THE AIRBORNE

C4

OWNER and SERVICE MANUAL Rev 1

Section 1 DESIGN FEATURES

Designed and manufactured by AIRBORNE WINDSPORTS, the Climax is one of the most advanced high performance topless hang glider on the market. The Climax C4 is the result of further refinements to the design.

Attention to detail and weight saving has allowed the C4 to have excellent static balance. A larger than average VG range provides the C4 with ease of handling and a large flare window without compromising outstanding glide performance throughout the speed range.

The C4 has an elliptical tip, which in the VG full setting allows a very tight mainsail whilst maintaining a progressive washout line right through to the tip.

AirBorne's original cam VG system has been improved allowing an increase in VG travel. Not only does the wing pull exceptionally flat when full on, the VG off setting is quite loose resulting in extremely light handling and improved climb ability. There are several advantages using the cam VG system. The drag in the pulley actuating system and lack of movement in the high load junctions allow for much lower operating pressures. The cam VG system also maintains constant anhedral, which significantly reduces glider oscillation throughout the VG range.

A combination of internal cloth ribs and hook and loop fastener tabs between the upper and lower battens control the under surface blow down at lower angles of attack. Not only does this minimise glider oscillation, the resulting pitch pressure is progressive and predictable.

Wire braced washout tubes (sprogs) are used in the C4. The centre sprog has a compensating system, which causes the sprog to raise approximately 120 mm when the VG is released. Certification pitch testing has confirmed the stability of the system with excellent pitching moment results throughout the VG range.

The C4 is easy to assemble or break down. It may be set up on the A-frame or laid flat, thereby accommodating for personal preference or site characteristics and restrictions. Pip pins and quick clips are used with integrated clip battens to speed up assembly. The sprog tubes are secured by simply closing the zips. Easy operating internal tip levers are used to load the tip rods.

At AirBorne we have a well-developed quality assurance program, ensuring that every glider is built in accordance with the standard it was designed and tested to. This gives even the most experienced pilot a sense of security.

We hope that you have hours of great flying with your new glider. Fly high and safely.

Rick, Russell and Shane Duncan, Rob Hibberd and Paul Mollison,
AirBorne WindSports

Section 2 SPECIFICATIONS

	C4-13		C4-13.5		C4-14	
	METRIC	IMPERIAL	METRIC	IMPERIAL	METRIC	IMPERIAL
SAIL AREA	12.7 sq m	137 sq ft	13.5 sq m	146 sq ft	14.3 sq m	154 sq ft
WING SPAN	9.6 m	31.5 feet	10.00 m	32.8 feet	10.4 m	34.1 feet
ASPECT RATIO	7.3		7.4		7.6	
NOSE ANGLE	128-133 degrees		128-133 degrees		128-133 degrees	
DOUBLE SURFACE %	93%		93%		93%	
BATTENS	22 + 6		24 + 6		24 +6	
GLIDER WEIGHT	33 kg	73 pound	34 kg	75 pound	36 kg	79 pound
PACK UP LENGTH	4.9 m	16.1 ft	5.1 m	16.7 ft	5.3 m	17.3 ft
SHORT PACK LENGTH	3.8 m	12.5 ft	4.0 m	13.1 ft	4.1 m	13.5 ft
RECOMMENDED PILOT HOOK IN WEIGHT RANGE (Includes Equipment)	55-80 kg	121-176 pounds	70-110 kg	154-220 pounds	85-120 kg	187-265 pounds
VNE (Recommended Maximum Velocity)	85 km/h	53 mph	85 km/h	53 mph	85 km/h	53 mph
VA (Recommended Maximum Rough Air Manoeuvring Velocity)	74 km/h	46 mph	74 km/h	46 mph	74 km/h	46 mph
VD (Maximum Steady State Velocity)	125 km/h	78 mph	125 km/h	78 mph	125 km/h	78 mph

Table 2 Specifications

Note: The stall speed of the C4 at maximum recommended wing loading is less than the minimum requirement of 25 mph (40 km/h). The minimum or steady state speed is at least 35 mph (56 km/h) for a prone pilot with correctly adjusted harness.

Conversions: * 0.4536 kg/pound * 25.4 mm/inch * 1.609 km/mile
Va = Test speed x 0.707
Vne = Test Speed x 0.816

Section 3 OPERATING LIMITATIONS

WARNING

Hang Gliding is a high-risk sport. The safe operation of this hang glider ultimately rests with you, the pilot. We believe that in order to fly safely you must maturely practice the sport of hang gliding. You should never fly this hang glider beyond the placard limits. The velocity never to exceed (VNE) for your glider is given in Section 2, as is the maximum speed for manoeuvres or flying in rough air (VA). The indicated airspeeds given are for calibrated instruments mounted on, or near, the base bar of the control frame. It is recommended that you fly your C4 with an airspeed indicator, as it is relatively easy in the VG on configuration to exceed the placard limitations. Flight operations should be limited to non-aerobatic manoeuvres where the pitch angle does not exceed 30 degrees up or down to the horizon and where the bank angle does not exceed 60 degrees. Aggressive stalls and spins should not be attempted. Operations outside the recommended flight envelope, such as aerobatic manoeuvres or erratic pilot technique may ultimately produce equipment failure. Your glider was designed for foot launched soaring and should not be flown by more than one person at a time. It should not be flown backwards or inverted. The setting up and breaking down of a hang glider, transportation on cars and flying itself will have an effect over time on its structural integrity. The glider will require maintenance as outlined in the maintenance section of this manual. Like any aircraft safety depends on a combination of careful maintenance and your ability to fly intelligently and conservatively. The owner and operator must understand that due to inherent risks involved in flying a hang glider, no warranty of any kind is made or implied against accidents, bodily injury and death, other than those that cannot by law be excluded. We hope that your new glider will provide you with many hours of safe flying.

Section 4 WARRANTY STATEMENTS

This warranty extends to new Hang Gliders and/or accessories and equipment manufactured by AIRBORNE WINDSPORTS PTY LTD ("Airborne") and shall not embrace any other accessories or equipment in the sale.

AIRBORNE warrants to the customer the hang glider and/or accessories manufactured or supplied by AIRBORNE to be free from defect in material and workmanship under normal use and service and of merchantable quality and fit the purpose for which they are ordinarily used. This Warranty will apply for a period of ninety (90) days from the date of dispatch of the hang glider not withstanding the number of hours flown but subject to the hang glider remaining the property of the customer. This warranty does not exclude any rights implied in favour of any customer by any applicable Federal and State legislation.

AIRBORNE will make good any parts required because of defective material or workmanship as set out in the Warranty.

THE WARRANTY WILL NOT APPLY TO:
Any mechanical adjustments, parts, replacements, repairs or other servicing that in the judgement of AIRBORNE are made or should be made as maintenance.
Any defect caused by any alteration or modification not approved by AIRBORNE.
Any defect caused by the fitment of parts that are not made or approved by AIRBORNE.
Any defect caused by misuse, accidents, negligence or failure to carry out proper maintenance service.
Damage caused by continued operation of the hang glider after it is known to be defective.
Any defect or consequential loss, damage or injury caused by overloading.
Loss of use of the hang glider, loss of time, inconvenience, damages for personal injuries, loss of property or other consequential damages.
Failure due to wear and tear, accident, fire, incorrect or incomplete rigging and/or assembly, exposure to the elements, operation outside the placarded limitations and repairs attempted or made other than by AIRBORNE or it's authorised agent.

AIRBORNE will replace, free of charge, any original part that is determined by it to be defective under the terms of this Warranty and reserves the right to pay monetary compensation or make good the defect in any manner it deems appropriate.

The customer is responsible for transporting the hang glider or parts to and from AIRBORNE or its authorised agent when making claims under this Warranty. The hang glider or parts are at the customer's risk whilst in transit to and from AIRBORNE or its authorised agent.

NOTE: Warranty service is available to the customer from AIRBORNE WINDSPORTS PTY LIMITED or authorised agent.

Section 5 ASSEMBLY PROCEDURES

The wing can be assembled in two positions, either lying flat or standing on the control frame. Assembling the C4 on the control frame is the most popular method of assembly in light winds. This method is preferable as the sail is less prone to being soiled or damaged during assembly. In higher winds it is preferable to lay the glider flat for assembly with the nose into the wind until ready to launch.

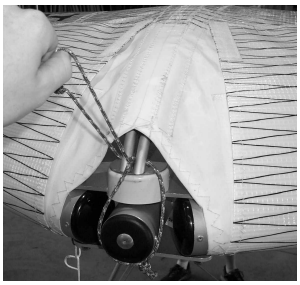
ASSEMBLING ON THE FRAME

UNZIP THE BAG. Lay the wing down with zip up and the nose facing approximately 120 degrees from the wind direction.

ASSEMBLE CONTROL FRAME. Spread the control bar down tubes and insert the base bar. The PIP pins are then inserted from front to rear, with the covers firmly secured. Check that all the rigging wires are outside the control frame.

STAND GLIDER UP. Rotate the control frame to the vertical position and rotate the wing 180 degrees so that it is sitting on the base bar.

REMOVE BAG. Remove the glider bag and unclip all of the ties. The washout strut covers should also be removed at this time.



INSERT NOSE BATTEN. Load the nose battens on the locating pins at this time. If you fail to load the battens prior to tensioning the glider the VG should be pulled full tight before attempting to load the battens.

Figure 1 Nose Batten

SPREAD LEADING EDGES. Carefully spread both leading edges out half way firstly then spread leading edges to their approximate flying position. Check the side wires are not twisted.

IT IS ESSENTIAL THAT THE KEEL AND THE LEADING EDGES ARE KEPT IN THE SAME PLANE OR DAMAGE WILL RESULT.

ATTACH FRONT FLYING WIRES. Ensure that the front flying wires are secure and that the quick clip is positively locked.

Figure 2 Attach front flying wires

INSERT MAINSAIL BATTENS #1 - 4. Remove the battens from the bag. The red battens are for the left side and the green for the right. Insert the battens from the centre to the tip with gentle pressure, until the batten meets resistance. Shake the sail at the trailing edge whilst maintaining gentle pressure on the batten to allow the batten to be inserted over the cross bar.
DO NOT FORCE THE BATTENS!

TENSION CROSS BARS.
The cross bars are now tensioned by pulling the 2:1 pull back rope until the shackle is positioned on the quick clip. Ensure that the catch is positively locked.

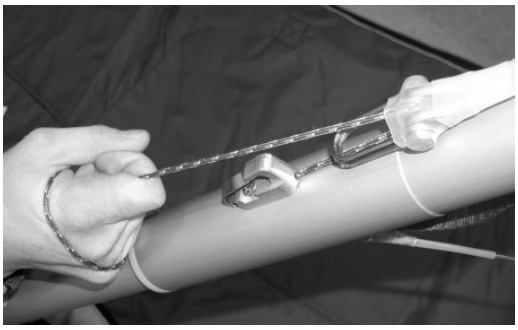


Figure 3 Cross Bar Haul Back

INSERT TIP RODS.
Remove the tip bags and insert the tip rod into the tip plug fitting at the rear of the leading edge. Ensure that the rod is fully inserted.

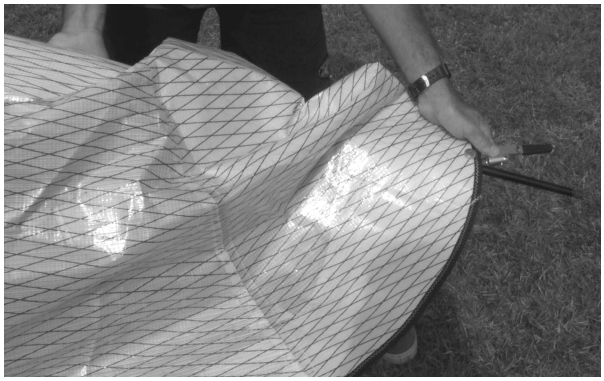


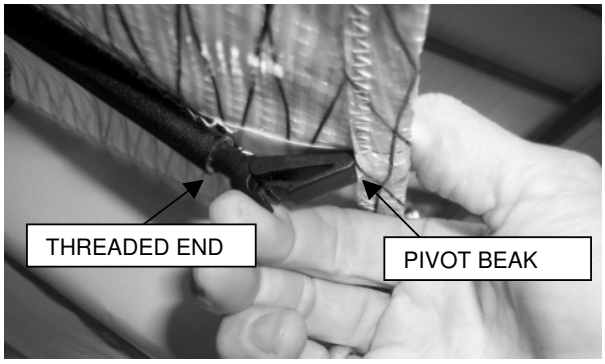
Figure 4 Load Tip Rod

LOAD TIP ROD.
Move to the front of the wing. For the right tip hold the rear leading edge with your right hand and the end of the sail with your left. Align the lever plug and bend the tip tube towards the trailing edge as you tension the tip tube. Locate the plug on the end of the tube. When installing the left tip rod the leading edge should be held with your left hand.

CLOSE TIP LEVER.
Move to the tip. Place your left thumb in the rope loop of the tip lever and close the lever. The lever should be held in the same plane as the trailing edge. Do not let the lever close rapidly as damage may result. Check that the lever is against the fibre tube and is not being forced above or below the tube. Close the zip once the lever is properly closed. Repeat for the left wing using the opposite hands.

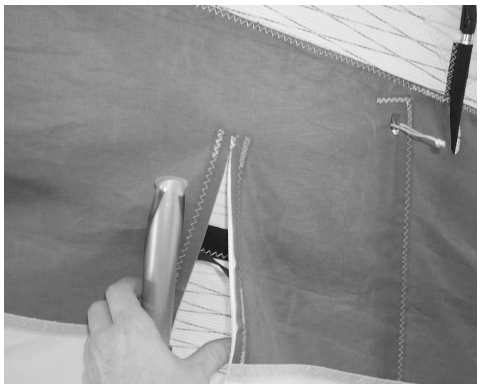
Figure 5 Load Tip Lever

INSERT REMAINING MAINSAIL BATTENS.



Slide batten into sail pocket. Unclip 'pivot beak' from 'threaded end'. Rotate *pivot beak* and locate in sail as shown. While supporting the underside of the batten, clip the *pivot beak* into the *threaded end.*
To adjust batten load tension, release *pivot beak* from sail and rotate batten clip.

Figure 6 Load Batten Tip

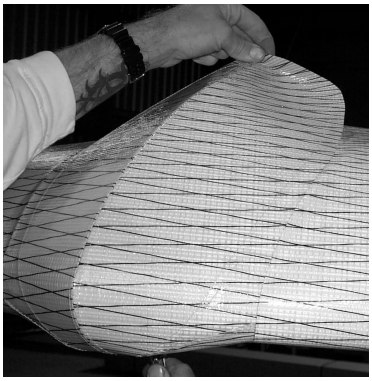


LOAD WASHOUT STRUTS. The sprogs should be rotated into position over the red webbing loops and the zips closed fully. It is a good time to inspect the junctions prior to closing all zips.

Figure 7 Load Washout Struts

INSERT UNDER SURFACE BATTENS.
The under surface battens should be inserted as far as possible. The batten should then be pushed in with your thumb. Use the string to pull the batten to the rear of the pocket.

Figure 8 Insert Under Surface Battens



INSTALL NOSE FAIRING.
Attach the nose fairing applying the top hook and loop fastener first then gently tension over the nose plates and attach the hook and loop fastener to the under surface.

Figure 9 Install Nose Fairing

PRE-FLIGHT INSPECTION.
You are now ready for the wing pre-flight inspection as outlined in the next section. It is imperative that you carry out this inspection every time you rig and before you fly.

ASSEMBLING LYING FLAT

UNZIP THE BAG. Lay the wing down with zip up and the nose facing into the wind. Unzip the bag and unclip centre ties.

ASSEMBLE CONTROL FRAME. Spread the control bar down tubes and insert the base bar. The pip pin is then inserted with the cover firmly secured. Check that all the rigging wires are outside the control frame.

ROTATE GLIDER. Rotate the glider so that the control frame is under the wing. Make sure the rigging is not tangled.

REMOVE BAG. Remove the glider bag and unclip all of the ties. The sprog tube (washout strut) covers should also be removed at this time.

INSERT NOSE BATTENS. Load the nose battens on to the locating pins at this time. Failure to do so will make it difficult to locate the battens after the sail is tensioned.

SPREAD LEADING EDGES. Carefully spread both leading edges out half way firstly then spread leading edges to their approximate flying position. Check the side wires are not twisted.

IT IS ESSENTIAL THAT THE KEEL AND THE LEADING EDGES ARE KEPT IN THE SAME PLANE OR DAMAGE WILL RESULT.

INSERT TIP RODS. Remove the tip bags and insert the tip rod into the fitting at the rear of the leading edge. Ensure that the rod is inserted all of the way.

LOAD TIP ROD. Move to the front of the wing. For the left tip hold the rear leading edge with your left hand and the end of the sail with your right. Bend the tip tube towards the trailing edge as you apply sail tension to the tip rod. Locate the tip lever on to the tip rod. When installing the right tip rod the leading edge should be held with your right hand.

CLOSE TIP LEVER. Move to the trailing edge. Place your right thumb in the rope loop of the tip lever and close the lever. The lever should be held in the same plane as the trailing edge. Do not let the lever close rapidly as damage may result. Repeat loading and closing for the right wing.

INSERT MAINSAIL BATTENS. Remove the battens from the bag. The red battens are for the left side and the green for the right. Insert the battens from the centre to the tip with gentle pressure, until the batten meets resistance. Shake the sail at the trailing edge whilst maintaining gentle pressure on the batten to allow the batten to be inserted over the cross bar. DO NOT FORCE THE BATTENS!

TENSION CROSS BARS. The cross bars are now tensioned by pulling the webbing loop until the shackle is positioned on the quick clip. Ensure that the catch is positively locked. When tensioning with the glider lying flat the keel can be raised approximately 200 mm to allow the side flying wires to be loose.

ATTACH FRONT FLYING WIRES. Lift glider and attach front flying wires. Ensure that the front flying wires are secure and that the quick clip is positively locked.

INSTALL NOSE FAIRING. Attach the nose fairing applying the top hook and loop fastener first then gently tension over the nose plates and attach the hook and loop fastener to the under surface.

LOAD WASHOUT STRUTS. The sprogs should be rotated into position over the red webbing loops and the zips closed fully. It is a good time to inspect the junctions prior to closing all zips.

INSERT UNDER SURFACE BATTENS. The under surface battens are inserted then pulled back into the rear of the batten pocket with the string handle.

PRE-FLIGHT INSPECTION. You are now ready for the wing pre-flight inspection as outlined in the next section. It is imperative that you carry out this inspection every time you rig and before you fly.

Section 6 PRE-FLIGHT INSPECTION

The wing was designed so that drag would be kept to a minimum. This means that most of the pre-flight check points are enclosed.

A thorough pre-flight inspection is mandatory for any aircraft, and the best technique is a circular walk around the wing.

The nose area is the ideal place to start your pre-flight check, followed by each assembly point.

Keep in mind the three most critical set up areas:

THE NOSE QUICK CLIP
CONTROL BAR BASE TUBE FASTENERS
THE CROSS BAR TENSIONER QUICK CLIP.

Starting at the nose we suggest the following checklist (ensuring all bolts and fasteners have the appropriate thread protruding beyond the nut).

Check the nose plate assembly ensuring that the VG routing is normal. Sight along both leading edges checking for similar curves.

Walk towards the tip feeling for dents in the leading edge.

Check cross bar/leading edge junction through the zipper access.

Check sail tip lever is fully closed and the sail is not damaged.

Check the tip rod is properly located and the rear leading edge is undamaged.

Walk towards the keel checking all battens are secured.

Check the sprogs are in order and the zips are fully closed.

Check the cross bar retaining shackle is secured on the quick clip.

Repeat the above steps for the other side wing in reverse order.

Check all lower rigging is correctly routed and free from damage. The most likely area for damage on wires is around the swage and thimble area.

Check control bar corners are correctly assembled with pip pin and cover.

Ensure the hang loop rocker is rotated 90 degrees to the keel and that hang loops are securely positioned and in good order. The hang loop should be free to move in both directions.

Check control bar top assembly and ensure that the down tubes are straight.

Unzip under surface and check cross bar hinge and restraining straps. The VG should be operated and inspected to ensure it is functioning properly.

Ensure that the double surface is zipped up and nose fairing is secure.

Clip your harness into the main and back up hang loops and perform a "hang check". Make sure that your harness is the correct distance from the base bar, your leg loops are secure and your carabiner is locked.

HANG GLIDER DAILY INSPECTION

Inspection of the following items after every assembly of the glider is required:

Check for bends, dents, scratches in all tubes.

Check wire ends for bolt and/or other fastener security.

Check wires for twisted or jammed thimbles.

Check wires are free of kinks, frays, abrasions, broken strands etc.

Nose plate connections; spring clip retains front wires.

Tips secure; tip rod and lever undamaged, zipper closed.

Battens and batten clip ends not broken or bent.

A-frame connection on both sides; spring pins located correctly.

Variable geometry operation (full and free movement).

Rear keel connections; spring clip retains shackle and tensioner cable.

Crossbar tension wire; free of kinks, frays, abrasions, broken strands.

Crossbar operation (free floating).

Sprog tubes, rod ends and clevis pins secure.

Sail condition; no tears, symmetrical appearance.

Harness straps and webbing secure, height adjustment correct.

Emergency parachute secure, correctly mounted and attached, operating handle accessible.