



AIRSPACE

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Essential Rules of the Air

The 'Rules of the Air' are the basic rules that all aircraft must follow when in flight. They are additional to the operational rules outlined earlier and represent the foundation of the safe interaction between different airspace users and the protection of third parties on the ground.

Key info



As **pilot in command** you are responsible for ensuring your aircraft remains in compliance with The Rules of the Air. If compelled to deviate from them by immediate danger, you may do so without fear of retribution.

They are set out in ICAO Annex 2 and legally applied in the UK through a combination of:

- > The Standardised European Rules of the Air¹ as applicable in the UK;
- > The UK Rules of the Air Regulations 2015; and
- > General permissions issued by the UK where SERA permits national discretion over certain requirements.

They apply equally to Part-21 and non-Part-21 aircraft while flying in the UK. In Europe SERA rules will generally apply, although there may be slight variations where national discretion is permitted.

State-specific variations can normally be found in the ENR section of the relevant AIP – for example ENR 1.2 covers the VFR, ENR 1.7 altimeter setting procedures and ENR 1.8 Regional Supplementary Procedures.

For ease of understanding, we have drawn the relevant regulations and permissions together and presented them in a consolidated format that covers the basics relevant to VFR flight. While the source regulation is always definitive, compliance with the guidance on the following pages should ensure both the letter and spirit of the law are observed.

FINDING REGULATIONS



Look on <https://info.caa.co.uk/uk-regulations/> for the version of SERA as applicable in the UK.

UK specific general permissions or exemptions relevant to SERA can be found in ORS4 – www.caa.co.uk/ors4.

For more information about the UK's implementation of SERA see www.caa.co.uk/sera.

The UK Rules of the Air Regulations 2015 can be found either at www.legislation.gov.uk or in the CAA's consolidation, CAP 393 – www.caa.co.uk/cap393.



For the version of SERA applicable within the EU, look on www.easa.europa.eu/regulations.

The European AIS Database (EAD) is the best place to look up European AIPs.

AIRSPACE

Essential Rules of the Air

RESPONSIBILITIES OF THE PILOT-IN-COMMAND

In addition to those responsibilities for the PIC set down in Part-NCO and the Air Navigation Order, Section 2 of Part-SERA also specifies that:

- > The PIC shall have the final authority as to the disposition of the aircraft while in command;
- > The PIC is always responsible for operation of the aircraft in accordance with SERA, regardless of whether they are manipulating the controls or not. The PIC may depart from the rules in SERA if absolutely necessary in the interests of safety; and
- > Before a flight the PIC shall be familiar with all available information appropriate to the intended operation. Preflight action for flights away from the vicinity of an aerodrome and for all IFR flights shall include careful study of available weather reports and forecasts, considering fuel requirements and an alternative course of action if the flight cannot be completed as planned.

Use of Psychoactive Substances

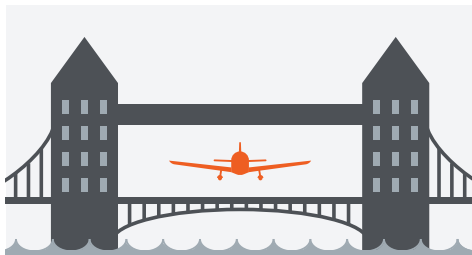
No person whose function is critical to the safety of aviation (safety-sensitive personnel) shall undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired. No such person shall engage in any kind of problematic use of substances.

RULES FOR THE PROTECTION OF THIRD PARTIES

Adherence to these rules is primarily to protect people or property on the ground from aircraft operations.

Negligent or reckless operation

- > Do not fly in a manner that would endanger either people or property.



AIRSPACE

Essential Rules of the Air

RULES FOR THE PROTECTION OF THIRD PARTIES

Low flying and congested areas

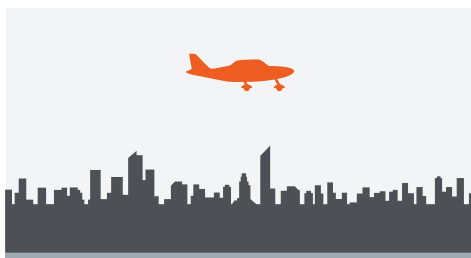
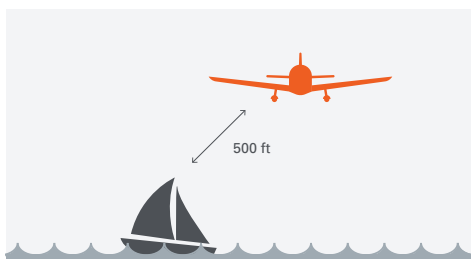
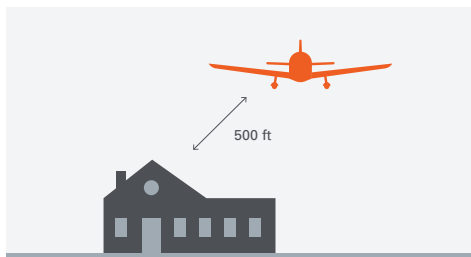
- > Unless necessary for taking off or landing, do not fly closer than 500 ft to any person, vessel, vehicle or structure.¹

There are some **UK-specific** exceptions to the above that permit certain manoeuvres (other than take-off or landing) to be conducted closer than permitted under the general 500 ft rule. These include:

- > Practising approaches at an aerodrome, but without intending to land;
- > Helicopters practising manoeuvres within the boundaries of an aerodrome, provided they do not come within 60 meters of a person, vessel, vehicle or structure that is outside the aerodrome boundary;
- > Picking up or dropping of towing apparatus at an aerodrome;
- > Gliders hill soaring; or
- > If permission has been issued by the CAA for specific circumstances or events – such as for an air display.

Full details can be found in the ORS4 section within the CAA website www.caa.co.uk/ors4.

- > Unless necessary for taking off or landing, do not overfly congested areas or open-air assemblies of people below a height that in the event of an emergency occurring, would permit a landing to be made without causing a hazard to people or property on the ground.



¹The standard rule under SERA for a VFR flight is to not fly below **500 ft above ground level**, unless taking off or landing, so when flying in Europe be aware that this requirement may apply.

AIRSPACE > RULES FOR PROTECTING THIRD PARTIES

Essential Rules of the Air

- > Unless necessary for taking off or landing, when flying over congested areas or open air assemblies of people, you must not fly lower than 1000 ft above the highest obstacle within 600 m of the aircraft.

There are some **UK-specific** general permissions that allow aircraft to fly below 1000 ft above the highest obstacle within 600 m of the aircraft:

- > If following a specific route published in the AIP (for example the low level VFR routes near Manchester and Liverpool's airspace) and complying with the specific conditions associated with that route;
- > Flying under a Special VFR clearance; or
- > A balloon that becomes becalmed while over a congested area and is compelled to land as a result.

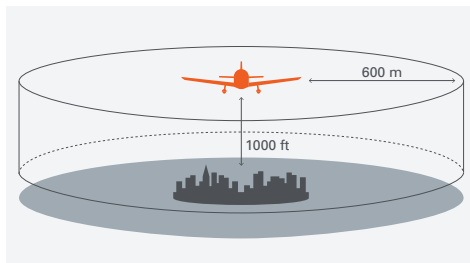
You must still be able to land in the event of an emergency without causing hazard to people or property on the ground.

Full details can be found in the ORS4 section within the CAA website www.caa.co.uk/ors4.

Guidance



In the event of an engine failure, single engine aircraft should be able to glide clear of any congested areas. You should not rely on being able to land in parks or other open spaces within congested areas, since there may be people on them.



The UK Rules of the Air Regulations 2015 also specify that you must not:

- > Take-off or land within a congested area, unless either at an aerodrome and in accordance with procedures in the AIP, or at a site other than an aerodrome with the specific permission of the CAA;
- > Take-off or land within 1,000 m of an open air assembly of more than 1,000 people, unless in accordance with procedures in the AIP (some large events will have specific procedures for the takeoff and landing of helicopters) and with the written permission of the organiser of the assembly;
- > Carry out aerobatic flights over congested areas; or
- > Carry out test or experimental flying over congested areas in an aircraft that does not have a valid certificate of airworthiness.

There are specific procedures for balloons taking off and landing in congested areas. Full details can be found in the ORS4 section within the CAA website www.caa.co.uk/ors4.

Note: Aircraft on a national permit to fly may be additionally restricted from flying over congested areas by the conditions of their permit. Generally this is not the case for most light aircraft up to about 1500 kgs; however the conditions of the permit should always be checked.

Note: 'Congested area' in relation to a city, town or settlement, is any area which is substantially used for residential, industrial, commercial or recreational purposes.

AIRSPACE

Essential Rules of the Air

RULES FOR THE PREVENTION OF COLLISIONS

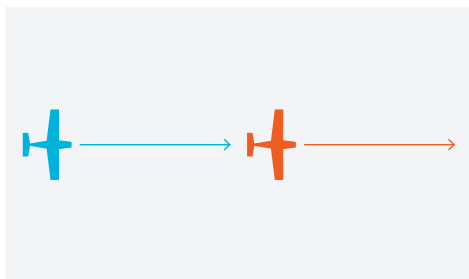
The following rules are primarily to avoid collisions between aircraft. They represent the standard actions and priorities that you should adhere to. If a situation dictates that avoiding immediate danger would be better achieved by an alternative course of action, you may do so without fear of retribution.

Proximity of aircraft

- > Do not intentionally fly close to other aircraft so as to cause a collision hazard.

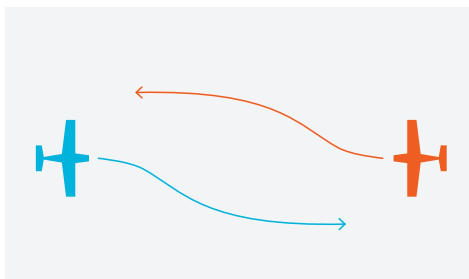
This does not preclude formation flying agreed between the PIC of each aircraft prior to flight.

SERA does contain specific rules regarding formation flying, but they are considered too specialised to reproduce here.



Rights of way in the air

- > If approaching another aircraft head on, such that there is a risk of collision, both aircraft shall turn right to avoid each other; and
- > If converging with another aircraft, the aircraft that has the *other* on its right must give way.

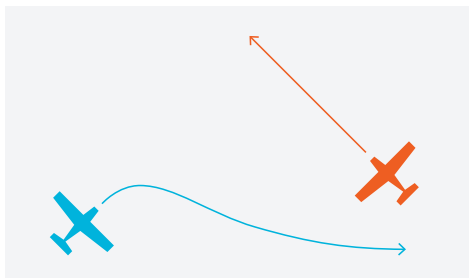


Head-on: Alter course to right

Guidance



If imagining the situation viewed from above, this could be thought of as "on the right, in the right".



Converging: On the right, in the right

AIRSPACE > RULES FOR THE PREVENTION OF COLLISIONS

Essential Rules of the Air

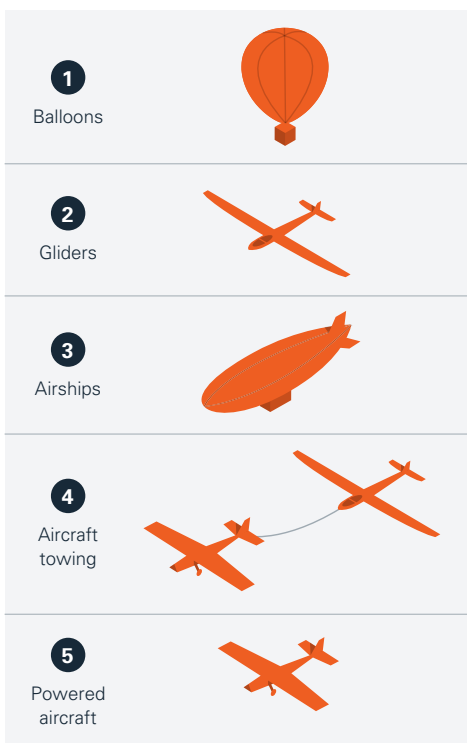
The exception to this is when aircraft of different categories are converging, and priority should be afforded in the following order:

- > Powered, heavier-than-air, aircraft (for example aeroplanes or helicopters), must give way to airships, gliders and balloons;
- > Airships must give way to gliders and balloons;
- > Gliders must give way to balloons; and
- > Powered aircraft must give way to aircraft that are towing other aircraft or objects.

Guidance ?

There used to be a rule in the UK Rules of the Air that stated aircraft following a line feature such as a road, railway or coastline, must fly to the right of that feature.

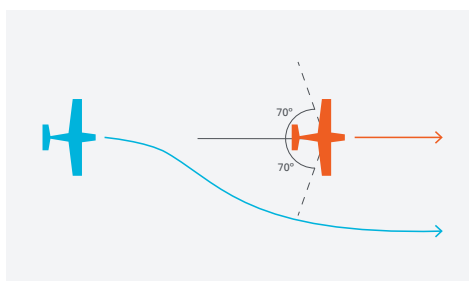
This is no longer a mandatory rule, however it is still considered good practice, particularly if following the coast.



- > When one aircraft is overtaking another, the aircraft *being overtaken* has right of way. Overtaking aircraft shall pass to the right, and keep clear of the other aircraft until the manoeuvre is complete.

An overtaking situation exists when an aircraft is approaching from behind another aircraft, and is within an angle of 70° from either side of its extended centre line.

Sailplanes may pass to either the left or right, but the principle that the aircraft *being overtaken* has right of way remains the same.



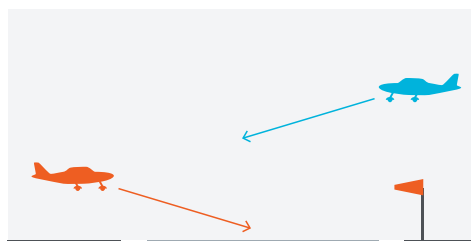
Overtaking: Overtake to right

AIRSPACE > RULES FOR THE PREVENTION OF COLLISIONS

Essential Rules of the Air

- > An aircraft in flight, or operating on the ground or water, shall give way to aircraft that are landing or in the final stages of an approach to land.

When two aircraft are approaching an aerodrome for landing, the one at a lower height shall have priority. This rule should not be used to cut in front of another aircraft that is already established on final approach. Powered aircraft shall give way to gliders when landing.

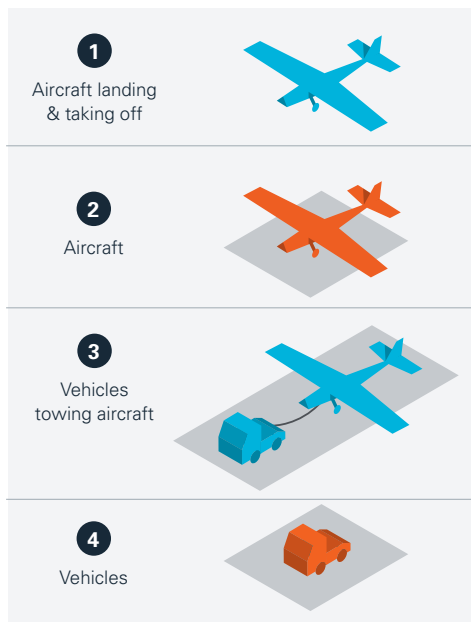


Landing: Blue aircraft gives way

- > If an aircraft is compelled to land due to an emergency, other aircraft must give way to it.
- > An aircraft taxiing on the manoeuvring area of an aerodrome shall give way to aircraft taking off or about to take off.

Rights of way on the ground

- > If approaching another aircraft head on, such that there is a risk of collision, both aircraft shall stop and turn right to avoid each other.
- > If converging with another aircraft, the aircraft that has the *other* on its right must give way. 'On the right, in the right.'
- > When one aircraft is overtaking another, the aircraft *being overtaken* has right of way. On the ground, overtaking aircraft may pass to the left or right.
- > Emergency vehicles proceeding to the assistance of an aircraft in distress have priority over all other surface traffic.
- > Vehicles and vehicles towing aircraft must give way to aircraft.
- > Vehicles must give way to vehicles that are towing aircraft.



AIRSPACE

Visual and instrument flight rules

Key info



Under SERA, all flying is conducted in accordance with either the:

- > Visual Flight Rules (VFR); or
- > Instrument Flight Rules (IFR).

VFR

You may fly under visual flight rules when in 'visual meteorological conditions' (VMC). Flying under VFR essentially means you may fly and manoeuvre as you wish, subject to the terms of any clearances to enter controlled airspace that may be required and compliance with the rules for the protection of third parties and prevention of collisions.

The presumption of VFR flight is that you have enough visibility to control the aircraft by visual references and avoid collisions with other aircraft.

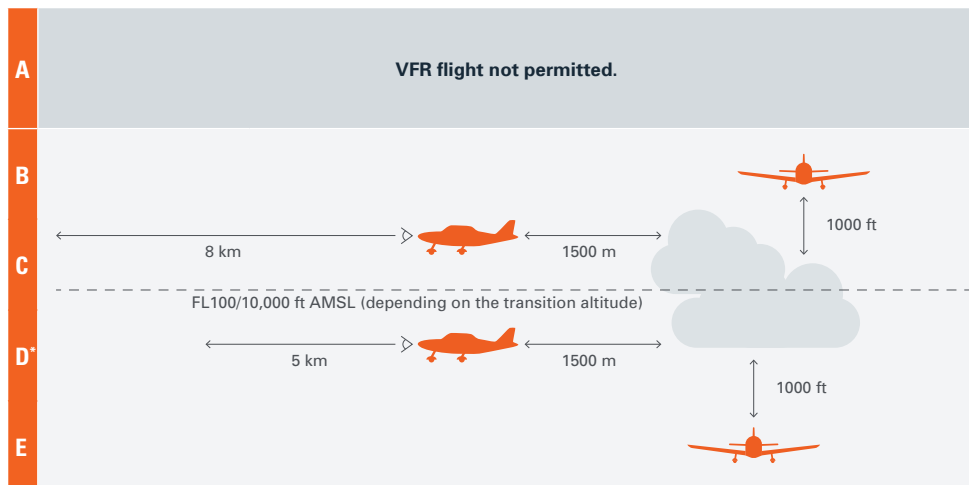
Generally the VMC minima correspond to the amount of visibility and clearance from cloud required to avoid other traffic in the different classifications of airspace. For example in Class E airspace, the cloud separation requirements are designed to prevent IFR traffic encountering VFR traffic very close to clouds.

Full details of the airspace classifications used in the UK can be found [on p.64](#). The table below details the SERA VMC minima.



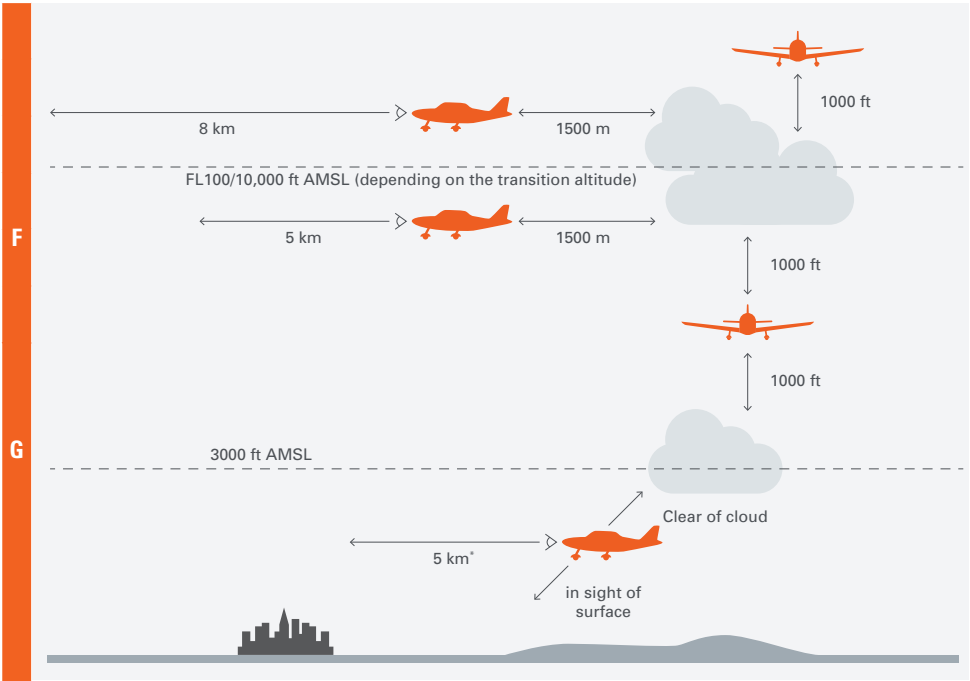
ENR 1.2 of the AIP contains more details on the VFR and IFR. ENR 1.7 and 1.8 should also be checked for state specific variations.

SERA VMC MINIMA



***Class D exemption:** There will be an amendment to SERA in the UK on 20th May 2021 which allows aircraft to fly 'clear of cloud' in class D airspace rather than complying with the specified cloud separation distances. This will only apply if flying by day at or below 3000 ft AMSL, in sight of the surface and at 140 kts IAS or less. 5 km visibility is still required, except for helicopters for which 1500 m is required.

Visual and instrument flight rules



Altitude band	Airspace class	Flight visibility	Distance from cloud
At and above 10,000 ft AMSL/FL100	A B C D E F G	8 km	1,500 m horizontally 1,000 ft vertically
Below 10,000 ft AMSL/FL100 and above 3,000 ft AMSL, or above 1,000 ft above terrain, whichever is the higher	A B C D E F G	5 km	1,500 m horizontally 1,000 ft vertically
At and below 3,000 ft AMSL, or 1,000 ft above terrain, whichever is the higher	A B C D** E	5 km	1,500 m horizontally 1,000 ft vertically
	F G	5 km*	Clear of cloud and with the surface in sight

***5 km:** In the UK this may be reduced to 1500 m if flying by day, in sight of the surface and at 140 kts IAS or less. May vary in other states.

****Class D exemption:** There will be an amendment to SERA in the UK on 20th May 2021 which allows aircraft to fly 'clear of cloud' in class D airspace rather than complying with the specified cloud separation distances. This will only apply if flying by day and at or below 3000 ft AMSL, in sight of the surface and at 140 kts IAS or less. 5 km visibility is still required, except for helicopters for which 1500 m is required.

AIRSPACE > VFR

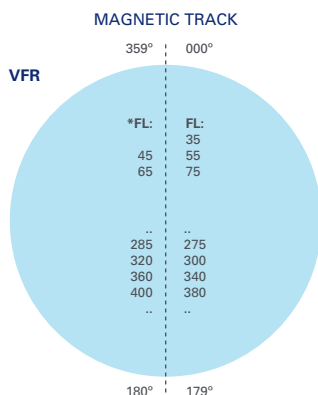
Visual and instrument flight rules

In addition to the VMC minima, VFR flights must also comply with the following:

- > A VFR flight may not take-off or land at an aerodrome within a control zone (CTR), or enter the aerodrome traffic zone or circuit when the reported conditions at that aerodrome are less than:
 - > cloud ceiling of 1500 ft; or
 - > ground visibility of 5 km.

This applies regardless of the CTR's airspace classification. If these conditions are not met, you may request a Special VFR clearance instead ([see p.62](#)).

- > Unless authorised, VFR flights may not operate above FL195 or at transonic or supersonic speeds.
- > In the UK, there is no requirement for VFR flights to fly at a particular altitude dependent on the aircraft's magnetic track. However in SERA, there are specified cruising levels for VFR flights more than 3000 ft above ground level (AGL). These may apply in other European states. For reference, these levels are set out here:



*If below the transition altitude, the levels should be flown as altitudes, such as 3500 ft, 4500 ft and so on.

VFR at night

Under SERA, VFR flights at night are subject to additional requirements over those for day.

They must also be authorised by the relevant state. Normally details of this can be found in ENR 1.2 of the AIP. The UK allows VFR at night in accordance with a general permission. Full details can be found in the ORS4 section within the CAA website www.caa.co.uk/ors4.

For VFR flights at night:

- > The in-flight visibility and cloud separation requirements are the same as by day, except that the reduced visibility minima of 1500 m in class G airspace is not permitted.
- > The cloud ceiling must be 1500 ft or more.
- > When at or below 3000 ft AMSL, or 1,000 ft above terrain, whichever is the higher, you must be in sight of the surface, in all airspace classifications.
- > You must fly at a level not less than 1000 ft above the highest obstacle within 8 km (5 NM) of the aircraft's position, except that under the UK permission, when at or below 3000 ft AMSL, you may fly:
 - > In sight of the surface;
 - > At a height of not less than 500 ft above the ground or water, or 500 ft above the highest obstacle within a radius of 500 ft from the aircraft; and
 - > At a height not less than 1,000 ft above the highest obstacle within a radius of 600 m from the aircraft when over the congested areas of cities, towns or settlements or over an open-air assembly of persons.

Guidance ?

Enroute obstacles that are 150 m (490 ft) above ground level or higher must be lit at night. This is normally by a steady red light on the highest point.

AIRSPACE > VFR

Visual and instrument flight rules

- > If leaving the vicinity of the aerodrome, a flight plan must be submitted. This may be an abbreviated plan submitted to an ATSU.
- > If an ATS is available, you must make use of it.

Special VFR

Special VFR (SVFR) is a provision that allows flight in a control zone (CTR) when conditions are below VMC minima, but without having to comply with the IFR. SVFR clearances are subject to the availability of ATC separation and consequently pilots may experience a delay in receiving a SVFR clearance. ATC provide separation between IFR flights and SVFR flights, and between SVFR flights.

The minimum permitted weather conditions for a pilot to accept a SVFR clearance from ATC are:

- > Clear of cloud and in sight of the surface;
- > In flight visibility of not less than 1500 m, or 800 m in the case of a helicopter; and
- > 140 kts or less indicated airspeed.

Additionally, in order for ATC to issue a clearance to take off or land at an aerodrome within the control zone, the reported conditions at that aerodrome must not be less than:

- > Ground visibility of 1500 m, or 800 m in the case of a helicopter; or
- > Cloud ceiling of 600 ft.

Guidance ?

If you wish to obtain a SVFR clearance to arrive or depart at a secondary aerodrome within a CTR, that does not have meteorological reporting capability, you may assess the above minima and request a SVFR clearance if you reasonably believe they are met. When assessing the conditions, you should take in account the conditions reported at the CTR's parent aerodrome.

Some GA aerodromes or routes within the CTR of a larger aerodrome have Special VFR permissions in place that allow flight within local areas without the need for individual SVFR ATC clearances.

Special VFR at night

Under SERA, Special VFR at night must be specifically permitted by individual member states. Special VFR at night is permitted in the UK.

For other states, ENR 1.2 of the relevant AIP should be checked.

*If below the transition altitude, the levels should be flown as altitudes, such as 3000 ft, 4000 ft and so on.

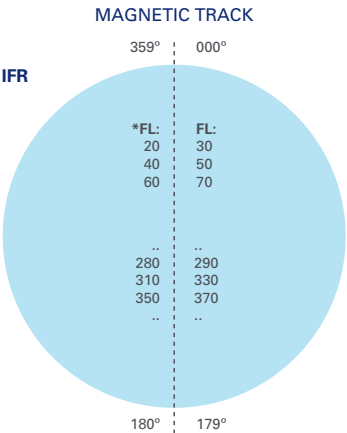
Visual and instrument flight rules

INSTRUMENT FLIGHT RULES

You must fly under IFR if conditions are below the VMC minima for the airspace being flown in (unless in a CTR and in receipt of a SVFR clearance). In the case of class A airspace, flight must always be conducted under IFR. In order to fly under IFR you must hold a valid instrument qualification.

The IFR require you to:

- > Except when necessary for take-off or landing, fly at a level at least 1000 ft (2000 ft in mountainous areas) above the highest obstacle located within 8 km (5 NM) of the aircraft.
- > When flying outside controlled airspace, fly in accordance with the IFR cruising levels. In the UK these only apply above 3000 ft AMSL:



AIRSPACE

Airspace classifications

Airspace is organised into different classifications A-G. The characteristics of these, including the applicable VMC minima, are set by the International Civil Aviation Organisation (ICAO) and applied in Europe under SERA. In the UK, classifications A, C, D, E and G are used. The vast majority of the UK is class G, with the controlled airspace classifications used for terminal and enroute airspace. The table below explains the characteristics of airspace classifications, as implemented in the UK.

CONTROLLED AIRSPACE

LID A FL46+	A	Where	Most airways; London/Manchester TMAs.
		Flight Rules	IFR only, VFR flight not permitted.
		Clearance	ATC clearance required.
		Air Traffic Service	Air Traffic Control service for all flights.
		Separation	Separation provided between all flights.
CTR C 5000-FL195	C	Where	Mostly above FL195 and some airways.
		Flight Rules	IFR and VFR permitted. In UK VFR is generally not permitted above FL195. Specific arrangements for glider operations in TRAs apply.
		Clearance	ATC clearance required.
		Air Traffic Service	Air Traffic Control service for all flights.
		Separation	Separation provided between IFR flights and between IFR flights and VFR flights. VFR flights are provided with traffic information. Traffic avoidance advice is available on request to VFR flights on other VFR flights.
CTR D 2000-3000	D	Where	Most aerodrome CTRs and CTAs. Some TMAs and lower levels of selected airways.
		Flight Rules	IFR and VFR flight permitted. SVFR permissible in CTRs.
		Clearance	ATC clearance required.
		Air Traffic Service	Air Traffic Control service for all flights.
		Separation	Separation provided between IFR flights, between SVFR flights, and between IFR and SVFR flights. VFR flights are not provided with separation but are provided with traffic information. Traffic avoidance advice is available on request to IFR flights on VFR flights and to VFR flights on IFR and other VFR flights.
TMA E 2000-6000	E	Where	Scottish airways and some CTAs.
		Flight Rules	IFR and VFR flight permitted.
		Clearance	ATC clearance not required for VFR flight, pilots encouraged to contact ATC.
		Air Traffic Service	Air Traffic Control Service provided to IFR flights and UK Flight Information Services (see p.75) (FIS) are available to VFR flights.
		Separation	Separation provided between IFR flights. VFR flights are not required to receive an Air Traffic Service and are not provided with separation. IFR flights may receive information on known VFR traffic.

OUTSIDE CONTROLLED AIRSPACE

G FL35-FL125	G	Where	'Open FIR'.
		Flight Rules	IFR and VFR flight permitted.
		Clearance	ATC clearance not required.
		Air Traffic Service	UK FIS (see p.75) may be available. All traffic may receive Basic or Traffic services. IFR traffic may additionally receive a Deconfliction service.
		Separation	No separation provided. Traffic information or collision avoidance may be received in accordance with the UK FIS service provided.

AIRSPACE

Airspace hazards and restrictions

Guidance ?

Other than compliance with the Rules of the Air, VFR operation in class G and E airspace is generally without restriction. However, the freedom to manoeuvre and navigate at will also brings the responsibility to fly in a manner that minimises hazard and inconvenience to others.

There are many different users of uncontrolled airspace, powered or unpowered, civil or military, GA or commercial air transport. They all have different operational needs, but share a common interest of flying safely.

The following section describes some of the main airspace hazards and restrictions GA pilots should be aware of and how they are depicted on VFR charts. It is by no means exhaustive, and for details of particular sites or hazards, reference should be made to the information on the VFR chart and in the ENR section of the AIP.

Aerodrome traffic zones

An ATZ is normally a cylindrical block of airspace, established around an aerodrome, for which there will be an assigned radio communication frequency. An ATZ extends 2000 ft above the ground level of the aerodrome and has a radius of:

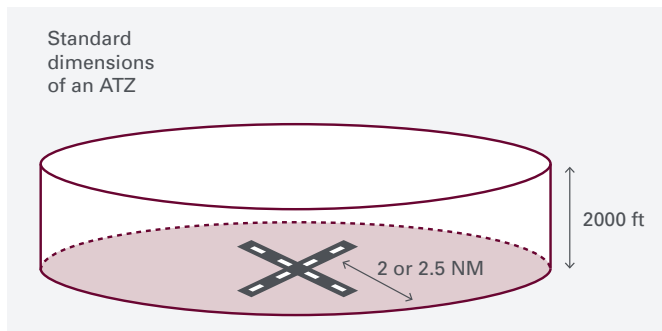
- > 2 NM when the longest runway is 1850 m or less;

- > 2.5 NM when the longest runway is more than 1850 m.

The details of how to operate correctly within an ATZ when landing or departing at an aerodrome are addressed in the 'Aerodrome Operations' chapter ([see p.93](#)).

Sometimes you may wish to cross an ATZ during enroute flight (for example the cloud base may prevent flight above the vertical limit of the ATZ). It is perfectly acceptable to cross an ATZ provided you announce your intentions or gain permission (if there is an air traffic control service provided within it) and do not cut across circuit traffic. Ideally, any transit should be done above circuit height. If you are unsure as to whether you can avoid traffic already in the ATZ, fly around instead.

- > The Rules of the Air Regulations 2015 require aircraft to announce their entry and exit (including height) of an ATZ during the hours of watch of the relevant A/G or AFIS station, and obtain information from the A/G or AFIS for the safe operation of the flight within the ATZ.
- > Flight within an ATZ for which an aerodrome control service is active requires permission from the relevant ATSU.



2 NM ATZ shown with aerodrome symbol

AIRSPACE

Airspace hazards and restrictions

MILITARY AIR TRAFFIC ZONES

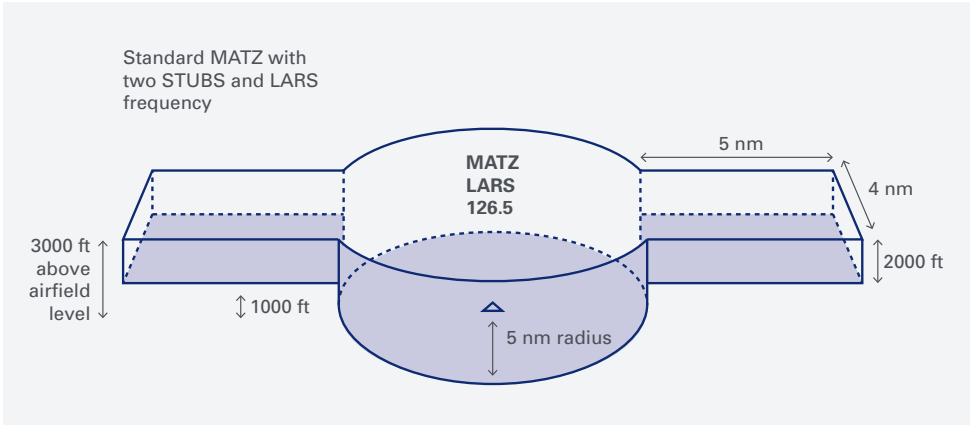
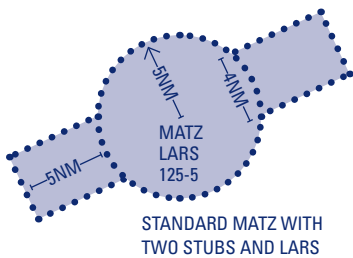
A MATZ is not controlled airspace but an area established around a military aerodrome designed to protect traffic flying in the vicinity. It is not actually a requirement to be “cleared” into a MATZ as such; but it is good airmanship to contact the relevant ATSU if intending to enter. A MATZ will contain an ATZ within it, for which the normal rules for an ATZ apply.

Aircraft operating near military aerodromes are not confined to the MATZ. This could include aircraft approaching to land or operating in what is known as the ‘radar training circuit’ (RTC). The RTC is a relatively standard pattern flown by aircraft around the aerodrome for the purpose of practising radar approaches.

The standard RTC sequence is:

- > Take off and climb to a height of between 1500 ft and 2500 ft;
- > Vectoring around the pattern;
- > Alignment and descent with the final approach track and glidepath; and
- > Landing or low approach and go-around.

This could take place either as a left or right hand pattern. It is primarily the downwind and base leg elements of which protrude beyond the extremities of the MATZ, so it is a good idea to contact the relevant MATZ frequency if transiting these areas, even if you are not penetrating the MATZ itself.



AIRSPACE > MILITARY AIR TRAFFIC ZONES

Airspace hazards and restrictions

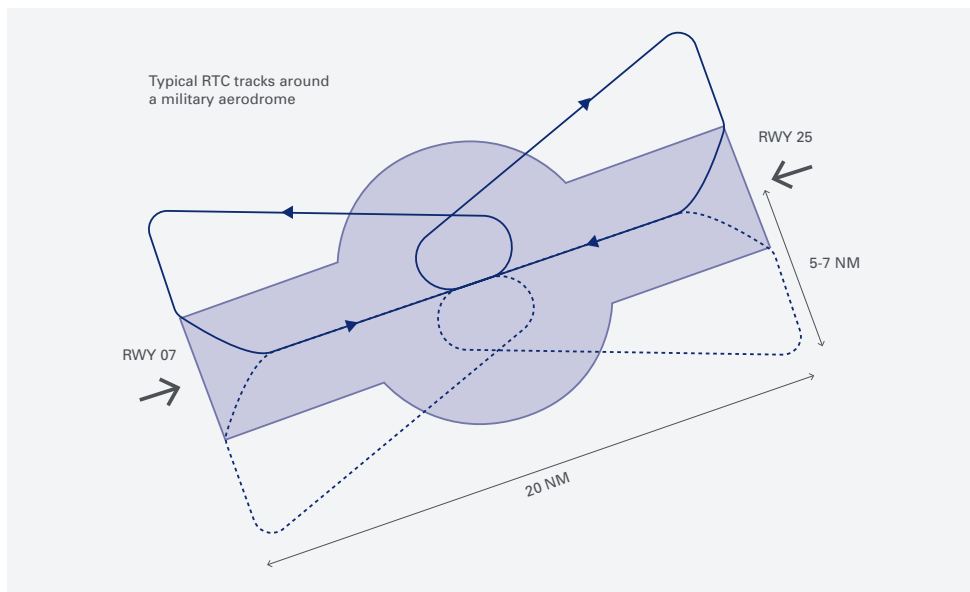
In addition to traffic in the RTC, arriving aircraft joining the final approach track may come from any direction, but similar to the RTC pattern, will likely be vectored onto a 90° base leg and then a 40° intercept angle to join the final approach track.

Fast jet traffic will often approach aerodromes at high speed and therefore need a large turn radius to line up with the runway. The final approach may therefore commence outside of the MATZ. This is then followed by a 'run and break' manoeuvre to lose speed and a close-in circuit within the MATZ to land.


Crossing a MATZ

If you wish to cross a MATZ you should contact the assigned frequency prior to entry and request a "MATZ penetration service" with your proposed route. The controller may ask if you can adopt a different route or altitude that would enable better separation with other activity in the MATZ. You should accommodate if possible. The most important thing is that the controller is now aware of you and your intentions. Use the standard 'freecall' ([see p.76](#)) format for initiating contact, adapted as required.

MATZ are often inactive at weekends, although you should always attempt a call to check the status. If there is no response from the assigned frequency after two attempts you may enter with caution, however you should never enter the ATZ within the MATZ without a positive clearance since there may be traffic within it on a different frequency.



Airspace hazards and restrictions

MATZ crossing exchange	
The following gives an outline of a typical radio exchange for a MATZ penetration. For more details of radiotelephony (RT) procedures please see CAP 413 – www.caa.co.uk/cap413 , which is the authoritative guide to RT procedures in the UK.	
Explanation	Example exchange
<p>Commencing the call with the request gives the controller the opportunity to consider whether they can immediately respond to it or whether to instruct the caller to “standby”.</p> <p>It also allows them to consider what information will need to be passed back to the aircraft before having to process the entire message – for example most stations will have a particular series of squawk codes to be given out depending on what service is being provided to the aircraft.</p>	<div><p>“Boscombe Zone, G-DOME, request MATZ penetration.”</p></div>
<p>Assuming the controller is ready to process your request, they will likely respond by asking to “pass message”.</p> <p>If they reply “standby” there is no need to acknowledge this, they will try and call you when they are able. It does not imply a rejection of your request; it just means they are not able to immediately respond to it.</p>	<div><div></div><p>“G-DOME, Boscombe Zone, pass your message.”</p></div>
<p>Use the standard “freecall” format to tell the controller what you are doing.</p>	<div><div></div><p>“G-DOME, PA28 from Old Sarum to Bristol overhead Alderbury, altitude 2200 ft, QNH 1009, VFR, direct track Bristol.”</p></div>
<p>Note that the giving of a squawk code does not necessarily mean that you have been identified. It may be a generic squawk for all traffic receiving a ‘Basic Service’ on that frequency.</p>	<div><div></div><p>“G-ME, roger, squawk 2650, Basic Service.”</p></div>
<p>Service level and squawk codes must always be read back by the aircraft.</p>	<div><div></div><p>“Squawk 2650, Basic Service, G-ME.”</p></div>
<p>When crossing a MATZ you will normally be given the aerodrome QFE to set, since the vertical dimensions of the MATZ are defined relative to the aerodrome elevation.</p>	<div><div></div><p>“G-ME, MATZ penetration approved at 1800 ft on Boscombe QFE 997 hectopascals, report entering the MATZ.”</p></div>

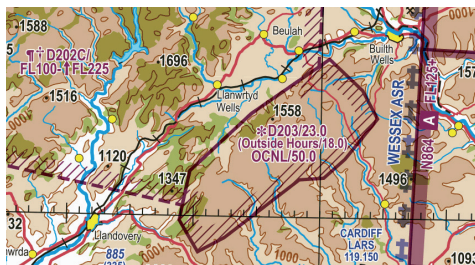
MATZ crossing exchange

AIRSPACE

Airspace hazards and restrictions

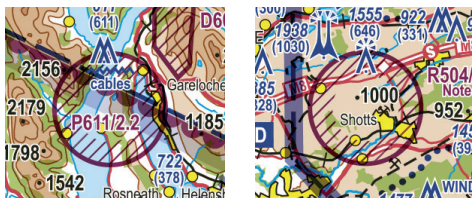
DANGER AREA

- > A danger area is a published area within which activity hazardous to aviation may be encountered. Flight within danger areas may be prohibited by local bylaws.
- > Danger areas normally have periods within which they are active – details of activity periods can normally be found in ENR 5.1 of the AIP. There is often a frequency and/or telephone number in the notes of the VFR chart from which the status of the danger area may be obtained. The status can sometimes also be obtained from either a local ATC unit or London/Scottish Information, as applicable to the region.
- > If unauthorised entry to a danger, restricted or prohibited area is detected, red and green pyrotechnic may be fired from the ground to warn the aircraft.
- > Some also offer a 'danger area crossing service', which may allow a tactical crossing clearance to be issued. Details can be found in the AIP or on the notes of the VFR chart.
- > If it can be established that the DA is 'cold' or a crossing service is available, then this can avoid unnecessary diversions around large DAs. In if doubt, remain outside. Danger areas with a broken boundary are activated by NOTAM.



PROHIBITED OR RESTRICTED AREAS

- > A prohibited area is an area within which flight is entirely prohibited.
- > A restricted area is an area within which some flying is restricted – for example, sometimes they only apply to certain categories of aircraft. These conditions can be found in the notes of the VFR chart and in ENR 5.1 of the AIP.
- > The altitude to which they extend is stated in thousands of feet AMSL. '2.2' is therefore 2200 ft.



WIND TURBINES

- > Careful consideration must be taken when operating near wind turbines since older units may not be lit in accordance with recent CAA policy guidelines.
- > Some LED obstacle lights fall outside the spectrum of night-vision goggles, therefore pilots using goggles should use extra caution when flying in the vicinity of obstacles to ensure that the required obstacle clearance is provided.
- > Remember the numerals in italics indicate elevation of top of obstacle above means sea level. Numerals in brackets indicate height of top of obstacle above local ground level.



AIRSPACE

Airspace hazards and restrictions

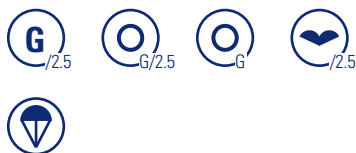
GLIDER AND PARACHUTE SITES

Guidance ?

You should never overfly a glider site below the specified winch launch altitude. You may encounter a vertical winch cable.

- > Winch launching involves the glider being launched by a cable from the ground. The cable tows the glider to flying speed along the ground and continues to pull it forward once airborne, giving a very steep climb angle. The winch cable is then released when the glider has reached sufficient altitude.
- > Glider sites with winch launching activities are marked on charts with a maximum altitude to which winch launches take place in thousands of feet. '2.5' indicates 2500 ft AMSL.
- > Where there is gliding without winch launching, there is no altitude displayed. In these cases the gliders are most likely launched by aero tow, meaning you may encounter aeroplanes towing gliders near the site. Aerotowing and winch launching activities often take place at the same site.
- > Pilots of powered aircraft should also be aware that gliders often congregate at locations well away from the launching site. On good 'thermaling' there may be many in a concentrated area. If you can see one, there will likely be others about. Remember that under the Rules of the Air, powered aircraft must give way to gliders and other powered aircraft towing gliders.

- > Parachuting sites may be active up to FL150. You should give them a wide berth unless you are able to confirm they are inactive through contact with the relevant ATSUs or drop zone frequency. Details of drop zone contact details can be found in ENR 5.5 of the UK AIP.



AREAS OF INTENSE AERIAL ACTIVITY

- > Within these areas very high levels of both civil and military aviation activity may take place. This might include low flying military aircraft and/or aircraft performing high energy manoeuvres. There is normally a radar service available in these areas, which pilots are strongly encouraged to make use of.
- > Aerial Tactics Areas (ATAs) are also marked in the same way. The same principles apply, although the traffic encountered is more likely to be manoeuvring military aircraft.



AIRSPACE

Airspace hazards and restrictions

INSTRUMENT APPROACHES

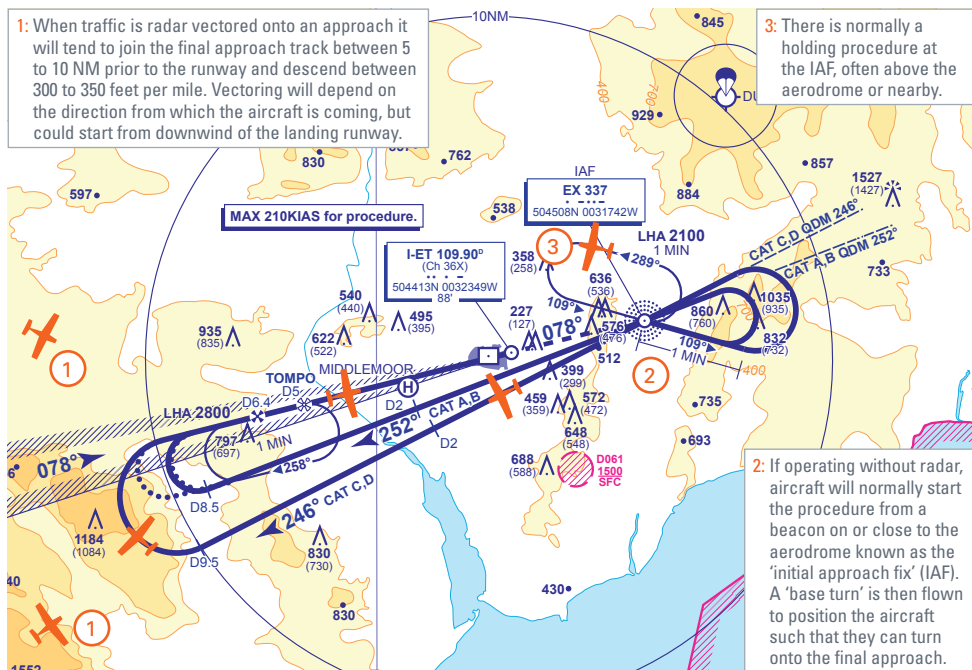
Some aerodromes outside controlled airspace have instrument approach procedures (IAPs). These are defined sequences of waypoints that guide aircraft to the final approach track. Details of IAPs can be found in entries for individual aerodromes in AD of the [AIP](#).

They are often used in VMC, especially by commercial air transport aircraft and those conducting instrument training.

Larger commercial air transport traffic will have reduced capability to 'see and avoid' due to the limitations of visibility from the cockpit. Aircraft also tend to descend further away from the aerodrome and make larger radius turns when conducting IAPs than they would when making a visual approach.

VFR traffic operating near aerodromes outside controlled airspace should be aware that there may be instrument traffic using IAPs and should avoid crossing them at similar altitudes to that of the procedure, unless talking to the relevant ATSU.

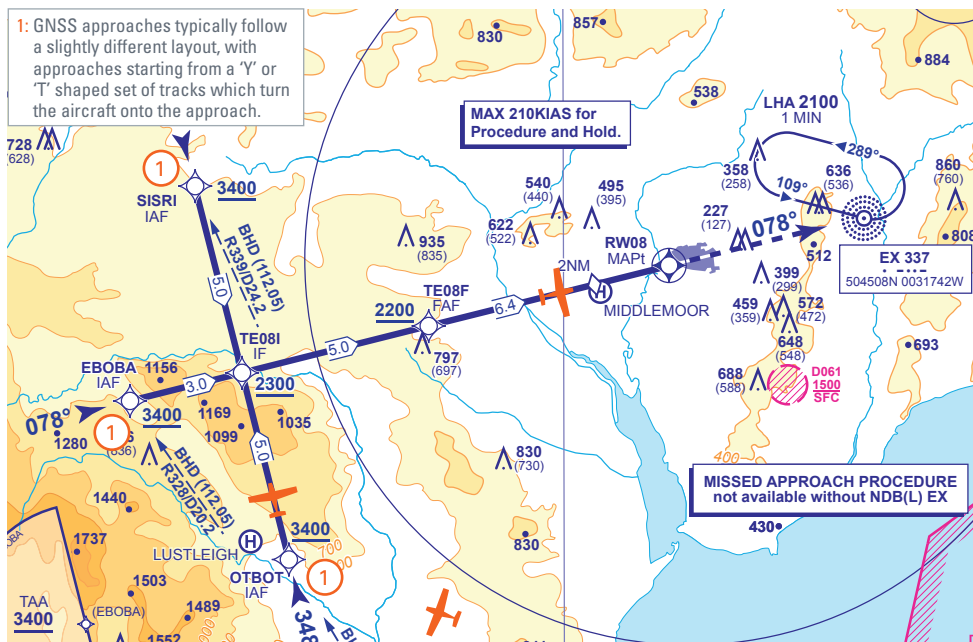
IAPs outside controlled airspace are indicated by 'feathered arrows'. Note they only align with the main instrument runway. There may also be approaches to other runways as well. Pilots are recommended to contact the aerodrome ATSU if flying within 10 NM of an aerodrome marked with such feathers.



A typical Instrument Landing System (ILS) approach established outside controlled airspace. In this case Exeter airport.

AIRSPACE > INSTRUMENT APPROACHES

Airspace hazards and restrictions



A typical RNAV (GNSS) approach established outside controlled airspace. In this case Exeter airport.

MILITARY LOW FLYING SYSTEM

Military low flying takes place across the whole of the UK, below 2000ft AGL and routinely as low as 250ft (100ft in Tactical Training Areas) AGL for fixed wing aircraft and the surface for light aircraft and helicopters. There is an increased likelihood of encountering military aircraft in areas of intense aerial activity or aerial tactics areas, although low flying aircraft are not confined to these areas.

The highest concentrations tend to be below 1000 ft AGL, so GA pilots are strongly recommended to remain above this height during enroute flight.

The Ministry of Defence (MOD) publishes a monthly low flying tactical training area timetable which can be found on-line.

www.gov.uk/guidance/military-low-flying.

Airspace hazards and restrictions

UNMANNED AIRCRAFT SYSTEMS

The number of unmanned aircraft systems (UAS) or 'drones' operating in the UK is growing. The term UAS also includes traditional model aircraft flown by remote control.

UAS operations normally take place up to 400 ft and within visual line of site of the operator. The UAS operator is responsible for looking out for conflicting traffic, however pilots of manned aircraft should also be aware that their responsibility to 'see and avoid' other traffic includes unmanned aircraft, even if practice many will be small and difficult to spot.

GA pilots operating below 500 ft should be aware that encounters with legitimate UAS operations in the open FIR are a distinct possibility. There are also some model aircraft flying sites where operations are permitted up to 1,500ft AMSL – details are in ENR 5.5 of the [AIP](#). The sites are generally not marked on VFR charts, although may appear in flight planning applications and/or moving map devices with an aeronautical database.

UAS operations involving the aircraft operating beyond visual line of site of the operator will normally be segregated from manned air traffic by use of temporary danger areas or restricted airspace – the details of these will be published by NOTAM in the normal way for temporary regulated airspace.

Electronic Conspicuity (EC) systems that may allow UAS to detect and avoid other aircraft and share airspace with manned aircraft are under development and will likely emerge in the future. For more information on EC developments please [see page 130](#).

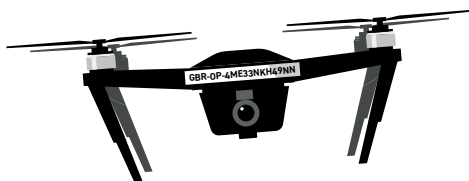
Emerging regulations require unmanned aircraft to be identified remotely by electronic means, in combination with a UAS registry database. The benefits include added security, higher safety standards, increased accountability, and easier access to airspace.

The principle of electronic identification (eID) is that a cooperative UAS regularly broadcasts a unique identifier and the current position through a radio frequency digital message. This enables authorized parties to detect, identify, locate and track UAS anywhere at any time, also in the absence of network connectivity or other infrastructure.

The Skyway Code does not address detailed rules for the operation of UAS – for more information about operating UAS see caa.co.uk/drones. The UAS community should consult the relevant CAA webpages and the complete set of CAP 722 publications.

CAP 722 is available at www.caa.co.uk/cap722.

The vast majority of UA operators and remote pilots must register with the CAA via the [DMARES Registration Page](#).



AIRSPACE

Air Traffic services outside controlled airspace

Pilots are encouraged to talk to appropriate ATSUs when flying outside controlled airspace. Situational awareness and safety may be enhanced by use of an air traffic service. In the UK, services may be available from:

- > Lower Airspace Radar Services (LARS);
- > Other ATSUs; and
- > Area Control Centre FIS – London or Scottish Information (Basic Service only).

Scottish and London Information do not have radar; the squawk code they give you is so that other radar units who may observe you know that you are talking to London or Scottish Information. They can therefore contact you via either London or Scottish – if for example you are about to infringe controlled airspace.

Collectively the air traffic services available outside controlled airspace are known as the UK Flight Information Services (FIS). Within the UK FIS there are distinct levels of service available to aircraft. Terrain avoidance remains the responsibility of the pilot.

Basic Service



A Basic Service is intended to offer the pilot maximum autonomy and is available to IFR flights in Class G airspace, or VFR flights in Class E and Class G airspace. If the ATCO or FISO are aware of airspace activity that may affect your flight they will tell you; however, this is subject to their workload and the avoidance of other traffic is solely the pilot's responsibility. **Maintain a good lookout.**

Traffic Service



Under a Traffic Service, an ATCO will use radar to provide you with detailed traffic information on specific conflicting aircraft; they will not provide you with deconfliction advice, regardless of your meteorological conditions. A Traffic Service is available to IFR flights in Class G airspace, or VFR flights in Class E and Class G airspace.

Deconfliction Service



Only available to IFR flights in Class G airspace. An ATCO will use radar to provide you with detailed traffic information on specific conflicting aircraft and advice on how to avoid that aircraft. However, the pilot retains responsibility for collision avoidance; you can opt not to follow the ATCO's advice.

Procedural Service

IFR only

A Procedural Service is an ATS for IFR traffic only. In addition to the provisions of a Basic Service, the controller provides restrictions, instructions, and approach clearances, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. The Procedural Service is typically provided by ATSUs without surveillance capability (eg radar) to IFR flights arriving or departing an aerodrome. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic.

More details of the UK FIS can be found in CAP 774 – www.caa.co.uk/cap774 and CAP 1434 – www.caa.co.uk/cap1434.

AIRSPACE

Air Traffic services outside controlled airspace

WHAT SERVICE TO ASK FOR?

- > It is common practice for GA pilots to request a Basic Service if operating in good VMC and a traffic service if in reduced visibility or entering IMC.
- > There can sometimes be a greater collision risk on good weather days since there is more traffic around. If you do not have any traffic awareness equipment on board the aircraft, you should consider requesting a Traffic Service, as see-and-avoid alone is known to be an imperfect means of detecting other aircraft.

REQUESTING A SERVICE


When operating under VFR you will often be calling enroute air traffic service units unannounced. This is known as a 'freecall'. There is a standard template for a freecall that can be varied for almost all requests that you will likely wish to make:

- > **Who you are and what you want** – call sign, aircraft type and request;
- > **What you are doing** – point of departure and destination, route or area of operation and/or intentions;
- > **Where you are** – position and altitude/level. Use a reference point such as a major town or aerodrome, that the controller will be able to identify; and
- > **What you want** – for example a 'Basic Service' or a controlled airspace transit.¹




¹Simple requests such as 'Basic Service' should be placed in the initial call, although you may need to give more information after the controller has asked you to 'pass your message'.

Requesting and receiving a 'Basic Service'

The following gives an outline of a typical radio exchange for requesting a Basic Service. For more details of radiotelephony (RT) procedures please see CAP 413 – www.caa.co.uk/cap413, which is the authoritative guide to RT procedures in the UK.

Explanation	Example exchange
<p>Commencing the call with the request gives the controller the opportunity to consider whether they can immediately respond to it or whether to instruct the caller to "standby".</p> <p>It also allows them to consider what information will need to be passed back to the aircraft before having to process the entire message – for example most stations will have a particular series of squawk codes to be given out depending on what service is being provided to the aircraft.</p>	 <p>"Boscombe Zone, G-DOME request Basic Service."</p>






Air Traffic services outside controlled airspace

Requesting and receiving a ‘Basic Service’	
Explanation	Example exchange
<p>Assuming the controller is ready to process your request, they will likely respond by asking to “pass message”.</p> <p>If they reply “standby” there is no need to acknowledge this: they will try and call you when they are able. It does not imply a rejection of your request; it just means they are not able to immediately respond to it.</p>	<div><p>“G-DOME, Boscombe Zone, pass your message.”</p></div>
<p>Use the standard “freecall” format, setting out more details of your flight. There is no need to repeat the original service request (e.g. for Basic Service).</p>	<div><p>“G-DOME, PA28, from Thruxton returning to Thruxton, intending to carry out general handling between Andover and Newbury. 2 NM north of Andover, altitude 2,300 ft, QNH 1023, VFR.”</p></div>
<p>Note that the controller has not identified the aircraft – this is not a requirement of providing a Basic Service. The code may be generic to all aircraft on a Basic Service from that unit, such that other units can identify who the aircraft is in contact with. Crucially it means that the controller will generally not be in a position to provide traffic information.</p> <p>Outside controlled airspace it is standard practice to give the regional pressure setting (RPS) (see p.86) when providing a service. You are not obliged to use this, and particularly if there is a risk of vertically infringing nearby airspace, you should ask for and set the relevant local QNH. The RPS will be lower and therefore under-read your actual altitude.</p>	<div><p>“G-ME roger, squawk 2650, Basic Service, Portland 1019, report general handling complete.”</p></div>

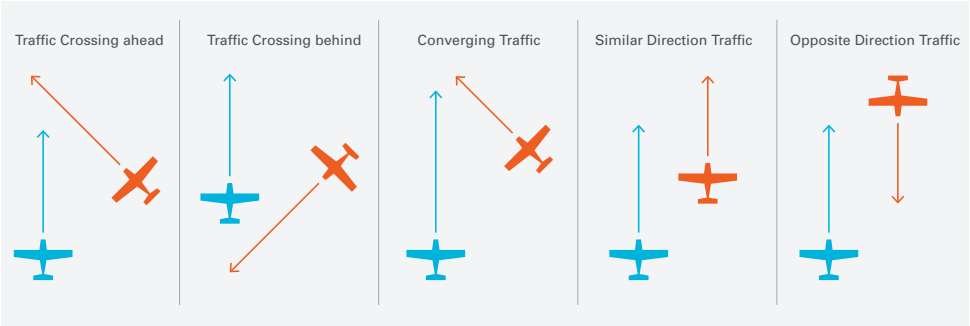
Air Traffic services outside controlled airspace

Requesting and receiving a ‘Basic Service’	
Explanation	Example exchange
<p>The type of service, pressure setting (even if you do not plan to use it) and squawk should be read back. Instructions to report at a particular point in the future can be acknowledged with “wilco” – meaning you will comply.</p> <p>Service, pressure setting, squawk and reporting instruction all in one call can be a mouthful – the controller may break this into two calls. If you do not catch everything, reply (for example) “say again squawk” or “say again all after pressure setting”, depending on what you did not hear the first time.</p> <p>You may abbreviate your callsign once the controller has done so.</p>	<div><p>“Squawk 2650, Basic service, Portland 1019, wilco, G-ME.”</p></div>
<p>When under a Basic Service the controller may pass information pertinent to the safe conduct of the flight. This is NOT specific traffic information; it is simply general information taking into account the area you have declared you are operating in and is subject to controller workload.</p>	<div><div></div><p>“G-ME, be aware there is a glider competition around Rivor Hill, large concentrations of gliders in the area up to 4000 ft.”</p></div>
<p>This can just be acknowledged.</p>	<div><div></div><p>“Roger, G-ME.”</p></div>
<p>Report as instructed.</p>	<div><div></div><p>“G-ME is general handling complete, returning to Thruxton.”</p></div>
<p>The controller will normally state the termination of the service and remind you to revert to squawking the relevant conspicuity code (VFR: 7000).</p>	<div><div></div><p>“G-ME roger, service terminated, squawk conspicuity.”</p></div>
<p>-</p>	<div><div></div><p>“Squawk conspicuity, G-ME”</p></div>

Air Traffic services outside controlled airspace

Traffic service	
The request for the service will be similar to that of the Basic, following the standard 'freecall' format – however you will be 'radar identified' and given traffic information in the following format.	
The standard format for calling traffic is position, range, relative movement and (if available) altitude. If the traffic is not transponding its altitude then the controller will not be able to pass this information.	 <div>"G-ME, traffic one o'clock, 4 miles, crossing right to left ahead, indicating 400 ft above."</div>
You may respond by saying "roger" while you look for the traffic.	 <div>"Roger, G-ME."</div>
It helps the controller if you report the traffic in sight and then they know they can prioritise calling other traffic. If after a period of looking you cannot see the traffic tell the controller "traffic not sighted".	 <div>"Traffic in sight, G-ME."</div>
If you lose sight of previously identified traffic, or simply want an update on the position of it, ask the controller for this.	 <div>"Traffic no longer in sight, G-ME."</div>
-	 <div>"G-ME, previously reported traffic now 10 o'clock, 2 miles, indicating 300 ft above."</div>

When passing traffic information the controller will use the following terms to describe the relevant movement:

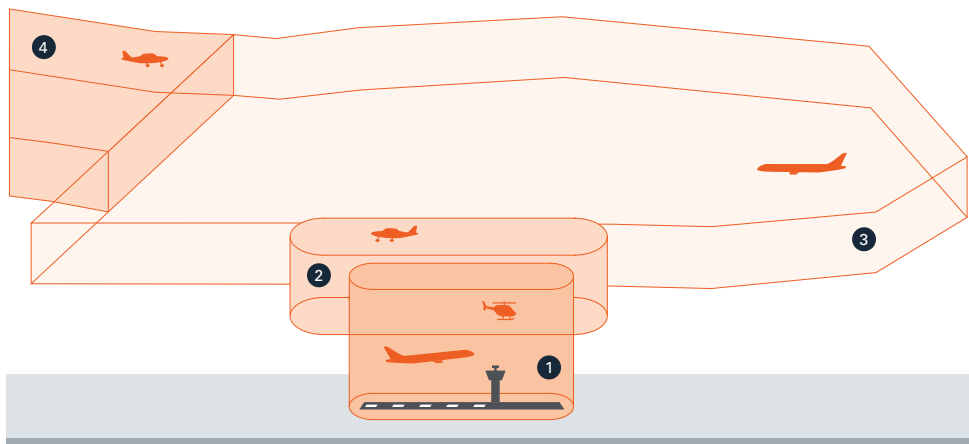


AIRSPACE

Controlled airspace operations

The [table on p.64](#) set out the clearance requirements for the different classifications of airspace. The vast majority of controlled airspace that GA pilots will encounter is class D. This is used in almost all control zones (CTRs) and control areas (CTAs) around aerodromes in the UK.

As well as the different classifications described earlier, controlled airspace is made up of different structures.



1 Control zone (CTR)

These are established around aerodromes, with the shape orientated around the length of the most commonly used runway. In the UK they are normally class D airspace and extend from the surface to around 2000 ft, although often higher.



AIRSPACE

Controlled airspace operations

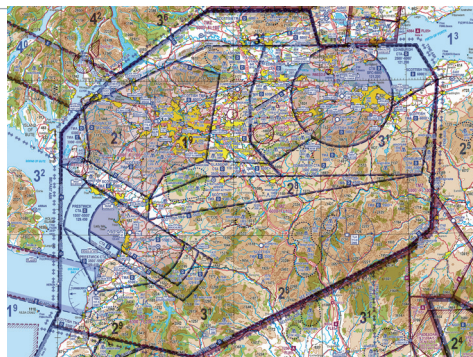
2 Control area (CTA)

These normally overlay CTRs and extend further beyond the aerodrome. They normally start around 1500 ft. They are normally class D, however some higher or larger ones are class A.



3 Terminal control area (TMA)

These cover areas where there may be several busy aerodromes close together; for example the London, Manchester or Scottish TMAs. They are normally class A, although the Scottish TMA is an exception to this.



4 Airways

These link different parts of the airspace structure together, in which mostly IFR traffic transits. They have designations consisting of letters and numbers. They are normally class A. Some airways in Scotland are class E combined with a transponder mandatory zone (TMZ), allowing VFR access without an ATC clearance.



AIRSPACE

Controlled airspace operations

REQUESTING TRANSITS

Guidance ?

GA pilots sometimes end up flying convoluted routes in an effort to avoid controlled airspace, when in fact it would be safer and more efficient to obtain a transit through it.

The key message on controlled airspace is that if it appears advantageous and sensible to do so, confidently request a transit. If not, plan a route that minimises the risk of infringement.

Controllers should make every effort to accommodate requests that are consistent with the safe and orderly flow of traffic.

The advantage of obtaining a controlled airspace transit:

- > Reduces the likely distance of the flight;
- > May reduce the risk of airborne conflict;
- > May reduce the risk of infringement:
 - > There is now a shared understanding of the intended route that will enable the controller to plan interactions with other traffic; and
 - > While it is still incumbent on the pilot to fly the route as cleared, the risk of infringement caused by distraction is reduced – rather than skirting around the edges, the aircraft is now positively cleared to enter along a defined area and/or route.

The chances of successfully obtaining a transit can be increased by:

- > Giving the controller reasonable time to respond to your request. 10 minutes flying time from the intended entry point is ideal.
- > Sounding professional on the radio by clearly and concisely articulating your request. Use the standard ‘freecall’ ([see p.76](#)) format (adapted for the relevant request). This will give the controller the confidence that you can be relied on to comply with the conditions of the clearance.
- > Plan for a transit that seems likely – if an aerodrome is busy it is unlikely that a transit that would be given that crosses the final approach track at a similar altitude to that of arriving aircraft. However a transit high above the traffic flow at right angles is much more likely to work. Crossing through the aerodrome overhead or just downwind of the arrival threshold can often be accommodated.

Guidance ?

If a pilot is denied access to airspace or refused an air traffic service they can complete online form: [FCS 1522 - UK Airspace Access or Refusal of ATS Report](#)

The CAA use this data to inform airspace change proposals and post implementation reviews. They can also intervene if an area of controlled airspace is not being serviced as it should be.

Controlled airspace operations

Request to transit controlled airspace	
The following gives an outline of a typical radio exchange for a transit of controlled airspace. For more details of radiotelephony (RT) procedures please see CAP 413 – www.caa.co.uk/cap413 , which is the authoritative guide to RT procedures in the UK.	
Explanation	Example exchange
<p>Commencing the call with the request gives the controller the opportunity to consider whether they can immediately respond to it or whether to instruct the caller to “standby”.</p> <p>It also allows them to consider what information will need to be passed back to the aircraft before having to process the entire message – for example most stations will have particular a series of squawk codes to be given out depending on what service is being provided to the aircraft.</p>	<div></div> <p>“Solent Radar, G-DOME, request Basic Service and zone transit.”</p>
<p>Assuming the controller is ready to process your request, they will likely respond by asking to you to “pass your message”.</p> <p>If they reply “standby” there is no need to acknowledge this: they will try and call you when they are able. It does not imply a rejection of your request; it just means they are not able to immediately respond to it.</p>	<div></div> <p>“G-DOME, Solent Radar, pass your message.”</p>
<p>Use the standard “freecall” format, spelling out more detail on your desired zone transit. There is no need to repeat the original service request (e.g. for Basic Service) but give more detail on your zone transit request if appropriate.</p>	<div></div> <p>“G-DOME, PA28, from Compton Abbas to Shoreham. 2 NM south of Alderbury, altitude 2,300 ft, QNH 1022. Request transit via Romsey and Bishop’s Waltham.”</p>
<p>Depending on what service you have requested and/or whether the controller anticipates giving you a clearance, they may simply reply by giving you a squawk code.</p> <p>They may ask you to “ident”, which means after selecting the squawk, press the ident key on the transponder. This draws their attention to you on the radar screen.</p>	<div></div> <p>“G-DOME, roger, Basic Service, squawk 3646 with ident.”</p>

Controlled airspace operations

Request to transit controlled airspace	
Explanation	Example exchange
The type of service and squawk code must be read back.	 "Basic Service, squawk 3646 with ident, G-DOME."
<p>If the transit request is straightforward then the clearance will likely be given shortly after identification, although do not always expect this and remain clear until given a clearance.</p> <p>If you are approaching the zone boundary and you still have not heard anything, a gentle request for clarification of whether a clearance can be expected does not go amiss.</p> <p>Otherwise, start to consider your alternative route (that you considered earlier of course) – the controller may have suddenly become busy dealing with another aircraft that needs more urgent attention.</p> <p>If a transit is not forthcoming, positively alter course away from the airspace and monitor your GPS to ensure that you remain clear of the airspace.</p>	 "G-ME, identified 10 NM west of Southampton, cleared to cross the zone VFR, not above altitude 2000 ft, Southampton QNH 1024. Report entering the zone at Romsey."
<p>Read back the clearance with any altitude limits or other conditions as received. Instructions, such as to report at certain points in the future may be acknowledged with the word "wilco".</p> <p>If ATC abbreviate your callsign you may reply in the same manner.</p>	 "Cleared to cross the zone, VFR, not above altitude 2000 ft, QNH 1024, wilco, G-ME."
Reporting as instructed will give ATC further confidence that you are a proficient pilot.	 "G-ME, entering the zone at Romsey."
Unless they have any further instructions, ATC will likely just acknowledge.	 "G-ME roger, report leaving the zone at Bishop's Waltham."
Instructions to report at a particular point in the future can be acknowledged with "wilco" – meaning you will comply.	 "Wilco, G-ME."

AIRSPACE

Transponder use

MODES AND CODES

Key info



In general, transponder-equipped aircraft in the UK should:

- > Squawk 7000 (VFR) or 2000 (IFR) as the general conspicuity code;
- > Select mode 'C' at all times so that your altitude is displayed; and
- > If 'listening in' on a frequency, use a relevant frequency monitoring code ([see p.11](#)).

It may be tempting to switch off mode 'C' if you fear you have infringed controlled airspace, however this is dangerous, illegal and very poor airmanship.

If you infringe and turn off your transponder, the penalty for the infringement will be higher.

In addition to squawk codes you may be given by ATSUs, the following general codes apply:

- > **7700** – General emergency code. Should be selected as soon as practical if the aircraft is suffering an emergency.
- > **7600** – Radio failure.
- > **7500** – Unlawful interference.

More details on transponder procedures can be found at Section 2 of ENR 1.6 of the [AIP](#).

MODE S REQUIREMENTS

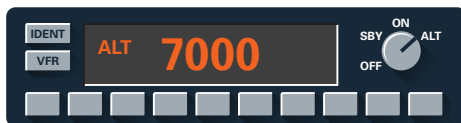
Generally, all aircraft in the following circumstances must be equipped with Mode S 'Elementary Surveillance' capabilities:

- > Within class A or C airspace;
- > Above FL100; or
- > Within transponder mandatory zones (TMZ).

Aircraft without Mode S may enter a TMZ with the approval of the relevant ATSU. Additional Mode S requirements also apply for aircraft above 5700 kgs MTOM or flying under IFR.

There are some areas in which gliders may fly above FL100 without Mode S – details of these can be found in ENR 1.1 and 5.2 of the [AIP](#).

Full details of Mode S carriage requirements can be found in GEN 1.5 of the [AIP](#).



Key info



SERA states that it is a legal requirement to use a transponder if fitted and serviceable.

AIRSPACE

Altimeter setting procedures

PRESSURE SETTINGS

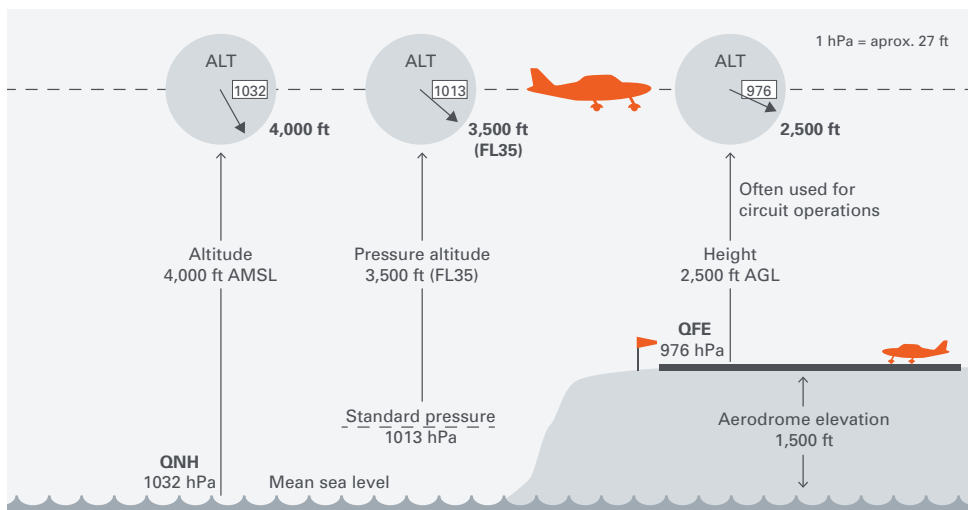
There are four types of altimeter settings used in the UK. They are all measured in hectopascals (hPa):

- > **QNH** – this will read altitude above mean sea level (AMSL). When on the ground at an aerodrome, it should indicate the known elevation above mean sea level.



- > **Regional pressure settings (RPS)** – this is the lowest forecast pressure in a particular altimeter setting region. The regions are given names such as 'Portland' or 'Cotswold'. Using the RPS will tend to indicate a lower altitude than you actually are, since unless you are at the specific point of lowest pressure, the actual pressure at your position is likely to be higher. Full details of the UK's altimeter setting regions can be found in ENR 6 of the [AIP](#).
- > **QFE** – this will read height above aerodrome level, so when on the ground at an aerodrome, the QFE is simply the pressure setting when the altimeter is at zero.
- > **Standard** – the 'standard' pressure setting is 1013 hPa. It is used above the transition altitude. When 1013 hPa is set above the transition altitude you should refer to your vertical position in terms of 'flight level' (FL). This also shows your 'pressure altitude'.

Altimeter settings example:



AIRSPACE

Altimeter setting procedures

TRANSITION ALTITUDE

The transition altitude is the altitude above which the vertical position of an aircraft is expressed in terms of flight level (FL) rather than altitude. It is not mandatory in the UK for VFR flights (it is for IFR) to change to FLs above the transition altitude, however it is in some states.

- > Outside controlled airspace, the transition altitude in the UK is generally 3000 ft.
- > Within and below areas of controlled airspace, it varies between 4000 ft and 6000 ft. The AIP contains details of transition altitudes for particular aerodromes.

Once at the transition altitude, to convert to FLs for the cruise, set 1013 hPa. You must then climb to at least the lowest available FL that is appropriate to your magnetic track ([see p.61](#)). You always climb to lowest available FL, never descend.

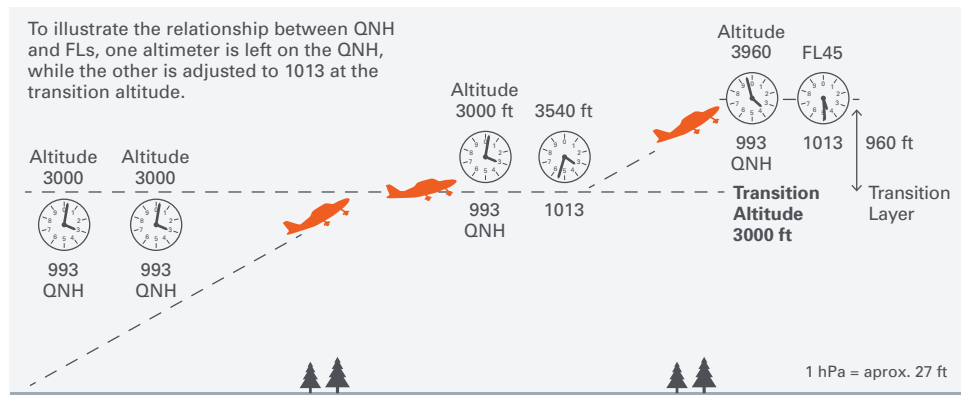
Under SERA, the lowest FL available to VFR traffic is normally FL35, although depending on the local QNH and transition altitude, this may be higher. The lowest available FL is known as the 'transition level'.

RECOMMENDED PROCEDURES

- > You should generally use the most current and relevant QNH to your flight. Only use the RPS if there is no other accurate QNH available.
- > When transiting immediately below or in the vicinity of controlled airspace boundaries that are expressed in terms of altitudes, you should use the QNH setting from the nearest relevant aerodrome.
- > When transiting immediately below or in the vicinity of controlled airspace expressed in terms of flight levels, you should use 1013 hPa.
- > Larger aerodromes generally use QNH for both take-off and landing.
- > GA aerodromes and the military often use QFE for landing.

Key info

Full details of UK altimeter setting procedures can be found in ENR 1.7 of the UK [AIP](#).



On this day the QNH is 993 hPa. When the aircraft reaches the transition altitude (3000 ft AMSL in this example) and 1013 hPa is set, the altimeter will read 3540 ft. Assuming the aircraft is traveling westbound, the lowest available VFR FL is 45.