



TM28 - PARAGLIDER TANDEM TECHNICAL MANUAL

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1. Outline

This manual has been developed for the NZHGPA for the purpose of documenting the technical aspects of tandem flying to promote safe flying skills and attitudes specifically required for passenger flights on tandem paragliders. This document should be used as a guide for training and a reference for all tandem pilots.

2. The Weather

Choosing safe conditions to fly is an important part of flying tandem. Remember that as the Pilot in Command you are making the decision to fly not only for yourself but for your passenger as well. Maximum wind strength and direction should be thought about specific to the site, glider model you are flying and where the wind reading is taken. Never fly to your limit, always consider that wind could be increasing once you are airborne.

Note: Tandem pilots in training should limit their operations to low wind days and mild thermal days. Recommended maximum wind speed is 12 knots (22 kilometers), thermal 1000ft/min. This is to avoid the probability of launching and flying in strong winds above the training pilot's skill set and potential turbulence over the terrain and landing area.

3. Equipment

Whilst flying under the NZHGPA, pilots are reminded to adhere to the NZHGPA Organisation and Procedures Manual (OPM). It is a pilot's responsibility to comply with the OPM's operational flight procedures and equipment standards.

When choosing tandem equipment, the Pilot in Command should be careful to choose the right equipment for the right purpose and for the passenger.

Note: High performance tandem wings or different harnesses for either: XC, Acro or Hike and Fly all have compromises in safety. You should also consider the glider that you are flying when it comes to assessing who you are flying (public or another pilot), where, when you fly and nature of the intended flight.

Tandem Gliders

Important: Read the glider manual and be familiar with the manufacturer's recommendations and Certification Test. Often as wings develop the designer may make adjustments. It is common for a manual to contain safety information specific to the glider, how it is designed and intended for flight and manoeuvres that should be avoided. All paragliders used or tandem flight flown in New Zealand shall be tested to EN/DHV or LTF standards and have a current Warrant of Fitness.

Solo Gliders used for Tandem

If using a solo glider for tandem; it is mandatory that the glider is fitted directly to the pilot harness carabineers, unless the riser and break lines have been specifically configured for tandem flight with tandem spreaders.

Connecting a passenger to a pilot without the use of tandem spreaders should only be done with light passengers/children using an appropriate lengthed and rated attachment. The all up flight weight must be within the certified loading of the glider. Cross loading of any carabineer must be avoided.

Note: Pilots are reminded to fly with all equipment fit for purpose, unmodified and within the manufacturer's recommended weight range to remain within the manufacturer's certification.

Harnesses

It is compulsory to use NZHGPA approved harnesses, certified by the DHV and harnesses certified to LTF/EN standard. The back protection/harness combination must be fit for purpose, securely fit the size of the passenger, used as specifically designed and intended by the manufacturer without any modifications and as presented for certification testing.

Spreaders

The spreaders are the attachment between the pilot, passenger, reserve parachute and risers. Spreaders used must be developed for the purpose of tandem paragliding or be fit for purpose and appropriately rated. Just like the rest of your equipment they should be regularly checked for any sign wear and tear or damage.

Carabiners

Carabiners used to connect risers to spreaders must have a minimum breaking strain of 24kn.

Reserve Parachutes

All tandem flights are required by the NZHGPA and the CAA to carry a reserve parachute. The reserve parachute should be repacked within the recommended time specified in the manufacturer's manual for tandem paraglider reserves the bridle connections must be adjacent to the risers.

Note: It is recommended that any reserve carried by a tandem pilot should be rated equal to or above the maximum all up weight that the tandem is certified to fly with. If your reserve is rated lower than your glider you must ensure to not exceed the maximum weight rating for the reserve parachute.

Helmet

Helmets must be a serviceable hard shell protective helmet conforming to or exceeding the 'Australia and New Zealand Bike Helmet Standard'. It is recommended that tandem helmets are certified to air sport standards - there are many options these days.

Altimeter

The Pilot in Command must use an altimeter accurate to within plus or minus 100ft.

4. Passenger Assessment

As the Pilot in Command, it is your responsibility to assess yourself and passenger's fitness to fly including impairment, (IMSAFE see Annex 1), the weather conditions, wing you are flying and your skill level. If you have concerns about the ability of the passenger to perform when you need them to, then remember it is your choice to fly them. Always be prepared to say no if you have any doubt. Remember that their safety is your first priority. It is common for a tandem pilot to require a passenger to demonstrate a run, jump or check their weight to help you assess their physical ability for take off.

Medical conditions should be asked about, if they have a condition, you were previously unaware of then you should discuss with them how it may affect them during the flight, takeoff and landing.

Clothing and footwear should be assessed. Will their shoes stay on? Are their shoes and clothing appropriate for the flight ahead?

Note: Passengers must have attained the age of 16 years or have parent or guardian consent.

Note: Due to the physicality and weight of a child, it is not recommended to fly children below the age of 5 years old. If you are, special consideration should be taken including your relationship with the child, harness used, always make sure you are within the weight range of the glider and if necessary, use an assistant on launch. Children should be asked independently of a parent or guardian if they would like to fly with you.

5. The Site

The Pilot in Command should carefully consider the take-off site with a view of being clear of obstacles in the abort area. With the very real possibility of a passenger sitting down or tripping over on take-off and the subsequent unplanned loss of control, avoid areas with fences, tree stumps, trees, and the like ahead of take-off. Wind conditions should be taken into consideration when choosing a launch site.

Note: Tandem pilots in training should only use authorised club sites and landings.

Note: Tandem pilots in training should limit their operations to low wind days and mild thermal days. Recommended maximum wind speed is 12 knots (22 kilometers), thermal 1000ft/min. This is to avoid the probability of launching and flying in strong winds above the training pilots skill set and potential turbulence over the terrain when ridge soaring and landing area.

6. The Pre-flight Check

Remember that your passenger is trusting you explicitly with their life! You must ensure you take maximum precautions and do a thorough pre-flight check.

A pre-flight check must be routine for all pilots, a specific preflight check must be developed by tandem pilots to ensure they have completed all steps correctly before launching. It is recommended that a preflight check is done using a number system and in the same order each time for example a 17-point check may look like the following:

(This is only an example all tandem pilots should develop their own checks which works with their equipment, this list is not exhaustive and there may be further checks required, 115 operators may have their own pre-flight procedures to follow.)

- | | |
|---|--|
| 1. Passenger Helmet | 10. Passenger spreader to harness carabineer; Right |
| 2. Pilot Helmet | 11. Pilot spreader to harness carabineer; Left |
| 3. Passenger Harness; Leg Left | 12. Pilot spreader to harness carabineer; Right |
| 4. Passenger Harness; Leg Right | 13. Main carabineer spreader to riser: Left |
| 5. Passenger Harness; Waist | 14. Main carabineer spreader to riser: Right |
| 6. Pilot Harness; Leg Left | 15. Riser maillions tight/secure |
| 7. Pilot Harness; Leg Right | 16. Reserve Handle and pins |
| 8. Pilot Harness; Waist | 17. Trimmers appropriately set, Risers attached correctly, and lines including brakes are clear. |
| 9. Passenger spreader to harness carabineer; Left | |

If the pilot is interrupted or distracted at any time during this check, they must start again from the start. Each check should be a physical & visual check.

Safety Seal

A "Safety Seal" is most commonly a short piece of brightly coloured webbing with Velcro at both ends so it can be hooked around a glider brake handle or passenger leg strap. It is a physical seal which confirms all pre-flight checks have been done before launch.

When using a Safety Seal: The Safety Seal should be kept attached around the brake handle prior to setup.

On take off once all preflight checks are completed, remove Safety Seal from brake handle and place on leg strap of passenger harness.

NOTE: The Safety Seal should be attached to the leg strap so once the harness leg straps are unclipped after the flight it will fall off, this is to ensure the Safety Seal is not left on the harness between flights.

If a pilot unclips any part of the system to reset the glider or for any other reason the Safety Seal must be removed from the passenger harness and placed back on the glider brake handle. Then once pilot and passenger are re-connected for launch the pilot must repeat their pre-flight checks before re attaching the Safety Seal to the passenger harness leg strap.

Once flight is completed the Safety Seal should be removed from passenger harness and placed back onto the glider brake handle.

7. Wing Loading

Due to different passenger size and weight, wing loading will vary from flight to flight.

Lighter Passengers mean easier take-off's and landings, slow speed flight (watch the wind!). Due to less loading, you will have a slower stall speed and notably less brake pressure. You must be careful not to over-apply brake in manoeuvres such as slow thermaling 360's, entering spiral or exiting a B-Line Stall to avoid stalling or spinning the glider. In turbulent conditions be particularly careful to keep your speed up on landing, feeling through the brakes, and watching the immediate environment for signs of turbulence (gusts on trees, long grass etc).

Heavy Passengers mean a higher stall speed, requiring a faster take-off and will result in faster landings, increased sink, and higher-flying speed. The wing will be under considerably higher strain during 360's and collapse recovery. Heavy people will also place much more strain on your body and legs during landings, especially if you do not have a soft touchdown. Ensure you give your maximum concentration on landings.

Note: Pilot must fly the glider within the manufacturer's recommended weight range to remain within the glider's certification.

8. The Passenger Briefing

It is important to inform the passenger of what to expect from the flight. This will hopefully prepare them and help focus on the instructions you give them for launch without being distracted by the 101 questions they may be thinking.

Remove anything from their pockets and store safely in the harness (ideally in a bag which can be secured inside the harness). Whilst getting them into the harness explain how the harness should feel loose and once airborne you will slip back into a comfortable seated position.

Always keep a calm voice during the brief and exude quiet confidence. If you're stressed, this will likely stress your passenger. Your briefing should be specific for the conditions and the planned launch style. Will it be forward, reverse and/or will you be assisted?

Forward launch - In light winds a suggested launch brief may go something like this:

"When I ask, take 3 big steps forward, there will be a slight pull backwards as the glider comes up overhead, stay steady on your feet, and I will then instruct you to move into a run. I will be saying "run, run, run" and you must keep running until you are running in the air. If there is anything that isn't 100% right then I will instruct you to STOP. At that point we can easily stop, reset and try again."

Reverse launch – In stronger winds and using a reverse launch, it may be necessary to explain that the passenger will need to move backwards up the hill as you bring the glider up. The more you explain the process, the more predictable your passenger is likely to be. It can be helpful to give them a point to look at and move towards.

Practice launches with the tandem pilot holding the passenger's harness by the carabineers as they try to move forward can be a great way to prepare your passenger for how the actual launch is going to feel.

Note: If the passenger falls over during launch, unclip the passenger so that they may easily stand up and take a breather. Calmly talk to your passenger to check they are OK and happy to continue with the planned tandem flight. If OK, start the flight preparation again from the beginning including a new pre-flight brief, clip in procedure, set up of the glider squarely into wind and do a thorough pre-flight check.

9. Take Off

The pilot must have full control of takeoff and be prepared to stop if anything is not right. As the pilot in command it is your job to be in control.

Following these 3 simple steps will avoid messy take offs and can avoid some of the potential risk of an accident:

- 1: Launch the glider off the ground;
- 2: Control the glider in pitch, roll, and yaw;
- 3: Commit to the take off (only when the glider is fully controlled should you commit to the take off).

A professional tandem pilot should never blame their passenger for anything. It is your job to adequately prepare the passenger for the takeoff and flight. You must manage any situation that may arise to the best of your ability. Having a high level of ground handling skill is essential to a tandem pilot.

10. In-flight

Once airborne communicate with your passenger to check how they are feeling. Check that they are comfortably seated. You may need to instruct the passenger to reposition themselves in the seat properly, knees up, lean back, or even use your legs to lift and tilt the passenger back into the harness.

Check your reserve handle. This is a good habit for many reasons including if you ever need to use it.

Constant communication with your passenger will help you make good decisions on the flight. Be aware of possible motion sickness and regularly check in that your passenger is feeling OK and enjoying the flight. Having a vomit bag available in case they do feel motion sickness can be a very good idea.

Remember when flying tandem you are no longer flying for yourself. The passengers' enjoyment and safety are your number one priority so always fly well within your ability. If you are doing any manoeuvres such as wingovers or spirals, consider your passengers willingness to be put through such manoeuvres. Performing these manoeuvres without a willing passenger can ruin their enjoyment of the flight.

Distractions in flight

Cameras can be considered very important to your passenger. However, you must not let anything distract you from flying the glider safely. Your passenger can be one of the biggest distractions so do not lose sight of your main responsibility: Flying the glider!

Flying with other gliders/aircraft

It is important to be aware of the reduced vision you have as a tandem pilot as well as the distractions mentioned above. These do not excuse you from always paying attention to all other gliders/aircraft and your responsibility to adhere to the Visual Flight Rules, Right of Way Rules, avoiding collision and any conflict with other aircraft.. You must maintain situational awareness at all times! Before allowing yourself to be distracted by anything it is important to note the position of all other aircraft within close proximity and intended flight path.

11. The Landing Brief

To prepare the passenger for landing, explain what to expect.

Depending on your skill or landing technique you may require the passenger to be prepared to run, lift their legs ready to land on the harness or simply to stand up and walk.

In some circumstances it may be the safest option to slide your passenger in seated for landing. To do this safely the passenger must be briefed on what will happen as you land.

12. Landings

Tandems can be much more difficult to manoeuvre than a solo. It is important to have a structured approach that leaves you options to adjust for any changes in conditions whilst on approach. Airspeed will give you flare authority so it is important to get your hands up and allow the glider to gain enough airspeed for an affective flare.

At times, your passenger's legs will give way or appear to go to sleep on them. It is helpful to grab the passenger's harness at the bottom of your flare and help your passenger onto their feet as you touch down. In strong wind the priority moves to managing the glider and depowering it so it won't drag you and your passenger.

As you may be flying the same circuit regularly, always ensure you give your approach your full attention. Safe, considerate flying is required on every single flight. As a tandem pilot your job is to provide an enjoyable, safe flight with a good take off and good landing. Take your solo wing out for a hot flight to get your thrill.

13. Hire or Reward and Commercial Tandem Paragliding

To fly for hire or reward you must have a Commercial Tandem rating and be flying for a company with a Part 115 Operator's Certificate from the CAA. If you fly for hire or reward on a recreational tandem rating you will be liable for prosecution by CAA.

The NZHGPA has an *advisory circular* on Bona Fide Trial Flights for instructors. It is advised to read this before completing any trial flights as an instructor.

Never jeopardize your passenger!

Remember that conservative flying means:

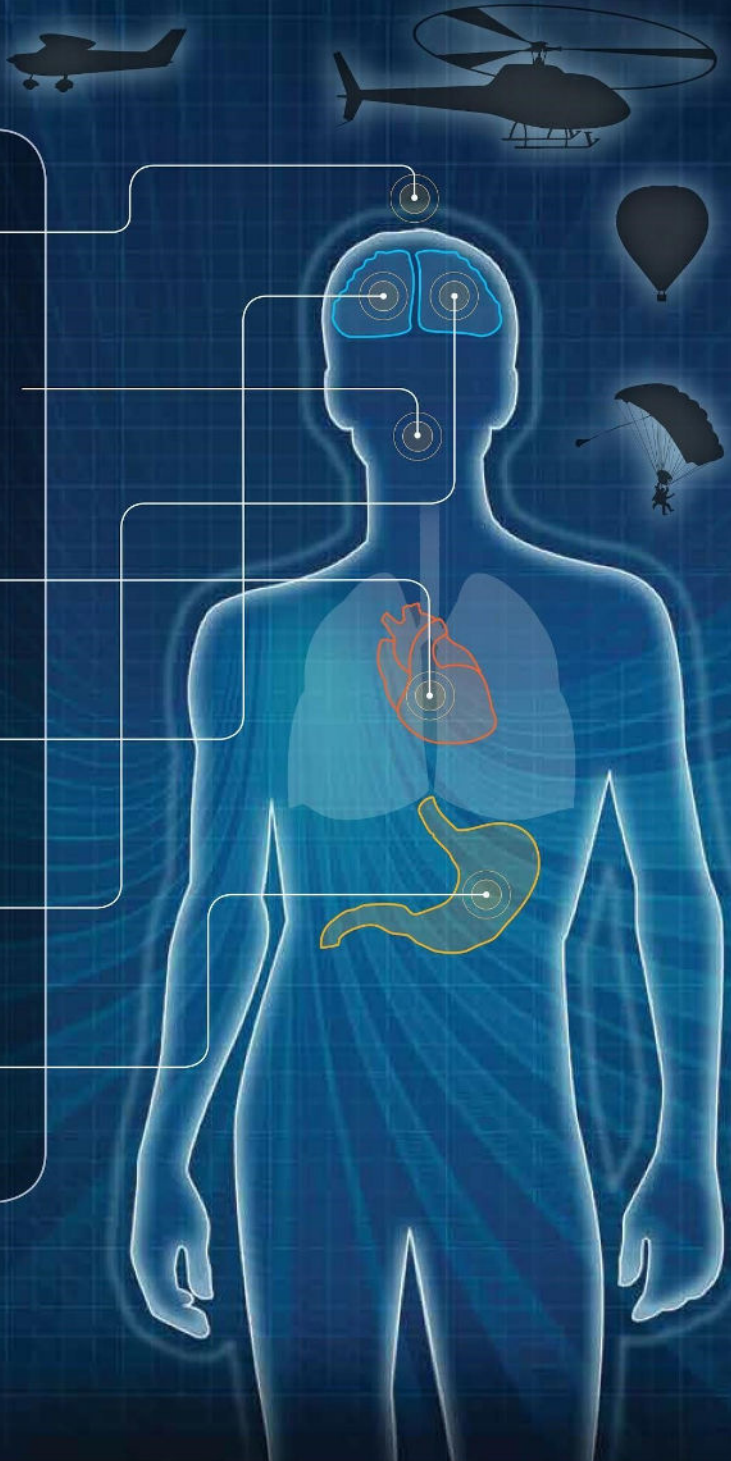
- Thorough pre-flight brief;
- Carefully planned, controlled take-off;
- Plenty of clearance;
- A well planned set up and landing;
- Stopping before you get tired;
- Not flying in marginal conditions.

The essence of tandem flights should always be Safe, Fun Flying

ANNEX 1:

I'M SAFE TO FLY

- I**LLNESS
Free of illness and symptoms
- M**EDICATION
Safe medication only
- S**TRESS
Managing stress well at home and work
- A**LCOHOL
Free of alcohol and drugs and their effects
- F**ATIGUE
Rested and sleeping well
- E**ATING
Fed, watered, and ready to go



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