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Pilot's Operating Handbook

Wing Type :

iFun 13

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1 Table of Contents

2 Amendment Record Sheet

2.1 Table of Amendments

Review	Date	Comment	Section
0030	09-2021	Reference document	

2.2 Amendments

The information in this manual is based on the data that was available at the time of its publication. The latest amendments to this manual will be issued on the Air Création website (http://www.aircreation.fr) in PDF format. This should be printed out and added to the manual. The amendment table should at that time be updated with the appropriate details and date. Therefore it is important for operators to check the website regularly for any amendments that have been made. If any errors or omissions are found in this manual please advise the factory.

3 General

3.1 About this Document

This manual is a legal document which is approved for use with Air Creation iFun 13 wing.

It must be used in conjunction with the particular trike's operating handbook.

It must remain with the aircraft, and not be amended or altered without authority from Air Creation.

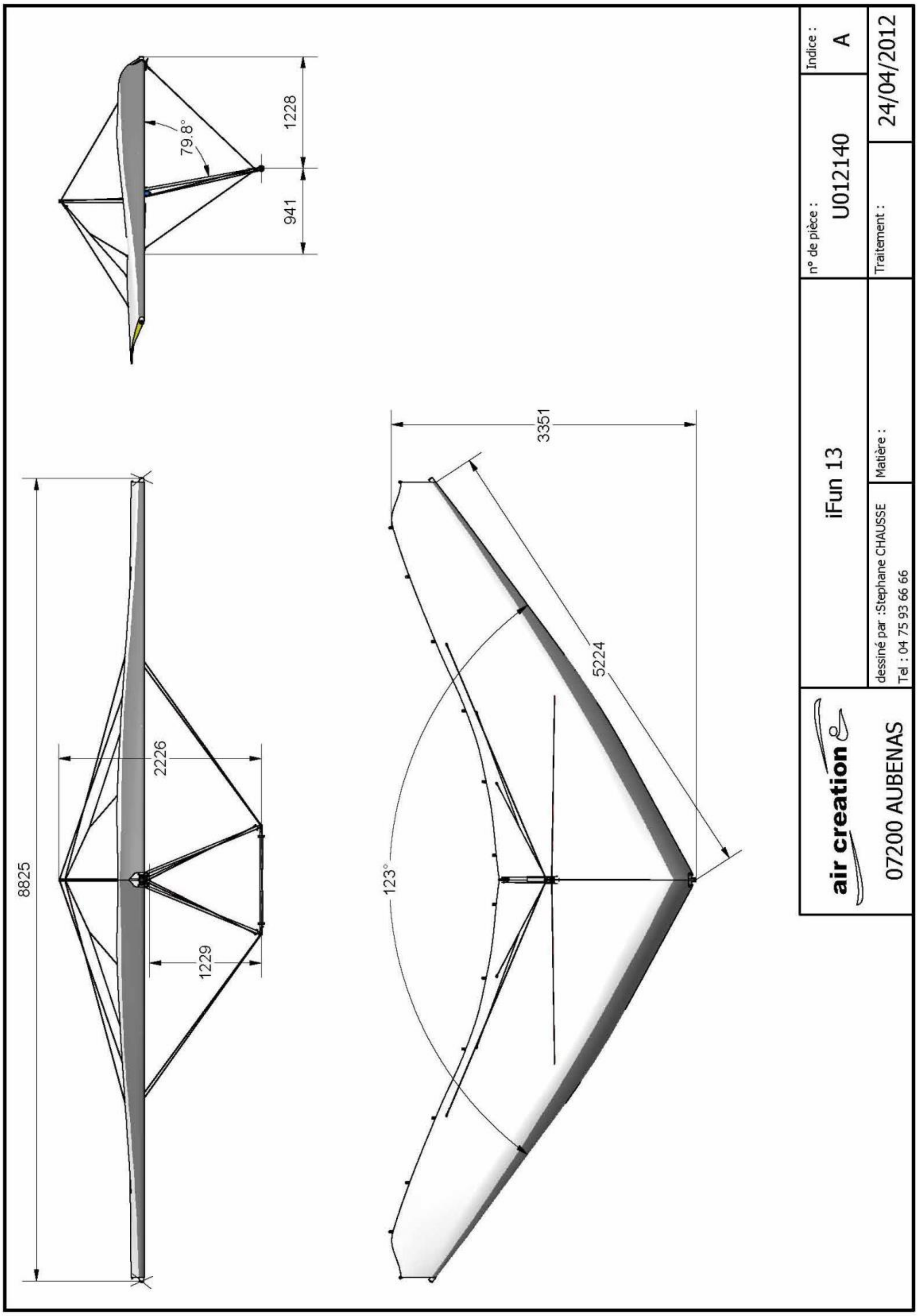
All pilots should read this manual before flying as pilot in command of the aircraft to which it refers.

This manual is not intended to teach you how to fly the aircraft. Learning to fly should be accomplished under the supervision of a suitably qualified flight instructor experienced in flying this type of aircraft.

What this manual will do is provide the information necessary to a qualified pilot for the safe flight of this weight shift aircraft.

3.2 3-Perspective Diagram

Figure 3-1: iFun 13 in 3 Perspectives



4 Technical Specifications – Performance

4.1 Technical Specifications

Area	13 sq m (140 sq ft)
Maximum wing loading	19.2 kg/sq.m (3.9 lbs/sq.ft)
Airfoil type	Double surface 40%
Span	8.8 m (29 ft)
Nose angle	122°
Aspect ratio	6
Empty weight	31 kg (68 lbs)
Ultimate load factors	+ 6g - 3g
Maximum take-off weight	250 kg (551 lbs)
Limit load factors	+ 4g 0g (-2g under gust)

4.2 Maximum Added Load / Trikes Adjustment

The following chart defines the useful load of our various trike models with the iFun 13 wing.

Trike Type	MTOW	Standard empty load	Maximum empty load	Maximum useful load *
Pixel 250	**230 kg (507 lbs)**	**90 kg (198 lbs)**	**139 kg (306 lbs)**	**140 kg (309 lbs)**
Pixel 303 XC	**230 kg (507 lbs)**	**96 kg (212 lbs)**	**140,5 kg (310 lbs)**	**134 kg (295 lbs)**
Pixel Aero 1000	**230 kg (507 lbs)**	**110 kg (242 lbs)**	**141 kg (311 lbs)**	**120 kg (265 lbs)**

* Optional equipment excluded

Other adaptations:

In the case of the adaptation of a trike from another factory or amateur different from those specified above, the maximum total weight of the trike under must be less than 219 kg (483 lbs).

Then progressive tests will be performed to check the adaptation wing/trike, especially concerning the position of the control bar and the thrust line height.

⚠ *Check during fitting whether the trike propeller stays clear of the lower rear longitudinal cables and the keel. A minimum clearance of 10 cm (4 inches) should be respected when the hang point is set to the front position and the wing is fully nose up and all the way banked on one side.*

4.3 Performance (*)

The indicated speeds are CAS corrected speeds.

(*) The indicated performances were measured with the standard propellers that equip the trikes. The performances obtained with the optional propellers proposed are at least equivalent.

Trike	Pixel 250		Pixel 303 XC		Pixel Aero 1000	
Take-off Weight	180 kg	Max 230 kg	180 kg	Max 230 kg	180 kg	Max 230 kg
	397 lbs	507 lbs	397 lbs	507 lbs	397 lbs	507 lbs
Stall speed	41 km/h	44 km/h	41 km/h	44 km/h	41 km/h	44 km/h
	25 mph	27 mph	25 mph	27 mph	25 mph	27 mph
Take-off run	40 m	55 m	40 m	53 m	40 m	55 m
	131 ft	180 ft	131 ft	174 ft	131 ft	180 ft
50 ft clearing distance	90 m	110 m	85 m	105 m	90 m	110 m
	295 ft	361 ft	278 ft	344ft	295 ft	361 ft
Climb rate	4,2 m/s	2,6 m/s	4,5 m/s	2,8 m/s	4,3 m/s	2,7 m/s
	827 ft/mn	512 ft/mn	886 ft/min	551 ft/min	847 ft/mn	532 ft/mn
Landing distance from 50 ft height	135 m	145 m	135 m	145 m	135 m	145 m
	442 ft	475 ft	442 ft	475 ft	442 ft	475 ft
Take-off and landing Side wind limits	25 km/h					
	15 mph					
V.N.E. (velocity never to exceed)	120 km/h					
	74 mph					
V.man (never to be exceeded in very turbulent air)	88 km/h					
	54 mph					

5 Instructions for Use

5.1 Rigging

5.1.1 Assembly

1. Open the wing bag, make sure that the A-frame is on top, and remove fastenings and paddings.
2. Assemble the A-frame with the push-pin. Cables must not pass through the inside.
3. Lift the wing from the front and rotate it so that the wing is laying with the assembled control frame flat on the ground. Carefully open the two half wings to their maximum extent.
4. Slip the tensioning handle behind the foot of the kingpost by the opening in the upper surface ***taking care not to cross or twist the cables.*** *(*Figure 5-2*)*.
5. Fit the king post plastic head at the top of the kingpost without entangling pitch lines.
6. Fit the king post onto its locating lug on the keel, between the two tensioning cables.
7. Carefully slide the upper sail bent battens in their respective pockets and tension the sail by fastening the Easyfit tighteners (Figure 5-1).

Figure 5-1 : EasyFit Tighteners

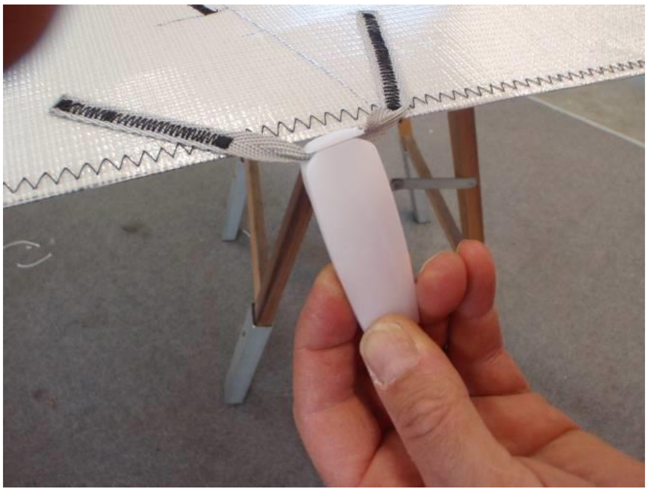
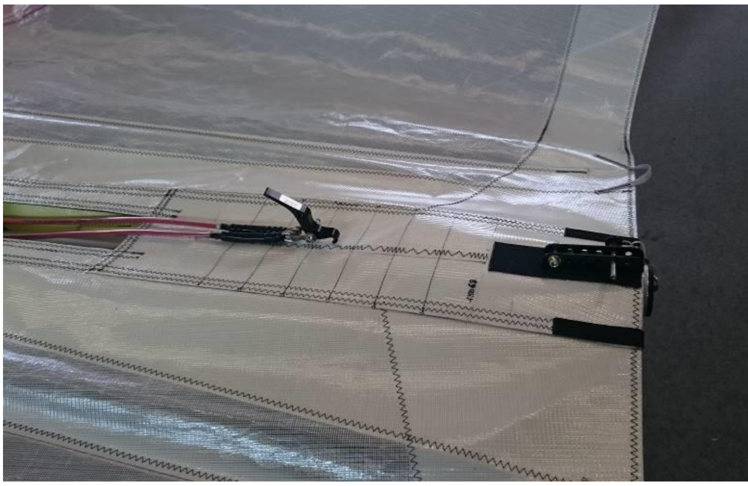


Figure 5-2 : Path of Tensioning Cables



8. Pull the cross tube swan catch tensioner towards the trailing edge, then hook it to the rail screw at the keel tip (Figure 5-2). To ease the operation, carefully center the A-frame, ensure that the tabs and heat shrink coverings of the lower lateral cables do not get stuck in the sail opening at the cross tube/leading edge connection and that the stainless steel tabs line up with the control bar.
9. Pull down the swan catch tension lever and fix it in the rail with the pushpin.
10. Raise the nose of the wing and lift it on its A-frame. To avoid dragging the tips of the wing on the ground, it is recommended that a second person hold the back of the keel.
11. Fix the front lower longitudinal cables in the rail under the nose plate with the help of the swan catch tension lever and the pushpin.
12. Install the tip struts in the appropriate openings on the leading edge. Insert them all the way into their housings and rotate them until they block. Check that they are correctly blocked by pulling them towards the rear. Raise the sail for ease of access.

13. Place the two straight battens of the wing tips on the plastic lug attached to the tube of the leading edge, and tighten the upper surface with the clasps. Attach the undersurface bungees by pulling them over the clasps.
14. Close the fabric closures at the tips by means of their velcros.
15. When connecting the trike, slip the security fastening cable through the loop in the security strap aligned with the front of the kingpost, behind the kingpost, through the loop again, and then fix it to the beam of the trike. The security cable should pass under the tensioning cables. This operation secures the trike as well as fastening the crossbar tensioning system.

For the final stage of lifting the wing on the trike, follow the instructions in the trike operating handbook.

5.1.2 Disassembly

Dismantling is carried out in reverse order of the assembling operations.

Before setting the wing flat on the ground, insert the protective padding on the keel over the hang point bracket.

Before folding up the two half-wings, check that the handle of the tensionning cables does not catch in the opening of the upper surface, disengage the kingpost, slide the handle as far as possible in front of the kingpost foot so that it cannot catch an element of sail or frame when closing the leading edges.

⚠ *Never release the tension of the wing without first removing the straight battens of the wing tips which rest on the leading edges.*

5.2 Preflight Check

The wing preflight check will be easier if made before lifting the wing above the trike. The following is a brief summary of the minimum pre-flight inspection, which assumes that the scheduled maintenance checks outlined in the maintenance manual has been performed. If you are unsure, it does no harm to increase the number of items in your inspection in accordance with the recommendations of the maintenance manual.

1. Position the wing horizontally once coupled with the trike.
2. Visually check the symmetry of the two leading edges.
3. Check noses plates' assembly, bolts, nuts, thimbles and Nicopress of the front lower longitudinal cables, swan catch correctly positioned, pushpin and wires attached.
4. Slide your hand along the leading edges to check for possible damage. Make sure the profile of the upper surface of the leading edge is free of deposits of raindrops, insects, snow or ice. Clean/dry if necessary.
5. Check the crossbar/leading edges connection, bolts, nuts, by unzipping the lower surface access. Check for correct fastening of lower flying wires and upper landing wires, also their condition, swages and thimbles. Check that the sail is not snagged on a metallic part. Close the lower surface access.
6. Check the fastening of the sail at the wing tips and the position lock of the two pivoting sleeves by means of the Parker screws.
7. Check the fitting of the upper surface battens and the closure of their tighteners on the trailing edge.
8. Check fitting and condition of the reflex bridles and their attachment to the sail.
9. Check that no upper cables are wrapped around the kingpost and that the luff lines are well positioned in the grooves of the pulleys at the top of the kingpost.
10. Check the axes of the swiveling piece, its safety pins and the thimbles and Nicopress of the rear lower cables at the keel end.
11. Check the correct routing of the tensioning cables ***on each side of the king post***. Check the tensioning system at the end of the keel, the nuts and bolts, the correct position and security of the push pin and its safety washer.
12. Slide your hand along all of the lower cables to detect signs of wear.
13. Check that the lower cables are attached to the A frame, check the nuts and bolts, check the condition of the cables and their Nicopress clamps, and the push-pin of the control bar. All the cables should be loose enough to pivot in the direction of the tension. Close the leather cover webbings.
14. Check the assembly of the crossbar central junctions, the nuts and bolts, the protection, the retaining straps on the keel, and the fastening of the tensioning cables.
15. Check the hang bracket and its positioning rings for condition (possible twist, cracks) and free pivoting movement.
16. Check that all zippers on the inspection hatches are closed and that the under / upper surfaces and wingtip closure are correctly positioned with their velcro.
17. Once the wing is assembled on its trike, check the position of the hook screw, its butterfly and its safety ring.
18. Check that the safety cable of the trike is correctly positioned and fastened. It must pass under the tensioning cables. This system ensures the fastening of the trike as well as tensioning of the crossbars in case of failure of one of the main components.

5.3 Flight Specifications

5.3.1 Operational Limitations

⚠ *Warning:*

This wing is not designed for aerobatics.

It is imperative to respect the flight envelope !

- Maximum Pitch attitudes 30° nose up, 30° nose down
- Maximum Bank angle 60°
- Aerobatics and deliberate spinning prohibited
- V.N.E. (never to be exceeded): 75 mph (120 km/h)
- Maximum Take-Off Weight : 250 kg (551 lbs) with compatible Trike
  230 kg (507 lbs) with Pixel Trike
- Acceleration limits +4/-0g ; positive "g" at all times
- Stalls authorized only in glide path with a progressive speed reduction and throttle to idle position.

⚠ The instructions in paragraph 5.3.3 concerning stall exercises must be followed.

⚠ *Over these limits, stability problems, structural failure or irreversible "tumbling" motions may occur.*

5.3.2 Controls

Control bar:

Pushing the control bar forward causes the wing to pitch its nose up, which increases the angle of attack (causing the aircraft to climb) – primary effect, and a decrease in air speed – secondary effect.

Roll control is effected from lateral movement of the control frame, and follows weight shift convention, i.e. bar right, aircraft rolls to the left.

A separate yaw control is not provided. Like other weight shift aircraft, yaw is provided from the secondary effect of banking.

5.3.3 Flight Techniques

Taxiing:

Avoid turning sharply as this generates large amounts of torque and hence wear, transmitted to the pylon, hang point and keel. Always try to keep the wing aligned with the trike when turning by bracing the control bar. Turning circle is very small, but beware – wing tips and tip fins stick out and can move around their arc very fast!

Take-off and landing techniques:

Take-off is conventional. Keep the aircraft straight using the nose wheel steering. Allow the bar to float in the neutral position in pitch and keep the wings level. Let the control bar move forwards to obtain takeoff rotation. As the aircraft rotates, allow the control bar to move back smoothly and allow airspeed to build.

If taking off in calm conditions or from a soft field or from a field with long grass, the minimum take-off roll distance is reached by increasing rpm to full power with brake, then releasing the brake and pushing the control bar fully forward. The control bar should be brought backwards immediately once the wheels are in the air to obtain a climbing speed of 55 km/h (34 mph) according to the load. If a performance take-off is not required then once the aircraft has rotated allow the bar to move back smoothly, adopt a shallow climb attitude and allow the airspeed to build to a safer low-level climbing speed of around 60 km/h (37 mph).

The landing is conventional. Maintain the approach speed until 8-10 foot height, then flare out to make a smooth touchdown. Braking may be used once all wheels are on the ground. A short landing requires a slow approach speed of 60 km/h (37 mph). Raise the nose a few meters from the ground, in order to touch down at stalling speed. Brake and pull the control bar to the maximum in order to obtain more aerodynamic braking once the rear wheels have touched ground. If conditions are gusty or a strong wind gradient is suspected, use a higher approach speed value.

Turning:

The iFun wing is very well-balanced in the turn and is capable of high rates of roll with modest control forces. Roll rate is proportional to both airspeed and wing loading. Fastest roll rates will be achieved at light weights and high airspeed. Conversely when flying at high weight and low speed, maneuverability is reduced. Ensure that the runway is long enough for take-off and that no sudden maneuvering is required to avoid obstacles early in the climb, when speed may be low.

Turns at bank angles up to 60 degrees are permitted. To balance the turn at this bank angle, forward bar movement is necessary to generate the required lift for level flight and increased power is required to overcome drag and maintain airspeed. Under these conditions substantial wake turbulence is produced. For turns of over 45 degrees of bank it is recommended that a heading change of no greater than 270 degrees is used, in order to avoid entry into the wake turbulence and a possible excursion outside the permitted flight envelope. The iFun has neutral spiral stability at high cruise speed and thus will remain balanced in a turn without any roll control pressure required. With a high loading and low cruise speed adjustment, it may be necessary to increase the speed before the wing is put into banking to avoid stalling the lower wing. An increase in engine power is also advised to maintain the flight level during the turn.

Stalling:

The stalling point is reached more easily with a backward hang point position. Once the stall angle of attack is reached, the control bar starts pushing back forcefully and some pre-stall buffet may be felt in the form of pressure bumps. Avoiding any resistance to this tendency for a short while allows the wing to return to correct speed. In that case, the loss of altitude will be less than 10 m. (33 ft). If the control bar remains extended despite the warning signs, the wing will stall and the loss of altitude may easily reach 30 m (100 ft). An asymmetrical start on one wing is possible, particularly during the running in of the sail (first 50 flying hours).

Nose high pitch attitudes generated prior to the stall break will lead to high nose down rotation rates. In common with all flexwing aircraft, extreme examples of this can result in tumbling motions, loss of control and massive structural failure.

⚠ *To avoid risk of tumbling, stalling exercises must imperatively be carried out with the engine at idle, with a very slow decrease in speed (less than 1kt/sec) obtained by progressively pushing the control bar out. No rolling action shall be taken when approaching the stall. The push action on the control bar must be released as soon as the first warning signs are evident (flutter of the sail, vibrations of the control bar, mush or beginning of a break).*

The stall obtained during a turn by an insufficient speed and an excessive pushing action on the control bar will cause a tilting of the inner wing in the direction of the turn and the nose towards the ground. If the pressure on the control bar is then released so as to bring the angle of attack back into the normal flight range, the bank angle will be reduced by a conventional maneuver. But if the bar is kept pushed after the wing tilts, the rotation will not be stopped by a simple rolling action and the machine will be able to engage a descending spiral. To summarize : In the event of a stall in turn, first make the wing fly again by reducing the angle of attack, then correct the bank !

Pilots should also be aware that as with all aircraft, overloading with baggage/heavy occupants will increase stalling speed, as well as the usual drawbacks of reduced performance, maneuverability and structural safety margins.

Behavior in strong wind:

Once grounded and motionless

Park the aircraft perpendicular to the direction of the wind, with its windward wing lowered and the tip of the leading edge rests on the ground, block the A frame on the front tube of the trike (using for example the Velcro used for packing the battens of the sail), block the park brake and put chocks under all three wheels. Take the wing off the trike and put it flat on the ground windward, if the aircraft is not going to be used immediately.

Ground-runs

Keep the sail flat into a headwind. Push the control bar against the trike front strut with a tailwind. This will avoid flipping. With a side wind, be careful to always tilt the wing so that the windward edge is slightly lower than the rest of the wing. It may be difficult to hold the A-frame in its position. Never let the wind lift the wing up.

Take-off and landing

As ground run distances are considerably reduced by strong wind, try to face the wind. Perform take-off and landing maneuvers at greater speed than you would normally do, in order to diminish the drift angle and counter the effects of the gradient.

Crosswind Take-off

Start the take-off run with the windward wing very slightly lowered. Hold the aircraft on the ground by holding the bar slightly back from the neutral position. Keep to the axis of the runway with the front wheel control without considering efforts on the sail. Allow airspeed to build to a higher-than-normal value then rotate positively into a shallow climb attitude. Keep the wings level and allow the trike to yaw into the relative wind. At this point adjust the drift angle if required to maintain runway centerline, and proceed as normal.

Crosswind Landing

Crosswind landing limits are largely dictated by the skill of the pilot. Make sure that you have lots of experience before attempting crosswind landings with components in excess of 8kt.

General technique should be to fly the approach maintaining the runway centerline by setting up a steady drift angle. During the final stages of the approach use a higher-than-normal approach speed to minimize the drift angle. Round out slightly lower than normal and aim for a short hold off, so that the aircraft lands smoothly, back wheels first with the control bar at or only slightly forward of the neutral position. The contact between the back wheels and the ground will then yaw the trike unit towards the runway centerline at which point the nose wheel can be gently lowered to the ground. Once all wheels are down the windward wing can be lowered slightly. To ensure maximum directional control during rollout from a crosswind landing the recommended technique is to move the bar back after landing and apply light to moderate braking. This eliminates any tendency to bounce and ensures good contact pressure between tire and runway surface. This technique of applying aerodynamic loading to increase ground pressure and hence braking efficiency during landing roll is also appropriate for short field landing.

Remember that crosswind landings on grass are slightly easier than on hard surfaces. During crosswind landings a lot of torque is carried through the structure which results in excessive wear to the hang point and attached structure. Always try to land into the wind if possible. If crosswind components are in excess of 15 knots then only a small windward distance will be required for landing – across a large runway could be the best option!

Flight in Turbulence:

Compared to other flexwing microlights, the iFun handles turbulence very well. However in common with all microlight aircraft, care must be taken in turbulent conditions, particularly when close to the ground. As previously stated high airspeed will enhance maneuverability in these situations. However if conditions become severely turbulent with hard jolts being transmitted through the aircraft, it is recommended that you do not exceed the maneuvering speed Vman. VNE should only be reached in smooth conditions.

In strong wind conditions, avoid flying on the downwind side of large hills or other obstructions. When landing in strong crosswind conditions, remember that low-level turbulence will be produced by obstructions on the upwind side of the runway. Always try to assess areas of possible lift, sink or turbulence from some distance away so that you can be fully prepared for their effects.

At height the best way to minimize pilot workload and physical fatigue is to fly the aircraft while trying to let the control bar float through turbulence. Use your arms as dampers and try not to rigidly fight the movement. Close to the ground, where accurate control is required, the displacement of the aircraft in turbulence can be reduced by bracing the control bar relative to the structure of the trike unit. This then transmits to the wing the pendulum stability of the trike mass. However the pilot must be ready to make any necessary corrective control inputs.

Smooth flight in turbulence in a flexwing aircraft is a skill that is learned with time and experience. Please remember the old adage: "It is better to be on the ground wishing that you were in the air, than in the air wishing that you were on the ground!"

Rain, ice and snow:

⚠ *Flight in rain may increase the stall speed of the aircraft and reduces maneuverability at slow speeds. Simple scattered drops deposited on the leading edge of the wing before or during the flight increase the stall speed by up to 10%.*

It is recommended to wipe the leading edge fabric with an absorbent cloth if such conditions are detected before the flight. During the flight, as long as drops are present on the tricycle windshield, expect a higher stall speed, obtained with a control bar position further back than normal. Be particularly careful during the final approach and increase the recommended speeds by 10%, especially if the load on board is high.

Any other form of contamination of the leading edge, the airfoil, and the upper surface such as ice or snow will result in strongly increased stall speeds and a large reduction in overall aircraft performance. Never take off under such conditions! If these conditions are encountered during flight, attempt to escape these conditions as quickly as possible. If this is not possible, the aircraft should make an emergency landing as soon as it is safe to do so. During this process avoid flight at low speed and expect poor aircraft performance.

5.3.4 Adjustments

In General :

Your wing was delivered with the optimum settings.
If you feel that the wing requires adjustment to trim in the roll or the pitch axis you should check that the problem is not caused by something asymmetrical in the frame or the battens. In order of priority check the following:

1. Check that the rotating sleeves at the tips are correctly positioned and blocked by means of the self-taping screws.

2. Ensure that the wires, especially the reflex bridles are correctly routed.
3. Check the battens profile.
4. Check that the leading edges are straight and that the rear parts are located correctly.
5. Check that the keel is straight.

After checking as outlined at the beginning of this section an adjustment can be performed by the following methods:

⚠ *Never change the length of the reflex lines.*

⚠ *Never alter batten shape except to match the batten profile drawing.*

The reflex lines are designed never to be adjusted, and their primary effect is for stability **outside the normal flight envelope**, so adjustment for flight within the envelope is pointless anyway.
The batten shape is intrinsic to stability, stall behavior and handling. Some aircraft require batten shape adjustment to correct for turns. This is not necessary for Air Creation wings.

⚠ *The tuning of a flexwing requires special training and regular practice. We offer hereunder global effect of the main means of tuning, but their application is delicate. We therefore recommend that you solicit the expertise of an Air Creation Technical Station or the factory itself if you wish to modify the tuning of your wing !*

Hang point position

Centering adjustment is done by moving the hang point on the keel. The nylon locking rings of this part should be positioned according to the desired centering (3 positions). The cruising speed at natural trim increased by about 5 km/h (3 mph) if the hang point is moved forward and vice versa. Each position may be used, the only effect is alteration of the cruising speed once control has been released, without any repercussions on stability and performance.
For the first flights the hang point should be left in its original position, intended for ease of handling.

Warning : Any alteration of centering means a variation of the A frame tilt and therefore modification of the lower longitudinal cables' tension. There are various adjustment holes in the cables fixation rail at the nose of the wing, so as to allow them to keep a correct tension whichever the adopted position of the hang point may be. When the position is in the middle, the blocking screws of the tensioning handle of the cables should be in the 2nd hole from the back of the rail. The first hole should be used when the position is in front, and the 3rd hole when in rear.

Tension of the sail on the last battens of the wing tips.

It is easy to adjust the symmetry of the wing by differentially adjusting the tension of the sail on the last batten wing tips (those that rest upon the plastic lugs on the leading edge). To do this, simply rotate the plastic tip of the batten which is fitted with a thread.

Increased tension raises the trailing edge of the wing tip under consideration and reduces its lift. Decreased tension has the opposite effect. Action should be taken in small corrections (1 turn on the tip batten) and simultaneously applied in opposite directions on each side (+1 turn right, -1 turn left, for example). Check the results and increase the adjustment if necessary.

Symmetric tuning of the tension of the sail on the last wing tip batten leads to a change in hands-off cruising speed. Increasing tension leads to a slowdown, reducing it leads to a speedup. The maximum tension allowed is obtained with 6 turns of tension on the batten tip, the minimum is 0 turns, standard setting is 3.

Position of the tip adjusters at the leading edges tips

The pivoting sleeves have been set during factory flight testing, depending on the engine group, and they are blocked in position by a screw. This position is adjustable by means of the position on the sleeve, which corresponds to a mark (0, +2.5, +5, -2.5, -5) on the scale glued to the tube of the leading edge. Their differential rotation may be used for correcting a tendency to turn on one side during hands-off straight, level flight. They work in the same sense as ailerons on a conventional aircraft – rotate the trailing edge down and more lift will be produced and vice versa.

If the wing pulls to the left, disassemble the last battens on the right wing tip, open the velcros holding the lowersurface to the uppersurface and unscrew the blocking screw on the inside of the leading edge. Turn each wing sleeve clockwise in order to attain the following level (+2.5 right, -2.5 left), pulling the fabric. Reposition the screw, the battens, and the Velcro. If the correction is insufficient for perfect trimming of the wing, repeat the operation until it is achieved (maximum authorized 10mm of difference right/left). Always use the same value on each side of the wing. Do not modify the tension of the last battens for the efficiency of this operation.

For a wing pulling to the right, turn the left sleeve 2.5mm counterclockwise (towards +), and the right sleeve counterclockwise using the same value (towards -).

Rotating the sleeves can also be done to fine-tune the cruising speed. A coupled rotation of both sleeves 2.5mm up (+) slows the wing down by 5km/h, and conversely for a rotation down (-). A maximum of +2.5mm or -2.5 is suitable. Beyond that point the stability and pitch of the wing may be affected and unseemly wrinkles appear in the wing fabric.

Sail tension

The sail tension at the wing tip may be altered to make up for wear of the sails, and improve its performance. This action should not be considered before a minimum of 300 hours of flight.

To perform this adjustment, remove the protecting cap from the wing tips and rotate the bolt placed at its end with a number 10 spanner. Put the cap back and readjust if necessary the tension of the small ropes or rubbers of the bottom and upper surface of the last wing tip batten, because of the modifications of the sail position on the leading edges tubes (same value of increase in the length of the batten as increase in tension on the leading edge). Tension maximum 5 turns (5mm) and make a flight test. The cruising speed will be increased by approximately 3km/h for 5mm of additional tension but maneuverability in roll will be slightly diminished. The maximum authorized total tension is 35 turns (35mm). The factory standard tension of a new wing is 20 turns (20mm). The minimum authorized tension is 15 turns (15mm) of total tension.

Tension of the sail on the removable battens of the upper surface

The tension of the sail on the upper surface battens may be modified to counteract the effects of aging on the sail, and improve its performance. This action is not to be considered before a minimum of 300 hours of flight. To adjust the tension, simply rotate counterclockwise the plastic tips of each batten. A retensioning of 2 turns generally provides the desired effect. The cruising speed will be increased by about 1 km/h per tensioning turn but handling in roll will be slightly reduced.

Tension of the crossbar cables

The tension of the crossbar tensioning cables may be modified to counteract the effects of aging on the sail, and improve its performance. This action is not to be considered before a minimum of 300 hours of flight. To do this, just move the screw that positions the tensioning swan catch back one hole on the rail at the end of the keel.

The cruising speeds will not change, but handling in roll will be slightly reduced, while aerodynamic performance will be improved.

6 Maintenance

6.1 Assembling from Shipping Crate

This procedure is to be followed if the wing arrives in a short packed configuration. An approved dealer is responsible for assembly from the short packed configuration. The short packed wing has had the rear leading edges removed to reduce the packed size for transport.

The correct reassembly of the wing is critical for safety and performance of the wing. If there are any doubts about the correct procedure for assembly after shipping contact Air Creation factory.

6.1.1 Reassembly Guide

1. Remove wing from box. Take care that no staple damages the bag or the sail during this operation.
2. Unzip bag
3. Remove all wing straps. Remove padding from control bar, keel and rear leading edges. Store Velcros and protections in the wing cover.
4. Unfold the ends of the sail
5. Assemble the control bar on the revolving base fixed to the left A-frame strut with the **screw CHC 6-40-12 (B064110)**, washers, Nylstop nut, Loctite 243 Threadlocker glue.
6. Assemble the control bar to the right A-frame strut with the push pin. No cables should pass inside the A-frame. Close the leather protections.
7. Rotate the wing so that it is lying flat on the ground.
8. Spread both leading edges approximately ½ meter.
9. Insert rear leading edges in the tip openings of the sail with the plastic lugs at the rear of the tubes positioned horizontally and to the inside.

⚠ ***The two rear parts of the leading edges are not identical. A sticker on the tube indicates whether it is a right (D) or left (G).*** *An inversion can have serious consequences because it modifies the tip angle resulting in negative twisting of the tips and strong longitudinal instability.*

10. Finish sliding the rear leading edges in the front part. Turn slightly and push in order to line up the tube slot and the horizontal bolt connecting the crossbar on the front part of the leading edge. Make sure that the plastic lugs at the rear of the tubes are face-to-face. Once installed the rear leading edge slot should be located on the channel horizontal bolt. It should be impossible to rotate the leading edge, if correctly assembled.
11. Remove the protective wrap caps from the wing tip sleeves. Pull the sail strongly back and position the fabric of the leading edge of each half-wing outwards.
12. Attach the sail to the tip sleeves with 2 **screws FHC 6-70-11**. Make sure that the aluminum guide that allows the setting of the sail's tension is facing the slot in the sleeves, at the end of the leading edge. Slide the screws first through the upper eyelets, then through the central hole in the tensioning guide and finally through the lower eyelets (Figure 6-1). A stainless steel washer should be placed under the head of the screw and a second one between the lower surface eyelet and the nut. Apply the Threadlock glue to the nuts and tighten the Nylstop bolts.

Figure 6-1 **Figure 6-2**

13. Gradually open the leading edges to the maximum, while checking that the lateral cables tighten correctly at the ends without loops nor blocking the neoprene openings in the sail. Proceed in small steps, returning to the nose of the wing to pull the sail forward and insure that the central battens remain in the right position on the screws of the leading edges. Return them to their place as necessary.
14. Unfold the wing as described chapter 5.1.1. Do not assemble the last straight battens at the ends of the wing.
15. Each wing tip should now be tightened by means of the tensioning **screw HM 6-45 (B126410)** placed at the end of each sleeve of the leading edge. Standard tuning is 20 turns. Turns are counted from the stop in front of the port, as soon as the tightening of the screw begins to have an effect. Each turn represents 1mm of tension in the sail. (Figure 6-2). After adjustment, reassemble the **plastic caps** at the ends of the tubes

Figure 6-4 **Figure 6-5**

16. Check that the rear parts of the leading edges and their wing tip sleeves are assembled on the right side of the wing as indicated by their marking Right/Left.
17. Check that the tubes are pivoted right as indicated by the mark on the scale sticker and blocked by their self-tapping screw. The standard setting is **the "0" of the scale** (Figure 6-5).
18. Assemble the last straight battens at the ends of the wing.
19. Complete assembly of the wing as indicated in Chapter 5.1.1.

⚠ *A thorough and complete preflight check is especially necessary after reassembly. Thoroughly check all nuts and bolts, wire routing, sail fit, Mylar shape and overall symmetry of the wing before flight.*

6.2 Transportation

Bumpy and long drives might damage the wing unless it is properly loaded onto the vehicle. Transporting the wing and the trike by road requires that the wing, in particular, is properly braced, cannot shake about and is generally very carefully tied down, so that no hard points can damage tubes and sail. Carry the wing carefully on a ladder covered with foam rubber to avoid precarious overhanging. Avoid bumps and swings.

6.3 Storage

Keep the wing in a dry place.

Clean it with fresh water after it has been exposed to sea air. Any grass stain should be washed out with water and household soap. Open the cover to allow the sail and the structure to dry after transport or use in the rain.

⚠ ***Ageing of the fabric and seams of the sails may cause an important loss of the wing resistance. The degradation is principally caused through exposure to ultraviolet rays emitted by the sun and the moon. In order to slow down the process, the sail should be stored folded in its cover, or if it stays rigged, in covered premises. Always put it in a sheltered place, shielded from the rays of the sun, even between flights. These measures help to lengthen/sail life.***

6.4 Inspections & Scheduled Maintenance

This section sets forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required.

The time limits and maintenance schedule provided are in addition to any regulation of the governing body where the aircraft is flown.

The pilot of the aircraft must ensure that the required maintenance is carried out and documented in the correct manner.

6.4.1 Time Limits

Extreme operating conditions and any extreme loads will reduce the time limits for components and the fatigue life of the airframe. The fatigue life of these components is dependent upon rigid adherence to maintenance schedules.

Air Creation will from time to time amend these maintenance checks as the service history of the aircraft evolves. It is the responsibility of the pilot to ensure compliance with new directives. (Information is available on the website http://www.aircreation.fr).

The following components are time limited and should be overhauled or replaced as indicated. This table may be updated to include more components in the future as airworthiness directives are amended.

Wing Components Life

Component	Life
Control frame and cross tubes	On inspection, no fatigue limit
Leading edges	900 hrs
Keel	1500 hrs
Rigging wires	600 hrs
Roll bracket	1500 hrs
Bolts/screws	300 hrs
Hang bolt	300 hrs

A strip of identical fabric as the one used for the top sail is stitched to it in the middle and over the keel pocket. The strip is made from two pieces stitched together. During each periodical overhaul, a strip must be cut off, and submitted to a test of wear and tear in the Air Creation factory. The result of the test determine the moment when replacement of the sail becomes essential for reasons of safety.

6.4.2 Safety Procedures

1. Nylstop Nuts

Nylstop nuts are used throughout the airframe. Nylstop nuts may not be reused.

2. Loctite

On any bolt that does have or not a Nylstop type locking mechanism, Loctite 243 should be used to prevent premature loosening.

⚠ ***All "Nylstop" nuts must be changed after each disassembly and always tightened with "LOCTITE" type glue.***

6.4.3 Wing Maintenance Schedule

Item	Maintenance Requirement	Hours of Operation					
		50	100 1 yr	150	200 2 yrs	250	300 3 yrs
Wing Sail	Wing fabric deterioration and tears		2		2		4
	Wing fabric stitching condition and abrasion		2		2		2
	Wing fabric attachments points	2	2	2	2	2	2
	Attachment of the keel pocket and the retaining strap at the rear of the keel		2		2		2
	Straps retaining luff lines on the upper surface		2		2		4
	Condition of tension straps on batten clasps		3		3		4
	Condition of Velcro strip closures at wingtips						4
	Wing fabric sample factory test						2
	Sail removal for general overhaul						4
Wing Frame	Profile of removable battens of the upper surface		2		2		2
	Profile of the central upper surface batten						4
	Batten clasps		3		3		3
	Wires and attachment fittings for tension, corrosion, fraying, kinking or fretting	2	2	2	2	2	4
	Condition and security of all screws, bolts, nuts & washers	2	2	2	2	2	6
	Condition and operation of all push pins	2	4	2	4	2	4
	Outer part of leading edges		4		4		4
	Keel, cross bars, and visible tubing	2	3	2	3	2	4
	Hang bracket for condition, deformation, cracks	2	3	2	3	2	4
	Main hang bolt	2	4	2	4	2	6
	Nose assembly, U-channel and cable gooseneck catch for condition		3		3		4
	Tensioning u-channel and cable gooseneck catch for condition		3		3		4
	Central cross-bar assembly, protection and webbing for condition		3		3		4
	Cross-bars to leading edges and struts assembly for condition		3		3		4
	Cross-bars to leading edges assembly for condition		3		3		4
	Condition of wing tip tensioning device		3		3		4
	All rig/unrig parts for condition and operation		3		3		4
	All airframe tubing for cracks, dents, deformation, corrosion or fretting						4
	All airframe fittings for cracks, dents, deformation, corrosion or fretting						4

Code:

1. Oil, lubricate, clean and service
2. Check as directed
3. Check for security, cracks, wear and faulty operation
4. Remove, inspect and replace if necessary
5. Recommended replacement or overhaul
6. Mandatory replacement

⚠ *In the case where the aircraft performs less than 100 hours of operation in a year, a typical 100 hour / 1 year inspection is mandatory.*

6.5 Unscheduled Maintenance

6.5.1 General

Unscheduled maintenance is required due to abnormal loads such as heavy landings. If any abnormal loads are encountered during transport or storage then the airframe needs to be checked.

The pilot will be responsible for identification of these extreme operating conditions and identification of the affected components. Where damage is found further checks should be carried out upon areas that may also be affected.

Thorough checks should also be carried out after transportation of the aircraft, and after extended storage periods.

6.5.2 Inspection after Heavy Landing

The main attachment point for the wing to the aircraft base should be inspected carefully for any permanent deformation of the U-bracket, the main bolt or the keel, as well as all of the other effected components. If the landing resulted in a jolt on the ground then a 300-hour overhaul must be performed. The tubing relies on being intact and in perfect condition for full strength. If tubing is bent or kinked in any way then it should be replaced prior to flying.

6.5.3 Inspection after Heavy Turbulence

Turbulence is more likely to structurally affect the wing of the aircraft than the trike.

The main areas that require attention after severe turbulence are the attachment points for structures. These include the front and rear wires, the side wires and the main hang point. The sail should also be inspected for any strain or tearing that may have occurred, though this is very unlikely. All of the tubing should be inspected for bending.

6.6 Maintenance Operation Board

Wing Type: ________________________ Serial Number: ___________________________

Date	Hours Flown	Type of Operation Performed	Operator Name, Address, Stamp

Date	Hours Flown	Type of Operation Performed	Operator Name, Address, Stamp

6.7 Notes

6.8 Wing – Quality Form

Anxious to ensure the perfection of our products, we have set up a sequence of controls covering all steps of production. We are continuously working on their improvement and we are in need of your help.

Please return this reply form accurately filled in if you find any issues or problems concerning your trike that could affect its quality or finish, even if it is a minor matter.

Name	
Address	
Telephone	
E-Mail	
Type of Wing & Trike	
Delivery Date	
Wing Serial Number	
Colors of Wing	
Distributor	
Hours Flown	

Problems noticed: (explanations and/or drawing) air création

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