Training for G-force

**The G-Force Trainer helps pilots experience high G-forces with low risk.**

By Bruce Goldsmith

Thomas Grabner is a paraglider pilot and mechanical engineer who was working for Diamond Aircraft in southern Austria when he came up with the idea of designing his own machine to recreate the high G-forces encountered in a spiral dive. Two years later and Thomas’s dream has become a reality and now sitting in a modern farm building in a green field in central Austria is the shining piece of steel and aluminium that is the G-Force Trainer.

Manufactured with aircraft precision and quality the G-Force Trainer started operating in July 2010. Since then it’s been used by pilots in training for reserve releases under G-force on it in January this year. In the group I joined, four out of five found their reserves quite quickly, but one pilot just could not find her reserve and it took her a full 30 seconds to finally locate it and throw. After repacking her chute into the harness she got a second go, and what had taken 30 seconds before took just three seconds. That training alone could perhaps save her life.

As well as pilot training the G-Force Trainer has been used by the DHV to test reserve deployment systems and by Advance to check the effect of high G-forces on the new Impulse harnesses that have no seat plate or rigid parts. Test pilots and instructors have also trained on the machine. And even though I have done thousands of spiral dives myself, I found the experience very useful. I also had the chance to learn the forced breathing technique, which really helps to resist higher G-forces without blackout.

The training is especially pertinent because of the number of paraglider pilot’s who not only that, but if you black out during a spiral you cannot be sure that your weight or even your hands are still not applying some kind of brake input. In short, you should not rely on the glider to save you from spiraling all the way into the ground – you need to pilot the glider out of the spiral.

The final ride was a test reserve deployment. In the group I joined, four out of five found their reserves quite quickly, but one pilot just could not find her reserve and it took her a full 30 seconds to finally locate it and throw. After repacking her chute into the harness she got a second go, and what had taken 30 seconds before took just three seconds. That training alone could perhaps save her life.

A one-day training session typically starts with the signing of medical forms and a disclaimer and then an initial briefing. Using their own harness and helmet each pilot then got a relaxed 1.5G start. The rest of the group then took it in turns to slowly build up the intensity of the G-force rides. Over the day each pilot got 15 to 20 rides as they got used to the sensation.

The training is especially pertinent because every couple of years there is a fatality from a paraglider pilot spiralling all the way into the ground. I remember the first time this happened was way back in the 1990s. Despite efforts to improve glider safety and spiral stability through certification, better testing and an understanding of the G-forces and potential blackout that they can cause, we still occasionally see fatal accidents. One of the reasons for this is that certification cannot guarantee that every glider will automatically recover from every combination of equipment, conditions and technique. This is because the way you enter a spiral, and the movements you make during the spiral, affect the nature of the spiral and the recovery. Not only that, but if you black out during a spiral you cannot be sure that your weight or even your hands are still not applying some kind of brake input. In short, you should not rely on the glider to save you from spiraling all the way into the ground – you need to pilot the glider out of the spiral.

When a pilot is centrifuged into his harness with a massive G-force it is terrifying. After being on the trainer I now find it easy to understand why pilots freeze and do not have the ability to steer out of a spiral or even pull their reserve, and just remain frozen, unable to react to save their own skin.

Austria is the shining piece of steel and aluminium that is the G-Force Trainer. It is manufacured with aircraft precision and quality that is the G-Force Trainer.

HOW IT WORKS

The G-Force Trainer is controlled directly from the pilot via the brake lines. The hanger assembly is designed so that weight shifting can also be used for control. The pilot moves just like in real flight to get into the same position as in a spiral dive. With increasing back the pilot turns around the vertical axis as in a deep spiral.

At 7G, with a pilot weight of 75kg the pilot is pressed into their harness with an equivalent ‘feel’ of 525kg. Learning how to monitor your G while in a spiral dive and then steer out of it is one of the key parts of training. Thomas says a constant 3.5G as experienced in a spiral dive is harder to bear than the short-term peak load of 6.5G experienced in an acrobatic maneuver like the Infinite Tumble.