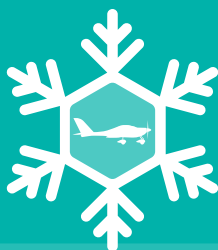


DEC 2021



WINTER FLYING



YOUR SAFETY SENSE LEAFLET FOR: WINTER FLYING

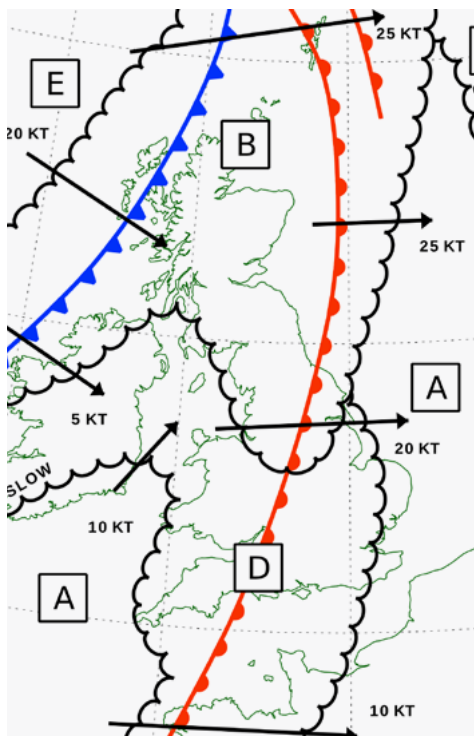
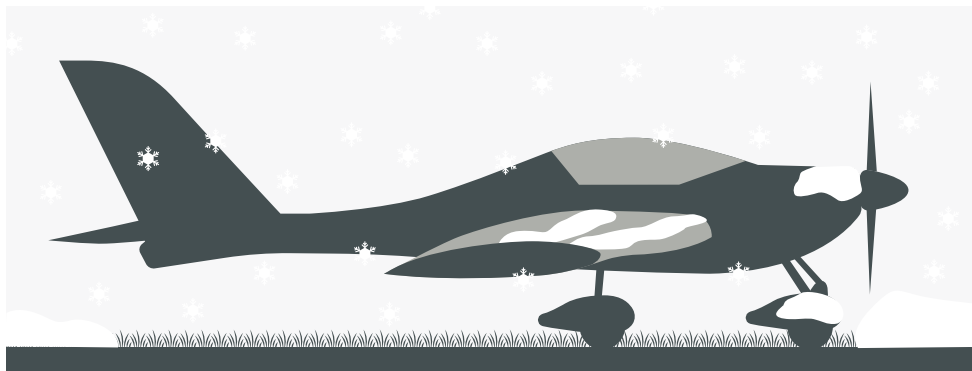
This leaflet is intended to provide guidance on common winter issues in GA flying such as weather systems, aircraft preparation, operations on contaminated surfaces and flight in icing conditions.

Table of contents

Winter weather	3	Takeoff and Landing	15
Weather information	4	Taxiing	15
TAFs and METARs	4	Global reporting format	15
Weather systems	5	Takeoff	16
Cold Fronts	5	Landing	16
Warm Fronts	5		
Depressions	6	Inflight icing	17
High Pressure	7	Carb icing	17
Fog	7	Other induction icing	18
		Airframe icing	18
Aircraft Preparation	8	Post flight	21
Exposure to the elements	8	Clothing and survival	21
Maintenance considerations	9		
Preflight checks	12		
Removal of ice and snow	13		
Starting	14		
Engine handling	14		

WINTER FLYING

Winter weather



Winter may bring different weather challenges and rewards for GA flying. Colder temperatures and more precipitation bring icing, snow and fog. Weather systems such as depressions will bring low cloud, rain and high winds. But winter can also be a time of stable conditions – crisp mornings, clear skies and good visibility.

One challenge of the UK flying environment is the changeable nature of the weather – as different [air masses and weather systems](#) approach, periods of mild temperatures can give way to colder ones. The stability of the weather can change rapidly.

You are encouraged to employ the principles of [Threat and Error Management \(TEM\)](#) when making weather-related decisions. TEM is about awareness of threats and considering plans to mitigate the associated risks. Identifying weather related risks and now to manage them is a fundamental part of good airmanship.

Such understanding and preparation will increase your chances of successful flying and will help to reduce the likelihood of encountering unanticipated weather conditions.

WINTER FLYING

Weather information

The Met Office is designated by the CAA Met Authority as the provider for regulated aviation weather information in the UK. Pre-flight planning should, as a minimum, include reference to regulated aviation meteorological products and information - forecast services for GA are made freely available on the [Met Office Aviation Briefing Service](#) webpages.

Other sources and platforms that disseminate weather information for aviation can be useful supplementary tools, but it is important to understand the difference between CAA regulated aviation meteorological products and unregulated sources.

Users should understand the accuracy and validity of the information being reviewed and whether or not data is derived from a regulated forecaster or directly from computer models.

The objective is to have an overall understanding of the weather systems present on your flight and what conditions you are likely to encounter.

For VFR flights, reviewing a good selection of TAFs and METARs is essential and the [F215 \(Low-Level Significant Weather Forecast\)](#) chart remains an excellent source for gaining an overall understanding of forecast weather conditions over the UK.

[Surface pressure charts](#) will also give a good indication of how the weather will evolve over the next 72-hour period.

For IFR flights, particular emphasis should be placed on the nature of the clouds present, the freezing level and takeoff and landing minima. Know your forecast requirements under UK Part-NCO for approach and alternate planning.

[CAP 1535 – The Skyway Code](#) contains a section on meteorology which provides further guidance on the information available to pilots for pre-flight planning, icing and ‘making the weather call’.

TAFs and METARs

It may be worth refreshing your knowledge of some common winter TAF and METAR codes and reporting parameters:

SN

snow

GR

hail

GS

snow pellets

BR

mist

FG

fog

Fog is reported when the prevailing visibility is less than 1000m. Between 1000m and 5000m it will be reported as mist. Descriptions such as Shallow (MI) and patches (BC) can also be used with FG to further specify the type of fog. For more information on METAR codes see [CAP 746](#) (Requirements for meteorological observations at aerodromes), Chapter 4.



Note: Since 05th November 2021 runway state is no longer included in METARs. Where applicable, runway state is now reported by aerodromes using the new ICAO ‘[Global Reporting Format](#)’ (GRF), which is a standardised format for reporting runway conditions. See p.15 for more details.

**Documents**

Document Sharing Hub

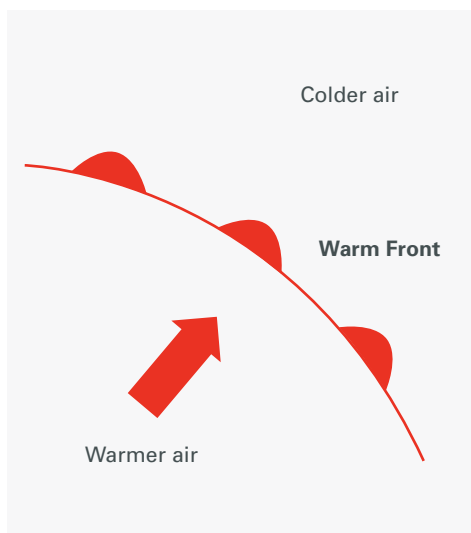
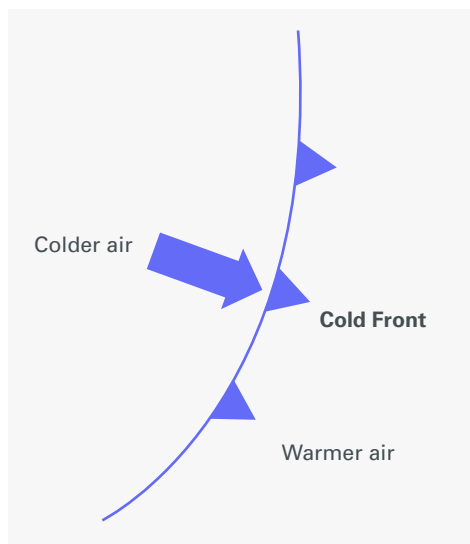
WINTER FLYING

Weather systems

Cold Fronts

Cold fronts will normally bring cold and unsettled weather. Showers and even winter thunderstorms are likely at the leading edge of the front. Visibility tends to be good, but the weather will be changeable, with sudden drops in visibility likely as rain or snow clouds develop. Temperature, wind speed and direction may change rapidly as the front passes, particularly if it is interacting with warmer air. After the passing of the front the weather will likely be unsettled for a while, but good flying can often be had in the clear air left behind.

Be cautious as further showers and high winds often follow after the cold front has past. Any rainfall may subsequently freeze overnight as the temperature falls. As the wind drops and the skies clear, overnight radiation fog also becomes likely.



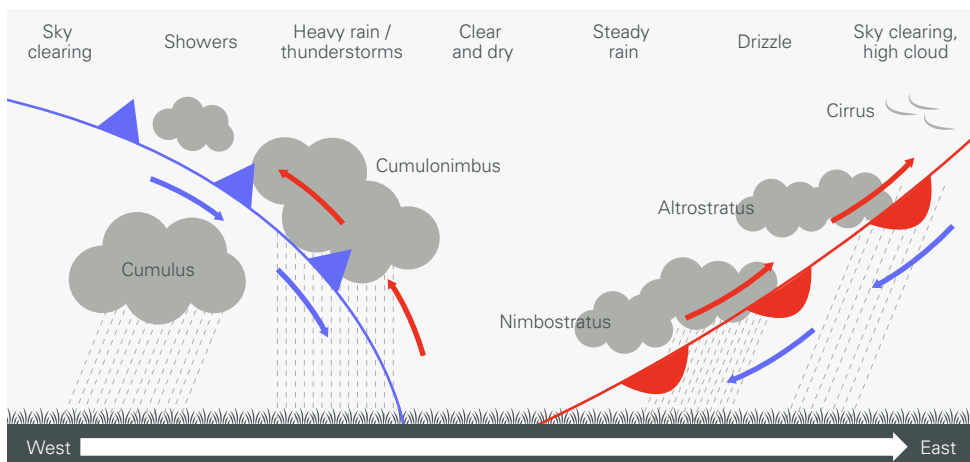
Warm Fronts

Warm fronts in the winter tend to bring mild weather, typically stratus cloud with rain. Flying conditions may be reasonable under a weak warm front but watch both the cloud base and visibility as they will lower significantly as the leading edge of the front passes at ground level.

WINTER FLYING

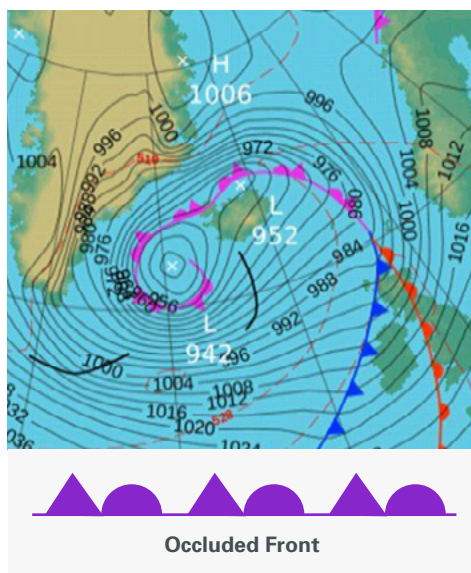
Weather systems

Depressions



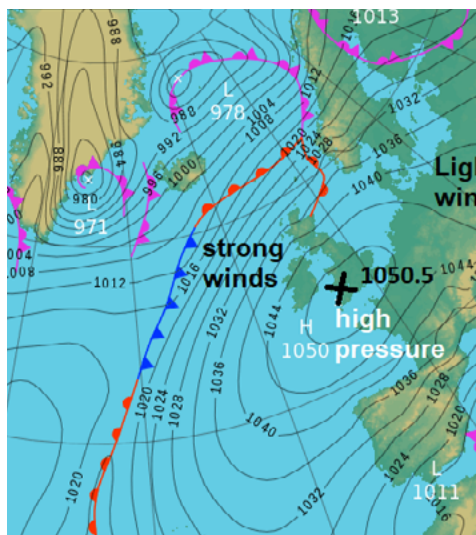
A common weather system during the UK winter is the 'Depression' – this is an area of low pressure, with fronts of cold and warm air circling around it. These systems mainly form over the Atlantic before moving east towards land. The warm front comes first, the signs of which will be a lowering cloud base, mild weather, some precipitation and strengthening winds. The pressure will start to drop and continue to do so until the warm front passes. The cold front then brings lower temperatures, showery precipitation and gusty winds.

Often by the time it reaches the UK, a depression will have started to 'occlude', whereby the cold air behind the warm starts to lift the warm air above ground level. This starts at the centre of the depression and moves along the leading edge of the warm front. The occluded part of the depression tends to be slower moving but also brings low cloud and precipitation.



WINTER FLYING

Weather systems



High pressure

Winter can often see periods of high pressure and associated stability in the atmosphere. Areas of high pressure are known as ‘anti-cyclones’ and elongated areas as ‘ridges’. Temperature inversion layers will tend to form and fog may be more persistent. When the pressure is high, air descends slowly in the atmosphere, so fewer clouds will form and those that do will be shallow. However, sometimes a low and widespread blanket of stratus cloud will develop, as low-level rising air meets the inversion layer.

Although the weather will be stable, after a few days haze and smog will tend to build since particles in the atmosphere cannot escape in the normal way. Combined with low winter sun, this can severely reduce visibility, even if conditions may look pleasant from the ground.

Fog

Fog can be persistent and difficult to predict. Most inland winter fog in the UK is ‘radiation’ fog, which is caused by the rapid cooling of the ground, normally after sunset. The loss of heat from the ground will tend to cool the air immediately above, reducing its capacity to hold moisture. A key indicator is the reported temperature and dew point comparison, if the difference is reducing, the likelihood is that mist or fog will occur.

Radiation fog tends to form under clear skies when the temperature is cold and the winds are light. Sometimes heavy rain that leaves a lot of standing water can encourage fog to form if the temperature subsequently drops. In winter fog is slow to clear, often taking much of the morning. Fog clearance is rarely uniform and can vary over small geographic areas or with elevation changes. If fog has lifted at your departure point, check it is not lingering elsewhere.

