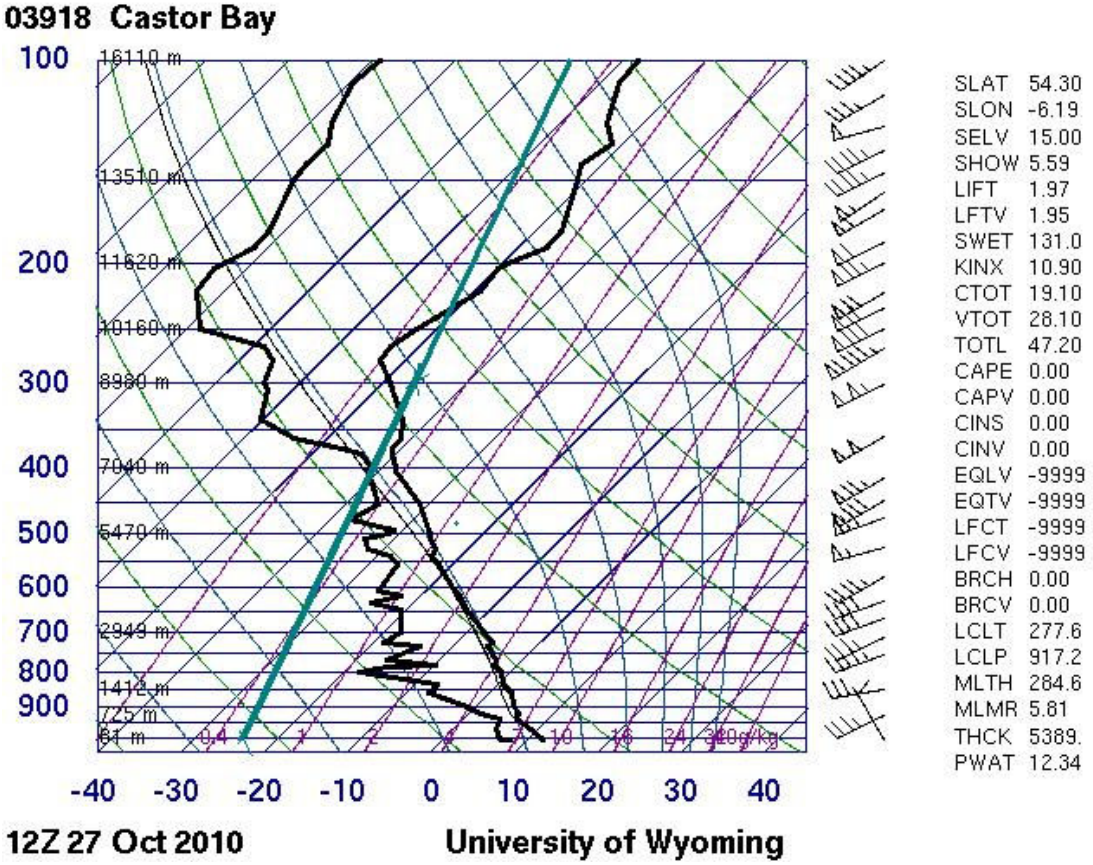
Contrails and how they can be forecast

The chart below is the ascent for Castor Bay in Northern Ireland, what we call a skew-t diagram. This shows the temperature (line on the right in black) and the dewpoint depression (the left hand black line). From this a whole variety of parameters can be forecast.
Convective cloud base and top
And all the 'goodies' follow from this for thunderstorm values, CAPE LI etc.
Layer cloud areas
Radiation fog
Maximum and Minimum temperature
Rain, snow
There is also what the wind at designated levels is recorded as, so we can spot jet streams and many other things upper winds show a forecaster

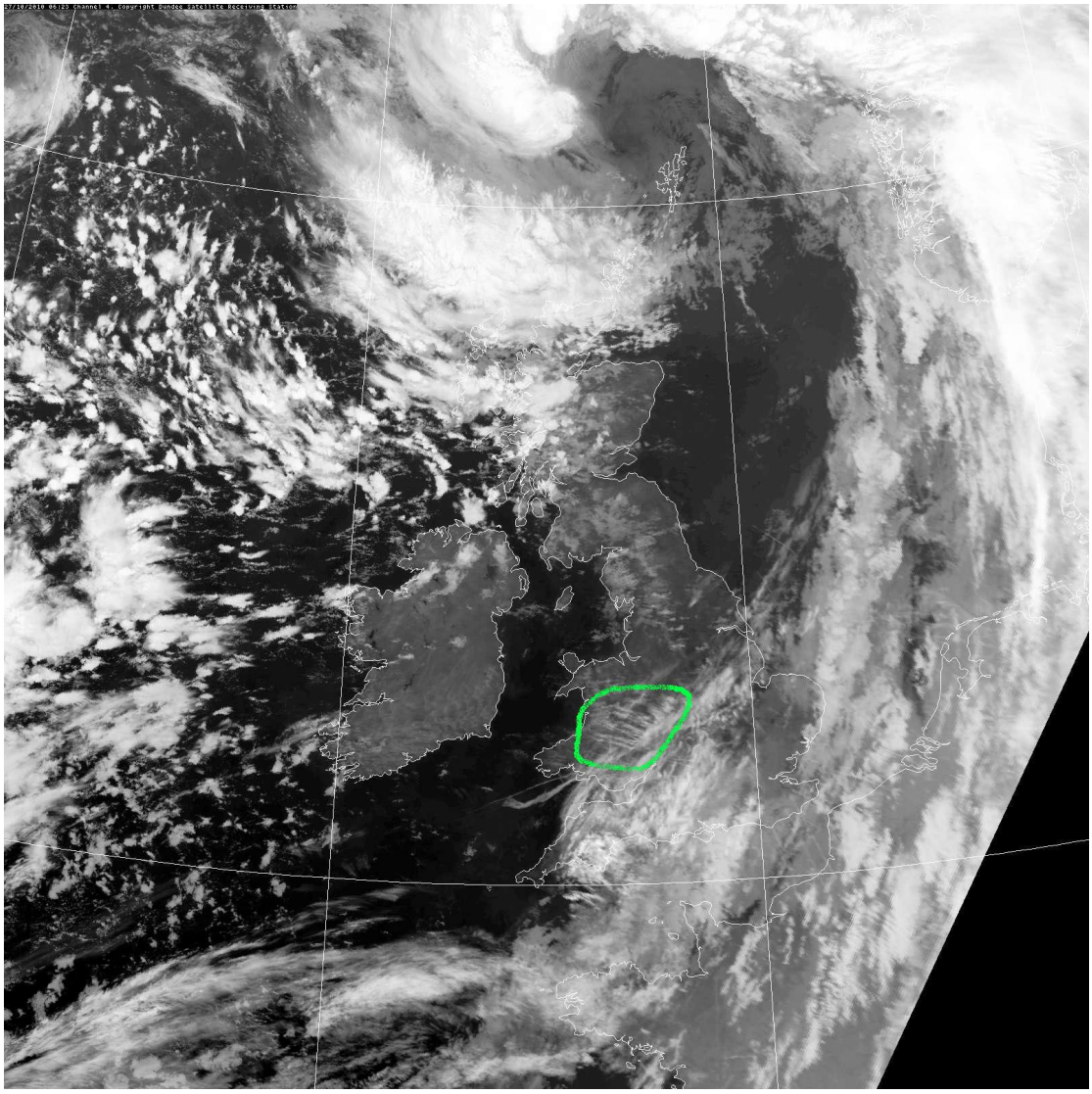
One item that was developed in the early part of World War 11 was forecasting when an aircraft would create vapour trails. Obviously making these gives the aircraft position away so it was deemed necessary to be able to forecast when these would form and at what height. Also whether they would be non persistent or persistent.

The green line shows what was developed to forecast this - the MINTRA line or minimum trail line. It goes from approximately -24C at the surface to -37C at 30,000ft. What we normally see are trails at high level but if the temperature is below the MINTRA line, even at the surface, if the temperature is low enough (-24C) then trails can form.

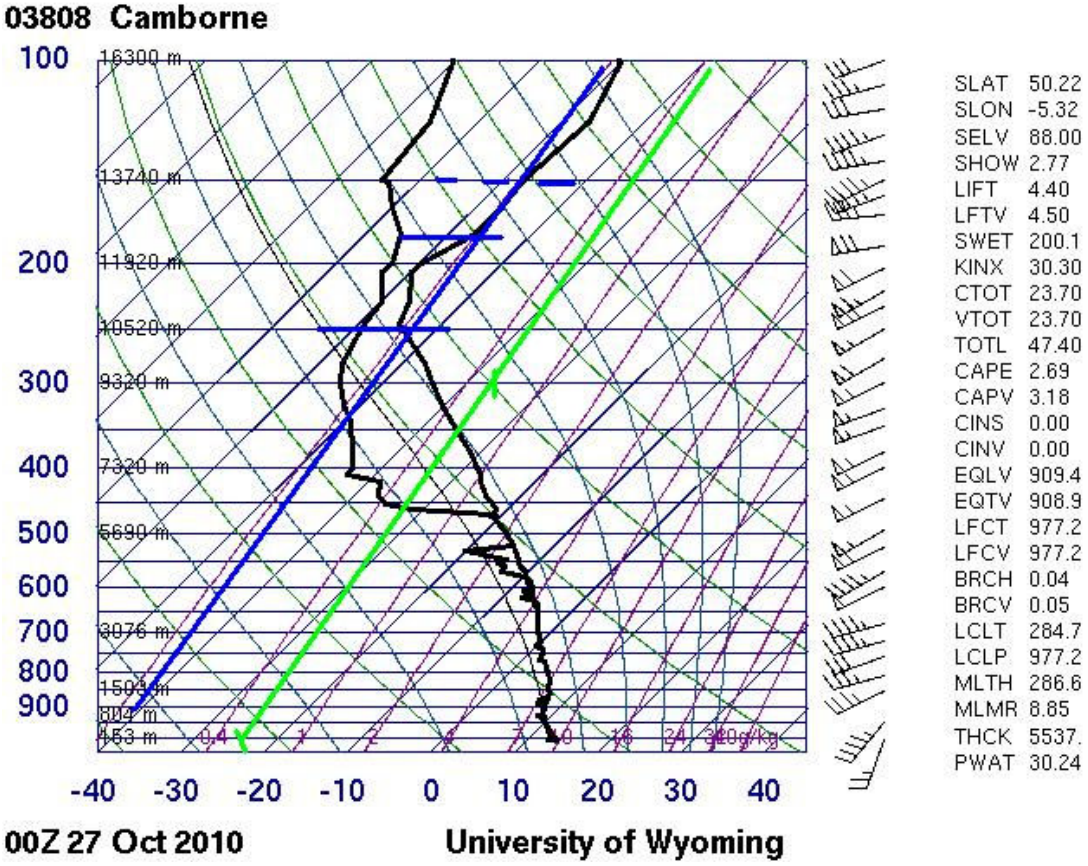
It was soon discovered that whilst trails might form below the MINTRA temperature they often did not last long. More research showed that between -11C and -14C below the MINTRA line trails were no persistent. With a temperature -14C below the MINTRA line these trails were usually persistent.



As you can see contrails would seem very unlikely. Yet on the satellite (infra red) shown below the area with a green marker round it has obviously got contrails showing?



Why is that?
Let's turn to an ascent closer to that area, Camborne in south west England, see below
On there I've marked the MINTRA line in green and the blue line is where the temperatures are -14C or more below that value from the surface to 100mb.
You can see that the temperature line, irrespective of the dewpoint depression line, is left of the -14C below the MINTRA line between about 35,000ft and 42,000ft perhaps 45,000ft.



I hope this explanation helps understand how contrails can be forecast. Remember when flying, not always, contrails are sometimes above the levels of real cloud, Cirrus/Cirrostratus or Cirrocumulus.
I'll put it in the learning area so its always available.

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