

XC PERFORMANCE 2020

Topic – Final Glides
Science or Art?

Performing efficient and safe final glides

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FINAL GLIDE OBJECTIVES

- ▶ Get home safely with good margin for a circuit and landing
- ▶ Get home safely with enough margin for a safe landing
- ▶ Optimise the final climb / final glide for best performance
- ▶ Get home!

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Stroll round the country – just get back safe

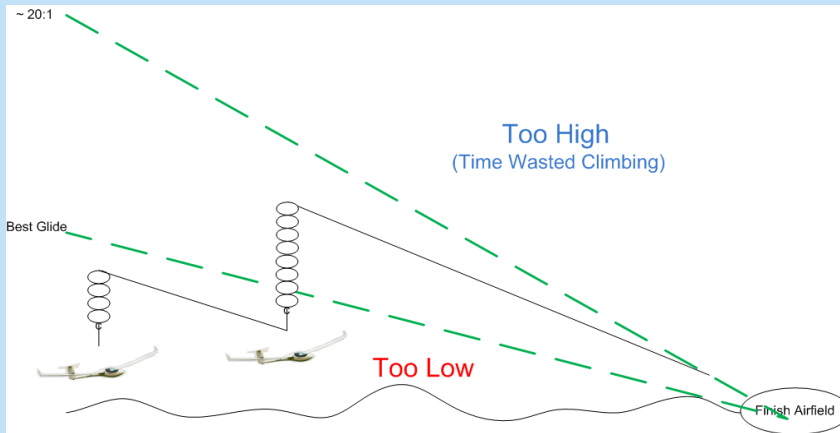
XC with normal risk appetite

Competition

Goal flight – get high stay high!

This presentation is about getting it optimised for performance

FINAL GLIDE CONE



In simple terms the idea is to climb or fly into the cone and then fly down it to the finish
Simples!

THEORETICAL TECHNIQUE

- ▶ Theory: set MC to average climb rate
- ▶ Climb to achieve desired margin
- ▶ Fly at set MacCready to the finish

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The theory says that you get established in a final climb
Set your computer's MC to the average climb rate
Climb onto glide.....and leave, flying at the MC set

Of course the real life final glide isn't like that.

PRACTICALITIES & PROBLEMS

- ▶ Too little height is much worse than too much
- ▶ Head winds and tail winds affect calculation
- ▶ Sink and bad air on glide
- ▶ Do we trust the computer?

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If you start with inadequate energy the chances of landing out are high. Too much energy is safer and allows you to fly faster, but costs a small amount of time.

In practice you cannot overtake the glider that leaves first. He will get home first.

Head winds and bad air affect the height needed
Tail winds and good air do too

The biggest impact is the pilots confidence. The glider will always surprise you!

SOLUTIONS AND MITIGATIONS 1

1. Understand your glider's L/D performance
2. Understand your computer and test its accuracy
3. Review your final glides in See You

Build confidence in your equipment

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What do you do to increase confidence?

Study your glider's expected and true performance
Understand how your computer works and tune it
to match real life performance

Review your final glides so you know what to look
for on the day

PERFORMANCE REVIEW – JIM

Booker 2016	Distance K	Av. GS KPH	Glide Ratio
Day 1	29.4	128	36:1
Day 2	48.5	138	40:1
Day 3	29.7	144	33:1
Day 4	30.0	196	26:1

Booker 2018	Distance K	Av. GS KPH	Glide Ratio
Day 1	36.6	132	41:1
Day 2	22.0	155	32:1
Day 3	50.5	169	36:1
Day 4	32.5	181	29:1

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For example, the data shown here is from flights I did in the 2016 and 2018 Booker Regionals

Looking at the first group notice the length of the glides 30-40k is not unusual as you often have a working band up to c. 4000ft.

Second, the glide ratios are between 30 and 40:1. The lower figures have been flown at higher speeds.

I can conclude that my glider can achieve final glides of 35:1 or so at decent speeds. This will be useful later.

PERFORMANCE REVIEW – JIM

Booker 2016	Distance K	Av. GS KPH	Glide Ratio	Height HNT	GR to Finish
Day 1	29.4	128	36:1	1700	29
Day 2	48.5	138	40:1	1800	28
Day 3	29.7	144	33:1	2100	24
Day 4	30.0	196	26:1	2600	19

Booker 2018	Distance K	Av. GS KPH	Glide Ratio	Height HNT	GR to Finish
Day 1	36.6	132	41:1	2300	22
Day 2	22.0	155	32:1	2100	24
Day 3	50.5	169	36:1	2000	25
Day 4	32.5	181	29:1	2100	24

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Looking at the right hand shows the height I was when turning Huntercombe and the glide ratio shown to the finish line.

We can conclude that in benign conditions even 1700ft is plenty. I recommend that you fly in from known positions and review the height lost against what your computer predicted at a variety of speeds to build your confidence.

If anything I was flying quite conservatively here.

SOLUTIONS AND MITIGATIONS 2

1. Study the sky ahead to the finish
2. Fly all the energy to gain margin
3. Fly a conservative profile

Reduce your risk of falling short

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Practical things to do are:

Study the sky ahead – is there lots of energy or none?
Can you join the dots to the finish?

Fly all the energy – hot spots, ridges, lines etc. to pick up margin as you go.

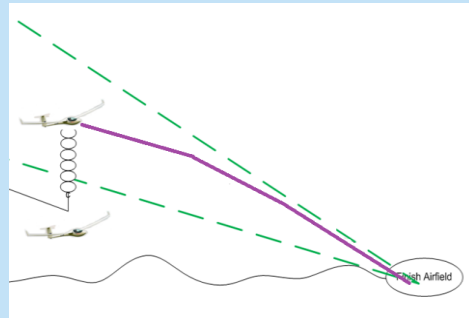
If it is streeting you can often start well below glide.

And fly a conservative profile. Let me show you what I mean...

FINAL GLIDE PROFILE



Bad!



Much better!

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In theory you set off at the set MC speed. All goes well until you hit sink. Now you are at MC 1 with little option. One more bit of sink and you have landed out!

Better to set off slower and build your margin. As the picture improves you can speed up to slam dunk the finish.

In this scenario you have some margin in hand to cope with sink. If that happens slow up a bit and build in margin again.

SOLUTIONS AND MITIGATIONS 3

- ▶ Plan for sufficient speed
 - allows you to slow down to increase margin
 - reduces the effects of bad air
- ▶ Resist big pulls in good air
 - turn if necessary

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So, start by setting your margin for a MC 3 glide or faster if the thermal is thumping. Don't fly slower than you have been on task.

Do milk lift that you find but do not slow right down. Going slow is very bad in sink and putting the nose makes it worse!

If you need margin and hit lift consider turning. One 360 in lift makes a huge difference and will give you the confidence to press on.

TIPS AND SUMMARY 1

- ▶ Centre your final glide candidate thermal
- ▶ Look down track and choose a margin
- ▶ Set computer to MC 3+
- ▶ Climb until chosen margin is achieved
- ▶ Move on if thermal not good enough

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So to summarise:

Centre, choose margin, set MC 3 or more, leave when margin achieved.

Don't get suckered into taking a poor or dying climb to put you on glide. If the thermal is no good, or not as good as you have been using, keep gliding until you get a good one or glide into the cone.

Of course if it is the end of the day and climbs are weakening you will have already got as high as possible

and been careful to stay there...won't you?

TIPS AND SUMMARY 2

- ▶ Start slower than MC setting
 - ▶ Follow the energy
 - ▶ Watch the numbers
 - ▶ Speed up as confidence grows
 - ▶ Slow down or climb if getting worse
- MC 0 is for suckers and organ donors

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Fly a conservative profile

Fly the energy – don't be tempted to go straight

Watch the numbers. The computer can tell you how high you will arrive and the glide ratio to the finish. Are the numbers improving or getting worse? Speed up as confidence grows

If you have set MC 1 or lower to get in you are in serious trouble. Climb or land.

Unless the air is dead still and you know that your instruments don't lie.

TIPS AND SUMMARY 3

- ▶ Make a safe landing out if inevitable
- ▶ Plan your circuit and landing
- ▶ Look out and listen out
- ▶ Follow finishing procedures
- ▶ Review your performance

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If it really hopeless. Don't just hope and pray. Make a decision to land and do it safely. You don't want to be picking a field at 200ft or lower!

The finish line is not the end of the flight. Think about your pattern and landing options.

Look and listen out hard. You may have high energy and be surrounded by idiots.

Don't infringe the rules

REVIEW and plan your next final glide.

Optimise your final glides

Increase confidence and speed

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