Theory Lesson # 12

Unit 38 – Meteorology & Flight Planning

Aim

Predicting soaring conditions

- Accessing weather information
- Wind speed and direction
- Cloud layers
- Thermal heights and strengths
- The soaring window

Planning a cross country flight

- Threats
- Prediction of cross country speed
- Planning a suitable task

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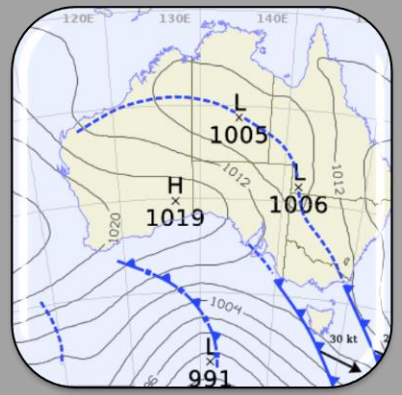
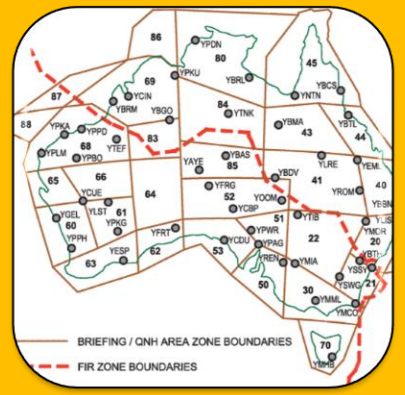
Weather Sources

Looking outside!

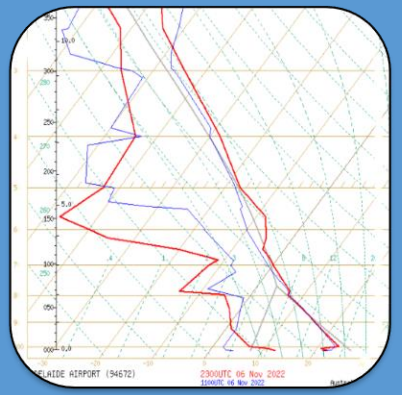


Bureau of Meteorology – General forecast, synoptic chart, prognostic chart, satellite images

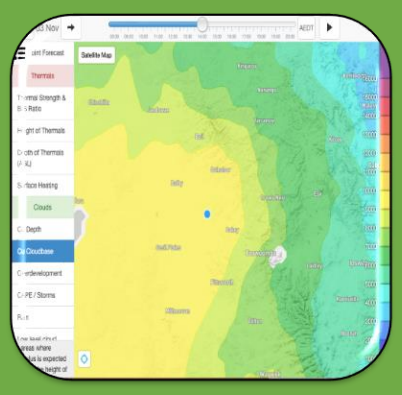
– Observations



NAIPS – Terminal Area Forecasts, Meteorology Aerodrome Reports, Graphical Area Forecasts



Atmospheric soundings (search BOM for "Aerological Diagrams")



Gliding weather models (such as GFAMet (free) or subscription services Skysight and XCSkies)

Predictions:
Weather

1. Weather events and timing (fronts, wind, rain, thunderstorms, dust/smoke etc)
2. Wind speed and direction during the day (at surface and selected altitudes)
3. Cloud – cumulus cloud base and high cloud over the day
4. Maximum temperatures over the task area
5. Thermal heights
6. Thermal strength
7. Soaring window

Compare predictions with observations as the day progresses

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Wind

Wind has a big impact on cross country flight

- Wind gradient and gust fronts make outlanding more hazardous
- Your achieved cross country speed will be lower
- Thermals are likely to be broken and harder to use, so slower average climb rate is achieved
- Increased danger in using thermals low due to turbulent gusts, wind shear and outlanding risks

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Predictions:
Cross Country Speed

You will need to develop a feel for your typical cross country speed

As a planning guide use the following for an LS4 (without water ballast)

Novice XC speeds (LS4)	
Avg Climb	km/h
2 kt	50
3 kt	60
4 kt	70
5 kt	80

Try to beat these speeds!

Your average climb rate will be much less than the thermal strength

Reduce the predicted average speed by about 1 km/h per knot of wind speed

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Task Planning

Calculate Task time from the soaring window

Calculate Task distance from the predicted cross country speed in the task time available

Choose Task waypoints

Consider:

- Airspace restrictions
- Areas of adverse weather
- If possible fly down wind on 1st and last legs - into wind during the peak of the day
- Avoid flying west at the end of the day (visibility is poor)
- Placing the airfield mid-leg minimises any retrieve
- Badge requirements
- Difficult outlanding terrain
- Suitable airfields.
- What is the longest retrieve you are comfortable with?

Simple Task Planner			Date	12/01/2019
Wind	Surface	2,000 ft	5,000 ft	10,000 ft
	350 / 4	345/8	290 / 12	N / A
Thermal Height	6000	Average achieved climb		3 kt
Cloud	Cu + Cirrus	(This will be less than the average thermal strength)		
Key Events	No fronts expected.			
Notes	Max temp 31. More cu to north.			
Expected XC Speed		60 km/h		
Planned Task Time (allow for longer flight time)		1400 - 1700	3 hours	
Task Length		180 km		
Task				
Flight review				

Novice XC speeds (LS4)

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