



TM09 - HANG GLIDER TANDEM TECHNICAL MANUAL

Contents:

1. Outline	2
2. Weather.....	2
3. Equipment.....	2
<i>Tandem Gliders</i>	<i>2</i>
<i>Wing Loading.....</i>	<i>3</i>
<i>Harnesses.....</i>	<i>3</i>
<i>Carabiners.....</i>	<i>3</i>
<i>Reserve Parachutes</i>	<i>3</i>
<i>Helmet.....</i>	<i>3</i>
<i>Altimeter.....</i>	<i>3</i>
4. Passenger Assessment.....	4
5. The Site	5
6. Passenger Briefing	5
7. Pre-flight Check, and Clip-in Hang Check.....	5
<i>Preflight.....</i>	<i>6</i>
<i>Section 1 - Hang Glider & Associated Equipment Check.....</i>	<i>6</i>
<i>Section 2 - Passenger Pre-flight Briefing</i>	<i>6</i>
<i>Section 3 - Clip-in & Hang Check</i>	<i>6</i>
8. Take Off	7
9. In Flight	7
<i>Distractions in flight.....</i>	<i>7</i>
<i>Flying with other Gliders / Aircraft.....</i>	<i>7</i>
10. Landings.....	8
<i>Landing Brief.....</i>	<i>8</i>
11. Hire or Reward and Commercial Tandem Hang Gliding.....	8

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 hang gliders. This document is designed to be used as a guide for training and a reference for all tandem pilots.

2. 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 must 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 must limit their operations to lighter wind days and mild thermal days. Recommended maximum wind speed is 12 knots (22 kph), thermal 1000 ft/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 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 must be careful to choose the right equipment for the right purpose.

Tandem Gliders

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 must be avoided.

Note: All tandem Hang Gliders flown in New Zealand shall be tested to either HGMA, BHPA or DHV load test certification standards and have a current Warrant of Fitness.

Tandem gliders have different loads and wear than solo gliders, increasing the importance that; they must be flown, inspected, and maintained according to the manufacturer's instructions. A flight maintenance log should be kept for each tandem hang glider.

A WOF does not replace a maintenance log.

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

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

Wing Loading

Lighter Passengers mean easier take-offs and landings, slow speed flight (watch the wind!). Due to less loading.

Heavy Passengers mean a higher stall speed, requiring a faster take-off and will result in faster landings, increased sink, and higher flying speed.

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

Harnesses

The hang glider harness combination must be fit for purpose, securely fit the size of the pilot and passenger.

Carabiners

Carabiners used to connect a harness to hang loops must be made of steel and be either screw gate or self-locking. They must have a minimum breaking strain of 30kn.

Reserve Parachutes

All tandem flights are required by the NZHGPA and the CAA to carry a reserve parachute. The reserve parachute must be maintained, inspected, repacked, and retired according to the manufacturer's manual.

Also reference the *NZHGPA TM51 Reserve Packing Manual*

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 serviceable hard shell protective helmets conforming to or exceeding the 'Australia and New Zealand Bike Helmet Standard'. It is recommended that tandem helmets are certified to air sport standards EN966 - there are many options these days.

Altimeter

The Pilot in Command must be equipped with an altimeter that shows height above the ground to an accuracy of 100 feet.

4. Passenger Assessment

As the Pilot in Command, it is your responsibility to assess yourself and the passenger's fitness to fly including impairment, (IMSAFE see Annex 1), the weather conditions, tandem hang glider 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 your passenger safety must be your first priority.

As the pilot in command, you will be required to assess the passenger's ability to run and to check their weight to help you assess their physical ability for take-off.

Medical conditions must be asked about. If they have a condition you were previously unaware of then you must discuss with them how it may affect them during the flight, take-off, and landing.

Clothing and footwear must be assessed. Will their shoes stay on? Are their shoes and clothing appropriate for the flight ahead or the journey to the take off?

If using a stirrup harness and landing on wheels, do they have long pants fitted to avoid any possibility of grass burns on landing.

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 must be taken including; your relationship with the child, harness used, always make sure you are within the weight range of the glider and use an assistant on launch. Children must be asked independently of a parent or guardian if they would like to fly with you.

5. The Site

The Pilot in Command must carefully consider the take-off site with a view of being clear of obstacles and of a suitable gradient. Avoid areas with fences, tree stumps, trees, or other hazards ahead of take-off. Wind conditions must be taken into consideration when choosing a launch site.

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

6. Passenger Briefing

A thorough pre-flight briefing is essential, but it shouldn't be too complicated. The passenger should be given parts of the pilot's harness to grip onto during launch, and immediately prior to launch should be reminded not to let go of the harness, not to grab any part of the control frame, and to keep running until in the air.

You must ensure you take maximum precautions and do a thorough pre-flight check.

Keep a calm voice during the brief and exude quiet confidence. If you're stressed it will likely make your passenger stressed.

Your briefing must be specific for the conditions and the planned launch style. Will it be unassisted, or will you be assisted with nose/side wire assistants? If you require nose/side wire assistants, you must give the nose/side wire assistants a safety briefing so that they know what is required of them and what to expect during the launch process.

Remember that your passenger is trusting you explicitly with their life!

7. Pre-flight Check, and Clip-in Hang Check

The hang-gliding tandem pilot has three distinct sections to their pre-flight check, they are:

1. Hang Glider & Associated Equipment Check
2. Passenger Pre-flight Briefing
3. Clip-in and Hang Check

It is recommended that sections one and two be completed in the order shown above if conditions allow. It is a good idea to have a specific number of points per section that you need to check; this way you will know if you miss any. If you get interrupted or distracted during the checklist you must start the ENTIRE preflight check again from the beginning of the section, you were currently working through.

Preflight

This is an example; tandem pilots must develop a preflight to suit their equipment and standard procedures.

Section 1 - Hang Glider & Associated Equipment Check

- a. Pre-flight Check of Hang Glider
- b. Pilot Harness Check, reserve parachute lock pins secure
- c. Passenger Harness & Helmet Check, correct size and fit for purpose
- d. Suitable clothing and footwear pilot and passenger. Remove any loose items from passengers clothing and store them securely.
- e. Fit harness and helmet to passenger and check for correct fitting
- f. Pilot to get into pilot harness, helmet and check for correct fitting

Section 2 - Passenger Pre-flight Briefing

- a. Introduce passenger to the hang glider
- b. Explain how they will be connected to the hang glider
- c. Explain that the passenger is not to touch the triangular frame (A-frame) as it is the steering wheel of the hang glider.
- b. Complete the Standard Passenger Briefing (see section 3 g. below)

Section 3 - Clip-in & Hang Check

- a. Move hang glider to launch area.
- b. Have a pilot or bystander hold the nose of the glider.
- c. Pilot clips into hang glider - main & backup hang loops
- d. Check passengers helmet strap, harness buckles, leg loops and foot bar.
- e. Clip passenger into hang glider - main & backup hang loops
- f. Both pilot & passenger lie down for a hang check
- g. Explain to the passenger how to get onto the footbar/stirrup, move passengers hands into the flying position and explain that this is how both of you will end up while flying and also landing on the wheels. unless the pilot intends landing on their feet, in which case the vertical landing technique will be explained.
- h. Pilot visually confirms both pilot & passenger are connected to hang glider while in the prone position, are at the correct height, no rope twists, carabiners locked and connected to both main and backup hang loops.**
- i. Both pilot & passenger stand. Pilot positions passenger behind upright
- j. The footbar looped through the passenger's arm.
- k. Pilot to place passenger's hands onto pilot harness handles
- l. Pilot to explain that the base-tube and A-frame in front of them will move up and out of the way as the hang glider lifts off the ground.

8. Take Off

The pilot must have full control of take-off and be prepared to complete a launch without any assistance from your passenger. As the pilot in command, it is your job to be in control.

A professional tandem pilot will never blame their passenger for anything. It is your job to adequately prepare the passenger for the take-off and flight. You must manage any situation that may arise to the best of your ability.

9. In Flight

Once airborne, communicate with your passenger to check how they are feeling. 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 that your passenger is feeling OK and enjoying the flight.

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 stalls or tight turns, 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 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 always maintain situational awareness! Before allowing yourself to be distracted by anything it is important to note the position of all other aircraft within proximity and your intended flight path.

10. 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.

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.

If the landing area is smooth, then the safest option for landing is generally to land on the wheels. A good set of pneumatic wheels is ideal.

Landing Brief

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

Landing briefing should be given during the flight prior to landing approach.

Remind them to not touch the controls.

11. Hire or Reward and Commercial Tandem Hang Gliding

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 (AC-1-01 Trial Flights) for instructors.

It is advised to read this before completing any trial flights as an instructor.

Never jeopardize your passenger!

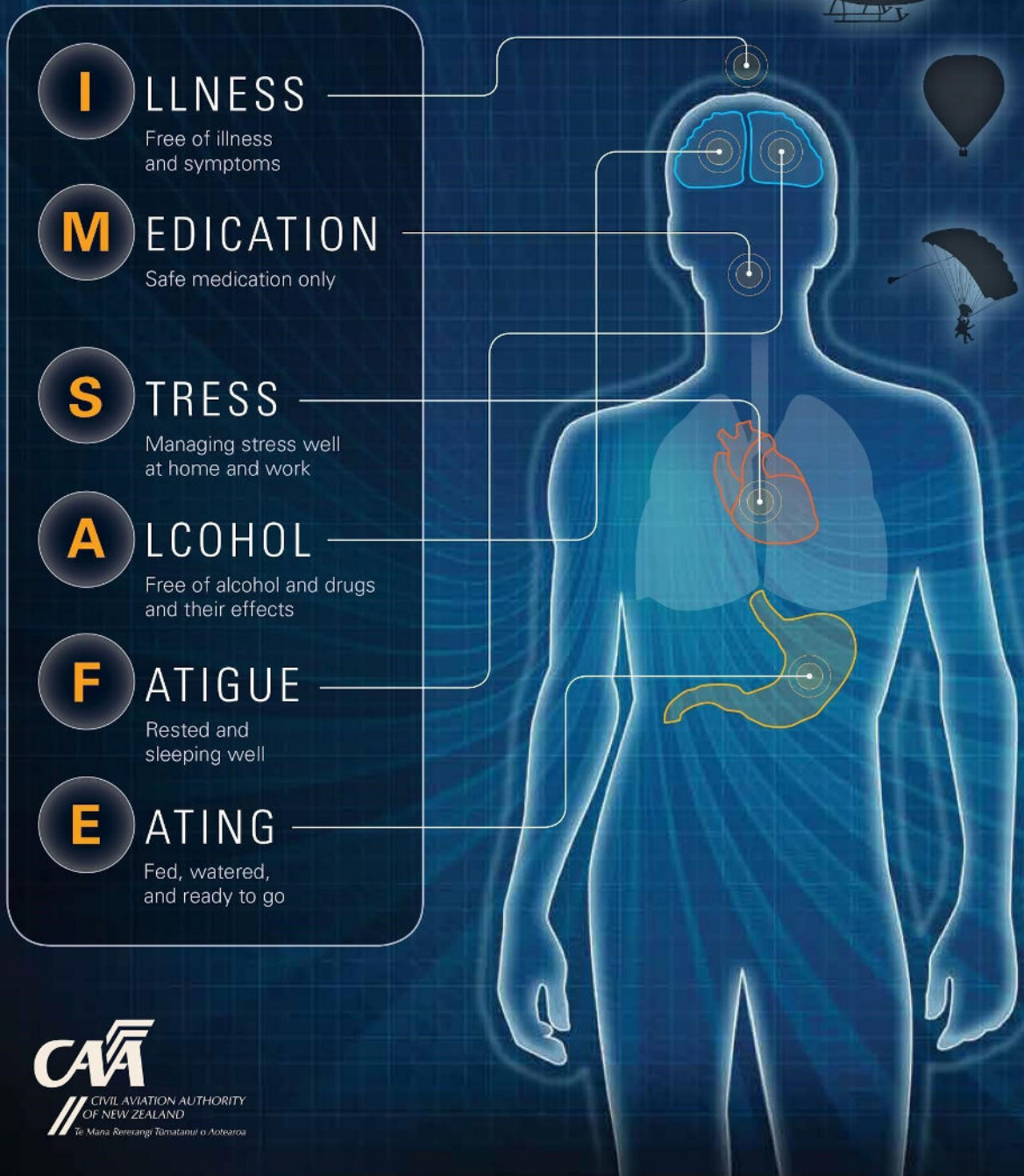
Remember that conservative flying means:

- Thorough pre-flight brief and checks;
- 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 must always be Safe, Fun Flying

ANNEX 1:

I'M SAFE TO FLY



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