

GLIDING – THREAT AND ERROR MANAGEMENT

– OR HOW TO REDUCE MISTAKES AND FLY SAFELY

Arthur Gatland



Arthur Gatland started flying in 1963 at age 13 and has accumulated 17,000 flying hours including 2,500 hours in RAF fighters such as Harriers, Hunters, Hawks. He is currently a Boeing 777 Captain and instructor, and for ten years was Manager of Training and Flight Standards for Air New Zealand. He is an A Cat glider instructor, with a Gold C and 3 Diamonds, and was a previous CFI of the Auckland Gliding Club.



In Soaring NZ issue 15, George Rogers asked why our gliding accident rate has been so bad over recent years. The fact is that on average we have one fatality a year with all the tragedy that this brings to families and friends, not to mention the huge cost in damaged and destroyed gliders and associated increase in insurance costs etc. Yet gliding is inherently a relatively safe sport, and historically has been second only to airline flying as one of the safest types of aviation. To my knowledge, none of our spate of accidents has been the result of structural or mechanical defects – all have resulted from pilots unnecessarily putting themselves in a situation that for various reasons have resulted in a crash. Ridges, rocks and trees do not suddenly leap out and hit gliders – yet we manage to collide with them on a regular basis. And despite the fact that gliders are safer, have better handling and performance, better airbrakes, more comfort, and better visibility than those of 30-odd years ago, our accident rate is worse.

Why is this – and more importantly, what can we do about it?

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Already, I can see a number of pilots losing interest in this discussion – because “This doesn’t apply to me – I’m experienced / skilled / smarter / an above average pilot (delete where applicable) and I don’t make those mistakes.” If you really believe this of

yourself, then you can replace those descriptions with “arrogant / overconfident / unrealistic / unaware” (delete where applicable).

This series of articles applies to every glider pilot in New Zealand, regardless of experience.

I believe that, like many accidents where contributing causes are often small but multiple, there has been a lowering of our flight standards for a number of reasons. These include:

- lower average flying hours due to less leisure time and financial constraints.
- higher performance gliders that create an unrealistic expectation that we always get home from cross-country flights.
- changes to national culture where people think they have the right to be more independent which leads to less discipline, reluctance to ask for on-going training, less time to talk to and listen to more experienced pilots, and unfortunately a lowering of instructing discipline and standards.

We all – individually and collectively – need to look at ourselves and see where we can attack these issues and reverse the slide in our flying standards and safety.

One technique we can all use to improve our flying safety is the



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use of Threat and Error Management, which I will describe in this and following articles. This is a simple technique of understanding the type of situation where we are more likely to make a mistake and to prevent making errors which might lead to disaster.

“To err is human.” (Cicero, 50 BC)

In other words, we ALL make mistakes. Accepting this is an important step to understanding when and where errors occur, and therefore how to prevent errors. Pilots who think they don't make mistakes are (a) seriously mistaken (b) dangerously over-confident (c) have a limited life expectancy!

Errors are most likely to occur when we are faced with a THREAT, that is, something that presents a change to what we are used to, or what we are comfortable with. To understand what constitutes a Threat, I will introduce the concept of a Pristine Flight (courtesy of Continental Airlines). In this first article, I will concentrate on a local soaring flight and discuss possible threats, and in part 2 and 3 we will expand this to cross-country flights, and competition and other specialised flights.

Pristine Flight

This is a simple gliding flight where everything goes exactly to plan. You arrive at the airfield and the club glider you want to fly is available, already DI'd and at the launch point. Helpers are readily available to pull it out for you, and a towplane is waiting. You are current on type and an instructor is happy to authorise your local flight. There is no wind and no lift or associated sink. There are no other gliders flying and no delay to your takeoff. The weather is

pleasant; not too hot. You aerotow to 2000 feet and glide gracefully back to the circuit, practising a few turns and speed control. Your well-planned circuit is uninterrupted by other gliders or crosswinds and landing is uneventful. This is a Pristine Flight – arguably a bit boring, but with no real interruptions to your simple plan.

Now let's talk about likely variations – many of them very common – that can upset your plan. You planned to be at the airfield by 11.00am but you are annoyed that you are late because your partner was late getting back from shopping. No-one has bothered to get the glider out of the hangar and it hasn't been DI'd. You are short of time so you must hurry these processes. The only instructor is flying, and you haven't flown for two months so although you think you might need authorisation, you decide it'll be OK to go without. There is only one other person to help push the glider on to the start line, an inexperienced student who you need to brief. After the exertion of pushing you are hot before you even get into the glider. You strap in and as you are doing your pre-takeoff checks, someone interrupts you to ask for your tow tickets. It's a bit windy and you haven't briefed the towpilot, so after takeoff he annoyingly takes you downwind to what he probably thinks is a good looking cloud. You don't find lift, but you practice a few turns, then head back to the airfield, encountering unexpected sink on the way. Your circuit is lower than you would have liked and you are concerned about another glider on circuit at the same time. Your circuit is a bit rushed, and with a short finals, you don't quite sort out the crosswind so the landing is a bit untidy. After landing the next pilot points out that the DI hasn't been signed today.

All of these variations to the Pristine Flight constitute Threats that will increase the likelihood of you making a small slip, or an



A race to the finish and other traffic has created a change from pristine flight. The lead glider is about to land with his wheel up.

error in judgement, or forgetting something – regardless of your experience. Let's review what these Threats might include:

Time pressure	Frustration
Impatience	Procedural uncertainty
Heat discomfort	Interruptions
Weather changes	Poor preparation
Unexpected sink	Outside interference
Inexperience	Lack of currency
Fatigue	Other traffic
Poor training	Poor health
Inexperienced crew	Launch delay
Turbulence	Unfamiliar airfield
ATC / airspace	Technical issue
Dehydration	Hunger

Cross-country introduces an additional list of threats which we will discuss in the next article.

Note that many Threats are normal and some even desirable. For example a moderate wind might be appreciated for ridge soaring, but results in a crosswind takeoff and landing, and results in a headwind when returning to the airfield. Good thermals can also cause unwanted sink on the downwind leg in the circuit. You may be aiming for your 5-hour endurance, but this will raise threats of thirst, hunger, fatigue, etc.

Threats

All threats increase your likelihood of making an error. A proficient pilot can easily recognise all threats, and implement a strategy to prevent an error resulting. Some examples might include:

Interruptions

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Procedural uncertainty

Any time you hear that nagging voice questioning something (are we clear for takeoff, did I do my checks, did I sign that DI, do I need instructor authorisation, did I remove the tail dolly) – then STOP and double-check. Observers always respect someone who acts professionally and questions some small detail, in stark contrast to someone who makes an assumption and is proven to be an idiot.

Time pressure

Any time you feel pressure to hurry – for whatever reason – you should be aware that this is a major cause of errors, through forgetting processes (tail dolly removed?), forgetting to take essential equipment (maps, drinks, hat etc.), ignoring procedures (takeoff checklist) etc.

Other traffic

A good pilot will always join the circuit assuming there will be other gliders rejoining, and have sufficient height to give way to a



Heavy landing.

lower performance glider. He/she will also know the rules regarding landing if there is a glider ahead on final approach – where to land etc.

Unexpected sink

Always anticipate sink in the circuit. However if a circuit is flown using correct techniques this should be self-correcting – don't rely on the altimeter, or ground features for turn-in points, but assess your angle to landing point. Any unexpected sink can easily be corrected by adjusting distance out and turn-in point – if a pilot is alert to the possibility of unexpected sink.

Inexperience and Instructor Responsibility

Early solo pilots cannot be expected to recognise all threats existing on any particular day. This is why an instructor must authorise and brief early solo pilots. It is the instructor's responsibility to assess all threats and brief an early solo pilot accordingly. The brief might be along the following lines (abbreviated):

I have checked your logbook and confirmed you are current on this glider type. Your aim of today's flight is to search for lift and practice thermalling. There are several other gliders airborne, so let's review how you join a thermal if another glider is there first. Remember when you are concentrating on thermalling and speed control that lookout is actually more important. There is a moderate northerly wind today, so stay upwind of the airfield. Always keep the airfield in sight and have a plan on how to rejoin circuit if you don't find lift. Be aware of the likelihood of sink in the circuit area. Where will you land if another glider has landed ahead of you? It's hot today – have you got a sunhat and sunglasses? Now make sure you take your time getting comfortable in the cockpit and doing your checks – don't let anyone rush you. Any questions – anything you have any doubts about?

The main ways that new pilots can gain experience and knowledge is by instructors or experienced pilots passing on these thoughts, OR learning by making mistakes! Which method is better??!!

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