

## Case 2

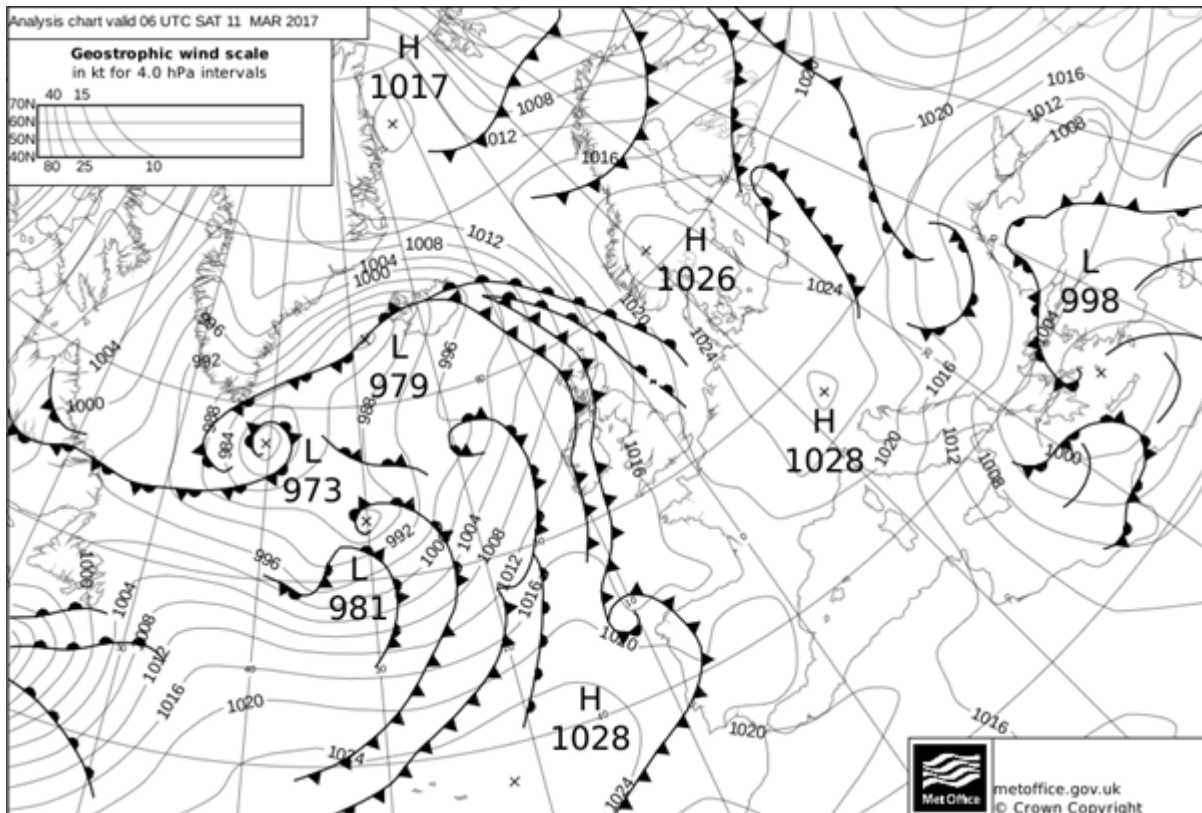
Route: Cambridge to Gloucester (VFR)

Date: 11<sup>th</sup> March 2017, departing 08 UTC

Let's take a look at the weather forecast, assess the potential threats and start investigating how to mitigate against these risks.

### a. Synoptic situation

Describe the broad features in the synoptic chart, what is the main type of airmass covering the region and what kind of weather can we expect from it? How strong is the wind likely to be and what will its direction be?



Most of the UK is covered by a south to south-westerly Tropical Maritime airstream. This airmass is mild and moist in its lowest layers, particularly over coastal areas and hills where it brings low clouds, drizzle and local hill fog. Judging from the number of isobars the gradient wind does not seem to be an issue but the complexity of the frontal system over the Atlantic indicates that conditions will deteriorate quickly and for quite a long time. The window of opportunity is brief and closing in!

So, what kind of hazards are usually associated with the Tropical Maritime airmass? See the cheat sheet below...



## Tropical Maritime Airmass




Tropical maritime air is warm and moist in its lowest layers. The predominant wind direction across the British Isles is south-westerly.

Over the British Isles, the cloud associated with a Tm airmass is low and extensive, often accompanied by drizzle and sometimes sea fog around southern and western coasts.



[Consider alternative routes](#)




Penetration of the stratus inland varies greatly with the season but is often widespread in the autumn and winter.

[Check METARs & TAFs](#)

Visibility will be poor over southern and western coasts but can become excellent to the lee of the hills. The cloud can also readily burn off and offer fine and sunny conditions there, particularly in the summer months.

[Check the F215 chart](#)

In autumn and winter, the air is stable and reluctant to lift. In spring and summer however, the airmass can become unstable and generate thunderstorms, particularly in central and eastern parts of England.


This airmass is particularly prone to lee waves.

An absence of cloud (due to a lack of moisture in the atmosphere) does not mean an absence of lee waves though.

[Look for ripples on satellite imagery](#)



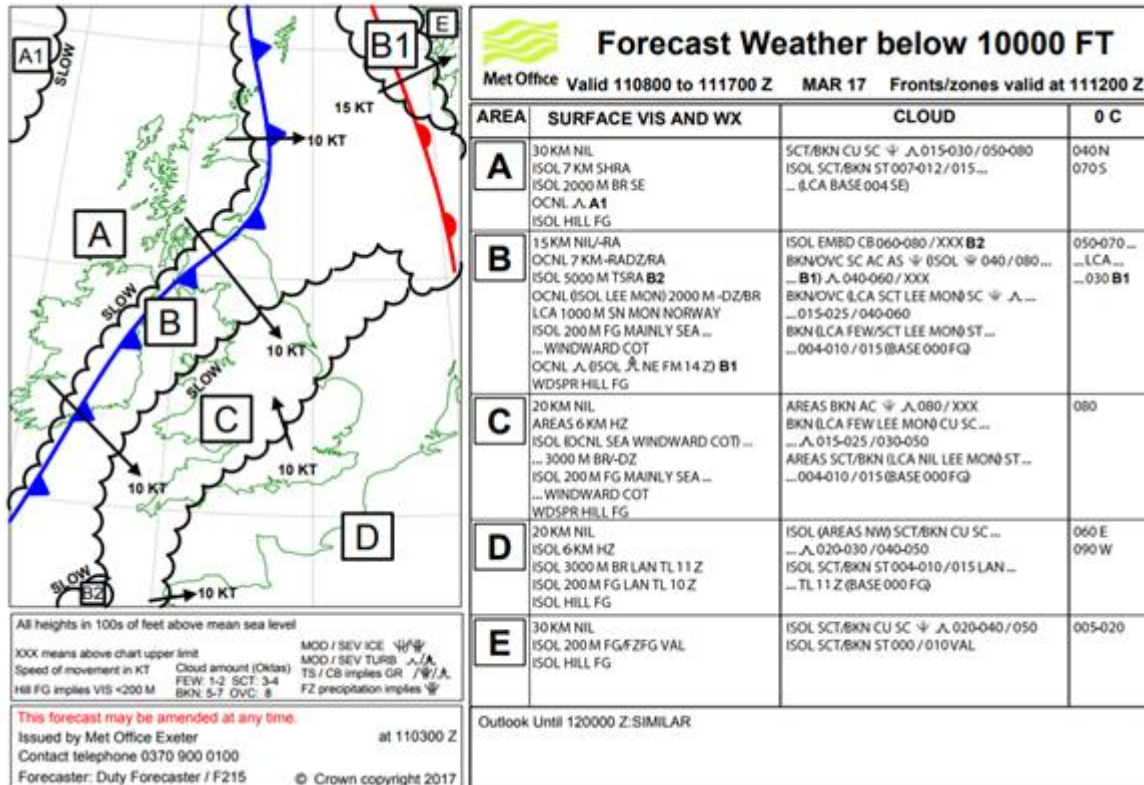
[Increased risk to safety – be weather aware](#)



Lee waves are associated with turbulence and in certain circumstances, severe wind shear lower down the ground.

### b. Area Forecast

Looking at the F215 chart, is there anything along the route that I should be taking into consideration? What is the main cloud base and visibility? What is the altitude of the freezing level? Can I expect any fronts, weather, turbulence or icing?



For the flight from Cambridge to Gloucester we need to focus on areas C & D where visibility may be reduced in haze, fog or hill fog and where the cloud base may be as low as 400ft at times. The conditions are expected to improve but will deteriorate further to the west later: not a great forecast for a Visual Flight Rules (VFR) flight. The freezing level is above 8000ft (AMSL) so there is no risk of icing at low level. Turbulence is expected along the route, but it is only slight. The possible restricted visibility means that you need to check the latest conditions at Gloucester (and the surrounding area) and make sure it will not be below minima for your arrival. In these conditions it is not a good idea to “see how it looks when we get there”!

### c. Site specific information

Let’s have a look at the METARs & TAFs along the route, do they confirm the information contained in the F215? Have you checked possible diversion airfield(s) along your track as well as your destination? Are they suitable?

METAR EGSC 110650Z NIL=  
 METAR EGGW 110650Z AUTO 16004KT 2900 BR OVC003 09/09 Q1018=  
 METAR EGTK 110650Z 16005KT 2500 BR OVC005 10/10 Q1018=  
 METAR EGVN 110650Z 17003KT 2000 BR OVC004 10/10 Q1018 YLO2 TEMPO 0600 FG BKN001 RED=  
 METAR COR EGBB 110650Z 16006KT 4800 BR BKN007 10/10 Q1017=  
 METAR EGBJ 110650Z NIL=

TAF AMD EGBB 110712Z 1107/1206 17005KT 3000 BR BKN004  
BECMG 1107/1110 9999 NSW SCT010  
TEMPO 1110/1114 8000 BKN009  
PROB40 TEMPO 1201/1206 7000 RA BKN004=

TAF EGVN 110741Z 1109/1209 17005KT 2500 BR BKN004  
BECMG 1109/1112 9999 NSW SCT018  
BECMG 1113/1115 FEW020  
BECMG 1200/1203 BKN012  
TEMPO 1201/1206 3000 RADZ SCT005=

The METARs are not very encouraging and indicate that the stratus is quite extensive. The TREND at Brize Norton also suggest a risk of fog during the next two hours. Cambridge and Gloucester airfields are not opened yet but there is no reason to believe that conditions will be any different there. Conditions described by the METARS confirm the information contained in the F215 chart but the TAFs indicate a potential improvement during the morning, with greater visibility and a higher cloud base.

#### **d. Threat & Error Management**

ANTICIPATION: Consider your limits and how the forecast cloud and visibility may present a threat:

- a. Is your departure and arrival time realistic given the forecast conditions at Cambridge and Gloucester?
- b. Can you fly your planned route in appropriate airspace when constrained by the terrain and forecast cloud?
- c. What is your safety altitude for the flight? Can you achieve this and remain within VFR given the forecast?

RECOGNITION: A safe flight depends on conditions improving as forecast and not deteriorating faster than expected.

- a. As well as keeping a good lookout, what is your plan to get en-route METARS or other weather updates?
- b. How does this fit in with your wider communications plan?
- c. Where and when are your decision points on the route if conditions are doubtful?

RECOVERY: At each decision point you MUST have planned actions for the eventuality that the weather has not improved or is deteriorating further on your route. Given the forecast, it is likely that the best weather will always be behind you and away from exposed southern areas.

- a. Do you have diversion information for appropriate airfields to the north and east?
- b. Have you planned alternative routes to these diversions from each decision point?

#### e. Summary

The main concerns in this Tropical Maritime situation are low-level cloud and visibility along the route and possible deteriorating conditions on the approaching cold front. Conditions are forecast to improve after a misty or foggy start. The Brize Norton TAF is encouraging, but also note Birmingham's best cloud conditions of scattered at 1000ft. This is expected to increase and lower to become broken at 900ft at times. This is probably because Brize Norton is slightly protected in the Thames Valley while Birmingham (and, importantly, Gloucester) are more exposed to the Bristol Channel and Severn Valley. The movement of the cold front in the west will be key to conditions at Gloucester and this should be monitored carefully.

The flight should only be started once you are confident that en-route conditions are safe, and you should make regular checks on conditions at the destination before continuing past planned decision points. You must *always* have an alternative plan for deteriorating conditions **and put it into action at the first sign of deterioration.**