chapter 2, paragraph 4, Note 6	Reference to table 2 corrected to table 3.
5	Section 1, chapter 4, paragraph 19.1	Cross reference to the Air Navigation Order updated.
6	Section 1, chapter 4, paragraph 24	Reference to Mareva Injunction changed to Freezing Order.
7	Section 1, chapter 6, paragraph 5C.7	Text amended to reflex the use of downlinked mode S barometric pressure setting data to assist in the resolution of an incorrect altimeter setting when the use of standard pressure is expected.
8	Section 1, chapter 6, paragraph 9.4	<p>Publication error in item (1) of the numbered list corrected:</p> <p>From:</p> <p style="padding-left: 40px;">(1) A well-known geographical position; Bearing (using points of the compass) and distance from a known position;</p> <p>To:</p> <p style="padding-left: 40px;">(1) A well-known geographical position;</p>

No	Location	Editorial changes
		(2) Bearing (using points of the compass) and distance from a known position; Subsequent items renumbered accordingly.
9	Section 1, chapter 7, paragraph 4.3	Amended to read: ATSUs are to have available the RPS for the ASR in which they are situated and appropriate adjacent regions. These values are to be passed to pilots when requested or at the discretion of the controller. However, the RPS shall not be volunteered if a controller believes it is not appropriate to the flight; for example, where an aircraft is operating below that controlled airspace which is notified in AIP ENR 1.7 paragraph 3.9.
10	Section 1, chapter 7, paragraph 4.4	Regional Pressure Setting abbreviated to RPS.
11	Section 1, chapter 7, paragraph 4.4	AIP reference updated.
12	Section 3, chapter 2, paragraph 9E.2(3)	Amended to read: When it is necessary to ensure that an aircraft joining the ILS/MLS does not commence descent until specifically cleared, solely instruct the pilot to report established on the localiser and to maintain the previously assigned level. Subsequently, as appropriate, the pilot shall be: <ul style="list-style-type: none"> (a) cleared for the approach; (b) cleared to descend on the glidepath; or (c) given alternative level instructions.
13	Section 6, chapter 1, paragraph 3.1 Section 6, chapter 3, paragraph 3.1, table 2 Section 6, chapter 3, paragraph 4.2, table 3 Section 6, chapter 3, paragraph 8A.4 Section 6, chapter 4, paragraph 3.1	Hyperlink URLs inserted in full.

No	Location	Editorial changes
14	Section 6, chapter 5, paragraph 3	Text relating to the observation and reporting of unidentified flying objects withdrawn.
15	Appendix D, paragraph 5 Symbols	"Coordinated Effected" changed to "Coordination Effected"

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Revision History

The table below is provided as a reference to highlight when major changes were made to the content of the MATS Part 1. It does not cover editorial changes.

As necessary, an update will be added to the table at each amendment and the detailed Explanatory Note will continue to be provided. Pages that are affected will be listed for each revision in the explanatory notes.

Eleventh Edition

Subject	Origin
SI 2022/06 – Royal Flights in Fixed-Wing Aircraft	CAA
SI 2022/07 – Lasers, Searchlights and Fireworks Displays	CAA
SI 2022/08 – Alternative Departure Separations	CAA
SI 2022/09 – Regional Pressure Setting	CAA
SI 2022/10 – Use of Co-operative Surveillance Systems in Support of Flight Information Service (FIS) Provision	CAA
SI 2023/01 – Flight Priorities Table	CAA
SI 2023/02 – Replacement of ORS4 Nos. 1343 & 1344	CAA
SI 2023/03 – Compliance with Cruising Level Requirements	CAA
SI 2023/04 – Global Action Plan on the Prevention of Runway Excursions	ICAO
SI 2023/05 – Police, HEMS and SAR Callsigns	CAA

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Foreword

1. Background

- 1.1 The Manual of Air Traffic Services Part 1 CAP 493 is based upon national legislation and non-legislative regulatory material, such as ICAO Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS). It is published in order to provide UK ANS providers (ANSPs) with:
- (a) guidance and clarification on the means of achieving compliance with UK regulatory requirements and ICAO SARPS and PANS; and,
 - (b) details of any additional national requirements, including appropriate supporting administrative procedures.
- 1.2 Two strands of UK aviation related regulation now exist. That made under the Air Navigation Order (which includes the Rules of the Air Regulations) and that made under The Basic Regulation (EU) No. 2018/1139 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018) and its Implementing Rules.
- 1.3 Some of this retained law is accompanied by acceptable means of compliance (AMC) and guidance material (GM) that have been adopted by the CAA as its policy with regard to compliance with the relevant UK law from 1 January 2021.
- 1.4 In publishing the Manual of Air Traffic Services Part 1 CAP 493, the CAA satisfies the obligations placed upon it by the Transport Act 2000¹, Chapter 1 Article 2 'CAA's general duty', which in paragraph 2(a) requires the CAA to exercise its functions under the Act in the manner it thinks best calculated, to further the interests of operators and owners of aircraft, owners and managers of aerodromes, persons travelling in aircraft and persons with rights in property carried in them. The only interests to be considered under subsection (2)(a) are interests regarding the range, availability, continuity, cost, and quality of air traffic services.
- 1.5 Publication of the Manual of Air Traffic Services Part 1 CAP 493 additionally satisfies the requirements set out by the Civil Aviation Authority (Chicago Convention) Directions 2007² to ensure that it acts consistently with the obligations placed on the UK under the Chicago Convention. The CAA is obliged to consider whether it is necessary to amend United Kingdom aviation legislation to ensure appropriate implementation of an ICAO provision.

¹ <http://www.legislation.gov.uk/ukpga/2000/38/contents> or <http://www.legislation.gov.uk/ukpga/2000/38/data.pdf>

² [CAA \(Chicago Convention\) Directions 2007 \(as amended\).pdf](#)

- 1.6 Where (a) the CAA considers it inappropriate to transpose an ICAO provision into domestic legislation and (b) the CAA has discretionary power to enforce the requirements of such a provision through a certificate, licence, or other means of approval, the Civil Aviation Authority (Chicago Convention) Directions 2007 obliges the CAA to develop and publish such requirements as are necessary to implement the ICAO provision and shall ensure that it is able to verify adherence to those requirements.
- 1.7 The Manual of Air Traffic Services Part 1 CAP 493 is subject to periodic revision to take account of changes to source regulatory material, feedback from industry, and recognised best practice. The Manual of Air Traffic Services Part 1 CAP 493 provides applicable guidance and clarification relating to – and is to be read in conjunction with - the regulatory material referenced below. **Non-inclusion of source regulatory material within this CAP does not preclude the end user from either the need to be aware of, or the need to comply with, the requirements contained within the source regulatory materials unless otherwise exempted from those requirements.**
- 1.8 It is the policy of the UK government that, unless a Difference from an ICAO Standard has been established, compliance with relevant international (i.e. ICAO and applicable equivalents such as International Telecommunications Union) provisions is required to the extent mandated in law. Moreover, unless an alternative 'Means of Compliance' (MOC) (related to a CAA 'Acceptable Means of Compliance' (AMC)) has been approved for use, then compliance with the relevant AMC is required to the extent mandated in the law as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018. Finally, compliance with other national requirements that are not addressed by international requirements or retained EU regulations is also required.
- 1.9 The words 'must', 'shall' and 'will' indicate that compliance with applicable regulatory requirements is necessary. In the case of AMC, the word 'should' indicates that compliance is required, unless complying with an approved alternative MOC.

2. Regulatory References

- 2.1 The Manual of Air Traffic Services Part 1 CAP 493 is published to assist ANSPs' understanding of, and compliance with the requirements laid down in:
- (1) **ICAO:** Annex 2, Annex 10 Volume II, Annex 10 Volume V, Annex 11, Annex 14 Volume I, Doc 4444 PANS-ATM and Doc 7030 EUR Supplement.
 - (2) **United Kingdom:** ANO 2016 (as amended), UK Reg (EU) No. 923/2012 'Standardised European Rules of the Air (SERA)', UK Reg (EU) No. 139/2014 'Aerodrome Regulation', UK Reg (EU) No 2017/373 'Air Traffic Management (ATM)/Air Navigation Services (ANS) Implementing Rule (IR)', CAP 168 Licensing of Aerodromes, CAP 413 Radiotelephony Manual, CAP 774 UK FIS, and CAP 1430 the UK ATM Vocabulary.

- 2.2 Where appropriate, this document references EU Regulations, as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018, as source material. References to the 'Cover Regulation' are cited as either UK Reg (EU) No. XXX/YYYY followed by the appropriate Article, or UK Reg (EU) No YYYY/XXX; where 'X' is the number of the Regulation and 'YYYY' is the year of publication. Where applicable, references to provisions contained within an Annex to the Regulation are cited as they appear in the Annex; for example, provisions contained within the Standardised European Rules of the Air (SERA) Annex to UK Reg (EU) No. 923/2012 are cited as 'SERA.XXXX', where 'X' refers to the number of the provision.

3. Purpose and Scope

- 3.1 The Manual of Air Traffic Services contains procedures, instructions, and information, which are intended to form the basis of ATS within the UK. It is published for use by civil Air Traffic Controllers and may also be of general interest to others associated with civil aviation.
- 3.2 The Manual of Air Traffic Services (MATS) is arranged in two parts:
- (1) MATS Part 1 Instructions that apply to all UK ATSU's
 - (2) MATS Part 2 Instructions that apply to a particular ATSU, produced locally, and approved by the CAA. They amplify and interpret, at local level, MATS Part 1 instructions. Any authorisation required by MATS Part 1 is to appear in the MATS Part 2.
- 3.3 Definitions and abbreviations are contained within [CAP 1430 – UK Air Traffic Management Vocabulary](#).

4. Manual of Air Traffic Services Part 1 – Status

- 4.1 Operational controllers are expected to have a detailed knowledge of Sections 1 and 5, together with the same degree of knowledge of those Sections appropriate to their licence. Sections 6 to 8 are of lesser importance or are for reference. Aerodrome controllers whose routine duties do not include those items detailed in Section 2 Chapters 6 to 8 are not expected to have in-depth knowledge of this content.

4A. Interpretation of Words

- 4A.1 To avoid any misunderstanding within the MATS, certain words are to be interpreted as having specific meanings when they are the operative words in an instruction.

Word	Interpretation
'shall', 'is to', 'are to' and 'must'	Mean that compliance with the instruction or regulatory requirement is necessary.

Word	Interpretation
'should'	In the case of AMC to requirements, the word 'should' indicates that compliance is required, unless complying with an approved AltMoC. Otherwise, it means that it is strongly advisable that an instruction is carried out and is applied where the more positive 'shall' is unreasonable but nevertheless a pilot / controller would have to have good reason for not doing so.
'may'	Means that the instruction is permissive, optional, or alternative, e.g. 'a controller may seek assistance...' but would not if they did not need it.
'will'	Is used for informative or descriptive writing, e.g. 'pilots will file...', is not an instruction to the controller.
Rule	refers to the Rules of the Air Regulations.
Order	refers to the Air Navigation Order.

4A.2 To prevent excessive repetition in instructions, certain collective words have been adopted.

Collective words	Interpretation
'Senior Controller'	the controller who, at a particular time, has full operational responsibility for an air traffic service unit. This could range from the supervisor of an ACC to an aerodrome controller on duty on their own.
'the CAA'	means the Civil Aviation Authority.
'authorised by the CAA'	an authorisation in writing from the CAA. The authorisation will amplify instructions, specify exemptions or both. The extent of the authorisation and other conditions that may apply in the particular circumstances appear in MATS Part 2.
'DEO' (Duty Engineering Officer)	Generic term used in the MATS Part 1 meaning the person or persons responsible for the specific task; namely engineering, telecommunications, surveillance system etc. As appropriate, locally established personnel titles shall be specified in MATS Part 2.

5. Manual of Air Traffic Services Part 1 – Format

5A. Headings

5A.1 Main subject headings are numbered. Where subjects have been expanded or qualified, bold headings have been inserted to break up the text. All the text under the main subject headings, including the material under the bold headings, belongs to that main subject heading.

5B. References

5B.1 All references in the index are to the section, chapter (if applicable) and page number as shown at the foot of each page. References to other documents, such as the ANO, are as at the effective date of the page. The current status of all CAA publications can be verified on the CAA website.

5C. Appendices

5C.1 Each appendix (or in some cases part of an appendix) is in suitable form for removal and independent use.

5D. Gender

5D.1 The text within this manual is gender neutral.

5E. Page Numbering

5E.1 The List of Effective Pages is numbered at the foot using roman numerals. The Explanatory Note, Foreword and Glossary are numbered at the foot with Arabic page numbers, and Sections 1 to 8 are numbered at the foot with the Section, Chapter and Page numbers. Supplementary Instructions have an identifying number and year of issue with individual page number; and Appendices have the word Appendix followed by an identifying letter an individual page number.

6. Manual of Air Traffic Services Part 1 – Amendments

6A. Amendments

6A.1 Amendments to MATS Part 1 will be published in March, July, and November.

6A.2 A side bar positioned on the right of the page is used to indicate new or revised text. Two weeks prior to the effective date of an amendment, the full CAP 493 will be available on the CAA website (www.caa.co.uk). This document will contain a summary of changes and an updated List of Effective Pages. From the effective date of the amendment the superseded version of CAP 493 will be removed from the website.

6A.3 Printed copies of CAP 493, together with amendments, are available for purchase from the CAA's publishers, whose details are given on the inside cover of this publication.

6B. Effective Date

6B.1 The effective date of an instruction is stated at the foot of the page. Publication of a new edition means that all pages will have the same date; however, new instructions are effective on the amendment publication date.

6C. Supplementary Instructions

6C.1 Supplementary Instructions to MATS Part 1 are issued for the following reasons:

- (1) to introduce an entirely new subject or a radical change to existing instructions;
- (2) to re-emphasise an existing instruction.

6C.2 Supplementary Instructions will be incorporated into the main body of the document in a suitable and timely manner.

7. Units of Measurement

- 7.1 The units of measurement to be used by controllers in communication with aircraft are listed within the UK AIP at GEN 2.1.

8. Conversion Tables

- 8.1 The units of measurement to be used by controllers in communication with aircraft are listed within the UK AIP at GEN 2.6.

9. ATS forms

- 9.1 The CAA no longer prints ATS forms in bulk. All CAA forms may be downloaded from the CAA website and reproduced locally. The following hyperlink should be used to access Air Traffic Services forms on the internet:

<http://www.caa.co.uk/atsforms>

- 9.2 In the event of difficulty accessing any forms from the CAA website, printed examples are available on request from the CAA.

10. Copyright

- 10.1 The copyright details of this publication are printed on the inside cover.

11. Enquiries

- 11.1 Any enquiries about the content of the MATS Part 1 should be addressed to:

ATS Enquiries
Airspace, ATM & Aerodromes
Civil Aviation Authority
Safety and Airspace Regulation Group
Beehive Ring Road
Crawley
West Sussex
RH6 0YR

E-mail: ats.enquiries@caa.co.uk

Section 1: General

Chapter 1: Air Traffic Services

1. Introduction

- 1.1 Air Traffic Services within the UK are provided in accordance with the Air Navigation Order, Rules of the Air Regulations and Standardised European Rules of the Air. Generally, these are in line with the Standards and Recommended Practices of the International Civil Aviation Organisation.
- 1.2 The Manual of Air Traffic Services contains instructions and guidance for controllers providing Air Traffic Services to cater for both routine and many emergency situations. However, nothing in this manual prevents controllers from using their own discretion and initiative in response to unusual circumstances, which may not be covered by the procedures herein.

2. Language Requirement

- 2.1 In accordance with ICAO requirements the English language shall be used for all operational communications at ATSUs within the UK.
- 2.2 Operational communication between UK and non-UK ATSUs shall, on the part of the UK ANSP, be conducted in the English language.
- 2.3 ANSPs may designate, within their unit, operational areas in which all communications (operational and non-operational) shall be in the English language.

3. Air Traffic Services

- 3.1 An Air Traffic Service is a generic term meaning variously:
- (1) Air Traffic Control Service;
 - (2) Air Traffic Advisory Service;
 - (3) Flight Information Service;
 - (4) Alerting Service.
- 3.2 Where air traffic services units provide both flight information service and air traffic control service, the provision of air traffic control service shall have precedence over the provision of flight information service whenever the provision of air traffic control service so requires (SERA.9001(c)).

4. Objectives of Air Traffic Services

- 4.1 The objectives of the air traffic services shall be to:
- (1) prevent collisions between aircraft;

- (2) prevent collisions between aircraft on the manoeuvring area and obstructions on that area;
- (3) expedite and maintain an orderly flow of air traffic;
- (4) provide advice and information useful for the safe and efficient conduct of flights;
- (5) notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required.

Note 1: These provisions are general statements which represent high-level safety objectives to be met when providing ATS. (GM1 SERA.7001)

Note 2: ATS personnel are not solely responsible for the prevention of collisions. Pilots and vehicle drivers must also fulfil their own responsibilities in accordance with RoA Regulations.

Note 3: Compliance with the procedures contained in this Manual and supplemented in MATS Part 2 are considered to meet the above objectives.

4.2 EASA regulations require that ATS units, in carrying out their objectives, shall have 'due regard' for the requirements of the aircraft operators consequent on their obligations as specified in the relevant EASA legislation on Air Operations, and, if so required by the aircraft operators, shall make available to them or their designated representatives such information as may be available to enable them or their designated representatives to carry out their responsibilities (UK Reg (EU) No. 923/2012 SERA.7005 (a)).

Note: The expression 'due regard' is meant to indicate that the ATS units, in their co-ordination with the aircraft operators, should take into account the obligations of the operators specified in the EASA rules on air operations, and provide them with the information they require to operate in accordance with those rules (GM1 SERA.7005(a)).

4.3 When so requested by an aircraft operator, messages (including position reports) received by air traffic services units and relating to the operation of the aircraft for which operational control service is provided by that aircraft operator shall, so far as practicable, be made available immediately to the aircraft operator or a designated representative in accordance with locally agreed procedures (UK Reg (EU) No. 923/2012 SERA.7005 (b)).

Note 1: Aircraft operators or their designated representatives (including Flight Operations Officers/Flight Dispatchers) are required to notify the appropriate ATS unit when the position of the aeroplane cannot be determined by an aircraft tracking capability and attempts to establish communication are unsuccessful. An 'appropriate ATSU' may be determined by reference to the UK AIP (AD 2, AD 3, and ENR 2 as appropriate).

Note 2: Operational control service refers to the aircraft operator's responsibility for exercising authority over the initiation, continuation, diversion, or termination of a flight in the interest of safety of the aircraft and the regularity and efficiency of the flight.

5. Air Traffic Control Service

- 5.1 An ATC service is provided according to the particular circumstances and class of airspace.
- 5.2 An Air Traffic Control Service shall include the provision of pertinent flight information.
- 5.3 Air traffic control service shall be provided (SERA.8001):
- (1) to all IFR flights in airspace Classes A, B, C, D and E;
 - (2) to all VFR flights in airspace Classes B, C and D;
 - (3) to all special VFR flights;
 - (4) to all aerodrome traffic at controlled aerodromes

6. Air Traffic Advisory Service

- 6.1 An Air Traffic Advisory Service is a service provided within Class F airspace to ensure separation, in so far as practical, between participating IFR flights. Class F airspace is not currently established in the UK FIRs.

7. Flight Information Service

- 7.1 A flight information service (FIS) (defined in ICAO Annex 11 and transposed into EU law through UK Reg (EU) No. 923/2012) is a service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flight and shall include the provision of pertinent:
- (1) SIGMET and AIRMET information;
 - (2) information concerning pre-eruption volcanic activity, volcanic eruptions, and volcanic ash clouds;
 - (3) information concerning the release into the atmosphere of radioactive materials or toxic chemicals;
 - (4) information on changes in the availability of radio navigation services;
 - (5) information on changes in condition of aerodromes and associated facilities, including information on the state of the aerodrome movement areas when they are affected by snow, ice, or significant depth of water;
 - (6) information on unmanned free balloons;
 - (7) information on space weather phenomena that have an impact on high frequency radio communications, communications via satellite, GNSS-based

navigation, and surveillance systems, and/or pose a radiation risk to aircraft occupants at flight levels; and

(8) of any other information likely to affect safety (SERA.9005(a)).

7.2 In Class G airspace, the ICAO requirements for Flight Information Service are met through a suite of services, known as the 'UK Flight Information Services' as detailed in CAP 774 – UK Flight Information Services.

8. Alerting Service

8.1 An Alerting Service is provided to notify appropriate organisations regarding aircraft in need of SAR aid and assist such organisations as required.

9. Air Traffic Control Units

9.1 The term 'ATC unit' will be used in this document when the unit provides an ATC service, or any of the following from the suite of UK Flight Information Services: Procedural Services; Deconfliction Service; or Traffic Service.

9.2 All ATC units shall provide an Alerting Service to aircraft under their jurisdiction.

Note: The term 'ATSU' will be used when it is significant that the instruction applies to an AFIS unit in addition to an ATC unit.

10. Safety and Expedition

10.1 The provision of an air traffic service should be based upon expedition consistent with safety. In complex environments any deviation from basic procedures in order to expedite traffic should be carefully considered against the extent of co-ordination required and the attendant risk of error. The controller should only deviate from the basic procedures when they are quite sure that the resultant co-ordination can be carried out without excessive workload and without detriment to the safety of traffic under their control.

10.2 Where controllers are working together, they should whenever possible, pay attention to each other's actions in order to provide an additional safeguard against errors or omissions.

Section 1: General

Chapter 2: Flight Rules

1. Division of Airspace

- 1.1 UK airspace is divided into two Flight Information Regions. Within each region the airspace below FL245 is known as the Flight Information Region (FIR) and that at and above as the Upper Flight Information Region (UIR).

2. Classification of Airspace

- 2.1 The classification of the airspace within a FIR determines the flight rules which apply and the minimum services that are to be provided (SERA.6001). These are summarised below.

Table 1: Classifications of Airspace Established in the UK FIRs

Class	Flight Rules	Aircraft Requirements	Minimum Services by ATC Unit
A	IFR only	ATC clearance before entry. Comply with ATC instructions.	Separate all aircraft from each other.
C	IFR and VFR	ATC clearance before entry. Comply with ATC instructions.	(a) Separate IFR flights from other IFR and VFR flights; (b) Separate VFR flights from IFR flights; (c) Pass traffic information to VFR flights on other VFR flights and give traffic avoidance advice if requested.
D	IFR and VFR	ATC clearance before entry. Comply with ATC instructions.	(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights and SVFR flights on VFR flights and give traffic avoidance advice when requested; (c) Pass traffic information to VFR flights on all other flights and provide traffic avoidance advice when requested.
E	IFR and VFR	IFR flights to obtain ATC clearance before entry and comply with ATC instructions. VFR flights do not require clearance.	(a) Separate IFR flights from other IFR flights;

Class	Flight Rules	Aircraft Requirements	Minimum Services by ATC Unit
			<p>(b) to IFR flights: wherever practicable, pass traffic information and if requested by the pilot or when deemed necessary by the controller, suggest traffic avoidance advice on participating and non-participating VFR flights;</p> <p>(c) to VFR flights: provide traffic information in accordance with CAP 774 – UK Flight Information Services</p>
G	IFR and VFR	None.	None.

Note 1: Airspace Classes A, C, D and E are controlled airspace.

Note 2: Class E airspace may additionally be notified as Transponder Mandatory Zones (TMZ).

Note 3: When the controller considers that more immediate action is required by the pilot, traffic avoidance advice may be passed by ATC before traffic information.

- 2.2 Notwithstanding the minimum service requirements associated with each airspace classification, the primary objective of air traffic services is to prevent collisions between aircraft (SERA.7001(a)). In support of this objective, on any occasion a controller considers it necessary in the interests of safety, traffic information and, where appropriate traffic avoidance advice, shall be provided. Pilots are responsible for collision avoidance (SERA.3201) and should be aware of the existence of factors that might adversely affect the ability of a controller to detect a collision hazard and provide timely and accurate traffic information, and when surveillance-based ATS is being provided, traffic avoidance advice.
- 2.3 Where volumes of airspace adjoin vertically (i.e. one above the other), flights at a common level should comply with the requirements of, and be provided with, air traffic services applicable to the less restrictive class of airspace (AMC1 SERA.6001).
- 2.4 Where controlled airspace is adjoined vertically by Class G airspace, aircraft may operate at the lower limit of control areas (including TMAs), or at the upper limit of a control zone or control area (including TMAs) and are deemed to be operating outside controlled airspace. Pilots operating at these levels and in communication with an air traffic control unit shall be provided with UK Flight Information Services in accordance with CAP 774. Controllers providing an ATS to such flights should, as necessary, include a wake turbulence caution when providing traffic information on

controlled flights operating at the lowest available level. Associated phraseology is found in CAP 413, chapter 9, paragraph 9.2.

2.5 With the exception of VFR flights operating into or out of Class E airspace and complying with any applicable TMZ requirement, flights without an ATC clearance and observed to be operating:

- immediately above the lower limit of a control area (including a TMA); or
- immediately below the upper limit of a control zone or control area (including a TMA), are to be considered an infringement of controlled airspace, see table 2 below.

Note: The risks of infringing controlled airspace when operating in Class G airspace at the lower or upper limit of controlled airspace and encountering wake turbulence generated by aircraft operating at the lowest available level within a control area are detailed for airspace users within the UK AIP at ENR 1.

Table 2: Airspace Infringement and MOR action.

Mode C / Mode S altitude report (whether verified or not)	Infringement (see notes 1 & 2)	MOR Required
Mode C / Mode S altitude reports indicates the aircraft is either: (i) at or below the lower limit of controlled airspace; or (ii) at or above the upper limit of controlled airspace.	No	No
Mode C altitude reports indicates the aircraft is either: (i) 100 ft or more above the lower limit of controlled airspace; or (ii) 100 ft or more below the upper limit of controlled airspace. Or Mode S altitude reporting indicates the aircraft is: (iii) Any level above the lower limit of controlled airspace; or (iv) Any level below the upper limit of controlled airspace.	Yes	Yes

Note 1: When considering whether an infringement of controlled airspace has occurred, controllers are not to consider aircraft total vertical error (TVE) and errors introduced by ATS surveillance systems in transmitting and processing SSR Mode C/Mode S altitude data.

Note 2: Controllers should take into account in their RT exchanges with pilots that the level displayed on the aircraft's altimeter might not be exactly the same as that displayed to the controller on ATS surveillance systems when the appropriate barometric pressure has been correctly set.

3. Speed Limit

3.1 Airspace speed limits and procedure speed limits are two types of speed restrictions, which may apply to certain flights.

3A. **Airspace Speed Limit**

3A.1 Aircraft flying below FL100 are required to observe, with exceptions, a speed limit of 250 kt IAS (SERA.6001). Such a limit is an essential component of the 'see and avoid' principle when separation is not established by ATC. This is in addition to speed limits, which may be notified for specific procedures.

3A.2 The 250 kt speed limit does not apply to:

- (1) flights in Class A and B airspace;
- (2) IFR flights in Class C airspace;
- (3) for exempted VFR flights in Class C airspace when authorised by an ATC unit in accordance with MATS Part 2;
- (4) for exempted flights in Class D airspace when authorised by an ATC unit in accordance with MATS Part 2;
- (5) test flights in accordance with specified conditions;
- (6) aircraft taking part in flying displays when authorised by the CAA;
- (7) aircraft subject to a written permission granted by the CAA;
- (8) State aircraft such as military aircraft.

3A.3 Controllers may only exercise the authority granted in paragraph 3A.2 (3) above when they are satisfied that they are in contact with all aircraft in the relevant part of the airspace. VFR flights in the vicinity are to be warned about aircraft flying at a higher speed.

3A.4 An airspace speed limit must not be relaxed by ATC for flights which will be transiting from a known traffic environment, e.g. Class A airspace, into airspace where the 'see and avoid' principle operates as the primary means of separation.

3A.5 In Class E, F and G airspace, conflicting traffic may not be known to ATC and so it is necessary for all flights to make use of the 'see and avoid' principle. In order for this to operate effectively, controllers shall not authorise a relaxation of the airspace speed limit.

Note: The speed limitation of 250 kt for VFR flights in airspace Classes C, D, E, F, G and for IFR flights in airspace Classes D, E, F, G is intended to facilitate visual acquisition of flights which are not separated (GM1 SERA.6001(b)).

3B. **Procedure Speed Limits**

3B.1 In certain cases, speed limits are published for specific ATC procedures for a number of reasons. For example:

- (1) A speed limit of 250 kt is applied to published SID procedures to assist in the initial provision of separation between successive departing aircraft;

- (2) A speed limit of 250 kt is applied to some STAR procedures to assist ATC in the integration of traffic flows;
- (3) Some holding patterns have non-standard maximum holding speeds for containment within controlled airspace or separation from adjacent routes or procedures;
- (4) Some instrument approach procedures have non-standard maximum speeds for obstacle avoidance or controlled airspace containment.

3B.2 When an aircraft is in receipt of an ATS surveillance service, except for instrument approach procedures, controllers may relax procedure speed limits. However, extreme caution should be exercised as the controller then becomes responsible for the provision of separation, controlled airspace containment and obstacle clearance, which would otherwise have been provided within the procedure design.

3B.3 Controllers should also be aware that, even if there is no tactical ATC requirement to sustain a speed limit, particularly for departing aircraft, the pilot remains responsible for operating their aircraft in such a manner as to adhere to other requirements, e.g. noise preferential route track-keeping.

3B.4 Speed control procedures are detailed in Section 1, Chapter 12.

4. Visual Flight Rules

4.1 The pilot of an aircraft is responsible for determining whether or not the meteorological conditions permit flight in accordance with the Visual Flight Rules. The criteria for determining Visual Meteorological Conditions are summarised in the tables below (SERA.5001 Table S5-1).

Table 3:

By Day	Distance from Cloud		Flight Visibility
	Horizontal	Vertical	
At and Above FL 100 (SERA.5001) Class B, C, D, E, F and G airspace	1500 m	1,000 ft	8 km
Below FL 100 and above 3,000 ft AMSL, or above 1,000 ft above terrain, whichever is the higher (SERA.5001) Class B, C, D, E, F and G airspace	1500 m	1,000 ft	5 km
At and below 3,000 ft AMSL, or 1,000 ft above terrain, whichever is the higher (SERA.5001) Class B, C, D and E airspace	1500 m	1,000 ft	5 km
Alternatively, in Class D airspace For aircraft other than helicopters, flying at 140 kts IAS or less For helicopters, flying at 140 kt IAS or less	Clear of cloud and with the surface in sight	Clear of cloud and with the surface in sight	5 km 1500 m
Class F and G airspace Alternatively, for aircraft including helicopters, flying at 140 kt IAS or less	Clear of cloud and with the surface in sight	Clear of cloud and with the surface in sight	5 km 1500 m

Table 4:

By Night	Distance from Cloud		Flight Visibility
	Horizontal	Vertical	
At and Above FL 100 (SERA.5001) Class B, C, D, E, F and G airspace	1500 m	1,000 ft	8 km
Below FL 100 and above 3,000 ft AMSL, or above 1,000 ft above terrain, whichever is the higher (SERA.5001) Class B, C, D, E, F and G airspace	1500 m	1,000 ft	5 km
At and below 3,000 ft AMSL, or 1,000 ft above terrain, whichever is the higher (SERA.5001 and SERA.5005(c)(3)(iii)) Class B, C, D and E airspace	1500 m	1,000 ft	5 km
Class F and G airspace	Clear of cloud and maintain continuous sight of the surface		

Note 1: VMC minima for Class A airspace are:

At or above FL100 8 km flight visibility, 1500 m horizontally and 1,000 ft vertically from cloud.

Below FL100 5 km flight visibility, 1500 m horizontally and 1,000 ft vertically from cloud

Note 2: For the purposes of gliders crossing airspace in VMC by day the minima are:

At all levels 8 km flight visibility, 1500 m horizontally and 1,000 ft vertically from cloud

Note 3: UK General Permission ORS4 No. 1477 permits VFR flight at night.

Note 4: UK General Exemption ORS4 No. 1576 exempts operations of helicopters conducting Police; HEMS; Search and Rescue (SAR) flights, including SAR training flights operating in accordance with a Letter of Agreement with the Air Traffic Service Provider, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 5: UK General Exemption ORS4 No. 1577 exempts operations of helicopters conducting powerline, pipeline and rail track inspection flights, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 6: The VMC criteria stated in table 3 above for flight by day in Class D, F and G airspace at or below 3,000 ft AMSL, or 1,000 ft above terrain, whichever is higher, reflect changes from SERA.5001 Table S5-1, as enabled through the Aviation Safety (Amendment) Regulations 2021.

Note 7: UK General Permission ORS4 No. 1578 permits an aircraft in level cruising flight above 3,000 feet above mean sea level and operated in accordance with the visual flight rules to be flown at a level other than a cruising level appropriate to its magnetic track as specified in the table of cruising levels in Appendix 3 of SERA.

5. Instrument Flight Rules

5.1 A pilot must fly according to the IFR:

- (1) If the airspace has been notified as Class A;
- (2) If the meteorological conditions preclude VFR flight or (within a Control Zone) Special VFR flight.

5.2 The IFR require a pilot to comply with (UK Reg (EU) No. 923/2020 SERA.5015(b)) and additional rules according to the type of airspace. These are summarised below:

- (1) Within Controlled Airspace (Classes A to E)
 - (a) File a flight plan and obtain a clearance before proceeding with the flight;
 - (b) Conduct the flight in accordance with clearances and instructions from ATC;
 - (c) Maintain a listening watch on the appropriate radio frequencies;
 - (d) Report the position of the aircraft according to published procedures.

(2) Outside Controlled Airspace (Class G)

Comply with the table of cruising levels (UK Reg (EU) No. 923/2012 SERA.5025(a) and Appendix 3) when in level flight above 3,000 ft amsl. The altimeter is set to 1013.2 hPa and the cruising level is selected according to the magnetic track unless the aircraft is operated:

- (a) in conformity with levels allocated by an appropriate air traffic service unit; or
- (b) in accordance with instrument approach procedures notified by the CAA in relation to an aerodrome.

Note: See ORS4 No. 1578

Table 5:

Magnetic Track	Cruising Level
Less than 180°	FL30, 50, 70, 90 etc. up to FL190
At least 180° but less than 360°	FL40, 60, 80, 100 etc. up to FL180

Note: The assignment of cruising levels is explained in Chapter 4.

6. Aerodrome Traffic Zone (ATZ)

- 6.1 ATZ adopt the classification of airspace within which they are situated. Therefore, aircraft flying within the ATZ are subject to applicable SERA and RoA Regulations, the specific conditions of the airspace, and the level of ATS provided at the particular aerodrome as follows:
- (1) At aerodromes with an ATC unit, all movements within the ATZ are subject to the permission of that unit. Aircraft will comply with instructions given by RTF and maintain a listening watch. Non-radio aircraft, which have been given prior permission to fly within the ATZ, will comply with visual signals.
 - (2) At aerodromes where an AFIS or AGCS is provided, pilots shall obtain information from the unit to enable the flight to be conducted safely within the zone and maintain a listening watch. Non-radio aircraft must comply with any conditions prescribed by the unit prior to the commencement of the flight.
- 6.2 Controllers who need to ascertain whether a pilot will either route around or transit through an ATZ in Class G airspace should advise the pilot of the ATZ status and confirm the pilot's intentions. Controllers may advise pilots to change to the published aerodrome RT frequency to either obtain ATZ crossing clearance from an ATC unit, or to obtain information from an AFIS or AGCS unit.

7. Cancellation of IFR Flight

- 7.1 Change from IFR flight to VFR flight shall only be acceptable when the pilot uses the expression "cancelling my IFR flight". No invitation to change from IFR flight to VFR flight shall be made by ATC either directly or by inference (SERA.5015(c)).
- Note 1:** Cancelling an IFR flight in Class A airspace is not possible.
- Note 2:** Cancelling an IFR flight in Class E airspace simultaneously cancels the provision of an Air Traffic Control Service; see CAP 774 for types of UK FIS available in Class E Airspace.
- 7.2 Controllers are to acknowledge a cancellation using the phrase "IFR flight cancelled at (time)". (GM1 SERA.5015(c)(3))
- 7.3 Pilots cancelling IFR plans shall be given any information which indicates that IMC may be encountered along the intended route.

- 7.4 ATS units receiving notification of an aircraft's intention to change from IFR to VFR flight shall, as necessary, by automated means or otherwise, inform subsequent ATS units of the IFR flight plan cancellation.

8. Special VFR Flight

8A. Conditions

- 8A.1 A Special VFR clearance is issued when requested by a pilot. Before issuing such a clearance a controller must consider the prevailing traffic conditions, the extent of the proposed flight and the availability of air-ground communications. Special VFR flights are not to hinder normal IFR flights.

8B. Weather

- 8B.1 When the reported meteorological conditions at aerodromes in Class D airspace reduce below a ground visibility of 1500 m and/or a cloud ceiling of 600 ft, both by day or night, ATC shall advise pilots of aircraft intending to operate under Special VFR to or from such aerodromes, and request the pilot to specify the type of clearance required.
- 8B.2 Except for helicopters using Police; Helimed; Rescue; Electricity; Grid; Powerline, or Pipeline callsigns, or a SAR training flight operating in accordance with MATS Part 2, or rail track inspection flights, controllers shall not issue a SVFR clearance to aircraft wishing to operate under SVFR to or from an aerodrome within a control zone, or enter the aerodrome traffic zone or aerodrome traffic circuit, when the official meteorological report at that aerodrome indicates:
- (1) By day or night:
 - (a) Aircraft other than helicopters: ground visibility less than 1500 m and/or cloud ceiling less than 600 ft (SERA.5010(c));
 - (b) Helicopters: ground visibility less than 800 m and/or cloud ceiling less than 600 ft (SERA.5010(c)).

Note 1: When the reported ground visibility at the aerodrome is less than 1500 m, ATC may issue a Special VFR clearance for a flight crossing the control zone and not intending to take off or land at an aerodrome within a control zone, or enter the aerodrome traffic zone or aerodrome traffic circuit when the flight visibility reported by the pilot is not less than 1500 m, or for helicopters, not less than 800 m (GM1 SERA.5010(c)).

Note 2: UK General Permission ORS4 No. 1477 permits VFR flight at night.

Note 3: UK General Exemption ORS4 No. 1576 exempts operations of helicopters conducting Police; HEMS; Search and Rescue (SAR) flights, including SAR training flights operating in accordance with a Letter of Agreement with the Air Traffic Service Provider, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 4: UK General Exemption ORS4 No. 1577 exempts operations of helicopters conducting powerline, pipeline and rail track inspection flights, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 5: For the purpose of observing the meteorological conditions at an uncontrolled and/or unlicensed aerodrome or operating site located within a control zone, and assessing whether those conditions satisfy the minima specified in SERA.5005(b) and SERA 5010(c) as appropriate, the Civil Aviation Authority deems the following to be competent to act as 'accredited observers' as required within UK Reg (EU) No. 923/2012 Article 2(28) for their flight:

- (a) The holders of valid EASA Flight Crew Licences, valid National Flight Crew Licences and Certificates issued by, or on behalf of, the United Kingdom Civil Aviation Authority, and third country licences deemed valid in accordance with Article 150 of the Air Navigation Order 2016; and
- (b) A student pilot-in-command (SPIC) who has passed the theoretical knowledge examination in meteorology toward the grant of an EASA Flight Crew Licence or National Flight Crew Licence or Certificate issued by, or on behalf of, the United Kingdom Civil Aviation Authority within the preceding two years.

8B.3 When the reported ground visibility consists of two values, the lower of the two values shall be used when determining if a Special VFR clearance can be issued.

8B.4 Procedures for operations into subsidiary aerodromes will be found in MATS Part 2.

8B.5 Aircraft flying along promulgated routes may encounter deteriorating weather conditions. Controllers should be prepared to provide an alternative route to enable the pilot to comply with the conditions of a Special VFR clearance.

8C. Separation

8C.1 Standard separation is to be applied between:

- (1) IFR flights and Special VFR flights;
- (2) Aircraft cleared for Special VFR flights (except where a reduction is authorised by the CAA).

8C.2 No separation can be provided between Special VFR flights which are flying in notified areas or routes where an individual clearance is not required, or between flights using such areas or routes and other flights on Special VFR clearances.

8D. Level to Fly

8D.1 Aircraft are not normally given a specified level to fly but vertical separation from aircraft flying above can be achieved by requiring the Special VFR flight to fly not above a specified level.

8E. Pilot's Responsibilities

8E.1 The pilot of an aircraft on a Special VFR flight:

- (1) must comply with ATC instructions;
- (2) is responsible for ensuring that flight conditions enable the pilot to remain clear of cloud, determine their flight path with reference to the surface and keep clear of obstructions;
- (3) is responsible for ensuring that the aircraft is flown at an indicated airspeed of 140 kt or less in order to provide adequate opportunity to observe any obstacles in time to avoid a collision (SERA.5010(b)(3));
- (4) is responsible for ensuring for flying within the limitations of their pilot's licence;
- (5) is responsible for complying with the relevant SERA and RoA Regulations low flying restrictions;
- (6) is responsible for avoiding Aerodrome Traffic Zones unless prior permission for penetration has been obtained from the relevant ATC unit.

8F. Flight Plan

8F.1 A full flight plan is not required for Special VFR flight but the pilot must give brief details of the callsign, aircraft type and their intentions. A full flight plan is required if the pilot wishes their destination to be notified.

9. Class C Airspace

9.1 The airspace classification between FL195 and FL660 within the UK FIRs / UIRs is Class C. However, the FIR / UIR boundary is FL245.

9.2 Controllers shall not allocate FL195 as a cruising level to any aircraft under their control.

9A. General Rules

9A.1 The basic rules for use of Class C airspace, irrespective of meteorological conditions, are:

- (1) A flight plan must be filed. Abbreviated flight plans for civil aircraft are permissible as described in UK AIP (ENR) section and MATS Part 1. For military aircraft, abbreviated flight plans will only be acceptable when operating under the control of a military ATSU or Air Surveillance and Control System (ASACS) unit;

- (2) An ATC clearance must be obtained to fly within Class C airspace;
- (3) Radio contact must be maintained on the appropriate frequency;
- (4) The flight must be conducted in accordance with ATC instructions.

9A.2 Above FL195 in Class C airspace the table of cruising levels shall apply (UK Reg (EU) No. 923/2012 SERA.5020(b) and Appendix 3). Flight Levels 200, 220 and 240 shall be westbound and Flight Levels 210 and 230 shall be eastbound.

9B. Class C Separation Requirements

9B.1 In Class C airspace, controllers shall provide separation between:

- (1) IFR flights,
- (2) IFR flights and VFR flights.

9B.2 For separation purposes, controllers must treat all flights as IFR until such time as the flight rules are ascertained.

9B.3 Unit specific procedures for the avoidance of collisions between VFR flights shall be detailed in MATS Part 2s and shall be subject to the following conditions:

- (1) The VFR status of aircraft is to be established. Pilots will inform controllers when they wish to operate VFR and when VFR operations are complete.
- (2) Military aircraft formations, in accordance with extant procedures, will remain responsible for separation within their formation (MARSA).

9C. Pilot Qualification

9C.1 Controllers should be aware that the pilot of a VFR flight in Class C airspace is not required to have an instrument rating. However, as VFR aircraft will be in receipt of a Radar Control Service within Class C airspace, pilots must comply with ATC instructions. In the event of an unforeseen deterioration in the weather, pilots who are not qualified or whose aircraft is not equipped to fly IFR will request an amended clearance to enable the flight to continue in VMC to its destination or an alternative aerodrome.

9C.2 The pilot on first RTF contact should notify the VFR status of the flight. En-route VFR flights above FL195 are not permitted unless they have been accorded specific arrangements by the appropriate ATS authority. VFR flights shall only be authorised:

- (1) in TRAs; or
- (2) outside of a TRA, by the responsible ATSU in accordance with the procedures established and published in the UK AIP. Civil air traffic above FL285 will only be permitted to operate VFR within airspace defined by an airspace reservation.

9D. ATC Procedures

- 9D.1 Within Class C airspace, above FL195, units will adopt the same procedures for co-ordination and application of service that apply above FL245. Civil controllers providing a service to off-route (ATS) flights are to comply with off-route notification and co-ordination procedures defined in MATS Part 2. Arrangements between civil and military ACC units to declare “off-route” status shall also be specified in the unit MATS Part 2. All aircraft shall be provided with a Radar Control Service, even whilst operating VFR, and separation against aircraft operating IFR shall be applied.
- 9D.2 Procedures for operators of civil aircraft requiring VFR access to Class C airspace above FL195 are detailed in the UK AIP and for military aircraft in the Military AIP and the Manual of Military Air Traffic Management.

10. Filing of Flight Plans

- 10.1 Flight plans fall into two categories:
- (1) Full flight plans: the information required on Form CA48/RAF2919.
 - (2) Abbreviated flight plans: the limited information required to obtain a clearance for a portion of flight, e.g. flying in a control zone, crossing a control area etc. filed either on the RTF or by telephone prior to take-off.
- 10.2 The local ATSU may assist in compiling flight plans and checking them. However, the ultimate responsibility for filing an accurate flight plan rests with the pilot or aircraft operator.
- 10.3 The destination aerodrome will be advised of the flight only if the flight plan information covers the whole route of the flight.
- 10.4 An airborne flight plan may be filed provided that the pilot leaves sufficient time for the clearance to be issued before the aircraft reaches the boundary of controlled airspace (normally 10 minutes).
- 10.5 A pilot may file a flight plan for any flight.
- 10.6 A pilot is required to file a flight plan for (UK Reg (EU) No. 923/2012 SERA.4001(b)):
- (1) any flight or portion thereof to be provided with an air traffic control service;
 - (2) any IFR flight within advisory airspace;
 - (3) any flight within or into areas, or along routes designated by the Authority, to facilitate the provision of flight information, alerting and search and rescue services;
 - (4) any flight within or into areas or along routes designated by the Authority, to facilitate coordination with appropriate military units or with air traffic service units in adjacent States in order to avoid the possible need for interception for the purposes of identification prescribed by the States concerned;
 - (5) any flight across international boundaries; and

Note: For the purposes of UK Reg (EU) No. 923/2012 SERA.4001(b)(5) 'Submission of a flight plan' in the UK, the international borders for flight planning purposes are the international FIR boundaries.

(6) any flight planned to operate at night, if leaving the vicinity of an aerodrome.

10.7 A pilot is advised to file a flight plan:

- (1) if the flight involves flying over the sea more than 10 nm from the UK coast or flying over sparsely populated areas where SAR operations would be difficult; or
- (2) if the pilot intends to fly into an area in which SAR operations are in progress. The flight plan should include the expected times of entering and leaving the area and the details must also be passed to the parent ACC. The ACC is to notify the JRCC concerned.

10.8 A pilot who has filed a flight plan to a destination without an ATSU and not connected to the AFTN shall comply with the following procedure:

- (1) Nominate a responsible person at their destination and inform them of the planned ETA. If the aircraft fails to arrive within 30 minutes of the ETA the responsible person will notify the parent ATSU. That ATSU will then initiate Alerting action; or
- (2) If no responsible person can be found, the pilot will contact the parent ATSU and request that they act in the same capacity. The pilot is then required to inform the parent ATSU of their arrival within 30 minutes of the notified ETA, otherwise Alerting action will automatically be initiated.

11. Non-Standard Routes

11.1 Any filed flight plan that specifies a non-standard route at aerodromes where SIDs are designated should be referred back to the originator for correction.

12. Repetitive Flight Plan

12.1 The repetitive flight plan scheme is a more convenient method of filing flight plans for flights that operate regularly. Only one plan is filed and the details are brought forward for each flight.

13. Availability of Supplementary Flight Plan Information

13.1 Where the operator or departure handling agency of an aircraft at the aerodrome from which it departs closes before ETA at destination plus one hour, they will advise the ATSU at the departure aerodrome of the number of persons on board. If there is no ATSU, the aerodrome operator or departure handling agency will file with the parent ACC the name and address of a person who has access to flight departure records.

- 13.2 If the ATSU at the departure aerodrome closes before ETA at destination plus one hour, the senior controller shall forward the details contained in field 19 of the flight plan form to the parent ACC ensuring that any change to the endurance or number of persons on board is included.

14. Booking-Out

- 14.1 Pilots who do not file a flight plan, either full or abbreviated, are required to inform the ATSU at the aerodrome of their departure. This is referred to as booking-out. The ATSU is to record the departure. No further action is required.

15. Exemptions and Non-Standard Flights

- 15.1 All requests from operators for exemptions from the legislation for particular flights shall be referred to the CAA for authorisation.
- 15.2 Requests for non-standard flights, e.g. photographic surveys above 1,500 ft agl, should be referred to the appropriate addressee (UK AIP (ENR) section).

16. Aircraft Proximity (AIRPROX)

- 16.1 An AIRPROX is a situation in which, in the opinion of a pilot or a controller, the distance between aircraft as well as their relative positions and speeds have been such that the safety of the aircraft involved was or may have been compromised.
- 16.2 If the pilot wishes to file the report by RTF the controller should, whenever possible, accept the relevant details, particularly when the flight is bound for a foreign destination. If, due to the controller's high workload, this cannot be done the pilot is to be requested to file the details after landing.
- 16.3 The senior controller is then responsible for taking follow-up action.
- 16.4 The pilot's report by RTF should commence with the term "AIRPROX Report". If the pilot omits the prefix the controller shall ask the pilot if it is their intention to file an AIRPROX report. The complete message will comprise:
- (1) The words "AIRPROX Report";
 - (2) Position at time of incident;
 - (3) Time of incident;
 - (4) Altitude/Flight Level (climbing, descending or level flight);
 - (5) Heading;
 - (6) Brief details of incident including first sighting and miss distance;
 - (7) Weather conditions.
- 16.5 If the pilot states an intention to file an AIRPROX report after landing the pilot is to be reminded that, to avoid any delay in its progression, the details are required as soon as possible after landing.

- 16.6 Controllers must not offer opinions as to cause or responsibility, either to pilots at the time or to operators or pilots subsequently. Pilots may be told that the incident will be investigated.
- 16.7 The identity of the reported aircraft is to be established as soon as possible by any practical means. If the identity is not immediately apparent the senior controller is to be advised so that they can commence search action.
- 16.8 Full reporting action after the receipt of an AIRPROX report is described in Section 6.

17. Search Action

- 17.1 The senior controller is to institute search action if the identity of an aircraft, which has been involved in an incident or has apparently infringed legislation, is not known.
- 17.2 Data is to be examined, other units consulted, and every means used consistent with safety in an attempt to identify the aircraft. ATS surveillance systems should be used to track the aircraft until it has landed, and the track and time correlated with movement at the appropriate aerodrome. If necessary, the aircraft's position indication may be transferred to another unit to enable tracking to be continued.

18. Failure of Navigation Lights

- 18.1 The ANO requires that an aircraft shall not depart from an aerodrome at night if there is a failure of any light which the ANO requires to be displayed and the light cannot be immediately repaired or replaced. If the aircraft is in flight the aircraft shall land as soon as it can safely do so, unless authorised by ATC to continue its flight. Controllers should take the following into consideration before authorising the flight:
- (1) Normally permission should only be granted if flight is to be continued wholly within UK controlled airspace classes A-D. Flight outside the UK under these conditions may not be authorised unless permission to continue has been obtained from the adjacent controlling authority;
 - (2) If the pilot's intention is to fly outside controlled airspace or within Class E airspace, the pilot should be instructed to land at the nearest suitable aerodrome. Selection of this aerodrome is the responsibility of the pilot although they may request information to assist their decision-making. Under certain circumstances the pilot may decide that the nearest suitable aerodrome is the original destination.

19. Operations of Aircraft with Unserviceable Equipment

- 19.1 Notwithstanding paragraph 18 above, decisions regarding the serviceability of an aircraft for flight are the sole responsibility of the pilot in command.

20. Action When Captive Balloons Break Free

- 20.1 When an ATSU receives information that a captive balloon has broken free the appropriate ACC shall be telephoned without delay stating:
- (1) The type of balloon and whether carrying any person;
 - (2) Position of balloon site;
 - (3) Direction and speed of drift;
 - (4) Last observed height;
 - (5) Length of cable attached to balloon; and
 - (6) Balloon operator's name and telephone number.
- 20.2 The action taken at the ACC, which includes warning aircraft in flight, is described in MATS Part 2.

21. Radio Mandatory Zones (RMZ)

- 21.1 An RMZ is airspace of defined dimensions wherein the carriage and operation of suitable/appropriate radio equipment is mandatory (SERA.6005(a) refers). RMZ airspace is to be operated in accordance with the regulations pertaining to the background airspace classification.
- 21.2 Flights operating in airspace designated as a RMZ by the CAA, shall establish two-way communication before entering the RMZ and maintain a continuous air-ground voice communication watch, as necessary, on the appropriate communication channel, unless in compliance with alternative provisions prescribed for that particular airspace by the ANSP. If unable to establish two-way radio communication with the designated ANSP the pilot is to remain outside the RMZ.
- 21.3 Two-way communication is considered to have been achieved once the pilot has provided at least the following information on the appropriate communications channel:
- (1) Callsign;
 - (2) Type of aircraft;
 - (3) Position;
 - (4) Level;
 - (5) Flight rules; and
 - (6) Intentions of the flight.
- and has received acknowledgment from ATS.

- 21.4 Where aircraft are based at aerodromes or operating sites located within a RMZ and radio communications are not possible either prior to getting airborne, or at all, pilots of such flights are directed to:
- (1) seek to agree letters of agreement with the ANSP describing alternative provisions for compliance; and
 - (2) establish two-way radio communications (where appropriate) at the earliest opportunity after take-off.
- 21.5 The pilot of an aircraft that wishes to operate in an RMZ without the necessary radio equipment must operate in accordance with conditions promulgated for the specific RMZ or in accordance with agreed tactical arrangements with the ANSP. If a pilot is unable to make such tactical arrangements, they are to remain outside the RMZ, unless in an emergency.

Section 1: General

Chapter 3: Separation Standards

1. Provision of Standard Separation

- 1.1 Standard vertical or horizontal separation shall be provided, between:
- (1) all flights in Class A airspace;
 - (2) IFR flights in Class C, D and E airspace;
 - (3) IFR flights and VFR flights in Class C airspace;
 - (4) IFR flights and Special VFR flights;
 - (5) Special VFR flights, except where a reduction is authorised by the CAA.
- 1.2 In Class G airspace, separation between aircraft is ultimately the responsibility of the pilot; however, in providing a Deconfliction Service or a Procedural Service, controllers will provide information and advice aimed at achieving defined deconfliction minima.

2. Increased Separation

- 2.1 Separation standards are minima and shall be increased when:
- (1) requested by the pilot;
 - (2) a controller considers it necessary;
 - (3) directed by the CAA.

3. Reduced Separation

- 3.1 In addition to the following paragraphs, standard separation may be reduced when authorised by the CAA and published in MATS Part 2.

3A. In the Vicinity of Aerodromes

- 3A.1 In the vicinity of aerodromes, the standard separation minima may be reduced if:
- (1) adequate separation can be provided by the aerodrome controller when each aircraft is continuously visible to this controller; or
 - (2) each aircraft is continuously visible to the pilots of other aircraft concerned and the pilots report that they can maintain their own separation; or
 - (3) when one aircraft is following another, the pilot of the succeeding aircraft reports the other aircraft is in sight and can maintain their own separation.

3B. Search and Rescue Escort

- 3B.1 Standard separation may be reduced when a SAR aircraft is escorting an aircraft in an emergency. A minimum is not laid down in UK FIRs and separation may be reduced to that which can be maintained visually or with airborne surveillance.

3C. Loss of Separation

- 3C.1 If, for any reason, a controller is faced with a situation in which two or more aircraft are separated by less than the prescribed minima, e.g. ATC errors or differences in the pilot's estimated and actual times over reporting points, the controller is to:

- (1) use every means at their disposal to obtain the required minimum with the least possible delay; and
- (2) when considered practicable, pass traffic information if an ATS surveillance service is being provided, otherwise, pass essential traffic information.

3D. Surveillance System Failure

- 3D.1 Reduced vertical separation may be applied during surveillance system failure as detailed in Section 1 Chapter 6.

4. Essential Traffic Information

- 4.1 Essential traffic is traffic which is separated for any period by less than the specified standard separation. It is normally passed in situations when ATS surveillance systems are not available. Essential traffic information passed to an aircraft shall include:

- (1) Direction of flight of conflicting aircraft;
- (2) Type of conflicting aircraft;
- (3) Cruising level of conflicting aircraft and ETA for the reporting point, or for aircraft passing through the level of another with less than the normal separation; the ETA for the reporting point nearest to where the aircraft will cross levels; and
- (4) Any alternative clearance.

5. Vertical Separation

5A. Vertical Separation Minima

- 5A.1 Vertical separation exists when the vertical distance between aircraft is never less than the prescribed minimum. The vertical separation minima are:

- (1) Between aircraft flying subsonic:
 - (a) Up to FL290 apply 1,000 ft;

- (b) Above FL290 apply 2,000 ft, except that between FL290 and FL410 inclusive, 1,000 ft may be applied between RVSM approved aircraft operating in airspace designated as being notified for the application of this separation standard.
- (2) Between aircraft flying supersonic and between aircraft flying supersonic and aircraft flying subsonic:
 - (a) Up to FL450 apply 2,000 ft;
 - (b) Above FL450 apply 4,000 ft.
- 5A.2 In the event of a pilot advising that their aircraft is no longer capable of RVSM operations, it is particularly important that the first ATSU made aware of the failure performs the necessary co-ordination with subsequent ATSUs.
- 5A.3 The Mode C of some military aircraft is accurate only to the nearest 400 ft during supersonic flight. On occasions, therefore, military controllers may have to apply 4,000 ft separation at all levels.
- 5A.4 Controllers are to assess the vertical distance between aircraft by observing the Mode C responses in accordance with the conditions for the use of Mode C specified in Chapter 6 or by obtaining level reports from pilots.

5B. Changing Levels

- 5B.1 Aircraft may be instructed to change level at a specified time, place or rate.
- 5B.2 An aircraft may be instructed to climb or descend to a level previously occupied by another aircraft provided that:
 - (1) vertical separation already exists;
 - (2) the vacating aircraft is proceeding to a level that will maintain vertical separation; and
 - (3) either:
 - (a) the controller observes that the vacating aircraft has left the level; or
 - (b) the pilot has reported vacating the level.
- 5B.3 If severe turbulence is known to exist, instructions shall be delayed until the vacating aircraft is known to be at, or through, another level separated by the required minimum.
- 5B.4 Controllers shall exercise caution when instructing an aircraft to climb or descend to a previously occupied level. Consideration shall be given to the fact that aircraft may climb or descend at markedly different rates and, if necessary, additional measures such as specifying a maximum or minimum climb or descent rate for each aircraft shall be applied to ensure that the required separation is maintained. This is particularly relevant when the aircraft concerned are established in the same holding pattern.

- 5B.5 Pilots in direct communication with each other may, with their concurrence, be instructed to maintain a specified vertical separation between aircraft during climb or descent.

5C. VMC Climb and Descent

5C.1 Controllers may authorise an aircraft to climb or descend in VMC provided:

- (1) the manoeuvre is restricted to Class D, E, F and G airspace at or below FL100;
- (2) it is during the hours of daylight;
- (3) the aircraft is flying in visual meteorological conditions;
- (4) the pilot of the aircraft climbing or descending agrees to maintain their own separation from other aircraft and the manoeuvre is agreed by the pilot of the other aircraft; and
- (5) essential traffic information is given.

5C.2 The application of VMC climb and descent could result in TCAS RA being triggered. Therefore, in Class D airspace when surveillance services are being provided, VMC climb and descent shall only be used where authorised and in accordance with any conditions specified in MATS Part 2.

6. Horizontal Separation

6.1 The three types of horizontal separation are:

- (1) Lateral separation;
- (2) Longitudinal separation;
- (3) Separation based on ATS surveillance system information.

6A. Explanation of Terms

6A.1 'Level change' means that portion of the climb and descent during which the vertical separation in relation to the level of another aircraft is less than the minima.

6A.2 An 'exact reporting point' is a position established by a navigational facility which is:

- (1) overhead a VOR;
- (2) overhead an NDB;
- (3) a position notified as a reporting point and which is established by the intersection of VOR radials, or of a VOR radial and a bearing from an NDB;
- (4) a position established by a VOR radial combined with a range from a co-located or associated DME.

6B. Separation Based on VOR/DME/TACAN Information

- 6B.1 Where measured distance values are used, each aircraft must be using the same 'on track' VOR/DME/TACAN facility i.e. the aircraft must be flying towards or away from the same facility.
- 6B.2 Communication must be maintained with the aircraft concerned throughout the period that measured distance values are being used to achieve separation. Separation is to be checked by obtaining simultaneous DME/TACAN readings from aircraft at intervals of not more than 10 minutes.
- 6B.3 VOR/DME/TACAN separation criteria are based on the condition that a VOR and its associated DME/TACAN station are within 5 NM of each other. Where this distance is exceeded, special separation criteria will be published in MATS Part 2.

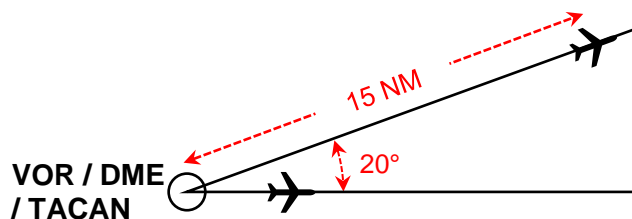
7. Lateral Separation

- 7.1 Lateral separation shall be applied so that the distance between aircraft is never less than a specified amount. It is achieved by requiring aircraft to fly on different tracks or in different geographical locations as determined by visual observations or by use of navigational aids.

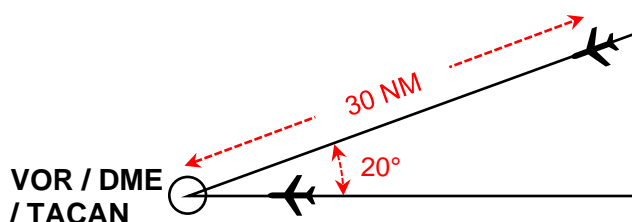
7A. Track Separation

- 7A.1 Track separation shall be established by requiring aircraft to fly on specified tracks, which are separated by a minimum amount appropriate to the navigation aid employed. Aircraft must be within the designated operational coverage of a VOR or the protected range of an NDB as shown in the UK AIP (AD) section. The minimum separation between aircraft is shown in the diagrams below:

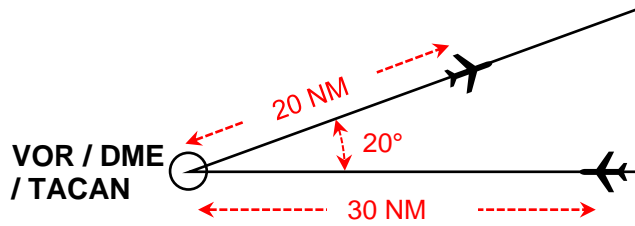
- (1) Using a VOR and associated DME/TACAN station. Both aircraft must have reported established on radials at least 20° apart;



Aircraft diverge and one aircraft is 15 NM from the DME/TACAN station.

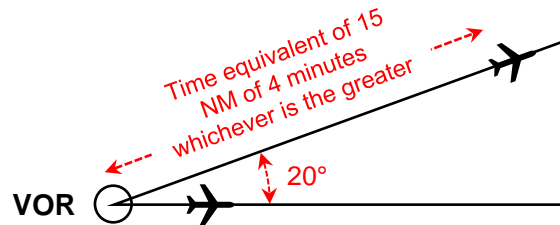


Aircraft converge and one aircraft is 30 NM from the DME/TACAN station.



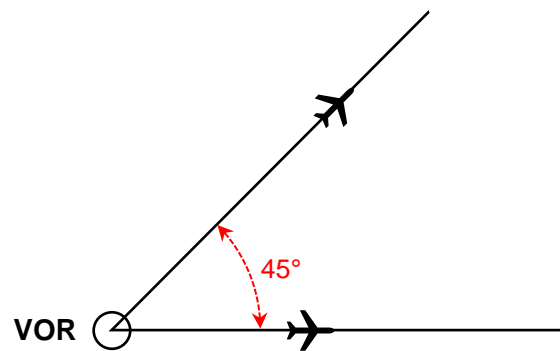
One aircraft inbound and the other outbound from the VOR station provided that the outbound aircraft is at least 20 NM OR the inbound at least 30 NM from the station.

- (2) Using VOR radials. When one aircraft is a time equivalent of 15 NM or 4 minutes (whichever is the greater) from the VOR and both aircraft have reported established on radials which diverge by 20° or more;



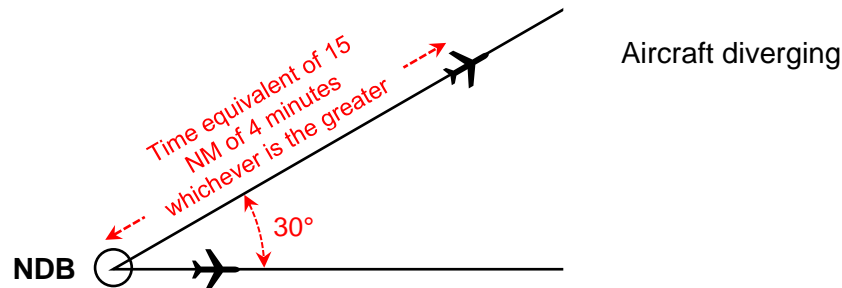
Aircraft diverging

- (3) Using VOR radials. Both aircraft must have passed a VOR on tracks diverging by 45° or more and have reported established on the relevant radials;



Aircraft diverging

- (4) Using specified tracks from an NDB. When one aircraft is the time equivalent of 15 NM or 4 minutes (whichever is the greater) from an NDB and both aircraft have reported established on tracks which diverge by 30° or more.



Note: If a pilot expresses concerns over the accuracy of NDB indications, this separation shall not be used.

7B. Geographical Separation

7B.1 Geographical separation must be:

- (1) indicated by position reports over different geographical locations that have been specified in MATS Part 2 as being separated; and
- (2) constant or increasing.

8. Longitudinal Separation – Time and Distance

8.1 Longitudinal separation based on either time or distance shall be applied so that the spacing between the estimated positions of the aircraft being separated is never less than prescribed minima. It is achieved by requiring aircraft to:

- (1) depart at a specified time;
- (2) lose or gain time to arrive at a geographical location at a specified time; or
- (3) hold over a geographical location until a specified time.

8.2 For the purpose of application of longitudinal separation, the terms below shall have the following meanings:

- (1) 'Same track', when the track of one aircraft is separated from the track of the other by less than 45°;
- (2) 'Reciprocal track', when the track of one aircraft is separated from the reciprocal of the other by less than 45°;
- (3) 'Crossing track', intersecting tracks which are not classed as 'same' or 'reciprocal'.

8A. Based on Time

8A.1 Separation minima based on time are specified in the table below.

Table 1: Longitudinal Separation Based on Time

Aircraft En-Route	Minimum Separation (see note 2)	Provisions
Same cruising level and same track	2 minutes (see note 1)	Provided the 2-minute departure separation has been applied (see table 3).
	3 minutes (see note 1)	When specifically authorised by the CAA provided both aircraft are: (1) equipped with functioning transponders; and (2) continuously monitored by ATS surveillance and the actual distance between them is never less than 20 NM.
	5 minutes (see note 1)	Provided the preceding aircraft has filed an airspeed of 20 knots or more faster than the following aircraft.
	5 minutes (see note 1)	When specifically authorised by the CAA, provided both aircraft are: (1) equipped with functioning transponders; and (2) monitored by ATS surveillance and the actual distance between them is never less than 30 NM.
	10 minutes	-
Climbing and descending on the same track	5 minutes at time levels are crossed (see note 1)	Provided that the level change is commenced within 10 minutes of the time the second aircraft has reported over the same exact reporting point.
	10 minutes	-
Crossing tracks	10 minutes	-
Reciprocal tracks	10 minutes before and after estimated passing time	Vertical separation shall be provided for at least 10 minutes both prior to and after the estimated time of passing unless it is confirmed that the aircraft have actually passed each other by: (1) ATS surveillance system derived information (see note 3); (2) a visual sighting report from both pilots (by day only); or (3) aircraft position reports over the same exact reporting point; provided vertical separation is maintained for sufficient time to take into consideration possible navigation errors.

Note 1: This separation should be based on actual aircraft position reports or through the use of ATS surveillance to observe aircraft overfly the appropriate exact reporting point, as forward estimates are not sufficiently reliable for this purpose.

Note 2: Separation minima based on time cannot be achieved unless the whole sixty seconds of each minute specified is permitted to elapse.

Note 3: When approved for use within MATS Pt 2 and both aircraft involved are in communication with and under the control of an approach surveillance control unit, ATS surveillance system derived information can be used to determine that aircraft on reciprocal tracks have passed. There is no requirement to ensure that minimum horizontal separation exists before reducing minimum vertical separation. Greater minima might be required for wake turbulence separation purposes.

8B. Based on Distance

8B.1 When using DME/TACAN, separation shall be established by maintaining not less than the distance specified in the table below between aircraft positions as reported by reference to the same 'on track' DME/TACAN stations.

8B.2 Separation based on DME/TACAN is not to be used when aircraft are within 15 NM of the overhead of the facility. Slant range errors beyond 15 NM may be ignored.

Table 2: Longitudinal Separation Based on Distance

Aircraft En-Route	Minimum Separation	Provisions
Same cruising level and same track	15 NM	Provided the preceding aircraft maintains a true airspeed of 20 knots or more faster than the following aircraft and both are within 100 NM of the DME/TACAN station.
	20 NM	Provided the preceding aircraft maintains a true airspeed of 20 knots or more faster than the following aircraft.
	20 NM	Provided both aircraft are within 100 NM of the DME/TACAN station.
	25 NM	-
Climbing and descending on the same track	15 NM at the time levels are crossed	Provided that one aircraft maintains level flight while vertical separation does not exist.
Reciprocal tracks	40 NM	The 40 NM separation need not apply if it has been established that the aircraft have passed each other and are at least 10 NM apart. The 10 NM may be further reduced to 5 nm when both aircraft are within 100 nm of the DME/TACAN station.

8C. Aircraft Holding

8C.1 When aircraft are being held in flight, the appropriate vertical separation shall be provided between holding and en-route aircraft while such en-route aircraft are within 5 minutes flying time of the holding aircraft's flight path (or holding area where

this is published), except where it is published in MATS Part 2 that lateral separation is deemed to exist.

8D. Departing Aircraft

- 8D.1 Unless alternative departure separation criteria are approved and contained in MATS Pt 2 (SERA.8010(a)), the separation between departing aircraft shall be applied so that after one aircraft takes-off the next succeeding aircraft does not take-off within less than the number of minutes specified in the table below.
- 8D.2 The minima in the table are complementary to the en-route longitudinal separations based on time. Greater minima than that listed below may be required for wake turbulence separation purposes.

Table 3: Departure Separation

Minimum Separation (see note)	Provisions
1 minute	Provided that the aircraft fly on tracks diverging by 45° or more immediately after take-off. The minimum may be reduced when aircraft are taking-off from independent diverging or parallel runways provided the procedures have been approved by the CAA.
2 minutes	Provided that: <ul style="list-style-type: none"> (1) the preceding aircraft has filed a true airspeed 40 knots or more faster than the following; and (2) neither aircraft is cleared to execute any manoeuvre that would decrease the 2-minute separation between them.
5 minutes	Provided that the preceding aircraft has filed a true airspeed of 20 knots or more faster than the following aircraft.
5 minutes	Provided that the 5 minutes separation is maintained up to a reporting point, within or adjacent to a control zone or terminal control area and the aircraft will subsequently be separated either: <ul style="list-style-type: none"> (1) vertically; (2) by tracks which diverge by 30° or more; or (3) by ATS Surveillance. Only to be used at locations approved by the CAA.
10 minutes	-

Note: Separation minima based on time cannot be achieved unless the whole sixty seconds of each minute specified is permitted to elapse.

8E. En-route and Departing Aircraft

- 8E.1 The minimum longitudinal separation between an en-route aircraft and a departing aircraft shall be 10 minutes.
- 8E.2 This may be reduced to 5 minutes provided that:

- (1) the en-route aircraft has filed a true airspeed of 20 knots or more faster than the departing aircraft; and
- (2) the en-route aircraft has reported over an exact reporting point at which the departing aircraft will join the same route; and
- (3) the departing aircraft is given positive instructions to arrive at the same exact reporting point 5 minutes behind the en-route aircraft.

9. Wake Turbulence Separation Requirements

9A. General

- 9A.1 In radiotelephony, the term 'wake turbulence' shall be used to describe the effect of the rotating air masses generated behind the wing tips of aircraft, in preference to the term 'wake vortex' which describes the nature of the air masses.
- 9A.2 All aircraft, including helicopters and tilt-rotor aircraft, generate vortices as a consequence of producing lift. The heavier the aircraft and the more slowly it is flying, the stronger the vortex. Vortices are especially persistent in calm conditions. They are most hazardous to aircraft with a small wingspan during the take-off, initial climb, final approach, and landing phases of flight.
- 9A.3 Wake vortices begin to be generated by fixed-wing aircraft when the nose wheel lifts off the runway on take-off and continue until the nose wheel touches down on landing.
- 9A.4 When helicopter or tilt-rotor aircraft mass is transferred from the landing gear to the rotor a strong downwash is created in all directions, although this can be moved by the wind. When helicopters are in forward flight the downwash from the main rotor(s) is transformed into a pair of trailing vortices similar to the wing tip vortices of a fixed wing aircraft. There is some evidence that, per kilogram of gross mass, the wake turbulence generated by a helicopter is more intense than that of a fixed-wing aircraft. Tilt-rotor aircraft combine the characteristics of aeroplanes and helicopters. For vertical flight, the rotors are angled so the plane of rotation is horizontal, lifting the aircraft in the way of a helicopter. As the aircraft's indicated airspeed increases, the rotors are progressively tilted forward, with the plane of rotation eventually becoming vertical, with the fixed wings providing lift and the rotors providing thrust. On final approach, as the aircraft reduces speed, the rotors are progressively tilted backward. As such, tilt-rotor aircraft operate as helicopters on final approach and departure, and as aeroplanes in the en-route and intermediate approach phases.
- 9A.5 UK wake turbulence categories are listed in Appendix B. It should be noted that they differ from the ICAO categories, which are used for flight plan purposes.

9B. Applicability

- 9B.1 Wake turbulence separation minima are the spacings between aircraft, determined either by time or distance, to be applied so that aircraft do not fly through the wake of a preceding aircraft within the area of maximum vortices.

- 9B.2 Where the separation minima required for IFR flights are greater than the recommended separation for wake turbulence, the IFR separation minima shall be applied.
- 9B.3 When a flight is operating visually (i.e. IFR or SVFR operating under the reduced separation in the vicinity of aerodromes, VFR, or IFR making a visual approach) and is following or crossing behind another aircraft, the pilot is to be informed of the recommended wake turbulence separation minima.

9C. En-route

- 9C.1 No special longitudinal wake turbulence separations based on time are required.
- 9C.2 The following surveillance-based wake turbulence separation minima shall be applied in en-route flight:
- (1) minimum of 5 NM between a HEAVY (including a SUPER) and a MEDIUM (UPPER and LOWER), SMALL or LIGHT aircraft following or crossing behind at the same level or less than 1,000 ft below.

9D. Intermediate Approach

- 9D.1 Unless alternative wake turbulence separation criteria are approved and contained in MATS Part 2, the following wake turbulence separation minima shall be applied in the intermediate approach segment (SERA.8012):
- (1) 5 NM between a HEAVY (excluding a SUPER) and a MEDIUM (UPPER and LOWER) or SMALL aircraft following or crossing behind at the same level or less than 1,000 ft below;
 - (2) 6 NM between a HEAVY (excluding a SUPER) and LIGHT aircraft following or crossing behind at the same level or less than 1,000 ft below;
 - (3) As per Final Approach minima for aircraft following or crossing behind a SUPER at the same level or less than 1,000 ft below.

Note: The intermediate approach phase is specific to each individual Instrument Approach Procedure. Therefore, ATC units should define and specify in MATS Part 2 the area or portion of a procedure where the intermediate approach wake turbulence separation minima apply.

9E. Final Approach

- 9E.1 Unless alternative wake turbulence separation criteria are approved and contained in MATS Part 2, the wake turbulence separation minima in table 3 below shall be applied to aircraft on final approach when (SERA.8012):
- (1) an aircraft is operating directly behind another aircraft at the same altitude or less than 1,000 ft below; or
 - (2) an aircraft is crossing behind another aircraft, at the same altitude or less than 1,000 ft below; or

- (3) both aircraft are using the same runway or parallel runways separated by less than 760 m.

Table 3:

Leading Aircraft	Following Aircraft	Wake Turbulence Separation Minima Distance (NM)
SUPER	SUPER	#
SUPER	HEAVY	5
SUPER	UPPER and LOWER Medium	7
SUPER	SMALL	7
SUPER	LIGHT	8
HEAVY	SUPER	#
HEAVY	HEAVY	4
HEAVY	UPPER and LOWER Medium	5
HEAVY	SMALL	6
HEAVY	LIGHT	7
UPPER MEDIUM	SUPER	#
UPPER MEDIUM	HEAVY	#
UPPER MEDIUM	UPPER MEDIUM	3
UPPER MEDIUM	LOWER MEDIUM	4
UPPER MEDIUM	SMALL	4
UPPER MEDIUM	LIGHT	6
LOWER MEDIUM	SUPER	#
LOWER MEDIUM	HEAVY	#
LOWER MEDIUM	UPPER MEDIUM	#
LOWER MEDIUM	LOWER MEDIUM	#
LOWER MEDIUM	SMALL	3
LOWER MEDIUM	LIGHT	5
SMALL	SUPER	#
SMALL	HEAVY	#
SMALL	UPPER MEDIUM	#
SMALL	LOWER MEDIUM	#
SMALL	SMALL	3
SMALL	LIGHT	4
LIGHT	SUPER	#
LIGHT	HEAVY	#
LIGHT	UPPER MEDIUM	#
LIGHT	LOWER MEDIUM	#
LIGHT	SMALL	#
LIGHT	LIGHT	#

Note: # Signifies that separation for wake turbulence reasons alone is not necessary.

9F. Departures

- 9F.1 Wake turbulence separation minima on departure shall be applied by measuring airborne times between successive aircraft. Take-off clearance may be issued with an allowance for the anticipated take-off run on the runway; however, the airborne time interval shall reflect a difference of at least the required time separation.
- 9F.2 Unless alternative wake turbulence separation criteria are approved and contained in MATS Part 2, the wake turbulence separation minima in the table below shall be applied when aircraft are using (SERA.8012):
- (1) the same runway; or
 - (2) parallel runways separated by less than 760 m; or crossing runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1,000 ft below; or
 - (3) parallel runways separated by 760 m or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1,000 ft below.

Table 4:

Leading Aircraft	Following Aircraft	Minimum Wake Turbulence Separation at the Time Aircraft are Airborne	
SUPER	SUPER	Departing from the same position or from a parallel runway separated by less than 760 m (2,500 ft)	No wake turbulence separation minima required
	HEAVY		2 minutes
	MEDIUM SMALL LIGHT		3 minutes
HEAVY	HEAVY		4 NM or time equivalent
	MEDIUM SMALL LIGHT		2 minutes
MEDIUM or SMALL	LIGHT		2 minutes
SUPER (Full length take-off)	SUPER	Departing from an intermediate point on the same runway or from an intermediate point of a parallel runway separated by less than 760 m (2,500 ft)	No wake turbulence separation minima required
	HEAVY		3 minutes
	MEDIUM SMALL LIGHT		4 minutes
HEAVY (Full length take-off)	HEAVY		4 NM or time equivalent
	MEDIUM SMALL LIGHT		3 minutes
MEDIUM or SMALL (Full length take-off)	LIGHT		3 minutes

Note 1: ATC shall apply the minima as prescribed above, irrespective of any pilot request for reduced wake turbulence separation. ATC does not have the discretion to reduce wake turbulence separation minima.

Note 2: The MEDIUM category is not split into UPPER and LOWER MEDIUM for the purposes of wake turbulence separation on departure.

9G. Departures – Opposite Direction

9G.1 **SUPER.** A wake turbulence separation minimum of 4 minutes shall be applied between a LIGHT, SMALL or MEDIUM (UPPER and LOWER) aircraft and a SUPER aircraft when the SUPER aircraft is making a low or missed approach and the LIGHT, SMALL or MEDIUM aircraft is:

- (1) utilising an opposite-direction runway for take-off; or
- (2) landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760 m.

9G.2 **SUPER.** A wake turbulence separation minimum of 3 minutes shall be applied between a HEAVY aircraft and a SUPER aircraft when the SUPER aircraft is making a low or missed approach and the HEAVY aircraft is:

- (1) utilising an opposite-direction runway for take-off; or
- (2) landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760 m.

9G.3 **Other aircraft categories.** A wake turbulence separation of 3 minutes shall be applied between a MEDIUM (UPPER and LOWER), SMALL or LIGHT aircraft and a HEAVY aircraft, and between a MEDIUM (UPPER and LOWER) or SMALL aircraft and a LIGHT aircraft whenever the heavier aircraft is making a low or missed approach and the lighter aircraft is:

- (1) utilising an opposite-direction runway for take-off; or
- (2) landing on the same runway in the opposite direction; or on a parallel opposite direction runway separated by less than 760 m.

9H. Crossing and Parallel Runways

9H.1 When parallel runways separated by less than 760 m are in use, such runways are considered to be a single runway, for wake turbulence reasons, and the wake turbulence separation minima listed apply to landing and departing aircraft respectively.

9H.2 The wake turbulence separation minima listed in paragraph 9G will apply to:

- (1) departures from crossing and/or diverging runways if the projected flight paths will cross; or
- (2) departures from parallel runways 760 m or more apart if the projected flight paths will cross.

9I. Displaced Landing Threshold

9I.1 **SUPER.** If the projected flight paths are expected to cross, a wake turbulence separation of 3 minutes shall be applied between a LIGHT, SMALL or MEDIUM (UPPER and LOWER) aircraft and a SUPER aircraft when operating on a runway with a displaced landing threshold when:

- (1) a departing LIGHT, SMALL or MEDIUM aircraft follows a SUPER aircraft arrival; or
- (2) an arriving LIGHT, SMALL or MEDIUM (UPPER and LOWER) aircraft follow a SUPER aircraft departure.

- 9I.2 **SUPER.** If the projected flight paths are expected to cross, a wake turbulence separation of 2 minutes shall be applied between a HEAVY aircraft and a SUPER aircraft when operating on a runway with a displaced landing threshold when:
- (1) a departing HEAVY aircraft follows a SUPER aircraft arrival; or
 - (2) an arriving HEAVY aircraft follows a SUPER aircraft departure.
- 9I.3 **Other aircraft categories.** If the projected flight paths are expected to cross, a wake turbulence separation of 2 minutes shall be provided between MEDIUM (UPPER and LOWER), SMALL or LIGHT aircraft following a HEAVY aircraft and between a LIGHT aircraft following a MEDIUM or SMALL aircraft when operating on a runway with a displaced threshold when:
- (1) a departing MEDIUM (UPPER and LOWER), SMALL or LIGHT aircraft follow a HEAVY arrival or a departing LIGHT aircraft follows a MEDIUM or SMALL arrival; or
 - (2) an arriving MEDIUM (UPPER and LOWER), SMALL or LIGHT aircraft follow a HEAVY aircraft departure, or an arriving LIGHT aircraft follows a departing MEDIUM or SMALL aircraft.

9J. Aircraft Making a Touch-and-go or a Low Approach

- 9J.1 For wake turbulence separation purposes, aircraft carrying out a touch-and-go or a low approach shall be considered as making a departure from an intermediate point on the runway.

9K. Helicopters and Tilt-rotor aircraft

- 9K.1 For wake turbulence separation purposes, helicopters and tilt-rotor aircraft air taxiing across runways shall be considered to be a departure from that intermediate point of the runway.
- 9K.2 When hovering or air taxiing, a helicopter or tilt-rotor aircraft directs a forceful blast of air downwards which then rolls out in all directions. This downwash and associated turbulence can drift a substantial distance downwind and may affect an adjacent runway or taxiway. To minimise the effects of this turbulence controllers should
- (1) instruct helicopters and tilt-rotor aircraft to ground taxi rather than air taxi when operating in areas where aircraft are parked or holding;
 - (2) not air-taxi helicopters and tilt-rotor aircraft close to taxiways or runways where light aircraft operations (including light helicopter operations) are in progress. If air taxiing is imperative, helicopters must be routed to:
 - (a) avoid over flying parked aircraft, vehicles, or loose ground equipment;
 - (b) follow standard taxi routes where helicopters and fixed wing aircraft share common areas on a movement area.

- 9K.3 When a helicopter or tilt-rotor aircraft is hover taxiing or in a stationary hover, controllers should avoid taxiing light aircraft, helicopters or tilt-rotor aircraft within a minimum area comprising three times the rotor diameter of that helicopter or tilt-rotor aircraft. Controllers should consider this to be a minimum distance which will need to be increased for larger helicopters.
- 9K.4 Caution should be exercised when a helicopter, tilt-rotor aircraft or fixed-wing aircraft of a lower weight turbulence category is cleared to land on a runway immediately after a helicopter or tilt-rotor aircraft of higher weight turbulence category has taken off from that runway's threshold.

10. Separation Based on ATS Surveillance System Information

- 10.1 Horizontal separations based on ATS surveillance system information shall be justified by the ANSP, approved by the CAA and detailed in MATS Part 2.
- 10.2 Horizontal separation based on ATS surveillance system information shall not be used between aircraft holding over the same holding point.
- 10.3 Where there is a requirement for an increase in separation between aircraft prior to transfer, this shall be documented and applied in accordance with MATS Part 2.

10A. Separation based on PSR and SSR

- 10A.1 Where PSR information is displayed, separation must be applied using the PSR returns. Horizontal separation based on PSR and SSR information displayed together exists when the distance between the centres of the returns does not represent less than the prescribed minimum provided that returns do not touch or overlap.
- 10A.2 When approved by the CAA, separation based on ATS surveillance derived information may be applied between an aircraft taking-off and a preceding departing aircraft, or other aircraft in receipt of an ATS surveillance service, provided there is a reasonable assurance that the departing aircraft will be identified within one mile from the end of the runway and that, at the time, the required separation will exist.

10B. Use of SSR Alone

- 10B.1 Provided the pilots are made aware of the limitations of the service, SSR may be used to provide horizontal separation in the following circumstances:
- (1) in accordance with MATS Part 2;
 - (2) to overcome temporary deficiencies within PSR cover, such as fading or clutter, the SSR return only of one aircraft may be used to provide separation from the PSR or SSR return of another aircraft provided the PSR and SSR situation displays are correctly aligned. In this context, 'unavailable for use due to maintenance' does not constitute a 'temporary deficiency';

- (3) immediately after PSR failure for the minimum time necessary to establish procedural separation. Once established, services normally provided using radar may be resumed when the PSR is serviceable.

10B.2 SSR shall not be used to provide horizontal separation if a controller has any doubt about the accuracy of the position symbol due to equipment malfunction, reflections, or any other reason.

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Section 1: General

Chapter 4: Control of Traffic

1. Air Traffic Control Clearances

- 1.1 A controlled flight shall be under the control of only one air traffic control unit at any given time.
- 1.2 An ATC clearance authorises an aircraft to proceed under conditions specified by an ATC unit. Clearances are based solely on known traffic conditions and are required for any flight, or portion of a flight, which is provided with an air traffic control service (SERA.8015(a)). Such traffic conditions include not only aircraft in the air and on the manoeuvring area over which control is being exercised, but also any vehicular traffic or other obstructions not permanently installed on the manoeuvring area in use (SERA.8015(a)(1)).
- 1.3 A pilot requests a clearance by submitting a flight plan (SERA.8015(b)(1)). The clearance can be issued directly to the aircraft or through an approved agency, such as another ATSU. The pilot shall inform ATC if an air traffic control clearance is not satisfactory, and in such cases, controllers will issue an amended clearance, if practicable (SERA.8015(b)(2)).
- 1.4 Clearances do not constitute authority to violate any regulation established by the DfT, CAA, or other appropriate authority for promoting safety of flight operation or for any other purpose. Controllers should not issue clearances which imply permission to breach regulations. This is especially relevant in respect of the low flying rules.
- 1.5 Where data link communications are used to facilitate clearance delivery, two-way voice communications between the pilot and the air traffic control unit providing the clearance should be available. Unless specified in the MATS Part 2, voice read-back of data link messages shall not be required.

2. Contents of Clearances

- 2.1 ATC clearances shall include (SERA.8015(d)):
- (1) Aircraft identification as shown in the flight plan;
 - (2) Clearance limit;
 - (3) Route, where prescribed in MATS Part 2;
 - (4) Levels of flight for the entire route or part thereof and changes of levels if required;
- Note:** Where an airborne joining clearance to enter controlled airspace is provided, the joining level assigned is considered acceptable with respect to the level content of a clearance.

- (5) Any necessary instructions or information on other matters such as approach or departure manoeuvres, communications and the time of expiry of the clearance.

Note: The time of expiry of the clearance indicates the time after which the clearance will be automatically cancelled if the flight has not been commenced. (GM1.SERA.8015(d)(5))

- 2.2 The form that the clearance message shall take is described in CAP 413 Radiotelephony Manual.

3. Clearance Limit

- 3.1 A clearance limit is the point to which an aircraft is granted an ATC clearance and shall be specified by naming:
 - (1) an aerodrome;
 - (2) a reporting point; or
 - (3) a controlled or advisory airspace boundary.
- 3.2 An aircraft shall be cleared for the entire route to the aerodrome of first intended landing when:
 - (1) it has planned to remain within controlled or advisory airspace throughout the flight; and
 - (2) there is reasonable assurance that prior co-ordination will be effected ahead of the passage of the aircraft.
- 3.3 The clearance limit for all other flights shall be the boundary of controlled or advisory airspace.
- 3.4 If the clearance for the levels covers only part of the route, it is important to specify that part to enable the pilot to comply with the radio failure procedures.
- 3.5 The CAA may issue special instructions concerning the clearance of inbound aircraft to certain aerodromes.

4. Conditional Clearances

- 4.1 Conditional clearances are to be given in the following order and are to comprise (SERA.8015(ec)):
 - (1) callsign of the aircraft or vehicle being given the clearance;
 - (2) the condition, e.g. "behind...";
 - (3) identification of the subject of the condition, e.g. aircraft, reporting point, level etc;
 - (4) the clearance; and

(5) a brief reiteration of the condition.

4.2 Standard phraseology should be used. The following is an example of a conditional clearance:

“(Callsign), behind the landing (aircraft type), via (holding point), runway (designator) line up behind.”

4.3 Use of conditional clearances at aerodromes, especially with regard to active runways, is detailed in Section 2.

5. Route

5.1 Every endeavour shall be made to clear aircraft according to the route requested. If this is not possible the controller shall explain the reason when issuing the clearance. The expression “cleared flight plan route” is not to be used for re-clearances (SERA.8015(d)(3)(ii)).

5.2 If a pilot requests, or a controller offers, a direct routeing then the controller must inform the pilot if this direct route will take the aircraft outside the lateral or vertical boundaries of controlled or advisory airspace. The pilot will then decide whether to accept or decline the new route.

5.3 When traffic conditions do not permit clearance of a pilot’s requested change in route, controllers shall use the word “unable” in RTF phraseology (SERA.8015(ea)(2)).

5.4 Following the introduction of area navigation requirements (RNAV), aircraft wishing to operate within the specified airspace must be appropriately equipped. If the aircraft is unable to comply with the RNAV requirements then the pilot will advise the ATSU on initial contact using the phrase “Negative RNAV”. Aerodrome ATSUs must advise the relevant ACC and, unless automatic message transfer facilities exist, the phrase “Negative RNAV” must be added to the end of estimate and co-ordination messages.

6. Allocation of Cruising Levels

6.1 Normally, the cruising level requested in the flight plan is to be allocated. If the flight planned level is not available, the nearest appropriate vacant level is to be allocated.

6.2 When two or more aircraft are at the same cruising level, the preceding aircraft shall normally have priority.

6.3 An aircraft at a cruising level shall normally have priority over other aircraft requesting that level.

6.4 When traffic conditions do not permit clearance of a pilot’s requested change in level, controllers shall use the word “unable” in RTF phraseology and offer an alternative level (SERA.8015(ea)(2)).

6.5 FL195 must not be allocated as a cruising level.

6A. ATS Routes and Upper FIRs

- 6A.1 Cruising levels normally to be assigned on ATS routes are contained in the UK AIP (ENR 3.2) section. However, other levels may be allocated according to MATS Part 2. (UK Reg (EU) No. 923/2012 SERA.5020 (b))
- 6A.2 Above FL195 in Class C airspace the table of cruising levels shall apply (UK Reg (EU) No. 923/2012 SERA.5020(b) and Appendix 3). Flight Levels 200, 220, 240, 260 and 280 shall be westbound; Flight Levels 210, 230, 250 and 270 shall be eastbound.
- 6A.3 Cruising levels at or above FL290, up to FL410 within RVSM designated airspace shall be selected according to the tables below:

Table 1:

RVSM Levels		CVSM Levels	
Westbound	Eastbound	Westbound	Eastbound
	FL410		FL410
FL400			
	FL390	FL390	
FL380			
	FL370		FL370
FL360			
	FL350	FL350	
FL340			
	FL330		FL330
FL320			
	FL310	FL310	
FL300			
	FL290		FL290

- 6A.4 Cruising levels at or above FL410 up to FL660 shall be selected according to the semi-circular rule, therefore, Flight Levels available are:

- (1) Eastbound FL410, FL450, FL490 etc.
- (2) Westbound FL430, FL470, FL510 etc.

6B. Outside Controlled Airspace below FL195

- 6B.1 In the provision of services to IFR aircraft outside controlled airspace, cruising levels shall be assigned according to the table of cruising levels (UK Reg (EU) No. 923/2012 SERA.5025(a) and Appendix 3). However, in accordance with ORS4 No. 1578 this is not required:

- (1) At or below 3,000 ft amsl.

- (2) Above 3,000 ft amsl, when aircraft are operated:
 - (a) in conformity with levels allocated by an appropriate air traffic service unit; or
 - (b) in accordance with instrument approach procedures notified by the CAA in relation to an aerodrome.

7. Amendments to Clearances

- 7.1 When an amendment is made to a clearance the new clearance shall be read in full to the pilot and shall automatically cancel any previous clearance. Controllers must be aware, therefore, that if the original clearance included a restriction, e.g. “cross ABC FL150 or below” then the issue of a revised clearance automatically cancels the earlier restriction, unless it is reiterated with the revised clearance.
- 7.2 Similar care must be exercised when a controller issues a clearance, which amends the vertical profile of an aircraft on a SID. For example, “climb now FL120” automatically cancels the vertical profile of the SID. If the profile contains a restriction that provides vertical separation from conflicting traffic on another SID, the restriction must be reiterated, e.g. “climb now FL120 cross XYZ 5,000 feet or above”, unless separation is ensured by other means.
- 7.3 Similarly, when controllers issue instructions which amend the SID route, they are to confirm the level profile to be followed, e.g. “fly heading 095, climb now FL80” or “route direct EFG, stop climb at altitude 5,000 feet”.

8. Withholding Clearance

- 8.1 The Aerodrome Operator and certain other persons are empowered to prohibit flight and they may instruct controllers to withhold a clearance. A list of the personnel authorised under civil aviation legislation and the procedures to be adopted when detaining aircraft appear in unit instructions.
- 8.2 If a controller is instructed to withhold take-off clearance, the controller should take reasonable steps to establish the authenticity and powers of the person giving the instruction.
- 8.3 In addition a controller shall withhold clearance to take-off when it is known that an aircraft has been detained by a police or HM Customs officer.
- 8.4 If a controller has not been instructed to withhold clearance but has reason to believe that a planned flight is liable to endanger life or involve a breach of legislation, the controller is to:
 - (1) warn the pilot of the hazardous condition or apparent infringement and obtain an acknowledgement of the message;
 - (2) in the case of an infringement of legislation, warn the pilot that if they take-off the facts will be reported to the appropriate authority;

- (3) if the pilot still requests take-off clearance after acknowledging the warning then the pilot should be advised, when traffic permits, that there are no traffic reasons to restrict take-off;
- (4) record the warning and any comment made by the pilot in the ATC Watch Log

8A. Phraseology

- 8A.1 Because of possible legal action when pilots disregard the warnings described above, or when aircraft which have been detained depart without clearance, it is essential that clear and precise messages are passed to the pilots concerned and acknowledgements obtained. The recommended phraseology appears in CAP 413. Further transmission may be necessary to ascertain the intentions of the pilot.

8B. Aerodromes Subject to Prior Permission

- 8B.1 The use of certain civil aerodromes is subject to prior permission of the licensees. This classification is a matter for the pilot of an aircraft and the appropriate Aerodrome Operator and normally of no concern to ATC. In no circumstances is either an ATC clearance or permission to take-off to be withheld solely because the pilot has not obtained prior permission to proceed to their destination aerodrome.

8C. Closed Aerodromes

- 8C.1 Information that an aerodrome abroad is closed is to be relayed by RTF to any aircraft in flight bound for that aerodrome. Action may be limited to aircraft which have departed less than 30 minutes after the message has been received. A controller has no authority to withhold take-off clearance because the intended destination is closed.

9. Data Display

- 9.1 Pertinent air traffic data is normally displayed on flight progress strips. Instructions for marking handwritten strips appear in Appendix D. Procedures for data display methods are described in MATS Part 2.

10. Flight Priorities

- 10.1 Normally requests for clearances shall be dealt with in the order in which they are received and issued according to the traffic situation. However, certain flights are given priority over others and the following table shows the categorisation.
- 10.2 When two or more flights of different categories request clearance the flight with the highest category shall be dealt with first. Flow control procedures are implemented and actioned by the Central Flow Management Unit. A flow control priority will be allocated automatically on receipt of a flight plan.

10A. Minimum Fuel and Fuel Shortage

- 10A.1 Once in possession of the estimated delay for an approach a pilot will determine whether or not they can continue to the aerodrome or divert to a suitable alternative aerodrome.
- 10A.2 A pilot's declaration of "MINIMUM FUEL" indicates that no further fuel diversion options are available where the aircraft is committed to land at the pilot's nominated aerodrome of landing with not less than 'final reserve fuel'. However, "MINIMUM FUEL" RTF phraseology is not universally used by every aircraft operator and pilot.
- Note:** Final reserve fuel is typically fuel for 30 minutes of flight for turbine powered aircraft or 45 minutes for piston powered aircraft. (ICAO)
- 10A.3 Controllers are not required to provide priority to pilots of aircraft that have declared "MINIMUM FUEL" or that have indicated that they are becoming short of fuel.
- 10A.4 Controllers shall respond to a pilot's declaration of "MINIMUM FUEL" by confirming the estimated delay they can expect to receive expressed in minutes, or no delay, when the pilot is en-route to, is joining, or is established in an airborne hold; or by expressing the remaining track mileage from touchdown if the aircraft is being vectored to an approach (SERA.11012(a)).
- 10A.5 At locations where EATs are not issued until the amount of delay reaches a particular value, controllers must provide a general indication of the delay, based on the best information available at that time (see ENR 1.9-4).
- 10A.6 Once in possession of either the estimated delay or remaining track mileage, the pilot will determine whether or not they can continue to the aerodrome with or without declaring a fuel emergency. Controllers shall keep pilots informed of any increase in delay or increase in track mileage after the pilot's initial declaration of "MINIMUM FUEL" following which the controller can expect the pilot to declare an emergency.
- 10A.7 Controllers shall respond to a pilot who has indicated that they are becoming short of fuel but has not declared "MINIMUM FUEL", by confirming the estimated delay they can expect to receive expressed in minutes, or no delay, when the pilot is en-route to, is joining, or is established in an airborne hold; or by expressing the remaining track mileage from touchdown if the aircraft is being vectored to an approach; then ask the pilot if they wish to declare an emergency.
- 10A.8 Pilots declaring an emergency should use the following RTF phraseology "MAYDAY, MAYDAY, MAYDAY" or "MAYDAY, MAYDAY, MAYDAY FUEL" and controllers shall provide such aircraft with flight priority category A (SERA.11012(b)).

10B. Medical Emergencies

- 10B.1 Pilots who allude to medical emergencies on-board, e.g. a sick passenger, but who do not formally declare an emergency or indicate that the person on board is

seriously ill, shall be asked to confirm that they are declaring an emergency. In the absence of such a declaration, controllers are not required to give priority to the flight.

10C. Flight Priority Categories

10C.1 Controllers shall give priority to aircraft according to flight priority category listed below, where category A is the highest priority and Z is the lowest priority.

Table 2:

Category	Type of Flight
A	Aircraft in emergency (e.g. engine fault, fuel shortage, seriously ill passenger). Aircraft which have declared a 'Police Emergency'. Ambulance/Medical/Search and Rescue aircraft when the safety of life is involved. (See note).
B	Flights operating for Search and Rescue or other humanitarian reasons. Police flights under normal operational priority. Other flights authorised by the CAA, including Open Skies Flights.
C	Royal Flights Flights carrying visiting Heads of State
D	Flights carrying the: (1) Prime Minister, (2) Chancellor of the Exchequer, (3) Home Secretary, or (4) Secretary of State for Foreign, Commonwealth and Development Affairs. Flights carrying visiting Heads of Government notified by the CAA.
E	HEMS/Search and Rescue positioning flights. Other flights authorised by the CAA, including flight check aircraft engaged on, or in transit to, time or weather critical calibration flights.
NORMAL FLIGHTS <ul style="list-style-type: none"> Flights which have filed a flight plan in the normal way and conforming with normal routing procedures. Initial instrument flight tests conducted by the CAA Flight Examining Unit. (RTF callsign "EXAM") 	
Z	Training, non-standard and other flights.

Note: Ambulance aircraft carry one or more patients or casualties, whereas medical aircraft carry harvested organs, biological material, medical equipment and/or medical personnel. Search and Rescue aircraft may operate as an ambulance or medical aircraft.

10C.2 The category of flight should be marked in box M of the flight progress strip showing a letter within a circle, e.g. (B)

- 10C.3 It should be noted that these categories are designed for use as a method of tactical handling by ATC and not as flow control priorities. A list of status indicators to be inserted in field 18 of the flight plan, associated with flow control priorities, can be found in the UK AIP.

11. Notification of Flights

- 11.1 For flights within controlled or advisory airspace, a current flight plan, estimate and control information shall be passed to the receiving ACC, sector, or unit in sufficient time to permit analysis prior to any co-ordination.
- 11.2 Details of flights passing from one UK FIR to another and not operating within controlled or advisory airspace but which have passed an estimate for the FIR boundary or adjacent reporting point are to be passed to the appropriate ACC whenever workload and communications permit.

11A. Estimate Messages

- 11A.1 The estimate message shall contain the following information about an intended flight:
- (1) Direction of flight (eastbound or westbound);
 - (2) Aircraft identification and type;
 - (3) Squawk;
 - (4) Transfer point and ETA;
 - (5) Level;
 - (6) True airspeed;
 - (7) Route;
 - (8) Destination and/or clearance limit.
- 11A.2 Revisions to the message must be passed if:
- (1) there are any subsequent changes in Flight Level, Squawk or route; or
 - (2) the estimated time varies by in excess of 2 minutes. (SERA.8020(b)(3))
- 11A.3 The phraseology to be used when telephoning estimate messages is shown in Appendix E.

12. Transfer of Control

- 12.1 Transfer of control is achieved when a flight, which is operating in accordance with the co-ordination, has reached the position or level agreed between the transferring and accepting units.
- 12.2 Transfer of control normally takes place:
- (1) At an agreed reporting point;

- (2) On an estimate for an FIR boundary;
- (3) At or passing an agreed level; or
- (4) While the aircraft is climbing or descending to a previously agreed level, provided that the transferring controller has ensured that standard separation will exist between the transferred aircraft and all others for the remainder of the climb or descent.

12.3 The phrase “continue as cleared” is not to be used in response to an initial call from an aircraft.

12A. Transfer of Communication

12A.1 Transfer of control must not be confused with transfer of communication. Transfer of communication may be permitted so that instructions, which become effective later, can be issued. It is emphasised that an accepting ATC unit which is in communication with an aircraft not having yet reached the stage of transfer of control shall not alter the clearance without the approval of the transferring unit.

13. Expected Approach Time (EAT)

13.1 EAT is the time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing. The actual time of leaving the holding fix will depend upon the approach clearance.

13.2 EATs are based on the landing rate and are calculated according to the traffic situation. They are to be expressed as actual times (not as time intervals) and revised if the situation changes. They are to be passed to aircraft well in advance and revised until the aircraft has left the holding facility.

13.3 Approach Control procedures for passing EATs are described in Section 3 and those for Area Control in Section 4.

13A. Delay Not Determined

13A.1 If, for reasons other than weather, e.g. an obstruction on the runway, the extent of the delay is not known, aircraft are to be advised “delay not determined”. As soon as it is possible for aircraft to re-commence approach procedures, EATs are to be issued.

13A.2 The expression “delay not determined” is not to be used when changing runways.

13A.3 Delays can be forecast with reasonable accuracy and EATs are to be passed to aircraft.

13B. Holding for Weather Improvement

13B.1 If aircraft elect to hold for the weather to improve at the landing aerodrome the controller shall inform the first aircraft entering the holding pattern “no traffic delay expected”. Subsequent aircraft are to be passed “delay not determined (number) aircraft holding for weather improvement”.

14. Calculated Take Off Time (CTOT)

- 14.1 When flow management is in force and an ATC clearance contains a CTOT the controller at the aerodrome is to arrange the traffic so that the aircraft departs within the tolerance specified in MATS Part 2, which must comply with UK Reg (EU) No. 255/2010 that details Common Rules on air traffic flow management.

15. Formation Procedures

15A. General Requirements and Procedures

- 15A.1 Formations are to be considered as a single unit for separation/deconfliction purposes provided that the formation remains within the parameters shown in the following table:

Table 3:

Airspace	Formation Parameters
Class A/C/D and IFR in Class E	Military aircraft: 1 NM laterally and longitudinally, and within 100ft vertically of the formation leader; Civilian aircraft: 0.5 NM laterally and longitudinally, and within 100ft vertically of the formation leader; Or for all aircraft: as agreed following prior tactical negotiation between appropriate civilian and military supervisors; Or for all aircraft: as detailed in an Airspace Co-ordination Notice (ACN) specific to the formation flight.
Class F/G and VFR in Class E	Military aircraft: 1 NM laterally and longitudinally, and within 100ft vertically of the formation leader; Civilian aircraft: 0.5 NM laterally and longitudinally, and within 100ft vertically of the formation leader; Or for all aircraft: subject to tactical ATC approval, 3 NM laterally and longitudinally and/or up to 1,000 ft vertically; Or for all aircraft: as detailed in an ACN specific to the formation flight.

- 15A.2 The callsign of the formation leader and the number of aircraft in the formation will be shown on flight plans. In making initial contact with the ATC unit, formation leaders should clearly state the number of aircraft in the formation; controllers are to ensure that this information is obtained prior to establishing an ATS.
- 15A.3 Units with SSR should allocate a discrete code to the lead aircraft, all other aircraft should normally be instructed to squawk 'standby'. However, if the stream extends

for 3 NM or more, the last aircraft should also be allocated the same code. For longer streams, the code should be allocated to intermediate aircraft as appropriate.

15A.4 All ATC instructions and clearances shall be addressed to the formation leader. The formation leader is responsible for ensuring safe separation between aircraft comprising the formation; for military aircraft this is known as 'Military Accepts Responsibility for Separation of Aircraft' or MARSA.

15A.5 During all co-ordination, traffic information and handover messages, controllers shall:

- (1) clearly state the number of aircraft in a formation;
- (2) identify the full extent of any formation of more than 1 NM in length.

15B. Formation Flights Within Controlled Airspace

15B.1 Civilian VFR transit, arrival and departure formation flights may take place in CTA/CTR/ TMA without NSF approval, subject to the normal airspace entry requirements, the general requirements and procedures above, and the additional controlled airspace procedures specified below. All other civilian formation flights within such airspace, including SVFR, are subject to NSF approval as detailed at UK AIP ENR 1.1.4. In considering such advance NSF requests, unit operations departments or ATC Supervisors should assess the impact of the requested routing and formation flight rules on the control task and airspace in question, also taking into account the current and forecast meteorological conditions.

15B.2 Formation flights by military aircraft may take place in controlled airspace without NSF approval subject to the normal airspace entry requirements, the general requirements and procedures above, and the additional controlled airspace procedures specified below.

15B.3 Formations are to be considered non-RVSM compliant irrespective of the RVSM status of the individual aircraft types.

15B.4 All aircraft in the formation will monitor the relevant ATC frequency.

15B.5 Prior to a formation entering CAS, controllers are to obtain confirmation on RT that all aircraft in the formation are within the parameters as specified at paragraph 15A above. In the event that formation leaders report that they are outside these parameters, controllers shall instruct the formation to remain clear of controlled airspace and establish their intentions.

15B.6 When a formation has been cleared to climb or descend in CAS, controllers are to obtain confirmation that all elements of the formation have vacated the level in question before ATC re-allocate the previously assigned level. Formation leaders should confirm when all formation elements have reached the new assigned level.

15B.7 The formation leader will immediately inform ATC if the formation elements are unable to maintain within the required parameters as specified at 15A.1. In such circumstances, controllers shall establish the extent of the formation so that

instructions and/or information appropriate to the airspace classification and flight rules of the formation can be provided. Where necessary, additional discrete SSR codes should be allocated to individual aircraft.

- 15B.8 For IFR formations that are unable to maintain within the required parameters, the formation leader remains responsible for separation between aircraft comprising the formation until standard separation has been achieved between individual aircraft and each aircraft has been identified and placed under service. Additionally, controllers shall:
- (1) provide other IFR traffic with essential traffic information and instructions as necessary.
 - (2) if practicable, establish standard separation minima between all aircraft in the formation as soon as possible, using ATS surveillance systems if available. If normal separation minima cannot be established, the aircraft shall be given as much separation from each other as possible and the formation given directions to enable it to leave controlled airspace by the shortest possible route.
- 15B.9 Civilian controllers shall only permit an IFR formation under their direct control to join up in controlled airspace when one of the aircraft is in emergency and a formation join up is essential. Military controllers have specific procedures for formation join up in controlled airspace that take due consideration of the formation's proximity to UARs and other airspace users.

15C. Additional Information – Military Formations

- 15C.1 Military formation flights within controlled airspace are normally conducted as OAT.
- 15C.2 However there may be occasions when formations flight plan as GAT and receive a service from civil controllers.
- 15C.3 Military procedures require an aircraft in an emergency that needs to break away from a formation, to squawk the emergency special purpose code. It is usual practice for a military aircraft in an emergency to be followed by another element of the formation. In this circumstance, the aircraft suffering the emergency will be instructed to squawk the emergency special purpose code. If an accompanying aircraft is not already in close formation with the emergency aircraft, it will be instructed to squawk a discrete code until it has joined formation with the emergency aircraft. Where the lead aircraft in a formation is the aircraft in an emergency, the formation will advise ATC of the new leader, who must then be identified and allocated a discrete squawk.
- 15C.4 Standard UK military callsign procedures apply to UK formations. In instances where there is any doubt, such as when working USAF or foreign aircraft whose callsign procedures may be different, the suffix "flight" or "formation" is to be used to indicate on RTF and landline that the call refers to a formation.

- 15C.5 Examples: “BLACKCAT” – denotes a UK formation “BLACKCAT 1” – denotes a UK single element “DEADLY 31 flight” – denotes a USAF formation “DEADLY 31” – denotes a USAF singleton.

16. Terrain Awareness Warning System

- 16.1 Terrain Awareness and Warning System (TAWS) is a generic term that captures all equipment that assists a pilot to avoid a CFIT event such as, but not limited to:
- Ground Proximity Warning System (GPWS);
 - Enhanced Ground Proximity Warning System (EGPWS); and
 - Ground Collision Avoidance System (GCAS).
- 16.2 The specific requirements for carriage of TAWS varies according to aircraft type and/or operation. However, all turbine powered aircraft engaged in CAT operations with a MCTOM of more than 5,700 kg or more than 9 passenger seats are required to be fitted with a TAWS system.
- 16.3 A TAWS warning that requires the pilot to climb immediately is normally triggered when the aircraft is at or below 2,500 ft AGL and typically gives a 20 second warning of a CFIT event. Consequently, pilots will prioritise manually operating their aircraft over informing ATC that they are responding to a TAWS warning.
- 16.4 Controllers are not to dissuade a pilot from climbing their aircraft upon receipt of a TAWS warning. The message should be acknowledged and the appropriate pressure setting passed for confirmation (QFE, QNH or Regional Pressure Setting).
- 16.5 Controllers should be aware that when a TAWS warning instructs a pilot to climb, ACAS RAs are temporarily suppressed. The suppressing of an ACAS RA only affects the aircraft receiving the TAWS warning during the time the TAWS warning remains active. Other aircraft in conflict that are suitably equipped and not receiving a TAWS warning may receive an ACAS RA and controllers shall respond to such ACAS RA reports in accordance with section 1, chapter 10, paragraph 6.
- 16.6 On all other occasions, essential traffic information and/or traffic information/traffic avoidance advice as appropriate should be passed first to aircraft in conflict with the aircraft that is known or appears to be responding to a TAWS warning. Essential traffic information and/or traffic information/traffic avoidance advice, as appropriate, should then be passed to the aircraft responding to the TAWS warning once the aircraft’s Mode C/Mode S altitude report is observed to be at or above the appropriate SMAC level. Exceptionally, a controller may elect to pass traffic information earlier, but only if it is considered essential to mitigate an actual or perceived risk of collision.

17. Non-Deviating Status (NDS)

- 17.1 CAA Airspace Regulation (AR) will notify ATC units in advance that a particular flight has been allocated NDS. Queries should be addressed to AR. Details appear in Appendix H.

- 17.2 Aircraft, both military and civil, which have been allocated this status have an operational requirement to maintain a specific track and level(s) or a particular route and level(s). It is imperative that an NDS aircraft is not moved from its pre-planned flight path because this could render it operationally ineffective. If, for any reason, it is anticipated that adequate separation cannot be maintained between other aircraft and the NDS flight, controllers are to seek co-ordination with the agency providing the service to the NDS aircraft.

18. Unusual Aerial Activity

- 18.1 Unusual Aerial Activity (UAA) is a generic term which, in its ATC context, includes the following:
- (1) A concentration of aircraft that is significantly greater than normal;
 - (2) Activities that may require the issue of a Permission or an Exemption from the ANO or RoA Regulations;
 - (3) Air Shows, Displays, Air Races or other competitions;
 - (4) Activities which require the establishment of a temporary ATSU.
- 18.2 Controllers may become involved in arrangements for UAAs, which can take place in any class of airspace. Approval and clearance for a UAA within controlled airspace rests with the relevant airspace controlling authority. However, many UAAs, whether in or outside controlled airspace, involve AR in co-ordination with the sponsor and other participants and require notification of the event to the aviation community.
- 18.3 Early warning of all UAAs is essential if co-ordination and notification is to be completed in good time by AR. Notice requirements and the responsibilities of sponsors of UAAs are described in the UK AIP and AICs. AR notifies affected ATC units of airspace reservations or temporary procedures, which have been agreed with participating agencies by means of NOTAM and Airspace Co-ordination Notices. This initial dissemination may be supplemented by, or transferred to, Temporary Operating Instructions or other locally produced briefing material.
- 18.4 AR is responsible for the allocation of GAT flight priorities and NDS in addition to co-ordinating CAS-T requirements, VVIP/special/calibration flights, air-to-air refuelling, military deployments, and exercises.

19. Balloon Flights in Controlled Airspace

- 19.1 Some controlled airspace is notified for the purposes of Article 92(2) of the ANO 2016 and for flights by unmanned free balloons (e.g. Met. balloons etc.) in this airspace, written permission from the CAA is required.
- 19.2 Pilots of controlled balloon flights are required to comply with the same rules that apply to other aircraft and subject to normal clearances. In practice balloons are only able to comply with instructions from an ATC unit for changes in level. It is anticipated, although not mandatory, that clearance would be sought prior to take-off

and would only rarely be issued for flights in busy airspace. The minimum in-flight weather conditions by day are those required for VFR in the relevant class of airspace. Balloon flights are not permitted in Class A airspace.

- 19.3 Controllers are reminded that, subject to the provisions of MATS Part 1, Section 1, Chapter 4, they should take into account the present and expected traffic situation when considering requests for flight and should not hesitate to refuse a clearance if other traffic is likely to be compromised. It is unlikely that balloons will be operating in wind speeds of greater than 15 knots.

20. Sailplane Operations

- 20.1 UK Reg (EU) No. 923/2012 Article 2(117) states that the term 'sailplane' ('glider' is often used as an alternative term for a 'conventional' sailplane) can refer to conventional or powered sailplanes, hang gliders, paragliders and other comparable craft. Sailplanes are supported in flight by the dynamic reaction of the air against its fixed lifting surfaces and do not depend on an engine for free flight. There are 3 main types of lift used by sailplanes:
- (1) thermal lift caused by a column of rising air.
 - (2) ridge (orographic) lift caused by rising air on the windward side of a slope or ridge; and,
 - (3) wave lift caused by oscillations to the lee side of high ground resulting from the disturbance in the horizontal air flow caused by the high ground.
- 20.2 Generally, sailplane flying utilising thermal or ridge lift involves deviations of up to 30° around a straight-line route in order to maximise the chances of finding lift and avoiding sink. Depending on the meteorological conditions, sailplanes can experience rapid changes in the vertical plane. 'Thermalling' sailplanes will, typically, circle in a thermal over an area around 0.5 NM wide. The surveillance returns, if any, may be intermittent and, if apparent, may appear stationary or with a downwind drift. Flights by paragliders and hang gliders will, except when ridge soaring, fly with the prevailing wind and flights of over four hours and in excess of 100 NM are regularly flown. 'Conventional' fixed-wing sailplanes have better performance and frequently plan long cross-country flights in excess of 300 NM and fly at speeds between 60 and 130 kt.
- 20.3 Typically, sailplane flying involves periods of straight-line flight, followed by periods of gaining height. It is likely that most requests for clearance will come from radio equipped, conventional sailplanes using thermals for cross country flying, either to cross or transit controlled airspace, or to exploit a source of thermal lift inside controlled airspace. In crossing or transiting controlled airspace, controllers should anticipate that the sailplane's flight path is likely to deviate around the straight-line route by around 30° or 2 NM to take advantage of lift and avoid sink and altitude may vary significantly. Where a sailplane pilot seeks to exploit a source of thermal lift, they will request to 'thermal' in a specific location.

- 20.4 Controllers should be aware that a sailplane's heading and track can differ markedly by tens of degrees due to the effects of wind and that, due to the limitations of the magnetic compass typically used on sailplanes, the pilot will tend to be aware of and navigate by track, rather than heading. Typically, the magnetic compass in a sailplane is useful only in making the pilot aware of the cardinal direction of flight, rather than a specific magnetic heading.
- 20.5 Controllers must decide whether the particular sailplane operation is compatible with the traffic situation prevailing at the time and may consider constraining the sailplane's flight laterally through reference to features detailed on the 1:500 000 Aeronautical Chart (for example, instructing the pilot to route no further west than a particular town or village, or no closer than a set distance from the aerodrome) or by specifying a track to follow. If it is not possible to issue a clearance immediately, the pilot must be advised when the clearance is likely to be granted. When it is considered necessary to identify a sailplane, controllers are to avoid the use of 'the turn method' and use SSR or ADS-B where approved and the aircraft carries appropriate equipment.
- 20.6 As a general guide to performance, the following are typical height losses against track nautical miles flown for various types of gliders which are not influenced by thermals and topography:
- Paraglider 1,000 ft loss for every 1.5 NM.
 - Hang glider 1,000 ft loss for every 2 NM.
 - Standard Class sailplane 1,500 ft loss for every 10 NM.
 - Open Class sailplane 1,000 ft loss for every 10 NM.
- 20.7 Further details of the handling of sailplanes operating VFR in class D Airspace and their integration with other VFR and IFR traffic are outlined in Section 1, Chapter 5. The same chapter provides information on Letters of Agreement between ATC units and other airspace users, including gliding operations. Details of sailplane operations in TRAs are detailed in Section 4. RTF phraseology and an explanation of terms relating to the operation of sailplanes is detailed in CAP 413.

21. Police Flights

- 21.1 A Police flight is defined as a flight by an aircraft operating under a Police Air Operator's Certificate, the purpose of which is to facilitate police operations, where immediate and rapid transportation is essential, which includes the following:
- (1) Responding to a 'Police Emergency'. The pilot of a police aircraft is likely to declare a 'Police Emergency' in situations where an immediate response is required when life is at immediate risk, or a serious crime or major incident is in progress.
 - (2) Supporting ground personnel in often sensitive and serious operations.
 - (3) Non-standard and other flights.
- 21.2 The flight categories relevant to Police flying operations are:

- (1) Flight category A: authorised for use by aircraft which have declared a “Police Emergency”. Callsign “POLICE [XX or XXX] Alpha”.
- (2) Flight category B: normal operational priority. The pilot will expect controllers to suggest a new altitude or minor changes to the police flight operating area in the event that the flight would cause a delay to other traffic. Callsign “POLICE [XX or XXX]”.
- (3) Flight category Z: used for training, test and other flights involving police aircraft. Callsign “POLICE [XX or XXX] Zulu”.

21.3 The callsign for a Police flight consists of three elements:

- (1) The radiotelephony callsign ‘POLICE’. The ICAO three-letter telephony designator is ‘UKP’.
- (2) A two-digit individual aircraft identifier, Exceptionally, sequential three-digit identifiers will be allocated to units operating two or more aircraft. These will consist of a two-digit individual aircraft identifier-based root followed by single digits to reflect the number of aircraft in a regional operation.
- (3) The two, or three-digit aircraft identifier may be suffixed with a flight category to indicate the priority required by the pilot. Suffix “Alpha” indicates a ‘Police Emergency’ is in progress. The absence of a suffix indicates the flight is to be handled as flight category ‘B’. Suffix “Zulu” indicates flight training, testing or other flights involving Police aircraft.

21.4 Police aircraft will select either Mode A0032 or other such SSR codes assigned to the Police and promulgated in AIP unless receiving a service from an ATS Unit which require a different setting to be assigned in accordance with their unit SSR allocation plan.

21.5 Certain police aviation operations may warrant special ATC co-ordination or handling procedures, in which case aircraft operators may consider the need for a SFN.

22. Helicopter Emergency Medical Service (HEMS)

22.1 A HEMS flight is a flight by a helicopter operating under a HEMS approval, the purpose of which is to facilitate emergency medical assistance, where immediate and rapid transportation is essential, by carrying medical personnel, medical supplies or ill or injured persons.

22.2 The flight categories relevant to HEMS operations are:

- (1) Flight category A: applies to all HEMS flights on emergency operational tasks. Callsign “HELIMED [XX] Alpha”.
- (2) Flight category E: is authorised for use by an aircraft positioning for the purpose of conducting HEMS duties, e.g. returning to its base after delivering

a casualty to hospital. It is afforded priority over normal flights. Callsign "HELIMED [XX] Echo".

- (3) Normal flight category: used when SAR aircraft do not require additional priority. Callsign "HELIMED [XX]".
- (4) Flight category Z: used for training, test and other flights involving HEMS aircraft. Callsign "HELIMED [XX] Zulu".

22.3 The callsign for a HEMS flight consists of three elements:

- (1) The radiotelephony callsign 'HELIMED'. The ICAO three-letter telephony designator is 'HLE'.
- (2) A two-digit individual aircraft identifier allocated to each HEMS aircraft by the CAA.
- (3) The two-digit individual aircraft identifier may be suffixed with the flight category to indicate the priority required by the pilot. Suffix "Alpha", "Echo", or "Zulu" indicates the corresponding flight category. The absence of a suffix indicates the 'normal flight' category.

23. Search and Rescue (SAR)

23.1 SAR flights operate to and from incidents where a response is required for the safety of life, which might be time critical and may also involve the transportation of casualties to hospital.

23.2 The callsign used for aircraft engaged in SAR activities is task dependent and will be "COASTGUARD" or "BRITISH RESCUE". 'Coastguard' callsigns can be re-tasked by the Joint Rescue Coordination Centre (JRCC) and will adopt the callsign 'British Rescue'. In addition, SAR helicopters may on occasions be required to undertake HEMS tasks and will also use the callsign 'British Rescue'.

23.3 The ATSU providing the ATS to the aircraft at the time of the re-tasking (i.e., callsign changing from 'Coastguard' to 'British Rescue') are to inform the ATS unit, where one exists, at the departure aerodrome of the change in callsign.

23.4 The callsign "BRITISH RESCUE" may be abbreviated to "RESCUE" by an ATSU within the UK FIR when appropriate after initial contact.

23.5 The flight categories relevant to SAR operations and HEMS operations conducted in SAR aircraft are:

- (1) Flight category A: applies to SAR or HEMS flights when the safety of life is involved. Callsign "BRITISH RESCUE [XXX] Alpha".
- (2) Flight category B: applies to SAR, HEMS or humanitarian flights when priority is required. Callsign "BRITISH RESCUE [XXX] Bravo".

- (3) Flight category E: is authorised for use by SAR aircraft carrying out a positioning flight following a SAR or HEMS task, e.g. returning to its base after delivering a patient/casualty. Callsign “COASTGUARD [XXX] Echo”.
- (4) Normal flight category: used when SAR aircraft do not require additional priority. Callsign “COASTGUARD [XXX]”.
- (5) Flight category Z: used for training and testing flights in SAR aircraft. Callsign “COASTGUARD [XXX] Zulu”.

23.6 The callsign for SAR operations consists of the following elements:

- (1) For “BRITISH RESCUE” callsigns:
 - (a) The ICAO three-letter telephony designator is SRG;
 - (b) A three-digit individual aircraft identifier allocated to each SAR Base and aircraft by the JRCC; and
 - (c) The three-digit individual aircraft identifier will be suffixed “Alpha” or “Bravo” to indicate the corresponding flight category required by the pilot.
- (2) For “COASTGUARD” callsigns:
 - (a) The three-letter telephony designator is SRD;
 - (b) A three-digit individual aircraft identifier allocated to each SAR Base and aircraft by the JRCC; and
 - (c) The three-digit individual aircraft identifier may be suffixed with the flight category to indicate the priority required by the pilot. Suffix “Echo” or “Zulu” indicates the corresponding flight category. The absence of a suffix indicates the ‘normal light’ category.

23.7 The callsign of SAR aircraft engaged in training and testing will be the base allocated callsign, prefixed with ‘Coastguard’.

24. Freezing Order

24.1 A freezing order (previously known as a ‘Mareva injunction’) is a court order, which prevents a defendant from removing assets from the UK and, thus, from the jurisdiction of the court. ATS providers and their personnel may be notified of freezing orders imposed on specific aircraft. Although a freezing order is most likely to be served at the aerodrome where the aircraft is located, it is possible that an order could also be notified to an ATS unit in relation to an aircraft in flight.

24.2 Freezing orders relating to aircraft are likely to specify the aircraft registration rather than a particular callsign. Upon receipt of such a freezing order, ATS providers should establish whether they are in communication with the aircraft in question.

24.3 Where an aircraft subject to a freezing order is being provided with an ATS, controllers should inform the pilot:

“You are subject to a Court Order prohibiting your aircraft from leaving the United Kingdom, what are your intentions?”.

This procedure is to be applied irrespective of whether the aircraft is conducting an internal UK or an international flight.

- 24.3 Controllers must not take any actions that would be detrimental to flight safety; consequently, ATS should continue to be provided as normal, even in the event that the pilot continues their flight. It should be noted that freezing orders are relevant to international flight and that aircraft subject to such an order could be flying legitimately on an internal flight with no intention of leaving the UK territorial boundaries.
- 24.4 ATS providers should promulgate, as considered necessary, local procedures dealing with the circumstances of a freezing order being served. In developing such local procedures, ATS providers should also consider taking legal advice as required in order to ensure that the procedures are consistent with legal obligations in relation to the order.

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Section 1: General

Chapter 5: Integration of VFR Flights with IFR Traffic in Class D CTR/CTA/TMA

1. Introduction

- 1.1 This Chapter provides advice and guidance to controllers on the safe integration of VFR flights with the IFR traffic flow within Class D CTA CTR/TMA.

2. Flight Rules

- 2.1 The pilot is responsible for determining the flight rules (VFR or IFR) under which the flight will be conducted, taking into account the prevailing flight meteorological conditions, airspace classification, and the limitations of their licence/qualifications. Within Class D airspace ground visibility is used for aircraft taking off from or approaching to land at aerodromes, or entering the aerodrome traffic zone, or aerodrome traffic circuit, whereas flight visibility is used for transiting aircraft. Controllers, therefore, must not declare control zones to be 'IFR' or 'IMC'.

3. Control of VFR Flight

- 3.1 The minimum services provided to VFR flights in Class D airspace are specified at Section 1, Chapter 2, paragraph 2. Separation standards are not prescribed for application by ATC between VFR flights or between VFR and IFR flights in Class D airspace. However, ATC has a responsibility to prevent collisions between known flights and to maintain a safe, orderly and expeditious flow of traffic. This objective is met by passing sufficient traffic information and instructions to assist pilots to 'see and avoid' each other as specified at Section 3, Chapter 1, paragraph 2A.2.
- 3.2 Instructions issued to VFR flights in Class D airspace are mandatory. These may comprise routeing instructions, visual holding instructions, level restrictions, and information on collision hazards, in order to establish a safe, orderly and expeditious flow of traffic and to provide for the effective management of overall ATC workload.
- 3.3 Routeing instructions may be issued which will reduce or eliminate points of conflict with other flights, such as final approach tracks and circuit areas, with a consequent reduction in the workload associated with passing extensive traffic information. VRPs may be established to assist in the definition of frequently utilised routes and the avoidance of instrument approach and departure tracks. Where controllers require VFR aircraft to hold at a specific point pending further clearance, this is to be explicitly stated to the pilot.
- 3.4 When issuing instructions to VFR flights, controllers should be aware of the overriding requirements for the pilot to remain in VMC, to avoid obstacles and to remain within the privileges of their licence. This may result in the pilot requesting an alternative clearance, particularly in marginal weather conditions.

- 3.5 Approach surveillance controllers in particular should exercise extreme caution in vectoring VFR flights – a geographical routing instruction is preferable. Prior to vectoring, the controller must establish with the pilot the need to report if headings issued are not acceptable due to the requirements to remain in VMC, avoid obstacles, and comply with the low flying rules. Controllers should be aware that pilots of some VFR flights may not be sufficiently experienced to comply accurately with vectors, or to recover to visual navigation after vectoring.

4. Operation of Gliders in Class D Airspace

- 4.1 Many gliders are radio equipped and therefore may request transit through Class D controlled airspace under VFR in accordance with the normal airspace procedures. Controllers should endeavour to accommodate such aircraft to the maximum practicable extent commensurate with the traffic situation, but should be aware that gliders may not be able to adhere to specific levels or routes and may not be able to supply precise details of their intentions.

5. Letters of Agreement

- 5.1 ATCUs may establish Letters of Agreement with adjacent aerodromes or airspace users to permit the integrated operation of airspace activities including glider, hang-glider, parachuting and other activities. Letters of Agreement shall specify airspace sharing and delegation arrangements, hours of operation and any necessary inter-unit co-ordination arrangements.

Section 1: General

Chapter 6: ATS Surveillance Systems

1. Services

1A. Provision of Surveillance Services

1A.1 Surveillance services comprise:

- (1) separation of arriving, departing and en-route traffic;
- (2) vectoring;
- (3) position information to assist in the navigation of aircraft;
- (4) monitoring traffic to provide information to the procedural controller;
- (5) assistance to aircraft crossing controlled airspace.

1A.2 Before a controller provides any of the above services they shall either:

- (1) identify the aircraft, using a method appropriate to the surveillance system in use; or
- (2) have had the identity of the aircraft transferred from another controller. The act of identifying an aircraft does not imply that a service is being given.

1A.3 Surveillance systems may also be used to provide the following, whether or not the aircraft has been identified:

- (1) Information on the position of aircraft likely to constitute a hazard;
- (2) Avoiding action;
- (3) Information about observed weather for pilots and other controllers; and
- (4) Assistance to aircraft in emergency.

1A.4 Surveillance services shall be provided to the maximum extent practicable to cover the operational requirement subject only to workload, communications or equipment capability.

1A.5 Regardless of the type of airspace, or the air traffic service being provided, nothing shall prevent a controller from taking action they consider appropriate if they believe a risk of collision exists.

1B. Type of Surveillance Service

1B.1 The airspace within which the aircraft is flying determines the type of surveillance service available, as shown in the table below.

Table 1:

Type of Airspace	Surveillance Service
Controlled Airspace	Radar Control Service
Outside Controlled Airspace	Deconfliction Service; or Traffic Service

- 1B.2 Unless specified in MATS Pt 2 and detailed within an SFN or LOA with the aircraft operator, pilots must be advised if a service commences, terminates or changes when:
- (1) outside controlled airspace;
 - (2) entering controlled airspace, except when entering controlled airspace in connection with an IFR flight holding in Class E airspace in accordance with paragraph 1B.5 below;
 - (3) changing from IFR to VFR or VFR to IFR within Class E airspace;
 - (4) VFR flights entering Class B-D airspace from Class E airspace, or VFR flights leaving Class B-D airspace to enter Class E airspace;
 - (5) leaving controlled airspace:
 - (a) unless pilots are provided with advance notice in accordance with paragraph 1B.4 below; or
 - (b) except when leaving controlled airspace in connection with an IFR flight holding in Class E airspace in accordance with paragraph 1B.5 below.
- 1B.3 Additionally, pilots of IFR flights must be advised of the change of airspace classification when entering and leaving Class E airspace when the flight is:
- (1) an unplanned diversion; or
 - (2) no flight plan has been filed at the time a clearance to enter controlled airspace is requested. The associated phraseology is contained within CAP 413.
- 1B.4 For flights leaving controlled airspace controllers should provide pilots with advance notice of:
- (1) the lateral or vertical point at which the aircraft will leave controlled airspace. Such notice should be provided between 5-10 NM or 3,000-6,000 ft prior to the boundary of controlled airspace;
 - (2) the type of ATS that will subsequently be provided, unless the aircraft is coordinated and transferred to another ATS unit before crossing the boundary of controlled airspace.
- 1B.5 IFR airborne holding might not be fully contained within the lateral boundaries of Class E airspace. Controllers are not required to advise pilots of such flights on the

changes of ATS provided as they leave or enter Class E airspace. However, the controller shall provide either a Deconfliction Service, or Procedural Service, depending on the availability of ATS surveillance, for the portion of IFR flight in Class G airspace. Controllers are only required to advise pilots when a Procedural Service will be provided as pilots assume, unless otherwise advised, that the type of UK FIS they will receive will be a Deconfliction Service.

1C. Radar Control Service

1C.1 A Radar Control Service may be provided to aircraft operating:

- (1) IFR,
- (2) Special VFR; and
- (3) VFR in Class B-D airspace.

1C.2 When providing the service controllers issue instructions to which:

- (1) pilots of aircraft operating IFR are required to comply; and
- (2) pilots of aircraft operating Special VFR or VFR will comply unless they advise the controller otherwise.

Note: The manner in which VFR flights under Radar Control Service may be safely integrated with the IFR traffic flow in the vicinity of aerodromes is described in Section 3.

1C.3 Before an aircraft enters controlled airspace the controller must establish which flight rules the pilot will be operating under.

1C.4 Before a Radar Control Service to IFR flights is terminated procedural separation must be applied, except at ACCs when an aircraft will be entering an adjacent sector and:

- (1) a radar handover has been given; or
- (2) the conditions of any standing agreement have been met.

1C.5 Participating VFR flights in Class E airspace shall not be provided with an Air Traffic Control Service, but one of the following types of UK FIS (see CAP 774 – UK Flight Information Services):

- (1) Basic Service; or
- (2) Traffic Service.

1D. Surveillance Services Within Class G Airspace

1D.1 Surveillance services provided within Class G airspace (Deconfliction Service and Traffic Service) are detailed in CAP 774 – UK Flight Information Services.

2. Penetration by Independent Units

- 2.1 The CAA has specified that certain units are permitted to provide an ATS surveillance service to aircraft wishing to penetrate controlled airspace which is under the jurisdiction of another ATSU.
- 2.2 Controllers at these independent units are responsible for separating aircraft under their control from all other aircraft in that controlled airspace.

3. Identification using PSR

- 3.1 One of the following methods is to be employed when PSR is used to identify aircraft. Direction finding equipment should be used to assist the identification provided it has been approved for such use.

3A. The Turn Method

- 3A.1 An aircraft may be identified by ascertaining its heading and, following a period of track observation, correlating the observed movement of a particular Position Indication with:
 - (1) the acknowledged execution of an instruction to alter heading by at least 30°;
 - (2) one or more changes of heading of at least 30°, as instructed by another controller;
 - (3) one or more changes of heading of at least 30° reported by the pilot.
- 3A.2 A turn for identification does not constitute the provision of a surveillance service. However, controllers should take into consideration, terrain, other surveillance returns, PSR coverage and the RoA Regulations before instructing an aircraft to alter heading.
- 3A.3 In using the turn method the controller shall:
 - (1) verify that the movements of not more than one Position Indication correspond with those of the aircraft;
 - (2) exercise caution particularly when employing this method in areas where changes of aircraft heading are commonly made as a navigational routine.

3B. Departing Aircraft Method

- 3B.1 By observing and correlating the Position Indication of a departing aircraft to a known airborne time. Identification is to be achieved within one mile of the end of the runway unless otherwise authorised by the CAA.
- 3B.2 Particular care should be taken to avoid confusion with aircraft overflying the aerodrome, making a missed approach, departing from an adjacent runway or holding overhead the aerodrome.

3C. Position Report Method

- 3C.1 By correlating a particular Position Indication with a report from the pilot that the aircraft is:
- (1) over an exact reporting point which is displayed on the situation display; or
 - (2) at a particular distance not exceeding 30 NM on a particular radial from a co-located VOR/DME or TACAN (DME). The source facility must be displayed on the situation display; or
 - (3) over a notified visual reference point or prominent geographical feature, in either case approved for the purpose and displayed on the situation display, provided that the flight is operating with visual reference to the surface and at a height of 3000 ft or less above the surface.
- 3C.2 The identification must follow a period of track observation sufficient to enable the controller to compare the movement of the Position Indication with the pilot's reported route. The reported position and level of the aircraft must indicate that it is within known PSR cover.
- 3C.3 This method must be reinforced by an alternative method if there is any doubt about the identification because of:
- (1) the close proximity of other returns; or
 - (2) inaccurate reporting from aircraft at high level or some distance from navigational facilities.
- 3C.4 A pilot is to be informed as soon as their aircraft has been identified. When operating inside controlled airspace, the pilot of an aircraft need only be so informed if the identification is achieved by the turn method.

4. SSR – Mode A

4A. Identification

- 4A.1 When using Mode A to identify aircraft, one of the following methods is to be employed:
- (1) Observing the pilot's compliance with the instruction to select a discrete four-digit code;
 - (2) Recognising a validated four-digit code previously assigned to an aircraft callsign. When code/callsign conversion procedures are in use and the code/callsign pairing can be confirmed, the callsign displayed in the data block may be used to establish and maintain identity;
 - (3) Observing an IDENT feature when it has been requested.
- 4A.2 Caution must be exercised when employing this method because simultaneous requests for SPI transmissions within the same area may result in misidentification.

Unless MATS Pt 2 states otherwise, aircraft displaying a conspicuity or special purpose code are not to be identified by this method.

4B. Code Assignment Plan

4B.1 Controllers are to assign Mode A codes to aircraft according to the Code Assignment Plan, which comprises:

- (1) Discrete codes comprising:
 - (a) domestic codes which are assigned to aircraft flying within the areas of responsibility of a unit;
 - (b) ORCAM codes which are assigned to international flights and will normally be retained beyond the area of responsibility of the assigning unit.
- (2) Special purpose codes allocated internationally.
- (3) Conspicuity codes, allocated nationally, or to specific users/units.

4B.2 When providing a surveillance service to an aircraft, controllers operating at SSR equipped units should allocate that flight with a discrete code in accordance with the SSR assignment plan. Unless otherwise directed by an ATC unit, Mode C will be selected in conjunction with Mode A. Controllers must, therefore, verify the accuracy of the Mode C readout when assigning discrete codes to aircraft.

4C. Validation of Mode A Codes

4C.1 A controller assigning any Mode A code must validate the code by checking as soon as possible, either by direct reference to their display or with the assistance of another controlling agency, that the data displayed corresponds with the code which has been assigned. At units where code callsign conversion equipment is in use, procedures to ensure the correct correlation of the callsign with the assigned code are to be applied.

4C.2 The code must be checked by one of the following methods:

- (1) Instructing the aircraft to squawk the assigned code and observing that the correct numbers appear on the situation display;
- (2) Instructing the aircraft to “squawk IDENT” and simultaneously checking the code numbers associated with the SSR response;
- (3) Matching an already identified Position Indication with the assigned code for the flight.

4C.3 If the code readout does not correspond to that assigned, the pilot is to be instructed to reset the assigned code (SERA.13005(c)(1)). Where this fails to achieve display of the assigned code then the pilot is to be instructed to select code 0000. If a corrupt code still exists, the pilot should normally be instructed to switch off the transponder (SERA.13005(c)(2)). However, the corrupt code may be retained to

assist identification and tracking provided the Mode C has been verified. Associated ATC units are to be informed of the retention of corrupt data.

4D. Deemed Mode A Validation

4D.1 Controllers may deem Mode A codes to be validated when it can be ascertained from the Code Assignment Plan that an observed Mode A code has been assigned by a unit capable of validating the code, unless:

- (1) the code is promulgated as being unvalidated; or
- (2) the controller has been notified that the code is corrupt.

4E. Special Purpose Codes

4E.1 The Mode A code and associated Mode C data of special purpose codes must be considered unvalidated and unverified. Controllers should be aware of the following special purpose codes:

- (1) Emergency codes 7500, 7600 and 7700;
- (2) Code 1000, to indicate an aircraft conducting IFR flight as GAT, where the downlinked aircraft identification is validated as matching the aircraft identification entered in the flight plan;
- (3) Code 2000 which is selected by pilots of aircraft entering the UK from an adjacent FIR where the operation of transponders has not been required; and

Note: Code 2000 is also used for the purpose of IFR conspicuity.

- (4) Code 7007, which is selected by aircraft engaged on airborne observation flights under the terms of the Treaty on Open Skies. Flight Priority Category B status has been granted for such flights and details will be published by NOTAM.

4F. Conspicuity Codes

4F.1 The Mode A code and associated Mode C data of conspicuity codes must be considered unvalidated and unverified. Pilots are required to squawk a VFR or IFR conspicuity when operating at and above FL100 and are advised to do so when below FL100 unless:

- (1) they have been assigned a discrete code;
- (2) they are transponding on one of the special purpose codes, a frequency monitoring code, or on one of the other specific conspicuity codes assigned in accordance with the Code Assignment Plan;
- (3) they are flying below 3,000 ft in the aerodrome traffic pattern and have been instructed to select the aerodrome traffic pattern conspicuity code (7010); or
- (4) on grounds of safety the aircraft has been instructed to squawk standby. In view of the associated reduction in protection from ACAS, such circumstances

are to be regarded as exceptional. ATSU shall log the circumstances and duration of any such occurrences. Records are to be made available to the CAA on request.

- 4F.2 In addition to those listed below, the SSR Code Assignment Plan provides a complete set of UK conspicuity codes, including those used at specific units or locations.

Table 2:

Code	Use	Notes
0024	Radar Flight Evaluation or Calibration	Only be used for the duration of the radar evaluation or calibration. The code shall not be used whilst transiting to/from the trial.
0033	Para Dropping	Unless a discrete Mode A code has already been assigned, pilots of transponder equipped aircraft should select Mode A code 0033, together with Mode C pressure altitude reporting mode of the transponder, five minutes before the drop commences until the drop is complete and parachutists or loads are estimated to be on the ground.
2000	IFR Conspicuity	Used when operating within United Kingdom airspace in accordance with IFR and have not received a specific instruction from ATS concerning the setting of the transponder.
7000	VFR Conspicuity	Used when operating within United Kingdom airspace in accordance with VFR and have not received a specific instruction from ATS concerning the setting of the transponder.
7001	Military Fixed Wing Low Level Conspicuity And Climbout	Used by military fixed-wing aircraft operating in the UK Low Flying System. When an ATS is required on climb-out from the low Flying System, the aircraft will retain the code until at ATC unit passes alternative instructions.
7002	Danger Areas General	
7003	Red Arrows Display/Transit	
7004	Aerobatics and Display	Unless a discrete code has already been assigned, pilots of transponder equipped aircraft will select Mode A code 7004 five minutes before commencement of their aerobatic manoeuvres until they cease and resume normal operations.
7005	High Energy Manoeuvres	Unless a discrete code has already been assigned, outside controlled airspace below FL 195 and outside the UK low-flying system, pilots of military fast-jet aircraft will select Mode A code 7005 prior to engaging in sustained high-energy manoeuvres.

Code	Use	Notes
7006	Autonomous Operations within TRA and TRA (G)	
7010	Aerodrome Traffic Pattern Conspicuity Code	The purpose of this code is to facilitate greater availability of the collision avoidance provided by ACAS. It also allows a unit with appropriate equipment to filter or highlight the aircraft's position symbol as appropriate. May be allocated by ATSU's, or selected by a pilot as local procedure may require, when the aircraft is operating in or within approximately 2 NM of the aerodrome traffic pattern.

4G. Frequency Monitoring Codes

4G.1 In order to both prevent and mitigate the consequences of airspace infringements, pilots operating close to the peripheries of certain controlled airspace may select local SSR conspicuity codes and monitor the promulgated frequency. Selection of such codes and associated frequency monitoring does not imply the provision of any form of ATS. Procedures for the use of monitoring codes and actions to be taken by controllers shall be detailed in MATS Part 2.

5. SSR–Mode S

5A. Introduction

5A.1 There are two levels of Mode S: Elementary and Enhanced. Elementary Mode S provides selective interrogation of aircraft, and the aircraft identification Down-Linked Airborne Parameter (DAP). Enhanced Mode S enables further DAPs from an aircraft's flight management system, which include:

- (1) Selected altitude (see 5C below);
- (2) IAS;
- (3) ground speed;
- (4) magnetic heading;
- (5) rate of climb / descent.

5A.2 In addition to traditional Mode A/C capabilities, Mode S transponder equipped aircraft engaged in international civil aviation also incorporate an Aircraft Identification Feature (sometimes referred to as Flight Identity or Flight ID). Flight crew of aircraft equipped with a Mode S Aircraft Identification Feature will set the aircraft identification in the transponder. The Aircraft Identification Feature should not be confused with the "aircraft address" which is a unique ICAO code relating directly to the airframe in which the Mode S transponder had been installed and over which crews have no control.

5B. Identification

- 5B.1 Direct recognition of the Aircraft Identification Feature on the situation display may be used to establish surveillance identification, subject to either:
- (1) correlation of the Aircraft Identification Feature with the aircraft identification entered in the flight plan and displayed to controllers on flight progress strips; or
 - (2) correlation of the Aircraft Identification Feature with the aircraft's callsign used in a directed RTF transmission to the controller. However, controllers shall exercise particular caution when there are aircraft with similar callsigns on the frequency and shall utilise an alternative method if they have any doubt about the surveillance identification.
- 5B.2 Whenever it is observed on the situation display that the down-linked Aircraft Identification Feature is different from that expected from the aircraft, the pilot shall be requested to confirm and, if necessary, re- enter the Aircraft Identification Feature.
- 5B.3 If the discrepancy continues to exist following confirmation by the pilot that the correct aircraft identification has been set in the Aircraft Identification Feature, the controller shall take the following minimum actions:
- (1) inform the pilot of the persistent discrepancy;
 - (2) assign a discrete Mode A code; and
 - (3) notify the erroneous Aircraft Identification Feature transmitted by the aircraft to the next control position or unit.
- 5B.4 Transfer of identification using the Mode S Aircraft Identification Feature relies on both units having appropriate Mode S surveillance capability; therefore, it shall only be conducted in accordance with locally agreed arrangements and specified in MATS Part 2.

5C. Selected Altitude

- 5C.1 The Selected Altitude DAP is generated by flight crew inputs into the aircraft's auto pilot system. Subject to appropriate surveillance system capability, the selected Altitude DAP can be displayed to controllers on situational displays.
- 5C.2 Selected Altitude data will be presented as either a flight level or an altitude, depending on local surveillance system settings, which are to be detailed in MATS Part 2. For ATC and RTF purposes, the generic phrase 'Selected Level' is used to encompass data presented as either an altitude or a flight level.
- 5C.3 Selected Levels display intent-based information only and shall not be used for the purposes of separation.
- 5C.4 There are occasions where, whilst the flight crew have correctly interpreted the ATC instruction, the Selected Level will be at variance. These situations will vary

according to aircraft type, aircraft operator, and mode of operation, but may include the following:

- (1) SID/STARs with vertical restrictions, where pilots may select the final cleared level, and utilise the aircraft flight management system to achieve the vertical constraints;
- (2) Final approach, at which point pilots may pre-select the missed approach procedure altitude;
- (3) When the aircraft is being flown manually, in particular in response to vertical avoiding action manoeuvres.

5C.5 Units equipped with Enhanced Mode S surveillance systems that enable DAPs should display Selected Levels on the situation display as a means of mitigating the risk of level busts. The checking of Selected Levels shall not be used as a substitute for RT readback of level clearances.

5C.6 Where the Selected Level is seen to be at variance with an ATC clearance, controllers shall not state on RT the incorrect level as observed on the situation display. However, taking into account the limitations of Selected Levels detailed above, controllers may query the discrepancy using the following phraseology:

“(Callsign), check selected level. Cleared level is (correct cleared level)”.

5C.7 Downlinked Mode S Barometric Pressure Setting data has the potential to assist in the prevention of level busts. Where such data is available to a controller and a discrepancy is observed between the altimeter setting passed and that selected by the pilot, a controller should query the discrepancy, using the following phraseology, as appropriate:

- “(Callsign), check altimeter setting QNH 1000” (where QNH 1000 hPa is the correct value); or
- “(Callsign), check altimeter setting, confirm standard pressure is set?” (where 1013.25 hPa is the correct value)

6. Transponder Mandatory Zones (TMZ)

6.1 A TMZ is airspace of defined dimensions within which aircraft are required to carry and operate a Mode S SSR transponder, unless in compliance with alternative provisions prescribed for that particular airspace by the ANSP (SERA.6005(b) refers).

6.2 A TMZ is established for overriding safety reasons where the airspace classification would not normally require the carriage of a transponder but where a change to a more restrictive classification of controlled airspace is not warranted. A TMZ creates a ‘recognised air traffic environment’ within which ATS, where provided, are more able to provide enhanced levels of safety to aircraft and can enable the operation of airborne and ground-based safety nets.

- 6.3 The pilot of an aircraft that is unable to comply with the notified requirements for entry into a TMZ may be granted access to the TMZ, subject to specific approval by the ANSP. Such approval is subject to the conditions prevailing at the time of the request which include but is not limited to: the types and density of air traffic operating or planned to operate within the TMZ, and the actual or forecast meteorological conditions.
- 6.4 Within a TMZ, standard ATS procedures and separation/deconfliction minima, appropriate to the airspace classification are to be applied. The existence of a TMZ does not confer or suggest any particular airspace classification.

7. Transfer of Identity

- 7.1 If only PSR is available, a controller may transfer the identity of an aircraft to another controller by any of the following methods:
- (1) Direct designation (pointing) of the Position Indication where two situation displays are adjacent or a conference type of display is used. If the information on two situation displays is derived from separate PSR heads (or beams, if using a stack beam system) the transferring controller must ensure that the blips on both displays correlate before using this method. If parallax is likely to cause an error, an alternative method is to be used;
 - (2) Designation of the Position Indication in terms of a direction and distance from a common reference point (geographical position or navigational facility) accurately indicated on both displays. The Position Indication, as seen by the accepting controller, must be within 3 NM of the position stated. The distance between the aircraft and the reference point must not exceed:
 - (a) 30 NM, if the aircraft is flying along a published ATS route or direction is given as a bearing in degrees;
 - (b) 15 NM in other circumstances.
 - (3) Designation of the Position Indication by positioning an electronic marker or symbol so that only one Position Indication is thereby indicated and there is no possible doubt of correct identification.

8. Lost Identity

- 8.1 Except as described in paragraph 8.2 below, a pilot shall be advised whenever identification is lost.
- 8.2 When using SSR, controllers may be temporarily unable to read the data blocks associated with aircraft due to overlapping or garbling e.g. in holding areas. Although this constitutes a loss of identification, the pilot need not be advised that identification has been lost if the controller anticipates that identification will be re-established immediately the overlapping or garbling ceases.

9. Identification and Position Information

- 9.1 When providing surveillance services outside controlled airspace, a pilot is to be informed as soon as their aircraft has been identified. When operating inside controlled airspace, the pilot of an aircraft need only be so informed if the identification is achieved by the turn method.
- 9.2 Pilots should be informed of their position in the following circumstances:
- (1) Following identification of the aircraft using the turn method;
 - (2) When the pilot requests the information;
 - (3) When the aircraft is flying off the correct track;
 - (4) When an aircraft estimate differs significantly from the controller's estimate based on ATS surveillance system observation; and
 - (5) When the pilot is instructed to resume their own navigation following vectoring, if considered necessary by the controller.
- 9.3 Additionally, controllers may pass position information to aircraft whenever they consider it necessary.

Table 3:

Method of Identification	Aircraft flying inside controlled airspace		Aircraft flying outside controlled airspace (see note)	
	Inform Identified	Pass Position	Inform Identified	Pass Position
SSR	No	No	Yes	No
Turn	Yes	Yes	Yes	Yes
Departing aircraft	No	No	Yes	No
Position Report	No	No	Yes	No

Note: When providing a Basic Service, a controller may identify an aircraft to facilitate co-ordination or to assist in the provision of generic navigational assistance, but is not required to inform the pilot that identification has taken place or to pass a position report.

- 9.4 Position information shall be passed in one of the following forms:
- (1) A well-known geographical position;
 - (2) Bearing (using points of the compass) and distance from a known position;
 - (3) Magnetic track and distance to a location displayed on the situation display that is a reporting point, an en-route navigational aid, or an approach aid;
 - (4) Latitude and Longitude (by specific units only when authorised in MATS Part 2); or

- (5) Distance from touchdown if the aircraft is on final approach.

10. Use of Mode C for Vertical Separation

10A. Mode C Responses

- 10A.1 When SSR is used to assess vertical separation the Mode C responses are to be continually monitored to ensure that the vertical distance is never less than the prescribed minimum.
- 10A.2 Vertical separation using Mode C is not applied against aircraft transponding A0000.
- 10A.3 Minimum vertical separation may be applied between verified Mode C transponding aircraft provided the intentions of both aircraft are known to a controller because either:
 - (1) they are under their control;
 - (2) they have been coordinated; or
 - (3) they are operating in accordance with established agreements.
- 10A.4 Aircraft Under Radar Control Service. If the intentions of verified Mode S altitude reporting or Mode C transponding aircraft are not known the minimum separation is for:
 - (1) IFR flights within Class A, C-E airspace, must be increased to 5,000 ft, or alternative approved minima within MATS Part 2; and
 - (2) VFR flights within Class C airspace, must be increased to 5,000 ft, or alternative approved minima within MATS Part 2.
- 10A.5 Unverified Mode S altitude reporting or Mode C data may be used for separation purposes within controlled airspace as follows:
 - (1) for IFR flights within Class A, C and D airspace, and VFR flights within Class C airspace, a minimum vertical separation of 5,000 ft, or an alternative approved minimum within MATS Part 2, and surveillance returns however presented are not allowed to merge;
 - (2) for IFR within Class E airspace, except against aircraft displaying VFR conspicuity or a Frequency Monitoring Code, a minimum vertical separation of 5,000 ft, or an alternative approved minimum within MATS Part 2, and surveillance returns however presented are not allowed to merge; and
 - (3) for IFR flights within Class E airspace, against aircraft displaying VFR conspicuity or a Frequency Monitoring Code, whenever practicable, pass traffic information and if requested by the pilot or when deemed necessary by the controller, suggest traffic avoidance advice.

Note: The procedure in (2) & (3) only applies to Frequency Monitoring codes notified for the purposes of VFR within Class E airspace.

10A.6 Aircraft that do not meet the published operating requirements for a particular volume of TMZ may be deemed to be operating outside that TMZ unless:

- (1) information received indicates that an aircraft is lost or has experienced a radio failure; or
- (2) the controller has approved such an aircraft to enter TMZ airspace without identifying the aircraft using an appropriate method.

10A.7 When suggesting traffic avoidance advice, controllers shall aim to prevent surveillance returns from merging.

10A.8 For aircraft receiving a Deconfliction Service, refer to CAP 774, chapter 4, paragraph 4.10.

10B. Verification of Mode C

10B.1 Controllers are to verify the accuracy of Mode C data, once the aircraft has been identified and the Mode A validated, by checking that the readout indicates 200 ft or less from the level reported by the pilot. If the aircraft is climbing or descending, the pilot is to be instructed to give a precise report as the aircraft passes through a level.

10B.2 Verification may be achieved with the assistance of an ATSU with which the aircraft is in contact.

10B.3 A Mode C readout can be assumed to have been verified if it is associated with a deemed validated Mode A code (SERA.13010(b)).

10B.4 There is no requirement to monitor level readouts when Mode C information is not being used to provide vertical separation. However, if a controller observes a discrepancy the pilot is to be asked to confirm their altimeter setting and level. If the discrepancy remains, the pilot is to be instructed to switch-off Mode C. If independent switching of Mode C is not possible the pilot is to be instructed to select A0000.

10C. Level Assessment using Mode C

10C.1 The following criteria apply when assessing the vertical position of a Mode C transponding aircraft:

- (1) An aircraft may be considered to be at an assigned level provided that the Mode C readout indicates 200 ft or less from that level;
- (2) An aircraft which is known to have been instructed to climb or descend may be considered to have left a level when the Mode C readout indicates a change of 400 ft or more from that level and is continuing in the anticipated direction;
- (3) An aircraft climbing or descending may be considered to have passed through a level when the Mode C readout indicates that the level has been passed by 400 ft or more and continuing in the required direction;

- (4) An aircraft may be considered to have reached an assigned level when three successive Mode C readouts indicate 200 ft or less from that level.

10C.2 Mode C information is normally displayed as a Flight Level but on some ground equipment the vertical position of an aircraft flying below a pre-determined datum is displayed as an altitude.

11. Radar Handover

11.1 The transfer of responsibility for an aircraft from one controller to another may be effected provided that:

- (1) satisfactory two-way speech communication is available between them;
- (2) the identity has been transferred to, or has been established by, the accepting controller; and
- (3) the accepting controller is informed of any level, speed or vectoring instructions applicable to the aircraft at the stage of transfer.

11.2 If the route of the aircraft is not known the offering controller is to pass the observed track or reported aircraft heading to the accepting controller.

12. Radar Release

12.1 Control of arriving aircraft may be transferred to Approach Radar Control, when other aircraft would otherwise delay the released aircraft's progress, in accordance with the following conditions:

- (1) The transfer of control message is prefixed "radar release";
- (2) Details of all conflicting aircraft are passed to the approach radar controller;
- (3) Conflicting aircraft are either transferred to Approach Radar Control or identified according to the accepting controller's decision; and
- (4) Neither the track nor the level of the conflicting aircraft is altered without co-ordination.

13. Vectoring

13A. Responsibility

13A.1 A controller may instruct an aircraft to turn in any direction as dictated by circumstances but when avoiding unknown aircraft the RoA Regulations should be observed if practicable.

13A.2 Aircraft flying outside controlled airspace and aircraft flying VFR within Class E airspace are not obliged to follow instructions given by ATC, but where the pilot of an aircraft accepts a Traffic Service or Deconfliction Service, the controller can expect that their instructions will be followed.

- 13A.3 Unless an aircraft has planned to leave controlled airspace, it is not to be vectored outside the horizontal or vertical limits, except:
- (1) when an emergency situation arises requiring the aircraft to be vectored outside controlled airspace;
 - (2) when avoiding severe weather; the circumstances must be explained to the pilot before the aircraft leaves controlled airspace; and
 - (3) when specifically requested by the pilot.
- 13A.4 Although IFR flights within class A-D airspace, and VFR flights within B/C airspace, are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace, controllers should aim to keep the aircraft under their control at least 2 NM within the boundary. Controllers should monitor the operation of aircraft in adjacent uncontrolled airspace, particularly if circumstances have made it necessary to vector an aircraft to be less than 2 NM from the boundary. In such circumstances, consideration should be given to co-ordinating with the appropriate controlling agency if applicable. However, regardless of airspace divisions and classifications, controllers should take appropriate action with respect to the safety of aircraft if unknown aircraft appear to present a risk of collision.
- 13A.5 When vectoring is complete, pilots will be instructed to resume their own navigation. Where a direct route is required, the controller shall specify this in the instruction.

13B. VOR/DME Holding

- 13B.1 When an aircraft inbound to a VOR/DME holding pattern is vectored away from a standard VOR radial, the controller must either provide magnetic track and distance information on instructing the aircraft to resume own navigation or issue vectoring instructions to intercept the appropriate radial to the holding or routing fix.

14. Terrain Clearance

14A. Within Controlled Airspace

- 14A.1 Controllers are to ensure that levels assigned to IFR flights in receipt of a Radar Control Service provide adequate terrain clearance for the phase of flight as shown below.
- 14A.2 Controllers have no responsibility for the terrain clearance of, and shall not assign levels to, aircraft operating Special VFR or VFR within controlled airspace which accept vectors.

Table 4:

Phase	Minimum Terrain Clearance
Within the defined final approach area	Achieved if levels are assigned in accordance with a procedure approved by the CAA.

Phase	Minimum Terrain Clearance
Within the Surveillance Minimum Altitude Area	Levels allocated must be in accordance with the information published on the SMAC.
Within 30 NM of the radar antenna associated with the unit providing the service	1,000 ft above any fixed obstacle within: (1) 5 NM of the aircraft; and (2) 15 NM ahead and 20° either side of the aircraft's track. When the aircraft is within 15 NM of the antenna, and provided a SMAC or approved procedure has been notified, the 5 NM in (1) and the 15 NM in (2) may be reduced to 3 and 10 NM respectively
Outside the phases above	1,000 ft above any fixed obstacle: (1) which lies within 15 NM of the centreline of the ATS route; or (2) within 30 NM of the aircraft (for all other flights). In sections of control areas where the base is defined as a flight level, the lowest useable level normally provides not less than 1,500 ft terrain clearance.

14B. Outside Controlled Airspace

14B.1 Within Class G airspace, regardless of the service being provided, pilots are ultimately responsible for terrain clearance. However, terrain requirements pertaining to level allocations and the provision of vectors are specified within the conditions of the services as detailed within CAP 774 – UK Flight Information Services.

15. Unknown Aircraft

15.1 A position symbol which cannot be associated with an aircraft known by the controller to be operating within the airspace concerned shall be considered to represent an unknown aircraft.

15.2 The action to be taken by controllers when they observe an unknown aircraft, which they consider to be in unsafe proximity to traffic receiving an ATS varies according to the airspace classification in which the event takes place as follows:

Table 5:

Class	Action to be taken by the Controller
A	If surveillance derived, or other information indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced radio failure, flights shall be given traffic avoidance advice and traffic information shall be passed.
C	If surveillance derived, or other information indicates that an aircraft is making an unauthorised penetration of the airspace, it lost, or has experienced radio failure:

Class	Action to be taken by the Controller
	<p>IFR flights shall be given traffic avoidance advice and traffic information shall be passed.</p> <p>VFR flights shall be given traffic information and if requested by the pilot or when deemed necessary by the controller, traffic avoidance advice shall be suggested.</p>
D	<p>If surveillance derived, or other information, indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced radio failure:</p> <p>IFR flights shall be given traffic avoidance advice and traffic information shall be passed.</p> <p>VFR and SVFR flights shall be given traffic information and if requested by the pilot or when deemed necessary by the controller, traffic avoidance advice shall be suggested; see note 1</p>
E	<p>Pass traffic information unless the controller's primary function of sequencing and separating IFR flights is likely to be compromised.</p> <p>IFR flights shall be given traffic avoidance advice when surveillance derived or other information indicates that an aircraft is lost, or has experienced a radio failure, or an aircraft operating in accordance with IFR infringes Class E airspace; see note 3.</p> <p>IFR flights shall be given traffic information whenever practicable and if requested by the pilot or when deemed necessary by the controller, traffic avoidance advice shall be suggested; and</p> <p>Participating VFR flights shall be given traffic information in accordance with CAP 774 – UK Flight Information Services.</p>
G	<p>Flights receiving either the Deconfliction Service or Procedural Service shall be given traffic information and deconfliction advice in accordance with CAP 774 – UK Flight Information Services; see note 2, and</p> <p>Flights receiving either the Traffic Service or Basic Service shall be given traffic information in accordance with CAP 774 – UK Flight Information Services.</p>

Note 1: When providing traffic avoidance advice, controllers shall remind pilots of their responsibility to remain clear of cloud with the surface in sight.

Note 2: When the controller considers that more immediate action is required by the pilot, traffic avoidance advice may be passed by ATC before traffic information.

Note 3: Whenever the flight rules employed by pilots of unknown aircraft cannot be determined the procedure detailed in section 1, chapter 6, paragraph 10A.5(2) shall be applied.

- 15.3 When traffic avoidance advice is issued to an IFR aircraft under a Radar Control Service, controllers must seek to achieve the required minima and pilots must comply with the instructions given. However when avoiding action is issued to an IFR aircraft under a Radar Control Service in Class D or E airspace, and the pilot reports that they have the unknown aircraft in sight and has positively stated that they will maintain their own separation from it, further controller action may then be limited to passing traffic information. It is recognised that it may not always be possible for controllers to achieve the required separation minima against unknown traffic infringing controlled airspace due to the potential for their sudden appearance and/or unpredictable manoeuvres; however, controllers shall apply all reasonable endeavours (SERA.7002(a)).
- 15.4 When traffic avoidance advice is issued on request to VFR/SVFR aircraft under Radar Control Service, controllers are not required to achieve separation minima. Such avoiding action instructions shall be aimed at ensuring that the risk of collision is reduced as far as possible subject to aircraft proximity and aircraft constraints. Pilot compliance is subject to prevailing meteorological conditions (SERA.7002(a)).
- 15.5 Controllers shall advise pilots when the conflict no longer exists (SERA.7002(b)).
- 15.6 Controllers who observe that an aircraft using an assigned SSR code is, or is about to, make an unauthorized infringement of their airspace should attempt to contact the relevant agency to identify the aircraft and agree a course of action.

15A. London FIS Code

- 15A.1 In the case of aircraft using A1177, controllers should contact the appropriate London FISO who will assist in identification. For example, by relaying instructions to “Squawk Ident”, and instructions, as necessary, for the aircraft to be transferred to the controller’s frequency:
- “G-ABCD, at (unit) request - contact (unit) (frequency) immediately”
- 15A.2 When the subject aircraft is on the controller’s frequency, the controller must ensure that identification of the aircraft is then achieved.
- 15A.3 Controllers should note that simple transfers of communication form part of the London FISOs’ standard operating procedures. However, FISOs are not permitted to issue any control instructions to aircraft. Controllers must not request FISOs to relay any instructions, other than for the aircraft to transfer directly to their control frequency so that the controller can resolve the situation.
- 15A.4 Procedures for Royal Flights in fixed-wing aircraft are detailed in Chapter 9.

16. Traffic Information to Aircraft

- 16.1 Traffic information to aircraft shall include the following:
- (1) Bearing from the aircraft in terms of the 12-hour clock (when the aircraft is turning, direction of the unknown aircraft by compass points);

- (2) Distance from the aircraft in nautical miles;
- (3) Direction in which the unknown aircraft is proceeding, e.g. “traffic is opposite direction/crossing left to right”, etc; and
- (4) Height information when available, this may include the unverified Mode C of unknown aircraft.

16.2 Under some circumstances, controllers may consider it prudent to inform a pilot of other traffic which is separated from their aircraft. In such cases, to prevent any possible confusion, no reference should be made to the actual level of the other aircraft. If necessary, the pilot should be informed that the other aircraft is “(number) thousand feet above/below”

17. Weather Avoidance and Solar Radiation

17A. Weather Avoidance

- 17A.1 A controller may be alerted to the presence of adverse weather by a variety of sources including radar observations, reports from pilots or adjacent ATSU's, Meteorological Office reports and unit briefings.
- 17A.2 When weather is observed on the situation display, or is known to be present, pilots should be advised of the weather's location and, if known, intensity and direction of movement.
- 17A.3 When a pilot requests an alternative heading or route for weather avoidance, controllers shall accommodate such requests, taking into account the prevailing traffic situation. When a pilot's request cannot be accommodated, controllers shall offer an alternative weather avoidance clearance or explain to the pilot why their request cannot be met.
- 17A.4 When weather avoidance will take an aircraft outside controlled airspace the pilot must be informed of this and offered an appropriate service. Pilots routing outside controlled airspace for weather avoidance should be issued a clearance to rejoin as required.
- 17A.5 If a pilot is cleared to follow their own navigation, or accepts a heading, in order to avoid weather, the pilot should be requested to report when able to accept vectors back on-track.

17B. Solar Radiation

- 17B.1 The Earth is constantly subjected to electromagnetic and high energy particle radiation from both galactic sources and the Sun. Most of the variability is of solar origin and is collectively known as space weather. Minor space weather events are more common than major events with the normal day-to-day variation in space weather having a negligible effect on technology and humans, however several times in each solar cycle of 11-years, space weather can have an operational impact.

- 17B.2 Typically, the amount of solar radiation detected increases with increasing altitude but during a severe space weather event, increased levels of solar radiation can be experienced globally by aircraft both at altitude and at ground level. Severe space weather events can generate a degradation or loss of satellite-based and/or ground-based navigation and/or communications systems and in extreme cases aircraft occupants, especially those in high level flight, can be exposed to increased levels of solar radiation.
- 17B.3 Space weather forecasts and alerts are available from the Met Office and Space Weather Advisories are available from ICAO and aircraft operators should consider the impact of space weather prior to filing a flight plan. However, space weather can change rapidly, and severe space weather events can occur without warning and flights intending to be operated above 49,000 ft AMSL are required to carry equipment that continuously monitors the dose rate and total amount of radiation being received and the cumulative dose on each flight.
- 17B.4 Pilots who encounter severe space weather may request a descent to a lower level before the effects of the space weather exceeds an acceptable level and controllers should take all reasonable measures to accommodate such requests. Controllers should be aware that on rare occasions pilots encountering severe space weather may initiate an emergency descent without waiting for a clearance. In such cases, pilots are expected to select transponder code A7700 and advise air traffic control units of the action taken as soon as possible. During the emergency descent pilots will be responsible for separation and collision avoidance.

Note: For further information see CAP 1428 – Impacts of space weather on aviation.

18. Clutter on the Situation Display

18A. Introduction

- 18A.1 There are many potential causes of spurious primary returns ('clutter'), including: weather; anomalous propagation; ground/sea returns; birds; wind turbine effects; and radar countermeasures such as chaff. Whilst it may be possible for some forms of clutter to be distinguishable from aircraft surveillance returns, this may not always be possible, especially where processed surveillance systems are employed.
- 18A.2 Clutter on the situation display has the potential to impact on ATS provision in the following ways:
- (1) Increased risk of the controller not detecting conflicting traffic.
 - (2) Aircraft position symbols, track histories, data blocks may be hidden or obscured.
 - (3) Spurious track(s) may be generated, which may be indistinguishable from genuine aircraft returns.
 - (4) There may be in delay in aircraft being identified and placed under an ATS.

(5) Increased controller workload.

- 18A.3 The impacts listed above are likely to affect the degree, accuracy and timeliness of the instructions, advice, and information that controllers are able to provide to pilots, with consequent impacts on safety and expedition. Additionally, the existence of clutter may necessitate aircraft being rerouted, or air traffic services reduced below the level requested by the pilot. Specific tactical procedures to be applied by controllers in response to clutter observed on the situation display are provided below.
- 18A.4 In addition to observable clutter, wind turbines have the potential to generate a variety of other negative effects on ATS systems and these should be considered by ATS providers when participating in the wind turbine application planning process. CAP764 (CAA Policy and Guidelines on Wind Turbines) provides specific information.
- 18A.5 Where clutter of a long term or permanent nature is generated in a particular area, in addition to the procedures, the potential impacts and mitigations should be assessed locally, and procedures documented in MATS Part 2.

18B. Outside Controlled Airspace

- 18B.1 In the event of clutter being present on the situational display controllers should consider the nature and extent of the clutter and if necessary, take the following actions:
- (1) For aircraft in receipt of a Deconfliction Service or Traffic Service, controllers should inform the pilot of the extent of the clutter and where practicable offer a reroute. However, this may not be possible due to traffic density, airspace availability and/or the requirement to follow specific arrival or departure tracks. The extent of such a reroute should where possible aim to achieve the planned lateral deconfliction minima from the observed clutter. However, it may still be necessary to reduce traffic information, and if applicable deconfliction advice, from the direction of the clutter as detailed within CAP 774 – UK Flight Information Services.
 - (2) For aircraft in receipt of a Traffic Service, and those aircraft under a Deconfliction Service that are not rerouted as above, controllers shall inform pilots of a reduction in traffic information/deconfliction advice as detailed within CAP 774 – UK Flight Information Services. If the controller cannot maintain aircraft identity, the service shall be terminated.
 - (3) For all surveillance services, in order to maintain track identity of aircraft being vectored to final approach, if re-routing around the clutter is not practicable for the reasons specified above, an alternative type of approach may need to be conducted.

18C. Inside Controlled Airspace

- 18C.1 In the event of clutter being present on the situational display Radar Control Service shall not be terminated, nor the air traffic service terminated. Controllers should consider the extent of the clutter and if necessary, take the following actions:
- (1) The controller may vector the aircraft around the clutter; however, this might not be practicable due to traffic density, airspace availability and/or the requirement to follow specific arrival or departure tracks.
 - (2) If the intensity of the clutter is such that the controller is not able to clearly see the aircraft's PSR or SSR position symbol, radar separation shall not be used to separate it and other controlled aircraft.
 - (3) The controller may provide IFR traffic in Class E airspace with reduced traffic information.
- 18C.2 In the event of clutter being present on the situational display, VFR flights receiving a Traffic Service within Class E airspace shall be managed in accordance with 18B.1(1) and 18B.1(2) above.
- 18C.3 The controller remains responsible for providing advice and information on aircraft that are considered to be infringing controlled airspace. Therefore, the controller should consider the nature and consistency of the clutter including any observed movement, relative speed and track, and take appropriate action if it is considered to be an unknown aircraft.

18D. Radar Approaches in all Classes of Airspace

- 18D.1 In addition to the procedures above, in all classes of airspace, for aircraft intending to make a radar approach, the controller shall assess the nature and extent of the clutter and decide whether:
- (1) a radar approach is not possible owing to clutter in which case the controller shall inform the aircraft; or
 - (2) a radar approach could be carried out, but there may be a possibility of radar contact being lost. In this case the controller shall inform the aircraft as early as possible that clutter is affecting their display and that missed approach instructions will be passed in good time if it becomes necessary to abandon the approach.

19. Situation Display Serviceability

- 19.1 Unit instructions lay down the checks that a controller is to make to ensure the situation display is serviceable.

20. Surveillance System Failure

- 20.1 In the event of surveillance system failure, the controller shall inform aircraft under control of the failure and apply local contingency procedures, which shall be detailed

in MATS Part 2. Reduced vertical separation of half the applicable vertical separation (e.g. 500 ft where a controller would normally apply 1,000 ft vertical separation and 1,000 ft where a controller would normally apply 2,000 ft vertical separation) may be employed temporarily if standard separation cannot be provided immediately. When reduced vertical separation is employed, pilots shall be informed, and essential traffic information passed as necessary.

- 20.2 When a previously failed surveillance system is notified as being serviceable, before any ATS surveillance service is provided the controller shall re-identify all aircraft by an approved method in accordance with the procedures described in this Chapter.
- 20.3 When approved by the CAA, procedures which obviate the need for controllers to be notified that the ATS surveillance system has been returned to a serviceable state shall be detailed in MATS Part 2.

21. Short-Term Conflict Alert (STCA) Procedures

- 21.1 In the event an STCA is generated in respect of controlled flights, the controller shall without delay assess the situation and, if necessary, take action to ensure that the applicable separation minimum will not be infringed. Specific local STCA procedures shall be detailed in MATS Part 2. Requirements for STCA can be found in CAP 670 (ATS Safety Requirements).

22. Cooperative Surveillance Systems in Flight Information Service provision

22.A Introduction

- 22A.1 ATS surveillance systems whose sole purpose is to support the provision of the Basic Service, or the Flight Information Service provided by Aerodrome Control or Aerodrome Flight Information Service Officer, are not required to have the same level of system integrity of ATS surveillance systems used to provide ATC surveillance separation or the Traffic Service or the Deconfliction Service.
- 22A.2 Where only co-operative ATS surveillance systems are used, aircraft without operating and/or interoperable electronic conspicuity devices will not be detected. As a result, the controller will not be aware of their presence and thus not be able to warn other pilots of their proximity. Controllers should refer to MATS Pt 2 for information on the type of electronic conspicuity devices that the FID is capable of displaying data from.
- 22A.3 The purpose of a flight information display (FID) is to improve the situational awareness of controllers exercising the privileges of an aerodrome or procedural rating, and to assist them in providing information that is useful for the safe and efficient conduct of flights. When providing such information, controllers must not use phraseology that implies the provision of a surveillance-based ATS.
- 22A.4 The information presented on the FID shall not be used as a substitute for pilot position reports, or to replace a pilot's read-back.

22B. Functions of ATS Surveillance Systems in FIS Provision

22B.1 In supporting the provision of services identified in paragraph 22A.1 above, ATS surveillance systems may be utilised to perform basic or enhanced functions. The performance of basic functions or enhanced functions is dependent upon, among other things, the performance specification of the ATS surveillance system and the licence privileges granted to the controller.

22C. Basic functions in FIS Provision

22C.1 When approved by the CAA, the FID may be used to support the provision of services identified in paragraph 22A.1 in performing the following functions:

- (1) flight path monitoring of aircraft on final approach;
- (2) flight path monitoring of other aircraft in the vicinity of the aerodrome;
- (3) providing navigation assistance to VFR flights; and
- (4) enhancing the provision of traffic information.

22D. Enhanced functions in FIS Provision

22D.1 The technical specification developed by the CAA for the FID supports only the provision of basic functions. The CAA considers the performance of enhanced functions to constitute a surveillance-based ATS, the procedures for which are found in section 1, chapter 6.

23. Operations with a Flight Information Display (FID)

23A. Basic Functions

23A.1 In relation to the basic functions described in paragraph 22C.1 above:

- (1) Flight path monitoring means that information from an ATS surveillance system may be used to:
 - (a) confirm that an aircraft that reported as being on final is approaching the correct runway;
 - (b) monitor the progress of a flight conducting a notified instrument approach procedure (IAP) at the aerodrome;
- (2) Flight path monitoring of other aircraft in the vicinity of the aerodrome means that information from an ATS surveillance system may be used to:
 - (a) monitor the progress of a flight conducting a notified instrument approach procedure (IAP) at the aerodrome;
 - (b) assist in confirming the reported position of aircraft joining and established within the aerodrome traffic circuit;

- (c) determine whether aircraft operating in the vicinity of the aerodrome and not in receipt of an ATS from that unit pose a collision hazard to aerodrome traffic;
 - (d) determine whether aerodrome traffic, or aircraft in receipt of an ATS from the unit, are proximate to adjacent airspace structures and at risk of infringing airspace;
 - (e) assist in visually acquiring aircraft operating within the aerodrome traffic circuit; and
 - (f) assist in confirming the position of aircraft in a state of DISTRESS or URGENCY.
- (3) Providing navigation assistance to VFR flights' means that information from an ATS surveillance system may be used to advise the pilot:
- (a) of their estimated position in relation to a known geographic feature (for example, a town or the aerodrome);
 - (b) if their estimated position is proximate to adjacent airspace structures and at risk of infringing that airspace; and
 - (c) if their observed track appears to be approaching an area with a markedly different minimum sector altitude (MSA) and are reported or are observed to be operating below that MSA.
- (4) Enhancing the provision of traffic information means that information from an ATS surveillance system may be used to supplement that received from pilot reports and the controller's visual observations to:
- (a) broadcast a warning, in general terms, to aerodrome traffic about unknown aircraft that are observed to be approaching the aerodrome traffic circuit including the area in which IAPs are being conducted;
 - (b) provide a warning, in general terms, to departing or arriving flights about aerial activity that is observed to be operating in the vicinity of the intended route of the departing or arriving flight; and
 - (c) provide a warning to a pilot when a controller considers that a definite risk of collision exists.

Note: Level information derived from the FID should not routinely be included in traffic information. However, when a controller considers that a definite risk of collision exists, pilot reports or pressure-altitude-derived level information from the FID should be included where available.

23A.2 In performing the basic functions described in paragraph 22C.1 above, controllers shall not use the information displayed on the FID to:

- (1) establish the identification of an aircraft;

- (2) validate the SSR Mode 3A code or Mode S and ADS-B aircraft identification;
or
- (3) verify pressure-altitude-derived level information.

23A.3 Pilots requiring such a service should be advised to contact an appropriate ATS unit that provides ATS surveillance services.

23A.4 In performing the basic functions described in paragraph 22C.1 above, when a controller observes that:

- (1) the aircraft identification transmitted by a SSR Mode S or ADS-B equipped aircraft appears to differ from that expected from the aircraft, they should ask the pilot to confirm the aircraft identification. If, following confirmation by the pilot that the correct aircraft identification has been set on the SSR Mode S or ADS-B identification feature, the discrepancy continues to exist, the controller shall inform the pilot but take no further action.
- (2) the pressure-altitude-derived level information displayed to the controller is either not present, or is displayed as zero(es), they should ask the pilot to confirm that they have selected the altitude reporting feature. If, following confirmation by the pilot that they have selected the pressure-altitude reporting feature, the discrepancy continues to exist, the controller shall inform the pilot but take no further action.
- (3) the pressure-altitude-derived level information displayed to the controller is more than 200 ft from the level reported by the pilot, they should advise the pilot of the appropriate altimeter pressure setting.

Section 1: General

Chapter 7: Altimeter Setting and Vertical Reference

1. Units of Pressure

- 1.1 Hectopascals are the notified units for the measurements of pressure for flying within UK airspace. Pilots are normally expected to carry out their own conversion from Hectopascals to inches of mercury if this is necessary and controllers will only provide pressure settings in inches of mercury when specifically requested by an individual aircraft. A conversion table can be found in Appendix A.

2. System of Flight Levels

- 2.1 Flight Levels are measured with reference to the standard pressure setting of 1013.25 hPa. Consecutive IFR cruising flight levels above the transition altitude are separated by pressure intervals corresponding to 1,000 ft in the ISA up to and including FL410 and by pressure intervals corresponding to 2,000 ft in the ISA above FL410.

3. Pressure Setting

- 3.1 A correctly calibrated pressure altimeter when set to:
- (1) QNH altimeter setting will indicate altitude; or
 - (2) QFE altimeter setting will indicate height above the reference datum.
- 3.2 Both of these settings are rounded down to the nearest whole Hectopascal before being passed to the pilot. However, they are given to the nearest tenth of a Hectopascal if requested.

4. Regional Pressure Setting

- 4.1 The regional pressure setting (RPS) is a conservative forecast of the lowest QNH value within an altimeter setting region (ASR). As such, the RPS can provide an effective mitigation against the risk of controlled flight into terrain (CFIT); however, its use can increase the risk of vertical airspace infringement.
- 4.2 The RPS values which are made available hourly for the period H+1 to H+2, are given in whole Hectopascals.
- 4.3 ATSU's are to have available the RPS for the ASR in which they are situated and appropriate adjacent regions. These values are to be passed to pilots when requested or at the discretion of the controller. However, the RPS shall not be volunteered if a controller believes it is not appropriate to the flight; for example, where an aircraft is operating below that controlled airspace which is notified in AIP ENR 1.7 paragraph 3.9.

- 4.4 Airspace below TMAs and CTAs listed in the UK AIP at ENR 1.7 paragraph 3.9 does not form part of the ASR RPS system. Instead, the QNH of an adjacent aerodrome should be used for aircraft at or below the Transition Altitude.

5. Transition

5A. Transition Altitude

- 5A.1 Transition altitude is the altitude at or below which the vertical position of an aircraft is controlled by reference to altitude (or height when QFE is used). Wherever possible there is a common transition altitude for aerodromes within a control zone. Unless otherwise notified the transition altitude for civil aerodromes is 3,000 ft.

5B. Transition Level

- 5B.1 Transition level is the lowest Flight Level available for use above the transition altitude and shall be located at least a nominal 1,000 ft above the transition altitude to permit the transition altitude and the transition level to be used concurrently in cruising flight, with vertical separation ensured. Except where an alternative means of calculating the transition level is detailed within local instructions, the transition level may be determined from the table in Appendix A as follows:

- (1) Within controlled airspace by the controlling authority, where it will normally be based on the QNH of the major aerodrome;
- (2) Outside controlled airspace by the Aerodrome Operator, where it will be based on the aerodrome QNH.

5C. Transition Layer

- 5C.1 Transition layer is the airspace between the transition altitude and the transition level. Within the UK, the first available flight level above the transition altitude is separated from the transition altitude by a minimum pressure interval corresponding to a nominal 1,000 ft.

6. Vertical Position

- 6.1 A pilot normally assesses the vertical position of their aircraft above obstacles by using an accurately set altimeter. It is imperative, therefore, that controllers always issue the correct pressure setting and that they check the read-back from the pilot.
- 6.2 When transmitting altimeter pressure settings that are lower than 1000 hPa, controllers are to specify clearly the unit of measurement and pay particular attention to the read-back.
- 6.3 The table below shows the altimeter subscale settings, the terms in which vertical position is reported and the occasions on which they are used to report to ATSU's (SERA.8015(eb)(1),(3),(4)&(5)).

Table 1:

Subscale Setting	Expressed in terms of	When to report vertical position to ATSU
1013.2 hPa	Flight level	(1) At, or above, the transition level. (2) Climbing through the transition layer. (3) Above 3,000 ft amsl and not in the vicinity of an aerodrome.
QNH	Altitude	(1) At, or below, the transition altitude, i.e. in the vicinity of an aerodrome or beneath specified TMAs and CTAs listed in ENR 1-7-2. (2) Descending through the transition layer. (3) During final approach.
QFE	Height	During final approach, as local procedures require or when requested by the pilot.
Regional Pressure Setting (RPS)	Altitude	At, or below, 3,000 ft amsl when outside controlled airspace and not in the vicinity of an aerodrome.

Note: When an aircraft has been cleared to climb from an altitude to a Flight Level, vertical position will be reported in terms of Flight Level, unless intermediate altitude reports have been specifically requested by ATC. Similarly, when a pilot is descending from a Flight Level to an altitude, the pilot will change to the aerodrome QNH unless further Flight Level vacating reports have been requested by ATC, in which case the QNH will be set following the final Flight Level vacating report.

7. Procedures at Aerodromes

7A. Aerodrome Reference Data

- 7A.1 Aerodrome elevation is the elevation of the highest point on the landing area. It is the elevation upon which the height for visual manoeuvring (circling) is based. In addition, a threshold elevation is published for each runway.
- 7A.2 The pressure settings associated with aerodrome and threshold elevation are expressed as QFE aerodrome and QFE threshold respectively. QFE threshold for an instrument runway is used when the threshold elevation is 7 ft or more below aerodrome elevation.

7B. Aircraft Taking-Off

- 7B.1 Prior to taking-off, aircraft are to be given the aerodrome QNH. The transition altitude and level will only be passed if requested by the pilot.

7C. Arriving Aircraft

- 7C.1 Aircraft at or below the transition level are to be given the aerodrome QNH.

- 7C.2 When an aircraft is cleared to descend from a Flight Level to an altitude the appropriate QNH shall be included in the same transmission. If Flight Level vacating reports are required, the request should be included with the descent clearance.
- 7C.3 The Transition Level must be passed to the pilot in due time prior to their aircraft reaching it during descent (SERA.8015(eb)(2)), either by voice communications, ATIS broadcast or data link (GM1 SERA.8015(eb)(2)).
- Note:** UK Reg (EU) No. 2016/1185 amending UK Reg (EU) No. 923/2012 incorrectly references GM as GM1 SERA.8015(f)(2).
- 7C.4 After QNH is assumed to have been set by an aircraft all reference to vertical position shall be in terms of altitude. Vacating reports, which have not been requested at the time of the descent clearance, may be in terms of altitude, particularly if the aircraft has only one altimeter.
- 7C.5 Aircraft are to be given the appropriate QNH prior to commencing an approach.
- 7C.6 Aerodrome and threshold elevations are to be available upon request. Alternatively, when requested by the pilot, or local procedures require, the appropriate QFE shall be given.
- 7C.7 After a missed approach, vertical position is referred to in terms of altitude. It may be necessary, therefore, to include QNH with the subsequent clearance.
- 7C.8 Additional altimeter setting procedures for Approach Radar are described in Section 3.

7D. Visual Manoeuvring (Circling)

- 7D.1 If an aircraft makes an instrument approach that is to be followed by a visual manoeuvre (circling) to land on another runway, as appropriate, the QFE aerodrome or QFE threshold is to be given.

8. Determination of the Lowest Cruising Levels

- 8.1 Cruising levels on ATS routes are notified in the UK AIP at ENR 3. Due to variations of atmospheric pressure the lower Flight Levels will not always be available.
- 8.2 The lowest cruising level available for assignment shall be determined at the ACC using the appropriate Regional Pressure Setting. On an ATS route this must always be at least 500 ft above the notified base.
- 8.3 Unit procedures for the determination and use of the first available Flight Level above the transition altitude shall be described in MATS Part 2.

9. Use of Levels by Controllers

- 9.1 Except when aircraft are leaving controlled airspace by descent or climb, controllers should not allocate a level to an aircraft which provides less than 500 ft vertical separation above the lower limit of a control area (including TMAs and ATS routes), or below the upper limit of a control zone or control area (including TMAs) where

Class G airspace adjoins vertically. This will provide some vertical separation from aircraft operating at the lower limit, or at the upper limit of controlled airspace.

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Section 1: General

Chapter 8: Diversion Procedures

1. Introduction

- 1.1 Aircraft may divert from their planned destination to another aerodrome on the initiative of the pilot or as requested by the appropriate authority on the ground.
- 1.2 Diversions will normally be made for the following reasons:
- (1) When the weather at the planned destination is reported to be below the minima prescribed by an Aircraft Operator for their aircraft;
 - (2) When obstructions on the landing area, which constitute a hazard to aircraft landing, cannot be cleared within a reasonable period;
 - (3) The failure of airborne equipment;
 - (4) The failure of essential ground aids to landing in circumstances which would require their use;
 - (5) Unacceptable delay due to congestion of air traffic;
 - (6) The closure of the aerodrome of destination.
- 1.3 The Aerodrome Operator is responsible for decisions regarding the availability of the aerodrome.

2. Diversions Originated by the Pilot

- 2.1 The pilot of an aircraft is primarily responsible for its safety, therefore the pilot will normally decide whether they can or cannot effect a safe landing at a given aerodrome. The pilot will normally be aware of weather conditions at the planned destination and alternate aerodromes, thus whenever they consider a diversion to be necessary, the pilot will make their intentions known to an ATC unit and request further clearance. The pilot's decision will normally be in accordance with the minima prescribed by the aircraft operator.
- 2.2 When specifically requested by the pilot that their company or a nominated addressee be advised of their diversion the controller is to pass this message to the ATSU at either:
- (1) the original destination; or
 - (2) the aerodrome nearest to the original destination.
- 2.3 An ATSU receiving such a message is to pass it to the addressee.

3. Diversions Originated by the Ground Organisation

- 3.1 When, for traffic reasons, a controller considers it advisable to divert an aircraft, the controller shall consult the aircraft operator. The controller and the aircraft operator shall decide between them the diversion aerodrome. The request to divert shall be passed to the pilot together with reasons for diversion, an ATC clearance and any further instructions.
- 3.2 In cases of emergency it may be necessary for an aircraft to be diverted without prior consultation with the Aircraft Operator. In this event, the controller shall pass the message to the pilot expressed as a request and inform the Aircraft Operator as soon as possible. When the operator of the aircraft is not known, the pilot is to be asked to nominate an addressee.

4. Action by Pilot

- 4.1 On receipt of the diversion message the pilot will acknowledge and comply with the request or give their reason for non-compliance. If the pilot decides against diversion, permission to attempt a landing shall not be refused unless the aerodrome has been closed by the Aerodrome Operator.

5. Diversion of Military Aircraft

- 5.1 All information concerning the diversion of military aircraft is to be passed to D&D.

6. Diversion to RAF Aerodromes

- 6.1 Except in an emergency, aircraft shall not be diverted to an RAF or USAF aerodrome without the prior approval of D&D.
- 6.2 Aircraft from the CIS, even though in an emergency, must not be diverted to RAF aerodromes except with the agreement of D&D.
- 6.3 In all other cases of emergency, controllers should, whenever possible, consult D&D before arranging for the aircraft to land at an RAF or USAF aerodrome. RAF aerodromes that intend to keep open beyond the hours of watch published in the RAF En-Route Supplement British Isles and North Atlantic will notify D&D. This information will be available to the civil supervisor if required.

Section 1: General

Chapter 9: Royal Flights

1. Introduction

- 1.1 A Royal Flight within UK airspace is defined as the movement of an aircraft specifically tasked to carry one or more members of The Royal Family afforded such status by the Head of Royal Travel, The Royal Household.
- 1.2 Flights within UK airspace by members of other Royal Families, other reigning Sovereigns, Prime Ministers and Heads of State of Commonwealth and foreign countries, may also be afforded Royal Flight status by the CAA.

2. Procedures for Royal Flights in Fixed-wing Aircraft

2A. Establishment of Temporary (Class D) Controlled Airspace (CAS-T)

- 2A.1 Royal Flights in fixed-wing aircraft will, whenever possible, be planned to take place within permanent controlled airspace. Standard ATC procedures shall be applied to Royal Flights when operating in permanent Class A, C and D airspace. In all other instances temporary controlled airspace (CAS-T) notified as Class D airspace will be established to contain a Royal Flight; applicable access criteria and separation standards apply.
- 2A.2 Regardless of the prevailing meteorological conditions, aircraft shall only fly within CAS-T when an ATC clearance has been obtained from the controlling authorities specified as follows:
- (1) **Temporary Control Zones:** Temporary control zones will be established around aerodromes of departure and destination for a period (for outbound flights) of 15 minutes before, until 30 minutes after the ETD, or (for inbound flights) for a period of 15 minutes before until 30 minutes after the ETA at the aerodrome concerned. The lateral and vertical limits will be designated to meet the specific requirements of the Royal Flight. Overall control of these control zones is to be exercised, as appropriate, by the Commanding Officer of a military aerodrome or the ATS authority of a civil aerodrome.
 - (2) **Temporary Control Area:** Temporary control areas will be established in the shape of a corridor to join temporary or permanent control zones or control areas, as appropriate, for a period 15 minutes before ETA at the start point until 30 minutes after ETD from the end/departure point of the established area. The lateral and vertical limits will be designated to meet the specific requirements of the Royal Flight. The controlling authority will be the appropriate civil or military ACC or notified ATSU.
 - (3) **Permanent Control Areas:** Class E control areas are reclassified as a class D temporary control area and the duration will be as laid down in

subparagraph (2) above. The controlling authority for such airspace will remain the controlling authority designated for that permanent control area.

- 2A.3 A temporary control zone or control area may be cancelled at the discretion of the military Commander or civil ATC Supervisor, as appropriate, when the Royal aircraft has left the temporary control zone or control area and is established en-route in permanent Class A, C or D airspace, or has landed.
- 2A.4 Training flights, including parachute training flights, by any member of The Royal Family, which are planned and carried out under VFR or IFR, and under the control of an ATS surveillance service unit, will normally be classified as Royal Flights. CAST, where required, will be established as agreed by the aircraft operating organisation and the CAA.

2B. Radar Control Service

- 2B.1 Civil ATS units equipped with ATS Surveillance systems shall, subject to coverage, provide a Radar Control Service en-route for all Royal flights. Where ATS surveillance coverage is not available, the ATC Supervisor at the civil ACC or notified ATCU shall co-ordinate with SWK Mil as appropriate, to determine whether a Radar Control Service can be provided by a military ATS unit equipped with ATS surveillance. In addition, when CAS-T is established outside existing controlled airspace structures, designated civil or military ATS units equipped with ATS Surveillance shall, subject to coverage, provide a Radar Control Service. Transfer of control between civil and military ATS units, is to be by 'Radar Handover'

2C. Promulgation of Royal Flight Information

- 2C.1 Dissemination of information concerning a Royal Flight is made via a Notification Message on a Royal Flight Collective, giving full flight details. Information on the establishment of CAS-T, including vertical limits, is promulgated by NOTAM.

3. Royal Flight Callsigns

- 3.1 The flight plan identification and the radiotelephony designators for flights flown in aircraft of No. 32 (The Royal) Squadron, the Queen's Helicopter Flight (TQHF) or in civilian chartered aircraft are contained in the UK AIP (ENR) Section.

3A. Royal Flights in Helicopters

- 3A.1 CAS-T is not normally established for Royal Flights in helicopters. Normal ATC procedures apply to a Royal helicopter within, or wishing to join, controlled airspace. For Royal helicopter flights outside controlled airspace, a Royal Low-Level Corridor will be promulgated by NOTAM, details of which are contained in the UK AIP (ENR) Section.

3B. SSR Code

- 3B.1 SSR code 0037 has been allocated for the exclusive use of helicopters engaged on Royal Flights. This code will be displayed from take-off to landing, whether or not an

ATS surveillance service is being provided; consequently, they are to be treated as unvalidated and unverified.

4. Diversions

- 4.1 The operational control of Royal aircraft of No. 32 (The Royal) Squadron is vested in the RAF. The pilot, however, retains authority to deviate from the flight plan when necessary. The operational control of civilian chartered aircraft being used for a Royal Flight remains with the company and diversions will be arranged in accordance with normal civil practices.

5. Incidents Involving Royal Flights

- 5.1 When an ATSU receives information that a Royal Flight has been involved in an incident giving rise to public comment, the senior controller is to pass the details immediately to the parent ACC.

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Section 1: General

Chapter 10: Airborne Collision Avoidance System

1. Introduction

- 1.1 Airborne Collision Avoidance System (ACAS) is an aircraft system based on SSR transponder signals, which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.
- 1.2 All civil turbine-engine aircraft having a maximum take-off mass (MTOM) exceeding 5700 kg or a maximum approved seating configuration of more than 19 are mandated to carry and operate ICAO SARPs-compliant Airborne Collision Avoidance System (ACAS) equipment. The only equipment currently able to meet the ACAS II mandate requirements is the Traffic Alert and Collision Avoidance System II (TCAS II) software version 7. Certain military transport-type aircraft may also be TCAS II equipped. Civil registered historical and ex-military turbine-engine aircraft are exempted from this requirement.
- 1.3 Aircraft Operators experiencing ACAS equipment failure may request permission to operate in UK airspace for up to 10 days in accordance with current TCAS II Minimum Equipment List provisions. Due to the safety benefits arising from TCAS operations and the collaborative way in which it arrives at collision avoidance solutions, any aeroplane with an unserviceable transponder as well as an unserviceable TCAS will not be permitted in UK airspace for which mandatory carriage of a transponder is required.
- 1.4 The carriage and use of TCAS II acts only as a safety net and does not in any way alter the respective responsibilities of pilots and controllers for the safe operation of aircraft.

2. Traffic Alert and Collision Avoidance System: TCAS II Warnings

- 2.1 TCAS II encounters may take place within all classifications of airspace. TCAS II equipment reacts to the transponders of other aircraft to determine whether or not there is a potential risk of collision. The warning, based on the time to an assumed collision, enables the pilot to identify the conflicting traffic and, if necessary, take avoiding action.
- 2.2 Warnings for aircraft equipped with TCAS II are given in two steps:

Table 1:

Step (see note)	Warning
Typically 45 seconds before the assumed collision	<p>Traffic Advisory (TA) warning</p> <p>Pilots are advised not to take avoiding action on the basis of TA information alone but may ask for traffic information. Pilot looks for conflicting aircraft visually.</p> <p>Does NOT manoeuvre.</p>
Typically 30 seconds before the assumed collision	<p>Resolution Advisory (RA) warning</p> <p>Pilot receives advice to climb, descend or maintain their existing flight profile. Rate of climb or descent may also be given. Pilots are expected to respond immediately but have been instructed to restrict manoeuvres to the minimum necessary to resolve the confliction, advise the ATC unit as soon as is practical thereafter and return to their original flight path as soon as it is safe to do so.</p>

Note: The times quoted vary with altitude and these examples relate to an aircraft at approximately FL200. The times will increase or decrease, above or below that level respectively.

2.3 If a conflicting aircraft is not reporting altitude, a TA may be given, but not an RA.

2.4 RAs will be presented only if the conflicting aircraft is transponding on Mode C or Mode S. Where both aircraft in an encounter are fitted with TCAS II, the transponders will communicate with each other to agree complementary Resolution Advisories. If the conflicting aircraft is not transponding, no warnings are given.

2.5 TCAS II is programmed to take account of the host aircraft's performance characteristics and level when issuing RAs.

3. Effects on ATC Operations

3.1 The procedures to be applied for the provision of air traffic services to aircraft equipped with ACAS shall be identical to those applicable to non-ACAS equipped aircraft. In particular, the prevention of collisions, the establishment of appropriate separation, and the information, which might be provided in relation to conflicting traffic and to possible avoiding action, shall conform with the normal ATS procedures and shall exclude consideration of aircraft capabilities dependent on ACAS equipment.

4. Nuisance Advisories

4.1 TAs and RAs may occur even though standard separation exists. Therefore, a controller should not immediately assume that separation has been lost, or that they are at fault, when a pilot reports they are manoeuvring in response to an RA.

4.2 One cause of an unnecessary RA is high vertical speed, particularly at low level and in congested airspace. Pilots have been asked to avoid these manoeuvres, particularly in the final stages of climb or descent, unless they are justified, for

example, a request to expedite a climb, emergency descent etc. It has been reported that ground testing of transponder equipment may generate advisories in TCAS II-equipped aircraft. CAP 562 Civil Aircraft Airworthiness Information and Procedures provides general guidance to aircraft maintenance organisations on precautions to be considered when ground testing transponder equipment.

5. Departure from ATC Clearance

- 5.1 The pilot in command of an aircraft is permitted to depart from an ATC clearance for the purposes of avoiding immediate danger (ANO 2016, Article 249(3)(a), SERA.2010(a), SERA.3201 and SERA.11014). The pilot in command is required to notify ATC as soon as possible (SERA.11014(4)) and submit a written report within 10 days (ANO 2016, Article 249(5)). The completion of an Operator's Air Safety Report satisfies the last requirement.
- 5.2 When a pilot reports a TCAS RA, controllers shall not attempt to modify the aircraft's flight path or reiterate previously issued instructions, until the pilot reports "Clear of Conflict". (SERA.11014(c))
- 5.3 Once an aircraft departs from an ATC clearance in compliance with an RA, or a pilot reports an RA, the controller ceases to be responsible for providing separation between that aircraft and any other aircraft affected as a direct consequence of the manoeuvre induced by the RA. The controller shall resume responsibility for providing separation for all the aircraft affected when:
- (1) The controller acknowledges a report from the flight crew that the aircraft has resumed the current clearance; or
 - (2) The controller acknowledges a report from the flight crew that the aircraft is resuming the current clearance and issues an alternative clearance which is acknowledged by the flight crew. (SERA.11014(d))
- 5.4 The passing of traffic information by controllers to aircraft conducting, or affected by a TCAS RA, is not proscribed, but such information has, if provided inappropriately, the potential to be misheard or to distract flight crews during a period of very high workload. Consequently, controllers should not routinely pass traffic information to aircraft conducting RA manoeuvres, or other aircraft affected by such manoeuvres. Nevertheless, there may be circumstances where the passing of traffic information is justified; consequently, controllers may provide traffic information under the following circumstances:
- (1) To aircraft conducting an RA manoeuvre if it is considered essential for flight safety (e.g. information on aircraft which are known to be in close proximity that are not transponding Mode C information).
 - (2) To other aircraft affected by an RA manoeuvre if judged necessary by the controller (e.g. in airspace where the carriage and operation of TCAS and/or SSR transponders is not mandatory).

6. TCAS Phraseology

- 6.1 Specific ICAO TCAS phraseology has been adopted. The phraseology is clear, simple, concise and to the maximum extent devoid of ambiguity and potential to cause operational confusion. This phraseology provides:
- (1) the means to ensure that the pilot and controller have, wherever possible, a clear mutual understanding of the progression of an RA manoeuvre; and
 - (2) the means to delineate the point at which the responsibility for the separation of aircraft directly affected by the manoeuvre is transferred from the controller to the pilot and, at the completion of the manoeuvre, from the pilot back to the controller.

- 6.2 There is no requirement for the pilot to notify the controller prior to responding to an RA. There are four cases for which communication is necessary between pilot and controller; the phraseology to be used is reproduced below. Notification after a flight crew starts to deviate from any ATC clearance or instruction to comply with a RA:

Pilot: (C/S) TCAS RA

Controller: (C/S) ROGER

Notification after the RA response is completed and a return to the ATC clearance or instruction is initiated:

Pilot: (C/S) CLEAR OF CONFLICT RETURNING TO (assigned clearance)

Controller: (C/S) ROGER (or alternative instructions)

Notification after the response to a RA is completed and the assigned ATC clearance or instruction has been resumed:

Pilot: (C/S) CLEAR OF CONFLICT (assigned clearance) RESUMED

Controller: (C/S) ROGER (or alternative instructions)

Notification after an ATC clearance or instruction contradictory to the ACAS RA is received, the flight crew will follow the RA and inform ATC directly:

Pilot: (C/S) UNABLE, TCAS RA

Controller: (C/S) ROGER

7. Controller Reporting

- 7.1 A holder of an Air Traffic Controller's licence or Flight Information Service Officer's licence is to report, within 72 hours, any occurrence which has, or if not corrected would have, endangered an aircraft, its occupants, or any other person. Ultimately the individual officer involved will have to use their own judgment to assess whether the incident as a whole meets the requirements for mandatory reporting as set out in UK Reg (EU) 2015/1018 Annex 3, and UK Reg (EU) No. 376/2014.

- 7.2 All ACAS RAs are required to be reported under the MOR scheme. If there is good reason to believe that the appropriate details of the occurrence have already been, or will be, reported under the MOR scheme by someone else (e.g. UK airline or pilot), there is no need to file a duplicate report.
- 7.3 The filing of the report does not absolve the controller from additionally reporting an AIRPROX or other report about the same incident, according to the circumstances.

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Section 1: General

Chapter 11: Traffic Information and Co-ordination Between ATS Personnel

1. Traffic Information

- 1.1 Traffic information passed between ATS personnel is information about aircraft that is relevant to the provision of an air traffic service. The purpose of traffic information is to enable the recipient to determine whether or not any action is necessary to achieve or maintain the required separation between the subject aircraft. For example, after receiving traffic information, a controller may consider it necessary to issue avoiding action or may request co-ordination with respect to the traffic.
- 1.2 The passing of traffic information does not imply a commitment to an agreed course of action and there is no undertaking to update the information that has been passed. The dynamic nature of an air traffic environment may render traffic information obsolete once passed but if, after receiving traffic information, a controller believes that co-ordination is necessary, they shall use the term “request co-ordination” and shall follow the verbal procedure detailed below.

2. Co-ordination

- 2.1 Co-ordination is the act of negotiation between two or more parties each vested with the authority to make executive decisions appropriate to the task being discharged. Co-ordination is effected when the parties concerned, on the basis of known intelligence, agree a course of action. Responsibility for obtaining the agreement and for ensuring implementation of the agreed course of action may be vested in one of the controllers involved.
- 2.2 Controllers should be aware that co-ordination between the parties involved can be upon aircraft that are either in receipt of, or about to be in receipt of, an air traffic service.
- 2.3 A controller may carry out co-ordination on behalf of another controller, provided that the traffic situation and time available are such that the controller being represented can put into effect any agreed actions.
- 2.4 Co-ordination may be achieved by one of the following methods:
- (1) **Tactical Co-ordination:** The co-ordination of individual aircraft to which the co-ordinating controllers are providing, or are about to provide, an ATS. It is achieved either verbally (face-to-face or over a landline) or silently using an electronic data communications system. Silent co-ordination procedures are to be detailed in the MATS Part 2 and Unit Military Procedures.
 - (2) **Standing Co-ordination:** Co-ordination which is implemented automatically, on a permanent basis, without communication between the controllers involved. It is effected in accordance with a written agreement between the

units or sectors involved, and is only valid for the aircraft and circumstances specified in the MATS Part 2.

- 2.5 When approved by the CAA, co-ordination is deemed to have been achieved if an estimate message has been passed and the accepting ATC unit has raised no objection.

3. “Request Co-ordination” – Verbal Procedure

- 3.1 When requesting co-ordination, a controller shall:
- (1) make verbal contact with the appropriate controller and, after identifying themselves, open the dialogue with the words “Request Co-ordination”;
 - (2) refer to their aircraft and the aircraft upon which co-ordination is requested in the order most appropriate to the situation;
 - (3) propose a course of action upon which agreement is requested and obtain a clear decision on that proposal. To ensure clarity and avoid misunderstandings, before terminating the call, parties shall explicitly state the action required of their aircraft to achieve the agreed course of action. For example, an appropriate response to a request for an aircraft to maintain FL120 may be, “My traffic maintaining FL120”. A response that does not reaffirm the details of the agreement, such as “Roger”, is not acceptable.
- 3.2 When co-ordinating aircraft that are or are about to be operating within RVSM designated airspace, the RVSM approval status of the individual aircraft involved shall be included in the co-ordination message, unless the status is known to be self-evident to both controllers.
- 3.3 The proposed course of action to achieve separation must be expressed in unambiguous terms. A statement that no action will be taken can constitute an agreement, although there is still a requirement for both controllers to state explicitly the actions required of their aircraft.

4. Co-ordination of Climbing/Descending Aircraft

- 4.1 Great care must be taken when co-ordinating aircraft that are climbing or descending, or are expecting further climb or descent, to ensure that accurate information is given, and that any agreement takes account of the actual or proposed flight profile and/or cleared level.
- 4.2 Where aircraft are climbing or descending, controllers may include the provision of horizontal separation until a flight profile is achieved that will provide adequate vertical separation with the conflicting traffic. For example, “I will take 5 miles until above FL210”, or “I will take 5 miles until 1,000 ft above/below on Charlie”. In the absence of an RT report from the pilot of passing or reaching the required level, the criteria for level assessment of Mode C shall be applied. Where combinations of horizontal and vertical separation are used in co-ordinating aircraft, controllers shall

closely monitor aircraft tracks and levels to ensure that standard horizontal separation is maintained until the requisite vertical separation exists.

- 4.3 Where both aircraft are climbing, or both are descending, controllers may co-ordinate to use Mode C indications to enable an expeditious step climb/descent, which maintains the required vertical separation/ deconfliction minima, e.g. “I will take 1,000 ft above/below on Charlie”, or “I will maintain 1,000ft above/below on Charlie”. In such circumstances the criteria for level assessment of Mode C shall be applied.

5. Considerations for Traffic Receiving a Service Outside Controlled Airspace

- 5.1 Instructions issued by controllers to IFR/VFR flights operating within Class F/G airspace are not mandatory; however, the services rely upon pilot compliance with the specified terms and conditions so as to promote a safer operating environment for all airspace users. The specific services have varying compliance requirements relating to the maintenance of headings, levels, time and radial allocations; consequently, the occasions when controllers may co-ordinate the aircraft without recourse to the pilot are detailed in the following paragraphs.
- 5.2 For IFR/VFR flights within Class F/G airspace, controllers are individually responsible for deciding whether they need tactical co-ordination, and to initiate such requests as appropriate. Therefore, unless specified in MATS Part 2, controllers should not rely on other controllers to initiate tactical co-ordination.
- 5.3 **Deconfliction Service or Procedural Service.** Unless safety is likely to be compromised, a pilot receiving a Deconfliction Service or Procedural Service shall not change heading/track or level without first obtaining approval from the controller. Consequently, such aircraft may be coordinated in both the lateral and vertical planes without the need for prior recourse to the pilot.
- 5.4 **Traffic Service.** Unless safety is likely to be compromised, a pilot receiving a Traffic Service shall not change level, route, manoeuvring area, or deviate from an ATC heading without first advising and obtaining a response from the controller. Consequently, such aircraft may be coordinated in the vertical plane, and in the lateral plane for those aircraft that have been allocated an ATC heading, without recourse to the pilot. For manoeuvring aircraft and aircraft following a route, coordination in the lateral plane may take place subject to the controller agreeing with the pilot the precise horizontal limits of the aircraft’s manoeuvres.
- 5.5 **Basic Service.** Unless the pilot has entered into an agreement with a controller to maintain a specific course of action, a pilot receiving a Basic Service may change level, heading, or route without advising the controller. Consequently, prior to such aircraft being coordinated in either the vertical or lateral planes, the following conditions shall be met:

- (1) The aircraft receiving the Basic Service is subject to identification, and it is expected that identity will be maintained throughout the period during which co-ordination is requested.
- (2) The pilot receiving a Basic Service agrees to maintain the required vertical or lateral profile for the required period or distance.
- (3) For manoeuvring aircraft and aircraft following a route, co-ordination in the lateral plane may take place subject to the controller agreeing with the pilot the precise horizontal limits of the aircraft's manoeuvres.

6. Penetration of Airspace

- 6.1 Aircraft receiving an ATS from an ATC unit must not be permitted to penetrate the airspace of another unit unless prior co-ordination has taken place. The responsibility for initiating co-ordination rests with the controller of the unit transferring control. The transferring controller must comply with any conditions specified by the accepting controller.
- 6.2 Certain CAA approved units are permitted to operate within controlled airspace without prior co-ordination.

7. Approval Request

- 7.1 If the first reporting point after take-off is in the adjoining area an approval request must be made to that ACC and coordination achieved before clearance is given to the aircraft unless the requirement has been waived by the CAA.

Section 1: General

Chapter 12: Speed Control

1. General

- 1.1 Controllers may request pilots to increase/decrease speed in order to facilitate a safe and orderly flow of traffic. Speed adjustments should be limited to those necessary to establish and/or maintain a desired separation/deconfliction minima or spacing and should not be outside the speed ranges laid down in MATS Part 2. Pilots shall be advised when a speed control restriction is no longer required.
- 1.2 Speed control should not be applied in the following circumstances:
- (1) In holding patterns, other than where published on approach charts; and
 - (2) In areas of thunderstorms or known turbulence.
- 1.3 At levels at or above FL280, speed adjustments for aircraft in the cruise should be expressed in multiples of 0.01 Mach. At levels below FL280, speed adjustments should be expressed in multiples of 10 kt based on indicated airspeed (IAS).
- 1.4 The application of speed control should be appropriate for the phase of flight, as its application over a long period of time may affect aircraft fuel reserves, and can affect the aircrew's planned operating profile. Instructions involving frequent changes of speed should be avoided.
- 1.5 Pilots will adhere to the speed (IAS or Mach Number) approved or assigned by ATC and will request ATC approval before making any changes thereto. Pilots of aircraft unable to maintain the approved or assigned speed (e.g. for aircraft performance reasons) will inform ATC as soon as possible. In such circumstances, controllers shall apply an alternative method to establish or maintain the desired separation/deconfliction minima or spacing between the aircraft concerned.

2. Arrivals and Descending Aircraft

- 2.1 For aircraft at or above FL280 that have been cleared to descend to levels below FL280, speed adjustments may be based on IAS. However, controllers should be aware that pilots might not be able to immediately change to IAS, as the timing of this change is dependent on variable aircraft system factors.
- 2.2 Instructions for an aircraft to simultaneously maintain a high rate of descent and reduce its speed should be avoided. Where possible, aircraft should be allowed to descend at their own preferred speed. Most operators have indicated that their preferred economical descent profile is in the speed range 250 – 280 knots, with 270 knots being seen as a good compromise where streaming is necessary.
- 2.3 Aircraft should not be instructed to operate at a high speed by one controller and, on transfer to the next sector, be instructed to reduce speed significantly. Aircraft should be transferred from en-route to Approach control in the speed range of 250 kt

- 300 kt IAS; speeds outside this band should be coordinated with the receiving sector. Allocated speeds should take into account speed limit points and target levels where published.

- 2.4 Controllers should endeavour to permit aircraft to operate in a clean configuration for as long as circumstances permit. Arriving aircraft below FL150 should not be allocated a speed of less than 210 kt (200 kt for propeller aircraft) unless within 20 track nautical miles of the runway threshold, at which point the speed may be reduced to between 150 and 180 kt. In exceptional circumstances a pilot may be asked to reduce to 'minimum approach speed'.
- 2.5 Speed control should not be applied to aircraft after passing a point 4 NM from the threshold on final approach. Commercial aircraft operations require that an approach is flown as a 'Stabilised Approach', in which an aircraft should be in its landing configuration and at its final approach speed by at least 1,000 ft above the threshold elevation. If agreed by the aircraft operator this may be lowered to 500 ft; however, this is not to be considered as normal operations. The higher the speed applied on final approach, the greater the chance of an approach becoming unstable, and a missed approach being initiated.

3. Departing Aircraft

- 3.1 For departing aircraft the minimum speeds allocated should be:
- (1) Jet aircraft 230 kt;
 - (2) Turboprop and piston-prop aircraft 150 kt;
 - (3) Helicopters and tilt-rotor aircraft 60 kt.

4. Speed Control Phraseology and Additional Guidance

- 4.1 Speed control phraseology is listed within CAP 413. Additional information and guidance on speed terminology, relationships, and speed control techniques, is at Appendix F.

Section 2: Aerodrome Control

Chapter 1: Aerodrome Control

1. Provision of Services

- 1.1 An Aerodrome Control unit shall provide:
- (1) Aerodrome Control Service.
 - (2) Basic Service.
 - (3) Alerting Service.
- 1.2 An Aerodrome Control unit provides services principally to aircraft flying with visual reference to the surface in, and in the vicinity of, the ATZ and operating on the manoeuvring area. It is normally a separate unit but may be combined, either temporarily or permanently, with an Approach Control unit.
- 1.3 Unless MATS Part 2 permits otherwise, an aerodrome controller shall not provide Approach Surveillance Services whilst engaged on Aerodrome Control duties.

2. Responsibilities

- 2.1 Aerodrome Control shall issue information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic with the objective of:
- (1) Preventing collisions between:
 - (a) aircraft flying in, and in the vicinity of, the ATZ;
 - (b) aircraft taking-off and landing;
 - (c) aircraft and vehicles, obstructions and other aircraft on the manoeuvring area.

Note: Aerodrome Control is not solely responsible for the prevention of collisions. Pilots and vehicle drivers must also fulfil their own responsibilities in accordance with RoA Regulations.
 - (2) Assist in preventing collisions between aircraft on the apron.
- 2.2 In order to execute their duties, an aerodrome controller has authority over aircraft, vehicles and personnel on the manoeuvring area and aircraft moving on the apron.
- 2.3 Aerodrome controllers shall maintain as far as practicable, a continuous watch by visual observation on all flight operations on and in the vicinity of an aerodrome as well as vehicles and personnel on the manoeuvring area. Visual observation shall be achieved through direct out-of-the-window observation, or through indirect observation utilising a visual surveillance system which is specifically approved for the purpose by the CAA.

2.4 Aerodrome Control may be divided into Air Control and Ground Movement Control.

Air Control shall provide services for (1)(a) and (1)(b) and has absolute authority over all movements on active runways and their access points.

Ground Movement Control shall provide services for (1)(c) and (2) except on active runways and their access points.

2.5 Clearance Delivery Officer (CDO) positions may be established at aerodromes to relay ATC departure clearances with approved procedures detailed in MATS Part 2.

2A. Specific Responsibilities

2A.1 In addition, Aerodrome Control has the following specific responsibilities:

- (1) Notifying emergency services as per local instructions;
- (2) Informing aircraft under its control of any depletion of the aerodrome emergency services;
- (3) Providing an Approach Control Service when carrying out functions delegated by Approach Control;
- (4) Supplying the following information to Approach Control and, according to unit instructions, Approach Radar Control:
 - (a) Pertinent data on IFR, Special VFR and VFR traffic including departures, missed approaches and overdue aircraft;
 - (b) Appropriate items of essential aerodrome information.
- (5) Informing the Aerodrome Operator when it becomes apparent that there is a deterioration in the state of the aerodrome or associated facilities for which the Aerodrome Operator is responsible;
- (6) Initiating overdue action at aerodromes where no Approach Control unit is established.

2A.2 Approach Control may instruct approaching IFR flights to contact Aerodrome Control before transfer of control has become effective. Until approaching aircraft are flying with visual reference to the surface, Aerodrome Control shall not issue any instructions or advice which would reduce the separation established by Approach Control.

3. Co-ordination

3.1 Aerodrome Control shall co-ordinate with Approach Control:

- (1) departing IFR flights; and
- (2) arriving aircraft which make their first call on the tower frequency (unless they are transferred to Approach Control).

3.2 Approach Control will co-ordinate with Aerodrome Control:

- (1) aircraft approaching to land; if necessary requesting landing clearance;
- (2) arriving aircraft which are to be cleared to visual holding points; and
- (3) aircraft routeing through the traffic circuit.

3.3 Approach Control may delegate the responsibility for co-ordination to Approach Radar Control.

3.4 Aerodrome Control shall co-ordinate with adjacent aerodromes to ensure that the traffic circuits do not conflict.

4. Transfer of Control

4.1 Unless specified otherwise in the MATS Part 2, the responsibility for control of a departing aircraft shall be transferred from Aerodrome Control to Approach Control:

- (1) **in VMC:** prior to the aircraft leaving the vicinity of the aerodrome, or prior to the aircraft entering IMC; and
- (2) **in IMC:** immediately after the aircraft is airborne.

5. Airspace Classification

5.1 In addition to the responsibilities described above, controllers are to provide minimum services according to the classification of the airspace within which the aerodrome and associated ATZ is located.

6. Effect of Weather on Operations

6.1 When the reported visibility consists of two values, the lower of the two values shall be used when determining whether or not to implement the procedures below.

6A. Class D

6A.1 When the reported meteorological conditions at aerodromes in Class D airspace reduce below a ground visibility of 5 km and/or a cloud ceiling of 1500 ft, both by day or night, ATC shall advise pilots of aircraft intending to operate under VFR to or from such aerodromes, and request the pilot to specify the type of clearance required.

6A.2 Except for helicopters using Police; Helimed; Rescue; Electricity; Grid; Powerline, or Pipeline callsigns, or an SAR training flight operating in accordance with MATS Part 2, or rail track inspection flights, controllers shall not issue any further VFR clearances to aircraft wishing to operate in accordance with VFR to or from an aerodrome, or enter the aerodrome traffic zone, or aerodrome traffic circuit, of an aerodrome within Class D airspace when the official meteorological report at that aerodrome indicates, by day or night, a ground visibility less than 5 km and/or a cloud ceiling less than 1500 ft (SERA.5005(b)(1)&(2)).

Note 1: UK General Permission ORS4 No. 1477 permits VFR flight at night.

Note 2: UK General Exemption ORS4 No. 1576 exempts operations of helicopters conducting Police; HEMS; Search and Rescue (SAR) flights, including SAR

training flights operating in accordance with a Letter of Agreement with the Air Traffic Service Provider, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 3: UK General Exemption ORS4 No. 1577 exempts operations of helicopters conducting powerline, pipeline and rail track inspection flights, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 4: For the purpose of observing the meteorological conditions at an uncontrolled and/or unlicensed aerodrome or operating site located within a control zone, and assessing whether those conditions satisfy the minima specified in SERA.5005(b) and SERA.5010(c) as appropriate, the Civil Aviation Authority deems the following to be competent to act as 'accredited observers' as required within UK Reg (EU) No. 923/2012 Article 2(82) for their flight:

- (a) The holders of valid EASA Flight Crew Licences, valid National Flight Crew Licences and Certificates issued by, or on behalf of, the United Kingdom Civil Aviation Authority, and third country licences deemed valid in accordance with Article 150 of the Air Navigation Order 2016; and
- (b) A student pilot-in-command (SPIC) who has passed the theoretical knowledge examination in meteorology toward the grant of an EASA Flight Crew Licence or National Flight Crew Licence or Certificate issued by, or on behalf of, the United Kingdom Civil Aviation Authority within the preceding two years.

6A.3 When the reported ground visibility consists of two values, the lower of the two values shall be used when determining whether to implement the above procedures.

6A.4 Procedures for operations into subsidiary aerodromes will be found in MATS Part 2.

6B. Low Visibility Procedures

6B.1 Aerodromes that wish to continue operating in poor visibility or are available for instrument approaches in conditions of low cloud are required to develop and maintain Low Visibility Procedures (LVP). Comprehensive details of LVP requirements are contained in CAP 168.

6B.2 Controllers shall advise pilots of the implementation and subsequent cancellation of LVP at an aerodrome.

7. Information to Aircraft

7A. Traffic Information and Instructions

- 7A.1 Traffic information and instructions shall be passed to aircraft on any occasion that a controller considers it necessary in the interests of safety, or when requested by a pilot. In particular, Aerodrome Control shall provide:
- (1) generic traffic information to enable VFR pilots to safely integrate their flight with other aircraft;
 - (2) specific traffic information appropriate to the stage of flight and risk of collision;
 - (3) timely instructions as necessary to prevent collisions and to enable safe, orderly and expeditious flight within and in the vicinity of the ATZ.
- 7A.2 MATS Part 2 shall detail local procedures for the integration of aircraft in the vicinity of the aerodrome.
- 7A.3 Aircraft under the jurisdiction of Aerodrome Control and in receipt of information critical to the continuing safe operation of the aircraft must be kept informed of any subsequent changes. For example:
- (1) Significant changes in meteorological and runway conditions;
 - (2) Changes in essential aerodrome information;
 - (3) Changes in the notified operational status of approach and landing aids.

8. Essential Aerodrome Information

- 8.1 Essential aerodrome information is that concerning the state of the manoeuvring area and its associated facilities that may constitute a hazard to a particular aircraft. It shall be given to every aircraft, except when it is known that the aircraft already has received the information from other sources. The information shall be given in sufficient time for the aircraft to make proper use of it, and the hazards shall be identified as distinctly as possible. This may include the provision of urgent information to pilots during aircraft take-off and landing runs.

Note: 'Other sources' include NOTAM, ATIS broadcasts, and the display of suitable signals.

- 8.2 Essential aerodrome information shall include:
- (1) construction work or maintenance on the manoeuvring area;
 - (2) rough or broken portions of the manoeuvring area and whether marked or not;
 - (3) failure or irregular functioning of the aerodrome lighting system. Defects must be passed to pilots in the form that they have been reported to the controller. Controllers should not make assumptions that a particular defect renders an associated aid unserviceable or not available. The pilot is responsible for deciding his course of action;

- (4) failure or irregular functioning of approach aids;
- (5) aircraft parked close to the runways or taxiways and aircraft engaged in ground running of engines;
- (6) water, snow, slush, ice or frost on a runway, a taxiway or an apron;
- (7) in snow and ice conditions: information concerning anti-icing or de-icing liquid chemicals or other contaminants or sweeping and/or sanding of runways, taxiways and aprons;
- (8) bird formations or individual large birds reported or observed on or above the manoeuvring area or in the immediate vicinity of the aerodrome and the extent of any bird dispersal action being carried out. When flocks of birds or single large ones are seen, the Aerodrome Operator or Bird Control Unit must be informed;
- (9) information on the location and operational status of any arrester gear installation.

9. Grass Aerodromes

- 9.1 The CAA has given guidance to operators and pilots as to the percentage increase to be added to landing/take-off distance on grass aerodromes in wet conditions. In the landing case, a higher figure is added when the surface is 'wet' as opposed to 'damp'. Controllers should appreciate the significance of these conditions and are to warn pilots of arriving aircraft when 'wet' surface conditions are known to exist.

10. Control of Surface Traffic

- 10.1 The movements of aircraft, persons or vehicles on the manoeuvring area and the movement of aircraft on the apron are at all times subject to permission from Aerodrome Control.
- 10.2 Aerodrome Control responsibility on the apron is limited to providing advice and instructions to assist the prevention of collisions between moving aircraft. The apron may be out of sight from some visual control rooms and in these circumstances any of the following procedures, adapted if necessary to suit local conditions, may be used to control moving aircraft:
- (1) An aircraft is cleared to taxi. A second aircraft may be given taxi clearance plus information on the position and intention of the first aircraft, with clear instruction to "follow" or "give way" to it;
 - (2) An aircraft is cleared to taxi and all further requests for aircraft movement are refused until the first aircraft comes into sight of the controller. A second movement is then approved following the same procedures;
 - (3) An aircraft is cleared to taxi and asked to report when clear of the apron or passing an easily identifiable reference point. A second movement may then be cleared subject to the known progress of the first.

- 10.3 Vehicles moving along a runway or taxiway shall give way at all times to aircraft taking-off, landing, taxiing or being towed, except that emergency services vehicles proceeding to the assistance of an aircraft in distress shall be afforded priority over all other surface movement traffic. In the latter case, all movement of surface traffic should, to the extent practicable, be halted until it is determined that the progress of the emergency vehicles will not be impeded. The phrase “give way” must not be used in RTF phraseology to vehicles to resolve conflicts between vehicles and aircraft on the manoeuvring area.

10A. Crossing Runways

- 10A.1 If the instructions given to surface traffic involve crossing a runway in use, clearance to cross should normally be withheld until no conflict exists. However, to achieve greater efficiency of operation clearance to cross may be given subject to aircraft which are landing or taking-off. The conditional clearance shall contain sufficient information to enable the pilot of the taxiing aircraft or vehicle driver to identify the other traffic and should be related to one movement only.
- 10A.2 When issuing a crossing instruction of a runway-in-use to a taxiing aircraft, controllers shall ensure that the crossing instruction is issued on the same frequency as that utilised for the issuing of take-off and landing clearances on that runway. Any subsequent instruction to change frequency shall be issued to the taxiing aircraft after it has vacated the runway.
- 10A.3 When a clearance to cross a runway in use is issued a report vacated instruction shall be included. However, this instruction may be omitted when Aerodrome Control has continuous sight of the aircraft or vehicle crossing.

10B. Runway Occupancy

- 10B.1 When aircraft, persons or vehicles have been given permission to cross or occupy a runway in use, the controller shall, as a positive reminder that the runway is blocked, display a strip(s) or marker(s) on the part of the flight progress board that is used to represent the runway.
- 10B.2 At units where flight progress boards are not used, such runway occupancy is to be shown effectively by a suitable method similar to the above.
- 10B.3 Vehicles fitted with appropriate equipment operating on an active runway, e.g. during runway inspection or short-term maintenance, are to be transferred to a RTF frequency which will enable them to hear transmissions to and from aircraft using that runway.

10C. Prevention of Runway Incursions

- 10C.1 Runway incursions can and do happen at all aerodromes during all weather conditions and present a major hazard to the safety of aircraft operating at aerodromes.

- 10C.2 A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for aircraft take-off and landing. The protected area of a surface for aircraft take-off and landing is determined by the existence and location of the runway strip, clear and graded area, obstacle free zone and ILS sensitive areas. The precise configuration of these areas is dependent on the aerodrome layout and the operations that are taking place.
- 10C.3 Pilots and airside vehicle drivers who are uncertain of their position on the manoeuvring area are one of the factors contributing to runway incursions. A loss of accurate positional awareness can occur at any point on the manoeuvring area. It is most critical when it occurs close to, or on, the runway.
- 10C.4 Pilots or vehicle drivers who are lost, or uncertain of their position, on the aerodrome manoeuvring area will stop and notify the ATS unit of the circumstances, including their last known position. However, if the pilot or vehicle driver recognises that they are on a runway and are able to locate a nearby suitable taxiway, they should vacate the runway as expeditiously as possible, unless otherwise instructed by the ATS unit; and then, stop the aircraft/vehicle. Controllers shall issue instructions to the pilot or vehicle driver in order to eliminate or mitigate any potential hazards arising from the aircraft or vehicle being in the wrong position.
- 10C.5 An ANSP may consider it valuable in safety terms to define in MATS Part 2 when aircraft have vacated the runway.

10D. Low Visibility

- 10D.1 In conditions of low visibility where non-radio equipped aircraft and vehicles cannot be controlled by light signals, the movement on the manoeuvring area of all such aircraft and vehicles, except emergency services vehicles, should normally be prohibited.

10E. Traffic Lights

- 10E.1 Traffic lights installed at aerodromes for the control of vehicles on the taxiway shall be operated by Aerodrome Control or the air controller who shall ensure that the red stop signal is displayed in adequate time to enable drivers to observe and obey the instructions.

10F. Jet Blast and Propeller Slipstream

- 10F.1 When issuing instructions and clearances on the aerodrome, controllers must take into account the hazards of jet blast and propeller slipstream. Even at ground idle large aircraft can produce localized wind velocities of sufficient strength to cause damage to other aircraft, vehicles and personnel operating within the affected area. Particular care should be taken when multiple line-up clearances at different points on the same runway are issued and aircraft later in the departure sequence will be subjected to jet blast or propeller slipstream from preceding departures.

Note: Research has demonstrated that the affected area behind a large aircraft with engines at ground idle extends up to 600 metres.

10G. Surface Movement Radar

10G.1 Surface movement radar may be used when traffic on the aerodrome cannot be adequately seen from the aerodrome control tower during the periods of low visibility or during the hours of darkness as follows:

- (1) To monitor the movements of aircraft and vehicles on the manoeuvring area;
- (2) To provide advice and assistance for the safe and efficient movement of aircraft and vehicles on the manoeuvring area. This should include the following:
 - (a) To ensure that departing aircraft are lined up on the correct runway;
 - (b) Determining that a runway is clear of aircraft and vehicles;
 - (c) To ascertain that aircraft have commenced take-off run;
 - (d) To monitor the positions of traffic in order to facilitate switching of taxiway lighting;
 - (e) To monitor and assist emergency service vehicles when required.

10H. Methods of establishing SMR Identification

10H.1 Before providing guidance to an aircraft/vehicle based on SMR-derived information, identification shall be established by the use of one of the methods specified below:

- (1) By correlating the position of a visually observed aircraft/vehicle to that displayed on the SMR; or
- (2) By correlating an identified SMR position from another ATS surveillance system source; or
- (3) By correlating an SMR position complying with an ATC instruction for a specified manoeuvre; or
- (4) By correlating a displayed SMR position to an aircraft/vehicle as reported by radio; or
- (5) By correlating a displayed SMR position to an aircraft/vehicle position, e.g. entering a runway or taxiway, holding position or any position marked on the situation display

10I. Relay of SMR Position Identification

10I.1 Identification of an SMR-derived aircraft/vehicle position may be relayed by the use of the following methods:

- (1) Direct designation; or

- (2) Specifying the location of the SMR-derived position by reference to identifiable features displayed on the situation display.

10I.2 SMR normally covers all runways and taxiways on the aerodrome. In the event of equipment failure, the controllers shall immediately advise all aircraft being assisted.

11. Taxiing Aircraft

11.1 When the pilot of an aircraft requests start-up or taxi clearance the following information shall be given:

- (1) Runway in use;
- (2) Surface wind direction and speed, including significant variations;
- (3) Aerodrome QNH;
- (4) Outside air temperature (turbine-engine aircraft only);
- (5) Significant meteorological conditions, e.g. RVR or marked temperature inversion.

11.2 Those items which are known to have been received by the pilot may be omitted. When requested, aircraft shall be provided with a time check; such time checks shall be accurate to the nearest minute. However, pilots have been requested to make arrangements to obtain time checks from other sources whenever possible.

11A. Taxi Clearance

11A.1 The importance of issuing clear and concise instructions to taxiing aircraft cannot be over-emphasised. The visibility from an aircraft flight deck is limited and, when taxiing, the pilot is dependent to a large degree upon Aerodrome Control to assist the pilot in determining the correct taxi route to be followed. Essential aerodrome information is to be passed to assist the pilot in preventing collisions with parked aircraft and obstructions on or near the manoeuvring area.

11A.2 Heavy aircraft are not to be given clearance or instructions that would require the use of more than normal power for taxiing or for entry on to the runway. Heavy aircraft, when at the holding position, are not to be cleared for an immediate take-off.

11A.3 In the interests of safety, use of the active runway for taxiing purposes is to be kept to a minimum.

11A.4 Controllers are not to instruct aircraft or vehicles to cross illuminated red stop-bars used at runway and intermediate taxiway holding positions. The Aerodrome Operator may decide, on the grounds of safety, that inoperable stop-bars and associated taxiways be withdrawn from service and alternative routes used where practicable.

11A.5 Where illuminated red stop-bars are used at runway holding positions they are only to be de-selected when clearance has been given for an aircraft or vehicle to enter the runway. If a conditional clearance has been issued in respect of a landing

aircraft the stop-bar must not be deselected until the landing aircraft has passed the position at which the vehicle or aircraft will enter the runway. This requirement may be satisfied either visually by the controller or by the use of SMR/SMGCS as specified in MATS Part 2.

- 11A.6 For aircraft departing from the same runway holding position, when a conditional line up clearance has been issued to a succeeding departing aircraft the illuminated red stop-bar may remain de-selected provided that it will be the next movement on that runway. Meteorological restrictions applicable to this procedure are to be specified in MATS Part 2.
- 11A.7 On the occasions when the withdrawal of inoperable stop-bars is not possible and the stop-bars cannot be readily suppressed, under exceptional circumstances, an aircraft may be instructed to cross such an illuminated stop-bar subject to the following minimum conditions:
- (1) The affected runway or intermediate holding position and the aircraft are visible to the controller. This requirement may be satisfied by the use of SMR/SMGCS as specified in MATS Part 2. When an aerodrome is not SMR/SMGCS equipped, local alternate solutions based on risk assessment and detailed in MATS Part 2 may be employed.
 - (2) The phraseology used is to leave the pilot or driver in no doubt that the crossing instruction only applies to the particular inoperable stop bar. Conditional clearances shall not be used under these circumstances.
 - (3) Additional MATS Part 2 procedures may be required where local risk assessments have identified that further mitigation measures may be necessary.
- 11A.8 In all cases particular care should be taken if this contingency procedure is to be used in Low Visibility Operations or at night as the green taxiway centreline lights linked to the stop-bar will not be available.

12. Clearance Limit

- 12.1 In addition to providing instructions about the route to be followed, all taxi clearances are to contain a specific clearance limit. This clearance limit should be a location on the manoeuvring area or apron.
- 12.2 Care must be exercised when clearing an aircraft to the holding point of the runway-in-use, for the aircraft is then permitted to cross all runways which intersect the taxi route designated in the clearance whether active or not. Therefore, when a taxi clearance contains a taxi limit beyond a runway, it is to contain an explicit clearance to cross that runway. If such a clearance cannot be given, the clearance limit and the specified route must exclude that runway and any route beyond it. When the controller considers it appropriate, the phrase "hold short" may be used to emphasise that the aircraft is not authorised to cross an intermediate runway, e.g. "taxi to holding point D2, hold short of runway 25R".

- 12.3 If an aircraft wishes to depart from an aerodrome in airspace where VFR flight is permitted and the flight details are unknown, the pilot is to be asked “Are you departing VFR?”.
- 12.4 The phrase “follow the...” is useful when issuing taxi instructions. However, controllers are warned that this phrase could lead to an aircraft inadvertently following another past a holding position or on to the active runway. Controllers are therefore to use caution when issuing taxi instructions containing the phrase “follow the...”; especially in the area of the active runway or runway holding positions.
- 12.5 Controllers must be alert to the potential for visual misidentification of aircraft on the aerodrome. This is particularly important when an aircraft may not be displaying a livery synonymous with its callsign.

13. Awaiting Take-off

- 13.1 Aircraft shall not be permitted to hold on the end of the runway if another aircraft has been cleared to land. Aircraft will hold clear of the runway at the marked holding position or, if one is not provided, not closer than those distances from the runway centreline as described in CAP 168 Chapter 3.
- 13.2 To guard against pilots misinterpreting a clearance message as permission to take-off, after an aircraft has been instructed to hold at a runway holding position and a clearance message is passed, the clearance message shall be prefixed with a repetition of the appropriate holding instruction.
- 13.3 Conditional clearances shall not be used for movements affecting the active runway except when the aircraft or vehicles concerned can be seen by both controller and pilot or driver. Conditional clearances are to relate to one movement only and, in the case of landing traffic, this must be the first aircraft on approach. However, when a number of aircraft are at a holding position adjacent to a runway, then a conditional clearance may be given to an aircraft in respect of another that is ahead in the departure sequence. In both cases no ambiguity must exist as to the identity of the aircraft concerned.

14. Line-Up Clearance

- 14.1 Line-up instructions may be issued to more than one aircraft at different points on the same or crossing runways provided that:
- (1) it is during daylight hours;
 - (2) all aircraft are continuously visible to the aerodrome controller;
 - (3) all aircraft are on the same RTF frequency;
 - (4) pilots are advised of the number of aircraft ahead in the departure sequence, and the position/runway from which these aircraft will depart;
 - (5) the physical characteristics of the runway do not render preceding aircraft in the departure sequence invisible to succeeding aircraft on the same runway.

- 14.2 When line-up will take place at a position other than for a full-length runway departure the intermediate holding position designator shall be included in the line-up instruction. Controllers may include holding position designators in any clearance to line-up as considered appropriate.
- 14.3 Conditional line-up clearances have been identified as a significant contributory factor in many runway incursion incidents. The use of non-standard phraseology when issuing a conditional line-up clearance exacerbates the risk of misunderstanding or confusion, which has the potential to increase the likelihood of runway incursions.
- 14.4 The phrase “(Callsign), line-up in turn” has been identified as ambiguous and misleading and is not to be used.

15. Take-off Clearance

- 15.1 The aerodrome controller is responsible for issuing take-off clearance and advising pilots of any variations to the surface wind or other significant changes to meteorological conditions. When a pilot requests the instantaneous surface wind, the word “instant” is to be inserted to indicate that the wind being reported is not the two-minute average.
- 15.2 Unless MATS 2 states otherwise, take-off clearance shall include the designator of the departure runway.
- 15.3 Take-off clearance may be issued when the aircraft is at or approaching the holding position for the runway in use or when the aircraft is lined up on or entering the runway in use. Controllers may include holding position designators in any clearance to take-off as considered appropriate.
- 15.4 A take-off clearance shall be issued separately from any other clearance message. If an aircraft is lined up on the runway and a revised clearance or post departure instructions need to be passed, the revised clearance or post departure instructions shall be prefixed with an instruction to hold position.
- 15.5 An aircraft shall not be permitted to begin take-off until the preceding departing aircraft is seen to be airborne or has reported ‘airborne’ by RTF and all preceding landing aircraft have vacated the runway in use.
- 15.6 A departing aircraft shall not be given instructions which would require it to make a turn before it has reached a height of 500 ft. This need not apply in the case of a light aircraft.

15A. Departure Clearances

- 15A.1 If an ATC clearance could initially be confused with a ground movement instruction (e.g. a turn) or otherwise to avoid pilots taking off without a take-off clearance, it should commence with the phrase “after departure” to ensure clarity.
- 15A.2 An aircraft on an IFR flight is not to be given take-off clearance until:

- (1) The ATC clearance from Area Control (if required) has been passed and acknowledged; and
- (2) Approach Control have authorised its departure and any specific instructions have been passed to the aircraft, e.g:
 - (a) Turn after take-off;
 - (b) Track to make good before turning onto desired heading;
 - (c) Level(s) to maintain.

15B. Expedition

15B.1 When given the instruction “cleared for immediate take-off” it is expected that the pilot will act as follows:

- (1) At the holding position, taxi immediately on to the runway and commence take-off without stopping the aircraft. (Not to be given to HEAVY or SUPER aircraft);
- (2) If already lined up on the runway, take-off without delay;
- (3) If an immediate take-off is not possible, the pilot will advise the controller.

15B.2 An aerodrome controller may, after co-ordination with Approach Control:

- (1) expedite departing aircraft by suggesting a take-off direction which is not into wind. The pilot has the right to reject the suggestion;
- (2) reduce the overall delay to traffic by altering the order in which aircraft are cleared for take-off;
- (3) when ATS surveillance systems are not available, clear departing IFR flights to climb VMC and maintain their own separation until a specified time, location or level, if reports indicate that this is possible.

15C. Wake Turbulence

15C.1 The pilot of a departing aircraft may request a delay in take-off because of the danger of wake turbulence from the preceding aircraft. There is a particular danger for aircraft commencing the take-off run part of the way along the runway.

16. Cancelling Take-off Clearance

16.1 If take-off clearance has to be cancelled before the take-off run has commenced, the pilot shall be instructed to hold position and to acknowledge the instruction.

16.2 In certain circumstances the aerodrome controller may consider that it is necessary to cancel take-off clearance after the aircraft has commenced the take-off run. In this event the pilot shall be instructed to stop immediately and to acknowledge the instruction.

- 16.3 The cancellation of a take-off clearance after an aircraft has commenced its take-off roll should only occur when the aircraft will be in serious and imminent danger should it continue. Controllers should be aware of the potential for an aircraft to overrun the end of the runway if the take-off is abandoned at a late stage; this is particularly so with large aircraft or those operating close to their performance limit, such as at maximum take-off mass, in high ambient temperatures or when the runway braking action may be adversely affected. Because of this risk, even if a take-off clearance is cancelled, the commander of the aircraft may consider it safer to continue the take-off than to attempt to stop the aircraft.
- 16.4 As the aircraft accelerates, the risks associated with abandoning the take-off increase significantly. For modern jet aircraft, at speeds above 80kt flight deck procedures balance the seriousness of a failure with the increased risk associated with rejecting the take-off. For example, many system warnings and cautions on the flight deck may be inhibited during the take-off roll, and between 80kt and V1 most aircraft operators define a limited number of emergency conditions in which the take-off will be rejected. Consequently, at speeds above 80kt, the take-off clearance should normally only be cancelled if there is a serious risk of collision should the aircraft continue its take-off, or if substantial debris is observed or reported on the runway in a location likely to result in damage to the aircraft. The critical speed will be dependent on the aircraft type and configuration, environmental conditions and a range of other factors but, as a general rule, for modern jet aircraft, it will be in the region of 80kt airspeed. The typical distance at which a jet aircraft reaches 80kt is approximately 300m from the point at which the take-off roll is commenced. The unit MATS Part 2 shall contain further guidance on the likely position on the runway at which those aircraft types commonly using the aerodrome typically reach 80kt.
- 16.5 Controllers should also be aware of the possibility that an aircraft that abandons its take-off may suffer overheated brakes or another abnormal situation and should be prepared to declare the appropriate category of emergency or to provide other suitable assistance.
- 16.6 Associated RTF phraseology is detailed in CAP 413.

17. Designated Positions in the Traffic Circuit

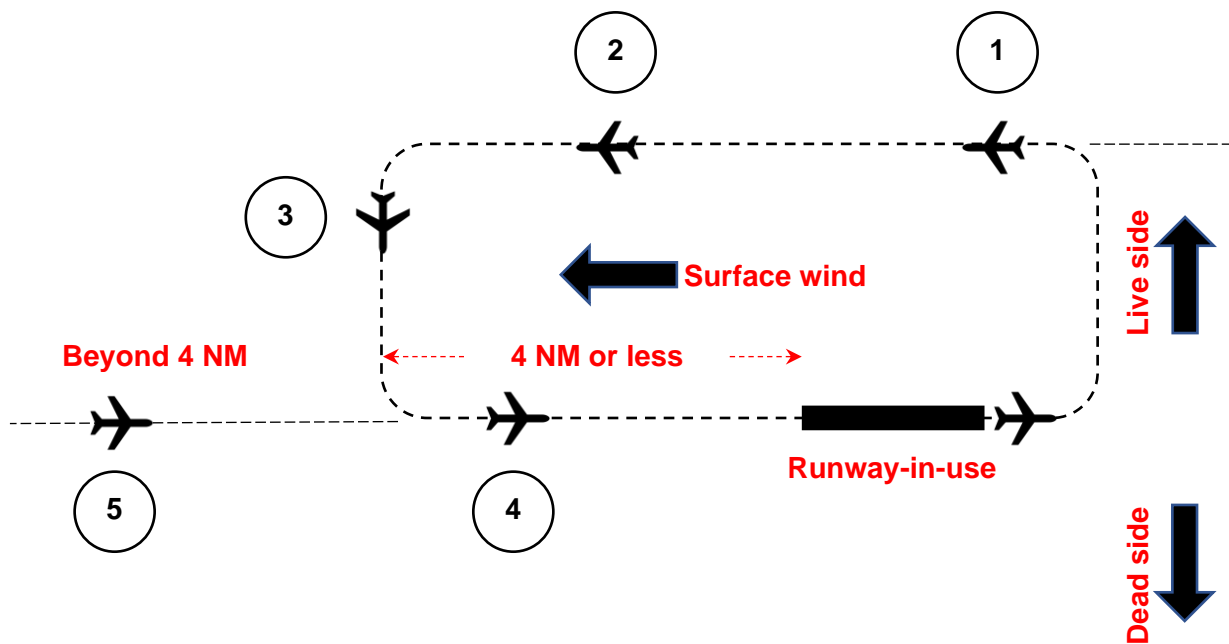


Figure 1 Designated Positions in the Traffic Circuit

- Position 1: Aircraft reports on 'downwind' leg when abeam upwind end of the runway.
- Position 2: Aircraft reports 'late downwind' if it is on the downwind leg, has been unable to report 'Downwind' and has passed the downwind end of the runway.
- Position 3: Aircraft reports 'base' leg (if required).
- Position 4: Aircraft reports 'final'. Clearance to land issued here.
- Position 5: Aircraft reports 'long final' (between 8 and 4 miles) when aircraft is on a straight-in approach.

Note: For light aircraft operations, circuit dimensions may be reduced, but the relative RTF reporting points are maintained.

18. Arriving Aircraft

18A. Joining Circuit

- 18A.1 Clearance to enter a traffic circuit is issued when an aircraft is still some distance from the aerodrome to enable the pilot to conform with the traffic circuit, pending clearance to land. Information concerning landing direction or runway in use and any other necessary instructions are given at the same time so that the pilot may intelligently position themselves in the traffic pattern.
- 18A.2 Aircraft may be cleared to position overhead the aerodrome for a standard overhead join. In these circumstances the aircraft will report overhead at 2,000 ft above aerodrome elevation, subject to remaining in VMC; and, when cleared to descend will route to the dead side of the circuit descending to circuit height. The aircraft will then cross the upwind end of the runway in use at circuit height, then position accordingly into the existing traffic pattern to report downwind. Any variance on this

procedure must be notified in MATS Part 2 and the phraseology “standard overhead join” must not be used in such circumstances.

- 18A.3 If an aircraft enters a traffic circuit without proper authorisation, the possibility of an emergency must be recognised. The aircraft should be permitted to land if its actions indicate that it wishes to do so and, if necessary, other aircraft are to be instructed to give way.

19. Landing

- 19.1 Unless MATS Part 2 states otherwise, landing, low approach, and touch and go clearances shall include the designator of the landing runway.
- 19.2 Unless specific procedures have been approved by the CAA, a landing aircraft shall not be permitted to cross the beginning of the runway on its final approach until a preceding aircraft, departing from the same runway, is airborne.
- 19.3 When a pilot requests the instantaneous surface wind, the word “instant” is to be inserted to indicate that the wind being reported is not the two-minute average.
- 19.4 When aircraft are using the same runway, a landing aircraft may be permitted to touch down before a preceding landing aircraft which has landed is clear of the runway provided that:
- (1) the runway is long enough to allow safe separation between the two aircraft and there is no evidence to indicate that braking may be adversely affected;
 - (2) it is during daylight hours;
 - (3) the preceding landing aircraft is not required to backtrack in order to vacate the runway;
 - (4) the controller is satisfied that the landing aircraft will be able to see the preceding aircraft which has landed, clearly and continuously, until it has vacated the runway; and
 - (5) the pilot of the following aircraft is warned. Responsibility for ensuring adequate separation rests with the pilot of the following aircraft.
- 19.5 A landing aircraft, which is considered by a controller to be dangerously positioned on final approach, shall be instructed to carry out a missed approach. An aircraft can be considered as dangerously positioned when it is poorly placed either laterally or vertically for the landing runway.

19A. Instructions to Aircraft in the Final Stages of Approaching to Land

- 19A.1 The final approach represents an increased period of flight deck workload. Unusual situations and emergencies during this period can be particularly demanding for the pilot. Therefore, with the exception of instructions to go-around, instructions shall not be issued to aircraft in the final stages of approaching to land that would require it to deviate from its expected flight path unless exceptional and overriding safety considerations apply.

20. Exemptions from Separation Minima in the Traffic Circuit

- 20.1 Aircraft in the traffic circuit shall be controlled in accordance with the procedures above except that controllers are not required to apply the separation minima described in those paragraphs to:
- (1) aircraft in formation with respect to other aircraft in the same formation;
 - (2) aircraft operating in different areas or lanes on aerodromes equipped with runways suitable for simultaneous landings or take-offs;
 - (3) aircraft operating under military necessity as determined by the appropriate authority.

21. Aerodrome Traffic Monitor (ATM)

- 21.1 An ATM is provided at certain aerodromes to assist in achieving maximum runway utilisation and aerodrome capacity. Operation of an ATM is not associated with a particular rating and, unless authorised by the CAA, must not be used as an ATS surveillance system to provide Approach Radar Services. The information derived from the ATM may be used to:
- (1) determine the landing order, spacing and distance from touchdown of arriving aircraft;
 - (2) assist in applying longitudinal separation for departing aircraft;
 - (3) enable the controller to confirm that the initial track of a departing aircraft conforms with the clearance issued;
 - (4) provide information to aircraft on the position of other aircraft in the circuit or carrying out an instrument approach.
- 21.2 When approved by the CAA and subject to sub-paragraph (2) below:
- (1) the ATM may also be used to:
 - (a) following identification, validate SSR codes of departing aircraft and verify associated Mode C read-outs;
 - (b) monitor the progress of overflying aircraft identified by Approach Radar Control to ensure that they do not conflict with the tracks of arriving or departing aircraft;
 - (c) establish separation between departing aircraft;
 - (d) pass traffic information;
 - (e) establish separation in the event of a missed approach;
 - (f) assist in taking initial corrective action when the separation between arriving aircraft becomes less than the prescribed minima.
 - (2) Provided that:

- (a) the controller has undertaken specified training;
- (b) the controller is only providing an Air Control Service and a separate Ground Control Service is being provided by another controller on a separate frequency; and
- (c) the procedures are detailed in MATS Part 2.

21.3 Units where Air Control and GMC are combined may apply to the CAA to be exempt from paragraph 21.2 (2)(b) above.

22. Low Approach Restrictions

22.1 If the runway in use is occupied by aircraft or vehicles, an approaching aircraft that has requested a low approach or a touch and go, may be cleared to carry out a low approach restricted to a height not below 400 ft above the threshold elevation. In such circumstances, the pilot is to be informed of the aircraft or vehicles on the runway. Additionally, the aircraft or vehicle on the runway is to be informed of the aircraft carrying out the low approach.

22.2 For aircraft operating on the aerodrome QNH, the low approach altitude restriction is to be based on 400 ft plus threshold elevation, rounded up to the nearest 50ft.

22.3 The runway in use shall be kept clear of aircraft and vehicles if an approaching aircraft is likely to descend below 400 ft above the threshold elevation.

23. Landing Direction and Runway-in-use

23.1 The term runway-in-use is used to indicate the particular runway or landing direction selected by Aerodrome Control as the most suitable at any particular time. Normally, the runway-in-use selected should be that most closely aligned to the surface wind direction. Where the surface wind conditions are light and variable the 2,000 ft wind should be taken into account before selecting the runway-in-use.

23.2 When selecting the runway-in-use, Aerodrome Control shall take into consideration other factors such as traffic pattern, the length of runways or landing runs, approach aids available and any meteorological conditions which may be significant to the choice of runway. At certain aerodromes more than one runway may be in use at any one time.

23.3 There are numerous reasons for using an out of wind runway, for example: operations, efficiency and noise abatement.

23A. Out of Wind Runway

23A.1 A runway may be nominated for noise abatement purposes, the objective being to utilise whenever possible those runways that permit aeroplanes to avoid noise-sensitive areas during the initial departure and final approach phases of flight.

23A.2 A runway shall not be selected for noise abatement purposes for landing operations unless visual or instrument glide path guidance is available to that runway.

- 23A.3 Noise abatement shall not be the determining factor in runway nomination when it is known that the crosswind component, including gusts, exceeds 15 kt, or the tailwind component, including gusts, exceeds 5 kt.
- 23A.4 Additional parameters when noise abatement is not to be used as a determining factor in runway selection shall be agreed with the aerodrome licensee and incorporated into MATS Part 2, taking due consideration of:
- (1) the degree and type of runway surface contamination;
 - (2) minimum visibility and cloud ceiling;
 - (3) other weather conditions such as wind shear or thunderstorms.
 - (4) If the pilot, prompted by safety concerns, considers that a runway offered, including those for noise abatement purposes, is not suitable, they may refuse that runway and request permission to use another. In such circumstances, controllers shall inform pilots of the expected delay necessary to facilitate a change of runway.

24. Runway Changes

- 24.1 As far as practicable, avoid changing the assigned runway to aircraft on approach or taxiing for departure because this creates additional cockpit workload.
- 24.2 Except when following an alternative procedure prescribed within MATS Pt 2, aircraft departing or making an approach with a tailwind should be informed of the tailwind component if available, or provided with a caution that a tailwind exists, and asked for their intentions using the following phraseology:
- “(Callsign) tailwind (XX) knots, report your intentions?”; or
 - “(Callsign) caution tailwind, report your intentions?”
- 24.3 Whenever a runway change is anticipated, notify it as early as practicable together with the expected time of the change to flight crews, by adding relevant information on ATIS, where available.
- 24.4 Should a change of runway be necessary Aerodrome Control, after consultation with Approach Control, shall inform the following:
- (1) Aircraft under their control;
 - (2) Aerodrome Fire Service;
 - (3) Contractors working on the aerodrome who will be affected by the change;
 - (4) Other agencies according to local instructions.

25. Closure or Restricted Operation of Aerodromes

25A. Responsibilities of the Aerodrome Operator

- 25A.1 The Aerodrome Operator is responsible for decisions regarding the operational status of the aerodrome including the apron and manoeuvring area in respect of:
- (1) routine operational limitations, e.g. runway maintenance;
 - (2) unforeseen hazards to aircraft operations, e.g. deteriorating surface conditions, obstructions etc. Specifically, the Aerodrome Operator will make decisions regarding:
 - (a) the closure or re-opening of the aerodrome;
 - (b) the withdrawal or return to use of runways, taxiways, and associated lighting aids;
 - (c) the revision of declared distances;
 - (d) any marking required in connection with the above;
 - (e) initiating NOTAM action to promulgate changes in serviceability.

25B. Responsibilities of the ATC Unit

- 25B.1 The Aerodrome Operator shall be informed immediately it becomes apparent from reports or observations that there is a hazard to the movement of aircraft on the apron or manoeuvring area.
- 25B.2 The Aerodrome Operator may take some time to assess the situation. During this period the controller is to decide the action to take according to the circumstances:
- (1) Where an operational occurrence has resulted in an obstruction in the vicinity of the runway-in-use:
 - (a) withhold take-off and landing clearance when the obstruction is within the cleared and graded area of the runway;
 - (b) withhold take-off and landing clearance if there is any doubt as to the position of the obstruction. Pilots will be advised of the reason for withholding clearance together with the position and nature of the obstruction.
 - (2) When the obstruction is obviously outside the cleared and graded area but on or in the vicinity of the apron or manoeuvring area the pilot will be advised of the position and nature of the obstruction. It is the responsibility of the pilot to decide whether or not to continue operations.
- 25B.3 When the Aerodrome Operator has decided the operational status of the apron or manoeuvring area they will inform ATC. The parent ACC should be informed of any situations which may restrict operations at the aerodrome.

25C. Availability of Aerodrome Services Outside Published Hours

- 25C.1 To cover the possibility of an aircraft which departs within 15 minutes of normal aerodrome closing time having to return, the Aerodrome Operator will normally retain sufficient services and equipment for 15 minutes after ATD. If the Aerodrome Operator informs ATC of a change in the extent of the services or equipment which will be available during this period, the pilot should be advised accordingly.

26. Extensions of Watch

- 26.1 Applications for extensions of watch will be handled in accordance with MATS Part 2.

27. Availability of Aerodromes for Special Flights

- 27.1 Applications for the use of an aerodrome for special or pleasure flights shall be referred to the Aerodrome Operator.

28. Work on the Manoeuvring Area

- 28.1 When repair or installation work, authorised by the Aerodrome Operator, is to take place on the manoeuvring area, a representative of the working party must be briefed by ATC or the Aerodrome Operations team about subjects relating to the proposed work, for example:

- (1) Methods of access to working area;
- (2) The area in which vehicles may operate;
- (3) The runway-in-use and the effects of any changes;
- (4) Methods of obtaining permission to cross the runway in use;
- (5) Signals or methods of indicating that vehicles and personnel must leave the manoeuvring area.

- 28.2 The representative of the working party should possess an authorisation to work on the aerodrome issued by the Aerodrome Operator. This is to be counter-signed by the senior controller, subsequent to the briefing, and a copy retained or a record of the briefing entered in the ATC Watch Log.

29. Ground Signals and Markings

- 29.1 The signals to be displayed in the signals square and elsewhere on the manoeuvring area of an aerodrome are to comply with those described in RoA Regulations.

29A. Close of Watch

- 29A.1 At aerodromes where the hours of watch are limited, the landing 'T' is to be withdrawn from the signals area and runway(s) at the close of watch.

30. Inspection of Runways

- 30.1 MATS Part 2 will detail the arrangements at aerodromes where the Aerodrome Operator retains the task of inspection or has delegated it to another agency.
- 30.2 Following any incident, or suspected incident, on a runway involving tyre failure, aircraft structural failure or, in the case of turbine-engined aircraft, engine malfunction, the runway is to be inspected before any other aircraft are allowed to use it.
- 30.3 Runway inspections are to be arranged through the Aerodrome Operator at aerodromes where the ATC unit is not responsible for surface inspections. If special arrangements have been made for aerodrome inspections to be carried out by the ATC unit, they should be conducted according to the instructions in Chapter 6.

31. Aerodrome Fire Service

31A. Introduction

- 31A.1 ATC should co-operate with the Aerodrome Fire Service and Aerodrome Operator in the pre-planning of preferential routes through the manoeuvring area. Controllers are to ensure that they are familiar with these routes.

31B. Aerodrome Categories

- 31B.1 The fire service category of an aerodrome is assessed according to the length of the longest aircraft expected to use it. The categories are tabulated in Section 5.

31C. Reduced Protection

- 31C.1 Changes in the level of RFFS protection normally available at an aerodrome will be notified by the Aerodrome Operator to the appropriate ATC unit to enable the necessary information to be provided to arriving and departing aircraft. ATC responsibilities are limited to the dissemination of information to flight crew, as provided by the Aerodrome Operator.
- 31C.2 ATC units shall ensure that unplanned reductions in the RFFS category are notified to flight crew either via ATIS or directly by RT. On receipt of such information, flight crew will decide whether to continue their flight or to divert according to their Company Standard Operating Procedures. Controllers should normally expect the aircraft to divert if the available RFFS category does not meet that required for the aircraft type as described in CAP 168 Licensing of Aerodromes.
- 31C.3 Exceptions to the above could be expected for emergency landings, and for occasions when, in the pilot's opinion, a diversion or hold may introduce a more significant hazard. Controllers shall continue to provide normal ATS and clearances in response to flight crew intentions.

31D. Practice Exercises and Drills

- 31D.1 The necessity for rapid and coordinated action in the event of a crash requires the closest co-operation between ATC and the Aerodrome Fire Service, and the frequent rehearsal of procedures. Details of procedures will be found in Aerodrome Emergency Orders.
- 31D.2 ATC, in consultation with the Aerodrome Fire Service, is to assist in providing practice emergencies which are to be held frequently and made as realistic as possible.

31E. Exercises on the Manoeuvring Area

- 31E.1 The Aerodrome Fire Service will obtain clearance and any special instructions from Aerodrome Control before testing vehicles or carrying out exercises on the manoeuvring area.
- 31E.2 Arrangements shall be made in co-operation with the Aerodrome Fire Officer for ATC to provide instruction to Aerodrome Fire Service personnel concerning light and visual signals used on an aerodrome.

31F. Other Duties of the Aerodrome Fire Service

- 31F.1 At certain aerodromes the Aerodrome Fire Service may undertake other extraneous duties. These duties will not interfere with the prime function of the Aerodrome Fire Service.
- 31F.2 The Aerodrome Fire Service is frequently called upon for 'Special Services'. These include attendance at accidents to personnel, pumping out flooded premises, clearance of fuel spillage etc. If any of these is considered to be an emergency and occur within the radius of action of the Aerodrome Fire Service, attendance will be made immediately. ATC will be informed and advised of any depletion of the emergency services. If the services are depleted the Watch Supervisor at the parent ACC must be informed.

32. Release of Racing Pigeons

- 32.1 In agreement with the Royal Racing Pigeon Association, it has been agreed that a proposed liberation of racing pigeons within 13 km of a licensed aerodrome should be notified to the Aerodrome Operator or air traffic control provider at least fourteen days prior to the date of release. In addition, the ATC unit should be notified by telephone at least 30 minutes before release time, in order to confirm, where practicable, the number of birds due to be liberated and the intended destination and direction of flight. If necessary, the ATC manager or senior controller may request a delay in the liberation by up to 30 minutes (or longer in exceptional circumstances) for traffic purposes.

Section 2: Aerodrome Control

Chapter 2: Aerodrome Lighting Aids

1. Lighting Systems in Use at UK Aerodromes

- 1.1 The requirements for lighting at aerodromes in the UK appear in CAP 168. The particular system in use at an aerodrome is notified in the UK AIP (AD) section.

2. Operation of Lighting Systems and Intensity Controls

- 2.1 Operating instructions for individual lighting systems and the intensity setting to be used in different weather conditions, by day and night, shall be detailed in MATS Part 2. Guidance on typical luminous intensity settings can be found in CAP 168 Chapter 6. These settings may be varied at the controller's discretion or at the request of a pilot, provided that other aircraft will not be adversely affected.
- 2.2 A general description of intensity settings to be used when RVR operations are in force are contained in Section 3.
- 2.3 At certain aerodromes, where RVR reference lights are in use, the runway lighting may be temporarily switched off if this will facilitate an accurate count of the reference lights for RVR purposes. This shall not be done either:
- (1) while an aircraft is taking-off;
 - (2) after an aircraft has reported completing a final procedure turn; or
 - (3) after an aircraft has reached 5 NM from touchdown on a radar approach.

3. Periods of Display

- 3.1 Aerodrome lighting appropriate to the runway a pilot is to use shall be displayed for an appropriate period of time as specified in MATS Part 2, before any ETA and after any ATD as follows:
- (1) By day: High intensity systems, where installed on the runway to be used, whenever the visibility is less than 5 km and/or the cloud base is less than 700 ft;
 - (2) By night: Irrespective of weather conditions.
- 3.2 When the reported visibility consists of two values, the lower of the two values shall be used when determining whether or not to illuminate aerodrome lighting.
- 3.3 MATS Part 2 requirements for the display of aerodrome lighting before any ETA and after any ATD shall be based on local assessment, which shall take into account, but not be limited to, the technical specifications of the lighting system in use, including the time taken for the lighting to reach the required brilliancy, and the availability of lighting in the event of a departing aircraft making an emergency return to the aerodrome.

- 3.4 When the ATD of an aircraft is such that lighting will be displayed after aerodrome closing time, the pilot concerned should be warned that the aerodrome will close at the normal published time and advised that lighting only will be displayed after their departure. The availability of other aerodrome services, e.g. the Aerodrome Fire Service, approach aids, etc., during this period should also be clearly stated. Availability of aerodrome services outside of published hours is detailed in Section 2 Chapter 1.
- 3.5 Obstruction lighting, hazard beacons and aerodrome light beacons shall be displayed at night during the published hours of watch. Hazard beacons shall also be displayed by day whenever the visibility is less than 3,500 metres.
- 3.6 In addition to the display periods shown above, lighting may be displayed at any other time if it is requested by the parent ACC, required by MATS Part 2 or considered necessary by the controller.

Section 2: Aerodrome Control

Chapter 3: Light Signals and Pyrotechnics

1. Light Signals and Pyrotechnics

- 1.1 Lights and pyrotechnic signals used to control aircraft and vehicles at aerodromes are to comply with those described in UK Reg (EU) No. 923/2012 SERA.3301.

2. Instructions and Training

- 2.1 It is the responsibility of each aerodrome operator to produce operating instructions and to train and supervise staff to ensure that signal pistols, pyrotechnics and bird scaring cartridges are used safely, correctly and effectively.

3. Misfires

- 3.1 Appropriate misfire procedures shall be contained in either MATS Part 2 or the Aerodrome Manual.

4. Storage

- 4.1 Signal pistols, pyrotechnics and bird scaring cartridges will be kept in accordance with current firearms legislation.

5. Lasers, Searchlight and Fireworks Displays

- 5.1 Guidance for the operation of lasers, searchlights and fireworks can also be found in CAP 736.
- 5.2 Lasers and searchlights are grouped together under the generic term 'Light Displays'. Although fireworks present less of a problem than lasers and searchlights, the effect and hazard is such that they are included in the term 'Light Displays'. Light displays also include the outdoor use of lasers, searchlights and fireworks for research measurement and non-entertainment activities.
- 5.3 Light displays must never be directed at, or towards, aircraft or aerodromes.
- 5.4 Specific guidelines apply to light displays using lasers and searchlights within 500 metres either side of extended runway centrelines within 10 NM of an aerodrome's aerodrome reference point. Within 3 NM of an aerodrome's aerodrome reference point but not on the extended centreline, the same guidelines apply but with the addition that any light should not stray towards the aerodrome or the extended centreline. In both cases, information should be passed to any affected aircraft. If a pilot requests that the lights are extinguished or if ATC consider this necessary, then action should be taken without delay.
- 5.5 Guidelines have also been laid down for fireworks displays which should be limited to a height of 1500 ft above ground level and should not take place within 500 metres either side of the extended runway centreline within 10 NM of an

aerodrome's aerodrome reference point, or within 3 NM radius of an aerodrome's aerodrome reference point. However, published guidelines apply if a fireworks display is to take place within these parameters.

- 5.6 For the light displays described above, CAA Airspace Regulation is responsible for the promulgation of the event by NOTAM and co-ordinating with the relevant ANSP as required.

5A. Malicious Use of Lasers against Aircraft and ATS Facilities

- 5A.1 The targeting of aircraft and ATS installations by lasers poses a threat to aircraft safety and security through the physiological impact upon pilots and ATS personnel. This can include distraction, glare, temporary flash blindness, afterimage and possibly eye injury. Current expert opinion is that it is extremely unlikely, except over very short distances, that laser light would pose a significant threat of permanent or long-term personal injury. At critical stages of flight, however, distractions caused to aircrew or ATS personnel by lasers may threaten aircraft safety.
- 5A.2 Whilst the majority of incidents appear to be the result of opportunists, the number of reported events is increasing significantly, and reports of aircraft being subjected to illumination from multiple coordinated lasers have been received.
- 5A.3 UK police forces treat all reports of laser attacks upon aircraft and ATS facilities very seriously and will respond to any reported activity. ATSU's are encouraged to establish procedures with their local police authority to facilitate the rapid reporting of all such incidents, and the passing of all information that may assist in the apprehension of those responsible. Such guidance should be published in the unit MATS Part 2.

5B. Malicious use of Lasers against Aircraft

- 5B.1 Where local arrangements have not been established, controllers should take the following actions whenever a report of a laser attack upon an aircraft is received:
- (1) Acknowledge the report from the pilot;
 - (2) Seek as much information regarding the incident as possible from the pilot, including:
 - (a) the time of the attack;
 - (b) altitude and position at the time of the attack;
 - (c) description of the laser light i.e. colour, whether continuous or pulsing etc;
 - (d) any avoiding action taken;
 - (e) any impact upon vision / concentration.
 - (3) Anticipate the need for the pilot to adopt manoeuvres/operational techniques to minimise the impact on the aircraft;

- (4) Dial 999, and pass all relevant information to the local police;
- (5) Warn pilots of other aircraft in the vicinity that laser activity has been reported. The duration of providing these warnings will be stated in MATS Part 2;
- (6) Record the details in the ATC watch log and report the occurrence in accordance with Section 6.

5C. Malicious use of Lasers against ATS facilities

5C.1 ATSUs should provide guidance to their staff in the event of being subjected to malicious illumination by lasers. Measures should include:

- (1) Look away from the laser beam if possible. Do not attempt to find the light source by staring at the laser;
- (2) Shield eyes and consider the feasibility of lowering/raising 'sun blinds' to reduce the effects of the laser;
- (3) Advise aircraft under your control that a laser is illuminating you;
- (4) Avoid rubbing the eyes to reduce the potential for corneal abrasion;
- (5) Consider the feasibility of increasing ambient light levels to minimise any further illumination effects;
- (6) Consider handing over the control position to a colleague in a position not exposed to the laser;
- (7) Where local arrangements have not been established, inform a Supervisor who in turn can: decide on restricting traffic in/out of the aerodrome; inform the aerodrome operator; dial 999 and pass all relevant information to the local police;
- (8) Ensure the event is recorded in the ATC watch log and reported for further investigation in accordance with Section 6.

5C.2 Guidance to ATSU staff in making a decision on whether or not to see an eye specialist following exposure to a laser beam is provided at Appendix I 'Aviation Laser Exposure Self-Assessment (ALESA)'.

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Section 2: Aerodrome Control

Chapter 4: Windshear

1. Introduction

- 1.1 Windshear is a sustained change in the wind velocity along the aircraft flight path, which occurs significantly faster than the aircraft can accelerate or decelerate.
- 1.2 Windshear can occur at any level, but it is low-level windshear, occurring from the surface to a height of approximately 1,500 ft which can cause problems of sufficient magnitude to affect the control of aircraft in departure or final approach phases of flight.

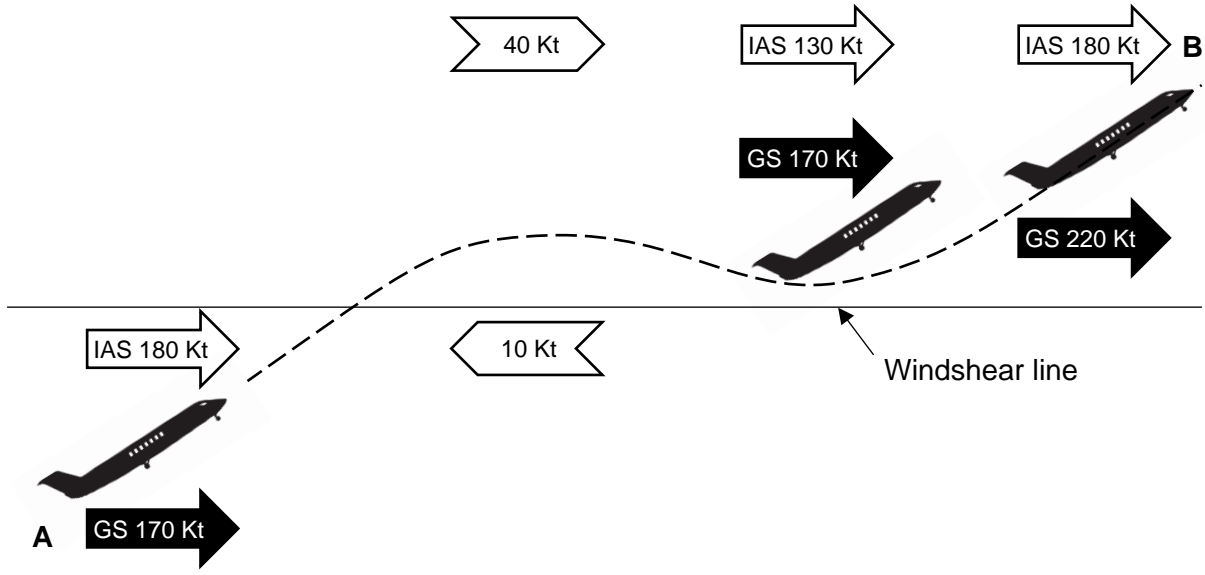
2. Conditions Conducive to Windshear

- 2.1 Controllers should be alert to the possibility of the existence of windshear in the following circumstances:
 - (1) The presence of frontal/squall/thunderstorm activity in the vicinity of the aerodrome.
 - (2) The presence of low-level inversions where the surface wind will be significantly different from that at only a few hundred feet above the ground.
 - (3) Local terrain or buildings considered in relation to wind speed and direction; such large obstructions can cause windshear as well as the more usual turbulence and gusts.

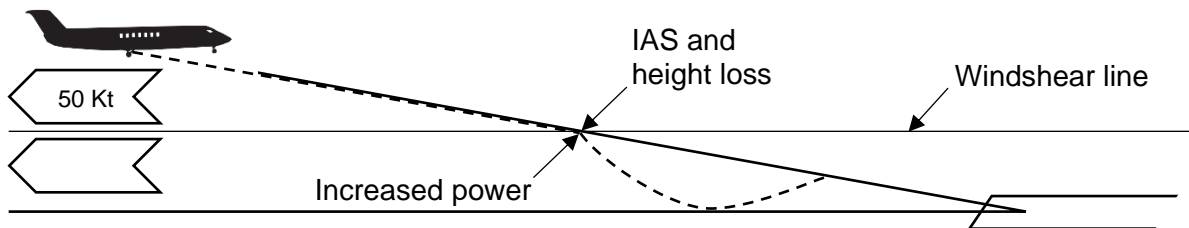
3. Effects of Windshear

- 3.1 A combination of factors can make the analysis of windshear very complex, but three simple examples of the hazards of low-level windshear are shown overleaf:

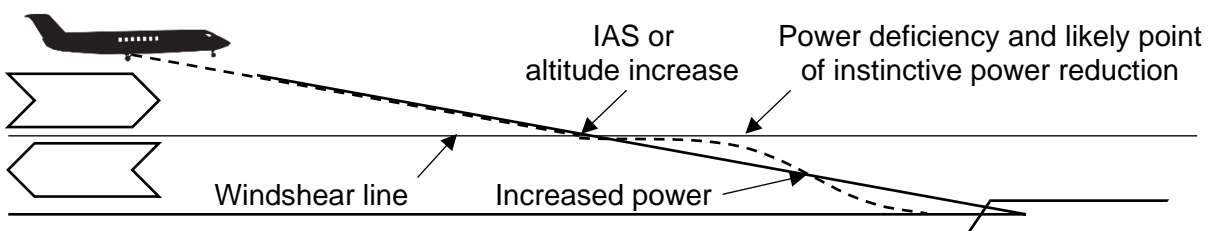
- (1) As the aircraft flies from A to B and traverses the windshear line, the inertia of the aircraft maintains the ground speed of 170 kt and the change of wind vector causes a sudden fall in airspeed. This can result in reduced lift until the inertia of the aircraft has been overcome and the original airspeed regained. Clearly this may be hazardous at critical climb-out speeds;



- (2) If an aircraft on final approach passes through a windshear line which causes a sudden loss of airspeed and a consequent increase in the rate of descent, a rapid application of power will be required if the aircraft is not to sink to a dangerously low height;



- (3) If the aircraft passes through a windshear line from a tailwind to a headwind component the inertia of the aircraft results initially in an increased airspeed and a deviation above the glidepath. The pilot's instinctive power reduction can result in the aircraft being short of power with a high rate of descent as the glidepath is approached and the effect of the inertia is lost. A rapid increase of power is now required if the aircraft is not to sink below the glidepath at a dangerously low altitude.



- 3.2 Due to the need to maintain both a safe margin above the stalling speed and a clearly defined flight profile, particularly during the climb-out and approach phases of flight, sudden changes in airspeed must be countered very rapidly. If the aircraft is in a turn when a windshear alert is generated, the crew may level the wings to maximize the climb gradient, unless a turn is required for obstacle clearance. Furthermore, due to high flight deck workload the reply 'Standby' in response to ATC instructions is not unusual during such events.

4. Windshear Detection Systems

- 4.1 Most modern airliners carry onboard windshear detection systems, which will audibly warn the crew of the presence of windshear. Such audible alerts can be either predictive, occurring before the aircraft encounters the windshear, or reactive after penetration of the windshear. Pilots will continue to fly the windshear recovery manoeuvre until the onboard system ceases to annunciate the windshear alert, and may therefore require deviation from their clearance.
- 4.2 Onboard windshear alerts take precedence over TCAS annunciations and due to the high flight deck workload during windshear recovery manoeuvres the TCAS display may not be monitored to the same extent as during normal operations. The priority of the crew during windshear recovery manoeuvres is to keep the aircraft under control whilst ensuring terrain clearance. Rates of climb during such recovery manoeuvres, which employ the use of maximum thrust, will significantly exceed those during missed approaches executed for reasons such as an occupied runway, or lack of visual contact in poor visibility. These high rates of climb, especially when associated with a missed approach which has a relatively low level-off altitude, can result in pilots exceeding their cleared level and eroding separation from other aircraft.

5. ATC Action

- 5.1 In the event of a pilot executing a missed approach due to a windshear alert, controllers should be prepared for the aircraft to exceed the missed approach altitude. Controllers should provide enhanced traffic information as necessary and provide instructions and advice as deemed appropriate to ensure safety.
- 5.2 Whenever a pilot reports windshear conditions to ATC, the information shall be relayed to subsequent inbound and outbound aircraft until confirmation is received that the condition no longer exists.
- 5.3 Reports from pilots should contain the following information:
- (1) A warning of the presence of windshear;
 - (2) The height or height band where the shear was encountered;
 - (3) The time at which it was encountered;
 - (4) Details of the effect of the windshear on the aircraft, e.g. speed gain or loss, vertical speed tendency, change in drift.

6. ATIS Broadcasts

- 6.1 At aerodromes where ATIS is available windshear information may be included in the broadcasts. Controllers should amplify the information for individual aircraft if necessary.

Section 2: Aerodrome Control

Chapter 5: Prevailing Visibility

1. Introduction

- 1.1 Prevailing visibility is defined as the visibility value that is reached or exceeded within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors.

2. Reporting of Prevailing Visibility

- 2.1 The prevailing visibility at an observing station will always be reported. Where the visibility in any direction is less than the prevailing visibility and less than 1500 metres or less than 50% of the prevailing visibility, the lowest visibility observed will also be reported. The general direction of the area of lower visibility will be indicated by reference to one of the eight points of the compass. If the lowest visibility is observed in more than one direction, then the most operationally significant direction will be reported.
- 2.2 When the visibility is fluctuating rapidly and the prevailing visibility cannot be determined, only the lowest visibility will be reported, with no indication of direction.

3. Effect on ATC Procedures

- 3.1 When verbally passing a report of visibility, e.g. as part of the aerodrome weather report passed to a pilot, the visibility should be transmitted as in current reports and without reference to the term prevailing visibility. An example is shown below for reference: METAR EGxx 1250 1800 0800NE ... should be transmitted as:

“Weather at one two five zero, visibility one thousand eight hundred metres, eight hundred metres to the North East”

- 3.2 Certain ATC procedures are implemented during specific visibility conditions. When two visibility values are present in a report, the lower of the two values shall be used to determine whether to implement such procedures.

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Section 2: Aerodrome Control

Chapter 6: Aerodrome Inspections

1. Introduction

- 1.1 The Aerodrome Operator is responsible for all aerodrome inspections. However, special arrangements may be made at some aerodromes for these duties to be delegated to the ATC unit.
- 1.2 Aerodrome surface and lighting inspections are carried out to ensure that:
- (1) ATC becomes aware of any unserviceabilities or obstructions that may affect the use of the aerodrome and are able to supply pilots with accurate Essential Aerodrome Information;
 - (2) unserviceabilities or obstructions that are observed may receive attention.
- 1.3 Comprehensive details of aerodrome inspections are contained in CAP 168.

2. Aerodrome Surface Inspections

- 2.1 At least one regular inspection should be made daily. At aerodromes which are open 24 hours this should be as soon as practicable after first light. At non 24-hour stations the inspection should take place before flying commences. A further inspection should take place before night flying.
- 2.2 Additional surface inspections should be made:
- (1) at cessation of work on the manoeuvring area;
 - (2) when a runway not previously inspected is brought into use;
 - (3) following an aircraft accident;
 - (4) following an abandoned take-off by a turbine-engined aircraft due to engine malfunction, or by any aircraft due to burst tyres;
 - (5) during snow and ice conditions as frequently as weather conditions warrant;
 - (6) when considered necessary by ATC, the Aerodrome Operator or as detailed in local instructions.
- 2.3 At aerodromes with runways, the inspection should cover the runway-in-use and those likely to be used prior to the next regular inspection, together with their associated prepared strips, clearways, stopways and appropriate taxiways.
- 2.4 At all grass aerodromes, the inspection should cover the areas likely to be used prior to the next regular inspection, together with any permanent or delineated taxiways. Where a grass area exists for landing light aircraft this area should be included in the inspection.

- 2.5 The person carrying out the inspection is not normally required to proceed outside the aerodrome boundary. They should carry out their inspection from a vehicle driven slowly over the area to be inspected, halting as necessary when individual items require closer inspection. They should report their findings in accordance with MATS Part 2.
- 2.6 In the following paragraphs 'temporary obstructions' means anything that would impede the normal movement of aircraft or infringe current aerodrome obstruction criteria.

2A. Normal Conditions

- 2A.1 A check should be made to ascertain whether or not:
- (1) the runways, stopways, clearways, taxiways and holding areas are free from obstructions, collections of loose stones, etc;
 - (2) temporary obstructions that exist on, or adjacent to, the runways or taxiways are properly marked or lighted;
 - (3) bad ground (particularly on non-runway aerodromes) is adequately marked;
 - (4) runway indicator boards, traffic signs, boundary markers, etc., are serviceable and in position.
- 2A.2 A note should be taken of the exact position of any obstruction or unserviceability observed. Any of the above conditions that are encountered should be reported to the section whose responsibility it is to deal with them.

3. Snow and Ice Conditions

- 3.1 As far as possible the checks for normal conditions should be carried out and a check should be made to ensure that:
- (1) badly rutted or frozen ground is adequately marked;
 - (2) runways and taxiways are delineated if covered with snow or ice and a note taken of the extent of sweeping and sanding carried out.
- 3.2 The measurement and reporting of snow, slush and ice conditions on runway surfaces is described in Chapter 7.
- 3.3 The responsibility for clearing, sanding, and marking will remain with the Aerodrome Operator who should maintain close liaison with ATC.

4. Aerodrome Lighting Inspections

- 4.1 The aerodrome lighting should be inspected before night flying commences. The Aerodrome Operator is responsible for aerodrome lighting inspections and full details are contained in CAP 168.

5. Reporting Action

- 5.1 Unserviceabilities or obstructions during aerodrome surface or lighting inspections should be recorded on the appropriate form or log and the information disseminated in accordance with MATS Part 2.
- 5.2 Where urgent attention is necessary, e.g. for marking, lighting or immediate repair, details should be passed to the responsible section by telephone in accordance with local arrangements.

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Section 2: Aerodrome Control

Chapter 7: Runway Surface Conditions

1. Introduction

- 1.1 The Aerodrome Operator is responsible for assessing aerodrome surface conditions and disseminating such information. However, special arrangements may be made at some aerodromes for the assessment and dissemination of aerodrome surface conditions to be delegated to the ATS unit.
- 1.2 Aeroplane performance can be considered to be impacted whenever the coverage of any water-based contaminants on any runway third exceeds 25 per cent. The ICAO's Global Reporting Format (GRF) standardises the assessment and reporting procedures to ensure that runway surface conditions impacted by any remaining contamination is communicated to aeroplane operators in a manner consistent with the effect on aeroplane performance. There are 5 fundamental elements of the methodology for the reporting and assessment of runway surface conditions; these are:
- (a) Runway Condition Report (RCR): Is used by pilots to inform their aircraft performance calculations and to provide them with situational awareness. The data contained within the RCR originate from the elements below;
 - (b) Runway Condition Assessment Matrix (RCAM): The matrix is used by the aerodrome operator's personnel conducting runway surface assessments to determine the appropriate Runway Condition Codes (RWYCC) for each third of the runway, and for pilots to decode the RWYCC into meaningful performance information (see table 4);
 - (c) Runway Condition Code (RWYCC): The RWYCC is determined through the assessment of the following aspects:
 - (i) Percentage of coverage of contamination in each runway third;
 - (ii) Type of contaminant, selected from the Runway Surface Conditions (see table 1) and Runway Surface Condition Descriptors (see table 2);
 - (iii) Depth of the contamination; and
 - (iv) Surface air temperature;
 - (d) Runway Surface Conditions (Reporting terms) (see table 1); and
 - (e) Runway Surface Condition Descriptors (see table 2).

Note 1: GRF is applicable to paved runways alone. For surface condition reporting of grass surfaces, see paragraph 4.

Note 2: In terms of information provided to pilots via RTF, only the runway condition code, runway surface conditions (using the reporting terms in table 1), and runway surface

condition descriptors (used in conjunction with contaminated runways (see table 2)) are of interest.

- 1.3 Reporting, in compliance with the runway condition report, shall commence when a significant change in runway surface condition occurs due to water, snow, slush, ice or frost. Reporting of the runway surface condition should continue to reflect significant changes until the runway is no longer contaminated. When this situation occurs, the aerodrome will issue a runway condition report that states the runway is wet or dry as appropriate.

2. Reporting Surface Conditions

- 2.1 When the presence or otherwise of surface contaminants on each third of a runway is brought to the attention of the ATS unit, this information, together with any other related information, is to be reported on the ATIS. If ATIS is not available or significant changes occur, this information must be reported by the controller to aircraft concerned in plain language on the RTF either:

- (a) individually; or
- (b) via the use of an all-stations broadcast, obtaining acknowledgement from each of the aircraft concerned.

- 2.2 It is important to consider the sequence in which the information should be transmitted, using the following reporting terms (see table 1), runway surface condition descriptors (see table 2), other related information (see table 3) and runway condition codes (see table 4) below:

Table 1:

Reporting Term	Runway Surface Conditions
DRY	The runway surface is considered dry if it is free of visible moisture and not contaminated within the area intended to be used.
WET	The runway surface is covered by any visible dampness or water up to and including 3 mm depth within the intended area of use. Note: If the surface shows a change of colour due to moisture, the runway will be reported as wet.
SLIPPERY WET	A wet runway where the surface friction characteristics of a significant portion of the runway have been determined to be degraded.
CONTAMINATED	A runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors. The term 'CONTAMINATED' is not to be used in RTF phraseology, the runway surface condition descriptors in table 2 are to be used instead.

Table 2:

Runway Surface Condition Descriptor	
COMPACTED SNOW	Snow that has been compacted into a solid mass such that aeroplanes tires, at operation pressure and loadings, will run on the surface without significant further compaction or rutting of the surface.
DRY SNOW	Snow from which a snowball cannot readily be made.
FROST	Frost consists of ice crystals formed from airborne moisture on a surface whose temperature is below freezing. Frost differs from ice in that the frost crystals grow independently and therefore have a more granular texture. Note 1: Below freezing refers to air temperature equal to or less than the freezing point of water (0°C). Note 2: Under certain conditions frost can cause the surface to become very slippery and it is then reported appropriately as reduced braking action.
ICE	Water that has frozen or compacted snow that has transitioned into ice, in cold and dry conditions. (See notes 1 & 2)
SLUSH	Snow that is so water-saturated that water will drain from it when a handful is picked up or will splatter if stepped on forcefully.
STANDING WATER	Water of depth greater than 3 mm.
WET ICE	Ice with water on top of it or ice that is melting. Note: Freezing precipitation can lead to runway conditions associated with wet ice from an aeroplane performance point of view. Wet ice can cause the surface to become very slippery. It is then reported appropriately as reduced braking action in line with procedures in the CAP 168 / PANS-Aerodromes (ICAO Doc 9981).
WET SNOW	Snow that contains enough water content to be able to make a well-compacted, solid snowball, but water will not be squeezed out.

Note 1: In providing information on runway surface conditions, many of the terms described in Table 2 may be used in combination as follows: DRY SNOW ON TOP OF COMPACTED SNOW, DRY SNOW ON TOP OF ICE, WATER ON TOP OF COMPACTED SNOW, WET SNOW ON TOP OF COMPACTED SNOW and WET SNOW ON TOP OF ICE.

Note 2: Descriptions of surface contamination will include, where applicable, the depth of deposit.

Table 3:

Other related information
<p>For example, provide details of any:</p> <ul style="list-style-type: none"> • runway de-icing activity that has taken place, such as chemical treatment or sanding; • snowbanks on the runway giving the distance left/right from the runway centreline; and • frozen ruts and ridges.

2.3 When reported, the presence or otherwise of contaminants on the surface of a runway will be assessed over the most significant portion of the runway, i.e. the area most likely to be used by aircraft taking-off and landing. The assessed area may be different on runways with a displaced threshold or other unusual configuration, e.g. starter extension. The Aerodrome Operator is responsible for determining the exact dimensions and location of the area that is assessed.

2.4 Reports of the runway condition, to be used on ATIS or RTF for each third shall be given in the direction of take-off or landing. Associated phraseology is contained within CAP 413.

2.5 Information on the runway surface condition shall include the aerodrome location, the date and time of assessment and the runway-in-use designator followed as applicable by the elements below. Associated phraseology is contained within CAP 413.

- (a) RWYCC for each runway third;
- (b) type of contaminant;
- (c) depth of contaminant;
- (d) percentage coverage of contaminant;
- (e) available width and/or length; and
- (f) other related information.

3. Pilot Reports

3.1 Pilot reports of braking action are to be passed to the Aerodrome Operator as soon as practicable. Such reports enable the Aerodrome Operator to consider reassessing the RWYCC in accordance with the RCAM below:

Table 4:

Runway Condition Assessment Matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway Condition code	Runway surface description	Aeroplane deceleration or direction control observation	Pilot report of runway braking action
6	<ul style="list-style-type: none"> • DRY 	---	---
5	<ul style="list-style-type: none"> • FROST • WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth) <p>Up to and including 3 mm depth:</p> <ul style="list-style-type: none"> • SLUSH • DRY SNOW • WET SNOW 	Braking deceleration is normal for the wheel braking effort applied and direction control is normal	GOOD
4	<p>-15°C and colder outside air temperature:</p> <ul style="list-style-type: none"> • COMPACTED SNOW 	Braking deceleration OR directional control is between Good and Medium	GOOD to MEDIUM
3	<ul style="list-style-type: none"> • WET ("slippery wet" runway) • DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW <p>More than 3 mm depth:</p> <ul style="list-style-type: none"> • DRY SNOW • WET SNOW <p>Warmer than -15°C outside air temperature:</p> <ul style="list-style-type: none"> • COMPACTED SNOW 	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<p>More than 3 mm depth of water or slush:</p> <ul style="list-style-type: none"> • STANDING WATER • SLUSH 	Braking deceleration OR Directional control is between Medium and Poor.	MEDIUM to POOR

Runway Condition Assessment Matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway Condition code	Runway surface description	Aeroplane deceleration or direction control observation	Pilot report of runway braking action
1	<ul style="list-style-type: none"> ICE 	Braking deceleration is significantly reduced for the wheel braking effort applied OR Directional control is significantly reduced.	POOR
0	<ul style="list-style-type: none"> WET ICE WATER ON TOP OF COMPACTED SNOW DRY SNOW or WET SNOW ON TOP OF ICE 	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

Note 1: Runway surface temperature should preferably be used where available.

Note 2: The aerodrome operator may assign a higher RWYCC (but not greater than RWYCC 3) for each third of the runway, provided the specific procedure is followed.

4. Grass surfaces

- 4.1 In reporting the surface condition of a grass runway, the report relates to the whole of the surface, and not to individual thirds. When the surface condition of a grass runway or grass taxiway is assessed as being WET or CONTAMINATED, then its condition, together with any other related information, is to be reported on the RTF to each aircraft concerned and, where appropriate, on the ATIS, in plain language using the description contained in tables 1, 2 and 3. A RWYCC is not to be passed.

5. Unofficial observations

- 5.1 Pilots of aircraft may report, or observations from the visual room may indicate, that the amount of contaminant water present or runway surface condition is different from that being reported. Under no circumstances is a controller to pass pilot's information which suggests that the runway surface condition is better than the

official report. However, when a pilot's report or an observation from the visual room indicates a worse runway surface condition, this information is to be passed.

- 5.2 Unofficial observations from the visual control room or pilot reports are to be prefixed by the words "Unofficial observation". In this case, the runway surface conditions will be advised using a single term for the entire runway.
- 5.3 Pilot reports are also to be passed to the Aerodrome Operator for action as soon as practicable.

6. Runway Drainage System

- 6.1 The Aerodrome Operator should be notified immediately it is suspected that abnormal conditions may be due to obstruction of the runway draining system.

7. Runway Surface Condition Reporting

- 7.1 It is CAA policy that Continuous Friction Measuring Equipment (CFME) should not be used on runways contaminated with wet snow, slush or water, and controllers must not pass runway co-efficient of friction measurements to pilots in such conditions. The reason for this is that readings obtained from CFME equipment such as 'Griptester' and 'Mu-meter', unless used only on compacted snow and ice, are considered unreliable and in some cases may indicate a surface condition that is better than the actual condition. UK runways contaminated with compacted snow and ice are not normally made available for use, with Aerodrome Operators applying a 'back to blacktop' policy.
- 7.2 Further details of the UK Snow Plan and procedures for dealing with winter contamination of aerodrome surfaces can be found in UK Reg (EU) No. 139/2014 ADR.OPS.B.035 Operations in winter conditions, CAP 168 Licensing of Aerodromes Appendix 3D and UK AIP (AD) section.

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Section 3: Approach Control

Chapter 1: Approach Control

1. Provision of Services

- 1.1 Approach Control Services within the UK FIRs comprise surveillance and non-surveillance based ATS. The type of ATS to be provided depends on the classification of airspace within which the aircraft is flying as tabulated below:

Table 1:

Class	Service Provided	Remarks
A, C & D	Air Traffic Control Service with or without surveillance; and Alerting Service.	Aircraft are required to comply with air traffic control instructions.
E	Air Traffic Control Service with or without surveillance to IFR flights and Alerting service; and Traffic Service or Basic Service and Alerting Service provided to participating VFR flights.	Participating VFR flights shall not be provided with an Air Traffic Control Service, but UK FIS in accordance with CAP 774 – UK Flight Information Services.
G	Procedural Service; or Deconfliction Service; or Traffic Service; or Basic Service; and Alerting Service.	Participating flights receive UK FIS in accordance with CAP 774 – UK Flight Information Services.

- 1.2 An Approach Control unit may be combined with an Aerodrome Control unit or a Zone Control unit. Alternatively, an Approach Control unit may share the Zone Control function with an Area Control unit.

1A. Within Controlled Airspace

- 1A.1 An Approach Control unit at an aerodrome within controlled airspace shall provide ATC Services to aircraft, according to the classification of the airspace within which the aerodrome is located, from the time and place at which:

- (1) arriving aircraft are released by Area Control until control is transferred to Aerodrome Control;
- (2) aircraft approaching from outside controlled airspace place themselves under the control of Approach Control until control is transferred to Aerodrome Control;
- (3) departing aircraft are taken over from Aerodrome Control until:
 - (a) they are transferred to Area Control; or
 - (b) they are clear of controlled airspace.
- (4) overflying aircraft are within the relevant controlled airspace.

- 1A.2 Approach Control shall provide standard separation between Special VFR and IFR flights and between Special VFR flights unless the CAA has approved a reduced separation.
- 1A.3 Participating VFR flights in Class E airspace shall, subject to controller workload, be provided with either Traffic Service or Basic Service in accordance with CAP 774 – UK Flight Information Services.

1B. Outside Controlled Airspace

- 1B.1 An Approach Control unit at an aerodrome outside controlled airspace shall provide ATS to aircraft, as determined by the Aerodrome Operator and approved by the CAA, from the time and place at which:
- (1) arriving aircraft place themselves under the control of Approach Control until control is transferred to Aerodrome Control;
 - (2) departing aircraft are taken over from Aerodrome Control until they no longer wish to receive a service or are 10 minutes flying time away from the aerodrome, whichever is the sooner;
 - (3) overflying aircraft place themselves under the control of Approach Control until they are clear of the approach pattern and either no longer wish to receive a service or are 10 minutes flying time away from the aerodrome, whichever is the sooner.
- 1B.2 Aircraft within an ATZ are required to comply with instructions from the ATC unit. Although IFR/VFR flight within Class F/G airspace outside the ATZ is permitted without an ATC clearance, controllers will act on the basis that pilots will comply fully with their instructions in order to promote a safer operating environment for all airspace users.

2. Information to Aircraft

2A. Flight Information

- 2A.1 Approach Control shall provide flight information to aircraft under its control; in particular any failure or irregular functioning of the aerodrome lighting system or approach aid.

3. Information to Other Units

3A. Aerodrome Control

- 3A.1 Approach Control shall supply the following information to Aerodrome Control:
- (1) Pertinent data on all relevant flights including the type of flight, i.e. IFR or VFR, level of arriving aircraft and ETA;
 - (2) The anticipated order in which control of aircraft is to be transferred;

- (3) The anticipated delay to departing IFR flights together with the reason for the delay.

3B. Approach Surveillance Control

3B.1 The approach controller shall supply to the approach surveillance controller, as required, the current weather report (including RVR) and any other significant information, e.g. aerodrome and lighting unserviceabilities, runway changes etc.

3C. Area Control

3C.1 Approach Control shall supply to Area Control the following data on IFR flights:

- (1) Lowest level at the holding facility available for use by Area Control;
- (2) The average time interval between successive approaches;
- (3) Revision of expected approach times issued by Area Control when Approach Control calculations show a variation of 5 minutes or more;
- (4) Arrival times over the holding point if these vary from the estimate by 3 minutes or more;
- (5) Missed approaches when re-routeing is entailed, in order that the subsequent action may be coordinated;
- (6) Departure times of aircraft;
- (7) All available information relating to overdue aircraft.

3C.2 Any of these items can be deleted from routine practice by agreement with Area Control.

4. Co-ordination

4A. Aerodrome Control

4A.1 Approach Control shall co-ordinate with Aerodrome Control:

- (1) Aircraft approaching to land, if necessary requesting clearance to land;
- (2) Arriving aircraft which are to be cleared to visual holding points;
- (3) Aircraft routeing through the traffic circuit.

4A.2 Aerodrome Control shall co-ordinate with Approach Control:

- (1) Departing IFR flights;
- (2) Arriving aircraft which make their first call on the tower frequency (unless they are transferred to Approach Control).

4B. Area Control

- 4B.1 Area Control shall co-ordinate with Approach Control an arriving aircraft which is to be cleared to an aerodrome holding facility or a visual holding point, instead of the normal holding facility.

5. Transfer of Control

5A. Aerodrome Control

- 5A.1 IFR flights operating with visual reference to the surface may be transferred by Approach Control to Aerodrome Control in the following circumstances:
- (1) When an aircraft carrying out an instrument approach has become 'number 1 to land', and for following aircraft when they are established on final approach and have been provided with the appropriate separation from preceding aircraft;
 - (2) Aircraft operating in the traffic circuit;
 - (3) Aircraft approaching visually below all cloud when the reported aerodrome visibility is 10 km or more. When the reported visibility consists of two values, the lower of the two values shall be used when determining whether an aircraft may be transferred to Aerodrome Control.
- 5A.3 In the case of 2 and 3 the volume of traffic and Aerodrome Control workload must be such as to allow the use of one of the reduced separations permitted in the vicinity of aerodromes. In order to clear other aircraft to descend through the cloud formation it will be necessary for the aircraft approaching underneath to be kept more than 1,000 ft below all cloud, or for horizontal separation to be provided.

6. Delegation

6A. Approach Surveillance Control

- 6A.1 Approach Control may delegate to Approach Surveillance Control its functions for any aircraft according to circumstances. Before an aircraft is controlled or monitored by Approach Surveillance Control the following information must be supplied:
- (1) Callsign, type, level, route, ETA (or position) and frequency;
 - (2) Expected approach time, if appropriate;
 - (3) Service required;
 - (4) Release and contact instructions issued by Area Control;
 - (5) Information on conflicting traffic;
 - (6) Actual time of departure of outbound aircraft.
- 6A.2 Approach Control may delegate the responsibility for co-ordination to Approach Surveillance Control.

6B. Aerodrome Control

- 6B.1 At certain aerodromes, authority may be granted to Approach Control to delegate its functions to Aerodrome Control for certain categories of IFR flights, operating in the vicinity of the aerodrome, providing the aerodrome controller holds an Approach Control rating valid for that aerodrome. Details of the extent of the permitted delegation will be published in MATS Part 2.

7. Transfer of Communication

7A. Aerodrome Control

- 7A.1 Approach Control may instruct IFR flights to establish communication with Aerodrome Control (for the purpose of obtaining landing clearance and essential aerodrome information) when the aircraft has become number one to approach and, for following aircraft, when they are established on final approach and have been provided with appropriate separation. Until such aircraft are flying with visual reference to the surface the responsibility for separation between them shall remain with Approach Control. Aerodrome Control shall not issue any instructions or advice that would reduce the separation established by Approach Control.

8. VFR Flights

- 8.1 Approach Control shall retain all arriving VFR flights under its control until appropriate traffic information on IFR flights and other VFR flights has been issued and co-ordination effected with Aerodrome Control.
- 8.2 A particular watch should be kept for situations where a VFR flight may approach the aerodrome in a sector in which other aircraft are letting down on an instrument approach aid, or where sequencing is in operation. D/F indications, where available, will assist in this respect. In these circumstances the pilot of the VFR flight should not be given clearance for a straight-in approach and should be advised to avoid the initial and final approach areas.
- 8.3 Approach Control must ensure that VFR flights are transferred in sufficient time for Aerodrome Control to pass additional information in respect of local traffic.
- 8.4 Visual Reference Points (VRPs) are established to assist ATC in routeing VFR traffic and to integrate VFR flights with IFR flights. Where VRPs are established outside controlled airspace, controllers should not instruct aircraft to hold over such VRPs. This does not apply to VRPs established within controlled airspace where a known traffic environment exists. Controllers should not direct VFR traffic over VRPs unless the IFR traffic situation specifically demands this.
- 8.5 When the reported meteorological conditions at aerodromes in Class D airspace reduce below a ground visibility of 5 km and/or a cloud ceiling 1500 ft, both by day or night, ATC shall advise pilots of aircraft intending to operate under VFR to or from such aerodromes and request the pilot to specify the type of clearance required.

8.6 Except for helicopters using Police; Helimed; Rescue; Electricity; Grid; Powerline, or Pipeline callsigns, or an SAR training flight operating in accordance with MATS Part 2, or rail track inspection flights, controllers shall not issue any further VFR clearances to aircraft wishing to operate in accordance with VFR to or from an aerodrome, or enter the aerodrome traffic zone, or aerodrome traffic circuit, of an aerodrome within Class D airspace when the official meteorological report at that aerodrome indicates, by day or night, a ground visibility less than 5 km and/or a cloud ceiling less than 1500 ft (SERA.5005(b)(1)&(2)).

Note 1: UK General Permission ORS4 No. 1477 permits VFR flight at night.

Note 2: UK General Exemption ORS4 No. 1576 exempts operations of helicopters conducting Police; HEMS; Search and Rescue (SAR) flights, including SAR training flights operating in accordance with a Letter of Agreement with the Air Traffic Service Provider, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 3: UK General Exemption ORS4 No. 1577 exempts operations of helicopters conducting powerline, Pipeline and rail track inspection flights, from complying with SERA.5005(b) and SERA.5010(b), and air traffic control units from complying with SERA.5005(b) and SERA.5010(c) when controlling such flights.

Note 4: For the purpose of observing the meteorological conditions at an uncontrolled and/or unlicensed aerodrome or operating site located within a control zone, and assessing whether those conditions satisfy the minima specified in SERA.5005(b) and SERA.5010(c) as appropriate, the Civil Aviation Authority deems the following to be competent to act as 'accredited observers' as required within UK Reg (EU) No. 923/2012 Article 2(82) for their flight:

- (a) The holders of valid EASA Flight Crew Licences, valid National Flight Crew Licences and Certificates issued by, or on behalf of, the United Kingdom Civil Aviation Authority, and third country licences deemed valid in accordance with Article 150 of the Air Navigation Order 2016; and
- (b) A student pilot-in-command (SPIC) who has passed the theoretical knowledge examination in meteorology toward the grant of an EASA Flight Crew Licence or National Flight Crew Licence or Certificate issued by, or on behalf of, the United Kingdom Civil Aviation Authority within the preceding two years.

8.7 When the ground visibility consists of two values, the lower of the two values shall be used when determining whether to implement the above procedures.

8.8 Procedures for operations into subsidiary aerodromes will be found in MATS Part 2.

9. Arriving Aircraft

9A. Terrain Clearance

- 9A.1 The assigned level in initial clearances to arriving aircraft should normally not be below the appropriate minimum sector altitude or, if this is not known, the highest minimum sector altitude. If a pilot is flying at, or has requested, a lower level or has confirmed that they are in a position to accept an ATC clearance at a lower level; a reminder of the highest sector altitude should be issued.
- 9A.2 This instruction does not apply where altitudes to be assigned on particular routes have been specifically approved by the CAA.
- 9A.3 If a clearance is to be relayed to an arriving aircraft by personnel providing a FIS at an ACC, the approach controller shall include the minimum sector altitude in the clearance message passed to them.

9B. Released from Area Control

- 9B.1 Area Control shall pass estimates on and release inbound aircraft to Approach Control.
- 9B.2 Inbound estimates shall be passed at least 15 minutes prior to the arrival of the aircraft at the designated approach fix.
- 9B.3 Release messages shall be passed to Approach Control in a timely manner as specified in MATS Part 2 and shall contain the following:
- (1) Aircraft identity, type and SSR code (if applicable);
 - (2) Point of departure;
 - (3) Release point;
 - (4) Estimated time and level at the holding facility, or arrival time and level at the holding facility if the release is given after arrival;
 - (5) Expected Approach Time;
 - (6) Contact point.
- 9B.4 Area Control shall clear arriving aircraft to the holding facility if the flight is remaining within airspace Classes A to F, give instructions to hold if necessary and include an EAT in the clearance.
- 9B.5 Approach Control may issue any instructions to an aircraft released to it by Area Control. However, that aircraft must not be instructed to climb above, or stop its descent to, the level at the holding point agreed with Area Control and passed in the release message, without prior co- ordination with Area Control.
- 9B.6 Unless approved by the CAA, Area Control shall not release arriving aircraft to Approach Control at FL195 or above. When such procedures are approved by the

CAA, MATS Part 2 shall include details of the area in which aircraft may be released and the full details of the conditions under which the procedures may be used.

- 9B.7 After co-ordination with Approach Control, Area Control may clear an arriving aircraft to an aerodrome facility, or to a visual holding point, instead of the normal holding facility.

9C. Radar Releases

- 9C.1 It should be noted that when an aircraft is the subject of a 'radar release' the approach controller shall not control it until the approach radar controller reports that it is clear of the conflicting traffic.

9D. Aerodrome Operating Minima

- 9D.1 Aerodrome Operating Minima are criteria used by pilots to determine whether they may land or take off from any runway at night or in IMC. Aerodrome Operating Minima in relation to take offs are the RVR and/or visibility, and if necessary, cloud conditions. For approach and landings, the Aerodrome Operating Minima consist of the decision height or minimum descent height, RVR and or visibility, and, if necessary, cloud conditions, as applicable for the type of approach.

- 9D.2 Aerodrome Operating Minima vary depending on:

- (1) the type of aircraft and its navigation equipment;
- (2) flight crew composition, competence, experience, and flight techniques used;
- (3) runway dimensions and characteristics;
- (4) availability and performance of visual and non-visual ground aids;
- (5) obstacles in the approach, missed approach, and climb out areas;
- (6) the obstacle clearance height for the instrument procedures;
- (7) the means to determine and report meteorological conditions; and
- (8) special provisions pertinent to low visibility procedures.

- 9D.3 Controllers are not responsible for determining, passing or enforcing a pilot's Aerodrome Operating Minima. However, in accordance with Section 6 Chapter 3, controllers should report any occurrence which they consider has endangered, or if not corrected would have endangered an aircraft, its occupants, or any other person.

9E. Information to Aircraft

- 9E.1 Except where an ATIS is employed as described at paragraph 11.7, after an arriving aircraft has placed itself under the control of Approach Control, the following information shall be passed as soon as practicable:

- (1) Runway in use;

- (2) Current meteorological information together with the time of observation:
 - (a) Surface wind direction (in degrees magnetic) and speed. The maximum wind speed should be included if it is 10 knots or more greater than the mean speed and the extremes in direction when the variation is 60 degrees or more and the mean speed exceeds 3 knots. Controllers should note that anemometers indicate magnetic direction but meteorological reports give wind direction in degrees true;
 - (b) Visibility;
 - (c) Present weather;
 - (d) Significant cloud amount and height of base;
 - (e) The appropriate barometric pressure setting as described in Section 1;
 - (f) Relevant information reported by pilots of other aircraft, e.g. vertical wind shear, severe icing, severe turbulence;
 - (g) Significant meteorological information, e.g. thunderstorms, hail;
 - (h) Warnings of marked temperature inversion;
 - (i) Any other relevant information;
 - (j) RVR according to the procedures in Chapter 3.

Note: This information may be reduced to items (a), (e) and (f) when aircraft are below cloud flying in VMC and able to continue VMC to the landing;

- (3) Current runway surface conditions when appropriate;
- (4) Any changes in the operational status of visual and non-visual aids essential for approach and landing;
- (5) LVP in operation.

9E.2 Aircraft which have received the information above must be kept informed of the following until they have landed:

- (1) Significant changes in the meteorological and runway conditions;
- (2) Further reports from other pilots;
- (3) Further changes in the operational status of approach and landing aids;
- (4) Implementation or cancellation of LVP.

9F. Self-positioning of Aircraft

9F.1 Controllers should exercise caution when approving self-positioning to final approach and are not to initiate reference to the 'Centrefix' or other locally used term.

- 9F.2 If controllers are in any doubt about the location of the 'Centrefix' or other position referred to by a pilot, they are to ask the pilot to define this position and take this definition into consideration when carrying out their controlling duties.

10. Transmission of Meteorological Information

- 10.1 When controllers receive requests for meteorological information from pilots, they must ensure that the information supplied conforms to the request, e.g. a report should not be given in place of a forecast.
- 10.2 As a general rule, controllers shall only transmit meteorological information that has been supplied, or agreed, by the Meteorological Office. The exceptions are:
- (1) Indicated wind direction (degrees magnetic) and speed when anemometer indicators are fitted in the control room;
 - (2) RVR observations;
 - (3) Sudden or unexpected deteriorations which, in the interests of safety, a controller considers it advisable to warn aircraft of immediately and consult with the Meteorological Office afterwards;
 - (4) Information from an aircraft in flight may be passed to other aircraft when a controller considers that it may be useful to them. Whenever this is done the controller shall state that the information originated from an aircraft in flight and the time at which the observation was made. Aircraft reports of meteorological conditions that affect safety, e.g. severe icing or severe turbulence, shall always be passed to other aircraft likely to be affected. Information on severe icing and/or severe turbulence is to be communicated as soon as possible to the duty meteorological forecaster who will decide whether the conditions warrant the issue of a special report;
 - (5) Cloud echoes observed on the situation display. The use of ATS surveillance systems for reporting and avoiding weather is described in Section 1, Chapter 6;
 - (6) Observations made at aerodromes by ATS staff who hold a meteorological observer certificate;
 - (7) Observations made at aerodromes without accredited observers (Meteorological Office staff or MET certificated ATS personnel) are not regarded as official reports. If transmitted to aircraft or disseminated beyond the aerodrome, the message must be prefixed by:

"Unofficial observation from (name of aerodrome) at (time) UTC gives (observation)".
- 10.3 Observations of visibility and RVR passed to aircraft making an approach to land when the visibility is less than 1500 m shall be recorded. Records shall be made available to the CAA on request.

- 10.4 SIGMET messages should be relayed with the least possible delay to all aircraft likely to be affected, but without prejudice to the control of aircraft in flight.
- 10.5 Meteorological information supplied by a Meteorological Office is described in Section 7.

11. ATIS

- 11.1 The ATIS message is intended to provide pilots with a range of information to enable them to make a definite decision about their approach and landing or take-off. The ATIS message is transmitted on a published VHF broadcast frequency or selected VORs therefore reducing RTF loading. The message should, whenever practicable, not exceed 30 seconds.
- 11.2 If a departure ATIS is installed it may only be used by aircraft on the ground as the frequency has limited range protection. Combined arrival/ departure ATIS facilities have a greater frequency protection and so may be used both on the ground and in the air.
- 11.3 Each message is to be consecutively coded using the phonetic alphabet. A new message is to be broadcast whenever there is a significant change in any of the items comprising the message and controllers must pass such changes to pilots on the RTF until the new ATIS message is being transmitted and has been acknowledged. All altimeter settings transmitted in the broadcast must be individually identified.
- 11.4 When rapidly changing weather conditions make it impracticable to include weather reports in the broadcast the ATIS message is to indicate that the information will be passed on the RTF.
- 11.5 In the case of a departure ATIS, controllers must obtain a read-back of all relevant altimeter settings contained in the broadcast, unless the setting will also be passed in association with start-up or taxi clearance.
- 11.6 Except where the broadcast includes a specific request to do so, pilots of departing aircraft need not acknowledge receipt of an ATIS message.
- 11.7 Pilots of arriving aircraft are required to acknowledge receipt of the ATIS message on initial contact with Approach Control using the code letter allocated to the message. If a non-current code letter is used, or if receipt of ATIS is not acknowledged, Approach Control must pass the complete Information to Aircraft detailed in paragraph 9E.1.
- 11.8 Comprehensive requirements for ATIS, including message elements, can be found in CAP 670 ATS Safety Requirements.

12. Visual Approach

- 12.1 To expedite traffic at any time, IFR flights, either within or outside controlled airspace, may be authorised to execute visual approaches if the pilot reports that visual reference to the surface can be maintained and:

- (1) the reported cloud ceiling is at or above the level of the beginning of the initial approach segment; or
 - (2) the pilot reports at any time after commencing the approach procedure that the visibility will permit a visual approach and landing, and a reasonable assurance exists that this can be accomplished.
- 12.2 Controllers shall not clear an aircraft for a visual approach when the RVR is less than 800 m. If a pilot requests a visual approach when the RVR is less than 800 m, controllers shall inform the pilot that this type of approach is unavailable and request the pilot's intentions.
- Note:** Where IRVR systems are employed, the touchdown value is used to trigger the above procedure. Transmissometer unserviceability and the impact on ATC procedures are detailed at Section 3 Chapter 3.
- 12.3 Within controlled airspace, standard separation shall be effected between such aircraft and other IFR and/or Special VFR aircraft.
- 12.4 Outside controlled airspace, IFR flights in receipt of any of the UK FIS may be authorised to conduct a visual approach. Responsibility for the provision of deconfliction advice and traffic information continues to be dictated solely by the service being provided. Continued ATS provision is subject to the following:
- (1) Procedural Service. There is no requirement for controllers to change the level of service provided;
 - (2) Deconfliction Service. When flights carrying out visual approaches descend below the unit's terrain safe level, controllers shall not provide Deconfliction Service, and should instead provide a Traffic Service;
 - (3) Traffic Service. Subject to maintenance of surveillance identity, there is no requirement to change the level of service provided;
 - (4) Basic Service. There is no requirement to change the level of service required.
- 12.5 Where IFR flights are authorised to make a visual approach, pilots are to be informed of any recommended wake turbulence separation minima.
- 12.6 Controllers shall exercise caution in initiating a visual approach when there is reason to believe that the flight crew concerned is not familiar with the aerodrome and its surrounding terrain.

13. Instrument Approaches

- 13.1 Official instrument approach procedures are notified by the CAA. Pilots are normally expected to be conversant with these procedures, but in exceptional circumstances a pilot may request the information. When this request is made, or it is apparent that the pilot is not conversant with these procedures, the following information is to be transmitted.
- (1) On initial contact:

- (a) “This is the approach procedure for (aid) for category A aircraft. Final approach track (degrees)”;
 - (b) Arrival level (if necessary);
 - (c) Type of reversal manoeuvre including outbound track, length in time or distance, level instructions and direction of procedure turn where applicable.
- (2) When aircraft commences final reversal: intermediate and final approach track, intermediate and final approach fixes together with level instructions, stepdown fixes and OCH;
- (3) Missed approach point and missed approach procedure (when required).
- 13.2 Items (1)(b) and (1)(c) may be omitted for straight-in approaches.
- 13.3 If the pilot is copying down the information the whole procedure can be passed in one message.
- 13.4 Even if visual reference to the ground is established before completion of the approach procedure, the pilot will normally complete the whole procedure. However, a pilot may request, and a controller may subsequently clear an aircraft for a visual approach, which enables the pilot to break-off the instrument procedure whilst carrying out the visual approach. Separation from other traffic is to be provided unless the pilot cancels their IFR plan.

14. Holding Procedures

- 14.1 Holding shall be accomplished in accordance with notified procedures. If the notified entry and holding procedures are not known to the pilot, the appropriate ATC unit shall describe the procedures to be followed.
- 14.2 Levels at holding facilities shall be assigned so as to permit aircraft to approach in their correct order. Normally the first aircraft to arrive over a holding facility should be at the lowest level with following aircraft at successively higher levels.
- 14.3 Departure times of aircraft from the holding facility shall be based on the desired time interval between aircraft landing. If the weather conditions are such that the pilot may encounter difficulty in completing the landing, the time interval may be increased to allow the first aircraft to land before the second aircraft commences descent of final approach.
- 14.4 If a pilot advises that it is not possible to comply with Approach Control holding or communication procedures, alternative procedures requested by the pilot should be approved if traffic conditions permit.

15. Approach Sequence

- 15.1 The approach sequence shall be established in a manner which will facilitate arrival of the maximum number of aircraft with the least delay. However, priority in the approach sequence is to be given to certain aircraft as indicated in Section 1.

- 15.2 When airborne holding is needed and the delay is expected to be less than that requiring the issue of EATs, controllers shall explicitly instruct pilots to hold (at the required exact reporting point) and provide the pilot with an estimate of the delay.
- 15.3 When EATs are required, they shall be passed sufficiently in advance to permit pilots to arrange their flight paths accordingly.
- 15.4 The first aircraft will descend from the lowest level of the holding stack and commence approach when instructed.
- 15.5 The second aircraft in the approach sequence may be instructed to descend to the level previously occupied by the first aircraft, after the first aircraft has reported vacating it. If, however, severe turbulence is known to exist, the instruction shall be withheld until the first aircraft has reported at least 1,000 ft below the vacated level.
- 15.6 The second aircraft may be instructed to leave the holding facility and descend for approach when the required separation has been established between it and the preceding aircraft and reasonable assurance exists that a normal landing can be accomplished.

16. Expected Approach Time

- 16.1 Approach Control shall calculate EATs for aircraft likely to be delayed before commencing an intermediate approach.
- 16.2 Unless otherwise instructed controllers shall pass EATs to aircraft with whom they are in contact. EATs shall not normally be issued when the delay is expected to be less than 20 minutes. The statement “no delay expected” is only to be used if it genuinely reflects the situation. However, at the request of a pilot, controllers are to give a general indication of the likely delay based on the information available at that time.

17. Holding for Weather Improvement

- 17.1 Pilots of arriving aircraft may elect to hold for the weather to improve. In addition to passing routine weather reports, controllers are to advise pilots of other relevant meteorological information.
- 17.2 The first aircraft to enter the holding pattern is to be advised, “no traffic delay expected”. No instruction to leave the holding facility shall be given until the pilot indicates their intention to attempt a landing.
- 17.3 Subsequent aircraft entering the holding pattern shall be advised “delay not determined (number) aircraft holding for weather improvement”. Controllers should establish the intention of any pilot if it has not already been stated.
- 17.4 When a pilot wishes to make an approach, they are to be provided with routeing instructions to enable the pilot to descend clear of other traffic and return to the holding facility above other aircraft which have elected to make an approach. In addition, the pilot is to be given an expected approach time relative to those aircraft and will take their place in the normal landing sequence.

- 17.5 If aircraft are making approaches in poor weather conditions the possibility of missed approaches shall be considered. The lowest holding level at a convenient holding facility shall normally be kept vacant for such eventualities.

18. Diversions

- 18.1 Where marginal weather conditions exist or where the need for diversions is likely to arise due to the state of the aerodrome, traffic density, or for any other reason, controllers at aerodromes are to maintain the closest liaison with operating companies and the supervisor at the parent ACC. They shall pass, as often as necessary, the latest pertinent information so that diversions may be anticipated and not interrupt the smooth flow of air traffic.
- 18.2 When the need does arise, the controller concerned is to take the following action:
- (1) Hold the aircraft in the vicinity of the aerodrome;
 - (2) Advise the ACC Watch Supervisor by telephone of the aerodrome selected for diversion, or if none selected, seek the ACC Watch Supervisor's advice as to the one most suitable;
 - (3) Obtain clearance instructions together with any other instructions to be passed to aircraft;
 - (4) Pass diversion messages to aircraft;
 - (5) If required, pass alternate aerodrome weather report;
 - (6) Advise the operating company or nominated addressee in accordance with the instructions in Section 1.

19. Aerodromes Receiving Diversions

- 19.1 When a controller is informed that aircraft are about to divert to their aerodrome, the controller shall ensure that full details are passed to the Aerodrome Operator.
- 19.2 After a diverted aircraft has landed an arrival signal shall be sent to:
- (1) the aerodrome of departure;
 - (2) the point of first intended landing;
 - (3) the ACCs serving the original planned route;
 - (4) LTCC Route charges section (EGTTYTYR).
- 19.3 At aerodromes not open on a 24-hour basis, close liaison shall be maintained with the Aerodrome Operator and the parent ACC before watch is closed, if it is known that diversions are likely to be received. Details of the procedures for arranging extensions of watch will be agreed with the Aerodrome Operator and published in MATS Part 2.

20. Departing Aircraft

- 20.1 ATC clearances issued by Approach Control shall specify any or all of the following:
- (1) Turn after take-off;
 - (2) Track to make good before turning on to desired heading;
 - (3) Initial level to fly;
 - (4) Time, point, and/or rate at which changes of level are made.
- 20.2 A clearance expiry time determined by Approach Control, when considering its own traffic, must not be later than that issued by Area Control.
- 20.3 Outbound clearances issued by Area Control to Approach Control may not take into account the need for separation from any inbound aircraft that have passed the release point. This responsibility rests with Approach Control.
- 20.4 Outbound clearances issued before inbound aircraft pass the release point shall take into account the need for separation of traffic except in cases where separation is automatically ensured by the use of fixed operating procedures, e.g. SIDs, standing agreements, or the outbound clearance is qualified by a “Release subject your discretion” (RSYD) restriction.
- 20.5 An RSYD restriction is intended to facilitate the overall expedition of traffic where Approach Control procedures may offer a more expeditious resolution of the confliction than Area Control procedures. In accepting an RSYD clearance the approach controller accepts the responsibility for the provision of separation between the outbound aircraft and the conflicting inbound or overflying aircraft. Before clearing the outbound aircraft for departure, the approach controller must ensure that:
- (1) they have received the release message on the inbound aircraft or full details of the overflying aircraft;
 - (2) they can provide the required separation.
 - (3) before the outbound aircraft is transferred to Area Control the conflictions must have been resolved or co-ordination effected.
- 20.6 Pilots of all aircraft flying instrument departures are required, on first contact, to inform the approach/approach surveillance controller of their callsign, SID designator (if appropriate), current or passing level and their cleared level. If the SID involves a stepped climb profile then the initial altitude/flight level to which the aircraft is climbing will be given. If the pilot does not provide the cleared level then controllers shall, without delay, either confirm that the crew are climbing to the correct initial level or clear the aircraft to climb to a higher altitude or flight level.

21. Joining and Overflying Aircraft

- 21.1 When an aircraft requests permission to enter controlled airspace for the purposes of landing at the associated aerodrome or transiting the airspace, it may not be possible, for traffic reasons, to issue that clearance immediately. In such situations controllers shall advise the pilot to remain outside controlled airspace, when to expect clearance and give a time check.

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Section 3: Approach Control

Chapter 2: Approach Surveillance

1. Area of Responsibility

- 1.1 The area within which Approach Surveillance Services are provided by an Approach Surveillance Control unit is determined by a number of factors, including the coverage of ATS surveillance systems and requires approval by the CAA.

2. Services

- 2.1 The service provided depends on the type of airspace within which the aircraft is operating as described below:
- (1) Within controlled airspace – Radar Control Service;
 - (2) Outside controlled airspace – Procedural Service, Deconfliction Service, Traffic Service, or Basic Service.
- 2.2 The extent of the ATS surveillance service which an Approach Surveillance Control unit may provide will depend on the type of ATS surveillance system and the operational procedures that have been approved by the CAA. These are described in MATS Part 2 and may include:
- (1) Surveillance Radar Approaches;
 - (2) Vectoring/sequencing to a pilot interpreted final approach aid;
 - (3) Flightpath monitoring of approaches utilising a pilot interpreted final approach aid;
 - (4) ATS surveillance services to departing aircraft;
 - (5) ATS surveillance services to transit aircraft, through an area for which Approach Radar Control is responsible.
- 2.3 Certain ATS surveillance systems are not suitable for providing separation to other aircraft when radar approaches are being given.

3. Co-ordination

- 3.1 Approach Surveillance controllers may be required to co-ordinate flights directly with Aerodrome Control and Area Control units.
- 3.2 Detailed co-ordination procedures are described in MATS Part 2.

4. Control of Inbound Aircraft

- 4.1 An approach surveillance controller shall not take control of an inbound aircraft unless:

- (1) it has been transferred to the approach surveillance controller by the approach controller; or
- (2) it is the subject of a 'radar release' from Area Control.

5. Inbound Aircraft – Provision of Weather Information

- 5.1 As early as practicable in the procedure, the approach surveillance controller shall transmit the latest weather observations to aircraft on radar approaches, except when this information has already been passed by Approach/Aerodrome Control, or the pilot indicates that the latest ATIS broadcast has been received.
- 5.2 Whilst the aircraft remains under the jurisdiction of the approach surveillance controller any revised or additional information must be passed to the pilot.

6. Altimeter Setting

- 6.1 Aircraft are to be given the QNH before commencing final approach. Aerodrome and threshold elevations shall be available on request.
- 6.2 At the pilot's request or if local procedures require, the QFE may be given.

7. Obstacle Clearance Criteria

- 7.1 Obstacle clearance criteria for all types of radar approaches, applicable to each runway on which radar approaches are used, are detailed on aerodrome approach charts.
- 7.2 Pilots using altitude will carry out their own conversion to obtain an obstacle clearance altitude.

8. Position Information

- 8.1 The position of an aircraft is to be passed to the pilot at least once on each leg of the circuit.
- 8.2 Position information for an aircraft making a straight-in approach is to be passed at least once before it commences the final descent.

Note: Range marks on extended runway centrelines usually indicate distance from touchdown but range rings almost always indicate distance from the position of the radar aerial head.

9. Vectoring to Final Approach

9A. Information to Aircraft

- 9A.1 Prior to or upon commencement of vectoring to final approach, the controller shall advise the pilot that the aircraft will be vectored to intercept the final approach and of:
 - (1) the type of final approach;

- (2) the runway in use; and

9A.2 Aircraft receiving an SRA shall be given:

- (1) the angle of the nominal descent path or the recommended descent gradient;
- (2) the termination range;
- (3) the applicable obstacle clearance altitude/height; and
- (4) the procedure to be followed in the event of a radio communications failure if this is not published. This may be achieved by using the published standard phraseology for SRA contained within CAP 413.

9B. Terrain Clearance

9B.1 Terrain clearance is to be applied in accordance with Section 1, Chapter 6.

9B.2 ATC Surveillance Minimum Altitude Charts (ATCSMACs) are published in the UK AIP; they indicate the minimum altitudes available to the controller when vectoring arriving aircraft. Controllers shall not use altitudes below those notified on SMAC except when levels are allocated in accordance with specific procedures that are approved for use within the final approach area.

9B.3 In exceptional cases, for example when the terrain profile is likely to generate TAWS nuisance warnings, minimum altitudes higher than the terrain clearance minimum may be specified for use in certain circumstances in order to minimise the likelihood of nuisance warnings. In such cases further details shall be included in MATS Part 2.

9C. Final Approach

9C.1 Unless specifically requested by a pilot or MATS Part 2 prescribes otherwise, aircraft shall be vectored so as to be established on the final approach track of an instrument approach procedure at a distance no closer than:

- (a) 2 NM before the Final Approach Fix (FAF) for an ILS, MLS, VOR, NDB approach or SRA; or
- (b) the Intermediate Fix (IF) waypoint for an RNP approach.

9C.2 If it is necessary to vector an aircraft through the final approach track before subsequently joining the approach from the opposite side, the controller shall advise the pilot prior to the aircraft passing through the final approach track.

9C.3 Except when Continuous Descent Approach (CDA) procedures are in operation or in an emergency, aircraft shall be positioned to facilitate a period of level flight (of not less than 1 NM for independent parallel approaches) at:

- (a) the published procedure height/altitude before the pilot commences descent at the FAF; or

- (b) a lower level when detailed in MATS Part 2 for precision approaches and permitted by the aerodrome's ATCSMAC.

9D. Continuous Descent Approach

- 9D.1 At units where CDA procedures are used, details of the operational procedures and the periods of use shall be included in MATS Part 2. Aircraft shall be allocated levels in accordance with the CDA procedure and controllers shall issue descent instructions accordingly. Levels shall be allocated such that pilots may intercept the glide path or final approach descent path without a level flight segment when the CDA has commenced. Distance from touchdown information shall be provided when issuing descent clearance and at any other times specified by the procedure or described in MATS Part 2.

9E. Precision Approaches – ILS or MLS

- 9E.1 Aircraft shall be vectored either onto the ILS or MLS localiser or onto an appropriate closing heading offset from the final approach track to enable the pilot to complete the turn onto the final approach track. Allocated closing headings should not be greater than 45° (or not greater than 30° for independent parallel approaches) offset from the final approach track. The controller shall continue to give heading instructions until the aircraft is established on the localiser. Controllers may instruct the pilot to report established on the localiser where it is judged that it will aid situational awareness. Controllers shall not instruct pilots to establish on the localiser at ranges outside the localiser Designated Operational Coverage (DOC). If necessary, controllers shall provide additional heading instructions until the aircraft is within the DOC.

- 9E.2 The controller shall use one of the following techniques when issuing a clearance to the pilot to descend on the ILS/MLS glidepath:

- (1) Clear the pilot for the ILS/MLS approach only if a descent instruction has been issued to the procedure altitude/height published on the ILS/MLS instrument approach procedure at the final approach fix, or if detailed in MATS Part 2, a lower level permitted by the aerodrome's ATCSMAC; or
- (2) Issue a conditional clearance to the pilot to descend on the ILS/MLS glidepath once established on the localiser; or
- (3) When it is necessary to ensure that an aircraft joining the ILS/MLS does not commence descent until specifically cleared, solely instruct the pilot to report established on the localiser and to maintain the previously assigned level. Subsequently, as appropriate, the pilot shall be:
 - (a) cleared for the approach;
 - (b) cleared to descend on the glidepath; or
 - (c) given alternative level instructions.

Note: The use of "maintain" in sub-paragraph (3) above, is to ensure separation, where required, from traffic below the level of an aircraft

joining the ILS or MLS localiser. When a controller intends to give a pilot successive instructions to establish on a localiser and descend on a glidepath (ILS/MLS), the use of “maintain” is not required. When available, Mode C/Mode S altitude reporting shall be monitored until the aircraft is established on the localiser in order to enable the controller to take appropriate action should the aircraft descend below the appropriate minimum altitude before following the glidepath. Controllers shall not instruct pilots to descend on the ILS/MLS when the glidepath intersect would be outside the glidepath DOC.

9E.3 Phraseology associated with ILS/MLS approaches is detailed in CAP 413.

Note: The MLS approach is flown in a similar manner to that of an ILS and for practical purposes the terms localiser and glidepath are retained, although an MLS localiser may also be referred to by alternative terms, e.g. an MLS approach track. Due to the possible confusion between the words ILS and MLS the word “Microwave” is used to describe an MLS approach in RTF phraseology and in telephone co-ordination.

9F. Non-Precision Approaches

9F.1 Non-precision approaches do not incorporate ground-based electronic descent guidance and include localiser only, localiser/DME, VOR, VOR/DME, NDB, NDB/DME, and SRAs. Non-precision approaches rely on the pilot being in a position to cross the FAF at the published procedure altitude/height in order to safely complete the approach.

9F.2 Controllers shall vector aircraft onto the final approach track, or onto a heading to close the final approach track at an angle not greater than 45° (or not greater than 30° for independent parallel approaches) offset from the final approach track. The aircraft is to be established on the final approach track and provided with a descent profile to enable a crossing of the FAF at the published procedure altitude/height.

9F.3 For procedures that are not supported by DME the controller shall pass a range check before clearing the aircraft for the approach. Additional distance from touchdown information may be passed as necessary or requested to assist the pilot to follow the published descent profile for the approach.

9F.4 For procedures that are supported by DME, the controller shall pass a range check and clear the aircraft for the approach when the aircraft is established on the final approach track.

9G. RNP Approaches

9G.1 An RNP approach utilises GNSS augmented by either ABAS (e.g. RAIM) or SBAS to provide lateral, or lateral and vertical guidance.

9G.2 Subject to prevailing traffic and the provision of standard separation/deconfliction minima, controllers should normally permit aircraft to route to the Initial Approach Fix

(IAF) waypoint with a descent profile that enables the aircraft to cross the IAF not below the published procedure height/altitude at the IAF.

- 9G.3 Alternatively, controllers may vector aircraft onto the final approach track or onto a closing heading of not more than 45° (not greater than 30° for independent parallel approaches) offset from the final approach track to enable the aircraft to establish on the final approach track no later than the Intermediate Fix (IF). Descent clearances should facilitate a descent profile to enable the aircraft to cross the IF at the published procedure height/altitude at the IF, or if ATCSMAC permits, a descent clearance that enables the aircraft to cross the FAF at the published procedure height/altitude at the FAF.
- 9G.4 Controllers should not position aircraft onto the final approach of a RNP approach closer to touchdown than the IF. The positioning of an aircraft inside the IF may result in the onboard RNP equipment preventing the approach from being flown.
- 9G.5 Once an aircraft has been cleared for the approach, the pilot will follow the lateral and vertical profile of the RNP approach.
- 9G.6 Phraseology associated with RNP approaches is detailed within CAP 413.

9H. Visual Approach

- 9H.1 The conditions under which an aircraft may be cleared for a visual approach are detailed in Chapter 1. When an aircraft is cleared for a visual approach the clearance must include, where appropriate, a descent restriction that will ensure that the aircraft remains within controlled airspace.

9I. VFR and Special VFR Flights

- 9I.1 Where sequencing of IFR flights is in operation, controllers shall provide sufficient information to pilots of VFR or Special VFR flights to enable them to integrate safely into the landing sequence. If it is necessary for a VFR flight to be given a vector, or specific routing instructions, the pilot shall be instructed to advise the controller if the routing or vector will prevent the pilot from remaining in VMC. If it is necessary for a Special VFR flight to be given vectors to establish it in the landing sequence, controllers shall ensure that vectors given do not preclude the responsibility for the pilot to remain clear of cloud, with the surface in sight and keep clear of obstacles by visual reference to the surface.

10. Clearance to Land

- 10.1 The approach surveillance controller, or such other person as may be detailed, shall notify Approach/Aerodrome Control when an aircraft making a radar approach is approximately 8 NM from touchdown. If landing clearance is not received a subsequent check shall be made at 4 NM. Clearance to land or alternative instructions received from Approach/Aerodrome Control shall be passed to the aircraft before it reaches a range of 2 NM from touchdown.

- 10.2 Where a landing clearance indicator system is installed between the approach surveillance controller and aerodrome control, it shall be used for giving clearance to land or missed approach instructions.
- 10.3 The indicated surface wind, passed with the landing clearance by Approach/Aerodrome Control, may be transmitted to the aircraft at the discretion of the approach surveillance controller.

11. Surveillance Radar Approaches

- 11.1 SRAs may be carried out only where the ATS surveillance system and the procedure have been approved by the CAA for use at a particular aerodrome.
- 11.2 The situation display must clearly indicate the final approach track and ranges from touchdown. If either of these fail to be indicated, the approach shall be discontinued, and the aircraft instructed to carry out a missed approach if unable to continue visually.
- 11.3 Aircraft making a radar approach shall be reminded, when on final approach, to check their gear.
- 11.4 The ranges at which SRAs terminate will vary according to the Approval. The appropriate phraseology is in CAP 413.

12. SRA Terminating at 2 NM

- 12.1 The following conditions apply to an SRA which terminates at 2 NM from touchdown:
- (1) Advisory heights through which the aircraft should be passing to maintain the nominal glidepath, together with ranges from touchdown, shall be passed at each nautical mile;
 - (2) The pilot shall be instructed to check their minimum descent height one mile before advisory heights are discontinued;
 - (3) Advisory heights shall be discontinued at the one above the highest OCH.

13. SRA Terminating at Less Than 2 NM

- 13.1 The following conditions apply to an SRA which terminates at less than 2 NM from touchdown:
- (1) Advisory heights through which the aircraft should be passing to maintain the nominal glidepath, together with ranges from touchdown, shall be passed at each half mile;
 - (2) Transmissions shall not be interrupted for intervals of more than 5 seconds from a range of 4 NM until the approach is terminated;
 - (3) The pilot shall be instructed to check their minimum descent height at a range of 2 NM;

- (4) Advisory heights shall be discontinued at the one above the highest OCH or at 1 NM, whichever is the sooner;
- (5) The controller shall not be responsible for any duties other than those strictly connected with the SRA.

14. Glidepath and Advisory Height

- 14.1 Details of glidepath angles to be used and of the associated advisory heights and ranges appropriate to the type of equipment shall be detailed in MATS Part 2.
- 14.2 Advisory levels, that are published in the UK AIP, for SRAs are initially calculated based either on QNH datum or QFE datum and rounded up to the nearest 10ft. An adjustment is then made to compute the advisory levels for approaches made using the other datum. Consequently, for any particular approach, the advisory levels published for the approach will not necessarily be round values. In order to minimise the potential for misinterpretation or transposition of digits, unless otherwise requested by the pilot, the advisory levels to be passed by ATC when conducting an SRA should be rounded up to the nearest 10 ft.
- 14.3 Advisory levels shall be prefixed with an indication of the datum being used, i.e. "height" or "altitude". Pilots conducting an approach based on QNH shall be passed the aerodrome/threshold elevation prior to commencing the final descent.
- 14.4 The rounded values to be used when conducting an SRA shall be detailed in MATS Part 2.

15. Missed Approach Instructions

- 15.1 An aircraft shall be instructed to carry out a missed approach in any of the following circumstances:
 - (1) On instructions from Approach/Aerodrome Control;
 - (2) When no landing clearance is received before 2 NM from touchdown (or such other range agreed with Aerodrome Control);
 - (3) When it appears to be dangerously positioned on final approach.
- 15.2 An aircraft is to be advised to carry out a missed approach in any of the following circumstances:
 - (1) If it reaches a position from which it appears that a successful approach cannot be completed;
 - (2) If it is not visible on the situation display for any significant interval during the last 2 NM of the approach;
 - (3) If the position or identification of the aircraft is in doubt during any portion of the final approach.
- 15.3 Missed approach instructions shall include the level to which the aircraft is to climb and, if necessary, heading instructions to keep the aircraft within the missed

approach area. The aircraft shall be instructed to contact Approach Control or, by arrangement, to remain with the approach surveillance controller.

- 15.4 In the event of a pilot initiating a missed approach due to a windshear alert generated from onboard aircraft systems, controllers should be prepared for the aircraft to exceed the missed approach altitude, and should provide traffic information, instructions, and advice as deemed appropriate to ensure safety. During such manoeuvres, maximum thrust is employed and rates of climb will significantly exceed those for missed approaches executed for other reasons. These high rates of climb, especially when associated with a missed approach which has a relatively low level-off altitude, can result in pilots exceeding their cleared level. Aircraft generated windshear alerts also take precedence over the annunciation of TCAS alerts.

16. Discontinuing of Radar Approach

- 16.1 When a radar approach cannot be continued due to any circumstances, e.g. the amount of clutter, a failure or malfunction of the ATS surveillance system or of the associated air-ground communications, the aircraft must be informed immediately.
- 16.2 If the aircraft has not commenced final approach it is to be cleared to an appropriate facility for an alternative approach, in which case procedural separation shall be provided.
- 16.3 If the aircraft has commenced final approach, the approach may be continued either visually or by using an alternative aid, otherwise it is to be cleared for an alternative approach as above.

17. Departures

- 17.1 The procedures for the control of departing aircraft by approach surveillance controllers vary from unit to unit and shall be detailed in MATS Part 2.
- 17.2 Departing traffic, which conflict with inbound aircraft receiving an ATS surveillance service, shall be transferred to the approach surveillance controller, who shall be responsible for providing separation, unless authorised procedures automatically ensuring separation are in operation.

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Section 3: Approach Control

Chapter 3: Runway Visual Range

1. Introduction

- 1.1 The RVR system has been evolved to make available a more localised assessment of visual range in relation to a particular runway when the meteorological report gives a visibility of less than 1,500 metres. The RVR indicates the range over which the pilot of an aircraft on the centreline of a runway can expect to see the runway surface markings, the lights delineating the runway or identifying its centreline.

2. Assessment of RVR

- 2.1 The two methods of RVR assessment available at suitably equipped aerodromes are:
- (1) Instrumented RVR, using electronic equipment;
 - (2) Human Observer Method.
- 2.2 The UK standard for reporting RVR extends from zero to 1,500 metres in the following steps:
- (1) 0 to 400 metres in 25 metre steps
 - (2) 400 to 800 metres in 50 metre steps
 - (3) 800 to 1,500 metres in 100 metre steps.
- 2.3 Not all RVR systems are able to report all increments from zero to 1,500 metres. Where the maximum reportable RVR value for a system and runway combination is less than 1,500 metres this information shall be included in the UK AIP.
- 2.4 Note that any observed value, which does not fit the reporting scale, shall be rounded down to the nearest step lower in the scale. It is recommended that 50 metres be regarded as the lower limit and 1,500 metres be regarded as the upper limit for assessments of RVR. Outside of these limits, reports should indicate that RVR is less than 50 metres or more than 1,500 metres.

3. Instrumented RVR (IRVR)

- 3.1 This method gives an automatic and continuous display of RVR values to ATC.
- 3.2 Transmissometers are used to measure atmospheric opacity from fixed points alongside a runway, the number of units in any system being determined by the category of the ILS or MLS installation and runway length. In a three transmissometer system the units are linked by an associated data transfer system to a central processor. The processor computes the RVR for each transmissometer position and displays it in digital form to ATC. The three transmissometers are located one at each end of the runway adjacent to the touchdown zone and the third

near the runway mid- point area. For RTF transmission purposes the locations will be known as “Touchdown”, “Mid-Point” and “Stop End” and RVR values will relate to these positions.

- 3.3 The system automatically allows for runway edge light intensity settings but the DEO is to be informed if a controller has reason to believe that the runway lighting is not operating at the selected level. Additionally, the DEO is to be informed if a pilot reports actual conditions which are significantly different from those being indicated by IRVR methods.

4. System Availability

- 4.1 IRVR systems are operational at all times unless notified to the contrary by the DEO.

5. Duration of Assessment

- 5.1 IRVR reporting to aircraft is started:
- (1) whenever the aerodrome meteorological report shows the visibility to be less than 1,500 metres;
 - (2) whenever the IRVR display is indicating an RVR value equal to or less than the maximum for that system;
 - (3) whenever shallow fog is reported and during a period for which it is forecast.

6. IRVR Indications

- 6.1 A number of different IRVR systems are installed at UK aerodromes. The processors in some systems are programmed to automatically reduce in intensity, or suppress, the display of the mid-point and/or stop-end readings when the values are not operationally significant.
- 6.2 Unless a suppressed value is specifically requested by a pilot, the RVR reports transmitted are to contain only those values that are displayed at full intensity. The value of the touchdown position is always displayed at full intensity and if no other values are at full intensity this is the only value which needs to be passed.
- 6.3 A description of the equipment, its use and any other associated liaison with the DEO shall be included in MATS Part 2.

7. Transmission to Aircraft

- 7.1 IRVR values are to be passed to aircraft at the beginning of each approach for landing and, thereafter, whenever there is a significant change in the RVR until the aircraft have landed. A significant change is defined as a change in value of one increment or more. The current RVR value is also to be passed to aircraft before take-off.
- 7.2 Even though a pilot may have received an IRVR value from the ATIS broadcast, controllers must ensure that they pass the current value as specified above.

- 7.3 When all three positions are to be reported to the pilot, they are to be passed as three numbers relating to touchdown, mid-point and stop end respectively, e.g.:

“RVR runway (designator) 650 — 500 — 550 metres”.

- 7.4 If only two values are to be passed, they are to be individually identified, e.g.:

“RVR runway (designator) Touchdown 650 — Stop End 550 metres”.

- 7.5 A high degree of priority should be given to such broadcasts to ensure that current RVR information is provided to pilots with the minimum delay.

8. Transmissometer Unserviceability

- 8.1 If the touchdown transmissometer fails, the IRVR system may still be serviceable provided that confirmation is received from the DEO to this effect. In such circumstances the mid-point value is to be used to determine the ATC procedure and is to be passed to the pilot together with the stop end value, if this is available. It is imperative that the pilot should be informed that the touchdown transmissometer has failed, e.g.:

“RVR runway (designator) Touchdown not available — Mid-Point 600 — Stop End 400 metres”.

- 8.2 If two transmissometers become unserviceable the RVR value for the remaining instrument provided that it is not the stop end value, may be used. If the RVR value for the stop end is the only one available, the system is to be regarded as unserviceable for that runway. By changing the direction of use of the runway it may become serviceable again with the single available value representing the touchdown reading.

- 8.3 When the IRVR system is unserviceable, controllers should revert to Human Observer RVR where provided, or to the reported meteorological visibility to determine ATC procedures. In the latter case, pilots should be passed the reported meteorological visibility and advised that the IRVR system has failed.

9. Human Observer Method

- 9.1 Detailed procedures for determining RVR by human observer methods are contained in CAP 168. MATS Part 2 shall also contain detailed procedures for the method of RVR calculation at the particular aerodrome.

- 9.2 Under no circumstances shall RVR be assessed from a position on the runway.

- 9.3 The number of runway edge lights visible is to be applied to a conversion table to obtain the RVR value. Detailed procedures of the method of calculation shall be included in MATS Part 2.

9A. Duration of Assessment

- 9A.1 The assessment of RVR by human observer and the reporting to aircraft are to commence whenever the official meteorological visibility is reported as less than

1500 metres and are to continue until both the official meteorological visibility is 1500 metres or more and the RVR is in excess of the maximum reportable value.

- 9A.2 In the event that an RVR measurement cannot be made, the pilot should be passed the meteorological visibility and advised that RVR is not available.

9B. Frequency of Assessment

- 9B.1 At aerodromes where traffic is continuous, assessments are to be made at half-hourly intervals or whenever significant changes of RVR occur. At aerodromes where traffic is intermittent or light an assessment is to be made before an aircraft departs and 15 minutes before the ETA of an arriving aircraft. Thereafter reports of significant changes are to be made until the aircraft has landed. A significant change is defined as a change in value of one increment or more.

- 9B.2 RVR reports are not to be used or passed after the observer has been stood down, except when that report is quoted as part of a full meteorological report including a time or origin.

9C. Transmission to Aircraft

- 9C.1 RVR values and subsequent significant changes are to be passed:

- (1) to inbound aircraft, before the commencement of approach until the aircraft has landed;
- (2) to departing aircraft, until the commencement of take-off.

- 9C.2 A high degree of priority should be given to such broadcasts to ensure that current RVR information is provided to pilots with the minimum of delay.

9D. Limitations

- 9D.1 Only RVR incremental values up to the maximum reportable value are to be passed to aircraft. The maximum reportable value for a particular runway shall be indicated in MATS Part 2.

- 9D.2 If the assessed value is more than the maximum reportable value, controllers are to state "RVR is greater than (number) metres".

- 9D.3 If no lights are visible, controllers are to state "RVR less than (number) metres", inserting the value corresponding to one light.

10. General

10A. Additional Information

- 10A.1 Occasionally pilots of aircraft may report, or observations from the aerodrome control tower may indicate, that the visibility conditions on the runway are significantly different to those being reported. Under no circumstances is a controller to pass a pilot information which suggests that the visibility is better than the RVR reported, whether assessed by IRVR or a human observer. However, when a pilot's

report or an observation from the aerodrome control tower indicates a worse condition on the runway, this information is to be passed with subsequent RVR reports for as long as the condition is considered to exist according to the phraseology in CAP 413.

10B. Intensity Setting

- 10B.1 All RVR observations, including those for transmission in meteorological reports, are to be made with the runway edge lights set at the intensity appropriate to the prevailing conditions.
- 10B.2 However, with some IRVR equipment, because of the design of the system, transmissometer readings may only be displayed when the runway lights are set at an intensity of 10% or more. Settings less than 10% may result in all three readings being replaced by zeros. If, during RVR conditions, a pilot requests a reduced runway edge light setting of less than 10%, they are to be advised that an RVR reading may not be available at this setting.
- 10B.3 RVR human observer assessments are not to be made with the lights set at an intensity for which there is no conversion table. If a pilot should request that the lights be reduced in intensity and this results in a setting for which there is no conversion table, the pilot is to be advised that RVR is not available at this requested setting.

10C. RVR Log

- 10C.1 At times during which RVR is being assessed, RVR and meteorological visibility values that are observed or measured shall be recorded such that the RVR and visibility reported at any particular time can be determined. Records shall be made available to the CAA on request.
- 10C.2 For records of Human Observer RVR the following minimum information shall be recorded:
- (1) Aerodrome;
 - (2) Date;
 - (3) Runway;
 - (4) Start and finish time for the period of observations;
 - (5) The time each observation is logged, expressed in UTC to the nearest minute;
 - (6) The actual count expressed as the number of lights observed, e.g. 'Four lights', and the corresponding RVR value.

10D. Aerodrome Operating Minima

- 10D.1 A controller is not responsible for ensuring that pilots observe their Aerodrome Operating Minima and is not to query the right of a pilot to attempt a landing or take-off.

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Section 4: Area Control

Chapter 1: Area Control Service

1. Provision of Services

- 1.1 Area Control Services within the UK FIRs comprise surveillance and non-surveillance-based air traffic services in airspace not under the jurisdiction of an approach or aerodrome control unit.
- 1.2 The type of service to be provided will depend on the Class of airspace within which the aircraft is flying as tabulated below:

Table 1:

Class	Service Provided	Remarks
A, C & D	Air Traffic Control Service with or without surveillance; and Alerting Service.	Aircraft are required to comply with air traffic control instructions.
E	Air Traffic Control Service with or without surveillance to IFR flights and Alerting service; and Traffic Service or Basic Service and Alerting Service provided to participating VFR flights.	Participating VFR flights shall not be provided with an Air Traffic Control Service, but UK FIS in accordance with CAP 774 – UK Flight Information Services.
G	Procedural Service; or Deconfliction Service; or Traffic Service; or Basic Service; and Alerting Service.	Participating flights receive UK FIS in accordance with CAP 774 – UK Flight Information Services.

2. Units

- 2.1 An ACC is established in each FIR to provide an Area Control Service in the airspace under its jurisdiction.
- 2.2 In addition, Area Control Services are provided at:
- (1) Oceanic Area Control Centres (OAC); and
 - (2) ATC units at aerodromes specified by the CAA.

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Section 4: Area Control

Chapter 2: Area Control Procedures

1. Principles of Procedures

1.1 An ACC is divided into sectors, which work in close liaison. The method of operation differs at each centre but will always be based on the following principles:

- (1) Each controller shall be responsible only for the efficient performance of those tasks that are specifically allocated in the task description. Tasks are detailed in MATS Part 2;
- (2) Controllers are to monitor the actions of other members of the sector team to the extent that prime duties permit;
- (3) Sectors must have a defined prime flight data display for the purpose of conflict detection, which should at all times reflect all clearance instructions issued and communications received;
- (4) Inter-sector co-ordination purposes require laid down criteria which enable the co-ordinator, when authorised by the CAA, to use surveillance derived information for the transfer of traffic between sectors without reference to the controller.

2. Co-ordination – Area Control Centres

2.1 Aircraft receiving an ATC or advisory service from one ACC or sector must not be permitted to penetrate the airspace of another ACC or sector unless prior co-ordination has taken place. The responsibility for initiating co-ordination rests with the controller of the unit or sector transferring control, who shall comply with any conditions specified by the accepting controller.

2.2 The complete process of co-ordination, which must precede transfer of control, has been achieved when:

- (1) notification, negotiation and agreement has taken place progressively, i.e. step-by-step;
- (2) it has been agreed that aircraft can proceed under specified conditions without the need for individual co-ordination. The principles of such agreements and controllers' positions to which they apply shall be detailed in MATS Part 2;
- (3) an estimate message has been passed and no objection has been raised by the accepting ATC unit. This procedure must be approved by the CAA.

2A. Revisions

- 2A.1 Subsequent changes in flight level, routing or revisions of 3 minutes or more are to be re-coordinated by the transferring controller and agreement reached before transfer of communication takes place.

2B. Approval Requests

- 2B.1 If the first reporting point after take-off is in an adjoining area, an approval request must be made to that ACC and co-ordination achieved before clearance is given to the aircraft. However, the CAA may waive the requirements for approval requests.

2C. Transfer Point

- 2C.1 Normally an ACC provides a service only to aircraft within its own FIR but, by prior arrangement between ACCs, the transfer point may be varied to suit traffic arrangements either permanently or for a particular flight.

3. Co-ordination – Approach Control Units

3A. Data on IFR Traffic

- 3A.1 Approach Control units are required to keep Area Control promptly advised of the following data on IFR flights:
- (1) Lowest level at the holding point available for use by Area Control;
 - (2) Average time interval between successive approaches;
 - (3) Revisions to expected approach times when calculations show a variation of 5 minutes or more;
 - (4) Arrival times over the holding point if these vary from the estimate by 3 minutes or more;
 - (5) Missed approaches when re-routing is entailed, so that subsequent action is coordinated;
 - (6) Departure times of aircraft;
 - (7) All information on overdue aircraft.
- 3A.2 The passing of any of this information may be delegated from Approach to Aerodrome Control. Any of these items can be deleted from routine practice by agreement with Area Control.

3B. Departing Aircraft

- 3B.1 Area Control may specify a time at which, or a period between two times (a 'slot') during which, an aircraft is authorised to take-off. Units at aerodromes are to be advised of any anticipated delay to departing aircraft together with the reason.

3C. Releases to Approach Control

- 3C.1 Area Control shall pass estimates on and release inbound aircraft to Approach Control. Inbound estimates shall be passed at least 15 minutes prior to the arrival of the aircraft at the designated approach fix.
- 3C.2 Release messages shall be passed to Approach Control in a timely manner as specified in unit (MATS Part 2) procedures and shall contain the following:
- (1) Aircraft identity, type and SSR code (if applicable);
 - (2) Point of departure;
 - (3) Release point;
 - (4) Estimated time and level at the holding facility, or arrival time and level at holding facility if the release is given after arrival;
 - (5) Expected approach time;
 - (6) Contact point.
- 3C.3 Aircraft released to Approach Control must be within controlled or advisory airspace when the release becomes effective. All other aircraft at lower levels must also be released or procedural separation provided. Aircraft released to Approach Control shall not be levelled off, or climbed, above the level at the holding facility passed in the release message without co-ordination with Area Control.
- 3C.4 Unless approved by the CAA, the release point of aircraft released to Approach Control shall be below FL195. When such procedures are approved by the CAA, MATS Part 2 shall include details of the area in which aircraft may be released and the full details of the conditions under which the procedures may be used.
- 3C.5 When approach sequencing is in force at an aerodrome within Classes A to F airspace, Area Control is to clear all aircraft to the holding facility. Where appropriate, holding instructions and an expected approach time are to be given.
- 3C.6 Aircraft proceeding to an aerodrome in Class G airspace are to be cleared to leave controlled or advisory airspace by descent, or on an appropriate track. If a release message is to be passed, the aircraft should be advised of its acceptance level.
- 3C.7 Area Control may, after co-ordination with Approach Control, clear an arriving aircraft to an aerodrome holding facility, or to a visual holding point, instead of the normal holding facility.

3D. Release Subject Your Discretion (RSYD)

- 3D.1 Outbound clearances may be issued which do not provide the required separation from either inbound aircraft which have not yet passed their release points or from overflying aircraft provided that:
- (1) The outbound clearance is qualified by "Release subject your discretion" together with details of the conflicting traffic; and

- (2) The release message on the inbound aircraft, or full details of the overflying traffic, have already been passed.

3D.2 An RSYD restriction is intended to facilitate the overall expedition of traffic where Approach Control procedures may offer a more expeditious resolution of the confliction than Area Control procedures. It is the responsibility of the approach controller to determine whether they can provide the required separation in order to clear the outbound aircraft for departure. Before the outbound aircraft is transferred to Area Control, all conflictions must have been resolved or co-ordination effected.

3E. Release Subject

3E.1 Approach Control issue departure clearances to Aerodrome Control; when two aircraft wish to depart in quick succession, the application of a condition may be required. Typically this could be a time delay to the second departing aircraft e.g. "Release subject (callsign) departure plus two minutes". It is the responsibility of the aerodrome controller to apply this separation or inform the approach controller if this is not possible.

3E.2 An ACC may issue two clearances to an Approach Control unit and request that an aerodrome separation is applied between the aircraft. In such cases the telephone phraseology used would be "... release subject (callsign)". Under such circumstances, before transfer of control takes place, the second aircraft to depart shall be separated from the first departure. In such cases the approach controller must ensure that separation between the two aircraft is constant or increasing. If the approach controller is unable to achieve this the centre must be advised immediately and a new course of action agreed.

3F. Radar Releases

3F.1 Area Control may, in order to expedite traffic, transfer control of arriving aircraft to Approach Control by issuing a 'radar release'. The procedure is detailed in Section 1, Chapter 6.

4. Responsibilities

4.1 Area Control is responsible for providing separation between aircraft operating in controlled or advisory airspace, in accordance with the airspace classification and aircraft flight rules, and ATC clearances to aircraft shall be based solely on the requirements for providing ATC services within such airspace.

4.2 The area within which ATS surveillance services are provided is determined by the coverage of the equipment but may be further limited to areas defined in MATS Part 2.

4.3 Where authorised, Area Control may on a permanent or limited basis, provide ATS in airspace normally the province of another control unit. The particular arrangements for each ACC shall be published in MATS Part 2.

5. Separation

5A. Unidentified Known Traffic

5A.1 Separation minima are detailed in Section 1, Chapter 3. In addition, separation may be deemed to exist between aircraft under Radar Control and unidentified known traffic in the following circumstances:

- (1) When authorised procedures are in operation whereby the known traffic is under the control of another controller, who is utilising an ATS surveillance system, and separation can be maintained by direct co-ordination; or
- (2) When authorised procedures are in operation whereby track or vertical separation is deemed to exist.

5B. Traffic Outside PSR/SSR Cover

5B.1 In certain circumstances it may be necessary to apply separation between an aircraft under Radar Control and known traffic outside PSR/ SSR cover. Bearing in mind the coverage, separation should be applied as follows:

(1) **Opposite Direction Traffic.**

Vertical separation must be provided at least 10 NM before the point at which the conflicting traffic can be expected to enter PSR/SSR cover;

(2) **Same Direction Traffic.**

Proceeding into PSR/SSR cover, vertical separation must be provided until the identified aircraft is at least 10 NM within the point at which the conflicting traffic can be expected to enter coverage.

Proceeding out of PSR/SSR cover, vertical or other procedural separation must be established at least 10 NM before the aircraft is expected to leave coverage.

6. Aircraft Off Track

6.1 Except when being vectored, aircraft should report “over” en-route reporting points as close as possible to the actual time of the event. If an aircraft reports “abeam” instead of “over” a position, controllers must ensure that the aircraft is aware of its correct routeing and that separation is not adversely affected.

7. Position Reports

7.1 In order to reduce RTF communication, a pilot will make a position report only:

- (1) on first transfer of communication from another ACC or sector. This report will contain aircraft identification and flight level only. Subsequent reports will contain aircraft identification, position and time;
- (2) on reaching the limit of the ATC clearance;

(3) when instructed to by ATC.

7.2 Controllers are to instruct pilots to make position reports:

- (1) when the aircraft is outside ATS surveillance system cover;
- (2) before identification has been achieved; and
- (3) as detailed in MATS Part 2.

8. Additional Services – Approach

8.1 At ACC units authorised by the CAA, and subject to any conditions included in such authorisation, vectoring and sequencing for ILS or radar approaches may be carried out, excluding the turn onto final approach, provided the unit endorsement of the Area Control Surveillance rating so indicates.

9. Aircraft Crossing and Joining

9.1 Flight data regarding aircraft requiring to cross or join controlled airspace (Airspace Class A-D or Class E under IFR) may be obtained from flight plans or aircraft RTF in-flight requests. The latter may be made direct on the appropriate sector frequency or via personnel providing a FIS at an ACC.

9.2 In-flight requests will provide the following:

- (1) Crossing Flights:
 - (a) Aircraft identification and type;
 - (b) Position and heading;
 - (c) Level and flight conditions;
 - (d) Crossing position;
 - (e) Requested crossing level and estimate for crossing position.
- (2) Joining Flights:
 - (a) Aircraft identification and type;
 - (b) Position and heading;
 - (c) Level and flight conditions;
 - (d) Departure aerodrome;
 - (e) Estimated time at entry point;
 - (f) Route and point of first intended landing;
 - (g) True airspeed;
 - (h) Desired level on the route.

- 9.3 Receipt of flight plan data does not constitute a clearance, except that when ATC has acknowledged receipt of the information from an aircraft in flight and radio failure occurs before a clearance can be transmitted, the aircraft may be expected to proceed in accordance with the flight plan. Aircraft should be given a clearance in reply to an in-flight request, but if this is not possible the aircraft are to be advised to remain outside controlled airspace, when to expect clearance and given a time check.
- 9.4 In considering requests for crossing or joining clearances it should be remembered that an aircraft already cleared to operate at a level within controlled airspace has prior claim to that level.
- 9.5 Pilots of aircraft that cannot comply with the full IFR are permitted to request clearances to cross ATS routes within a control area in VMC by day. However, controllers are to handle these requests as though they are IFR flights.
- 9.6 No clearance is required for an aircraft to operate at the lower limit of controlled airspace (AMC1 SERA.6001). However, pilots of such flights are encouraged to obtain an appropriate ATS from the controlling authority, see section 1, chapter 2, paragraph 2.4.

10. Military Aircraft

- 10.1 Military aircraft which wish to join controlled airspace and then continue to operate as GAT will conform to the procedures applicable to civil aircraft.
- 10.2 Military aircraft will either obtain a clearance to cross an ATS route within a control area or will cross under military surveillance control, whereby separation, either horizontal or vertical or both, between the crossing aircraft and traffic on the ATS route is provided without reference to the civil controller. Requests for crossing clearances will be made to the planner/coordinator or directly to the civil controller. The procedure is entirely at the discretion of the civil controllers and shall be granted only if workload permits and adequate communication facilities are available.
- 10.3 In an emergency, where no crossing clearance can be obtained, military aircraft may cross an ATS route within a control area at an intermediate 500 ft level in order to provide vertical separation from ATS route cruising levels. The intermediate 500 ft levels referred to are levels of whole thousands plus 500 ft.

11. Aircraft Holding

- 11.1 When an aircraft is instructed to hold en-route it must always be given an onward clearance time. Aircraft must never be told that such holding is indefinite. If it is not possible to make an accurate calculation immediately, the aircraft shall be given an arbitrary onward clearance time requiring 10 to 15 minutes holding, which must be amended to an accurate time before the arbitrary period has elapsed.
- 11.2 Aircraft which will be delayed by 20 minutes or more before commencing an intermediate approach for landing shall be given an expected approach time together with their clearance to the holding facility. If an aircraft is likely to be

delayed less than 20 minutes no expected approach time is to be passed. If the pilot requests the delay, they shall be informed that the delay is expected to be less than 20 minutes.

- 11.3 Procedures for aircraft waiting for approach clearance when the delay cannot be determined are described in Section 1, Chapter 4.

12. Diversion

- 12.1 In the majority of cases, it shall be the responsibility of the Watch Supervisor at the ACC to make arrangements for the diversion of aircraft. When weather indicates a possibility of diversions the Watch Supervisor shall:
- (1) keep a close watch on the weather at aerodromes in their area and ensure that arriving aircraft have the latest information;
 - (2) anticipate which aerodromes are likely to be the most suitable according to:
(a) forecast weather conditions as given in TRENDS/TAFs and, if clarification is necessary, in consultation with the duty meteorological forecaster. (b) types of aircraft (runway length, approach aids etc.);
 - (3) check that diversions can be accepted and note any particular arrangements the aerodrome may require.
- 12.2 When a diversion is requested or considered expedient, the ACC shall:
- (1) give the aircraft a diversion message containing the latest weather information, clearance instructions, radio frequencies to be used, etc.;
 - (2) give full information to the diversion aerodrome, including details of the aircraft, its clearance instructions, etc.;
 - (3) inform original destination aerodrome of the diversion action.
- 12.3 This paragraph should be read in conjunction with Section 1, Chapter 8.

Section 4: Area Control

Chapter 3: Flight Information Services at Area Control Centres

1. Introduction

- 1.1 FISOs at ACCs provide a Basic Service to aircraft from dedicated positions and on discrete frequencies. This service is provided by London/Scottish Information within airspace and during periods that are notified in the UK AIP.
- 1.2 Controllers provide a Basic Service to aircraft outside this airspace and within this airspace outside the notified periods of operation when the service is provided by FISOs. When carrying out co-ordination, controllers shall distinguish between their ATC and London Information roles.
- 1.3 Detailed procedures for FISOs at ACCs are contained in the unit MATS Part 2 and other FISO documentation. Some of the guidance in this chapter also applies to FISOs but, for simplicity, the text will refer only to controllers performing the London/Scottish Information role.

2. Limiting Factors

- 2.1 Factors limiting the air traffic services given by controllers providing a FIS include the following:
 - (1) Civil and military aircraft may fly on random tracks with consequent multiplicity of reporting points;
 - (2) Communication with the appropriate ACC is not mandatory;
 - (3) Absence of accurate navigation and associated position fixing may cause unreliable position reporting and estimates;
 - (4) The size of the sectors makes it difficult for controllers to be aware of the many geographic locations used and their proximity to each other;
 - (5) Even when flight plan information is known to an ATSU, frequently the controller has no indication as to whether such aircraft are adhering to planned routes, altitudes and timings;
 - (6) RTF coverage may not be available in all parts of the unit's airspace.
- 2.2 Because accurate assessment of collision risk is doubtful, it is recognised that no form of control or separation can be provided.

3. Proximity Warnings

- 3.1 When it is self-evident from the amount and accuracy of the information presented by pilots in receipt of a Basic Service, controllers, when practicable, should provide supplementary warnings related to the proximity of the subject aircraft. In particular, warnings should be issued to aircraft which are, or may become, in dangerous

proximity to each other. For other situations, controllers may inform a pilot of the presence or absence of traffic as indicated to them. It is recognised that the provision of proximity warnings and traffic information may be based on data of doubtful accuracy and completeness. The decision to make any alteration to the flight remains with the pilot and traffic avoidance advice shall not be issued.

4. Co-ordination and Liaison

4.1 Flights crossing FIR boundaries are to be coordinated as shown in the table below:

Table 1:

Aircraft Position	Coordinated Action
Flights within the UK: (1) Aircraft has passed an estimate for the boundary. (2) Aircraft reports at the boundary or details had not been passed.	Details passed to the appropriate ATSU in the adjacent FIR, (if workload and communications permit). Advise aircraft to contact the appropriate ATSU in the adjacent FIR.
Flights leaving the UK:	Details passed to appropriate ATSU, unless otherwise instructed in MATS Part 2.

4.2 Scottish Information task does not imply any SAR obligation. In this regard, controllers are not to take action in the case of an aircraft failing to establish communication after an estimate has been received.

Section 4: Area Control

Chapter 4: Oceanic Area Control

1. Introduction

- 1.1 This section contains a general outline of those procedures relating to Oceanic Control that are relevant to controllers operating sectors in adjacent domestic airspace. More detailed procedures for Oceanic Area controllers are contained in MATS Part 2.
- 1.2 Shanwick OAC (Prestwick) provides Area Control, ICAO Standard FIS and Alerting Services to aircraft operating within the Shanwick OCA.
- 1.3 The oceanic controller is assisted in this task by the use of an FDPS, which carries out conflict prediction and detection, automatic update of flight profiles and data transfer to online adjacent units.
- 1.4 The vertical limits of the Shanwick OCA are from FL55 with no upper limit. Throughout the control area, airspace at and above FL55 is notified as Class A. VMC climbs or descents are not permitted.

2. Air Traffic Control Clearances

- 2.1 Aircraft entering the Shanwick OCA from domestic airspace are required to obtain an oceanic clearance from Shanwick. The clearance becomes effective only at the Shanwick OCA boundary. The pilot is responsible for obtaining any necessary clearance, or re-clearance to enable compliance with the oceanic clearance.

2A. Methods of Obtaining Clearances

- 2A.1 Westbound aircraft operating within the UK UIR/FIR and the northern part of the France UIR should request oceanic clearance from “Shanwick Oceanic” on VHF RTF. UK departures are to request clearance as soon as possible after departure. Aircraft overflying the UK UIR/FIR and the northern part of the France UIR are to request clearance when they consider that they are within VHF RTF range of “Shanwick Oceanic”. Aircraft other than turbojets should request clearance at least 40 minutes before the ETA for the OCA entry point.
- 2A.2 Aircraft unable to contact “Shanwick Oceanic” on VHF should request clearance on North Atlantic en-route HF RTF Network (NARTEL) at least 40 minutes before the ETA for the oceanic boundary and thereafter maintain a SELCAL (Selective Call) watch for receipt of the oceanic clearance.
- 2A.3 While in communication with Shanwick for oceanic clearance, aircraft must also maintain communication with the ATC authority for the airspace in which they are operating. Aircraft unable to contact Shanwick on VHF or NARTEL HF should request the ATC authority for the airspace in which they are operating to relay their request for oceanic clearance to Shanwick.

2B. Oceanic Route Clearance Authorisation (ORCA) System

2B.1 Suitably equipped aircraft, which will enter Shanwick airspace along the eastern boundary between ATSIX and PASAS inclusive, can obtain an oceanic clearance using VHF datalink. Pilot requests for oceanic clearance using datalink are to be made between 30 and 90 minutes prior to the oceanic boundary. Aircraft utilising equipment that is covered by ARINC 623 specification are able to request, receive and acknowledge receipt of the oceanic clearance via datalink. Aircraft using equipment that is covered by ARINC 620 specification are able to request and receive the oceanic clearance via datalink but voice read-back is required to confirm the clearance.

2C. Clearance Requests

2C.1 Requests for oceanic clearance shall include:

- (1) callsign;
- (2) OCA entry point and ETA;
- (3) requested Mach number and flight level;
- (4) any change to flight plan affecting OCA.

2D. Contents of Clearances

2D.1 An abbreviated clearance shall only be issued when clearing an aircraft to follow one of the organised tracks throughout its flight within the NAT OCAs. In all other cases full details of the cleared path shall be specified in the clearance message.

2D.2 When an abbreviated clearance is issued it shall include:

- (1) track specified by the track code;
- (2) flight level(s);
- (3) Mach number;
- (4) if the aircraft is required to report meteorological information in flight, the phrase "Send Met reports".

2D.3 The Mach number shall be included in each clearance given to subsonic aircraft operating within Gander, New York, Reykjavik, Santa Maria and Shanwick OCAs.

3. Organised Track Structure

3.1 In order to permit the optimum use of oceanic airspace during peak traffic periods, an organised track system may be applied, subject to appropriate co-ordination. The track system shall be organised on the basis of available information regarding requested turbo-jet routes, minimum time paths calculated from available meteorological data, airspace reservations, lateral separation minima and expected traffic density.

- 3.2 Shanwick is responsible for establishing and publishing the westbound tracks and Gander the eastbounds. Westbounds are allocated the designators A to M and the eastbound tracks N to Z, excluding the letters I and O.

3A. Period of Operation

- 3A.1 The periods of operation of the organised track system are:

- (1) Westbound 1130 to 1900 UTC
- (2) Eastbound 0100 to 0800 UTC.

- 3A.2 These times are applicable at 30 degrees west.

- 3A.3 The track signal shall be despatched at least 8 hours in advance of their period of operation. Any subsequent changes in the structure shall be notified as soon as practicable.

4. Oceanic Separation

- 4.1 Separation of aircraft within the OCA shall be in accordance with ICAO Doc. 7030. During ionospheric or radio blackout periods, or when deemed necessary, greater separation should be applied.
- 4.2 Both horizontal and longitudinal separation minima in certain circumstances are greater than standard domestic separation. The separation minima for the Shanwick OCA applicable to aircraft at the time they cross the oceanic/domestic airspace boundary are as stated in MATS Part 2.

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Section 4: Area Control

Chapter 5: Meteorological Information

1. Supply of Information

- 1.1 Meteorological information supplied to ACCs is summarised below. Details of the information supplied by the Meteorological Office is contained in Section 7. Runway visual range is described in Section 3.

Table 1:

Routine Reports	Designated main and alternate aerodromes within the FIR and, where necessary, within adjacent FIRs.
Trend Forecasts	Designated main and alternate aerodromes within the FIR.
Forecast of Conditions in the FIR	Met forms 214/215 or AIRMET Regional/Area Forecasts.
Aerodrome Forecasts	Met forms 214/215 or AIRMET Regional/Area Forecasts.
SIGMET Messages (see note)	Met forms 214/215 or AIRMET Regional/Area Forecasts.
Forecast Regional Pressure Setting Values	For all altimeter setting regions lying wholly or partly within the FIR.
Runway Visual Range	Directly from each aerodrome.
Advice on Diversions	When requested.

Note: SIGMET messages are broadcast routinely on the SHANNON HF VOLMET broadcast.

2. Summary of Meteorological Information Supplied to ACCs

- 2.1 Most of the meteorological information required by aircraft in flight can be obtained directly from the VOLMET broadcast. It may be necessary occasionally to supplement this information on operational frequencies, particularly when SIGMET messages and RVR observations are received.

3. Transmission to Aircraft

- 3.1 Either of the following methods may be used to pass meteorological information to aircraft in flight:
- (1) Direct transmission to individual aircraft;
 - (2) Broadcast on ATC frequencies.
- 3.2 Controllers must ensure that information transmitted to flights conforms to that which is requested (e.g. a report should not be given in place of a forecast).

- 3.3 SIGMET messages should be relayed with the least possible delay to all aircraft likely to be affected but without prejudice to control of aircraft in flight.
- 3.4 RVR values are to be transmitted when requested by pilots or at the discretion of the controller.
- 3.5 As a general rule, controllers shall only transmit meteorological information to aircraft that has been supplied, or agreed by, the Meteorological Office. The exceptions are detailed in Section 3, Chapter 1.

Section 4: Area Control

Chapter 6: Temporary Reserved Areas (TRA)

1. Operating Procedures

1A. Definition

- 1A.1 A Temporary Reserved Area is a defined volume of airspace normally under the jurisdiction of one aviation authority and temporarily reserved, by common agreement, for the specific use by another aviation authority and through which other traffic may be allowed to transit under an ATS authority.
- 1A.2 Detailed access arrangements for TRAs are notified in civil and military AIPs. The airspace within an activated TRA shall be treated as uncontrolled and ATS shall be provided on the basis of services to aircraft outside controlled airspace. Aircraft in receipt of an ATS surveillance service shall be provided with advice or information appropriate to the service being received.
- 1A.3 The dimensions and activation times of TRAs are defined in the UK AIP. Charts of the airspace structure arrangements between FL195 and FL245 are also notified in the UK AIP.
- 1A.4 TRAs may overlap other airspace structures such as Danger Areas. In such circumstances, the airspace structure with the more restrictive access criteria or rules will take precedence.
- 1A.5 Operations within an activated TRA should be conducted on standard pressure setting, 1013.2 hPa.
- 1A.6 Within an activated TRA between FL195 and FL245, the table of cruising levels shall be applied (UK Reg (EU) No. 923/2012 SERA.5025(a) and Appendix 3).
- 1A.7 Controllers should be aware that military aircraft operating autonomously in an activated TRA will squawk 7006. Where the TRA is contiguous with controlled airspace, pilots operating autonomously have been requested to aim to operate no closer to the lateral boundary than 3 NM or within 500 ft of the vertical limit of that TRA.

1B. Gliders

- 1B.1 Some TRAs have been established for sole use by gliders. These shall be identified by the acronym TRA(G). Access arrangements to TRA(G)s will be detailed in the UK AIP and flights will be conducted in accordance with the appropriate LoA arrangements. Gliders without transponders shall only operate above FL195 when within an activated TRA(G). Specific rules for non-SSR equipped gliders operating in a TRA(G) will be detailed in the respective LoA.

- 1B.2 Except for Air Defence Priority Flights and aircraft in an emergency, IFR traffic shall not be cleared to transit through an activated TRA(G).

1C. TRA Access Requirements

- 1C.1 Detailed requirements for flight within a TRA are notified in the UK AIP, military AIP, Air Traffic Management 3000 Series Regulatory Articles, and Manual of Military Air Traffic Management (MMATM). ATS units with responsibility for airspace in and around a TRA(G) shall document the access requirements for the TRA(G) in MATS Part 2.
- 1C.2 Civil aircraft flying VFR and seeking to access an activated TRA shall:
- (1) comply with CAA requirements notified in the UK AIP;
 - (2) file a flight plan (when specified, an abbreviated flight plan will be acceptable – see Section 1, Chapter 2, paragraph 9A.1 sub-paragraph (1));
 - (3) obtain an ATC clearance to enter the TRA. IFR aircraft requiring transit through a TRA to or from adjacent controlled airspace will already be in receipt of an ATC service and will not require an additional ATC clearance;
 - (4) select SSR code as directed by ATC; and
 - (5) monitor the ATC frequency.

2. Collision Avoidance

- 2.1 The pilots of aircraft operating within an activated TRA are responsible for avoiding collisions in accordance with the RoA Regulations.
- 2.2 Vectoring responsibilities are detailed in Section 1, Chapter 6. Controllers should be aware of the potential for conflicts with aircraft in TRAs adjacent to the boundaries of their airspace, particularly if circumstances have made it necessary to vector an aircraft to be less than 2 NM from the boundary. In such circumstances, consideration should be given to co-ordinating with the appropriate controlling agency. When this cannot be achieved, aircraft should be vectored to be at least 2 NM from the boundary.
- 2.3 Aircraft operating within an activated TRA and receiving a Deconfliction Service or Traffic Service will be advised of the proximity of aircraft operating within adjacent Class C airspace.

3. Provision of ATS above FL195

- 3.1 ACCs, approved military ATS and ASACS units, CAA-approved units and autonomous surveillance units will be authorised to provide ATS above FL195 within Class C airspace in accordance with current specified operating limitations.
- 3.2 Specified approved military ATS units may be authorised by the CAA to provide ATS within an activated TRA up to FL245 in accordance with the conditions of the Approval.

- 3.3 Unless otherwise approved by the CAA, the provision of ATS by civil Approach units shall only be permitted below FL195.
- 3.4 The following principles apply for provision of ATS:
- (1) Civil ACC controllers are responsible for all aircraft operating on an ATS route.
 - (2) The MoD is responsible for military aircraft not operating on an ATS route and may be responsible for civil aircraft operating off-route, including within activated TRAs, as detailed in the Air Traffic Management 3000 Series Regulatory Articles, Manual of Military Air Traffic Management (MMATM), and unit order books.

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Section 5: Aircraft Emergencies

Chapter 1: Aircraft Emergencies

1. Operating Procedures

- 1.1 The circumstances of each aircraft emergency can vary to such an extent that detailed instructions cannot be given for every situation. The procedures outlined in this section are intended as a general guide and controllers must use their own judgement when handling a particular emergency.
- 1.2 However, in accordance with UK Reg (EU) No. 923/2012:
- (1) In the case of an aircraft known or believed to be in a state of an emergency, including being subject to unlawful interference, ATS units shall give the aircraft maximum consideration, assistance and priority over other aircraft as may be necessitated by the circumstances (SERA.11001(c)). Subsequent ATC actions shall be based on the intentions of the pilot, the overall air traffic situation and the real-time dynamics of the contingency (SERA.11001(d)).
 - (2) When an occurrence of unlawful interference with an aircraft takes place or is suspected, air traffic service units shall attend promptly to requests by the aircraft. Information pertinent to the safe conduct of the flight shall continue to be transmitted and necessary action shall be taken to expedite the conduct of all phases of the flight, especially the safe landing of the aircraft (SERA.11005(b)).
 - (3) When an occurrence of unlawful interference with an aircraft takes place or is suspected, ATS units shall, in accordance with locally agreed procedures, immediately inform the appropriate authority and exchange necessary information with the aircraft operator or its designated representative (SERA.11005(c)).
 - (4) When an air traffic services unit knows or believes that an aircraft is being subjected to unlawful interference, no reference shall be made in ATS air-ground communications to the nature of the emergency unless it has first been referred to in communications from the aircraft involved and it is certain that such reference will not aggravate the situation (SERA.10005(b)).

Note 1: An aircraft which is being subject to unlawful interference shall endeavour to set the transponder to Code 7500 and notify the appropriate ATS unit of any significant circumstances associated therewith and any deviation from the current flight plan necessitated by the circumstances, in order to enable the ATS unit to give priority to the aircraft and to minimise conflict with other aircraft (SERA.10005(ab)).

Note 2: If an aircraft is subject to unlawful interference, the pilot-in-command shall attempt to land as soon as practicable at the nearest suitable aerodrome or

at a dedicated aerodrome assigned by the competent authority, unless considerations aboard the aircraft dictate otherwise (SERA.11005(ab)).

- 1.3 The procedures described in the preceding sections and the appropriate standard phraseology may also be varied to meet an emergency situation but any reduction in separation, necessary to cope with the emergency, should be restored as soon as possible. Special arrangements, made locally for handling aircraft emergencies, are detailed in MATS Part 2.
- 1.4 In addition to the procedures outlined below, CAP 745 Aircraft Emergencies – Considerations for Air Traffic Controllers, is available to give further guidance on handling emergency situations.

2. Controllers Responsibility

- 2.1 Controllers must always be alert to the possibility of an aircraft emergency. Speed may be necessary in certain circumstances, but calm coordinated actions are essential in all situations.
- 2.2 Controllers shall offer as much assistance as possible to any aircraft that is considered to be in an emergency situation. Assistance to the aircraft can include the provision of information on the availability of aerodromes and their associated approach aids, vectoring, weather information and details of terrain clearance. An emergency may require alerting action to be taken immediately or it may develop to that point later.
- 2.3 The supervisor, if available, should be informed as soon as practicable and where more than one ATSU is involved complete co-ordination must be maintained between units.
- 2.4 If the ACC is involved the ACC supervisor should take charge of the operation. Controllers must be ready to give all possible assistance to the ACC, JRCC and other units. If more than one ACC is involved, then the supervisors should agree between them which one takes charge.
- 2.5 The D&D cell should be advised of any aircraft emergency.
- 2.6 The Alerting Service is described in Chapter 6 and the aerodrome emergency service in Chapter 7.

3. Recognising an Emergency Situation

- 3.1 A controller may suspect that an aircraft is in an emergency situation or has suffered unlawful interference when:
 - (1) radio contact is not established at the time it is expected to be established;
 - (2) radio contact is lost;
 - (3) a pilot makes a report about the malfunctioning of their aircraft or the unusual behaviour of persons on-board;

- (4) the erratic behaviour of an aircraft or position symbol is observed;
 - (5) it is overdue at an aerodrome; or
 - (6) the pilot reports that the aircraft is short of fuel.
- 3.2 If the controller is in radio contact with the aircraft, the controller should ask the pilot if they wish to declare an emergency and, if not specified by the pilot, the class of emergency being declared.
- 3.3 More positive indications that an aircraft is in an emergency are described in the following paragraphs.

4. Distress and Urgency Messages

- 4.1 Pilots have been advised that, in the event of an emergency situation, an ATSU can only provide the necessary priority and handling if the controller is made aware of the emergency by the crew's formal declaration on the RTF. Pilots have also been advised that the extent to which an ATSU will be able to offer assistance will depend on the amount of information provided and on its being transmitted at the earliest opportunity. Furthermore, it is preferable that if pilots believe that they are facing an emergency situation, to declare it as early as possible and cancel it later if they decide that the situation allows.
- 4.2 There are two classes of emergency message: Distress: A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance. Urgency: A condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight, but which does not require immediate assistance.
- 4.3 The message will contain as many as possible of the following items:
- (1) MAYDAY, MAYDAY, MAYDAY (for distress messages); or PAN PAN, PAN PAN, PAN PAN (for urgency messages); and
 - (2) Name of the station addressed (time and circumstances permitting)
Identification of the aircraft;
 - (3) Nature of the emergency;
 - (4) Intention of the person in command Present position, level and heading;
 - (5) Qualification of the pilot e.g. Student, IMC or full instrument rating (urgency messages); and
 - (6) As much other information as time permits
- 4.4 When a pilot has given certain items of information normally associated with an emergency message but has not prefixed the transmission with 'MAYDAY' or 'PAN', the controller is to ask the pilot if they wish to declare an emergency. If the pilot declines to do so, the controller may, if they think it appropriate, carry out the necessary actions as if the pilot had declared an emergency. The term 'fuel

emergency' has no status in the UK and controllers are not required to give priority to aircraft with a reported shortage of fuel unless an emergency is declared.

- 4.5 If a controller considers that another ATSU may be able to give more assistance and, in the circumstances, it is reasonable to do so, the pilot should be asked to change frequency.

5. Indications by Visual Signal from Aircraft

- 5.1 Notification of distress by visual signal will be by one or more of the following methods:

- (1) The signal SOS with signalling apparatus;
- (2) A succession of pyrotechnical lights fired at short intervals, each showing a single red light;
- (3) A parachute flare showing a red light.

- 5.2 Notification of urgency by visual signal will be:

- (1) for an aircraft in difficulties that compel it to land without requiring assistance, the following signals:
 - (a) Switching the landing lights on and off repeatedly;
 - (b) Switching the navigation lights on and off repeatedly;
 - (c) A succession of white pyrotechnical lights.
- (2) For an aircraft with a very urgent message to transmit concerning the safety of an aircraft (including that sending the message), a ship or person, the signal XXX with signalling apparatus.

6. Indications on the Situation Display

- 6.1 Pilots may select the following SSR transponder codes to indicate the emergency situation:

- (1) Code 77 (7700) – Aircraft Emergency
- (2) Code 76 (7600) – Radio Failure (see Chapter 4)
- (3) Code 75 (7500) – Hijack or Other Act of Violence (see Chapter 5).

- 6.2 To indicate an emergency condition pilots are encouraged to select Code 7700 as soon as is practicable after declaring an emergency situation, having due regard for the overriding importance of controlling aircraft and containing the emergency.

- 6.3 However, if the aircraft is already transmitting a discrete code and receiving an air traffic service, that code may be retained at the discretion of either the pilot or the controller.

7. Emergency Triangle Procedure

- 7.1 Pilots lost or uncertain of position and experiencing either transmitter or complete radio failure are advised, as a last resort, to carry out special procedures to indicate to controllers that they require assistance.
- 7.2 The aircraft fly at least two triangular patterns, before resuming course, as follows:

Table 1:

Aircraft speed	Length of Leg	Transmitter Failure Only	Complete Failure
300 knots or less	2 minutes	Right hand turns	Left hand turns
More than 300 knots	1 minutes		

- 7.3 If a triangular pattern is observed, controllers shall advise the D&D cell of the position and track and continue to plot the aircraft whilst it is within ATS surveillance system cover. Controllers should also be aware of the effect wind may have on the pilot's ability to fly an accurate triangle.

8. Emergency Aircraft – Selection of Controlling Agency

- 8.1 On receipt of information that indicates that an aircraft is in an emergency, the controller must decide whether or not to transfer the aircraft to another agency. The choice of agency will depend upon the circumstances and no hard and fast rules apply. The following guidance material will help controllers to make this decision.

8A. Retaining Control

- 8A.1 If the controller can offer immediate assistance the aircraft should normally be retained on the frequency. If necessary, impose a radio silence on other aircraft or transfer them to another frequency.
- 8A.2 Alternatively, it may be more expedient to transfer the emergency aircraft to a discrete frequency, particularly if a radio silence would endanger other traffic.
- 8A.3 The aircraft should be retained on the original frequency if it is unreasonable to ask the pilot, or the pilot is not prepared, to change frequency. The controller may be able to relay instructions and information from other units to the pilot.

8B. Transferring Control

- 8B.1 If a controller considers that another unit may be able to give more assistance than they can and in the circumstances it is reasonable to ask the pilot to change frequency, the controller shall either:
- (1) consult the ACC supervisor and transfer the aircraft according to their instructions; or
 - (2) alert the nearest suitable unit and transfer the aircraft to a common frequency, giving assistance to that unit as required.

- 8B.2 Before transferring aircraft, controllers should obtain sufficient information from the pilot to be convinced that the aircraft will receive more assistance from another unit. If a change of frequency is desirable the pilot must be instructed to revert immediately if there is no reply on the new frequency. Controllers should then listen out on the original frequency until the aircraft is known to be in two-way communication with the other unit.

9. Distress and Diversion Cell

- 9.1 The RAF Distress and Diversion (D&D) cell at Swanwick can provide assistance to civil aircraft in an emergency in addition to the service it provides for military aircraft on 243.0 MHz. The D&D cell has access to NATS ATS surveillance systems, with a facility to detect emergency SSR squawks automatically; and although D&D can provide an ATC surveillance service to an emergency aircraft in transit to its diversion aerodrome, other ATC agencies and in particular controllers at aerodromes, should consider the following points when dealing with D&D:

(1) **Terms used by D&D for handling of emergency**

D&D use the terms 'Executive Control' and 'Operational Control.' If an aircraft calls on 121.5 MHz, the D&D controller has both executive and operational control. Once D&D hand the aircraft to another unit they pass-over Operational Control but retain Executive Control. This means that D&D do not give up all responsibility for an emergency once the aircraft is working another unit. They retain responsibility for overall management until the emergency ends.

(2) **Surveillance Cover**

D&D controllers only have access to the Area Control ATS surveillance systems at their parent unit, which may have poor low-level coverage, therefore a D&D controller may seek an early handover to the aerodrome ATSU in order to avoid the need to stop the descent of an emergency aircraft.

(3) **Minimum Sector Altitudes**

D&D controllers do not have a detailed knowledge of the local airspace, terrain or obstacles surrounding aerodromes. Therefore, the D&D controller may require guidance on local Minimum Sector Altitudes in order to provide the fullest possible service to actual emergencies.

(4) **RTF Coverage**

D&D's low-level radio coverage (below 3,000 ft amsl) is poor and so an early handover to the diversion aerodrome may be sought by the D&D controller. In certain circumstances, e.g. A UHF-only equipped aircraft diverting to a VHF-only equipped aerodrome ATSU, it may be impossible to transfer RTF communications with the aircraft to its destination aerodrome. In these circumstances the D&D controller may request that the control of the aircraft be transferred to the aerodrome ATSU, which would necessitate all

subsequent control instructions being passed on the telephone, through the D&D controller, for relay to the pilot. It is imperative when this happens that controllers are agreed as to who is responsible for the control of the aircraft. Additionally, the aircraft may initially need to be kept high and/or very early landing clearances passed to the pilot, so that all necessary control instructions are completed before loss of RTF occurs.

- 9.2 D&D controllers have a detailed knowledge of minor aerodrome availability within their area as well as a comprehensive database that enables rapid communication with aerodromes, Aircraft Operators, ATSU's, and the SAR organisation including Police Air Support Units and the regional emergency services. The D&D cell can assist a pilot of an aircraft in an emergency and the civil ATSU to select the most suitable diversion aerodrome. The D&D cell also provide facilities for practising emergency procedures to both civil and military pilots.
- 9.3 The D&D cell can provide an instant VHF auto-triangulation fixing service on 121.5 MHz. In the London FIR, this service is expected to be available to aircraft operating over land to the east of Wales and south of Manchester at and above 3,000 ft amsl and at and above 2,000 ft amsl within 40 nm of Heathrow. In the Scottish FIR, this service is expected to be available at and above 8,500 ft amsl, reducing to 2,000 – 5,000 ft amsl over the sea, lowland areas and around the Scottish TMA. Outside these parameters, the service can be unreliable.
- 9.4 Successful VDF fixing also depends to a great extent upon the quality of additional information that the pilot and controller can give to the D&D cell.
- 9.5 With exception to the following circumstances, ATS units should not transmit on 121.5 MHz or 243.0 MHz without authorisation of the D&D cell:
- (1) A pilot in distress calls a specific ATS unit that is local to the pilot concerned; or
 - (2) It is apparent that the D&D cell is not responding to an emergency transmission.

10. Intercepted Messages

- 10.1 If a controller intercepts a message from an aircraft that indicates that it is in an emergency they should, if possible, obtain a VDF bearing and pass it to the station being called. The controller should also continue to listen out until they are satisfied that the aircraft is in two-way communication with an ATSU.
- 10.2 In addition, if it appears that the message is not being acknowledged the controller shall:
- (1) forward the message to the station being called and/or the ACC supervisor;
 - (2) attempt to establish two-way communication with the aircraft; and
 - (3) give every assistance to the emergency aircraft.

11. Aircraft Emergencies – General Principles

11.1 Having decided to retain the aircraft and deal with the emergency, controllers shall use every means available to assist the pilot. Each situation must be dealt with according to the circumstances. Controllers are to take any of the actions described below which may be appropriate but should note that this list is not exhaustive nor in any preferred order.

11A. Local Emergency Services

11A.1 Alert local emergency services in the area of an expected forced landing. This should be done via the ACC supervisor unless the aircraft is within the radius of action of the Aerodrome Fire Service. Aerodrome emergency services are described in Chapter 7.

11A.2 Emergency Orders should detail that the local emergency services are also informed, even if the aircraft is within the agreed response radius of the Aerodrome Fire Service. This response radius could be considerable in terms of distance. Depending upon where the incident occurs, the local emergency services may be closer to the incident area and, if first to arrive, could assist by passing the exact location to the responding Aerodrome Fire Service.

11A.3 If it is doubtful that an aircraft can reach an aerodrome, the Distress phase exists. The ACC supervisor must be informed so that they can take alerting action with the RCC.

11B. Nearest Aerodromes

11B.1 Advise the pilot of the nearest aerodromes and suggest a suitable aerodrome for landing (see paragraph 11I.2 below). The ACC will be able to assist in the selection.

11B.2 Notify the aerodrome selected for emergency landing so that it can make suitable preparations.

11B.3 Warn other aerodromes in the vicinity and on track to stand by. This can most easily be done through the ACC supervisor.

11B.4 When it is known that the emergency aircraft is committed to landing at the selected aerodrome, units shall, in conjunction with any other appropriate ATSUs, give consideration to the sterilization of the landing runway.

11C. Plot Position

11C.1 Plot the position of the emergency aircraft and its subsequent track. ATS surveillance systems should be used until the aircraft is out of cover.

11C.2 It may be advisable to plot the position and track on a map. VDF can be used to fix the position by obtaining bearings from other units having the same frequency.

11C.3 Controllers should always pass position and bearing information about an emergency aircraft to other interested units; particularly the ACC.

11D. Uninterrupted Approach

- 11D.1 Ensure that an aircraft in an emergency has an uninterrupted approach to the selected aerodrome; rearrange the traffic pattern if necessary.

11E. Emergency Descent

- 11E.1 An emergency descent is a manoeuvre initiated by flight crew in order to bring an aircraft in emergency to a safe level, in the minimum time, with the least possible passenger discomfort. The procedure is most frequently applied by aircraft that have suffered an uncontrollable loss of cabin pressurisation, requiring a higher-than-normal rate of descent to approximately 10,000 ft amsl.
- 11E.2 Due to high flight deck workload, the first indication to a controller that an aircraft is carrying out an emergency descent may be an unexpected change in level on the situation display. However, the pilot may be able to make a short RTF broadcast and should select the emergency SSR code 7700.
- 11E.3 Immediately upon recognising that an emergency descent is in progress, controllers should acknowledge the emergency by RTF. If the pilot has not done so already, a simple prompt to squawk 7700 is acceptable, even during a time of intense flight deck workload. Pilots will be wearing their emergency oxygen masks and communications will be difficult, often with excessive noise on the frequency when the pilot transmits. If the level off altitude stated by the pilot is below the minimum altitude for the area of operation, controllers should state the applicable minimum altitude to maintain terrain clearance, together with the applicable QNH altimeter setting.
- 11E.4 ICAO procedures require that when undertaking an emergency descent, pilots shall navigate as they consider appropriate; this has the potential for aircraft to turn off track without advising ATC. However, given the complex and congested nature of UK controlled airspace, pilots flying in UK FIRs have been instructed that they should, if able, remain on the assigned route or track whilst carrying out the emergency descent; unless to do so would endanger the aircraft. Ultimately it is the pilot's responsibility to take the action most appropriate in the circumstances. Consequently, controllers must remain alert to the potential for aircraft conducting an emergency descent to change heading without notice and be ready to provide appropriate instructions and information to aircraft in proximity.
- 11E.5 The controller's priority is to provide separation from all conflicting traffic on the emergency descent aircraft's track, issuing traffic information as appropriate. A rapid descent will cause the aircraft to pass through numerous sectors very quickly; therefore, co-ordination with adjacent sectors and even other control centres is essential. Primarily, controllers should ensure that separation is maintained by turning other aircraft away from the aircraft conducting the emergency descent. However, if necessary, controllers may, as required by the situation, suggest a heading to be flown, if able, by the aircraft carrying out the emergency descent in order to achieve separation from other aircraft concerned. However, controllers

should remember that they may not be fully aware of any particular handling difficulties the aircraft may have.

- 11E.6 When deemed necessary, controllers may broadcast an emergency message, or cause such message to be broadcast, to alert all other aircraft of the emergency descent. The emergency broadcast message should contain instructions for specific actions to be taken by aircraft addressed in the broadcast or, alternatively, instructions to continue in accordance with their current clearances, and to stand by on the appropriate channels for further clearances and instructions. Controllers should be aware that ICAO Doc 4444 states that aircraft receiving an emergency descent broadcast will clear the specified areas and then standby on the appropriate radio frequency for further clearances from the ATC unit. Consequently, in the absence of specific instructions provided to the aircraft addressed in the broadcast, it may be expected that such aircraft will clear the area on their own initiative.

11F. Supervisor at the ACC

- 11F.1 Inform the supervisor at the ACC of the aircraft emergency giving details of action already taken. The supervisor is responsible for:
- (1) Co-ordinating the operation unless immediately effective action can be taken at the originating unit.
 - (2) Taking alerting action as described in Chapter 6.
 - (3) Alerting the D&D cell.

11G. Other Aircraft

- 11G.1 Advise other aircraft likely to be affected or able to assist.

11H. Aircraft Operator

- 11H.1 Inform the operator if one of their aircraft is in an emergency. Normally the ACC supervisor should keep the operator informed of all subsequent developments.
- 11H.2 A message from the operator, e.g. bomb warning, suspected damage to airframe, etc, is to be passed to the commander immediately using the operator's own words. A message, which has to be relayed via an ACC outside the UK, must be confirmed with a priority SS signal and addressed to the aircraft.

11I. Handling Aircraft Emergencies

- 11I.1 When a pilot has declared an emergency and stated the aerodrome to which they wish to proceed, controllers shall acknowledge this message. If the controller is instructed to inform the aircraft that it is required or requested to divert to another aerodrome then the reason for this change should be established. The message, together with the reason, shall then be passed to the captain and their intentions requested.

- 11I.2 The decision to comply with advice or instructions to land at an aerodrome, other than their selected diversion, lies with the captain of the aircraft who has ultimate responsibility for the safety of their aircraft.
- 11I.3 It is desirable that aircraft in an emergency should not be routed over densely populated areas, particularly if there is reason to believe that the aircraft's ability to remain in controlled flight is compromised or that parts of the aircraft could detach in flight. If this is inconsistent with providing the most appropriate service to the aircraft, for example when any extended routeing could further jeopardise the safety of the aircraft, the most expeditious route is the one that should be given. Where possible, when expeditious routeing is not required, suggestions of alternative runways or aerodromes together with the rationale that the routeing would avoid densely populated areas and be consistent with safety, shall be passed to the pilot and their intentions requested.
- 11I.4 It is recognised that controllers providing en-route services at ACCs may not be aware of the boundaries of major cities, towns, or villages. However, controllers providing aerodrome, approach or approach surveillance control services should be familiar with the centres of population within their areas of jurisdiction.
- 11I.5 Controllers should be aware that aircraft experiencing engine failure may also experience associated handling difficulties and should therefore limit manoeuvring instructions to the minimum necessary.

11J. Dangerous Goods – General

- 11J.1 When the pilot of an aircraft in an emergency provides information about dangerous goods being carried as cargo, this information must be relayed without delay to the ATSU at the aerodrome of intended landing. The senior controller at the aerodrome must notify the Aerodrome Operator and RFFS immediately.
- 11J.2 ICAO requires the pilot to give information about the dangerous goods to the ATSU either in full detail, as a summary or by providing to a telephone number of the location from where this detailed information can be obtained immediately. Therefore, when a pilot intends to provide an ATSU with dangerous goods information, controllers should, as the preferred option, request the pilot to provide a telephone number from where detailed information can be obtained.
- 11J.3 However, it is possible that the pilot might not be able to provide this telephone number and therefore, controllers should then request the pilot to provide a summary of the quantities and classes or divisions of dangerous goods carried, as receipt and transcription of full details of voluminous and technically detailed chemical information would be impracticable.
- 11J.4 It is important that all details provided by the pilot are passed, without delay, to the relevant emergency services.
- 11J.5 In the event that an aircraft that is known to be carrying dangerous goods has crashed, all pertinent information, including that relating to the dangerous goods

carried on the aircraft, shall be passed to the Senior Fire Officer (or the Fire Service Incident Commander or Senior Police Officer) at the accident site without delay. Where the crash occurs whilst the aircraft is en-route, the ACC Watch Supervisor shall pass this information to the relevant emergency services without delay.

- 11J.6 Notification of dangerous goods will not always be found on the flight plan. Whilst this may be so on some occasions, many aircraft will be carrying dangerous goods as cargo of some sort and the absence of an annotation on the flight plan should not be taken as an indication that no dangerous goods are being carried.

11K. Carrying Explosives under an Exemption Issued by the CAA

- 11K.1 Pilots of aircraft who state that they are carrying explosives specifically under an exemption issued by the CAA are to be treated as an aircraft carrying dangerous goods, except that such aircraft must not to be deviated from their flight-planned route except in an emergency. If the aircraft is required to divert, a military aerodrome (RAF or USAF) should be considered in the first instance, however, the following civil airfields also have expertise in the handling of aircraft carrying such explosives:

- (1) Humberside; and
- (2) Prestwick.

- 11K.2 Other civilian aerodromes may be suitable subject to the type and quantity of explosive being carried and consequently, if the situation permits, the agreement of the Aerodrome Operator should be sought. Heathrow, Gatwick, and Manchester should not be considered as suitable diversion aerodromes for emergency aircraft specifically carrying explosives under an exemption issued by the CAA.

- 11K.3 Operators of aircraft carrying explosives under an exemption issued by the CAA are required to insert, on the aircraft's flight plan, a telephone number from where detailed information concerning the explosives carried can be obtained. This telephone number will be found in item 18 immediately after the Operator descriptor e.g. OPR/ (operator name) Tel: +(country code) (telephone number).

12. RAF Distress and Diversion

- 12.1 If the pilot of a military aircraft in an emergency declares that they are carrying dangerous cargo or explosives under an exemption issued by the CAA, the RAF Distress and Diversion cell is to be informed immediately.

13. Fuel Jettisoning

- 13.1 Pilots of aircraft in flight are permitted to jettison fuel in an emergency. The decision to jettison rests solely with the pilot but they may request guidance from ATC.
- 13.2 When an aircraft in controlled airspace needs to dump fuel, ATC should co-ordinate with the flight crew:

- (1) the route to be flown which, if possible, should be clear of cities and towns, preferably over water and away from areas where thunderstorms have been reported or are expected;
 - (2) the level to be used;
 - (3) the estimated duration of the fuel dumping; and
 - (4) the frequency to be monitored whilst the aircraft is dumping fuel.
- 13.3 Controllers are to recommend to flight crew that jettisoning of fuel should be carried out above 10,000 ft agl. Exceptionally, if fuel dumping at this level, or over water, is operationally impracticable or inconsistent with safety, fuel may be jettisoned above 7,000 ft agl in winter and above 4,000 ft agl in summer. For fuel to be jettisoned below these levels the situation must be unavoidable.
- 13.4 A vertical separation of at least 1,000 ft between aircraft should be maintained.
- 13.5 Adjacent ATC units and control sectors should be informed of the fuel dumping taking place, including co-ordination with units providing services outside controlled airspace where the aircraft's track is near to the boundary of controlled airspace (both laterally and vertically).

14. Emergency Overweight Landings

- 14.1 Controllers may experience a situation where a flight in an emergency is unable to continue as planned and an immediate landing at the nearest, suitable aerodrome is necessary. This may result in an aircraft landing above the certificated maximum weight for landing. The decision to make an overweight landing rests solely with the commander of the aircraft who may elect to land immediately when it is inappropriate, on safety grounds, to spend time jettisoning fuel.
- 14.2 An overweight landing requires extra care on the part of the crew for the approach, landing and deceleration on the runway. In particular, there are limits to the maximum rates of descent on final approach that have to be achieved to ensure a successful landing. Ideally, the aircraft should intercept the final approach track at or below the ILS glide path to ensure that these rates of descent are not exceeded. Deceleration on the runway may require additional braking with the attendant risk of wheel fires and it is likely that the full length of the runway will be utilised. Except in the most extreme situations where the aircraft is compelled to land at all costs, controllers should not observe significant differences from normal aircraft performance with regard to rate of turn and speed.

15. Facilitation

- 15.1 DfT require that, upon notification by a pilot of a suspected communicable disease, controllers are to notify the appropriate authorities as detailed in MATS Part 2, the Aerodrome Manual, or local orders.

16. Ballistic Recovery Systems

- 16.1 Ballistic recovery systems, which take the form of a parachute, are fitted to some general aviation aircraft for use in situations where a pilot considers continued safe flight is no longer possible. Such situations could include engine failure and loss of control.
- 16.2 They are typically activated by use of a handle which deploys a solid fuel rocket out of a hatch covering the compartment where the parachute is stored. Where the system has been activated but has not deployed, the possibility exists that the rocket may still be live.
- 16.3 Deployment of the parachute assists a controlled descent rate, and in many situations the pilot should be able to maintain radio contact subject to the level at which the parachute is deployed and VHF coverage. The aircraft will generally drift with the wind and the pilot will have no further control over the path of the aircraft. It should be noted therefore, that deployment of the parachute does not guarantee survivability of an in-flight incident.
- 16.4 If time permits, a pilot deploying such a recovery system should notify this as part of additional information within the normal emergency message, using the RT phraseology:
- “Ballistic recovery system deployed”
- 16.5 ATCOs should treat such pilot reports with the same priority as those pertaining to engine failures and forced landings. Furthermore, they should ensure that RFFS are provided with this information, as not only may it aid in identification of the aircraft but will reassure them that if the chute has deployed, the system should present no further hazard.
- 16.6 Where it is known that a recovery system has been activated but has failed to operate, ATCOs should also provide this information to RFFS, which should be alert for the possibility of a live rocket on board the aircraft.

Section 5: Aircraft Emergencies

Chapter 2: Strayed and Unidentified Aircraft

1. Introduction

- 1.1 For the purposes of this chapter, the terms strayed and unidentified aircraft have the following meaning: Strayed aircraft: An aircraft which has deviated significantly from its intended track, or which reports that it is lost. Unidentified aircraft: An aircraft which has been observed or reported to be operating in a given area but whose identify has not been established.
- 1.2 An aircraft may be considered, at the same time, as a “strayed aircraft” by one unit and as an “unidentified aircraft” by another unit.
- 1.3 Controllers are reminded that a strayed or unidentified aircraft may be the subject of unlawful interference and when this is suspected, shall follow the appropriate local procedures.
- 1.4 The actions in response to strayed and unidentified aircraft detailed below may not be exhaustive, as no two instances may be similar in nature. Furthermore, ANSPs should ensure that their local instructions reflect any unit specific actions to be taken by controllers when handling such aircraft.

2. Strayed Aircraft

- 2.1 When a controller becomes aware of an aircraft which has deviated significantly from its intended track but has not reported as being lost, the following actions should be followed in so far as is necessary:
- (1) Attempt to establish two-way communication, unless such communication already exists, and inform the pilot of their position (SERA.11010(a)(1)(i) & (ii));
 - (2) Inform other ATS units into whose area the aircraft has strayed or may stray (SERA.11010(a)(1)(iii));
 - (3) Request appropriate assistance from D&D, other ATS units, and other aircraft in establishing communication with the strayed aircraft (SERA.11010(a)(1)(iv) & (v));
 - (4) Notify, the Civil Watch Supervisor at the parent ACC in the event that unlawful interference is suspected (SERA.11005 & SERA.11010(c)).
- 2.2 In the event that a pilot reports that they are lost, controllers should endeavour to provide every possible assistance to the pilot and use all available means to determine the aircraft’s position. Controllers should follow, in so far as is necessary, the actions outlined below (SERA.11010(a)(1)(ii)):
- (1) Treat an estimated position given by the pilot with caution;

- (2) Use ATS surveillance systems and VDF in an attempt to locate the aircraft;
- (3) If communications are poor, or the controller suspects that the aircraft is below surveillance coverage, the pilot may be advised to climb. However, controllers should be aware that such a climb may present a pilot with flight conditions beyond their capabilities, and the pilot may prefer to remain with the surface in sight;
- (4) Consider terrain clearance if the aircraft is flying at a low level. Controllers should make allowance for terrain and obstructions within a wide area around the estimated position of the aircraft and advise the pilot to climb if there is any doubt that adequate clearance exists. If a pilot is unable or unwilling to climb, they are to be warned of potential terrain hazards in the area;
- (5) Request assistance from other ATS units in determining the aircraft's position;
- (6) VDF bearings from other units may assist in fixing the position. If it is not possible to establish the position of the aircraft immediately, bearings should be passed to the pilot;
- (7) Inform D&D, who are equipped to provide dedicated assistance;
- (8) Notify the Civil Watch Supervisor at the parent ACC in the event that unlawful interference is suspected.

2.3 When the position of a lost aircraft has been established, the controller shall:

- (1) advise the aircraft of its position and the corrective action to be taken. This advice shall be immediately provided when the ATS unit is aware that there is a possibility of interception or other hazard to the safety of the aircraft (SERA.11010(a)(3)(i)); and
- (2) provide, as necessary, other air traffic service units and appropriate military units with relevant information concerning the strayed aircraft and any advice given to that aircraft (SERA.11010(a)(3)(ii)).

3. Unidentified Aircraft

3.1 When a controller becomes aware of an unidentified aircraft within airspace for which they are the controlling authority and an ATC clearance is required, or when required by appropriate military authorities, they should follow, in so far as is necessary, the following actions:

- (1) Attempt to establish the identity of the aircraft;
- (2) Attempt to establish two-way communication (SERA.11010(b)(1));
- (3) Inform D&D and any other affected ATS units or neighbouring FIRs, and request their assistance in establishing the identity of and two-way communication with the aircraft (SERA.11010(b)(2),(3)&(5));

- (4) Notify, the Civil Watch Supervisor at the parent ACC in the event that unlawful interference is suspected (SERA.11005 & SERA.11010(c));
- (5) If possible, attempt to obtain information from other aircraft in the area (SERA.11010(b)(4));
- (6) As required, notify those units consulted in the tracing of the unidentified aircraft that the aircraft's identity has been ascertained;
- (7) Complete a Mandatory Occurrence Report.

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Section 5: Aircraft Emergencies

Chapter 3: Overdue Aircraft

1. Introduction

- 1.1 Overdue action should not be considered in isolation and the emergency actions described in other chapters, in particular radio failure procedures should be applied if they are appropriate. For example, if a radio equipped aircraft fails to make an expected report, continued attempts should be made to re-establish communication while at the same time commencing overdue action.
- 1.2 Overdue action is not related solely to the filing of a flight plan. If, at any stage of a flight the pilot has made their intentions clear and subsequently does not arrive or report when expected, controllers should seriously consider taking overdue action.
- 1.3 Overdue action described in this chapter must be commenced not later than the times shown in the following paragraphs. The decision to take overdue action before these times is left to the discretion of the controller. The following points may assist in making the decision:
- (1) Type of Aircraft: Strict adherence to the flight plan cannot always be expected of a non-radio light aircraft.
 - (2) Route: Need for prompt action if the route is over sparsely populated areas, mountainous country, long stretches of water, etc.
 - (3) Weather: The pilot of a non-radio aircraft might well be expected to extend their flight time by deviating from their planned route to avoid bad weather. Where no additional hazards exist, sufficient time for a deviation should be allowed.

2. Aerodrome Procedure

2A. Non-Radio Aircraft – Preliminary Action

- 2A.1 The following preliminary action for a non-radio aircraft shall be commenced not later than 30 minutes after ETA:
- (1) Check flight plan for obvious errors in compilation or transmission;
 - (2) Consult operating company or representative if available;
 - (3) Confirm ATD with aerodrome of departure using the quickest means of communication;
 - (4) Inform and in co-ordination with the ACC supervisor
 - (a) Check with alternate aerodromes;
 - (b) Send RQS message;

- (c) Check with any likely aerodromes on and adjacent to the proposed route of the aircraft.

2B. Non-Radio Aircraft – Full Overdue Action

- 2B.1 The following overdue action for a non-radio aircraft shall be commenced not later than 1 hour after ETA:
- (1) Notify the parent ACC that the aircraft is now fully overdue and state the action already taken;
 - (2) In consultation with the ACC supervisor, continue endeavours to trace the aircraft, e.g. notify local police or any other appropriate bodies to be on the lookout for the aircraft if it is assumed that it has made a forced landing in a particular area.

2C. Radio Equipped Aircraft – Preliminary Action

- 2C.1 If an aircraft fails to make a position report when expected, the following preliminary action shall be commenced not later than the estimated time for the reporting point plus 30 minutes:
- (1) Advise the ACC supervisor that the aircraft is overdue;
 - (2) Confirm ATD from departure aerodrome by quickest possible means;
 - (3) Ensure that an RQS message is sent.

2D. Radio Equipped Aircraft – Full Overdue Action

- 2D.1 If, after the action above, no news is received or 1 hour has elapsed since a scheduled position report should have been received, or the fuel carried by the aircraft is considered to be exhausted, whichever is the sooner, the controller at the destination aerodrome shall inform the ACC supervisor that the aircraft is fully overdue.

2E. Non-Appearance of Aircraft

- 2E.1 If an aircraft, which has been cleared to commence approach, after completing any necessary holding fails to land within 5 minutes of the estimated time of landing and communication cannot be established, the following action shall be taken:
- (1) Alert Approach Surveillance Control where available;
 - (2) Request other aircraft flying in the vicinity of the aircraft's last known position to be on the lookout;
 - (3) Exercise caution when authorising the movement of aerodrome traffic;
 - (4) Alert the emergency services in accordance with MATS Part 2;
 - (5) Check with other aerodromes in vicinity;
 - (6) If necessary, send RQS message;

- (7) Advise the ACC supervisor.

3. ACC Procedures

- 3.1 When aircraft are reported overdue, the ACC supervisor shall notify the D&D cell and take the action described below according to the circumstances. The alerting message, which is to be dispatched at the beginning of each phase of emergency, shall be telephoned to the JRCC and confirmed by signal as described in Chapter 6.

3A. Non-Radio Aircraft – Preliminary Action

- 3A.1 When advised by an aerodrome ATSU that a non-radio aircraft has not arrived, the supervisor shall:

- (1) assist the aerodrome in completing its preliminary enquiries;
- (2) ensure that an RQS message has been sent;
- (3) notify the JRCC that the Uncertainty phase exists;
- (4) notify area surveillance units.

3B. Non-Radio Aircraft – Full Overdue Action

- 3B.1 Not later than 30 minutes after the beginning of the Uncertainty phase or when advised by an aerodrome ATSU that the aircraft is fully overdue, the supervisor shall:

- (1) notify the JRCC that the Alert phase exists;
- (2) assist the destination aerodrome in checking with aerodromes on or in the vicinity of the overdue aircraft's proposed route;
- (3) request other aircraft following the overdue aircraft's proposed route to keep a lookout for it having made a forced landing or crashed.

- 3B.2 Not later than 1 hour after the beginning of the Alert phase or when it is considered that the fuel carried by the aircraft is exhausted, the ACC supervisor shall:

- (1) notify the JRCC that the Distress phase exists;
- (2) give all possible assistance to the JRCC.

3C. Radio-Equipped Aircraft – Preliminary Action

- 3C.1 Preliminary overdue action for a radio-equipped aircraft, which either fails to make a position report or fails to appear at an aerodrome, shall be commenced as shown in the table overleaf:

Table 1:

Situation	Commence Preliminary Action
Aircraft fails to make a position report when it is expected.	Not later than the estimated time for the reporting point plus 30 minutes.
Not later than the estimated time for the reporting point plus 30 minutes.	As soon as the information is received from the aerodrome.

3C.2 The supervisor shall take the following preliminary action:

- (1) Confirm ATD and time of last contact with preceding ATSU (if appropriate);
- (2) Ask likely alternate aerodromes whether or not they have any information about the aircraft;
- (3) Where applicable, pass relevant information to the next ATSU on the aircraft's route, who will in turn pass information to succeeding units;
- (4) Ensure that an RQS message has been sent;
- (5) Notify the JRCC that the Uncertainty phase exists.

3C.3 Succeeding ATSUs along the proposed route of the aircraft shall follow the above action by endeavouring to establish contact with the aircraft at the appropriate times and shall warn units equipped with ATS surveillance systems to watch for the aircraft.

3D. Radio-Equipped Aircraft – Full Overdue Action

3D.1 If, not later than 30 minutes after the beginning of the Uncertainty phase, enquiries to relevant sources have failed to reveal any news, the supervisor shall notify the JRCC that the Alert phase exists.

3D.2 Subsequently, the JRCC shall be notified that the Distress phase exists if no contact has been made and either:

- (1) 1 hour has elapsed beyond the last ETA for destination; or
- (2) it is considered that the fuel carried by the aircraft is exhausted; or
- (3) 1 hour has elapsed since the beginning of the Alert phase, whichever is the sooner.

3E. Non-Appearance of Aircraft Cleared to Land

3E.1 When informed by an aerodrome ATSU that an aircraft has been cleared to land and has failed to do so within 5 minutes of the estimated time of landing and communication cannot be established, the supervisor shall:

- (1) notify the JRCC that the Alert phase exists;
- (2) request other aircraft in the vicinity of the last known position of the missing aircraft to look out for it; and

(3) ensure that an RQS message has been sent.

3E.2 If, after this action, the position of the aircraft is unknown or its fuel is considered to be exhausted, notify the JRCC that the Distress phase exists and subsequently give all possible assistance under their direction.

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Section 5: Aircraft Emergencies

Chapter 4: Radio Failure

1. Introduction

- 1.1 Radio failure procedures should not be considered in isolation and emergency action described in other chapters should be applied if they are appropriate. For example, if an aircraft fails to make a report when expected, overdue action may have to be taken at the same time, particularly if the aircraft cannot be tracked on a situation display.
- 1.2 Radio failure procedures shall be adopted when:
- (1) an aircraft is observed to have selected A7600, and the pilot does not respond to ATC communication;
 - (2) communication cannot be maintained with an aircraft on any flight which is being provided with an ATC or advisory service;
 - (3) communication cannot be established with an aircraft operating, or intending to operate, on an IFR flight plan within controlled or advisory airspace.
- 1.3 The following procedures are based on the assumption that the pilot will comply with the current procedures for radio failure detailed in the UK AIP.
- 1.4 Controllers should be alert to the possibility that a radio failure aircraft may have suffered unlawful interference.

2. Standard Procedure for Controllers

- 2.1 As soon as it is known that an aircraft is experiencing an apparent radio failure, the ATS unit shall forward information concerning the radio failure to all ATS units concerned along the route of flight. The ACC in whose area the destination aerodrome is located shall take steps to obtain information on the alternate aerodrome(s) and other relevant information specified in the filed flight plan.
- 2.2 After attempts to establish normal two-way radio communication have failed, controllers are to carry out the following standard radio failure procedures:
- (1) Maintain separation between the radio failure aircraft and other known traffic;
 - (2) Give pertinent information about the movements of the radio failure aircraft to other aircraft in the presumed vicinity;
 - (3) Ask aircraft in the presumed vicinity to establish communication with the radio failure aircraft and relay messages;
 - (4) Use all means possible to monitor the aircraft's progress;
 - (5) Attempt to relay information using ACARS/datalink.

Note: Pilots may attempt to contact ATC using HF or if equipped with approved installations for accessing the UK telephone network may attempt to contact ATC via the D&D cell.

- (6) Transmit, on the appropriate frequencies:
 - (a) level, route and EAT (or ETA) to which the radio failure aircraft is assumed to be adhering; and
 - (b) the weather conditions at the destination aerodrome, a suitable alternate and, if practicable, in areas suitable for a descent through cloud.
- (7) When, in consultation with the operator, instructions to divert have been transmitted to the radio failure aircraft, inform the alternate aerodrome and request that they attempt to establish communication;
- (8) If necessary, commence overdue action as described in Chapter 3.

3. Use of ATS Surveillance Systems

3.1 If available, ATS surveillance systems shall be used to assist in separating other aircraft from a radio failure aircraft and to determine whether it is receiving and complying with instructions.

3A. PSR

3A.1 If an identified aircraft experiences a radio failure the controller shall instruct the aircraft to make a turn(s). If movement of the Position Indication indicates that the aircraft receiver is operating, the controller shall continue to pass instructions and resume normal service.

3A.2 If the Position Indication indicates that the aircraft is not responding to instructions(s), the controller shall ensure that other known traffic are separated from the radio failure aircraft.

3A.3 If the position of the radio failure aircraft is not known the controller may continue to provide a service to identified aircraft, provided the PSR cover is adequate and the controller is confident that they can maintain 5 NM, or alternative approved minima within MATS Part 2 separation, from all unknown traffic.

3B. SSR

3B.1 If an aircraft carrying a secondary radar transponder experiences a radio failure the controller shall instruct the pilot to make mode and/or code changes or to operate the IDENT or SPI feature. If the responses indicate that the aircraft radio receiver is operating, control of the radio failure aircraft may continue using the transponder replies as acknowledgement of instructions.

3B.2 If the radio receiver is not working, pilots may be expected to select A7600 and follow established procedures.

4. Failure of Two-way Radio Communications

- 4.1 As soon as ATC know that two-way communication has failed they will, as far as practical, maintain separation between the aircraft experiencing the communication failure and other aircraft, based on the assumption that the aircraft will operate in accordance with radio communication failure procedures described below.
- 4.2 It should be noted that for many aerodromes in the UK, the radio communications failure procedures published in the UK AIP AD 2 section differ from, or amplify, the basic procedures published below.
- 4.3 For the purposes of these procedures, ATC will expect an IFR flight following the ATS route structure to adopt the IMC procedure. If there is an overriding safety reason, the pilot may adopt the VMC procedure.
- 4.4 Flights operating outside controlled or advisory airspace, without reference to ATS, should only use these procedures when the pilot decides there is a need to alert ATC that two-way radio communications failure has occurred.
- 4.5 It should be noted that the use of two-way communications failure procedures may result in aircraft flying outside controlled airspace.
- 4.6 The procedures detailed in this chapter apply to two-way radio communications failure. In the event that an additional emergency situation develops, ATC will expect the pilot to select A7700.
- 4.7 The expression “Expected Approach Time” (EAT) will mean either an EAT given by the appropriate ATC unit or, if the pilot has been given ‘No delay expected’, the ETA over the appropriate designated facility serving the destination aerodrome.
- 4.8 Pilots are given an EAT of ‘Delay not determined’ when the destination runways cannot be used for landing and it is not possible to accurately predict when they will become available. In some circumstances an EAT of ‘Delay not determined’ will also be given when a preceding flight has elected to remain over the holding facility pending an improvement in weather conditions at the destination. If ‘Delay not determined’ has been given, pilots should not attempt to land at the destination aerodrome, but instead divert to the alternate destination specified in the current flight plan or another suitable aerodrome.

5. VMC Procedures for Pilots

- 5.1 The pilot of a VFR flight experiencing communication failure shall: select SSR Mode A, Code 7600 with Mode C and land at the nearest suitable aerodrome. Pilots should take account of visual landing aids and keep watch for instructions as may be issued by visual signals from the ground. The pilot should report arrival to the appropriate ATC unit as soon as possible. When VMC cannot be maintained, the pilot should adopt the IMC Procedures as detailed below.
- 5.2 Subject to the provisions of paragraph 4.3 above, the pilot of an IFR flight experiencing communication failure in VMC shall:

- (1) select SSR Mode A, Code 7600 with Mode C; and
- (2) land at the nearest suitable aerodrome.

5.3 Pilots should take account of visual landing aids and keep watch for instructions as may be issued by visual signals from the ground. The pilot should report arrival to the appropriate ATC unit as soon as possible. If it does not appear feasible to continue the flight VMC, or if it would be inappropriate to follow this procedure, the pilot should adopt the procedures for flights in IMC detailed below.

Note: Pilots already in receipt of an ATC clearance may enter controlled airspace and follow the procedures referred to above. Those flights that have not received an ATC clearance should not enter controlled or advisory airspace unless an overriding safety reason compels entry.

6. IMC Procedures for Pilots

6.1 A pilot of a flight experiencing communication failure in IMC shall:

- (1) select SSR Mode A, Code 7600 with Mode C;
 - (a) maintain for a period of 7 minutes, the current speed and last assigned level or minimum safe altitude, if this is higher. The period of 7 minutes begins when the transponder is set to 7600 and this should be done as soon as the pilot has detected communications failure;
 - (b) if the failure occurs when the aircraft is following a notified departure procedure such as a SID and clearance to climb, or re-routeing instructions have not been given, the procedure should be flown in accordance with the published lateral track and vertical profile, including any stepped climbs, until the last position, fix, or waypoint, published for the procedure has been reached. Then for that part of the 7 minutes that may remain, maintain current speed and last assigned level or minimum safe altitude, if this is higher;
 - (c) thereafter, adjust the speed and level in accordance with the current flight plan and continue the flight to the appropriate designated landing aid serving the destination aerodrome. Attempt to transmit position reports and altitude/flight level on the appropriate frequency when over routine reporting points;
- (2)
 - (a) if being vectored, or proceeding offset according to RNAV, without a specified limit, continue in accordance with ATC instructions last acknowledged for 3 minutes only and then proceed in the most direct manner possible to re-join the current flight planned route. Pilots should ensure that they remain at, or above, the minimum safe altitude;
 - (b) if being vectored by an Approach Surveillance Control unit (callsign DIRECTOR/ RADAR/APPROACH), comply with the loss of

communications procedures notified on the appropriate RMAC as detailed in the UK AIP AD 2 section;

- (3)
 - (a) arrange the flight to arrive over the appropriate designated landing aid serving the destination aerodrome as closely as possible to the ETA last acknowledged by ATC. If no such ETA has been acknowledged, the pilot should use an ETA derived from the last acknowledged position report and the flight-planned times for the subsequent section of the flight;
 - (b) arrange the flight to arrive over the appropriate designated landing aid serving the destination aerodrome at the highest notified Minimum Sector Altitude taking account of en-route terrain clearance requirements;
 - (c) if following a STAR, after the 7-minute period detailed above has been completed, pilots should arrange descent as close as possible to the descent planning profile. If no descent profile is published, pilots should arrange descent to be at the minimum published level at the designated Initial Approach Fix;
- (4) on reaching the appropriate designated landing aid serving the destination aerodrome, begin further descent at the last acknowledged EAT. If no EAT has been acknowledged, the descent should be started at the ETA calculated in paragraph (4)(a) above, or as close as possible to this time. If necessary, remain within the holding pattern until the minimum holding level, published for the facility, has been reached. The rate of descent in holding patterns should not be less than 500 ft per minute. If 'Delay not determined' has been given, pilots are not to attempt to land at the destination aerodrome, but instead divert to the alternate destination specified in the current flight plan or another suitable aerodrome;
- (5) carry out the notified instrument approach procedure as specified for the designated navigational aid and, if possible, land within 30 minutes of the EAT or the calculated ETA. When practical, pilots should take account of visual landing aids and keep watch for instructions that may be issued by means of visual signals from the ground;
- (6) if communications failure occurs during an approach directed by radar, continue visually, or by using an alternative aid. If this is not practical, carry out the missed approach procedure and continue to a holding facility appropriate to the aerodrome of intended landing for which an instrument approach is notified and then carry out that procedure.

6.2 The procedures to be adopted by pilots of Special VFR flights experiencing two-way radio communication failure are:

- (1) if the aircraft is suitably equipped, select A7600 and Mode C;

- (2) if it is believed that the radio communication transmitter is functioning, transmit blind giving position reports and stating intentions;
- (3) if, when radio communication failure occurs, the aircraft has not yet entered the CTR concerned, the pilot must in all cases remain clear even if Special VFR clearance has been obtained;
- (4) if Special VFR clearance has been obtained and the aircraft has entered the CTR concerned when the radio communication failure occurs, proceed as follows:
 - (a) aircraft inbound to an aerodrome within CTR – proceed in accordance with the Special VFR clearance to the aerodrome and land as soon as possible. When in the aerodrome traffic circuit watch for visual signals;
 - (b) aircraft transiting a CTR – continue flight not above the cleared altitude to leave the CTR by the most direct route, taking into account weather limitations, obstacle clearance and areas of known dense traffic.

Note 1: In a) and b), if flying on a heading advised by radar, when radio communication failure occurs, resume own navigation and carry out the appropriate procedure described.

Note 2: In all cases, notify the ATC unit concerned as soon as possible after landing.

7. Resumption of Normal Operations

- 7.1 Radio failure procedures shall be continued until it is determined that alternative action can be taken or normal operations resumed without impairing safety.
- 7.2 A controller who re-establishes communication with an aircraft must inform the unit at which the radio failure procedure was initiated and provide it with information required for further control of aircraft.

7A. Aircraft Lands

- 7A.1 When positive information is received that the radio failure aircraft has landed, normal operations shall be resumed.
- 7A.2 If the aircraft lands without re-establishing radio communication the controller at the aerodrome shall inform the unit at which the radio failure procedure was initiated.

7B. Re-allocation of Level

- 7B.1 If required, the level occupied by the radio failure aircraft in the holding stack, and subsequent levels that the aircraft will have to pass through, may be re-allocated to succeeding aircraft 15 minutes after the latest time they should have been vacated.
- 7B.2 The lowest level in the stack and the level at which, according to published procedures, radio failure aircraft are expected to leave the vicinity are to be kept

clear for 30 minutes after the time descent should have begun plus an appropriate period to allow the aircraft to leave the vicinity.

7C. Operator's Discretion

- 7C.1 If the position of the radio failure aircraft has not been determined within a period of 30 minutes after the time it should have begun the descent over the holding point, pertinent information about it shall be given to the Aircraft Operators and/or pilots of other aircraft. It is then their responsibility to determine whether they will resume normal operations or take some other action.

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Section 5: Aircraft Emergencies

Chapter 5: Hijacking and Unlawful Interference

1. Introduction

- 1.1 Instances may occur when civil and military aircraft operate unlawfully or without proper authorisation within UK airspace, including:
- (1) the unlawful seizure, or exercise of control, of an aircraft by force or threats (Hijacking);
 - (2) the unauthorised removal of an aircraft and its subsequent flight;
 - (3) flight of an aircraft with intent to defect;
 - (4) illegal use of an aircraft to effect the escape of prisoners or special hospital patients;
 - (5) the use of aircraft in the furtherance of a crime, including terrorism.

2. Safety

- 2.1 At all times the safety of the aircraft and its occupants is of prime importance. Unless otherwise specifically directed by a responsible higher authority, the policy within UK airspace is for Hijacked aircraft to land as soon as possible. Requests from the lawful commander, which the commander states are essential for flight safety, are to be complied with and no attempt shall be made to influence the course of events without their concurrence.

3. Direction

- 3.1 The Watch Supervisor at the parent ACC shall act as ATC Co-ordinating Authority for the incident until, if required, responsibility is assumed by the UK Air Defence Authority under standing procedures. Thereafter, the Watch Supervisor shall support the actions required by the UK Air Defence Authority and co-ordinate actions with civil/military ATSU's as agreed tactically.
- 3.2 Responsibility for overall direction of the incident will rest with Government officials acting through the DfT or MoD and the ATC Co-ordinating Authority. Controllers should be aware that their communications with these aircraft may be subject to Government instruction in accordance with contingency plans not detailed here. Such contingency plans may result in requests to issue instructions which, whilst not prejudicing safety in any way, controllers would not otherwise consider suitable.

4. ATC Operations

4A. General

- 4A.1 When an occurrence of unlawful interference with an aircraft takes place or is suspected, controllers shall attend promptly to requests by the aircraft.
- 4A.2 The aircraft concerned shall be given priority where possible and necessary action shall be taken to expedite all phases of the flight, especially the safe landing of the aircraft. Any reference to the special situation is to be avoided in air-ground communications with other aircraft unless it has first been referred to in communications from the aircraft involved and it is reasonable to assume that such reference will not aggravate the situation. Where more than one aircraft is involved in the incident, reduced separation may be allowed between the aircraft involved at the request of a lawful commander.
- 4A.3 An aircraft known or believed to be the subject of unlawful interference or which for other reasons needs isolation from normal aerodrome activities shall be cleared to the designated isolated parking position in accordance with local instructions. Where such an isolated parking position has not been designated, or if the designated position is not available, the aircraft shall be cleared to a position within the area or areas selected by prior agreement with the Aerodrome Operator. The taxi clearance shall specify the taxi route to be followed to the parking position. This route shall be selected with a view to minimising any security risks to the public, other aircraft and installations at the aerodrome.

4B. ATS Surveillance Systems

- 4B.1 Whenever possible the flight paths of the aircraft are to be monitored; appropriate adjacent ATC units are to be provided with information to enable them to assist with flight path monitoring.
- 4B.2 Whenever it has been established that the aircraft is transponding on A7500 the controller shall attempt to verify by RTF with the aircraft concerned that the code selection is intentional. The phraseology to be used is:
- “(Callsign) confirm you are squawking assigned code (code assigned by ATC that it would otherwise be squawking).”
- 4B.3 The RTF message must exclude specific mention of A7500. Whenever it has been verified that the code has been intentionally selected, or when no verification can be obtained, it shall be assumed that the aircraft has suffered unlawful interference.
- 4B.4 The phraseology above may also be used to provide a discrete check or prompt to pilots if A7500 is not being displayed when information, such as is described in paragraph 6B below, indicates a potential security threat. The pilot may then, if able, select A7500.

4C. Clearances

- 4C.1 Normal ATC clearances and provision of information pertinent to the safe conduct of the flight shall continue to be transmitted unless otherwise directed by the appropriate higher authority.
- 4C.2 It may be considered expedient by HM Government to withhold an ATC clearance to aircraft. This may include an aircraft that is planning to enter, land or depart UK airspace or is already in UK airspace in breach of UK sanctions. When authorised by HM Government through the parent ACC or Aerodrome Authority, the following RTF phraseology is to be used:
- (1) “(Callsign) I am instructed by Her Majesty’s Government to refuse entry into United Kingdom airspace. What are your intentions?”;
 - (2) “(Callsign) I am instructed by Her Majesty’s Government to inform you that landing clearance has been refused for any airfield within the United Kingdom. What are your intentions?”;
 - (3) “(Callsign) I am instructed by Her Majesty’s Government that you are to hold at (e.g. location on the aerodrome, exact reporting point, or latitude/longitude) at (level). Acknowledge.”.
- Note:** If the aircraft is on the ground, the Aerodrome Authority will be the coordinating authority with HM Government.
- 4C.3 If an adjacent ATC agency is required to relay a message on behalf of the UK they should be requested to pass the text verbatim.
- 4C.4 The aircraft’s intentions or observed non-compliance with HM Government instructions are to be reported to the parent ACC or Aerodrome Authority as appropriate as soon as practicable.
- 4C.5 ATC units are to make provision for normal separation should the aircraft ignore the lack of clearance and the parent ACC should be advised of the situation.
- 4C.6 Should the aircraft declare an emergency, then all assistance must be given including direct routings and landing if required. The MoD, acting on advice from DfT, NATS or the Police, may select a diversion destination if necessary.

5. Reporting Action

- 5.1 If the subject aircraft is within, or is planned to enter, UK airspace, or the interests of the UK are in any way likely to be affected, the civil Watch Supervisor at the parent ACC must be informed immediately. It has been agreed that Hijack incidents and subsequent relevant changes, occurring in European airspace, will be signalled by the affected State to all other States. The reporting action to be taken by ATC units is detailed in Section 6.

6. Identification of Hijacks/Unlawful Interference Situations

6A. Verified Hijack Status

6A.1 Aircraft subject to hijacking are identified to ATC staff by the selection of A7500 on the aircraft's transponder and/or declaration on the RTF frequency.

6B. Unverified Hijack Status/Potential Renegade Aircraft

6B.1 Suspected hijacks or airborne security situations, where selection of A7500 has not been made or a definitive RTF call received by ATC, may be indicated by various means. Due to the infinite variety of possible situations, a complete and comprehensive list of suspicious aircraft/pilot activities cannot be prescribed. The following examples are situations that may represent an unusual event:

- (1) Unauthorised deviation from cleared flight profile;
- (2) Refusal or inability to comply with ATC instructions (including vectoring) with no good reason;
- (3) Loss of RTF contact, particularly associated with flight profile deviation;
- (4) Unauthorised SSR code changes or extended use of IDENT;
- (5) Use of non-standard phraseology by the crew, or other covert attempt to highlight the situation (marked change in voice characteristics, etc.);
- (6) Selection of A7600 (RTF failure) or A7700 (emergency), particularly associated with flight profile deviation;
- (7) Notification from non-official sources (e.g. news agencies, etc.);
- (8) Open RTF transmitter from the cockpit;
- (9) Non-ATC related RTF transmission (e.g. political statement);
- (10) Non-specific threat passed via third party.

6B.2 In the case of the latter three bullet points, these would normally mean that the identity of the aircraft is unknown until other factors become apparent. Individual events may not constitute suspicious aircraft/pilot activity alone, however a combination of such events should be considered as an unusual occurrence and the appropriate alerting action undertaken.

Section 5: Aircraft Emergencies

Chapter 6: Alerting Service

1. Introduction

- 1.1 Alerting service shall be provided by air traffic service units in accordance with UK Reg (EU) No. 923/2012 SERA.10001:
- (1) for all aircraft provided with an air traffic service;
Note: For the purposes of SERA.10001(a)(1), the United Kingdom also provides an Alerting Service to all aircraft receiving an Air Traffic Service (ATS).
 - (2) in so far as practicable, to all other aircraft having filed a flight plan or otherwise known to the air traffic service unit; and
 - (3) to any aircraft known or believed to be the subject of unlawful interference.
- 1.2 The responsibility for initiating action normally rests with the ATSU that was last in communication with the aircraft in need of search and rescue aid or that receives the news from an outside source.

2. Aerodromes

- 2.1 Approach and aerodrome control units, when they are aware that an aircraft is in need of search and rescue aid, shall immediately:
- (1) set in motion the local rescue services and emergency organisations, as described in Chapter 7; and/or
 - (2) notify by telephone the Watch Supervisor at the parent ACC. The contents of the telephone message are shown in paragraph 9 below.

3. Area Control Centres

- 3.1 Whenever it is reported from any source that an aircraft within an FIR is in need of search and rescue aid the ACC Watch Supervisor shall initiate emergency action unless it is known that the appropriate rescue organisation has already been alerted.
- 3.2 If the position of the aircraft is in doubt, emergency action shall be initiated by the ACC responsible for the FIR:
- (1) within which the aircraft was flying at the time of the last communication;
 - (2) that the aircraft was about to enter when communication was last established at or close to the boundary;
 - (3) within which the destination aerodrome is located, for aircraft which are either:
 - (a) not equipped with suitable RTF; or
 - (b) not under any obligation to transmit position reports.

- 3.3 The ACC shall take emergency action, with the agreement of the ATSU concerned, when an aircraft crashes during the transfer of control from one unit to another.

3A. Initial Action

Table 1:

Emergency Phase	Agencies Informed
UNCERTAINTY and ALERT	D&D cell Aircraft Operator JRCC
DISTRESS	
Aircraft not known to have force landed or crashed	D&D cell JRCC Appropriate emergency services Aircraft Operator
Aircraft known/reported to have force landed or crashed, position unknown	D&D cell JRCC Aircraft Operator
Aircraft known/reported to have force landed or crashed (approximate position known)	D&D cell Appropriate emergency services JRCC Aircraft Operator

3B. Subsequent Action

3B.1 Where appropriate:

- (1) Confirm notification to the JRCC by signal using the prefix INCERFA, ALERFA, or DETRESFA;
- (2) Ensure that a supplementary flight plan is requested from the departure aerodrome;
- (3) Inform the original destination aerodrome of a crash and of the action taken;
- (4) If it is known that an aircraft which has crashed or is likely to crash has a dangerous cargo on board, inform the rescue services;
- (5) Keep the Aircraft Operator informed of all developments;
- (6) If the incident is reported by an outside source, take the name, address and telephone number of the person reporting it.

3B.2 Reporting action is detailed in Section 6.

4. Civil Rescue Organisations

- 4.1 An ACC, when it is aware of an aircraft in distress shall immediately notify the police as laid down in paragraph 3 above. The police are then responsible for alerting the fire, ambulance, and hospital services. Detailed procedures appear in MATS Part 2.

5. Joint Rescue Coordination Centre

- 5.1 The Joint Rescue Coordination Centre (JRCC) is responsible for promoting efficient organisation of search and rescue service and for co-ordinating the conduct of search and rescue operations within a search and rescue region. The JRCC is located in Fareham, Hampshire.
- 5.2 The ACC shall notify aircraft emergencies which require search and rescue aid to the JRCC as detailed in paragraph 3 above. Other ACCs, which may be involved, shall also be informed. Details of the telephone message appear in paragraph 9 below.
- 5.3 The JRCC controller is responsible for initiating search and rescue action. To assist the JRCC controller in this task, the Watch Supervisor may include a recommendation for search and rescue action in the telephone message.
- 5.4 Messages shall not be delayed because of lack of information. If a message is incomplete a further message is to be sent when the information is available.
- 5.5 Further messages are to be sent:
- (1) if any useful additional or significant information is received, e.g. information relating to any dangerous goods carried by the aircraft; and
 - (2) when the emergency situation no longer exists.
- 5.6 If an alerting message is received from an adjacent ACC, the Watch Supervisor shall:
- (1) telephone the message to the JRCC without delay and confirm by teleprinter signal (unless it is known that the JRCC has the information);
 - (2) assist the initiating ACC in searching for information about the emergency aircraft.
- 5.7 The SAR organisation is described in the UK AIP (GEN) section.

6. Phases of Emergency

- 6.1 The table below shows the phases into which emergencies fall. The decision to declare a phase earlier than described must be left to the discretion of the controller.

Table 2:

Type of aircraft emergency							
Radio Failure	Overdue	Operating Efficiency Impaired	Forced Landing (Crash)	Exceptions	Phase	Duration	Action Taken
<p>No communication within a period of 30 minutes after the time it should have been received.</p> <p>OR</p> <p>from the time an unsuccessful attempt to establish communication was first made.</p>	<p>Fails to arrive within 30 minutes of the ETA last notified to, or estimated by, ATC whichever is the later.</p> <p>OR</p> <p>Has been cleared to commence approach after completing any necessary holding and fails to land within 5 minutes of the estimated time of landing.</p>	---	---	No doubt exists as to the safety of the aircraft and its occupants.	UNCERTAINTY (INCERFA)	Maximum of 30 minutes.	<p>JRCC and ACC collect and evaluate reports.</p> <p>Other JRCC or MRCC may be informed of the situation.</p>
<p>Attempts to establish communication during the UNCERTAINTY phase have failed.</p>	<p>Enquiries to relevant sources during the UNCERTAINTY phase have failed to reveal any news.</p> <p>OR</p> <p>Has been cleared to land and fails to land within 5 minutes of the estimated time of landing and communication cannot be re-established.</p>	<p>But not to the extent that a forced landing is likely.</p>	---	Evidence exists that would allay apprehension as to the safety of the aircraft.	ALERT (ALERFA) (see note)	Maximum of one hour.	JRCC alerts the search and rescue services for immediate action.
<p>Further attempts to establish communication during the ALERT phase have failed.</p>	<p>More widespread enquiries during the ALERT phase have failed to reveal any news.</p> <p>OR</p> <p>The fuel on board is considered to be exhausted or insufficient to enable the aircraft to reach safety.</p>	<p>To the extent that a forced landing is likely.</p>	<p>Known to have force landed or crashed.</p>	<p>Where there is a reasonable certainty that the aircraft and its occupants are not threatened by grave imminent danger and do not require immediate assistance.</p>	DISTRESS (DETRESFA)	<p>Until the aircraft is found and the survivors rescued.</p> <p>OR</p> <p>It is clear that there is no longer any chance of so doing.</p>	<p>JRCC puts the search and rescue plan into operation and directs it for the duration of this phase.</p>

Note: An ALERT phase will be initiated when an aircraft is known or believed to be the subject of unlawful interference.

7. Telephone Precedence

- 7.1 Most ATC units have direct operational telephone lines for use in emergencies.
- 7.2 However, if it is necessary to use operational or administrative networks, a precedence call may be appropriate. The order of precedence is:
- (1) DISTRESS;
 - (2) URGENT (CIVIL OR GOVERNMENT).
- 7.3 A DISTRESS call is used for a call of extreme operational emergency or concerned with the safety of human life. It takes absolute precedence over all other calls and will be connected immediately. Subject to telephone equipment capability, other calls will be disconnected if necessary. On NATS networks the term "DISTRESS CALL" is used with the routing instruction, e.g. "Distress call to Scottish AC".
- 7.4 An URGENT precedence is used for operational and administrative calls which should not suffer the delays of ordinary calls. However, connected ordinary calls will only be disconnected, subject to equipment capability, at the request of the caller. Staff at civil aerodromes and civil ATSU's are to use the term CIVIL URGENT for such calls. Military units and government departments use the term GOVERNMENT URGENT.
- 7.5 DISTRESS and URGENT calls should be kept to a minimum consistent with safety and a controller should be prepared to give their name to the operator.

8. Telephone Message

- 8.1 The alerting message by telephone shall comprise the following information overleaf:

Table 3:

The phase of emergency – Uncertainty, Alert or Distress		
Aircraft identification	Item 7	From the transmitted flight plan
SSR mode and code allocated		
Flight rules	Item 8	
Type of aircraft	Item 9	
Equipment	Item 10	
Aerodrome and time of departure	Item 13	
Speed, level and route	Item 15	
Destination/ETA/Alternate	Item 16	
FIR boundary estimate	Item 18	
Other information	Item 18	
Supplementary information Pilot's name Operator (if not included above)	Item 19	From the filed flight plan retained at the departure aerodrome
Unit which made the last contact, time and RTF frequency Last reported position and method of determination Aircraft colour and markings		
Dangerous goods carried as cargo		
Action taken by reporting unit		
Other pertinent information (To include recommendation for SAR action if appropriate)		

9. Operations normal

- 9.1 Pilot transmissions containing the RTF phraseology “operations normal” may be associated with aerial activities where the flight receiving an ATS is required to operate within the area of responsibility of a single ATSU for prolonged periods. Such transmissions may occur following a period of RT inactivity of 30 minutes between the ATSU and the pilot receiving the ATS. The pilot’s declaration of “operations normal” is used to inform the ATSU that their flight is progressing according to plan (SERA.10001(b)&(c)).
- 9.2 Within Europe the use of the operations procedure is applicable to all sectors of flights over mountainous or sparsely populated areas, including sea areas (Doc 7030). However, the use of this procedure in other scenarios is permitted in accordance with MATS Part 2.
- 9.3 Controllers who do not receive an “operations normal” report when expected should attempt to contact the pilot using the following phrase:
- “(Callsign) confirm operations normal?”
- 9.4 Following the pilot’s failure to respond to three successive attempts to confirm operations normal, controllers should initiate overdue action.

- 9.5 If a 'Rescue' call sign fails to respond to three successive attempts to confirm operations normal, controllers are to contact the JRCC and request that they attempt to establish communication with the 'Rescue' call sign and confirm 'operations normal'. The JRCC should be in constant communication with 'Rescue' call signs using HF or satellite communication equipment and controllers shall initiate overdue action when the JRCC is unable to obtain an 'operations normal' report from the aircraft.

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Section 5: Aircraft Emergencies

Chapter 7: Aerodrome Emergency Services

1. Introduction

- 1.1 The responsibility for alerting the aerodrome emergency services normally rests with the air traffic service. In general, the ATSU last in communication with the aircraft, or which receives information from an outside source that an aircraft is in need of rescue aid, shall initiate action.
- 1.2 No specific instructions can be made for an aircraft that crashes during the transfer of communication from one ATSU to another, but as soon as either unit becomes aware of the incident it must be agreed immediately which unit is to alert the emergency services.

2. Aerodrome Operator

- 2.1 The Aerodrome Operator is responsible for:
- (1) the preparation of detailed aerodrome emergency orders applicable to a particular aerodrome and making them available to all personnel concerned in aircraft emergencies;
 - (2) determining the radius of action of the Aerodrome Fire Service, which may include an area adjacent to and outside the boundary. The size of attendance within this radius will as far as is possible be predetermined and detailed in MATS Part 2;
 - (3) advising ATC and Aircraft Operators whenever the fire and rescue services are depleted for any reason. Such messages will normally be given in a form which is suitable for immediate relay to aircraft.

3. Air Traffic Control Actions

- 3.1 When an ATC unit becomes aware that an aircraft is in need of rescue aid within the radius of action, the controller shall immediately alert the emergency services and, in accordance with the aerodrome emergency orders, give them the fullest available information.
- 3.2 If the rescue services are depleted for any reason the ATC unit at the aerodrome shall:
- (1) transmit to aircraft the message received from the Aerodrome Operator. An example of the phraseology is shown in CAP 413;
 - (2) inform the Watch Supervisor at the parent ACC;
 - (3) inform any other agency, unit or controller as appropriate.

- 3.3 The RFFS category of a licensed/certificated³ aerodrome is determined according to Table 1, based on the length of the longest aeroplane normally using the aerodrome and its fuselage width. If, after selecting the category appropriate to the longest aeroplane's overall length, that aeroplane's fuselage width is greater than the maximum width in Table 1, column 3, for that category, then the category for that aeroplane should actually be one category higher (AMC2 ADR.OPS.B.010(a)(2)(a)(1) and (2). For example, an aeroplane with a fuselage length of 47.5 metres, and a fuselage width of 5.1 metres, would be Category 8).

Table 1:

Aerodrome Category	Aircraft overall length	Maximum fuselage width
Special (see note)	up to but not including 9 m	3 m
1	up to but not including 9 m	3 m
2	9 m up to but not including 12 m	3 m
3	12 m up to but not including 18 m	3 m
4	18 m up to but not including 24 m	4 m
5	24 m up to but not including 28 m	4 m
6	28 m up to but not including 39 m	5 m
7	39 m up to but not including 49 m	5 m
8	49 m up to but not including 61 m	7 m
9	61 m up to but not including 76 m	7 m
10	76 m up to but not including 90 m	8 m

Note 1: CAP 168 Licensing of Aerodromes Table 8.1.

Note 2: AMC2 ADR.OPS.B.010(a)(2) to UK (EU) Reg No 139/2014 does not specify a 'Special' category; other than this, the aerodrome RFFS categories defined in CAP 168 Table 8.1 and AMC2 ADR.OPS.B.010(a)(2) to UK (EU) Reg No 139/2014 are the same.

- 3.4 At all licensed and certificated aerodromes, the level of rescue and firefighting protection provided is appropriate to the aerodrome category determined using the principles in 3.3 above. Exceptionally, where the number of movements (landing or take-off) of the aeroplanes performing passenger transportation in the highest category, normally using the aerodrome, is less than 700 in the busiest consecutive three months, the level of protection provided in accordance with 3.3 above may be

³ A 'Licensed Aerodrome' is one issued a national licence in accordance with CAP 168. A 'Certificated Aerodrome' is one issued with a certificate issued in accordance with UK (EU) Reg No 139/2014.

reduced by no more than one category below the determined one (AMC2 ADR.OPS.B.010(a)(2)(a)(3).

- 3.5 When full emergency or local standby action is to be instituted the pilot should be asked to confirm the aircraft type unless there is a reasonable assurance from another source that the type shown in the flight plan is correct.
- 3.6 Whenever possible controllers should anticipate the need for Aerodrome Fire Service vehicles to cross runways and should issue clearances in advance of requirements. Other traffic may be stopped or diverted to avoid conflict with appliances.
- 3.7 If it is known that an aircraft which has crashed or is about to crash had radioactive material on board or is carrying any dangerous goods, including agricultural chemicals in a crop spraying aircraft, the rescue services shall be so informed.
- 3.8 In the event of an aircraft on the ground reporting that it may be on fire or when an aircraft on the ground is advised of signs of fire, the surface wind shall be passed to the aircraft with the acknowledgement of the pilot's report or together with the transmitted observation.

4. Aerodrome Fire Service

- 4.1 The Aerodrome Fire Service will be responsible for final determination of the size of the attendance, which will depend upon whether the accident is within or outside the aerodrome boundary. Normally a full attendance is made to all incidents within the boundary.

5. Definitions of Emergency and Incidents

- 5.1 It is the responsibility of the Aerodrome Operator to prepare a detailed Aerodrome Emergency Plan, which includes terms and priorities to be used for alerting the emergency services. Further details can be found in CAP 168 Chapter 9. Emergency Orders translate the Emergency Plan into courses of action for various participants, including ATC, to follow. The specific response by ATC should be detailed in the Aerodrome Emergency Orders and the MATS Part 2.
- 5.2 The following terms are in general use but individual variations and additional terms may be found in local emergency orders.

5A. Aircraft Accident/Aircraft Accident Imminent

- 5A.1 Aircraft accidents, which have occurred or are inevitable on, or in the vicinity of, the aerodrome.

5B. Aircraft Ground Incident

- 5B.1 Where an aircraft on the ground is known to have an emergency situation other than an accident, requiring the attendance of emergency services.

5C. Full Emergency

5C.1 When it is known that an aircraft in the air is, or is suspected to be, in such difficulties that there is a danger of an accident.

5D. Local Standby

5D.1 When it is known that an aircraft has, or is suspected to have, developed some defect but the trouble would not normally involve any serious difficulty in effecting a safe landing.

5E. Weather Standby

5E.1 When weather conditions are such as to render a landing difficult or difficult to observe, e.g. strong crosswind, poor visibility, ice or snow on the runway.

5F. Unlawful Acts

5F.1 Action to be taken in the case of any unlawful act will be contained in the aerodrome's Contingency Plan, which will be drawn up in conjunction with the local Police.

5G. Off-Aerodrome Accidents

5G.1 Emergency Orders should contain details of the action to be taken in the case of aircraft accidents occurring outside the aerodrome boundaries.

5H. Other Duties

5H.1 The emergency arrangements are generally focused on an aircraft accident or incident. However, the plans may include other incidents that occur such as domestic fires, road traffic crashes and hazardous materials. Emergency Orders should include the action to be taken by aerodrome-based Responders and, where appropriate external emergency services, in the event of such calls being received. The classification 'Domestic' is given to any incident:

- (1) on the aerodrome not included in the categories above;
- (2) outside the aerodrome boundary (other than aircraft accidents) which is liable to constitute a danger to flying or aerodrome property;
- (3) which the Aerodrome Rescue and Fire Fighting Service might attend where the response is according to an agreement with the local emergency services;
- (4) which is in response to calls from the public or police on humanitarian grounds.

6. Communications between the Aerodrome Fire Service and Aircraft during an Emergency

- 6.1 At an aerodrome where this service is promulgated, communication between an aircraft in an emergency and the Aerodrome Fire Service may take place on 121.6 MHz.
- 6.2 Communication will only take place when the aircraft is on the ground and the pilot will maintain a listening watch on the appropriate ATC frequency. The ATC unit will be informed when 121.6 MHz is to be used.
- 6.3 Controllers should be aware that, if called upon to facilitate communications between a pilot and the Aerodrome Fire Service on 121.6 MHz, the company callsign of the aircraft may not be readily apparent to the Aerodrome Fire Service who may attempt to communicate using the aircraft's registration as displayed on the fuselage.

7. Removal of Crashed Aircraft

- 7.1 Removal of crashed aircraft is the responsibility of the Aerodrome Operator and the aircraft owner or operator. In the case of a reportable accident the permission of the AAIB is required before removal action can be commenced.

7A. Emergency Removal

- 7A.1 If it is apparent that continued obstruction of a runway, or interference with an approach aid, by a crashed aircraft might further endanger life, e.g. other arriving aircraft having insufficient fuel for diversion, the senior controller should ensure that the emergency situation is fully understood by the Aerodrome Operator. Under normal circumstances the AAIB may be contacted at any time without undue delay. Exceptionally, if there are communication difficulties, the Aerodrome Operator may wish to take action in accordance with the Civil Aviation (Investigation of Accidents) Regulations 1996, which provide that an aircraft may be removed or interfered with so far as may be necessary for the purpose of preventing any danger or obstruction to the public or to air navigation.

8. Heliport Fire Fighting Categories

- 8.1 The table below shows the rescue and firefighting categories used at licensed heliports. Experience has shown that the fire situation expected to be found at a helicopter crash may be more serious than one involving an aeroplane of similar size.
- 8.2 The level of protection to be provided at a heliport is determined according to the overall length, including the tail boom and rotors, of the longest helicopter irrespective of its frequency of operations. However, during anticipated periods of operations by smaller helicopters, the heliport firefighting category may be reduced to that of the highest category of helicopter planned to use the heliport at that time.

Table 2:

Category	Helicopter overall length
H1	up to but not including 15 m
H2	15 m up to but not including 24 m
H3	24 m up to but not including 35 m

Section 5: Aircraft Emergencies

Chapter 8: Miscellaneous Procedures

1. Emergency Position Indicating Radio Beacons

- 1.1 Emergency Position Indicating Radio Beacons are carried by some marine craft to indicate position when in distress by the transmission of a distinctive signal. When operating on 121.5 MHz they have a range of approximately 30 NM and the signal characteristics are a downward sweep over a range of not less than 700 Hz within the limits of 1600– 300 Hz repeated 2 or 3 times per second. Although it is unlikely that ATSUs will hear this signal, reports of reception may be received from aircraft.

2. Ships in Distress

- 2.1 Occasionally, when the SAR organisation is attempting to give aid to a ship in distress whose precise position is uncertain, the RCC may request an ACC to ask aircraft operating or about to operate in the vicinity of the ship to report if they see any sign of it along or near their normal route.
- 2.2 The ACC shall notify all aircraft in communication with them and which are in the vicinity of the search area. The ACC shall also pass on the request to all civil aerodromes likely to have aircraft in the area.
- 2.3 If an aircraft reports a sighting directly to the ACC, the RCC that made the original request shall be informed without delay.
- 2.4 If a sighting is reported to an ATSU other than an ACC, the unit shall advise its parent ACC who in turn shall advise the RCC.
- 2.5 When a sighting is reported, ATC shall ask the reporting aircraft to attempt to guide other ships to the scene.
- 2.6 The RCC will inform the ACC as soon as searching by aircraft is no longer required and the ACC shall relay this message to all units which had been asked to assist in the search.

3. Nuclear and Chemical Accidents

- 3.1 In the event of a nuclear or major chemical incident, the CAA will set up an Expert Team within SARG, which will be responsible for the formulation and implementation of airspace management measures, and the dissemination of information to aircraft and airspace users.
- 3.2 The CAA Expert Team should be activated through the CAA AR:

AR normal operating hours – Principal Airspace Regulator (Tel: 01293 983 880 or Email: arops@caa.co.uk)

Outside of AR normal operating hours – The Duty Airspace Regulator (Tel: 07798 571385) and on the basis of information received from one of the following sources:

- (1) Meteorological Office;
- (2) National Radiological Protection Board;
- (3) Another ATSU;
- (4) Police (via request for an Emergency Restriction of Airspace);
- (5) Internal;
- (6) Any other reliable source of information, such as the Department for Transport, the Ministry of Defence and the Department of Trade and Industry.

3.3 In the event of an incident, one or more of the above will contact AR, who will alert members of the CAA Expert Team. Initially, ACCs are to provide tactical re-routing of aircraft in, or adjacent to, the UK FIR as necessary. The CAA Expert Team will advise subsequent action.

3.4 Contact numbers for the CAA Expert Team are held by the CAA AR. AR Operations can be contacted on 01293 983 880 or arops@caa.co.uk.

Section 5: Aircraft Emergencies

Chapter 9: Bomb Warnings - Aircraft

1. Introduction

- 1.1 A bomb warning involving an aircraft is to be treated as an emergency and controllers are to follow the procedures and general guidance given in Chapter 1 of this Section. Controllers shall not provide any advice or suggestions concerning action to be taken by the flight crew in relation to an explosive device.
- 1.2 Action is to be taken at ATSU's as described below.
- 1.3 Operators wishing to pass warning messages to their pilots have been advised to contact the Watch Supervisor at the appropriate ACC.

2. Assessment of Warnings

- 2.1 Bomb warnings are usually anonymous and are communicated by telephone or in writing and normally identify a specific aircraft in flight. Each bomb warning should where possible be assessed to determine its credibility and the level of risk. ATC, whilst having responsibility for flight safety, has a much more limited responsibility in threat cases. ATC is a vital communication and support facility but should not take part in the threat assessment. Aerodrome Authorities and Airline Operators whose assets are involved take the lead in assessing the threat and have specialist assessors for that purpose. The pilot may or may not be involved in that analysis but the assessors are recommended to consult with the DfT and the police as necessary. Appropriate and timely notification is vital. Threat assessors categorise bomb warnings as follows:

Category RED

A credible threat relating to a specific target, or where the caller has positively identified themselves or the organisation involved, likely to involve danger to people, property and/or operational/commercial activities and therefore requires immediate protective measures e.g. diversion of an aircraft in flight.

Category AMBER

A threat of doubtful credibility but where it is prudent to consider taking additional protective measures, especially if there are doubts about the effectiveness of existing countermeasures.

Category GREEN

A non-credible threat requiring no further action.

3. Procedures

3A. General

- 3A.1 Bomb warnings involving aircraft in flight that are Category Red, or where there has been no time to categorise the threat, are to be treated as an emergency and provided with flight priority A.
- 3A.2 Flights that are categorised as Category Amber may be treated as an emergency depending on the response determined by the 'NatRep' (National Representative of the Air Defence Authority). Such flights are to be allocated flight priority category A and assistance requested by the NatRep and/or the pilot is to be given to enable the aircraft to land as soon as possible. Controllers are to follow the procedures and general guidance for Aircraft Emergencies in Chapter 1.
- 3A.3 When the captain of an aircraft becomes aware of a bomb threat and has sufficient concern, they will declare an emergency using the RTF phraseology "MAYDAY, MAYDAY, MAYDAY" and will describe the nature of the emergency as "Bomb On-board". The captain will likely request a landing at the nearest suitable aerodrome.
- 3A.4 The NatRep is responsible for deciding which airport the aircraft will land at and the route they will take to get there, including whether or not the aircraft overflies densely populated areas. This decision will be based on advice provided from both DfT and NATS.
- 3A.5 Aircraft Operators have been advised that aircraft subject to a bomb threat where a response e.g. a diversion and/or expedited landing is deemed necessary should, unless already committed, avoid over-flying densely populated areas and land at the nearest adequate or suitable airport.

3B. Area Control Centres

- 3B.1 When an ACC is the initial recipient of a bomb threat the Operations Supervisor is to ensure that action is taken according to the following table.

Table 1:

Situation	Action
Bomb warning received	<p>(1) Inform aircraft operator or company representative. If the warning is received from ATSU check whether:</p> <p>(a) the aircraft is in contact with the unit; and</p> <p>(b) the operator has been informed.</p> <p>(2) Inform the DfT Transport Security Division Threats Office (see Appendix H). They have 24/7 contact details for all airlines and police forces and will pass the information on and alert the NatRep at the National Air Defence Operations Centre. The NatRep will advise on next steps and whether the pilot should be alerted and with what information.</p>
If Operator requests that pilot is passed warning message.	<p>Trace aircraft and pass the message to pilot by the quickest means available.</p> <p>Messages passed to another ATSU by telephone must be confirmed by signal, priority SS, identifying the subject aircraft.</p> <p>All messages must be in the company representative's precise wording.</p>
If the NatRep, operator, representative or captain of the aircraft wish to take the threat seriously.	<p>(1) Inform ACCs on flight path of aircraft that it is the subject of a bomb warning.</p> <p>(2) Inform the ATSU at the destination aerodrome.</p> <p>(3) Alert the D&D Cell.</p>

3C. Aerodromes

- 3C.1 When a bomb warning is received at an aerodrome ATSU the senior controller is to ensure that the appropriate local emergency orders are carried out.
- 3C.2 If the aircraft is in flight the senior controller shall, in addition, ensure that the Watch Supervisor at the parent ACC is informed. Messages to pilots from operators must always be referred to and coordinated with the appropriate ACC Watch Supervisor.
- 3C.3 If the aircraft is likely to land at the aerodrome, although it may not be in contact with the unit, the local emergency orders are, nevertheless, to be carried out.
- 3C.4 An aircraft on the ground should be advised to remain as far away from other aircraft and installations as possible and, if appropriate, to vacate the runway. The aircraft should be instructed to taxi to a designated or isolated parking area in accordance with local instructions. Should the flight crew disembark passengers and crew immediately, other aircraft, vehicles and personnel should be kept at a safe distance from the threatened aircraft.

- 3C.5 An aircraft known or believed to be the subject of unlawful interference or which for other reasons needs isolation from normal aerodrome activities shall be cleared to the designated isolated parking position in accordance with local instructions. Where such an isolated parking position has not been designated, or if the designated position is not available, the aircraft shall be cleared to a position within the area or areas selected by prior agreement with the Aerodrome Operator. The taxi clearance shall specify the taxi route to be followed to the parking position. This route shall be selected with a view to minimising any security risks to the public, other aircraft, and installations at the aerodrome.

4. Reporting

- 4.1 Reporting action is to be in accordance with Section 6.

Section 6: Reports

Chapter 1: General Guidance

1. Introduction

- 1.1 The immediate action that must be taken by a controller at an operational position when an AIRPROX is reported, is described in Section 1. The purpose of this section is to list, for quick reference, the subsequent reporting action for accidents, incidents, alleged breaches of legislation or AIRPROX events. It contains detailed instructions common to all ATSU's. Instructions amplifying these procedures or peculiar to a unit will be found in MATS Part 2 or local unit instructions.
- 1.2 To ensure prompt follow up action, all available information should be forwarded to the relevant authority following an incident. In particular, when a controller has a subsequent conversation with the pilot concerned, details of this exchange should be included as part of the reporting procedure. These should include items such as:
- (1) the pilot's name (if volunteered);
 - (2) the content of the discussion;
 - (3) whether or not the controller considers the matter closed from a flight safety viewpoint.
- 1.3 It is accepted that these supplementary details may well be dispatched after the initial reporting documentation. ANSPs should have appropriate procedures for ensuring that all details are correctly forwarded to the relevant bodies.
- 1.4 When a possible infringement of legislation is involved, controllers should follow the guidance contained in Chapter 4.
- 1.5 Common telephone numbers and postal addresses used in reporting action are listed in Appendix H.
- 1.6 Units may find it useful to make copies of Appendix H, or any other part of this section, for display at suitable positions in control rooms.
- 1.7 ANSPs that have an ECCAIRS/ADREP complaint format, containing the appropriate mandatory data fields, may submit an MOR via this format. Other ANSPs who do not operate a system capable of producing a compliant format are to use the EU Reporting Portal for MOR submissions.

2. Reports by Telephone

- 2.1 Some occurrences require a report to be made fairly promptly by telephone, e.g. malicious interference to VHF communications. Telephone numbers appear in the directory located in Appendix H.

3. Reports

- 3.1 All reports required from individual controllers about incidents and accidents are to be reported to their organisation (their ANSP employer), in line with MATS Part 2 or local unit instructions. The organisation is to collect all reports and other related documents and send them to the appropriate address. Submission of a completed report, provided it contains all information required by law, constitutes compliance with UK Reg (EU) 2015/1018 Annex 3, and UK Reg (EU) No. 376/2014. The required information is set out in these Regulations, which is available on the CAA website at: <https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/mor/occurrence-reporting/>
- 3.2 The following notes about compiling a report may be of assistance:
- (1) Relate the events in chronological order;
 - (2) Amplify the facts with explanations but do not attempt to pre-judge or investigate;
 - (3) Refer to the watch log, flight progress strips (FPS) or any other document for accurate details of times, dates, places, aircraft registration, etc;
 - (4) Use accepted aeronautical abbreviations (except for CA939 – Alleged Infringement of Legislation);
 - (5) Keep sentences and paragraphs as short as possible;
 - (6) Include a sketch or diagram if it will simplify the description;
 - (7) Write in the first person; and
 - (8) If you have not heard the RTF recording endorse your report 'The events described have not been checked for accuracy against the appropriate RTF recording'.

4. ATS Records

- 4.1 All ATS records concerning unusual occurrences must be preserved until enquiries or investigations have been completed. In particular:
- (1) the DEO is to be advised of occurrences immediately;
 - (2) the Meteorological Office or a qualified met. observer is to be asked to supply a copy of the weather report for the time of the occurrence;
 - (3) the original FPS are to be retained at the unit, or in the case of electronic strips, appropriate records secured.

5. Access to Original Records

- 5.1 Access to original records should be limited as follows, to protect from damage the very important evidence which they may contain.

5A. Accidents

5A.1 Replay of original RTF recordings and access to original communications logs and the contents of FPS record stores is normally permitted only on the authority of the AAIB. These facilities will be made available to ATC if immediately essential to the safety of the subject aircraft or any others (e.g. to help establish the position of the aircraft involved to facilitate search and rescue). If the authority of the AAIB cannot be obtained in time, the authority of the senior controller available shall be accepted. Written confirmation of this authority may be required.

5B. Incidents (including AIRPROX)

5B.1 Replay of original RTF recordings and access to other original records may be authorised by the appropriate designated local responsible person.

5B.2 Occasions may arise when replays of RTF recordings are requested in circumstances not associated with accidents, incidents or AIRPROX. Such requests may originate from ATC or from outside organisations (e.g. airline representatives) but, in all such cases, the written authority of the responsible person will be required to release the information.

6. Disclosure of Information

6.1 The contents of reports described in this section are to be suitably protected in accordance with UK Reg (EU) No. 376/2014 Article 15. If there is any doubt about the identity of an individual requesting report details, a controller should ask for the telephone number, check that it is authentic and return the call.

6.2 Members of the press and general public who make enquiries about an occurrence should be referred to the person authorised to release information. UK Reg (EU) No. 376/2014 and its Guidance Material offers guidance on the release of information. Additional instructions on relations with the press and general public may appear in MATS Part 2 or local unit instructions.

6.3 Controllers should not approach a pilot or the Aircraft Operator if there is an alleged infringement of legislation. Guidance for the occasions when the pilot contacts ATC is given in Chapter 4.

6.4 Controllers may contact the Aircraft Operator by telephone to obtain details for other reports, but they are neither to discuss the occurrence further nor offer opinions as to cause or responsibility. If aircraft operators require further information they are to be told from which authority they will, in due course, hear. These are:

- (1) for serious incidents – DfT (AAIB);
- (2) for AIRPROX and incidents – CAA (Safety and Airspace Regulation Group) or United Kingdom Airprox Board (UKAB).

7. Additional AAIB Post-Incident Investigation

- 7.1 In the interest of flight safety, the AAIB may require to investigate categories of incidents which are not normally reported to them. When the AAIB are investigating such an incident the AAIB Duty Co-ordinator will inform the appropriate Area Control Centre (ACC). The appropriate ACC shall then inform the appropriate ATSU that AAIB will require the normal post-incident actions to be taken.

Section 6: Reports

Chapter 2: Air Traffic Control Incident Assessment

1. Air Traffic Control Incident Assessment

- 1.1 Any ATC related occurrence, such as an accident, AIRPROX or other incident involving safety, where a controller's actions, inadequate ATC procedures or faulty equipment may have been a contributing factor, is to be assessed as quickly as possible by nominated local unit managers.
- 1.2 The assessment procedure, following the reporting action at an aerodrome or ACC described in this section, falls into two phases:
- (1) Initial action at the unit;
 - (2) Full investigation by the CAA (ATS Investigations).

1A. Phase 1 – Initial Action

- 1A.1 The nominated Unit Manager at the unit is to take the following action without delay:
- (1) when circumstances dictate, the controller(s) concerned is (are) to be withdrawn from operational duty and informally interviewed to establish the basic facts;
 - (2) if it is likely that controller(s), ATC procedures or equipment are implicated, telephone the appropriate Principal ATS Inspector (or nominated deputy), giving immediately available details of the incident. It is useful if, prior to contacting the Principal Inspector and subject to the guidance in Section 5 above, appropriate RTF and telephone recordings have been reviewed to better inform the conversation.
- 1A.2 The Principal Inspector will decide whether or not to provisionally vary the controller's unit endorsement, rating or licence, if appropriate and the extent, if any, of further remedial action, e.g. competence check, period of training etc. and advise the nominated unit manager accordingly. The act of withdrawing the controller from duty pending the conclusion of this work is likely to be sufficient to address any immediate safety concerns and will provide time for further assessments to be made where the controller's competence is in doubt, ATC procedures are suspected of being unsafe or the equipment might be at fault.
- 1A.3 The local management assessment is to:
- (1) enable immediate action to be taken locally to prevent a recurrence, e.g. cease using a particular procedure, withdraw suspect equipment etc;
 - (2) include evidence which will form the basis of the in-depth investigation of the incident. It is to be discussed with the appropriate Principal ATS Inspector at

the earliest opportunity. Internal procedures ensure that relevant incident material is transferred between CAA departments as required.

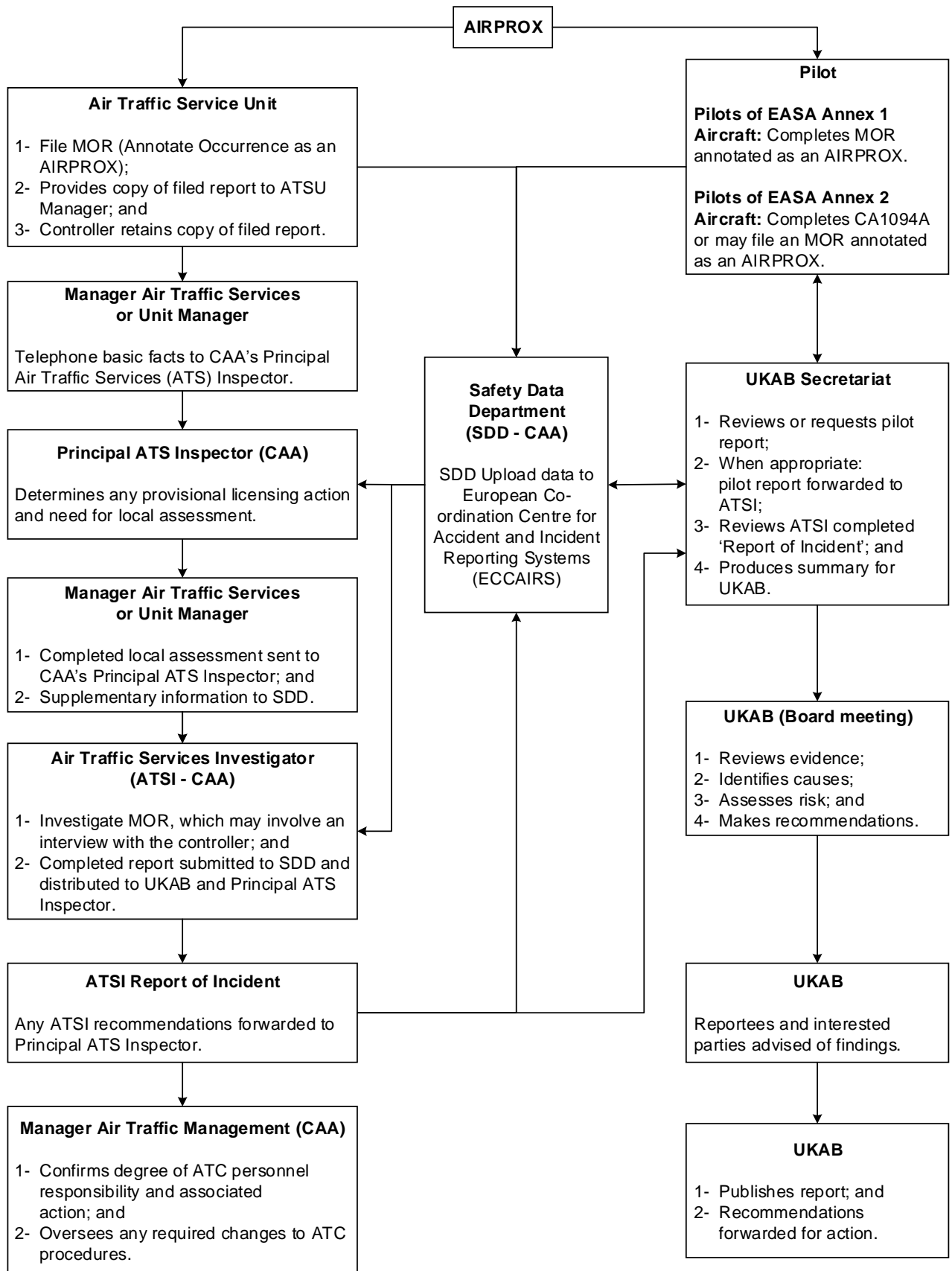
- 1A.4 Whether or not the Principal ATS Inspector requires a local assessment, the unit manager should carry out a local assessment for the purposes of 1A.3(1) above.
- 1A.5 The Unit Manager should ensure that any local unit investigation is conducted in accordance with local unit procedures.

1B. Phase 2 – Full Investigation (CAA ATSI)

- 1B.1 A full field investigation will be conducted by an ATS Investigator if deemed appropriate. This usually involves interviews at the unit(s) concerned (or may involve an interview by telephone) and may require further evidence from controllers who have already been informally interviewed. Other relevant evidence, where available, is taken into account, e.g. pilots' reports, RTF transcripts and surveillance recordings.
- 1B.2 ATSI will analyse the evidence and seek to identify the causes of the occurrence in their report conclusion. Where appropriate, recommendations can be made.
- 1B.3 The subsequent report from the ATS Investigator is submitted to the appropriate Principal ATS Inspector.

1C. Remedial Action

- 1C.1 The Principal ATS Inspector oversees implementation and audit of any adopted recommendation that ATSI may make.
- 1C.2 Whether or not ATC is implicated in the cause of the incident, reports are submitted as MORs to the CAA and in the case of an accident also to the AAIB. The diagram on the following page illustrates the routeing for an AIRPROX report. Provided AIRPROX is clearly mentioned or annotated on the original MOR then the report is forwarded to UKAB by SDD.



Note: This flow diagram should be read in conjunction with the reporting action for aerodromes and ACCs detailed in this section.

1D. Mandatory Occurrence Report

- 1D.1 A safety related incident, which does not fall into the above categories, is to be filed as a Mandatory Occurrence Report and submitted to the CAA for initial evaluation and processing. It should be noted that if, during the local assessment, the competence of a controller is in doubt the unit manager should withdraw the individual from operational duty and telephone the appropriate Principal Inspector as for AIRPROX.

1E. The Role of Safety Data Department (SDD)

- 1E.1 SDD acts as the focal point for receipt of all occurrence reports. ATC related incidents form only part of the overall input but are, nevertheless, mandatory occurrences. Other CAA departments could be involved. SDD assesses each report and assigns an appropriate CAA department for investigation.

2. Controller Overload

- 2.1 Controllers who consider that they were involved in an ATC situation during which they experienced excessive workload to the point where the safety of aircraft under their control was, or could have been, compromised, shall file an MOR. When completing the report, controllers shall commence the narrative with 'Overload Report'. The Unit Manager shall ensure that a unit investigation is carried out into the alleged overload and shall submit a follow up in line with UK Reg (EU) No 376/2014 timelines.
- 2.2 The Unit Manager shall include in the report the effect the overload had on the controller's ability to safely handle aircraft under their control and, if appropriate, details of the remedial action the unit has decided to take.

Section 6: Reports

Chapter 3: Aircraft Accident, Incident and AIRPROX Reports

1. Explanation of Terms

- 1.1 UK Reg (EU) No. 376/2014 (article 4 (5)) requires that a list classifying the type of occurrences that require report action is created. This list is detailed within UK Reg (EU) No. 2015/1018, which is not reproduced within this document. However, the following information gives guidance on the types of occurrence and the action to follow at unit level. It is also recognised that some units may have additional reporting action as detailed in local unit instructions.
- 1.2 In this section the term 'incident' means any of the unusual occurrences, involving aircraft, which are tabulated below.

Table 1:

Incident	Explanation
Aircraft Accident	An aircraft, manned or unmanned, receives substantial damage or causes death or serious injury or damage to property.
Reportable Accident	<p>An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards an aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:</p> <p>(1) a person is fatally or seriously injured as a result of:</p> <ul style="list-style-type: none"> (a) being in the aircraft, or (b) direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or (c) direct exposure to jet blast, <p>except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or</p>

Incident	Explanation
	<p>(2) aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damage to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or</p> <p>(3) the aircraft is missing or is completely inaccessible.</p>
Serious Incident	An occurrence involving circumstances indicating that an accident nearly occurred.
AIRPROX	A situation in which, in the opinion of the pilot or a controller, the distance between aircraft as well as their relative positions and speeds have been such that the safety of the aircraft involved was or may have been compromised.
Incident involving safety	An occurrence which has endangered, or if not corrected would have endangered an aircraft, its occupants or any other person.
Wildlife or Birdstrike	An occurrence either witnessed by ATC or advised by a pilot where an aircraft has come in to contact with one or more birds or other wildlife.
Incident on-board an aircraft in flight	A commander of an aircraft in flight, in pursuance of the powers bestowed on the commander by the Tokyo Convention Act 1967, finds it necessary to restrain a person on board.
Hijacking	The unlawful seizure, or exercise of control, of an aircraft by use of force or threats.
Unlawful use of aircraft	Movement on the ground and flight of an aircraft by an unauthorised person or for an illegal purpose.
Aircraft Ground Incident	An aircraft on the ground is in an emergency situation, other than an accident, and requires the attendance of the emergency services.
Unintentional use of unpaved areas	An aircraft of 2300 kilogrammes or more all-up-weight touches down short of the recognised landing area, overruns on landing or otherwise leaves the paved surfaces of the manoeuvring area.
Aircraft Radio Equipment Fault	Aircraft Radio Equipment Fault
Radio Frequency Interference	Interruption of reception on ATC RTF frequencies by unwanted signals or atmospherics.
Ground Fault Report	A report by an aircrew member alleging that a telecommunications facility is not operating correctly.

2. Reporting Action

- 2.1 Reporting action will depend upon the circumstances of the incident. The actions to be taken at aerodromes and ACCs are listed in the respective tables below. If more than one circumstance applies to a particular incident, then the actions applicable to all appropriate circumstances must be taken. E.g. an accident in the vicinity of an aerodrome is also one that is reportable. The combined reporting action is to telephone the ACC and the Aerodrome Operator. Subsequent action is to submit written reports from all concerned to SDD. Additional reporting action may be specified in MATS Part 2 or local unit instructions.

Note: Where the posts described in the tables below are not the job titles used locally, the reporting action to be used shall be detailed in MATS Part 2 or local unit instructions.

3. Reporting Action at Aerodromes

- 3.1 The senior controller at an air traffic control unit at an aerodrome is responsible for ensuring that the reporting action described below is taken.

Table 2:

Circumstances of an Incident	Reporting Action by telephone to	Subsequent Action
Aircraft Accident in the vicinity of the aerodrome	AAIB ACC Watch Manager	Submit an MOR
Additionally if an accident is Reportable	Aerodrome Operator (but see local emergency orders) ACC can assist	Submit an MOR
Involves any of approach, navigation or communications facilities	DEO at the aerodrome	Submit an MOR
Unintentional use of unpaved areas	Aerodrome Operator	Submit an MOR
AIRPROX Report	ACC Watch Manager Aircraft Operators Other ATSU's involved	Submit an MOR
AIRPROX Report involving SUA	Civil Police: Provide location of AIRPROX as soon as practicable to initiate tracing action ACC Ops Supervisor Aircraft Operator Other ATSU's as necessary	Submit an MOR
Serious Incident	AAIB ACC Watch Manager Aerodrome Operator	Submit an MOR

Circumstances of an Incident	Reporting Action by telephone to	Subsequent Action
MAYDAY and PAN messages	ACC Watch Manager Aerodrome Operator	Submit an MOR
Air Traffic Services may be subject to criticism	ACC Watch Manager Head of ATSU	Submit an MOR
Likely to give rise to public interest	ACC Watch Manager Head of ATSU	
Hijacking and the unlawful use of aircraft	ACC Watch Manager Aerodrome Operator (according to local unit instructions)	Submit an MOR
Bomb Warning involving an aircraft is received	Aircraft Operators ACC Watch Manager (See local emergency orders) Next ATSU concerned with flight (if aircraft is airborne)	Submit an MOR
Incident on-board an aircraft in flight (aircraft intends to land)	Aerodrome Operator Aircraft Operators	Submit an MOR indicating that a CA939 has been raised and Submit CA939 to Investigation and Enforcement Team via: https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/report-and-alleged-breaches-of-air-navigation-legislation/
Aircraft Radio Equipment Fault	DEO	Submit an MOR
Ground Fault Report (Telecommunications Service)	DEO at aerodrome (see Section 7 for successive reports of the same fault)	Submit an MOR
Radio Frequency Interference Report	DEO	Submit an MOR
Alleged Infringement of Legislation		Submit an MOR indicating that a CA 939 has been raised and Submit CA 939 to Investigation and Enforcement Team via: https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/report-and-alleged-breaches-of-air-navigation-legislation/
See also Chapter 1 – GENERAL GUIDANCE and the flow diagram in Chapter 2		

Circumstances of an Incident	Reporting Action by telephone to	Subsequent Action
A LIST OF TELEPHONE NUMBERS AND LOCATIONS IS SHOWN IN THE DIRECTORY AT APPENDIX H		

4. Reporting Action at ACCs

4.1 The Operational Supervisor at an ACC is responsible for taking action upon receipt of reports from:

- (1) aircraft within the FIR;
- (2) ATSU's situated in the FIR;
- (3) other ACCs;
- (4) military units associated with the ACC;
- (5) civilian police or HMRC.

4.2 Reporting action is shown in the table below. Note that more than one circumstance may be appropriate to an incident. Operational Supervisors should also ensure that actions taken include those described in Section 5, Chapter 6, 'Alerting Action'.

Table 3:

Circumstances of an Incident	Reporting Action (by telephone to)	Subsequent Action
Reportable Accident (if reporting action not taken at an aerodrome)	AAIB Civil Police	Submit an MOR
Serious Incident (this may include some MAYDAY and PAN messages)	AAIB	Submit an MOR
AIRPROX Report	Aircraft Operators Other ATSU's involved	Submit an MOR
AIRPROX Report involving SUA	Civil Police: Provide location of AIRPROX as soon as practicable to initiate tracing action ACC Ops Supervisor Aircraft Operator Other ATSU's as necessary	Submit an MOR
Air Traffic Services may be subject to criticism	ACC General Manager	
Likely to give rise to public interest	ACC General Manager CAA Press Officer DfT Duty Officer	

Circumstances of an Incident	Reporting Action (by telephone to)	Subsequent Action
May involve NATS en-route navigational or communications facilities	System Control at the ACC	Submit an MOR
May involve any of approach, navigational or communication facilities at non-NATS aerodromes	System Control at the ACC	Submit an MOR
Hijacking and unlawful use of aircraft	DfT Duty Officer ACC Military Supervisor Next ATSU concerned with the flight	Submit an MOR
BOMB Warning involving an aircraft	Aircraft Operators (if action not already taken at ATSU) DfT Duty Officer Next ATSU concerned with flight, and ACC Military Supervisor (if aircraft airborne)	Submit an MOR
Incident on-board an aircraft in flight	Aerodrome of intended landing Next ACC concerned with flight Aircraft Operator DfT Threats Office Duty Officer	Submit an MOR
Aircraft Radio Equipment Fault	System Control	Submit an MOR
Ground Fault Report (Telecommunications Service)	DEO at aerodrome (see Section 7 for successive reports of the same fault)	Submit an MOR
Radio Frequency Interference Report	System Control	In accordance with local reporting procedures.
Alleged Infringement of Legislation		Submit an MOR indicating that a CA939 has been raised and Submit CA939 to Investigation and Enforcement Team via: https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/report-and-alleged-breaches-of-air-navigation-legislation/

Circumstances of an Incident	Reporting Action (by telephone to)	Subsequent Action
See also Chapter 1 – GENERAL GUIDANCE and the flow diagram in Chapter 2		
A LIST OF TELEPHONE NUMBERS AND LOCATIONS IS SHOWN IN THE DIRECTORY AT APPENDIX H		

5. Accident Reports

5A. Telephone

5A.1 When telephone action is required pass as much of the following information as is available:

- (1) Type, nationality and registration of the aircraft;
- (2) Owner or operator;
- (3) Date and time of the accident;
- (4) Nature of the flight;
- (5) Location of the accident site;
- (6) Number of crew and passengers;
- (7) Casualties;
- (8) Circumstances of the accident;
- (9) Lighting facilities, navigational and/or landing aids in use (as appropriate) and any known unserviceabilities.

5B. Written Reports

5B.1 General advice on writing reports is given in Chapter 1. The following details are to be included in the report when an accident at an aerodrome is, by definition, reportable:

- (1) Runway in use;
- (2) Approach aids and Lighting facilities in use and their serviceability;
- (3) Relevant information on the serviceability of the aerodrome facilities and surface;
- (4) Any damage to aerodrome or third-party property.

6. Serious Incident Reports

6.1 A serious incident (fully defined in UK Reg (EU) No. 996/2010) is one involving circumstances which indicate that an accident nearly occurred. The purpose of this reporting action is to provide an early degree of awareness to the AAIB that a serious incident may have occurred.

6.2 The following list provides a number of typical examples of those incidents likely to be considered serious. The list is not exhaustive and serves only as guidance to the definition of a serious incident. The AAIB are the final arbitrators in deciding whether the incident will be considered serious. If doubt exists, an incident should be reported rather than excluded:

- (1) Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when avoidance action would have been appropriate;
- (2) Controlled flight into terrain only marginally avoided;
- (3) Aborted take-offs on a closed or occupied runway;
- (4) Take-offs from a closed or occupied runway with marginal clearance from obstacle(s);
- (5) Landings or attempted landings on a closed or occupied runway;
- (6) Gross failures to achieve predicted performance during take-off or initial climb;
- (7) Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents;
- (8) Events requiring the emergency use of oxygen by the flight crew;
- (9) Aircraft structural failures or engine disintegrations not classified as an accident; Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft;
- (10) Flight crew incapacitation in flight;
- (11) Fuel quantity requiring the declaration of an emergency by the pilot;
- (12) Take-off or landing incidents (incidents such as under-shooting, over-running or running off the side of runways);
- (13) System failures, weather phenomena, operations outside the approved flight envelope or other occurrence which could have caused difficulties controlling the aircraft; and
- (14) Failure of more than one system in a reduced system mandatory for flight guidance and navigation.

6.3 Where an AIRPROX is filed there is no need to follow the serious incident reporting procedures as the details will be sent by the normal reporting systems to AAIB. Reporting procedures shall commence as soon as practicable after the incident and, in all cases, no later than 72 hours after the occurrence. It is accepted that all details may not be available soon after the incident in which case the available information should be sent within the required timescale and the additional details forwarded on as soon as possible thereafter. If a serious incident occurs and ATC are not

informed by the crew then the onus rests with the flight crew to ensure that reporting action is taken.

6A. Telephone

6A.1 When telephone action is required pass as much of the following information as available:

- (1) Type, nationality and registration of the aircraft;
- (2) Owner or operator;
- (3) Date and time of the serious incident;
- (4) Nature of the flight;
- (5) Location where the serious incident took place;
- (6) Number of crew and passengers;
- (7) Casualties;
- (8) Circumstances of the serious incident; and
- (9) Where appropriate, lighting facilities, navigation and/or landing aids in use and any known unserviceabilities.

7. AIRPROX Reports

- 7.1 AIRPROX reports are processed and handled by the UK AIRPROX Board (UKAB). ATSI review all AIRPROX reports and may carry out a full investigation. During the ATSI review the extent to which ATC were involved in the AIRPROX is assessed, and on completion of any investigation, an appropriate report is forwarded to UKAB.
- 7.2 In order to comply with MOR procedures, the report from the originating ATSU shall clearly state 'AIRPROX' and contain as much information as possible. SDD will then forward the report to UKAB.
- 7.3 A pilot may file an AIRPROX report on the RTF or, after landing, by telephone or in person. Following a pilot's declaration that they will file an AIRPROX, controllers should complete their own incident report. This should ensure that any action, such as recovery of RTF or surveillance data can be initiated at the earliest opportunity.
- 7.4 Any completed AIRPROX reports, initiated by pilots, (including signals from foreign ACCs) received at an ATC unit are to be sent without delay to the UKAB.
- 7.5 Controllers, when initiating the filing of an AIRPROX, shall file an MOR including clear reference to the status as an AIRPROX. Pilots of aircraft involved in an AIRPROX initiated by a controller should be informed by the controller or their unit management, as soon as possible, that an AIRPROX is being submitted by ATC.

7A. Search Action

- 7A.1 The following action is to be taken at ACCs to trace a reported aircraft if its identity is not known:
- (1) If the unidentified aircraft is suspected to be military (of any nationality) or not positively identified as civil, telephone LACC (Mil) Radar Analysis Cell (RAC) and request search;
 - (2) If the search for a civil aircraft (especially light aircraft outside controlled airspace) is unsuccessful, telephone LACC(Mil) RAC and seek assistance. In particular, ask if any military unit has any knowledge of the reported civil aircraft.
- 7A.2 In both cases confirm the request by including LACC(Mil) RAC in the list of addresses of the signal.
- 7A.3 Where ACC trace action is taken entirely by LACC(Mil) RAC, final signal action will be taken by LACC(Mil) RAC.
- 7A.4 If a military aircraft, not in communication with a civil ATC unit, reports an AIRPROX with a civil aircraft the ACC will be requested by LACC (Mil) RAC to attempt to trace the reported aircraft.
- 7A.5 LATCC (Mil) RAC is responsible for all trace action undertaken at the London AC and LTCC and the Prestwick AC.

8. Mandatory Occurrence Reports (MOR)

- 8.1 Information and guidance on the MOR scheme is contained on the CAA website.
- 8.2 The holder of an Air Traffic Controller's licence or Flight Information Service Officer's licence is to report, within 72 hours, any occurrence which has, or if not corrected would have, endangered an aircraft, its occupants or any other person. The CAA Website contains guidance on what is a reportable occurrence but ultimately the individual licence holder involved will have to use their own judgement. UK Reg (EU) 2015/1018 contains details.
- 8.3 To enable other reports to be completed without delay licence holders should, if possible, inform operators and other ATS units involved as soon as practicable.
- 8.4 If telecommunications services and facilities are involved, the systems controller or the DEO should be advised of the circumstances of the occurrence without delay.
- 8.5 Licence holders are to report all occurrences regardless of the category or nationality of the aircraft.

8A. Reporting Procedure

- 8A.1 All ATC initiated MORs are to be filed as detailed in paragraph 1.7 (Chapter 1 of this section).

- 8A.2 Occurrence Reports are treated confidentially to maintain full and free reporting from the aviation community and to protect the identity of the individual in accordance with EU legislation.
- 8A.3 If the controller considers that the incident they are reporting under the MOR scheme may have involved a breach of legislation they are advised to seek the views of local management. If after consultation it is decided that CA939 action is appropriate a completed form CA939 should be sent to the Investigation and Enforcement Team (IET) accompanied by a MOR which indicates that CA939 action has been requested.
- 8A.4 If a reporter encounters a situation where a mandatory report is not appropriate but has an allegation about an individual or organisation that may affect safety, then a Voluntary Occurrence Report (VOR), or a Whistleblower report may be filed. Details of the whistleblowing process can be found on the CAA website via the MOR scheme page: <https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/make-a-whistleblowing-report/>

9. Incidents on Board an Aircraft in Flight

- 9.1 If the commander of an aircraft finds it necessary to restrain a person on-board an aircraft in flight they may report the matter to an ATC unit. The report will normally contain the following items:
- (1) The nationality and registration marks of the aircraft;
 - (2) The commander's name;
 - (3) The name and nationality of the person under restraint and the details of their journey;
 - (4) A description of the incident in which the person was involved and the position of the aircraft at the time;
 - (5) The names of up to three witnesses;
 - (6) The ETA at the aerodrome of intended landing.
- 9.2 Controllers should submit an MOR.

10. Matter Allegedly Dropped by Aircraft

- 10.1 A complaint alleging that matter has fallen from an aircraft is to be treated as an incident involving safety. All reasonable efforts are to be made as soon as possible to identify any aircraft that might have been responsible. The aid of the Watch Manager at the ACC may be enlisted. It should be remembered that military aircraft, often beyond civil control or means of identification, may have been responsible. Controllers must not express opinions as to the likely source of the falling matter to the person reporting the incident.

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Section 6: Reports

Chapter 4: Infringement of Legislation

1. Introduction

- 1.1 Offences against the Civil Aviation Act, the ANO, its supporting Regulations or published procedures may be one of three basic types:
- (1) An offence against the RoA Regulations and ATC Regulations or against published procedures;
 - (2) An offence against regulations based on safety;
 - (3) An offence against regulations having no direct bearing on safety (e.g. requirements for registration and markings, carriage of documents or Customs requirements).
- 1.2 Offences in category 1.1 3) above should be reported by telephone to the nearest representative of the appropriate authority (e.g. Customs) or, in cases of doubt, to the CAA Investigation and Enforcement Team (IET).
- 1.3 Controllers should report offences in categories 1.1(1) and 1.1(2) above using form CA939 in accordance with paragraph 3 below.

2. Tracing Action

- 2.1 If the offending aircraft has not been identified but is seen on a situation display, it is to be tracked, if possible, until it appears to be landing. Correlation of the track and time with the movements at the appropriate aerodrome should be attempted so that identification can be made.
- 2.2 If the pilot's name is volunteered it should be noted in the report. There is no requirement to speak directly to the pilot concerned. However, if contact is made, the pilot shall not be invited or persuaded to give an explanation but if they do voluntarily, it shall be written down in their exact words and not paraphrased or interpreted. This does not constitute a statement under caution, but it does form a very important link in the chain of information upon which to decide whether to prosecute. The reporting officer should endorse the form with the date and time of completion.
- 2.3 If the pilot states that special circumstances existed, e.g. that service was being provided by another ATSU, efforts should be made to corroborate the statement.
- 2.4 If the pilot asks what action is going to be taken, the controller should say that they will endeavour to trace the identity of an aircraft involved in an incident and that the circumstances of the flight are being reported to the CAA for consideration of action to be taken.

- 2.5 Controllers should not, in conversation with pilots:
- (1) Specify the Article, Rule or Regulation apparently infringed;
 - (2) Give any form of admonition.
- 2.6 To do so may inhibit action by CAA Investigation Officers.

3. Written Reports

- 3.1 Alleged breaches of Air Navigation Legislation (ABANL) are to be reported on form CA939. A link to this form is available on the CAA website under Aviation Industry Related Issues via the 'Make a report' link (<https://www.caa.co.uk/our-work/make-a-report-or-complaint/report-something/report-and-alleged-breaches-of-air-navigation-legislation/>). Details under the heading 'General Information' should be inserted if they are known. Copies of statements and relevant supplementary evidence, such as watch log extracts and flight plans, should be attached.
- 3.2 Staff having first-hand knowledge of the incident are to type their statements in a MOR report. It should be noted that on this occasion code groups and aeronautical abbreviations are not to be used. RTF recordings should be preserved in case a transcript is required.

4. Forwarding Reports

- 4.1 Reports on CA939 are to be sent to the CAA IET. Reports may be submitted by post or by email as detailed on the form. It is essential that any report which may merit prosecution is dealt with expeditiously. If delays occur in the preparation of supporting documents, the CA939 is to be forwarded at once and endorsed 'additional documents to follow'.
- 4.2 Controllers are reminded that the event should be described with as much detail as possible. The report should include the following where appropriate:
- (1) The identification of all aircraft involved together with relative tracks and times;
 - (2) Any loss of separation associated with the ABANL; and
 - (3) A statement as to the degree of actual impact the event had on ATC operations including any tactical avoiding or delaying action taken by ATC.

5. Military Aircraft

- 5.1 Although air navigation legislation does not normally apply to military aircraft (of any nationality) all apparent contraventions are to be reported.
- 5.2 When an unidentified aircraft (suspected as being military) has apparently contravened regulations, the LACC (Mil) RAC should be requested to take search action to establish its identity. The reason for requesting the search must be clearly stated to distinguish it from the search action following an AIRPROX report.

Section 6: Reports

Chapter 5: Miscellaneous Reports

1. Bird Strikes

- 1.1 Pilots are required to report all bird strikes (and other wildlife related events) in UK airspace whether or not damage is caused. A controller receiving such a report should obtain as much information as possible and complete an MOR clearly stating the nature of the report.

2. Maritime Incidents

2A. Disasters at Sea

- 2A.1 Pilots witnessing a disaster at sea, or seeing a disaster not previously notified, have been requested to report the incident to any ATC unit as quickly as possible.

2B. Maritime Pollution

- 2B.1 Pilots sighting substantial patches of oil or possible harmful substances have been asked to make reports to the ATC unit with whom they are in communication, or to the appropriate personnel providing a FIS at an ACC. Reports on RTF will be prefixed 'Oil Pollution Report', or '... Pollution Report' if a harmful substance other than oil is suspected.
- 2B.2 A controller receiving a report should obtain as much information as possible to complete a report in the format shown below:
- A Date and time pollution observed and identity of aircraft reporting.
 - B Position and extent of pollution.
 - C Tide, windspeed and direction.
 - D Weather conditions and sea state.
 - E Characteristics of pollution.
 - F Name and nationality, or description, including any distinctive markings, of any vessel seen discharging oil or other harmful substances; also assessment of course and speed of vessel and whether any pollution observed ahead of the discharging ship and the estimated length of pollution in her wake.
 - G The identity of any other vessels in the immediate vicinity.
 - H Whether or not photographs have been taken.

2C. ATC Action

- 2C.1 Any ATC unit receiving such reports should pass them without delay to an ACC. The ACC Watch Manager receiving such a report should pass this as soon as possible

to the appropriate Maritime Rescue Coordination Centre (MRCC) or the Joint Rescue Coordination Centre (JRCC) (a list of addresses, telephone and telex numbers is held at each ACC).

- 2C.2 Similar procedure should be followed if a pilot makes such a report by telephone after landing.

A LIST OF TELEPHONE NUMBERS AND LOCATIONS IS SHOWN IN THE DIRECTORY AT APPENDIX H
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3. Sonic Boom

- 3.1 An ATSU receiving a report of a boom alleged to have been caused by an aircraft in supersonic flight should obtain as much information as possible, including:
- (1) Name and address of informant;
 - (2) Time boom was heard;
 - (3) Description of sound (e.g. single or double crack, dull boom or rumble, etc.);
 - (4) Details of any alleged effects on persons, property, or livestock.
- 3.2 The report should be passed immediately to the parent ACC, whose MATS Part 2 or local unit instructions shall contain procedures for processing such reports.

4. Malicious Interference to VHF Communications

- 4.1 The malicious use of the aeronautical VHF mobile band involves persons who deliberately impersonate controllers and the types of message they broadcast. When such transmissions are made they may sometimes be identified by:
- (1) a change in the individuality of the transmissions, i.e. the controller's voice characteristics are not those previously experienced;
 - (2) the message transmitted is out of context with the expected next message; it is obviously in error or uses incorrect phraseology;
 - (3) the messages are usually transmitted for a short time only and not repeated when queried;
 - (4) the signal is sometimes received only by the pilot or controller, not both.
- 4.2 When illegal transmissions are suspected controllers should ensure that either the DEO or ATC contacts Ofcom's Spectrum Management Centre (SMC) who will seek to track down the source of the transmissions and take appropriate legal action. For this process to work, it is essential that the SMC is informed as soon as practicable providing the following information:
- (1) radio interference category (malicious interference is category 1);
 - (2) frequency or channel on which the interference occurs, or the identification of the navigational aid affected;

- (3) description of interference (details of speech, description of noise etc);
- (4) location of the aircraft and/or ATSU transceiver receiving the interference;
- (5) station receiving the interference (this can be the aircraft and/or ATSU callsign); and
- (6) any other relevant details.

4.3 The SMC should be informed in the first instance via telephone using the following telephone number:

Tel: (H24) 01462 428528

The SMC may require a written report to be submitted subsequently using either of the following:

Email: SMC@ofcom.org.uk

Fax: (H24) 01462 438510

4.4 It is important that the best possible evidence is made available for any potential prosecution. Original records of communications received must be preserved where possible. Advice from CAA Investigation and Enforcement Team (IET) can be obtained if ANSPs are unclear on what action to take or what to preserve when cases arise.

4.5 In all cases of interference, controllers shall complete an MOR form and a CA939.

4.6 Additional procedures may be found in MATS Pt 2.

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Section 7: Meteorological Services / Telecommunication Services / Aeronautical Services

Chapter 1: Meteorological Services

1. Briefing of Controllers

- 1.1 Prior to taking-over watch, controllers shall obtain full information regarding the weather to be expected during the period of their watch. This may be accomplished by a study of forecasts and charts supplied routinely by the Met Office and, if clarification is necessary, supplemented by a briefing from the designated forecast unit.

2. Explanation of Terms

- 2.1 The use of the words 'cloud base' in meteorological reports and aerodrome forecasts means the height of the base of any cloud above aerodrome elevation.
- 2.2 The Meteorological Authority for civil aviation in the United Kingdom is the Civil Aviation Authority, CAA House, 45–59 Kingsway, London WC2B 6TE.

3. Supply of Information

3A. Source

- 3A.1 Meteorological forecasting services to ATSUs are provided by the Met Office from the Operations Centre at Exeter or other designated forecast offices, as directed by the Meteorological Authority. As a general rule, controllers shall only transmit to aircraft, information that has been supplied, or agreed, by the Met Office. The exceptions are:

- (1) Indicated wind direction and speed where anemometer indicators are fitted in the control room;
- (2) RVR observations;
- (3) Sudden or unexpected deteriorations of which, in the interests of safety, a controller considers it advisable to warn aircraft immediately and consult with the meteorological forecast office afterwards;
- (4) Information from an aircraft in flight may be passed to other aircraft when a controller considers that it may be useful to them.
- (5) Whenever this is done the controller shall state that the information originated from an aircraft in flight and the time at which the observation was made.
- (6) Special Aircraft Reports of meteorological conditions which affect safety;
- (7) Cloud echoes observed on PSR;

- (8) Observations made at aerodromes by personnel who hold a Meteorological Observing Certificate;
- (9) Observations made at aerodromes without accredited observers (non-MET certificated ATS personnel) are not regarded as official reports. If transmitted to aircraft or disseminated beyond the aerodrome, the message must be prefixed by: "Unofficial observation from (name of aerodrome) at (time) UTC gives (observation)".

3A.2 Controllers shall ensure a close watch is kept on the weather and report any sudden or unexpected deteriorations or improvements observed, or obtained from pilots, to the duty observer on the aerodrome or forecaster at the appropriate forecast office without delay. Controllers may be asked to obtain weather observations from aircraft.

3B. Aircraft Observations and Reports

3B.1 Special Aircraft Observations will be passed to ATC as Special Air-Reports whenever an aircraft encounters or observes any of the following conditions:

- (1) moderate icing (MOD ICE) or severe icing (SEV ICE);
- (2) moderate turbulence (MOD TURB) or severe turbulence (SEV TURB);
- (3) severe mountain wave (SEV MTW);
- (4) thunderstorms with or without hail (that are obscured, embedded, widespread or in squall lines) (TSGR or TS);
- (5) volcanic ash cloud (VA CLD or VA); and
- (6) pre-eruption volcanic activity or volcanic eruption.

3B.2 Special and non-routine Air-Reports shall be recorded by ATS units using the model AIREP SPECIAL form contained at Appendix J (SERA.12005(c)(1)) or similarly ANSP produced document and the information disseminated, as soon as practicable in accordance with (SERA.12020(a)) to:

- (1) other aircraft concerned and shall cover the portion of the route up to one hour's flying time ahead of the aircraft;
- (2) the Met Office at Exeter or Aberdeen (as appropriate), as soon as practicable, who will decide whether the conditions warrant the issue of a SIGMET; and
- (3) other ATS units concerned.

Note: Other ATS units concerned are those that have flights under their jurisdiction which are expected to enter the airspace concerned at a later stage of flight. Those flights could, for instance, require rerouting before entering the airspace concerned. As an example, a special air-report concerning volcanic ash or volcanic eruption could be necessary to transmit

to aircraft by ATS units in the FIR adjacent to that affected by the Air-Report. (GM1 SERA.12020(a)(3)).

3B.3 Transmissions to aircraft shall be repeated at a frequency and continued for a period of time which shall be determined by the ATS unit concerned. (SERA.12020(b))

3B.4 The Special Air-Report shall contain the following information:

- (1) Position or latitude and longitude;
- (2) Time;
- (3) Flight Level or altitude;
- (4) Meteorological information/conditions.

3C. Checking Information

3C.1 If time allows, current weather reports should be compared with previous reports and the prevailing conditions. Differences which are difficult to reconcile with the observed conditions, or barometric pressures which are not consistent with the apparent tendency, should be confirmed with the duty meteorological observer before transmission to aircraft.

3D. Aerodrome Weather Report Form

3D.1 The method by which meteorological observers communicate routine and special reports to ATC is described in MATS Part 2.

3D.2 Special reports (see below) are to be identified as such on the aerodrome weather report form or display. Similarly, elements of a routine report which show a specific change, and which would otherwise require the issue of a special report, are to be underlined or otherwise highlighted on the form or display.

3E. Recording Information

3E.1 All weather reports, both routine and special, must be recorded either in the Meteorological Register or other method approved by the CAA. Contingency arrangements shall be developed and followed in the event of the failure or non-availability of equipment used to record weather reports. Any information, except surface wind measurements, that is at variance with the official weather report and is passed to aircraft or operators will be recorded in the approved manner.

4. Aerodrome Meteorological Reports (Routine)

4.1 Routine aerodrome meteorological reports are issued hourly or half hourly as required and contain the items shown in the table below. Full details are contained in CAP 746 Meteorological Observations at Aerodromes. The time of observation shall be in UTC.

Table 1:

Item	Description
Surface Wind	<p>Direction in degrees True and speed in knots, usually averaged over 10 minutes. In addition, if appropriate to the same 10-minute period:</p> <ol style="list-style-type: none"> (1) Extremes in direction when the variation is 60 degrees or more but less than 180 degrees and the mean speed exceeds 3 knots; (2) Maximum wind speed when it exceeds the mean by 10 knots or more.
Surface Visibility	<p>Prevailing Visibility:</p> <ul style="list-style-type: none"> • in increments of 50 metres when the visibility is less than 800 metres; • in increments of 100 metres when it is 800 metres or more but less than 5 km; • in kilometre steps, when the visibility is 5 km or more but less than 10 km; and • it shall be given as 10 km when the visibility is 10 km or more. <p>Visibility values are rounded down to the nearest lower step. RVR shall be included when measured.</p> <p>Where the visibility in any direction is less than the prevailing visibility and less than 1,500 metres or less than 50% of the prevailing visibility, the lowest visibility observed will also be reported in the increments described above.</p>
Weather	At the time of observation, e.g. drizzle, fog, heavy rain etc.
Cloud	<p>The following layers showing the amounts in terms of few, scattered, broken, or overcast along with bases in feet, but limited to cloud bases which are not more than 5,000 ft above aerodrome elevation:</p> <ol style="list-style-type: none"> (1) The lowest individual layer whatever the amount; (2) The next highest of at least 3 oktas (SCT, BKN or OVC); (3) The next highest of at least 5 oktas (BKN or OVC). <p>Towering cumulus and cumulonimbus will always be specified, whatever the amount and height, whilst retaining base height order (from lowest to highest). When cloud base is not discernible due to fog, snow, etc., 'sky obscured' is reported.</p>
CAVOK	<p>This term replaces the entries for visibility, weather and cloud when the following conditions apply simultaneously:</p> <ol style="list-style-type: none"> (1) Visibility 10 km or more. (2) No significant weather at or in the vicinity of the aerodrome. (3) No cloud below a level 5,000 ft above aerodrome elevation or minimum sector altitude (whichever is the greater) and no cumulonimbus (CB) or towering cumulus cloud (TCU) at any level.

Item	Description
QNH	Rounded down to the nearest whole Hectopascal (e.g. 1014.9 becomes 1014).
QFE	Rounded down to the nearest whole Hectopascal. At aerodromes where more than one elevation is notified (e.g. threshold elevation for an instrument runway) the QFE is supplied to the nearest tenth of a Hectopascal. The ATC unit will convert as appropriate and round down the resultant to the nearest whole Hectopascal.
Air Temperature and Dew Point	Air Temperature and Dew Point

4.2 In reports to aircraft for take-off and landing, direction is to be expressed in degrees Magnetic; and, where averaging is appropriate, the period shall be 2 minutes. In addition, the extremes in direction and speed (gust and lull) during the past 10 minutes shall be provided.

5. Aerodrome Meteorological Reports (Special)

5.1 Specific improvements and deteriorations of any of the items in a routine report are supplied in a special report. They are issued between routine reports and contain only those items which are affected. The criteria for raising special reports are shown in the table below.

Table 2:

Item	Description
Surface Wind	Criteria to be agreed locally, based on changes of operational significance at the aerodrome; otherwise: <ol style="list-style-type: none"> (1) a change in mean direction of 60° or more, the mean speed before or after the change being 10 kt or more, but a change of 30° when 20 kt or more; (2) a change in mean speed of 10 kt or more; (3) a change in gust speed of 10 kt or more, the mean speed before or after the change being 15 kt or more.
Surface Visibility	<ol style="list-style-type: none"> (1) When the prevailing visibility changes from one of the following ranges to another: <ul style="list-style-type: none"> • 10 kilometres or more • 5,000 metres to 9 kilometres • 3,000 metres to 4,900 metres • 2,000 metres to 2,900 metres • 1,500 metres to 1,900 metres • 800 metres to 1,400 metres • 750 metres or less. (2) When the minimum visibility in one or more directions becomes less than 50% of the prevailing visibility, after being 50% or more of the prevailing visibility, or when the minimum visibility in one or more directions becomes greater than 50% of the prevailing visibility, after being 50% or less than the prevailing visibility.

Item	Description
	<p>(3) If the minimum visibility is being reported, when the minimum visibility changes from one of the ranges given in a) above, to another.</p> <p>Note: In addition, arrangements can be made at aerodromes where RVR is not available, either permanently or during a temporary unserviceability, to report a change from one range to another:</p> <ul style="list-style-type: none"> • 600 to 750 metres • 350 to 550 metres • 150 to 300 metres • 125 metres or less
Weather	<p>At the onset, cessation or change in intensity of:</p> <ol style="list-style-type: none"> (1) Moderate or heavy precipitation (including showers): (2) Freezing precipitation (of any intensity) (3) Freezing fog (4) Thunderstorm (with or without precipitation) (5) Funnel cloud (tornado or waterspout) (6) Squall (7) Low drifting or blowing; snow, dust, or sand.
Cloud	<p>Base: When the base of the lowest cloud covering more than half the sky changes from one range to another:</p> <ul style="list-style-type: none"> • 2000 ft or more • 1,500 ft to 1,900 ft • 1,000 ft to 1,400 ft • 700 ft to 900 ft • 500 ft to 600 ft • 300 ft to 400 ft • 200 ft 100 ft • Less than 100 ft (including sky obscured). <p>At certain aerodromes the upper limit may be higher.</p> <p>Amount: When the amount of the lowest layer below 1500 ft changes from half or less to more than half; and vice versa.</p>
Pressure	When the QNH or QFE changes by 1.0 Hectopascal or more.
Temperature	When the air temperature changes by 2.0 degrees or more.
Severe icing and/or turbulence	When an aircraft on the approach or on climb out reports severe icing and/or severe turbulence, and it is confirmed by the duty forecaster at the local meteorological forecast office.

6. Coded Aerodrome Weather Reports

- 6.1 The weather information prepared routinely hourly or half-hourly by accredited meteorological observers may be disseminated in an OPMET bulletin, encoded as a Meteorological Aerodrome Report (METAR). QFE and any remarks are omitted, but additionally, recent weather of operational significance and runway state reports are included when required.

7. SIGMET

- 7.1 SIGMET messages are issued and disseminated on OPMET and AFTN when phenomena which may affect the safety of aircraft have been reported, or are expected to occur, in an area over which a meteorological watch is maintained.
- 7.2 The description of the phenomenon, its location, expected movements, expected development and whether observed or forecast, is usually expressed in abbreviated plain language using approved ICAO abbreviations. Only one weather phenomenon will be referred to in each message. The messages are numbered sequentially from 0001 UTC each day.
- 7.3 SIGMET messages are not usually valid for more than 4 hours (except volcanic ash cloud where the period may be up to 12 hours) and are re-issued if they are to remain valid after the original period expires. They can be amended when the conditions change and cancelled as soon as the specified conditions cease.
- 7.4 The phenomena necessitating the issue of a SIGMET are listed below:

Thunderstorm (see note)	Tropical cyclone
Heavy hail	Severe mountain waves
Freezing rain	Heavy dust or sandstorm
Severe icing	Volcanic ash cloud
Severe turbulence	

Note: This refers not only to thunderstorms but also to cumulonimbus clouds that may not be currently accompanied by a thunderstorm.

8. Forecasts

8A. Regional Pressure Setting

- 8A.1 The lowest QNH value for each Altimeter Setting Region is forecast and made available hourly for the period H + 1 to H + 2.

8B. Area and Aerodrome Forecasts

- 8B.1 Area forecasts (AIRMET) and coded aerodrome forecasts (TAFs and TRENDS) are prepared and issued by the Met Office as directed by the Meteorological Authority. They are updated routinely and may be amended as necessary.

8C. Area Forecasts

- 8C.1 AIRMET regional and area forecast texts are prepared every 6 hours covering a period of 8 hours with an outlook for a further 6 hours. They comprise:

- (1) Meteorological (synoptic) situation;
- (2) Upper winds and temperatures – at 1,000 ft, 3000 ft and 6000 ft;

- (3) Height of 0°C isotherm;
- (4) Weather conditions – surface visibility, weather and cloud (amount, type, height of base and top);
- (5) Weather warnings – strong winds and gales, turbulence, icing, mountain waves or thunderstorms.

8C.2 Additionally these forecasts are available in chart format as Form 214 (spot wind) and Form 215 (low level weather).

8D. Coded Aerodrome Forecasts

- 8D.1 For those aerodromes providing regular coded aerodrome weather reports (METARs) undertaken by certificated meteorological observers, TAFs can also be prepared covering a period of 9 hours (or the period flying is expected to take place, if less), 24 hours or 30 hours.
- 8D.2 All TAFs are issued approximately one hour before the start of validity time. The update periods of the TAF will be every 3 hours for aerodromes provided with 9-hour TAF, and every 6 hours for aerodromes provided with 24 or 30-hour TAF.
- 8D.3 Additionally for selected aerodromes, landing forecasts (TRENDS) are added to each routine METAR to indicate significant changes expected from the current weather conditions over the next 2 hours.

9. Aerodrome Warnings

9A. General

- 9A.1 An ATSU may be provided with warnings of any of the following weather hazards which could affect the safety of aircraft operations and parked aircraft: gales, squalls, snow, frost, thunderstorm, freezing precipitation and fog.
- 9A.2 Once the service has been approved by the Meteorological Authority, the procedure for the issue of warnings is arranged locally between the aerodrome management and the designated liaising meteorological forecast unit and is reviewed annually.
- 9A.3 A warning usually remains in force until the end of the quoted period of validity but may be extended or cancelled as necessary and amended if the conditions change.

9B. Marked Temperature Inversion

- 9B.1 A marked temperature inversion warning is issued when a temperature differential of 10°C or more is present in the lowest levels of the atmosphere up to 1,000 ft above ground level. The message, for the information of departing aircraft, remains in force until it is cancelled.
- 9B.2 The service is provided only to those aerodromes from which routine surface air temperature reports are available.

9C. Low-Level Windshear

- 9C.1 Currently, advice on potential windshear situations is provided only to London Heathrow and London City Airports. Details are given in the UK AIP (GEN) section under 'Windshear Warning Service'.

10. Provision and Exchange of Information Relevant to Volcanic Ash

- 10.1 ANSPs at ACCs should be aware of the co-ordination requirements between UK ACCs, the UK Meteorological Watch Office and other Volcanic Ash Advisory Centre (VAACs) for the provision/exchange of information relevant to volcanic ash. Full details are published in CAP 782 – Regulation of Aeronautical Meteorological Services.
- 10.2 As required by CAP 782, appropriate on-the-job training for meteorological and ATS personnel shall be organised periodically with the objective of familiarising or updating personnel with their respective functions, as well as processes and procedures to be followed, in the event of a volcanic eruption resulting in volcanic ash affecting aeronautical operations.

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Section 7: Meteorological Services / Telecommunication Services / Aeronautical Services

Chapter 2: Telecommunications Services

1. The Aeronautical Mobile Service

1.1 The aeronautical mobile service provides the radiotelephony facilities necessary for the provision of air traffic services. Standard radiotelephony phraseology appears in CAP 413.

1A. Automatic Recording

1A.1 Transmissions on ATC frequencies are recorded in accordance with the Air Navigation Order. Controllers should appreciate that the intercommunication facility associated with a radio frequency may also be recorded.

1A.2 Access to original records is limited to protect from damage the very important evidence which they may contain. The extent to which recordings are available is described in Section 6.

1A.3 If a breakdown of equipment prevents automatic recording, controllers must be prepared to assist the telecommunications staff by keeping a temporary log of the frequency affected. This activity will, of course, take second place to a controller's normal duties and must not be allowed to interfere with their proper execution.

1B. Copies of Communication Records

1B.1 Copies of tapes, communication logs and transcriptions are to be made available when requested to the AAIB and the CAA.

2. Air-Ground Communications and Surveillance Systems

2A. Routine Checks

2A.1 Procedures for checking equipment vary from unit to unit. At some units the telecommunications staff check that the equipment is serviceable but at others, controllers are required to carry out the checks themselves.

2B. Routine Maintenance

2B.1 Routine weekly and daily maintenance of radio facilities is carried out at specified times. Periods of more than one hour are published in the UK AIP and will be strictly adhered to.

2B.2 Daily periods (normally less than one hour) are not necessarily published but before switching off a facility the maintenance staff will communicate with the ATC unit to ensure, as far as can be ascertained, that it is not being used or about to be used by aircraft.

- 2B.3 Should weather or traffic conditions indicate that a facility is likely to be needed during a specified maintenance period, the controller shall contact the DEO as early as possible to arrange for maintenance to be carried out at a more convenient time.
- 2B.4 When a request for a particular facility is received for an aircraft due to arrive during a maintenance period, the controller shall consider the weather and alternate facilities available to the aircraft before asking the DEO to defer maintenance.

2C. Testing

- 2C.1 The DEO may on occasions request that an aircraft be asked to carry out a test of a facility. Such tests are of importance, and controllers shall always endeavour to arrange for them to be carried out, subject to weather and traffic conditions. However, new installations, until declared operationally serviceable, and existing ones requiring calibration after unserviceability, may only be flight tested by aircraft approved by the CAA.

2D. Flight Checking

- 2D.1 Flight checking procedures are described in Appendix C.

2E. High Winds

- 2E.1 If the wind exceeds the maximum normally permissible for operation of particular equipment the senior controller shall inform the DEO. However, if the senior controller decides that the equipment should continue in use because of urgent operational requirements, the DEO shall be informed, and the fact recorded in the Watch Log. It should be noted, however, that some equipment will switch-off automatically when the wind speed reaches the limit. MATS Part 2 should contain the wind limiting speed for the particular equipment.

3. Aeronautical Fixed Service

- 3.1 Teleprinter messages originated by ATC will only be accepted by the Aeronautical Fixed Service if they conform to the requirements specified in the UK AIP (GEN) section.

4. Serviceability of Equipment

- 4.1 Controllers shall report defects in the serviceability of any telecommunication facility to the DEO. If appropriate, detailed reporting procedures should be incorporated in MATS Part 2.
- 4.2 Ground fault reports made by aircrew members should be passed to the DEO immediately. If an aircrew member criticises any part of the telecommunications organisation, controllers shall not discuss the matter but refer it to the DEO. If successive reports from aircraft confirm the fault but the ground indications suggest that the facility is serviceable, the DEO and the senior controller are to decide, in consultation, the new status of the facility.

- 4.3 Control room equipment should not be tampered with in an attempt to investigate or remedy a fault.
- 4.4 Unserviceable telephone equipment should be reported to the DEO except where MATS Part 2 states otherwise.
- 4.5 The standby RTF equipment and emergency telephone shall be tested at regular intervals as agreed with the DEO. These should be at least daily.

5. Aircraft Radio Equipment Fault Reports

- 5.1 Aircraft radio equipment faults, as described in Section 6, shall be reported to the DEO for action in accordance with local reporting procedures.

6. Withdrawal of Approach Aids

- 6.1 In the event of a reportable accident occurring to an aircraft during final approach and landing, in which any aid has been used, no further approaches using that aid should be permitted unless it is obvious that the use of the aid was not contributory to the accident. Telecommunications staff, where available, should be advised immediately so that they can initiate ground checks and other essential action.

6A. Restoration of Approach Aids

- 6A.1 Responsibility for deciding that the ground checks are satisfactory and that the aid may be returned to service rests with the duty telecommunications officer, where employed, in consultation with ATC, or with the Aerodrome Operator at aerodromes.
- 6A.2 Where necessary, post-accident flight inspections will be arranged by the DEO or the Aerodrome Operator.

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Section 7: Meteorological Services / Telecommunication Services / Aeronautical Services

Chapter 3: Aeronautical Information Service

1. Introduction

- 1.1 The function of the Aeronautical Information Service (AIS) is to:
- (1) receive, collate or assemble, edit, format, publish, store and distribute aeronautical data and aeronautical information concerning the entire territory of the State as well as those areas over the high seas for which the State is responsible for the provision of ATS.
 - (2) ensure that aeronautical data and aeronautical information are available for:
 - (a) personnel involved in flight operations, including flight crews, flight planning, and flight simulators;
 - (b) ATS providers responsible for flight information service; and
 - (c) the services responsible for pre-flight information.
 - (3) provide aeronautical data and aeronautical information as aeronautical information products.
- 1.2 The area of responsibility of the UK AIS and information on Foreign AIS Products are published in UK AIP GEN 3.1 at paragraph 2.1 and 2.2 respectively.
- 1.3 The regulation of UK AIS is described in CAP 779 Regulation of Aeronautical Information Management Services.

2. Aeronautical information products

- 2.1 'Aeronautical Information Product' is the collective term for aeronautical information that a State is required to provide and which consists of:
- (1) Aeronautical Information Publication (AIP), including Amendments and Supplements;
 - (2) Aeronautical Information Circulars (AIC);
 - (3) Aeronautical charts;
 - (4) NOTAM; and
 - (5) Digital data sets.
- 2.2 All UK aeronautical information products are made available via the UK AIS website www.ais.org.uk. NOTAM are available on the AIS website in the form of Pre-flight Information Bulletins (PIB).

- 2.3 Additional information on the UK aeronautical information products delivered by UK AIS including availability of paper and electronic format, numbering systems, promulgation schedule, NOTAM Types, NOTAM Series and submission process can be found in the UK AIP section GEN 3.1 Aeronautical Information Services.
- 2.4 Additional information on UK Aeronautical Charts made available by UK AIS can be found in the UK AIP section GEN 3.2 Aeronautical Charts.

3. Amending aeronautical information products

- 3.1 AIP Amendments, AIP Supplements, AICs and Permanent NOTAM can be submitted by Authorised Sources via Aurora Data Originators Portal (www.aurora.nats.co.uk).
- 3.2 NOTAM proposals should be submitted by AFS (EUECYIYP). In the event of being unable to submit NOTAM proposals via this method, then the AIS Generic Email eg_notamprop@ead.eurocontrol.int may be used. Comprehensive UK AIS NOTAM Guidance Material for NOTAM Sponsors can be found on the AIS website.

4. AIP amendments

- 4.1 AIRAC AIP amendments are distributed by AIS at least 42-days in advance of the AIRAC effective dates with the objective of reaching users at least 28-days in advance of the effective date. These amendments will be published every 28-days and in accordance with the AIRAC schedule available on the AIS website and UK AIP GEN 3.1 section 4 AIRAC System.

5. AIP Supplements and AICs

- 5.1 Temporary changes to the AIP (AIP Supplements) and Aeronautical Information Circulars (AIC) are normally published every 28 days in accordance with a separate publication schedule ('AIC and SUP Schedule') available on the AIS website.

6. NOTAM

- 6.1 Changes of a temporary nature and of short duration, or operationally significant permanent changes or temporary changes of long duration made at short notice, are published via NOTAM. Additional 'Trigger NOTAM' are also provided for specific changes to the AIP published as an AIP amendment or a Supplement.

7. Authorised sources of aeronautical information

- 7.1 The UK AIP is the product of an amalgamation of aeronautical information and data derived from various parties which are submitted to the AIS provider (AISP) for publication.
- 7.2 The parties (Authorised Sources), and aeronautical information for which they are responsible for, are shown in CAP 1054, Annex A.

- 7.3 The Authorised Source is the person (role) nominated to represent the organisation that is ultimately accountable for aeronautical information published by the organisation in the Aeronautical Information Products.
- 7.4 The Authorised Source can nominate individuals (“AIP Sponsors”), who are responsible for submitting changes to aeronautical information products within a clearly defined scope of authorised changes.
- 7.5 All parties are required to have formal arrangements with the AIS provider for the provision of aeronautical data/information.

8. AIS contact details

- 8.1 Contact details and service hours for principal UK AIS sections are detailed in Appendix E and also available in the UK AIP GEN 3.1 paragraph 1.3.
- 8.2 The AIS information line is a voice recorded message system, designed to supplement the information available on the AIS website. It is not designed to replace the need to obtain a full pre-flight briefing. The message provides information on temporary restricted areas, airspace upgrades and emergency restrictions of flying.

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Section 8: Control Room Administration

Chapter 1: Control Room Administration

1. Watchkeeping Rosters

- 1.1 A watchkeeping roster shall be prepared by the senior controller at each ATSU. The roster should be promulgated not later than the 20th day of each month and shall show the hours of watch-keeping and hours of duty required of individual controllers throughout the following month.

2. Regulation of Controllers' Hours

- 2.1 Controllers, as well as unit managers, have a responsibility to ensure that they conform to the Scheme for the Regulation of Air Traffic Controllers' Hours (SRATCOH) (CAP 670 Part D Section 2). It is particularly important that controllers who provide air traffic control services at more than one unit keep sufficient account of their periods of duty as only they will be in a position to establish that they have not breached SRATCOH.

3. Taking-Over Watch

- 3.1 MATS Part 2 shall contain details of any specific procedures applicable to the taking-over of watch by controllers at a particular unit. However, as a minimum, prior to taking-over watch, controllers shall:
- (1) ensure that they are fully conversant with the latest promulgated orders, instructions, notices and signals; with particular reference, where appropriate, to the serviceability of the aerodrome and its facilities. Note should be taken of details regarding any Royal, Special or NDS flights expected during the period of their watch;
 - (2) obtain full information regarding the weather situation and tendencies for the period of their watch. This may be accomplished by a study of forecasts and prognostic charts supplied routinely by the Meteorological Office and if clarification is necessary, supplemented by a briefing from the designated forecast unit;
 - (3) familiarise themselves with the serviceability of all equipment under their charge and liable to be used during the period of their watch;
 - (4) ensure that they have a full understanding of the prevailing air traffic situation, with particular reference to separation standards.
- 3.2 Having completed these procedures, controllers shall sign the ATC Watch Log as having taken-over watch. This signature shall imply that items 1. to 4. above have been complied with and that the controller taking-over watch has assumed all the defined responsibilities of the controller handing-over watch, including the safe

custody of equipment and any secret or confidential documents within the place of duty.

- 3.3 At stations where more than one controller is employed at one time on aerodrome, approach, or area control duties, the ATC Watch Log shall be signed by the supervisor or senior controller on duty. Other controllers shall record taking over their specific duties as described in MATS Part 2.

4. Handing-Over Watch

- 4.1 MATS Part 2 shall contain details of any specific procedures applicable to the handing-over of watch by controllers at a particular unit. Controllers handing-over watch shall ensure that they provide their successor with the fullest possible information regarding the prevailing traffic situation; including any items of specific interest or urgency that have influenced the development of the situation and that may have a bearing on the progress of the ensuing watch. Where pictorial displays are in operation, they shall give a true presentation of the traffic situation.
- 4.2 There may be occasions when, in the interests of safety or continuity of operation, it is more appropriate for the controller handing-over to remain on duty to complete any associated actions, subsequent reports and records rather than transfer the responsibility for completion to another controller. Notwithstanding the fact that the watch roster defines the appointed time to hand-over, the controller handing-over watch shall remain on duty until such time as this responsibility has been discharged.
- 4.3 When the controller taking-over is fully conversant with the air traffic situation and is prepared to assume full responsibility for the watch, the controller handing-over shall sign the ATC Watch Log as handed-over watch.

5. Handing-Over an Operational Position

- 5.1 The responsibility for the accuracy of a hand-over lies with the person vacating an operational position. If the traffic levels are very high or the traffic situation complex, consideration should be given to splitting the position, where this is possible, before the hand-over takes place. The order in which information should be passed from one controller to another should be as follows:
- (1) General information, including any variations from routine operations;
 - (2) Other supplementary information relating to the position;
 - (3) The detailed traffic situation.
- 5.2 Controllers taking-over should be alert to the possibility of errors and omissions in the information being provided and must verify the data transferred to them by a thorough check of the situation display, flight progress strips and any other relevant information. Only when they are completely satisfied that they have a total awareness of the situation, should they indicate to the controller handing-over that they are ready to accept responsibility for the operational position. On the occasions

when controllers hand-over a busy and complex situation, they should remain available adjacent to the position for a short period following the hand-over. This will enable the accepting controller to seek immediate clarification of any points that may arise during this time.

6. Combined Operational Positions

- 6.1 MATS Part 2 shall contain the circumstances in which more than one sector/position are combined into one operational position (known as bandboxed operations), and the procedures to be followed.

7. Visitors

- 7.1 No unauthorised person shall be allowed access to an ATC operations room. Before bringing authorised visitors into the control room a check shall be made with the senior controller as to whether the traffic situation makes it convenient to do so. At no time shall visits be allowed to interfere with the smooth running of the watch.

8. Clocks

- 8.1 Clocks in control rooms shall indicate UTC.

9. Publications

- 9.1 The following documents are to be available for immediate reference at operational control positions:

- (1) CAP 493 Manual of Air Traffic Services Part 1, including current Supplementary Instructions;
- (2) CAP 774 UK Flight Information Services;
- (3) Manual of Air Traffic Services Part 2;
- (4) Aerodrome Manual (see note);
- (5) Aerodrome Emergency Orders (see note);

Note: Only required at units providing an aerodrome, approach or approach surveillance control service.

- 9.2 ATC units should, if deemed by the unit to be necessary and appropriate, have available for immediate reference at operational control positions the following documents. In considering the option to make available these documents, ATC units shall consider their day-to-day task and historical need to access such information.

- (1) ICAO Doc. 7910 Location Indicators;
- (2) ICAO Doc. 8643 Aircraft Type Designators (available free of charge from ICAO's website: Aircraft Type Designators);
- (3) ICAO Doc. 8585 Aircraft Operating Agencies, Aeronautical Authorities and Services.

9.3 The following documents are to be available in the operational environment/control room:

- (1) CAA Information Notices (as applicable to ATS);
- (2) CAA Safety Notices (as applicable to ATS);
- (3) CAA Safety Directives (as applicable to ATS);
- (4) UK AIP (including Supplements and NOTAMs) and AICs;
- (5) Air Navigation Order, Air Navigation (General) and Rules of the Air (RoA) Regulations;
- (6) Standard European Rules of the Air (UK Reg (EU) No. 923/2012 as amended);
- (7) CAP 168 Licensing of Aerodromes (see note);
- (8) CAP 413 Radiotelephony Manual;
- (9) CAP 772 Birdstrike Risk Management for Aerodromes (see note).

Note: Only required at units providing an aerodrome, approach or approach surveillance control service.

9.4 CAP 670 specifies the documents that are to be available at the ATSU.

9.5 Documents are to be correctly amended and, unless otherwise approved by the CAA, be in a conventional printed form. Requirements for the keeping of documents in electronic format are detailed in CAP 670.

10. ATC Watch Log

10.1 An ATC Watch Log, detailing significant events and operational information of note to controllers and unit management, shall be maintained by each ATC unit.

10.2 Whatever the format used to maintain the ATC Watch Log, it shall include the name of the ATC unit, the period for which the log contains entries and shall be capable of providing a documentary record of entries made.

10.3 An ATC Watch Log shall permit descriptive text associated with a particular date and time (in UTC) to be recorded and enable the identity of the author to be established. Entries shall be made in chronological order and, as far as possible, concurrently with the events being recorded. Entries should be of sufficient detail to enable subsequent investigation of events to have a complete understanding of actions taken by ATC. 10.4 Items logged shall include:

- (1) changes to the serviceability of radio and surveillance systems;
- (2) essential aerodrome information and changes to runway in use (at aerodrome-based units);
- (3) result of routine equipment checks conducted by controllers;

- (4) details of reportable events such as aircraft accidents, incidents and AIRPROXs;
 - (5) any unusual occurrences;
 - (6) hand-over of responsibility for providing ATC services and, at units not operating throughout the 24-hour period, times of opening and closing of watch.
- 10.5 An ATC Watch Log shall normally be maintained in each control room or in association with each operational control position. When approved by the CAA and where a suitable unit management structure exists, a single ATC Watch Log may be maintained in respect of more than one control room or operational position.
- 10.6 Measures shall be taken to ensure that entries made in an ATC Watch Log cannot subsequently be altered or be tampered with in any other way.
- 10.7 The method by which the ATC Watch Log is managed and entries made shall be detailed in MATS Part 2.

11. Aircraft Movement Log

- 11.1 Special arrangements are made at certain aerodromes for the ATSU to maintain an Aircraft Movement Log. Where this is the case, details shall appear in MATS Part 2.

12. Impounding of ATC Watch Logs

- 12.1 ATC Watch Logs may be impounded by the CAA or the AAIB. Upon notification that an ATC Watch Log is required to be impounded, the ATC Watch Log shall be withdrawn as soon as possible and forwarded to the CAA or AAIB in the manner agreed. If an ATC Watch Log that is in current use is impounded a replacement ATC Watch Log shall be opened immediately.
- 12.2 At ATSUs which do not utilise handwritten logbooks as ATC Watch Logs, MATS Part 2 shall include procedures to ensure that the entries required to be impounded are extracted from the ATC Watch Log and are no longer accessible to unauthorised readers.
- 12.3 Procedures by which the authenticity and integrity of log entries are attested, if required, shall be documented.

13. Disposal of Records

- 13.1 ATS records and ATC Watch Logs are to be retained for the periods shown overleaf, and then may be destroyed or deleted locally if required, provided they are not required for the investigation of accidents, incidents, or official complaints.

Table 1:

Subject Matter	Minimum Retention Period
ATC watch log	12 months (after the date on which the last entry was made)
Paper flight progress strips	30 days
Electronic flight progress and co-ordination data	30 days
AIRPROX reports (station copies)	6 months
RVR log (records of observations made by human observer)	12 months
Meteorological information records	30 days
AFTN messages	30 days
Aircraft movements logs	Former CAA units (as of March 2001): as agreed by the CAA Records Management Team.
	Other units: disposal at the discretion of the Aerodrome Operator.

Appendix A: Pressure Setting Tables

1. Determining Transition Level

Table 1:

Aerodrome QNH (hectopascals)	Transition altitude (ft)							
	3000		4000		5000		6000	
	Flight level	Minimum IFR cruising level	Flight level	Minimum IFR cruising level	Flight level	Minimum IFR cruising level	Flight level	Minimum IFR cruising level
1060 1050	30	30	40	40	50	50	60	60
1049 1032	35	40	45	50	55	60	65	70
1031 1014	40	40	50	50	60	60	70	70
1013 995	45	50	55	60	65	70	75	80
994 977	50	50	60	60	70	70	80	80
976 959	55	60	65	70	75	80	85	90
958 940	60	60	70	70	80	80	90	90

Note: The calculation of the transition level is based upon:

- (a) Standard Pressure Setting (1013.25 hPa) – ICAO Doc 7488 Manual of the Standard Atmosphere and EASA Certification Specification – Definitions.
- (b) Assumed value of 27.3 ft per hPa derived from a linear correction which is applied to corrected barometric altitudes and confirmed as being utilised in aircraft and ATS systems.

2. QNE Values

- 2.1 During conditions of exceptionally low atmospheric pressure it is not possible to set QFE or QNH on some aircraft altimeters. In these circumstances an aerodrome or runway QNE can be requested. The QNE is the reading in feet on an altimeter with the sub-scale set to 1013.2 hPa when the aircraft is at aerodrome or touchdown elevation.

Table 2:

QFE Aerodrome/ Threshold (Hectopascals)	0	1	2	3	4	5	6	7	8	9
970	1202	1174	1146	1117	1089	1061	1033	1005	977	948
960	1486	1458	1429	1401	1372	1344	1315	1287	1259	1230
950	1773	1744	1715	1687	1658	1629	1601	1572	1543	1515
940	2062	2033	2004	1975	1946	1917	1888	1859	1830	1802
930	2353	2324	2295	2265	2236	2207	2178	2149	2120	2091
920	2647	2618	2588	2559	2529	2500	2470	2441	2412	2382
910	2944	2914	2884	2855	2825	2795	2766	2736	2706	2677
900	3243	3213	3183	3153	3123	3093	3066	3033	3003	2974

Adjustment for decimal fractions

Subtract (feet)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	3	6	9	12	15	17	20	23	36

Example:

Given QFE 943.8 hPa, to calculate QNE,

- (1) enter first column at the figure 940 and follow this line to column headed 3. Read off result at point of intersection, in this case 1,975 ft.
- (2) refer to lower table if original QFE contains a fractional figure, 0.8 in this example, and apply the difference as shown – i.e. subtract 23 ft. QNE = 1975 – 23 = 1952 ft.

3. Conversion Tables

Table 3: For converting Hectopascals to Inches of Mercury (Hg) 940.0 – 974.9 hPa

Tenths hPa:	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
(Hecto-pascals)	Inches Hg									
940	27.75	27.76	27.76	27.76	27.77	27.77	27.77	27.77	27.78	27.78
941	27.78	27.79	27.79	27.79	27.79	27.80	27.80	27.80	27.81	27.81
942	27.81	27.82	27.82	27.82	27.82	27.83	27.83	27.83	27.84	27.84
943	27.84	27.84	27.85	27.85	27.85	27.86	27.86	27.86	27.87	27.87
944	27.87	27.87	27.88	27.88	27.88	27.89	27.89	27.89	27.89	27.90
945	27.90	27.90	27.91	27.91	27.91	27.92	27.92	27.92	27.92	27.93
946	27.93	27.93	27.94	27.94	27.94	27.95	27.95	27.95	27.95	27.96
947	27.96	27.96	27.97	27.97	27.97	27.97	27.98	27.98	27.98	27.99
948	27.99	27.99	28.00	28.00	28.00	28.00	28.01	28.01	28.01	28.02
949	28.02	28.02	28.02	28.03	28.03	28.03	28.04	28.04	28.04	28.05
950	28.05	28.05	28.05	28.06	28.06	28.06	28.07	28.07	28.07	28.08
951	28.08	28.08	28.08	28.09	28.09	28.09	28.10	28.10	28.10	28.10
952	28.11	28.11	28.11	28.12	28.12	28.12	28.13	28.13	28.13	28.13
953	28.14	28.14	28.14	28.15	28.15	28.15	28.15	28.16	28.16	28.16
954	28.17	28.17	28.17	28.18	28.18	28.18	28.18	28.19	28.19	28.19
955	28.20	28.20	28.20	28.21	28.21	28.21	28.21	28.22	28.22	28.22
956	28.23	28.23	28.23	28.23	28.24	28.24	28.24	28.25	28.25	28.25
957	28.26	28.26	28.26	28.26	28.27	28.27	28.27	28.28	28.28	28.28
958	28.28	28.29	28.29	28.29	28.30	28.30	28.30	28.31	28.31	28.31
959	28.31	28.32	28.32	28.32	28.33	28.33	28.33	28.33	28.34	28.34
960	28.34	28.35	28.35	28.35	28.36	28.36	28.36	28.36	28.37	28.37
961	28.37	28.38	28.38	28.38	28.39	28.39	28.39	28.39	28.40	28.40
962	28.40	28.41	28.41	28.41	28.41	28.42	28.42	28.42	28.43	28.43
963	28.43	28.44	28.44	28.44	28.44	28.45	28.45	28.45	28.46	28.46
964	28.46	28.46	28.47	28.47	28.47	28.48	28.48	28.48	28.49	28.49
965	28.49	28.49	28.50	28.50	28.50	28.51	28.51	28.51	28.52	28.52
966	28.52	28.52	28.53	28.53	28.53	28.54	28.54	28.54	28.54	28.55
967	28.55	28.55	28.56	28.56	28.56	28.57	28.57	28.57	28.57	28.58
968	28.58	28.58	28.59	28.59	28.59	28.59	28.60	28.60	28.60	28.61
969	28.61	28.61	28.62	28.62	28.62	28.62	28.63	28.63	28.63	28.64
970	28.64	28.64	28.65	28.65	28.65	28.65	28.66	28.66	28.66	28.67
971	28.67	28.67	28.67	28.68	28.68	28.68	28.69	28.69	28.69	28.70
972	28.70	28.70	28.70	28.71	28.71	28.71	28.72	28.72	28.72	28.72
973	28.73	28.73	28.73	28.74	28.74	28.74	28.75	28.75	28.75	28.75
974	28.76	28.76	28.76	28.77	28.77	28.77	28.77	28.78	28.78	28.78

Table 4: For converting Hectopascals to Inches of Mercury (Hg) 975.0 – 999.9 hPa

Tenths hPa:	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
(Hecto- pascals)	Inches Hg									
975	28.79	28.79	28.79	28.80	28.80	28.80	28.80	28.81	28.81	28.81
976	28.82	28.82	28.82	28.83	28.83	28.83	28.83	28.84	28.84	28.84
977	28.85	28.85	28.85	28.85	28.86	28.86	28.86	28.87	28.87	28.87
978	28.88	28.88	28.88	28.88	28.89	28.89	28.89	28.90	28.90	28.90
979	28.90	28.91	28.91	28.91	28.92	28.92	28.92	28.93	28.93	28.93
980	28.93	28.94	28.94	28.94	28.95	28.95	28.95	28.96	28.96	28.96
981	28.96	28.97	28.97	28.97	28.98	28.98	28.98	28.98	28.99	28.99
982	28.99	29.0	29.0	29.0	29.01	29.01	29.01	29.01	29.02	29.02
983	29.02	29.03	29.03	29.03	29.03	29.04	29.04	29.04	29.05	29.05
984	29.05	29.06	29.06	29.06	29.06	29.07	29.07	29.07	29.08	29.08
985	29.08	29.09	29.09	29.09	29.09	29.10	29.10	29.10	29.11	29.11
986	29.11	29.11	29.12	29.12	29.12	29.13	29.13	29.13	29.14	29.14
987	29.14	29.14	29.15	29.15	29.15	29.16	29.16	29.16	29.16	29.17
988	29.17	29.17	29.18	29.18	29.18	29.19	29.19	29.19	29.19	29.20
989	29.20	29.20	29.21	29.21	29.21	29.21	29.22	29.22	29.22	29.23
990	29.23	29.23	29.24	29.24	29.24	29.24	29.25	29.25	29.25	29.26
991	29.26	29.26	29.27	29.27	29.27	29.27	29.28	29.28	29.28	29.29
992	29.29	29.29	29.29	29.30	29.30	29.30	29.31	29.31	29.31	29.32
993	29.32	29.32	29.32	29.33	29.33	29.33	29.34	29.34	29.34	29.34
994	29.35	29.35	29.35	29.36	29.36	29.36	29.37	29.37	29.37	29.37
995	29.38	29.38	29.38	29.39	29.39	29.39	29.40	29.40	29.40	29.40
996	29.41	29.41	29.41	29.42	29.42	29.42	29.42	29.43	29.43	29.43
997	29.44	29.44	29.44	29.45	29.45	29.45	29.45	29.46	29.46	29.46
998	29.47	29.47	29.47	29.47	29.48	29.48	29.48	29.49	29.49	29.49
999	29.50	29.50	29.50	29.50	29.51	29.51	29.51	29.52	29.52	29.52

Table 5: For converting Hectopascals to Inches of Mercury (Hg) 1000.0 – 1024.9 hPa

Tenths hPa:	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
(Hecto- pascals)	Inches Hg									
1000	29.53	29.53	29.53	29.53	29.54	29.54	29.54	29.55	29.55	29.55
1001	29.55	29.56	29.56	29.56	29.57	29.57	29.57	29.58	29.58	29.58
1002	29.58	29.59	29.59	29.59	29.60	29.60	29.60	29.60	29.61	29.61
1003	29.61	29.62	29.62	29.62	29.63	29.63	29.63	29.63	29.64	29.64
1004	29.64	29.65	29.65	29.65	29.65	29.66	29.66	29.66	29.67	29.67
1005	29.67	29.68	29.68	29.68	29.68	29.69	29.69	29.69	29.70	29.70
1006	29.70	29.71	29.71	29.71	29.71	29.72	29.72	29.72	29.73	29.73
1007	29.73	29.73	29.74	29.74	29.74	29.75	29.75	29.75	29.76	29.76
1008	29.76	29.76	29.77	29.77	29.77	29.78	29.78	29.78	29.78	29.79
1009	29.79	29.79	29.80	29.80	29.80	29.81	29.81	29.81	29.81	29.82
1010	29.82	29.82	29.83	29.83	29.83	29.84	29.84	29.84	29.84	29.85
1011	29.85	29.85	29.86	29.86	29.86	29.86	29.87	29.87	29.87	29.88
1012	29.88	29.88	29.89	29.89	29.89	29.89	29.90	29.90	29.90	29.91
1013	29.91	29.91	29.91	29.92	29.92	29.92	29.93	29.93	29.93	29.94
1014	29.94	29.94	29.94	29.95	29.95	29.95	29.96	29.96	29.96	29.96
1015	29.97	29.97	29.97	29.98	29.98	29.98	29.99	29.99	29.99	29.99
1016	30.0	30.0	30.0	30.01	30.01	30.01	30.02	30.02	30.02	30.02
1017	30.03	30.03	30.03	30.04	30.04	30.04	30.04	30.05	30.05	30.05
1018	30.06	30.06	30.06	30.07	30.07	30.07	30.07	30.08	30.08	30.08
1019	30.09	30.09	30.09	30.09	30.10	30.10	30.10	30.11	30.11	30.11
1020	30.12	30.12	30.12	30.12	30.13	30.13	30.13	30.14	30.14	30.14
1021	30.15	30.15	30.15	30.15	30.16	30.16	30.16	30.17	30.17	30.17
1022	30.17	30.18	30.18	30.18	30.19	30.19	30.19	30.20	30.20	30.20
1023	30.20	30.21	30.21	30.21	30.22	30.22	30.22	30.22	30.23	30.23
1024	30.23	30.24	30.24	30.24	30.25	30.25	30.25	30.25	30.26	30.26

Table 5: For converting Hectopascals to Inches of Mercury (Hg) 1025 – 1049.9 hPa

Tenths hPa:	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
(Hecto-pascals)	Inches Hg									
1025	30.26	30.27	30.27	30.27	30.28	30.28	30.28	30.28	30.29	30.29
1026	30.29	30.30	30.30	30.30	30.30	30.31	30.31	30.31	30.32	30.32
1027	30.32	30.33	30.33	30.33	30.33	30.34	30.34	30.34	30.35	30.35
1028	30.35	30.35	30.36	30.36	30.36	30.37	30.37	30.37	30.38	30.38
1029	30.38	30.38	30.39	30.39	30.39	30.40	30.40	30.40	30.40	30.41
1030	30.41	30.41	30.42	30.42	30.42	30.43	30.43	30.43	30.43	30.44
1031	30.44	30.44	30.45	30.45	30.45	30.46	30.46	30.46	30.46	30.47
1032	30.47	30.47	30.48	30.48	30.48	30.48	30.49	30.49	30.49	30.50
1033	30.50	30.50	30.51	30.51	30.51	30.51	30.52	30.52	30.52	30.53
1034	30.53	30.53	30.53	30.54	30.54	30.54	30.55	30.55	30.55	30.56
1035	30.56	30.56	30.56	30.57	30.57	30.57	30.58	30.58	30.58	30.59
1036	30.59	30.59	30.59	30.60	30.60	30.60	30.61	30.61	30.61	30.61
1037	30.62	30.62	30.62	30.63	30.63	30.63	30.64	30.64	30.64	30.64
1038	30.65	30.65	30.65	30.66	30.66	30.66	30.66	30.67	30.67	30.67
1039	30.68	30.68	30.68	30.69	30.69	30.69	30.69	30.70	30.70	30.70
1040	30.71	30.71	30.71	30.72	30.72	30.72	30.72	30.73	30.73	30.73
1041	30.74	30.74	30.74	30.74	30.75	30.75	30.75	30.76	30.76	30.76
1042	30.77	30.77	30.77	30.77	30.78	30.78	30.78	30.79	30.79	30.79
1043	30.79	30.80	30.80	30.80	30.81	30.81	30.81	30.82	30.82	30.82
1044	30.82	30.83	30.83	30.83	30.84	30.84	30.84	30.84	30.85	30.85
1045	30.85	30.86	30.86	30.86	30.87	30.87	30.87	30.87	30.88	30.88
1046	30.88	30.89	30.89	30.89	30.90	30.90	30.90	30.90	30.91	30.91
1047	30.91	30.92	30.92	30.92	30.92	30.93	30.93	30.93	30.94	30.94
1048	30.94	30.95	30.95	30.95	30.95	30.96	30.96	30.96	30.97	30.97
1049	30.97	30.97	30.98	30.98	30.98	30.99	30.99	30.99	31.00	31.00

Note: Uses density of mercury at 0°C of 13595.1 kg/m³ and acceleration of gravity 9.80665 m/s².

Then 1hPa = 0.02953 in Hg.

Values are rounded down to the nearest 0.01 in Hg

Appendix B: Wake Turbulence Categorisation

1. Categories

- 1.1 The UK wake turbulence categories are adapted from those of ICAO. In the UK, aircraft are divided into six categories for approach, and five categories for departure, according to their Maximum Certificated Take-off Mass (MCTOM) in kilogrammes (KG) as described below.

Table 1: Aeroplanes

Category	ICAO (KG)	UK Departures (KG)	UK Arrivals (KG)
SUPER (J) ¹	≥136,000	≥136,000	≥136,000
HEAVY (H)	≥136,000	≥136,000	≥136,000
MEDIUM (M)	>7,000 and <136,000	>40,000 and <136,000 ²	N/A
UPPER MEDIUM (UM) ³	N/A	N/A	>104,000 and <136,000
LOWER MEDIUM (LM) ³	N/A	N/A	>40,000 and ≤104,000
SMALL (S) ³	N/A	>17,000 and ≤40,000	>17,000 and ≤40,000
LIGHT (L)	≤7,000	≤17,000	≤17,000

Table 2: Helicopters and tilt-rotor aircraft

Category	ICAO (KG)	UK Departures (KG)	UK Arrivals (KG)
MEDIUM (M)	>7,000 and <136,000	>40,000 and <136,000 ²	N/A
UPPER MEDIUM (UM) ³	N/A	N/A	>104,000 and <136,000
LOWER MEDIUM (LM) ³	N/A	N/A	>40,000 and ≤104,000
SMALL (S) ^{3 4 & 5}	N/A	≥7,000 and ≤40,000	≥7,000 and ≤40,000
LIGHT (L) ⁴	≤7,000	<7,000	<7,000

Note 1: The SUPER category is only assigned to specific aircraft types by the competent authority. Types assigned to the SUPER category by the CAA are the Airbus A380-800, Antonov AN-124 Ruslan and Antonov AN-225 Mriya.

Note 2: The MEDIUM category is not split into UM and LM for the purposes of wake turbulence separation on departure.

Note 3: UPPER MEDIUM, LOWER MEDIUM and SMALL are UK categories only, and are not to be entered onto the flight plan under item 9.

Note 4: There is some evidence that, per kilogram of gross mass, the wake turbulence generated by a helicopter is more intense than that of a fixed-wing aircraft. Consequently, in the UK, all helicopters with a MCTOM greater than or equal to 7,000 KG and less than or equal to 40,000 kg are classified as SMALL for the purposes of providing wake turbulence separation on approach and departure.

Note 5: All tilt-rotor aircraft with a MCTOM greater than or equal to 7,000 KG and less than or equal to 40,000 kg are classified as SMALL for the purposes of providing wake turbulence separation on final approach and departure.

1.2 The wake turbulence category of an aircraft should be indicated on the flight plan (item 9) as: 'J', 'H', 'M' or 'L', with flight plans being completed in accordance with AIP ENR 1.10 and ICAO Doc 4444 PANS-ATM.

1.3 UK wake turbulence categories for aircraft types can be found at:

UK Wake Turbulence Categories

2. Wake Turbulence Separation Procedures

2.1 The wake turbulence categories in Table 1 and Table 2 above are to be used for the application of wake turbulence separation procedures at Section 1, Chapter 3.

2.2 For aircraft in the SUPER or HEAVY wake turbulence category (i.e. those aircraft with a MCTOM of 136,000 KG or more), the word 'Super' or 'Heavy' shall be included, as appropriate, immediately after the aircraft call sign in the initial radiotelephony contact between such aircraft and ATS units.

2.3 Where specific aircraft have been reclassified from the HEAVY category, this initial contact announcement will not be required in the UK, as these aircraft types will be considered as MEDIUM (UPPER MEDIUM on approach).

Appendix C: Radio and Radar Aids

1. Summary of Contents

- (1) Blip Strength
 - (2) Flight Inspection of Radio Navigation Aids and Radar
- 1.1 The operating instructions for radio and radar equipment are detailed in MATS Part 2.

2. Blip Strength

- 2.1 The strength of radar blips is detailed in the table below. These values should be used whenever controllers are required to record blip strength.

Table 1:

Strength	Description of Radar Blip		Usability
Strength 0	Nil	No visible blip	None
Strength 1	Poor	Barely visible blip	Unreliable
Strength 2	Acceptable	Discernible blip. No persistence	} Normal
Strength 3	Good	Blip discernible during complete revolution	
Strength 4	Good	Discernible blip with positive trail	

3. Flight Inspection of Radio Navigation Aids and Radar

3A. Types of Flight Inspection

- 3A.1 The flight inspection of radio navigation aids and radar can be divided into four basic categories:
- (1) A commissioning flight inspection to determine the state of a facility before it is brought into operational service;
 - (2) Routine flight inspection at specific intervals to check that facilities are operating within tolerances;
 - (3) Special flight inspection in addition to routine flight inspection whenever the performance of a facility is suspect and airborne measurement is required. This may affect all or part of the facility;
 - (4) Accident/Incident flight inspections to determine the performance of all equipment, used or considered to have been used by the aircraft concerned,

which could have contributed to the accident or incident. Both these flight inspections may be concerned with all or only part of the facility.

3B. Arrangements for Flight Inspections

- 3B.1 Information about flight inspections can be obtained by telephoning the appropriate flight inspection organisation.
- 3B.2 Weather conditions are assessed by the flight inspection organisation and the final decision on whether or not to proceed rests with the captain of the flight inspection aircraft. Unexpected deteriorations of weather of more than a temporary nature are to be reported to the appropriate flight inspection organisation or directly to the captain if the aircraft is already en-route.

3C. Priority

- 3C.1 Whenever possible the flight inspection should be arranged to cause the minimum of interference to other aircraft. The senior controller is to discuss the degree of urgency for a flight inspection with the DEO. The weather, traffic density, alternative aids and time available before dusk are to be taken into account when deciding upon any priority to be given to the flight inspection aircraft. This may be necessary if the flight inspection is likely to become overdue.
- 3C.2 Flight inspection aircraft may, where necessary, be allocated category E priority en-route and should be fitted into the traffic pattern upon arrival at the aerodrome. Short delays to other aircraft may result, but this is preferable to the withdrawal of an aid because the flight inspection is overdue.

3D. Duration of Flight Inspection

- 3D.1 The ATSU should establish the duration over which the flight inspection will take place. Due to the nature of the inspection it may be necessary to extend the flight inspection duration at short notice. In these circumstances the senior controller is to assess the situation and, if necessary, give the flight inspection aircraft priority over other traffic.

3E. ATC Procedures

- 3E.1 Although a flight inspection aircraft will normally need to operate in VMC, it is to be treated at all times as an IFR flight. The captain will report altitude, area of operation and the particular manoeuvre to the appropriate ATC unit. As necessary, controllers are to transfer control to adjacent units as the flight inspection aircraft passes into different areas of jurisdiction in reasonable time before a flight inspection is conducted the unit should obtain a detailed brief from the organisation conducting the inspection with regard to the flight profiles to be flown.
- 3E.2 The profile information should include the following information:
- (1) Description of manoeuvre;
 - (2) Altitude Start range;

- (3) Position at which the go-around will commence; and
- (4) Details of any required protection of the navigational aid signal in space.

3E.3 The unit should establish with the flight inspection organisation a system to identify the particular profile to be flown so as to avoid excessive RTF. For example:

Table 2:

RTF Phraseology	Description	Protection
'Number 1, Clockwise, (Anti-clockwise) Part Orbit 7 miles,ft (Altitude)'	A curving path flown level approximately 40 degrees either side of the localiser, clockwise or anti-clockwise, at 7 NM from the localiser.	Localiser when within ± 10 degrees of the centreline

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Appendix D: Flight Data Display

1. Introduction

- 1.1 Data showing the progress of flights under the jurisdiction of an ATC unit is to be displayed in a manner approved by the CAA.

2. Display Systems

- 2.1 Flight data may be displayed using a variety of systems. Systems should be capable of displaying to the controller sufficient information to enable a safe air traffic service to be provided and to permit a record to be made of ATC co-ordination agreements and of instructions or information passed to or received from the pilot.
- 2.2 This information acts as an aide memoir to the controller and assists when the responsibility for the operating position is transferred from one controller to another. Flight data may also be used, for example, following an incident or accident, to assist in establishing the course of events that led to the occurrence.
- 2.3 The flight data display shall be updated immediately whenever necessary to reflect the current traffic and control situation. In order to ensure that all relevant ATC actions are reflected in the data display, it is essential that agreements made during controller-to-controller communication, whether this is effected by the use of recorded telephone lines or intercom systems or by face to face verbal co-ordination, are indicated on the flight data display. All items such as levels, pertinent traffic, headings and/or speeds must be recorded on the data displays of both controllers involved. This is particularly important in respect of agreements made between controllers that do not result in an instruction or other communication to a pilot.
- 2.4 The method to be used to display flight data and to record ATC co-ordination agreements and instructions or information passed to or received from pilots shall be consistent at each individual unit and is to be described in MATS Part 2.

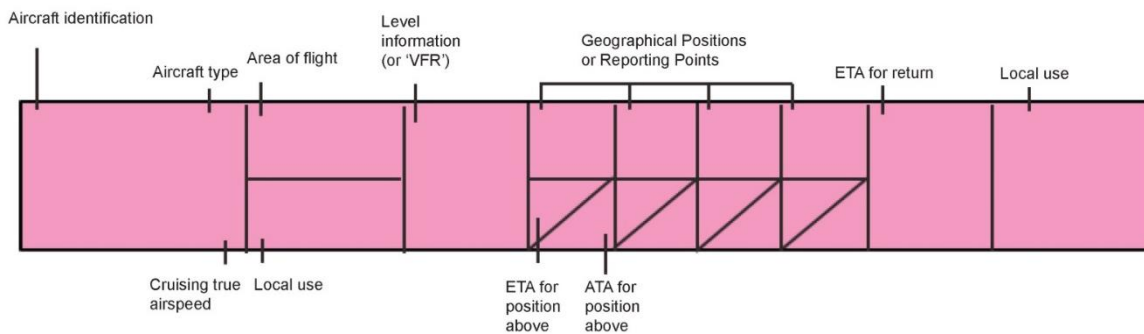
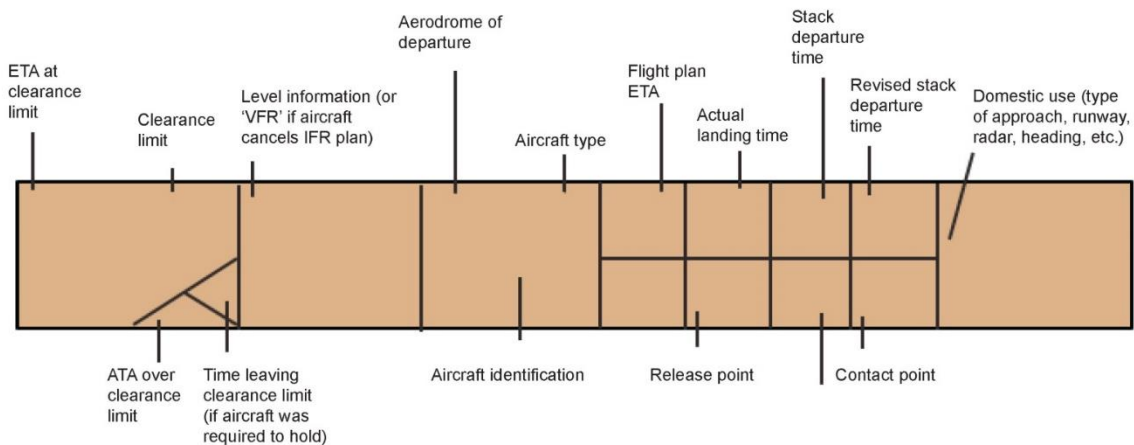
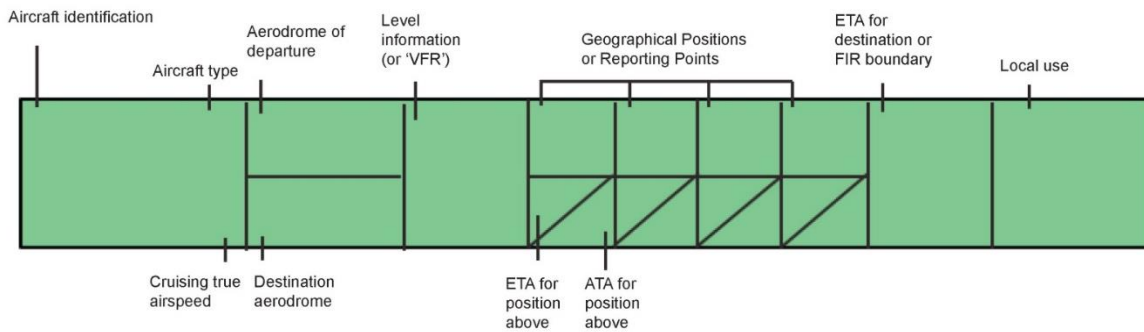
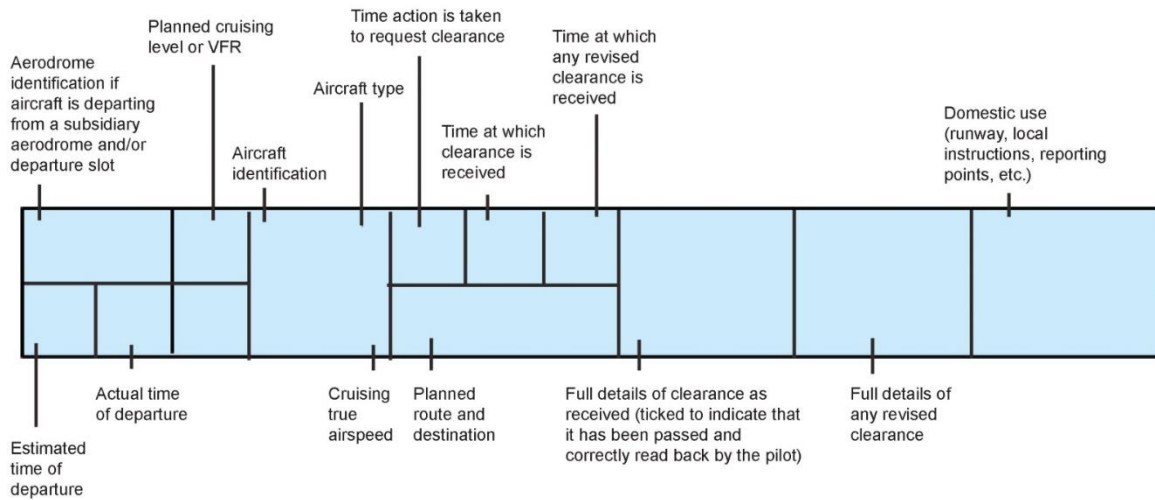
3. Flight Progress Strips

- 3.1 Commonly, flight progress strips are used to display flight data. The following information may be of use to ANSPs in developing a system of flight data display utilising flight progress strips.

3A. Strip Design

- 3A.1 Strips should include pre-defined markings to permit specific items of information to be recorded in a standard manner. Colour should be used where possible to clearly denote different types of flight. Typically, flight data relating to arriving flights is displayed on buff-coloured strips, departing flights on blue coloured strips, local flights on pink coloured strips and transit flights on green coloured strips.

3A.2 The typical locations in which information is recorded on each type of strip is shown below.



3B. Strip Management

- 3B.1 Strips should be mounted in such a way as to permit information to be recorded on the strip and to enable the strips to be moved to different positions within the controller's work area to indicate the relative location of aircraft under the controller's jurisdiction. Unless otherwise approved by the CAA, strips should be mounted on a 'strip board' that prevents their inadvertent movement. A clearly defined and specific location should be used to denote the runway(s).
- 3B.2 Additional strips describing common activities or situations, e.g. 'Work in Progress', 'Runway Blocked', Airspace delegation, 'Low Visibility Procedures in force' and Danger/Restricted airspace activity, should be provided. Such strips should be displayed in an appropriate location within the controller's work area to denote information that may affect the service provided by the controller.
- 3B.3 The strip management procedures, including the layout of the strip board and, in particular, the method used to indicate that an aircraft has been cleared to use the runway (or that it is in some other way in use), are to be described in MATS Part 2.

3C. Strip Marking

- 3C.1 Standard symbols as shown on the next page may be used to denote commonly recorded data when recording information and instructions on flight progress strips. Any additional symbols used, or indication of locally significant information (such as type of service being provided) should be described in MATS Part 2.

3D. Abbreviations

- 3D.1 Unless otherwise approved by the CAA, abbreviations published by ICAO should be used whenever possible for recording data on flight progress strips. The following documents include commonly used abbreviations:

ICAO Doc. 8643 Aircraft type designators

ICAO Doc. 8585 Abbreviations of aircraft operating agencies

ICAO Doc. 7910 Location indicators.

- 3D.2 Any abbreviations that are specific to the unit, e.g. abbreviations to denote a VRP or local route, should be described in MATS Part 2.

4. Alternative Methods of Data Display

- 4.1 Alternative methods of data display, or the use of flight progress strip systems that differ significantly from the guidance provided above, require approval by the CAA and are to be described fully in MATS Part 2.

5. Symbols

Above ft	+	Clearance expires at (time)	CE	Overflight	∇
. ft or above +	Coordination Effected	↻	Radar	R
After passing	/	Current Weather	WX	Radar vectoring for a visual approach	R/V
Aircraft given time check	T	Delay not determined	Z	Radar vectoring for ILS approach	R/I
Aircraft given appropriate altimeter setting	Q	Descend	↓	Release not before	_____ (time)
Aircraft instructed to hold	H	Descent coordinated	↻	Release not before (for use with data transfer systems)	_____ R (time)
Aircraft has reported at wrong level (indicated in circle)	⊙80	Expected Approach Time	EAT	Release not before (call sign or title, aircraft or agency)	RS
Alternative instructions	(.)	Flight Priority Letter (indicated in circle)	⊙A	Reporting Leaving (level)	RL
Below ft	-	ILS	I	Reporting Passing (level)	RP
. ft or below -	Joining flight	≡	Reporting Reaching (level)	RR
Climb	↑	Leaving controlled airspace	△↗	Restrictions written below this line	_____
Coordinated Climb	↻	Maintain	M→	Reporting Point	F

Climb 1,000 ft below (aircraft)	↑ $\frac{\text{(a/c callsign)}}{1}$	No delay expected	∧	Slot time (for use with data transfer systems)	̄
Cruise	↑CC	Outer Marker	OM	Surveillance Radar Approach	SRA
Cleared to cross an ATS route(s) in a Control Area	X	Overhead	QFG	This information has been passed and acknowledged	✓

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Appendix E: Communications Technique and Standard Phraseology

1. Introduction

- 1.1 Radiotelephony provides the means by which pilots and ground personnel communicate with each other. Used properly, the information and instructions transmitted are of vital importance in assisting in the safe and expeditious operation of aircraft. However, the use of non- standard procedures and phraseology can cause misunderstanding. Incidents and accidents have occurred in which a contributing factor has been the misunderstanding caused by the use of non-standard phraseology. The importance of using correct and precise standard phraseology cannot be over-emphasised.
- 1.2 The United Kingdom Radiotelephony Manual (CAP 413) is the authoritative reference for all users of RTF and includes examples of communication between pilots and controllers.

2. Distracting Conversations

- 2.1 Non-operational and other conversations have the potential to distract a controller from their primary task of providing a safe air traffic service. Examples include telephone conversations with external agencies, such as airline representatives, and discussions between controllers conducted on the telephone, intercom or, in some cases, face to face, following an unplanned traffic situation.
- 2.2 Non-operational conversations must not be permitted to interfere with a controller's operational duties. Procedures at units should ensure that non-urgent telephone calls from external agencies could be accommodated without prejudicing the controller's primary task.
- 2.3 Discussions regarding unplanned traffic situations, which may include incidents and alleged breaches of procedure, are not to be conducted from operational positions. If appropriate, only brief details of the occurrence should be exchanged between the controllers involved. If there is a need to discuss the matter further, this should be deferred to a time when all the personnel affected are relieved from their operational duties. Where staffing levels permit, unit management staff that are not working at an operational position should make arrangements for further discussions.

3. Landline Telephone

- 3.1 It is correct procedure for controllers to announce identity on all telephone calls: with incoming calls it is the opening remark and with outgoing calls the reply to the recipient's announcement of identity.
- 3.2 It is just as important that this procedure is not relaxed for direct telephone lines because mistaken identity can occur when another line has been inadvertently left open from a previous call. Announcing identity on outgoing calls when using direct

telephone lines is not required at those units where equipment and labelling ensure that mistaken identity cannot occur. Specific details are to be documented in MATS Part 2.

- 3.3 The identity to be used is that of the function relative to the telephone extension being used. On outside calls the identity should be given in full, for example “London Control Sector 21 Planner” but on direct lines, where it will require no further amplification, it may be abbreviated to “Sector 21 Planner”.
- 3.4 Controllers shall read back any operationally significant information contained in telephone (and intercom) co-ordination messages including:
- (1) Levels;
 - (2) Headings;
 - (3) Speed Restrictions;
 - (4) ATS route instructions;
 - (5) Runway in use;
 - (6) SSR Codes;
 - (7) Pressure Settings, including units when value is below 1000 hPa;
 - (8) Frequencies;
 - (9) Release and contact points.
- 3.5 A list of standard landline telephone phrases is at E (Attach).

4. Transmission of Company Messages by Controllers

- 4.1 When requested by a company representative, controllers may transmit specific operational messages to aircraft subject to normal air traffic service requirements and shall prefix the transmission “Company advise/request...”. When passing such messages the controller must ensure that doing so will not compromise the safe provision of an air traffic service and such messages should not be passed when they could act as distraction to pilots during critical phases of flight.
- 4.2 Where messages of a technical and complicated nature are involved it may be found advisable to permit direct speech between the originator of the message and the pilot. In such cases the company’s representative may be permitted to use the RTF themselves provided that their identity is announced before the message is passed and that the controller continues to monitor the frequency.
- 4.3 A message affecting the safety of an aircraft in flight, e.g. bomb warning, suspected damage to the aircraft, etc., is to be passed to the commander immediately using the company representative’s precise wording. An abbreviation or precis could be misunderstood and lead to a wasteful operation or even a dangerous situation.

- 4.4 Prolonged company messages could prevent controllers from providing a safe air traffic service and the use of discrete frequency for the passing of such messages should be considered.

4A. Readback of ATS Co-ordination Messages

- 4A.1 Controllers must ensure they obtain a read-back of any operationally significant information contained in telephone and intercom co-ordination messages, including:

- (1) Levels;
- (2) Headings;
- (3) Speed Restrictions;
- (4) ATS route instructions;
- (5) Runway in use;
- (6) SSR Codes;
- (7) Pressure Settings, including units when value is below 1000 hPa;
- (8) Frequencies; and
- (9) Release and contact points.

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Attachment to Appendix E

1. List of Standard Landline Telephone Phrases

Co-ordination between units	Phraseology
Flight Plan details	(Direction of flight) ETD (time) flight level requested (number) aircraft identification (callsign) type (designation) TAS (departure aerodrome) (route) (destination) (flight plan number).
Clearance request	Aerodrome) request clearance for (a/c identity).
ATS route clearance	<p>Clearance (a/c identity) cleared to (clearance limit) (level) (SID) squawk (four digits).</p> <p>Clearance (a/c identity) cleared to (clearance limit) via (route) cross (significant point(s)) at (level(s)) (climbing instructions) (cruising level) squawk (four digits).</p> <p>Clearance (a/c identity) cleared to (clearance limit) via (route) cross (significant point(s)) at (level(s)) squawk (four digits).</p>
Restriction to clearance	<p>(A/c identity) unable to clear (item not approved).</p> <p>Released subject to your discretion with regard to (a/c identity) (aerodrome) (direction of flight) departing/landing at (time).</p> <p>Clearance expires (time).</p> <p>Release not before (time).</p> <p>Release not before (a/c identity) plus (number of minutes).</p> <p>Release not before (a/c identity) has left (level).</p> <p>Release not before (a/c identity) has reported (place).</p> <p>Release to maintain (number) feet below (a/c identity).</p> <p>Release subject (a/c identity).</p>
Departure	(Aerodrome) departure (a/c identity) departed at (time).

Co-ordination between units	Phraseology
Approval Request	<p>Approval request (a/c identity) (type) expected departure from (aerodrome) at (time) requests (level) (filed TAS) via (route) (point of first intended landing).</p> <p>(A/c identity) request approved (restriction if any). (A/c identity) unable (alternative instruction).</p>
Estimate Message and Revision	<p>(Direction of flight) estimate (a/c identity) squawking (four digits) (type) estimated over (significant point) at (time) (level) speed (filed TAS) via (route) (Clearance limit if other than destination).</p> <p>Revision (a/c identity) now estimated over (place) at (time) or other revisions, e.g. a different level.</p>
Release to Approach Control	<p>Inbound release (a/c identity) squawking (four digits) (type) from (point of departure) released at (significant point, time or level), cleared to and estimating (clearance limit) at (time) at (level) expected approach time (time) (or no delay expected) contact at (significant point, time or level).</p>
Radar Handover Message	<p>Radar handover (a/c identity) (position, SSR code and heading/observed track, if own navigation) (level) (additional information).</p> <p>Additional information shall include transfer of control details if not coincident with transfer of communication.</p>
Radar Identification Message	<p>Radar identification (position) (a/c identity).</p>

Appendix F: Speed Control Guidance

1. Speed Terminology and Relationships

1.1 Four main speeds are used within the ATC environment:

- (1) **Ground speed** – the actual speed of the aircraft over the surface of the earth. This equates to TAS corrected for the effects of wind;
- (2) **True airspeed (TAS)** – the actual speed of the aircraft through the air and is shown on the flight plan and flight progress strips;
- (3) **Indicated airspeed (IAS)** – often used by ATC for speed control and varies from the TAS dependant on altitude, air density and temperature (see Figure 1); and
- (4) **Mach number** – TAS expressed as a fraction of the local speed of sound. The speed of sound (Mach 1) is a function of temperature – colder (i.e. higher) equalling slower. In international standard atmosphere (ISA) conditions, at sea level Mach 1 is a little over 661 kt TAS, but at FL360 it has decreased to 572 kt and remains at that figure to around FL600 – FL700 (see Figure 2).

Figure 1:

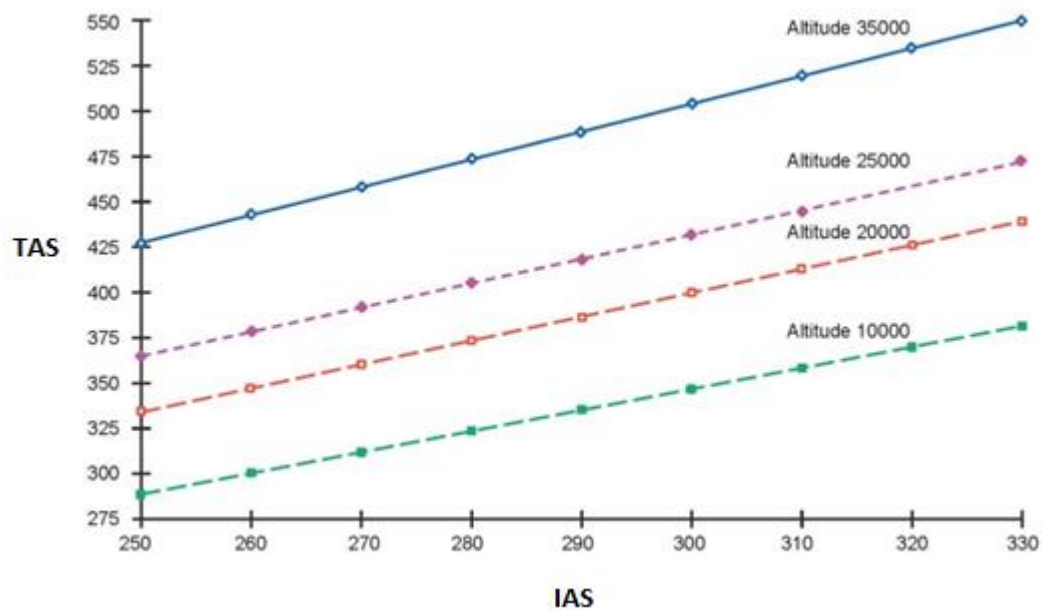
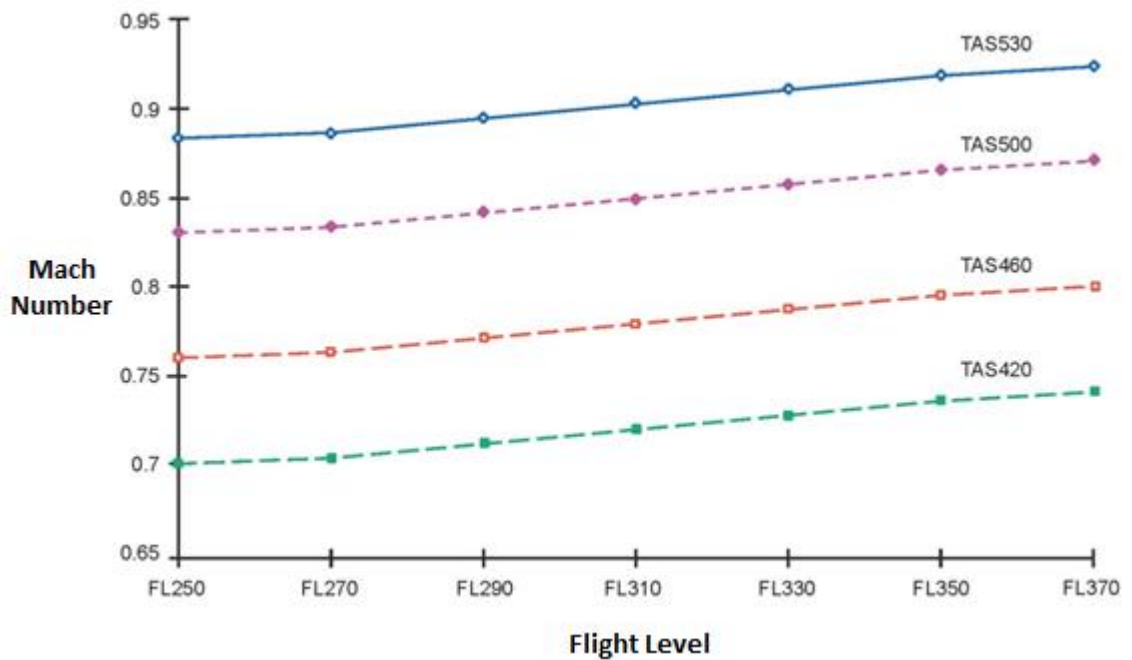
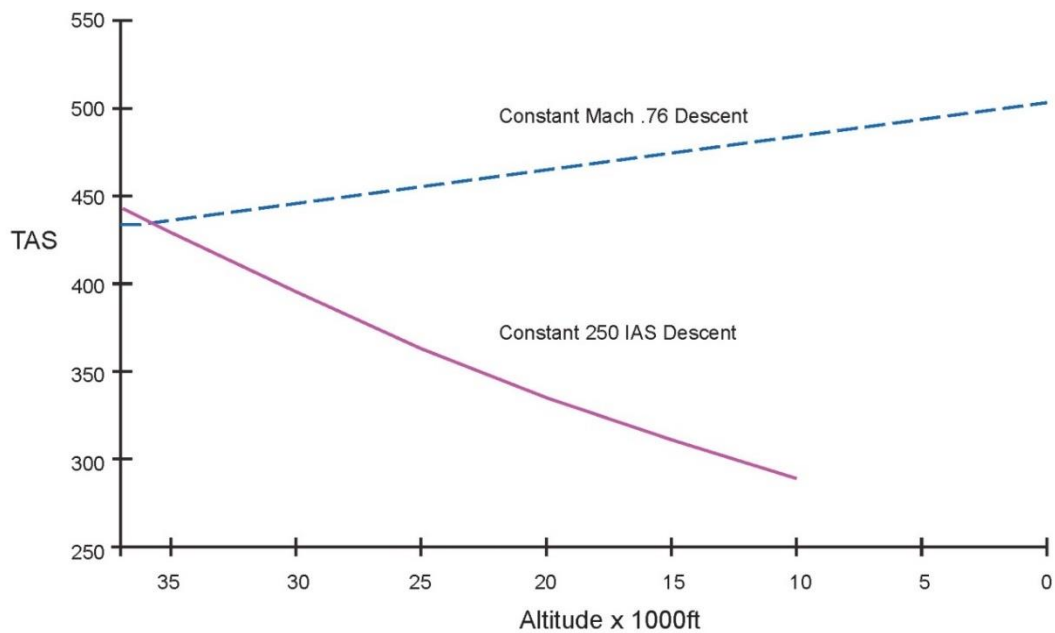


Figure 2:



If an aircraft climbs from sea level to FL350 at a constant Mach number of .70 then the TAS will decrease from 463 to 400 kt. Similarly, a constant Mach number descent will result in increasing TAS.

- 1.2 Due to the low air density at high altitude, airspeed indicators read less than the actual speed of the aircraft, but at sea level there is virtually no difference between them. Therefore, an aircraft climbing at a constant IAS will have an increasing TAS. For example, under ISA conditions 250 kt IAS at sea level equates to 250 kt TAS, but at FL430 an IAS of 250 kt equals a TAS of 502 kt. Conversely, if a descent is carried out at a constant IAS the TAS will decrease as altitude is lost. (See Figure 3.)

Figure 3:

Looking at a typical climb/descent profile for an MD80 the following can be observed.

- 1.3 The aircraft climbs at 290 kt IAS until it reaches Mach .76. It continues the climb maintaining .76 to cruise altitude, cruises at .76 and holds that Mach speed in descent until reaching 290 kt IAS again. As there is a speed limitation of 250 kt IAS below FL100 the initial climb will be at 250 kt IAS (289 kt TAS/Mach .45). The aircraft will then accelerate to 290 kt IAS (334 kt TAS/Mach .52 at 10,000 ft) and then climb at this constant indicated speed. During this climb both the TAS and Mach number will be increasing as follows:

Table 1:

Altitude	TAS	Mach	IAS
15,000	359 kt	.57	290 kt
20,000	387 kt	.63	
25,000	418 kt	.69	
29,000	445 kt	.75 (see note)	
33,000	441 kt	.76	268 kt
37,000	435 kt	.76	245 kt

Note: From this point on the pilot will fly at Mach .76 and no longer use IAS as a reference unless requested to do so by ATC.

If the crew had not changed from IAS to Mach number and tried to hold 290 kt IAS all the way to FL370, the speed at top of climb would be Mach .88 – far in excess of the permitted limit.

- 1.4 In the descent, the process is reversed. The pilot will fly at Mach .76 until the IAS reaches 290 kt, which should occur around FL290. During this part of the descent the aircraft will accelerate slightly from 245 to 290 kt IAS (435 to 445 kt TAS). In the descent from FL290 to FL100 the aircraft will be flown at a constant 290 kt IAS and the TAS will decrease from 445 to 334 kt. IAS will then be reduced to around 210 kt in preparation for configuring the aircraft for approach. Controllers should be aware of airspeed changes according to the stage of flight when applying speed control.
- 1.5 Turbulence narrows the allowable speed range of the aircraft as minimum speeds are increased to maintain control effectiveness and maximum speeds may be reduced to prevent damage from excessive 'G' loads encountered in rough air.

2. Aircraft Performance and Handling

- 2.1 Whilst TAS and ground speed are of interest to ATC and are factors in aircraft navigation, they are of very little significance to the pilot's task of handling the aircraft. Aircraft performance, handling qualities and limitations are dependent upon, and expressed in terms of, IAS and Mach number. IAS considerations predominate at lower altitudes and Mach number at higher ones.
- 2.2 Considering the aircraft in the clean configuration that applies throughout the flight, except for short periods during take-off and landing, the operational speed range is bounded by the stall at low speed and by the maximum operating speed at high speed (This maximum operating speed when defined as an airspeed is designated V_{mo} and when a Mach number is used, M_{mo}). The stall speed is principally related to IAS and increases with increasing weight and, to some extent, with increasing altitude. Minimum operational speeds will allow a margin from the stall speed to permit a manoeuvre capability and protection from short term atmospheric effects without encountering the stall.
- 2.3 The high-speed limits of V_{mo}/M_{mo} are set at a suitable margin below the ultimate design limits to provide protection for inadvertent speed increases due to atmospheric disturbances or other causes. The high-speed design limits may be set by structural or handling considerations. While the pilot may fly at speeds up to V_{mo}/M_{mo} , various performance considerations will generally preclude this except during the descent. At high altitude and high weight an aircraft may encounter high Mach buffet when manoeuvring at speeds below M_{mo} which will present an additional constraint on maximum speed. As these are also the considerations that lead to the highest values of low-speed stall, it can be seen that the effective speed range available may be reduced markedly with altitude. Indeed, the minimum and maximum operational speeds due to low-speed stall and high-speed Mach buffet respectively, may become coincident at a particular weight/altitude combination that is below the absolute ceiling that the aircraft might utilise at lower weights.
- 2.4 Optimum climb and descent profiles are determined by various performance characteristics and speeds close to V_{mo}/M_{mo} may frequently be flown in the descent. In the climb, optimum speed, especially for large aircraft at high weight,

can be severely limited to give protection against the stall. This speed may also be close to, if not above, the 250 kt ATC speed limit below 10,000 ft.

- 2.5 The methods at a pilot's disposal to increase descent capability are reduction of thrust, increase of airspeed, and use of airbrakes. However, pilots are reluctant to use airbrakes, unless necessary, due to passenger discomfort and increased fuel burn considerations. Thus, the optimum descent profile is one which permits the aircraft to maintain cruising altitude to that point from which a gliding descent to intercept the final approach can be made with throttles closed but with airbrakes retracted. Speed will normally be kept high initially, often at or close to V_{mo}/M_{mo} . The pilot may have significant flexibility over the speed at which they can safely and legally fly, but at the risk of deviating from the optimum descent profile. Subsequent corrections to the flight path may require the use of airbrakes or an indirect routing to final approach.
- 2.6 The available speed range is altered very considerably once flaps are extended. The use of flaps is normally restricted to lower altitudes. Once the flaps are extended the maximum permitted airspeed is significantly reduced. However, extending flaps does delay the onset of the stall and permits lower minimum speeds to be used. However, this again imposes fuel efficiency penalties and pilots normally prefer to maintain a holding speed that is not less than that at which they can safely maintain the clean (flaps retracted) configuration.
- 2.7 When an aircraft is heavily loaded and at a high level, its ability to change speed may, in cases, be very limited. In the event of engine failure or other systems failures, additional speed constraints are likely to apply. Quite apart from a reduced performance capability, these may involve an increased minimum speed, a reduced maximum speed, or both, at which the aircraft can be flown safely.

3. Speed Control Technique and Practical Application

- 3.1 When using speed control to maintain spacing between two aircraft, it is the aircrafts' Ground Speed that ATC are trying to match. However, it is not practical to use this speed as a reference because it is dependent on the local wind. It is easier to manage the ground speed of two aircraft by reference to their IAS or Mach number. When controlling aircraft at the same level, assigning the same IAS or Mach number will produce the same TAS and the same Ground Speed.
- 3.2 At high levels (FL280 and above), speed control instructions should be passed by reference to Mach number. As a general rule of thumb, at these levels, 0.01 Mach equals 6 kt TAS. If a controller is trying to match speeds of aircraft at different levels, the same Mach number will mean that the higher aircraft will be a little slower. An allowance of 0.01 Mach for each 2 – 3,000 ft level difference will achieve a closer match in ground speed.
- 3.3 Unlike Mach number control, the results of allocating IAS restrictions to aircraft vary substantially with altitude. An aircraft maintaining 280 kt IAS at FL330 will have a TAS of 459 kt while an aircraft with the same IAS at FL270 will produce a TAS of

417 kt. For aircraft operating at the same IAS, a rule of thumb is 7 kt for each 1,000 ft level difference. Above FL240 each 10 kt of IAS equals approximately 15 kt of TAS.

- 3.4 The result of these differences is that when two aircraft are assigned the same Mach number, an aircraft at a higher level will be slower but when they are assigned the same IAS an aircraft at a higher level will be faster.
- 3.5 The variation in wind strength and/or direction with height is a factor to be considered before applying any speed control. A large variation in either element can cause any separation to be eroded very quickly.
- 3.6 It is important to give crews adequate notice of any speed restrictions they can expect particularly if other descent restrictions have been applied, e.g. to be at a level at a specified point. Aircrew plan descents at a given speed and rate so high descent rates and low airspeeds are not normally compatible. Short notice speed restrictions issued while descent to a target level is in progress, may cause problems for the crew.
- 3.7 The lack of aerodynamic drag and the presence of significant idle thrust of turbine-engine aircraft, particularly in icing conditions, make rapid descents with speed reduction generally impracticable. Whilst piston-engine aircraft do have this performance capability by virtue of rapid engine response, propeller and airframe drag and less inertia, pilots may not be able to exploit this advantage as reduction in engine power while descending quickly can result in 'shock cooling' to the engine resulting in an expensive overhaul.
- 3.8 Significant speed reductions may require the pilot to level off to lose speed before returning to the descent. Planning is even more important with heavy jets. At the bottom of a high-speed descent their inertia will be great, and both time and distance will be needed to reduce speed for ATC purposes.
- 3.9 'Minimum clean speed' signifies the minimum speed at which an aircraft can be flown in a clean configuration, i.e. without deployment of lift-augmentation devices, speed brakes or landing gear. The use of the phrase 'minimum clean speed' can achieve a reduction in aircraft speed in a very short space of time and is useful in appropriate circumstances. However, the actual speed flown will vary depending on type, and compliance may be affected by other factors such as local turbulence. This instruction to fly at minimum clean speed should be given early to enable aircrew to plan and achieve descent profiles.
- 3.10 A speed reduction instruction issued to a climbing aircraft may result in a temporary increase in climb rate. The pilot is likely to raise the nose of the aircraft to allow the airspeed to reduce and so the vertical speed will increase.

Appendix G: Crosswind and Tailwind Component Tables

1. Crosswind component table

1.1 This table provides guidance on the calculation of crosswind component and should be used when determining 'out of wind runway' operations.

Table 1:

Wind Speed (knots)	Crosswind Speed (knots)								
	Difference between Wind Direction and QFU (degrees)								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
5	1	2	3	4	4	5	5	5	5
10	2	4	5	7	8	9	10	10	10
15	3	6	8	10	12	13	15	15	15
20	4	7	10	13	16	18	19	20	20
25	5	9	13	17	20	22	24	25	25
30	6	11	15	20	23	26	29	30	30
35	7	12	18	23	27	31	33	35	35
40	7	14	20	26	31	35	38	40	40
45	8	16	23	29	35	39	43	45	45
50	9	18	25	33	39	44	47	50	50
55	10	19	28	36	43	48	52	55	55
60	11	21	30	39	46	52	57	60	60
65	12	23	33	42	50	57	62	65	65
70	13	24	35	45	54	61	66	69	70
75	14	26	38	49	58	65	71	74	75
80	14	28	40	52	62	70	76	79	80
85	15	30	43	55	66	74	80	84	85
90	16	31	45	58	69	78	85	89	90

Note 1: Crosswind component, where necessary have been rounded up.

Note 2: Values more than 15 knots have been shaded.

2. Tailwind component table

2.1 This table provides guidance on the calculation of tailwind component and should be used when determining 'out of wind runway' operations.

Table 2:

Wind Speed (knots)	Tailwind Speed (knots)								
	Difference between Wind Direction and QFU (degrees)								
	100°	110°	120°	130°	140°	150°	160°	170°	180°
5	1	2	3	4	4	5	5	5	5
10	2	4	5	7	8	9	10	10	10
15	3	6	8	10	12	13	15	15	15
20	4	7	10	13	16	18	19	20	20
25	5	9	13	17	20	22	24	25	25
30	6	11	15	20	23	26	29	30	30

Note 1: Tailwind component, where necessary have been rounded up.

Note 2: Values more than 5 knots have been shaded.

Appendix H: Directory

AAIB (Air Accident Investigation Branch)

Berkshire Copse Road
Aldershot
Hants GU11 2HH

Tel: 01252 512 299
Fax: 01252 376 999

Aeronautical Information Service (AIS)

UK NOTAM Office (NOF/INO)

Tel: (H24) 01489 612488 / 01489 612489

Tel: 07769 672014

(Available under contingency conditions)

NOTAM proposals (H24)

Email: eg_notamprop@ead.eurocontrol.int

Fax: (H24) 01489 612490

AIS Information Line UK

Tel: (H24) 08085 354802

Tel: (H24) 01489 887515

UK AIS Publication Section
(AIP/SUP/AIC etc)

Tel: (Mon to Fri 08:00-16:00) 01489 887462

UK Charting Section

Tel: (Mon to Fri 08:00-16:00) 01489 887463

Foreign AIP Library

Enquiries and self-briefing visits.

Tel: (Mon to Fri 08:00-16:00) 01489 887462

(Visits subject to prior arrangement)

Civil Aviation Authority

Westferry
11 Westferry Circus
Canary Wharf
London E14 4HD

Tel: 0330 0221500 (Switchboard)

Safety and Airspace regulation Group

Aviation House
Beehive Ring Road
Crawley
West Sussex RH6 0YR

Tel: 0330 0221500 (Switchboard)

CAA – MATS Part 1 Policy

Airspace, ATM and Aerodrome (AAA)
1E Aviation House
Civil Aviation Authority
Safety and Airspace Regulation Group
Beehive Ring Road
Crawley
West Sussex RH6 0YR

Email: ats.enquiries@caa.co.uk

CAA – Safety Oversight

Airspace, ATM and Aerodrome (AAA)
1E Aviation House
Civil Aviation Authority
Safety and Airspace Regulation Group
Beehive Ring Road
Crawley
West Sussex RH6 0YR

Email: atssouthern.regionaloffice@caa.co.uk

ATS Investigations

Tel: 03301 382406

Email: atsiadmin@caa.co.uk

En-Route and College Regulation

Email: atssouthern.regionaloffice@caa.co.uk

Southern Region

1E Aviation House
Civil Aviation Authority
Safety and Airspace Regulation Group
Beehive Ring Road
Crawley
West Sussex RH6 0YR

Email: atssouthern.regionaloffice@caa.co.uk

Northern Region

First Floor, Kings Park House
Laurehill Business Park
Stirling FK7 9JQ

Email: atsnorthern.regionaloffice@caa.co.uk

CAA - Safety Data

2W Aviation House
Civil Aviation Authority
Safety and Airspace Regulation Group
Beehive Ring Road
Crawley
West Sussex RH6 0YR

Email: sdd@caa.co.uk**CAA – Investigation and Enforcement Team**

Westferry
11 Westferry Circus
Canary Wharf
London E14 4HD

Email: iet@caa.co.uk**CAA – Press Office**

Westferry
11 Westferry Circus
Canary Wharf
London E14 4HD

Tel: 0333 103 6000 (office hours)**Tel:** 07789 745 636 (outside office hours)**Email:** content@caa.co.uk**DfT - Transport Security****Co-ordination and Operational Response Division, Threats office**

Great Minster House
33 Horseferry Road
London SW1P 4DR

Tel: (Monday – Friday 0900 – 1730)

0207 944 2870 / 2071 or 2072

Tel: (Outside Office Hours) 0207 944 5999

If call is connected with a 'BOMB threat' or other security issue ask for the "Threats Office Duty Officer"

Email: tibc@dfat.gsi.gov.uk**Fax:** 0207 944 2873**Military**

D&D Cell
LATCC (Mil) LJAO Supervisor
LATCC (Mil) East Supervisor
LATCC (Mil) North Supervisor
LATCC (Mil) RAC

Tel: 01489 612 406**Tel:** 01489 612 417**Tel:** (outside office hours) 01489 612 408**Tel:** 02380 401 509**Tel:** 01489 612 172

MoD (AFO)

RAF Main Building
Whitehall
London SW1A 2HB

Tel: 0207 218 9000

NATS**London ACC**

NATS En-Route Ltd
Sopwith Way Swanwick
Hants SO31 7AY

Watch Manager

Tel: 01489 612 420

Flow Management Unit (Post Box 23)

Tel: 01489 612 427

Fax: 01489 612 437

Scottish ACC and Shanwick OACC

Fresson Avenue
Prestwick
Ayrshire KA9 2TR

Operational Supervisor

Tel: 01294 655 300

Ofcom

Spectrum Management Centre
(Reporting Malicious Interference)

Tel: (H24) 01462 428528

Fax: (H24) 01462 438510

Email: SMC@ofcom.org.uk

UKAB (United Kingdom AIRPROX Board)

Building 59
First Floor
RAF Northolt
West End Road
Ruislip
Middlesex HA4 6NG

Tel: 0208 842 6051

Fax: 0208 842 6056

Email: info@airproxboard.org.uk

Appendix I: Aviation Laser Exposure Self-Assessment

1. Self-Assessment (ALESA)

- 1.1 This self-assessment is designed to aid pilots, air-traffic controllers, or flight crew members who have been exposed to a laser beam in making a decision on whether or not to see an eye specialist.
- 1.2 The eye specialist may be either an Optometrist or Ophthalmologist. It is extremely unlikely that a laser beam exposure will result in permanent eye damage. Eye discomfort and irritation during the exposure is common and rubbing your eye can result in abrasion that may be painful. If you have experienced one or more of the following after a laser beam exposure consult an eye specialist.
- Eye problems – swelling, pain, itching, watering, discharge, dryness or redness of the eye.
 - Visual disturbance – blurring, black spot, trouble reading, loss of peripheral vision, floaters, halos, poor night vision, sensitivity to light.
- 1.3 These symptoms may not appear until hours after the incident and may not be related directly to laser exposure but could reflect other eye issues perhaps not previously noticed.

2. Types of exposure



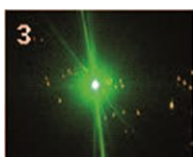
Flash blindness

A visual impairment during and after exposure to a very bright light. It may last for seconds or minutes.



Glare

Difficulty seeing in the presence of a bright light.



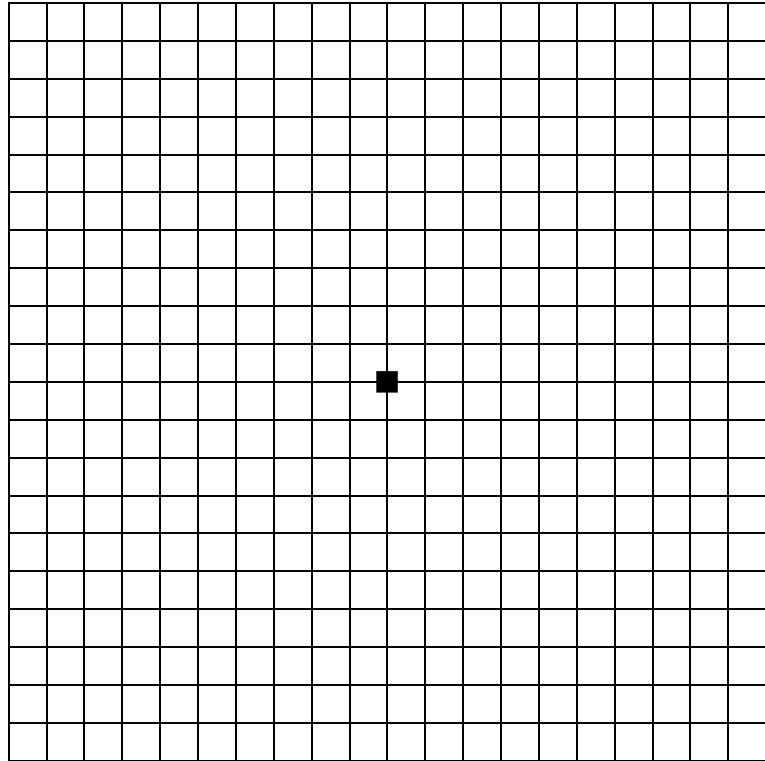
Distraction

A light bright enough to disrupt attention.

3. Amsler Grid

While viewing the grid from 30 cm in front of your eyes, please test one eye at a time to answer the following questions:

1. Can you see a dot in the centre of the grid?
2. Whilst looking at the centre dot, can you see all four sides and corners of the grid?
3. While looking at the centre dot, do all of the lines appear straight with no distortions or blank or faded areas?

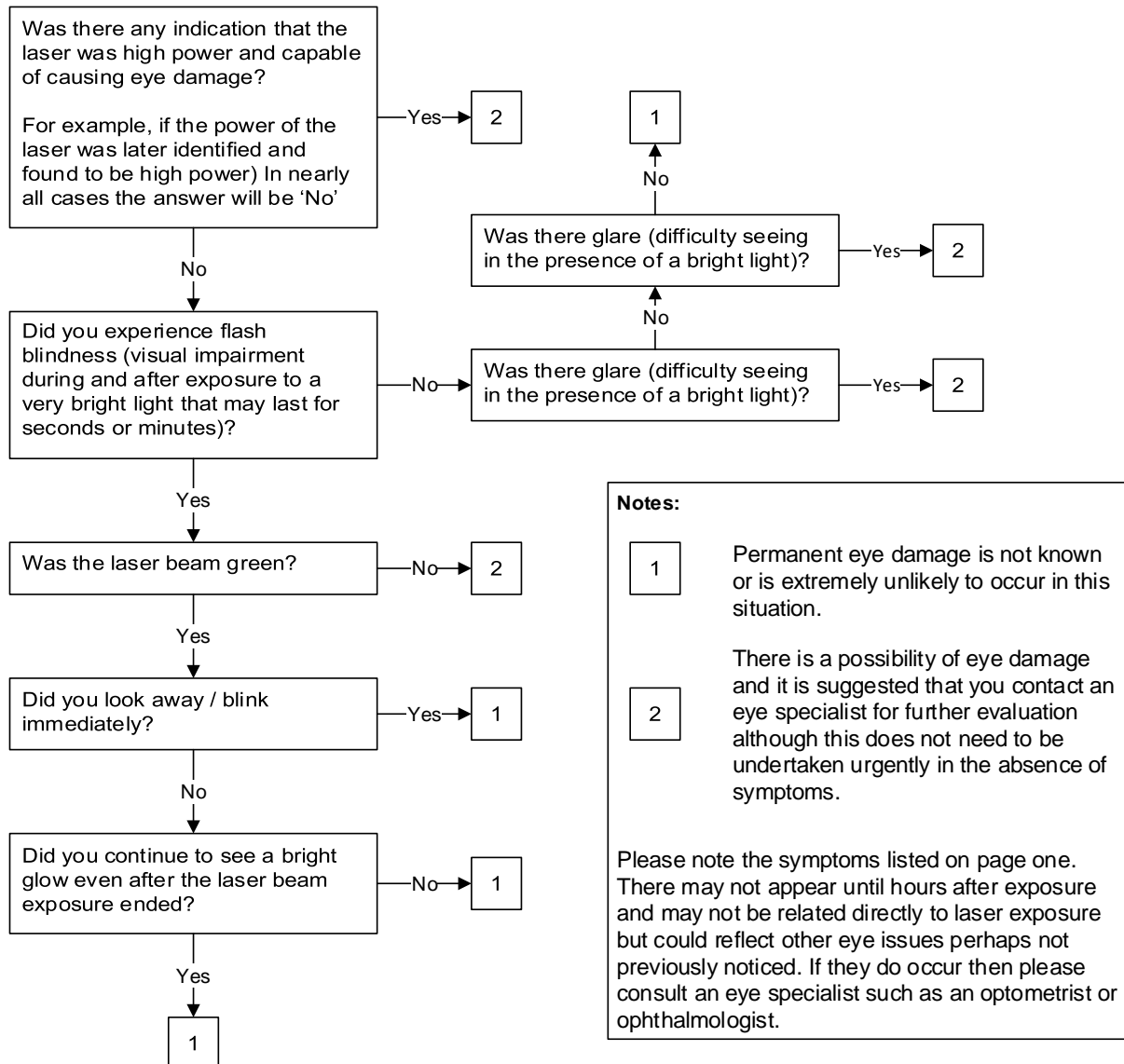


The dimensions of the grid should be 10cm x 10 cm.

If you answered YES to all three questions, then please turn to page 3.

If you answer NO to any of the above questions, then you may wish to remove yourself from flying or controlling duties as soon as it is safe to do so and consult an eye specialist.

In some circumstances it may be possible to have retinal damage without obvious symptoms. The relevance of this is uncertain in the absence of abnormal visual signs (e.g. answering “yes” to all three Amsler Grid questions on page 2 as it is unlikely to have an operational impact or be amenable to treatment. The following is designed to aid a pilot or ATCO in deciding whether or not an assessment should be sought with an optometrist or ophthalmologist after an exposure.



For further information, the British Airline Pilots Association (BALPA) have produced an advisory information sheet which will be available on their website www.balpa.org

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Appendix J: Model AIREP Special Form

Item	Parameter	Transmit in Telephony	
-	Message – type designator	[AIREP] SPECIAL	
1	Aircraft identification		
2	Position: POSITION (latitude and longitude) OVER (significant point) ABEAM (significant point) (bearing) (distance)		
3	Time		
4	Level: FLIGHT LEVEL (number) or (number) feet CLIMBING TO FLIGHT LEVEL (number) or (number) feet DESCENDING TO FLIGHT LEVEL (number) or (number) feet		
5	Phenomenon encountered or observed prompting a special air-report:		Tick as appropriate
		TURBULENCE MODERATE	
		TURBULENCE SEVERE	
		ICING MODERATE	
		ICING SEVERE	
		MOUNTAINWAVE SEVERE	
		THUNDERSTORMS	
		THUNDERSTORMS WITH HAIL	
		DUSTSTORM or SANDSTORM HEAVY	
		VOLCANIC ASH CLOUD	
PRE-ERUPTION VOLCANIC ACTIVITY or VOLCANIC ERUPTION			

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