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# Cross Country 176



**INTO THE WILD**

Flying the impossible in the Alaska Range



**BRUCE GOLDSMITH** *ICARISTICS*

## SHIFTING OUR THINKING ON SAFETY

### ▼ PASSIVE RESISTANCE

A lot of work goes into your glider to help keep you safe, but the real safety valve is the pilot  
Photo: Marcus King



**I**n the mid-1980s, a Dutch traffic engineer named Hans Monderman invented the 'squareabout'. Responding to an accident blackspot he threw away all traditional efforts of control and in their place built a square instead of a roundabout. There was very little signposting and no traffic lights.

It sounds dangerous, yet it works. Traffic glides through slowly but rarely stops moving for long. The number of cars passing through has risen, yet congestion has fallen. And there are half as many accidents as before.

Traditional traffic calming solutions try to improve safety by direct action on the traffic. What Monderman did was use the drivers' psychology to make them act differently.

### How does this apply to paragliders?

Through certification we have made enormous progress in the safety of paragliders. Designers also make wings faster, more stable and easier to fly. However, statistics show the accident rate does not really change much despite all this improved safety.

This is because pilots adjust their flying to suit the level of safety that they want. If they feel their wing is more stable they will fly in more turbulent air. If their glider can go faster they will take off in windier conditions.

This shows us that safety is not simply a passive characteristic of each glider. The

human factor, the pilot, is the crucial point that changes everything.

Just like the driver who feels he is safe when speeding dangerously it is the pilot's perception of safety that is more important than the passive safety of the wing. If a pilot feels his wing is super-safe this becomes a danger in itself, as he is more likely to push the limit. Accident statistics show that a safer wing does not lead automatically to fewer accidents.

### What would help?

My idea is to use the same trick as Monderman. We need to concentrate on the psychology of the pilot to truly improve safety. It is the perception of the pilot that

# SAY HELLO TO THE NEW

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has to be considered as the biggest factor in flying safety.

**Gliders that talk:** We need the glider to help the pilot to make the right decisions. One important safety problem is when pilots get caught out, when things happen differently to what the pilot expected, causing danger and accidents. This can happen due to the weather, but it can also be caused by the flying characteristics of the wing.

One way to improve the information to the pilot is to avoid gliders that are completely rigid. Gliders should move or deform, giving the pilot feedback or warning of what might happen before it actually does. This helps pilots be more aware of the air they are flying through.

This is not a new idea, but to regard it as an important safety feature, one that is even more important than certification, is new.

**Progressive stability:** A wing that is super stable and almost never collapses can lead to more accidents. This is because the wing rarely collapses, so when it does collapse the pilot is not prepared and has little experience of how to deal with the situation.

Pilots naturally fly in more and more turbulence because they are not aware of the increasing risks they are taking. But any wing will collapse given enough turbulence. So if a wing is going to collapse, it's better that it makes a small collapse in medium turbulence rather than a big collapse in strong turbulence.

The nature of the collapse as well as the amount of turbulence the wing can resist before the collapse is what makes the collapse easier to cope with and safer.

The best solution is what I call progressive stability. A glider that gets small collapses in light turbulence and builds up progressively to big collapses in strong turbulence. This

helps pilots learn how to deal with collapses and understand the air around them. It means they can understand the level of turbulence they are in and choose the level of safety they feel comfortable with.

The progressive nature of a glider's stability means it warns them about what is going on and helps them to make the right decisions.

## Assessing glider characteristics

In the above we are talking about some fundamentally important factors in the safety of a glider – and none are measured by certification. Pilot reviews may touch on factors such as the feeling a wing has or its feedback, but people don't take this as seriously as certification.

In reality though these factors are even more important than certification. They really matter because they help the pilot to fly more safely by considering the pilot as the main source of safety rather than the passive safety of the wing.

I have made a short list of some flying characteristics that are important to the perception of the pilot. These characteristics can easily be assessed. All of these are outside certification.

1. Does the glider move and warn you before a collapse might happen, or is it too rigid?
2. Is the stability of the glider progressive – does it react to increasing levels of turbulence in an incremental way?
3. When the glider actually collapses do you get small collapses first before you get big ones?
4. Is the glider predictable in every way? Does it always react in the way you expect – or could there be some surprises?

Your glider should help you to fly safely, it is not just a passive machine. 



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