



## 327 FLIGHT PRE-COURSE STUDY PACKAGE



### 1.0 INTRODUCTION.

Welcome to 327 Flight! You have been successful in applying for a position on a continuous training gliding course. Your fully catered course will be held at the Bathurst Aerodrome with accommodation at Bathurst Goldfields, a function centre on Mount Panorama.

There will be a number of fellow students on the course who are all at different ability levels. Therefore, this will provide you with a great opportunity to watch and learn from those more experienced who were beginners like you once!

This pre-course study package will tell you a little of what you can expect on course, and will provide you with some material that you will need to learn before you arrive. *You will be tested on arrival at the course and will not be permitted to fly until you have attained a satisfactory pass.*

### 2.0 BATHURST AERODROME.

A diagram of the Bathurst Aerodrome appears in Figure 1. There are two runways: the main one RW 17/35 being of a sealed asphalt surface and is shown below in black; the other RW 08/26 is gravel and is shown as dotted. Runways are identified by numbers. The main runway provides pilots with two possible takeoff/landing directions. Runway 17 is used when the local wind is blowing from the south. Runway 17 is aligned on a magnetic heading of approximately 170 degrees, hence its name. The reciprocal runway, runway 35, is aligned on a heading of 350 degrees magnetic.

Gliding operations will be conducted from a grass strip adjacent to the left hand side of runway 35, as shown in Figure 1. Power traffic, including Regional Express commuter aircraft, will use runway 17/35 main. All AAFC gliders carry radios and make the same circuit broadcasts as powered aircraft. The Bathurst Common Traffic Advisory Frequency (CTAF) is 127.35MHz.

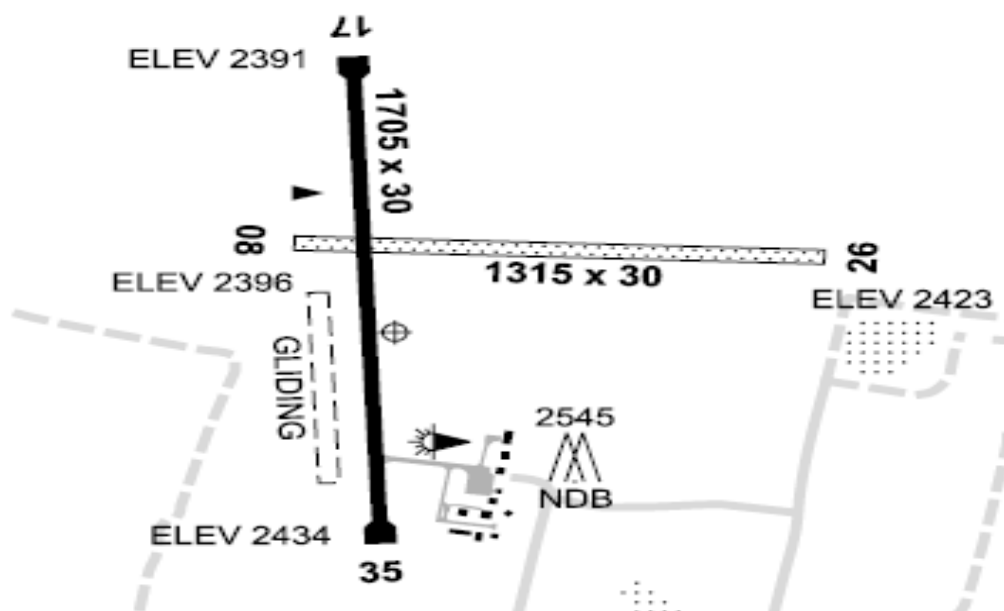


Figure 1. Diagram of Bathurst Aerodrome



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Depending on the wind direction, gliding operations may also be conducted from runway 08/26. This gravel strip is shorter than the main runway and unlike 17/35, gliding operations are conducted on the grass verge *within* the runway boundary. Because of this we must show consideration to other users and remove parked gliders from the runway when power traffic is in circuit.

### **2.1 AIRFIELD SAFETY**

The main runway is separated by white, triangular prism 'gable markers'. Gliders, personnel and vehicles must remain outside these gable markers at all times, otherwise the main runway is legally blocked and cannot be used by other aircraft. The edge of the dedicated gliding strip is marked by yellow cones. For safety reasons, personnel should remain outside these markers unless retrieving aircraft or preparing to launch. Hazardous areas, including ditches, are marked by white and red-stripe cones. These should be avoided when towing aircraft.

Gliders require small teams of people to recover and push back to the launch point after a landing. Whilst this will be explained on your first day, consider these general principles. Firstly, *always maintain a lookout* for aircraft taking off, circuiting and landing. Before crossing a runway, look carefully up along the final approach path in both directions: remember that landing aircraft are the most difficult to see. Secondly, take the shortest route across the runway, and move in groups. You will be more visible to landing aircraft, and will minimise the time you are exposed to hazards.

Other hazards are less obvious, but just as dangerous. Dehydration and sunburn are of particular concern in our operation. You must wear a broad brim bush hat, apply sunscreen regularly and drink the supplied water frequently. Sunglasses are essential for flying.

### **3.0 GROB 103 TWO SEAT TANDEM TRAINING GLIDER**

327 Flight owns a number of gliders including the Grob 103 glider, one of which is pictured on the next page Figure 2. The Grob 103 is a fibreglass two seat glider. It is a well proven training aircraft with excellent handling qualities and a glide ratio of 36:1. The seats are arranged in the fore and aft configuration found on most gliders: the student occupies the front seat and the instructor the back.



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**Figure 2. The AAFC Grob 103 (VH-VHI)**

The photo below shows the Grob's front cockpit. This will become a familiar environment during your time on course.



**Figure 3. The front cockpit of the Grob 103.**

You may also fly in other training gliders provided to the AAFC by the Bathurst Soaring Club, which operates from a neighbouring airfield. These aircraft will be introduced to you during your course.

### **4.0 PRE- COURSE STUDY**

Achieving all the allocated flights on each course is not easy. Bad weather can cause the flying program to be disrupted and delays at the launch point caused by pilots who do not know their checks also reduce the number of flights that can be achieved. Before you arrive on course it is therefore expected that you will already have learnt your pre-takeoff, pre-landing and post release checklists; **indeed you will not be allowed to fly until you can confidently recite them.**



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This package will provide you with the necessary information and it is expected that you will undertake this study in the weeks prior to your first course.

### 4.1 WHY USE CHECKLISTS?

Checklists are an essential part of aviation and are used in commercial, military and recreational aircraft. They are used prior to all critical aspects of flight such as takeoff and landing and help ensure that the aircraft is correctly configured for the next phase of the flight. They serve as a formal reminder to help prevent errors of omission and contribute to a safer flying environment.

For example, prior to landing one might reasonably expect that the undercarriage should be in the down position. The task of lowering the undercarriage is part of the pre-landing checks.

In large aircraft written check lists are frequently used, especially where the list of items is long and difficult to remember. In gliders the list of items to be checked is short and acronyms are used to assist the pilot. While being able to recite checklists is important, this will not guarantee that the checks are actually performed correctly.

When carrying out each item on the checklist it is therefore necessary to:

1. Locate the control concerned;
2. Identify its current position with reference to the label or placard (where relevant);
3. Operate that control if this is required, checking that the control is in the correct position as prescribed by the label or placard (where relevant).

Consider the undercarriage example cited earlier. As part of the pre-landing checks it is necessary to correctly locate the undercarriage lever, identify its current position from the placard and operate it if necessary. If the undercarriage is already in the down position then it is not necessary to operate it; in fact doing so would raise the undercarriage and result in a wheels-up landing. Therefore identifying the current position of the control is a critical part of the check.

The following material will provide you with the information you will need to learn your checklists and a little about how each item relates to the aircraft. On board the aircraft your instructor will demonstrate how each step is to be carried out.

For now, you should learn to recite the following check lists, (bold type) as this will save considerable time in the glider at the launch point. It will help your retention if you have someone regularly test you on this material.

### 4.2 FLIGHT INSTRUMENTS AND CONTROLS.

Before we consider the checklists, a review of the basic flight instruments and controls will assist in their understanding. Figure 4 shows a close up view of the Grob instrument panel and Figure 5 a top view of the cockpit. Your primary concern will be with the controls in bold.



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- The yaw string is fixed to the outside of the canopy; it aligns itself with the airflow over the glider and is used to assist the pilot with rudder co-ordination.
- The airspeed indicator shows the speed of the glider in knots. This is controlled by lowering or raising the nose of the glider, changing the aircraft attitude. Attitude refers to the position of the nose relative to the horizon. The glider's attitude will become your primary speed reference. The ASI will be used to confirm that the correct speed has been achieved.
- The variometers, electrical and mechanical, provide the pilot with a measure of the aircraft's rate of climb or sink. These are also calibrated in knots. A climb rate of one knot represents approximately 100 feet per minute. The electric vario provides a faster response than the mechanical one; both are useful to the pilot when thermalling in rising air.
- The altimeter shows the altitude of the aircraft above mean sea level (AMSL). It is a pressure sensitive device and must be set to show the airfield elevation before takeoff. The elevation of the Bathurst aerodrome is 2450ft AMSL.
- **The most important control the control column ('joystick'). This operates both the ailerons and elevators; the pilot will hold this lightly in their right hand at all times. To lower the nose and accelerate, ease the stick forward. To raise the nose and decelerate, ease the stick back. To roll the aircraft right, ease the stick right. To roll the aircraft left, ease the stick left.**
- **The rudder pedals lie beneath the instrument panel and the pilot operates these with their feet. To yaw the aircraft to the right, ease in the right rudder pedal. To yaw the aircraft to the left, ease in the left rudder pedal.**
- You will learn very early on in your training that we don't use the controls in isolation. They are always coordinated.



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Figure 4. The Grob Instrument Panel

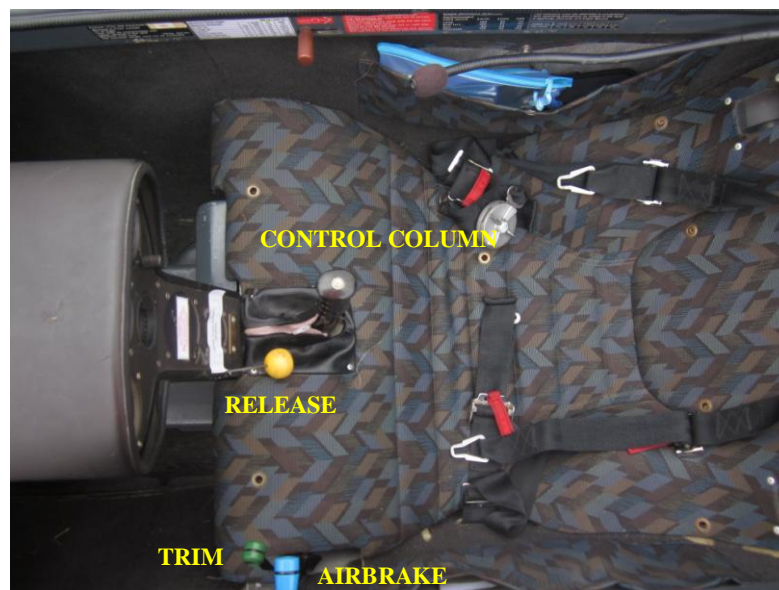


Figure 5. The Grob Controls

- The airbrake lever (always coloured **BLUE**) is located on the left hand side of the cockpit. It deploys and retracts the airbrakes from the top of the wings – as per figure 6,, which allow a pilot to control the rate of descent.
- The trim lever (always coloured **GREEN**) is located on the left hand side of the Grob cockpit. In other aircraft, it may be located next to the control column, or even on the right hand side of the cockpit. It is typically controlled with the pilot's left hand, and takes the fore/aft load off the stick, much like a cruise control.



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- The release mechanism (the golf ball looking object always coloured **YELLOW** ) in the centre of the panel operates the release mechanism which detaches the glider from the tow rope. Again, this can be in different positions on various aircraft. Do not touch this unless instructed. Figure 6 Glider Control Surfaces





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### 4.3 CHECKLISTS

There are four checklists that you will need to learn before your course. We will discuss each in turn. So as to assist us to remember our checks we use a particular acronym for each.

#### 4.3.1 THE ABCD PRE-TAKEOFF CHECKLIST

Before entering the glider we conduct an **ABCD** check on the aircraft.

<b>A: Airframe</b>	Look for any obvious damage that may have occurred recently. Examples include flat tyres, dimples in the wing surface, tears in fabric, and cracks in the aircraft skin.
<b>B: Ballast</b>	All gliders must be flown within carefully defined centre of gravity (CoG) limits. To achieve this, the pilot weights must lie within the margins specified on cockpit weight and balance placards. You must know how much you weigh dressed and tell your instructor, so he can ensure that the weight requirements are met. It may even be necessary for you to carry extra weight (called ballast) under your seat to ensure compliance. If not, check that no ballast is already installed. The ballast check must be completed before you enter the aircraft.
<b>C: Controls</b>	While you are still outside the glider and can see the control surfaces, you should check that they are connected and <i>operating in the correct sense</i> . Take hold of the stick and ensure that as it moves towards a control surface, that surface rises to meet the stick. Your instructor will brief you on the effects of controls and how to fully carry out this check.
<b>D: Dolly</b>	Some gliders use a swivelling dolly wheel, temporarily attached to the rear of the glider, to assist in ground manoeuvring the aircraft. These must be removed before flight as they will adversely affect the glider's centre of gravity if left attached.

#### 4.3.2 The CHAOTIC CHECKLIST

Once seated inside the glider we conduct the pre-takeoff **CHAOTIC** checks. This check is carried out only after both pilots are seated with their harnesses fastened.





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<b>C: Controls &amp; Access</b>	First of all ensure that you can comfortably reach the control column and rudder pedals. Check for <i>full, free movement</i> of the control column and rudder. Move each smoothly to the extremity of its travel. Control checks are vital. It is too late to discover a problem once the glider is airborne. Do not confuse this with the ABCD control check.
<b>H: Harness</b>	Both harnesses must be fitted correctly, without twists, and properly fastened. The pilot carrying out the checks must ensure both harnesses are secure. When securing your harness it is important to tighten the lap belt before the shoulder straps, so that the harness lies firmly across your hips and not your stomach. Smaller cadets may need to sit on cushions to ensure that the harness fits correctly and to provide an unobstructed view over the instrument panel.
<b>A: Airbrakes and Flaps</b>	The airbrakes must be opened, to check that they both deploy at the same rate, then that they are closed and locked for the takeoff. The flaps are also set as required for takeoff as part of this check (where fitted).
<b>O: Outside and Options (COWO)</b>	<p><b>Crew:</b> ground crew sufficient for launch;</p> <p><b>Obstacles:</b> runway clear of obstacles;</p> <p><b>Wind:</b> assess the wind strength and direction with reference to a windsock. Calculate the safe speed near the ground (speed to fly in circuit) (<math>V_{\text{safe}} = 1.5 \times V_{\text{stall}} + 0.5 \times V_{\text{wind}}</math>);</p> <p><b>Options:</b> consider options from this runway in the event of a launch emergency.</p>
<b>T: Trim and Ballast</b>	The green trim lever should be checked for full, free movement and set fully forward for takeoff. Since the trim of the glider is affected by the ballast, this is also a final mental check that the glider has been ballasted correctly.
<b>I: Instruments</b>	Altimeter set to the airfield elevation AMSL (2450ft at Bathurst). Master switch on, radio on and tuned to the correct frequency, vario volume turned down, no broken instrument glass. If the radio is not tuned correctly, inform the instructor but do not attempt to tune it yourself.
<b>C: Canopy, Carriage, Controls</b>	<p><b>Canopy:</b> down and locked - push up on the frame (<i>not the Perspex itself</i>) to check;</p> <p><b>Carriage:</b> down and locked as placarded, or fixed;</p> <p><b>Controls:</b> full, free movement.</p>



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Only after these checks have been completed can the rope be hooked on. Do not let your checks be interrupted by the ground crew. Should an interruption occur, start the checklist again from the beginning.

#### 4.3.3 THE POST RELEASE CHECKLIST

The post-release checks are conducted after releasing the rope and making a clearance turn to the right. They use the acronym **FUST** as follows:

<b>F: Flaps</b>	Set as required for soaring.
<b>U: Undercarriage</b>	Up and locked as placarded, or fixed.
<b>S: Speed</b>	Set cruising attitude to give desired airspeed.
<b>T: Trim</b>	Trim for this attitude.

#### 4.3.4 THE PRE-LANDING CHECKLIST

The pre-landing checks are conducted on the downwind leg of the circuit, and also use the acronym **FUST** as follows:

<b>F: Flaps</b>	Set as required for soaring.
<b>U: Undercarriage</b>	Down and locked as placarded, or fixed.
<b>S: Speed</b>	Select safe speed attitude.
<b>T: Trim</b>	Trim for this attitude.

You should learn to recite these checklists (the bold text) before you arrive on course. Your instructor will brief you on how they relate to each glider that you fly. Knowing your checks will save considerable time at the launch point, which will assist in ensuring that everyone receives their allocated number of flights. Remember you must pass a test on them before you can fly.



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### 5.0 HELPFUL CLOSING REMARKS

Do not become fixated with the instrument panel. Gliders can be – and were – flown without any of the gauges and dials which adorn modern cockpits. Training you to fly without reference to these devices is a central component of the 327 Flight instructional philosophy.

Keep your eyes outside the cockpit. Look out and around at the horizon. Check for other traffic, check the position of the airfield, and most importantly, enjoy the view of earth from aloft. Lookout is the basis of proper airmanship and safe flying. Stare at the instrument panel, and you will learn very little whilst becoming increasingly airsick and risking a midair collision.

Gliding is a discipline which relies heavily on teamwork. Those who participate wholeheartedly in all aspects of the operation – however menial, – end up benefitting the most from this immersive aviation experience. Enthusiasm on the field directly correlates with enthusiasm in the air.

Remain focussed and do not be afraid to ask questions. Almost every course will be led by instructors who flew in military and commercial environments, who can attest to the innumerable benefits of gliding experience, and who can provide valuable information for those with airborne career ambitions.

Finally, ensure you pack sunglasses, along with hot or cold weather gear as appropriate.

Congratulations once again, and we trust you will enjoy the course.