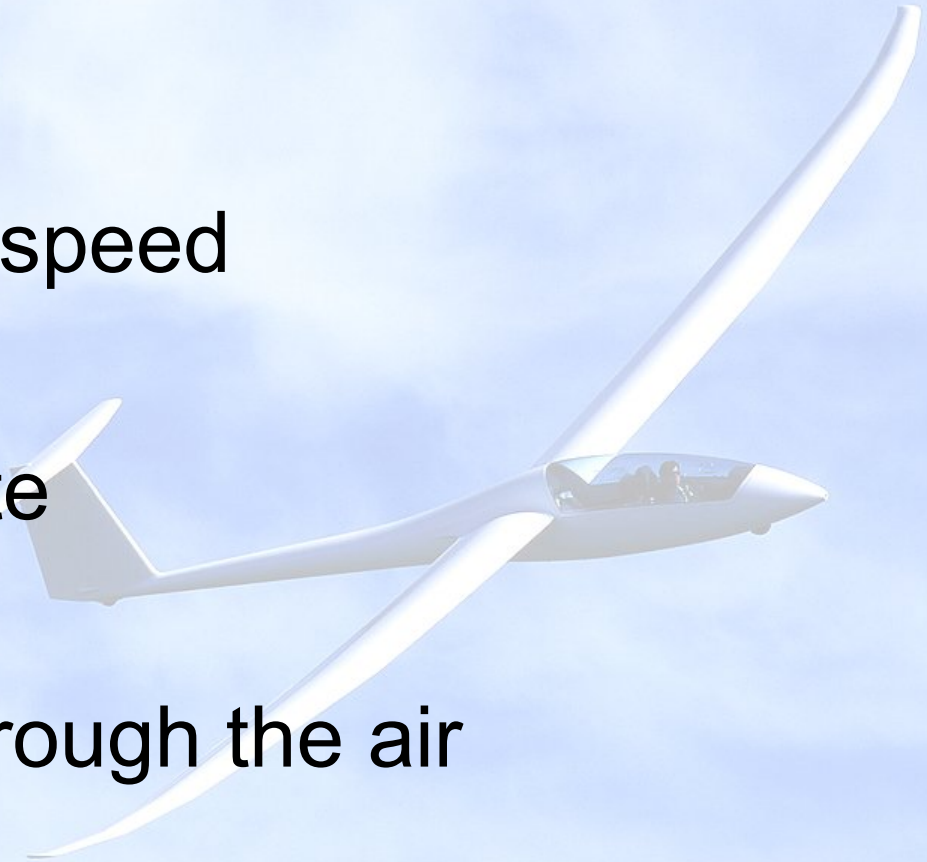
The Traverse

The journey between thermals

X country speed is related to:



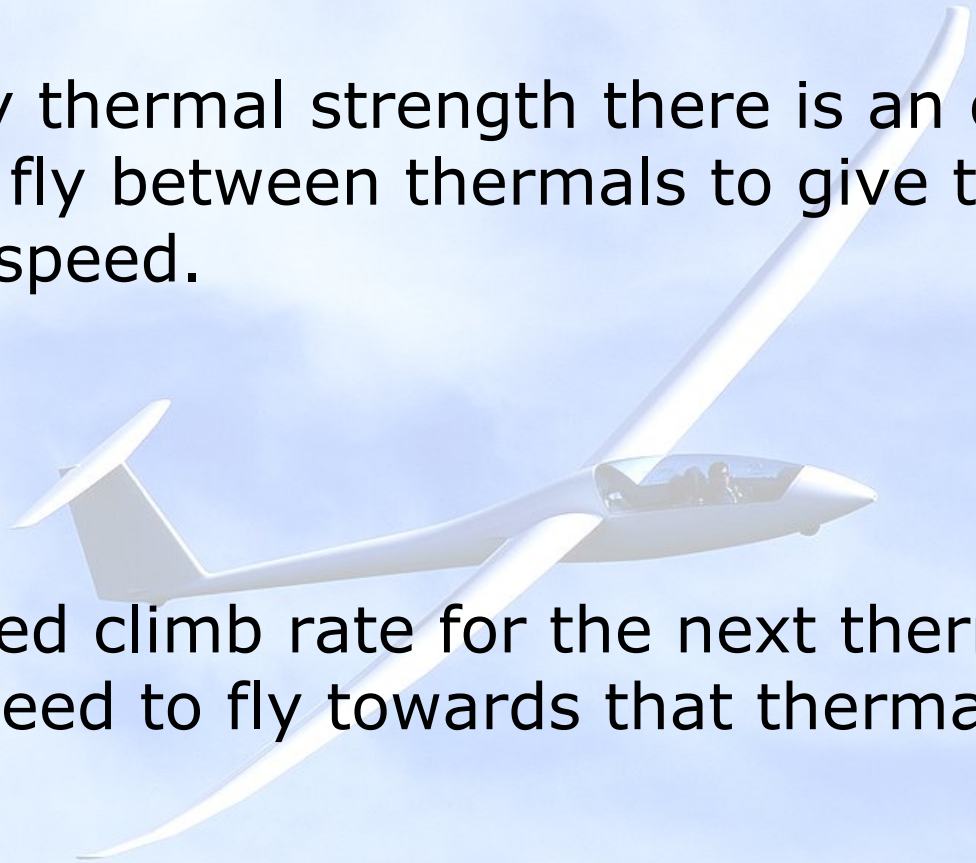
- Cruising speed
- Climb rate
- Route through the air

What speed to fly

- McCready theory

- Block speeds or dolphin?

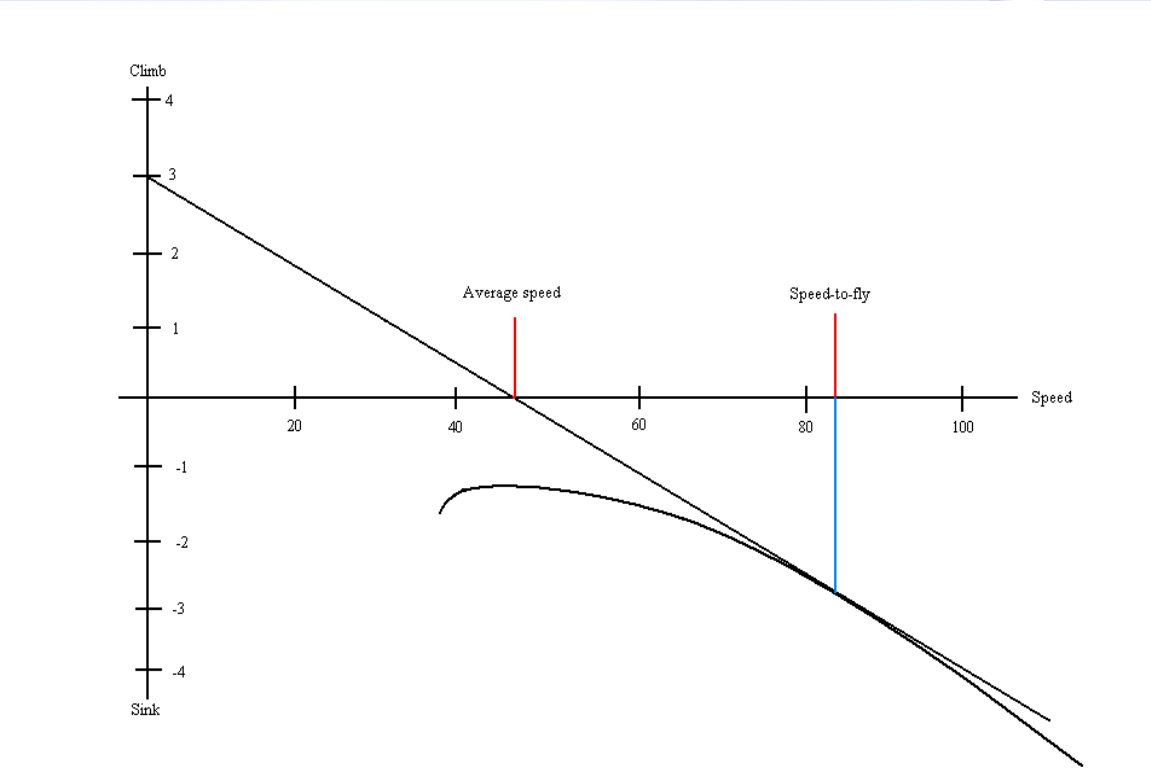
McCready theory



- For every thermal strength there is an optimum speed to fly between thermals to give the fastest average speed.

- Anticipated climb rate for the next thermal will give a speed to fly towards that thermal

Devised from the gliders performance curve



Discus without water ballast								
Thermal in Knots	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Cruise speed knots	**62**	**68**	**75**	**78**	**83**	**84**	**86**	**88**
Average x country speed Kilometers per hour	**46**	**70**	**80**	**94**	**102**	**110**	**114**	**121**

Ingo's table of speed to fly

Lift	Heavy		Light	
	High	Low	High	Low
0	**60**	**55**	**55**	**50**
1	**70**	**65**	**65**	**60**
2	**75**	**70**	**70**	**65**
3	**80**	**75**	**75**	**70**
4	**85**	**80**	**80**	**75**
5	**90**	**85**	**85**	**80**
6	**95**	**90**	**90**	**85**
7	**100**	**95**	**95**	**90**
8	**105**	**100**	**100**	**95**

MacCready rules of thumb

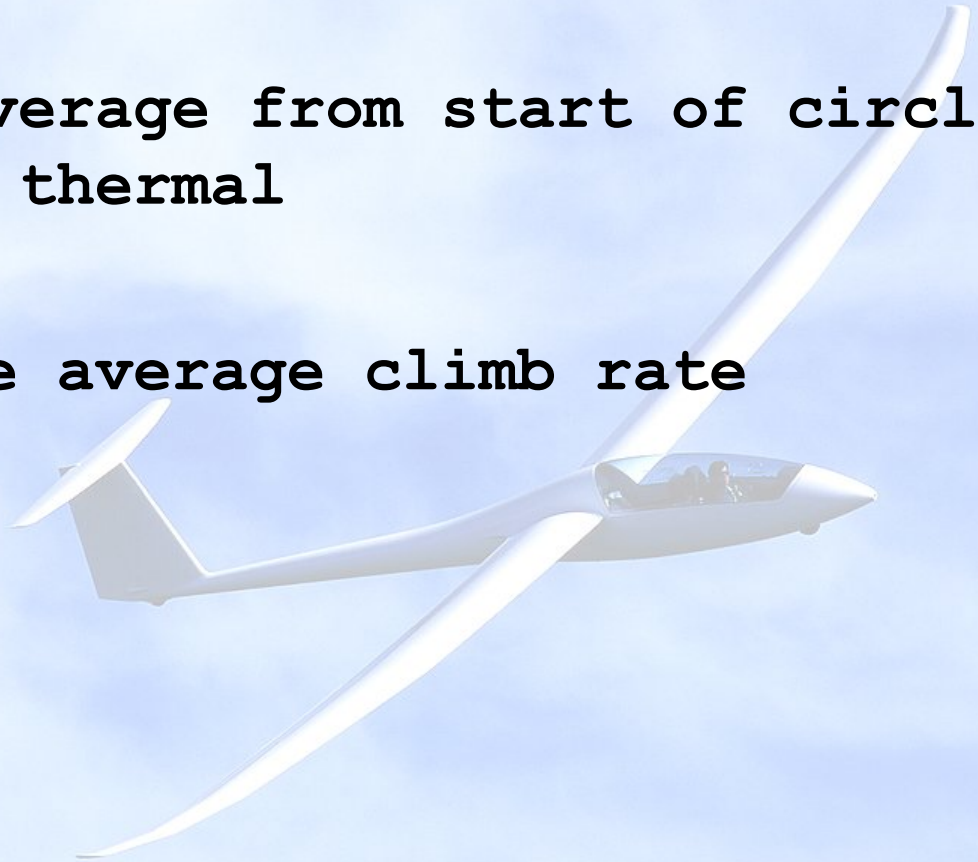
- Steadily reduce the MacCready setting as you get lower -- fly more slowly and take weaker thermals
- MacCready settings are substantially lower than best climbs.
- The MacCready value now should be the same as you expect it to be ahead.

- Speed to fly changes with wing loading
- Leave weak thermals to go find better lift, as you get higher
- Sometimes it pays to trade speed for distance
- never set the ring to zero; penalty is to high
- Conservative ring settings increase your chance

The speed you fly shows the confidence that you have for the future

What is my average climb rate?

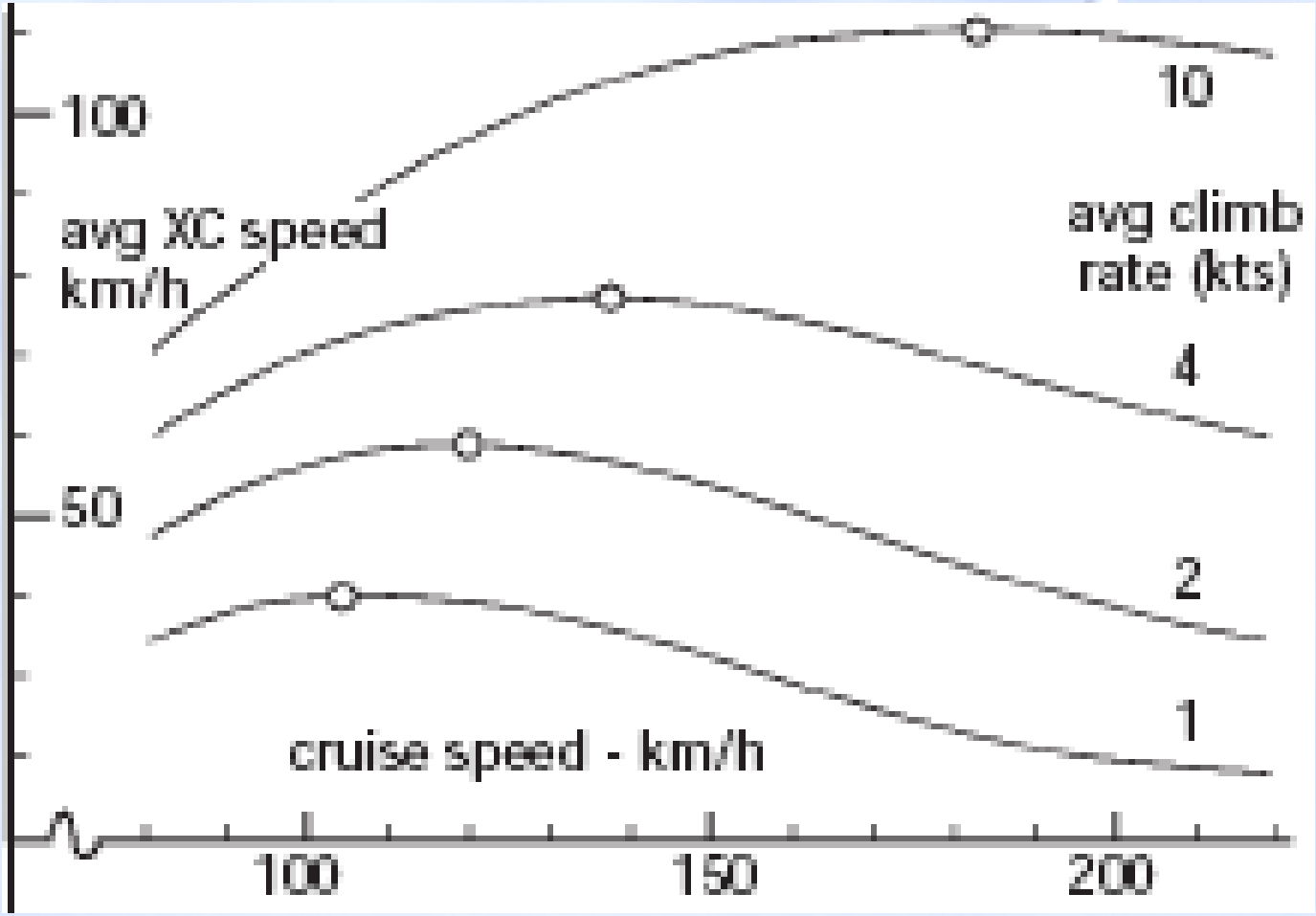
- VAR t average from start of circling to leaving thermal
- Half the average climb rate



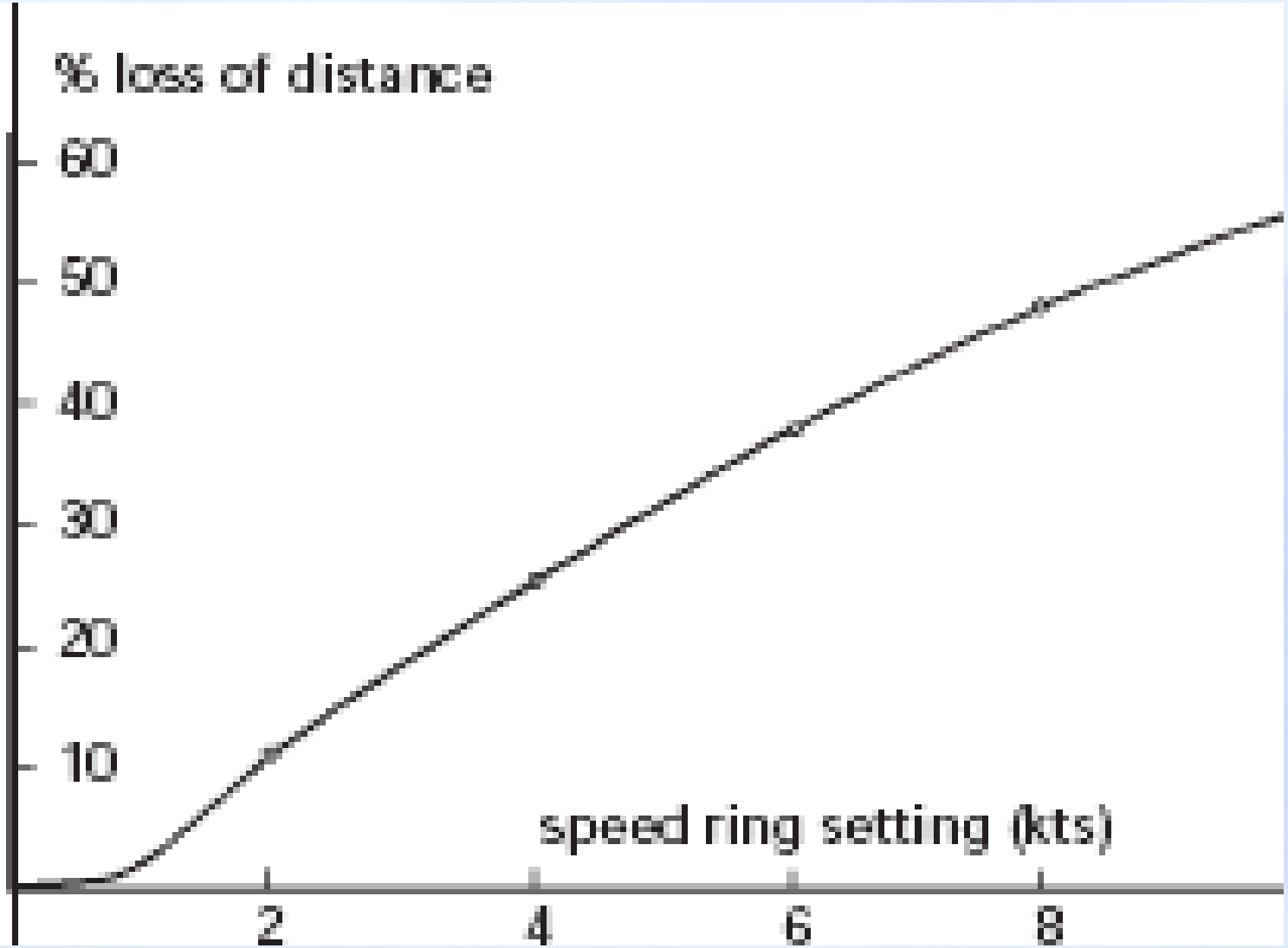
flying slower

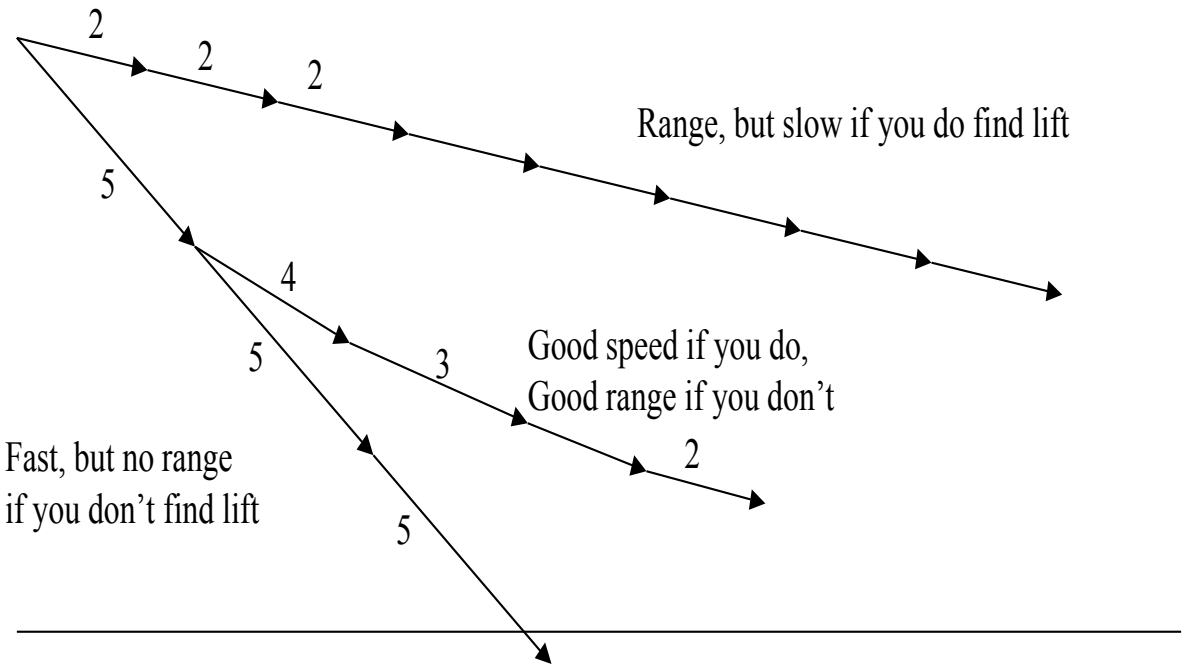
Average climb rate 6 knots							
Cruise speed setting in knots	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Average x county speed	**110**	**109**	**108**	**106**	**103**	**93**	**88**
Reduction in search area %	**39**	**34**	**30**	**25**	**18**	**5**	**_**

Flying slower

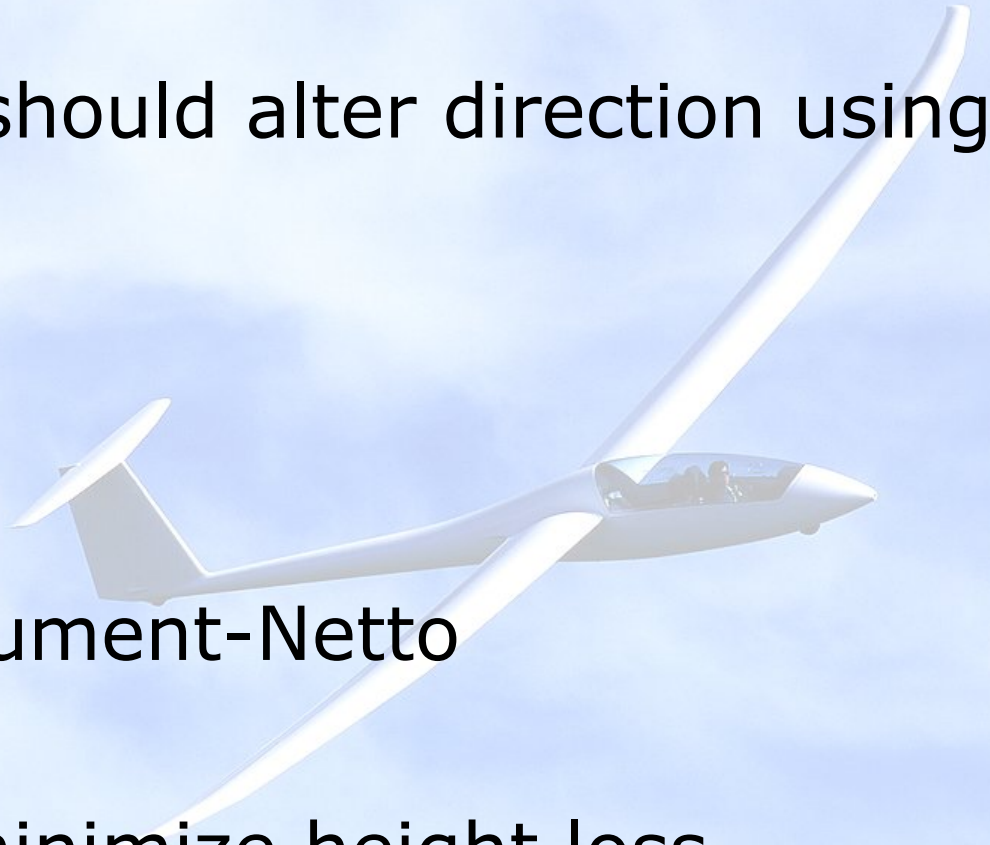


Speed=Range




2
2
2
Range, but slow if you do find lift
5
4
5
3
Good speed if you do,
Good range if you don't
2
Fast, but no range
if you don't find lift
5

Effective inter thermal flying



the pilot should alter direction using visual clues:

- clouds
- gliders
- terrain
- or instrument-Netto

To minimize height loss

Effective Inter-thermal Flying

- Set a working height band for the day
- below what height are the thermals weak and difficult to work?
- At what height does the thermal strength drop off
- These altitudes will change throughout the day!

Operating height band- aggressive and fast

Caution height band – conservative, a bit slower

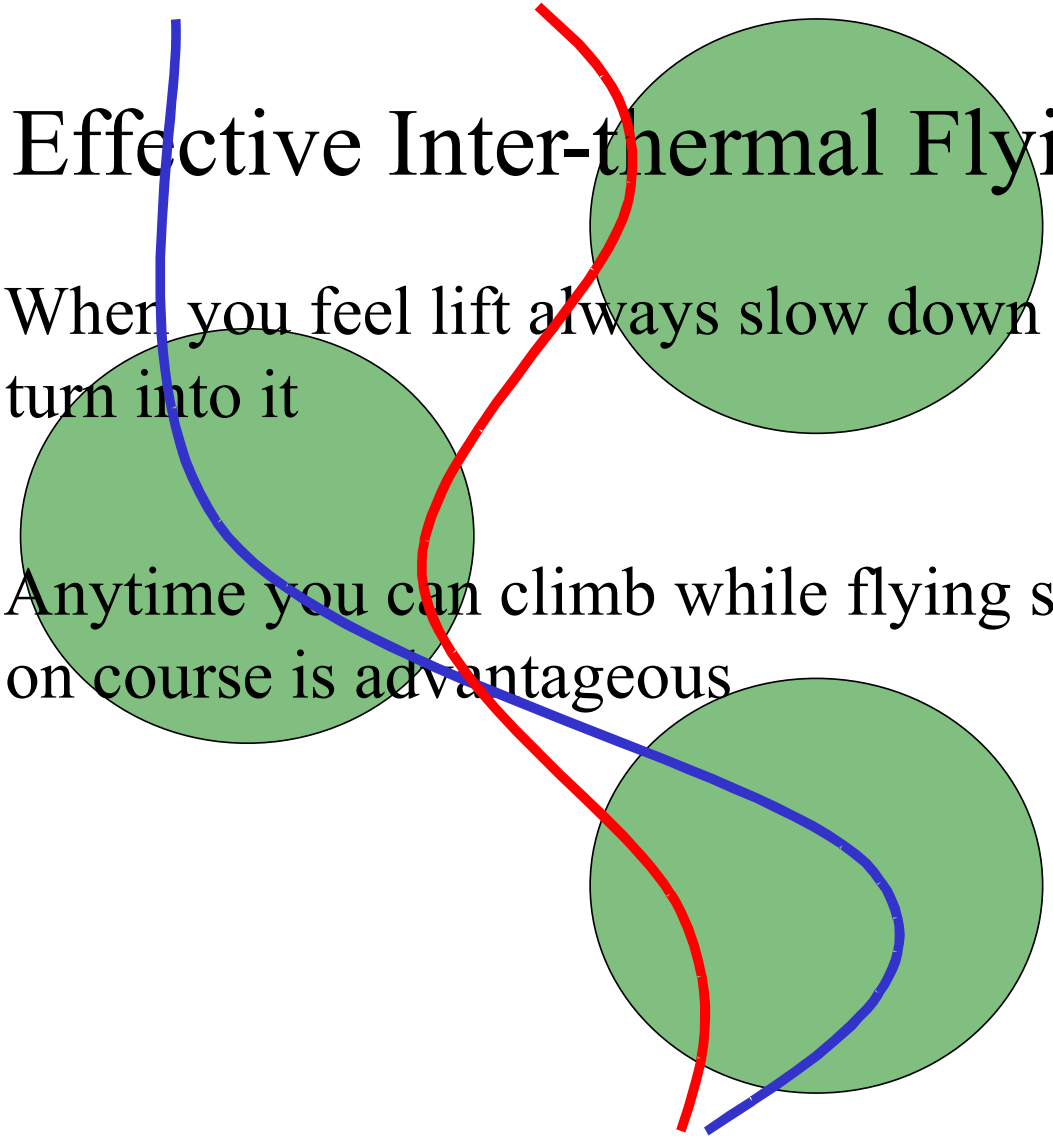
Survival height band –just stay in air

Effective Inter-thermal Flying

- Identify patterns of lift under clouds
- Look for patterns of lift using clouds and haze domes
- Look for good thermal sources and streets
- Look ahead 50-100km
- When high, look at cloud shadow patterns, when low look at cloud patterns.

Effective Inter-thermal Flying

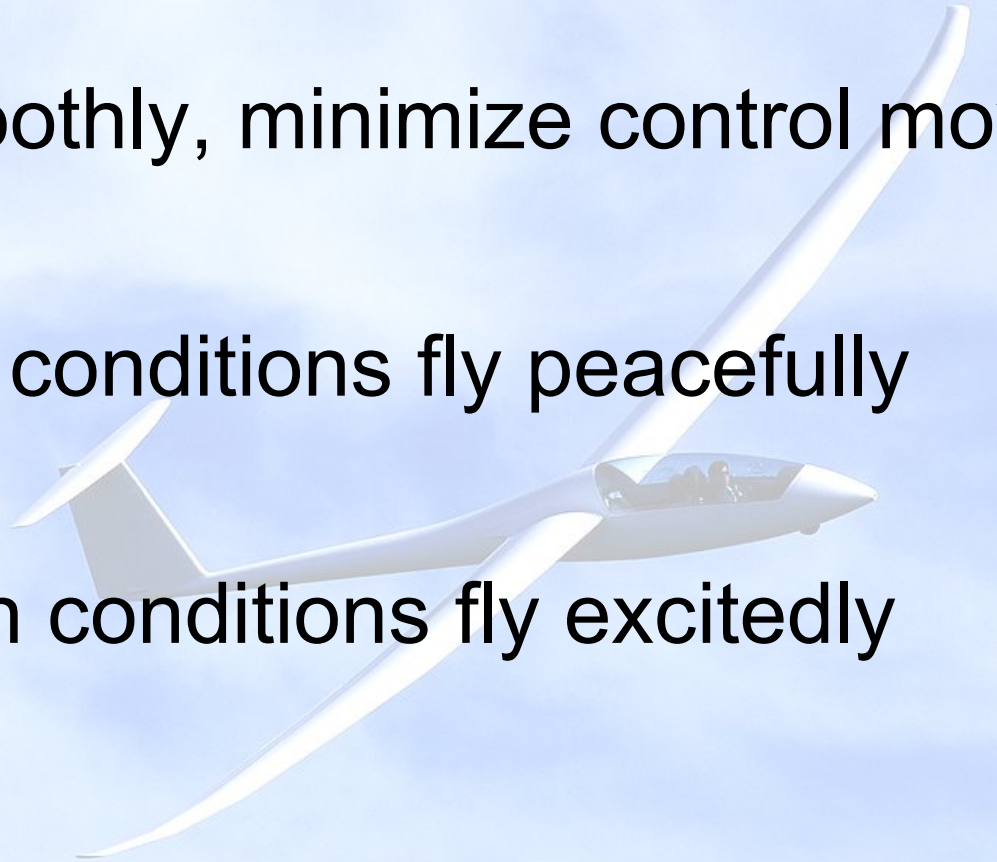
- When you feel lift always slow down and turn into it
- Anytime you can climb while flying straight on course is advantageous



Deviations

	Degrees off track					
	On track	10	20	30	40	50
Thermal strength	1.0	1.0	1.2	1.5	1.6	2.6
	2.0	2.0	2.2	2.8	3.6	5.8
	3.0	3.0	3.4	4.2	6.0	9.6
	4.0	4.2	4.8	5.8	8.2	13.6
	5.0	5.2	6.0	7.4	10.6	17.4
	6.0	6.2	7.0	8.8	12.6	10.6

Momentum and rhythm



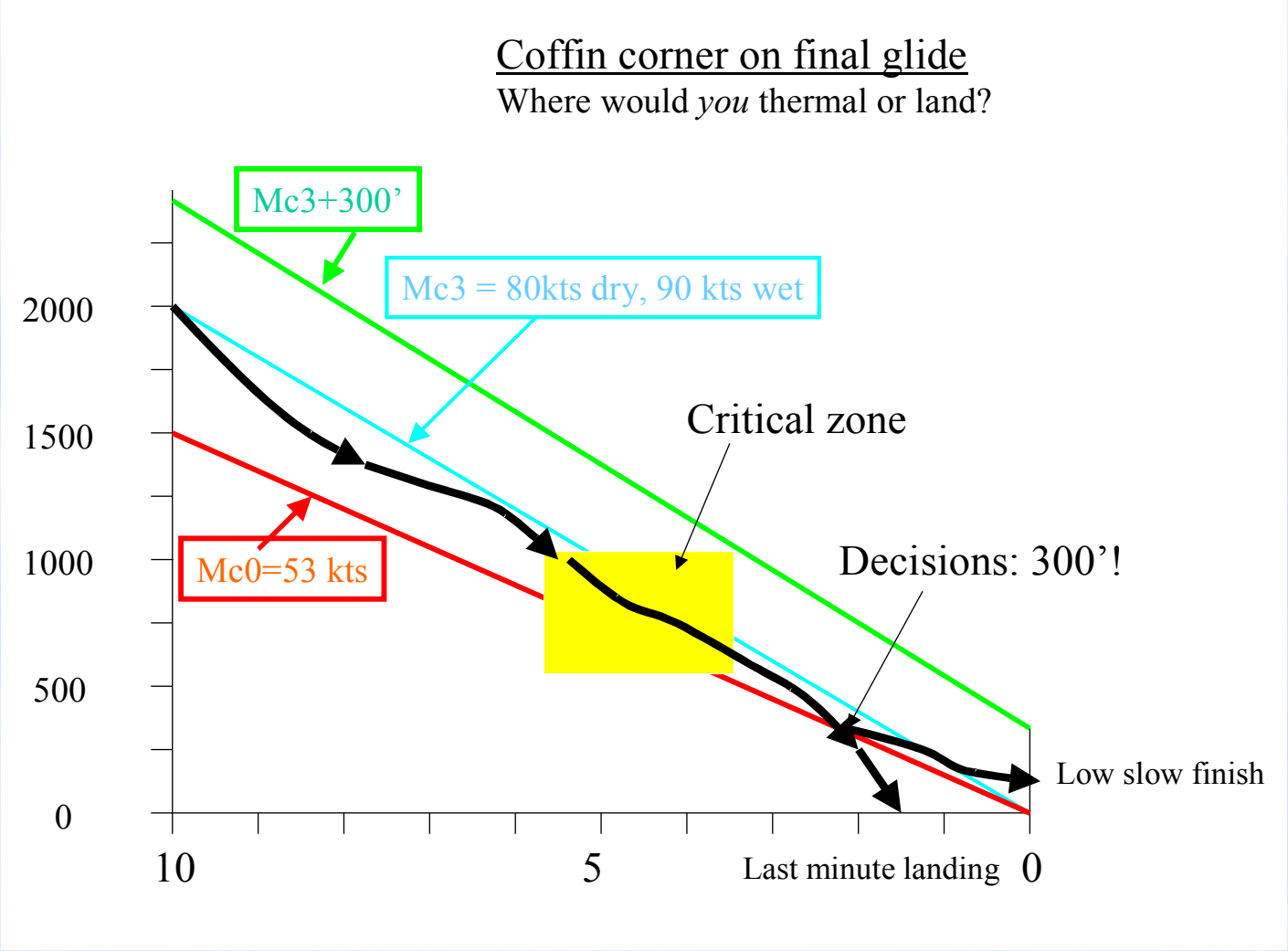
- Fly smoothly, minimize control movements
- In calm conditions fly peacefully
- In rough conditions fly excitedly

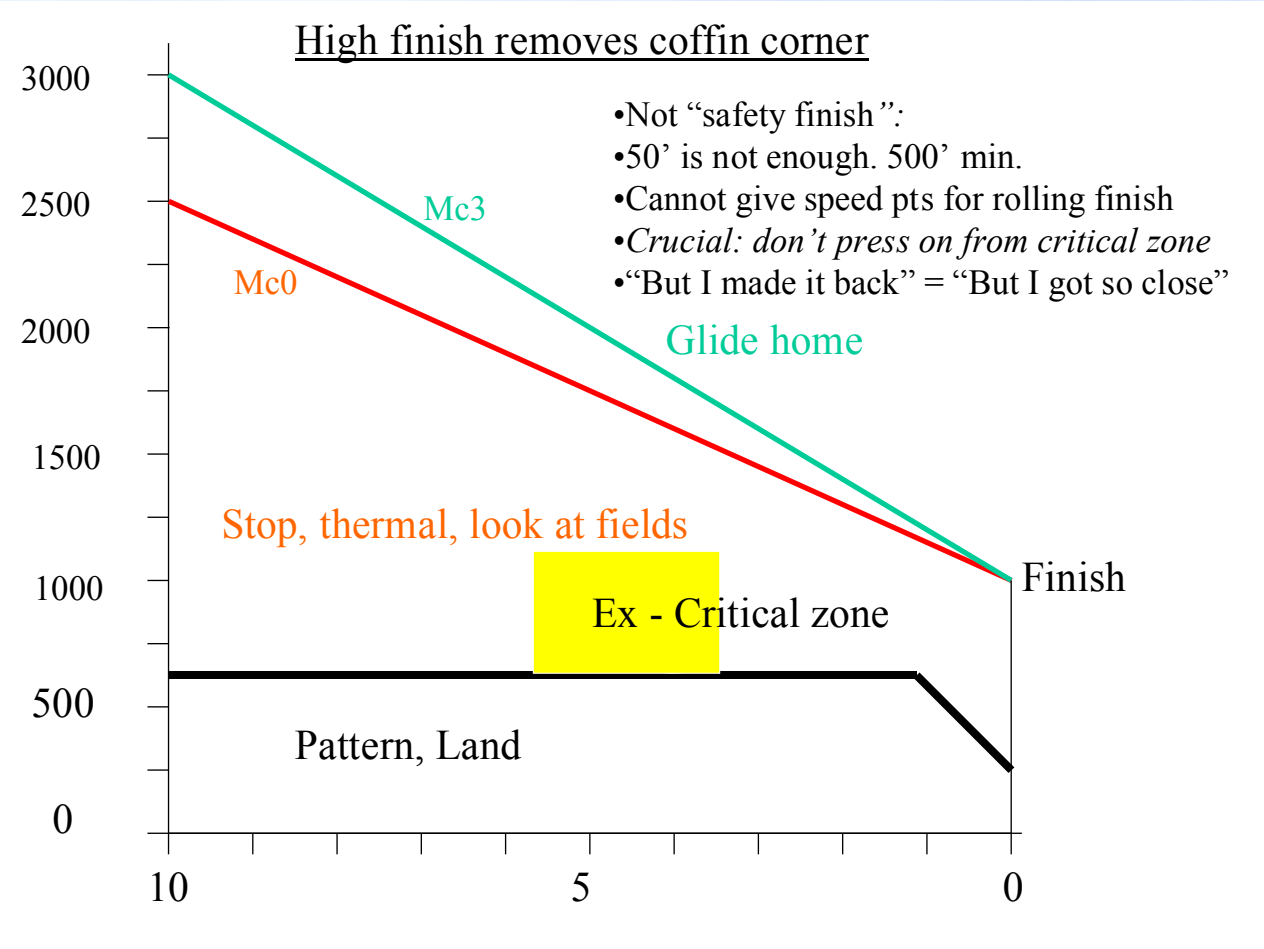
Final glides

Final glides

- A well flown final glide will increase the average speed considerably
- Be aggressive far out and conservative when close and low
- If gaining on the glide speed up
- If losing, find a climb
- high ring setting = high safety margin

Final glides




High finish removes coffin corner
3000
2500
2000
1500
1000
500
0
10
5
0
Mc3
Mc0
•Not "safety finish":
•50' is not enough. 500' min.
•Cannot give speed pts for rolling finish
•Crucial: don't press on from critical zone
•"But I made it back" = "But I got so close"
Glide home
Stop, thermal, look at fields
Finish
Ex - Critical zone
Pattern, Land

Summary

- The fastest average speed can be obtained by improving the climb rate rather than any possible variation in speed between thermals.
- By selecting only the strongest thermals will the fastest speeds be achieved.
- There are no hard and fast rules, everything depends on the circumstances