Pilot's Operating Handbook

Wing Type :

iXess 13

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1 Table of Contents

2 Amendment Record Sheet

2.1 Table of Amendments

Amendment date	Affected sections	Affected pages	Date inserted	Signature

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 iXess wings.

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.

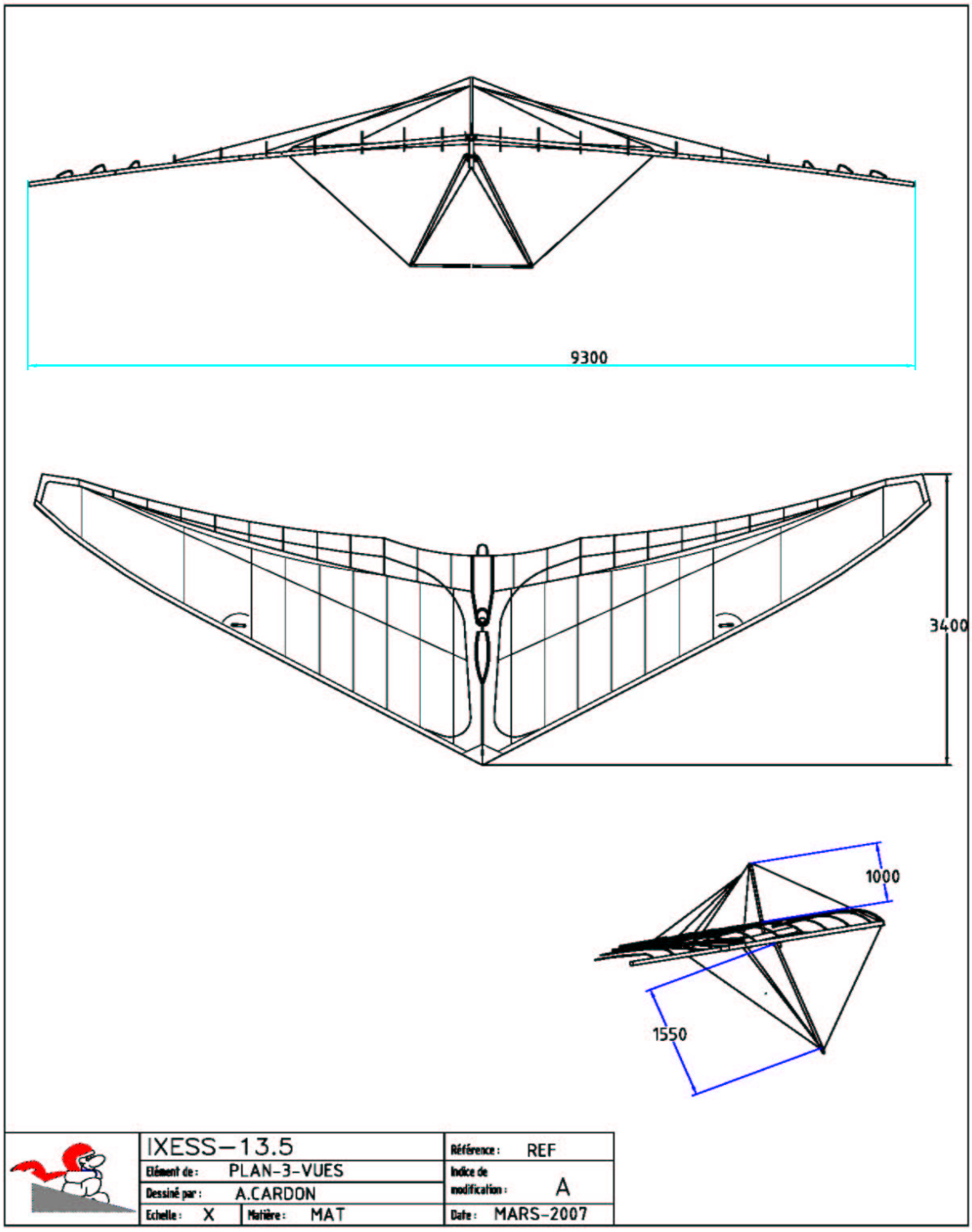
All pilots should read this manual before flying as pilot in command of the aircraft to which it refers.

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 Drawings

Figure 3-1: iXess 13 in 3 Perspectives



4 Technical Specifications – Performance

4.1 Technical Specifications

Area	13,5 sq.m. (145.31 sq.ft.)
Maximum wing loading	33 kg/m² (6,88 lbs/sq.ft.)
Airfoil type	Double surface 90%
Span	9,3 m (30,51 ft)
Nose angle	120°
Aspect ratio	6.41
Empty weight	51 kg (112,44 lbs)
Ultimate load factors	+ 6g - 3g
Maximum take-off weight	450 kg (992 lbs)
Limit load factors	+ 4g - 0g (- 2g under gust)

4.2 Maximum Added Load / Trikes Adjustment

The maximum load that may be added under the wing is **399 kg (880 lbs)**. The following chart defines the useful load of our various trike models with the iXess 15 wing.

Trike	**Lst Skypper 582 / S**	**Lst Skypper 700E**	**Lst Skypper 912 (S)**	**TANARG 582**	**TANARG 912**	**TANARG 912 S**	**TANARG 912 ES**
Empty weight * (w/o options)	198 kg	198 kg	219 kg (221 kg)	218 kg	237 kg	241 kg	234 kg
	437 lbs	437 lbs	483 lbs (487 lbs)	481 lbs	522 lbs	531 lbs	516 lbs
Useful load * (w/o options)	252 kg	202 kg	231 kg (229 kg)	232 kg	213 kg	211 kg	216 kg
	556 lbs	445 lbs	509 lbs (505 lbs)	511 lbs	470 lbs	469 lbs	476 lbs
MTOW	450 kg	400 kg	450 kg	450 kg	450 kg	450 kg	450 kg
	992 lbs	882 lbs	992 lbs	992 lbs	992 lbs	992 lbs	992 lbs

* optional equipment excluded

⚠ *Caution: fitting of any equipment or any other change should never lead to exceeding the maximum empty weight value mentioned above, according to security standards and aircraft conformity.*

It is possible to adapt other trikes than the ones mentioned above. Their maximum weight should be less than 399 kg (880 lbs) fully loaded. *The stability of the trike alone must be absolutely positive in yaw* in order to guarantee the stability at high speed.

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. The necessary engine power for safe two-seater flight should be at least 60 HP. *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 at Maximum Take-Off Weight

Trike	Lst Skypper 582 / S	Lst Skypper 700E	Lst Skypper 912 (S)	TANARG 582	TANARG 912	TANARG 912 S	TANARG 912 ES
MTOW	450 kg	450 kg	400 kg	450 kg	450 kg	450 kg	450 kg
	992 lbs	992 lbs	992 lbs	992 lbs	992 lbs	992 lbs	992 lbs
Stall speed	62 km/h	62 km/h	62 km/h	62 km/h	62 km/h	62 km/h	62 km/h
	39 mph	39 mph	39 mph	39 mph	39 mph	39 mph	39 mph
Minimum speed	65 km/h	65 km/h	65 km/h	65 km/h	65 km/h	65 km/h	65 km/h
	40 mph	40 mph	40 mph	40 mph	40 mph	40 mph	40 mph
Recommended climbing speed	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h
	56 mph	56 mph	56 mph	56 mph	56 mph	56 mph	56 mph
Take-off run	115 m	120 m	110m (100m)	125 m	115 m	105 m	110 m
	377 ft	394 ft	361 ft (328 ft)	410 ft	377 ft	345 ft	361 ft
50 ft clearing distance	245 m	260 m	235 m (205 m)	255 m	240 m	210 m	220 m
	804 ft	853 ft	771 ft (673 ft)	837 ft	787 ft	689 ft	722 ft
Climb rate	3.2 m/s	2.9 m/s	4.2 m/s (5.2 m /s)	3.2 m/s	4.2 m/s	5.2 m/s	5 m/s
	630 ft/mn	571 ft/mn	827 ft/mn (1024 ft/mn)	630 ft/mn	827 ft/mn	1024 ft/mn	984 ft/mn
Recommended approach speed	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h
	56 mph	56 mph	56 mph	56 mph	56 mph	56 mph	56 mph
Landing distance from 50 ft height	220 m	200 m	200 m	200 m	200 m	200 m	200 m
	722 ft	656 ft	656 ft	656 ft	656 ft	656 ft	656 ft
Max L/D ratio	8.5	8.5	8.5	9	9	9	9
Max glide ratio speed	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h	90 km/h
	56 mph	56 mph	56 mph	56 mph	56 mph	56 mph	56 mph
Side wind limits	15 kts	15 kts	15 kts	15 kts	15 kts	15 kts	15 kts
V.N.E. (velocity never to exceed)	165 km/h	165 km/h	165 km/h	165 km/h	165 km/h	165 km/h	165 km/h
	103 mph	103 mph	103 mph	103 mph	103 mph	103 mph	103 mph
V.man (never to be exceeded in very turbulent air)	130 km/h	130 km/h	130 km/h	130 km/h	130 km/h	130 km/h	130 km/h
	81 mph	81 mph	81 mph	81 mph	81 mph	81 mph	81 mph
Roll rate at 120% V min. (45°/45°)	4 s	4 s	4 s	4 s	4 s	4 s	4 s

5 Instructions for Use

5.1 Rigging

1. Open the wing bag, make sure that the A-frame is on top, and remove fastenings and packing.
2. Assemble the A-frame with the push-pin. Cables must not pass through the inside.
3. Turn the wing over, and carefully open the two half wings to their maximum extent.
4. Fit the king post onto its locating lug on the keel, take care that the tensioning cables do not become entangled.
5. Fit the king post nylon head at the top of the king post without entangling pitch lines.
6. Carefully slide the upper sail bent battens in their respective pockets and secure them with the doubled ropes. Do not force the battens during the assembly.
7. Slip the cross tube swan catch tensioner through the opening between the king post and the trailing edge, pull to hook it to the rail screw tensioning at the keel tip. 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.
8. Pull down the swan catch tension lever and fix it in the rail with the pushpin.
9. 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.
10. Fix the front lower longitudinal cables in the rail under the nose plate with the help of the tension lever and the pushpin.
11. Carefully slide the lower sail battens in their pockets and secure them within the triangular openings.
12. Place the two straight battens of the wing on the plastic lug at the extremity of the leading edge, and secure them with the upper and lower surface ropes. Carefully check, with the help of the graded scale set on the leading edge tube at the end of the wing, the correct framing of the pivoting sleeves of the leading edge before tightening the strings. Standard tuning requires the alignment of each sleeve's mark with the 0 of the scale.
13. When connecting the trike, slip the security fastening cable into the security strap at the king post level, make a loop around the king post, slip it again through the security strap, and then fix it on the upper 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.
14. Fix the nose bonnet with the Velcro patches (see 5.3.1).

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

Dismantling is carried out in reverse order of the assembling operations. *Before folding up the two half-wings,* place the leather cap on the tensioning device lever and pass it through the upper sail aperture at the front of the post bottom to avoid tearing any part of the sail or the structure while closing 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. 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.
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 as well as the correct positioning of the two wing tip adjustment sleeves. Normally these should be set to the zero position (alignment of each sleeve's mark with the 0 of the graded scale set on the leading edge tube).
7. Check that all upper surface battens are fully pushed home and that securing strings are in position.
8. Check that all lower surface battens are fully pushed home and make sure that their ends are blocked in the triangular openings in the fabric.
9. Check positioning and condition of the reflex bridles and their attachment to the sail. Check the positioning and condition of the trimmer bridle.
10. Make sure that no upper cable is looped around the king post, and that luff lines are correctly positioned into the groove of the fixing pulley.
11. Check the thimbles and swages of the rear lower cables at the keel end.
12. Check that the crossbar pull back cables at the keel end are attached, bolts, nuts, swan catch correctly positioned, pushpin and wires attached.
13. Check the condition and the stitching of the upper surface central link fabric and of the keel pocket, as well as the condition, the fastening, and the stitching of the sail retainer strap at the end of the keel.
14. Slide your hand along all of the the lower cables to detect signs of wear.
15. Check control frame corners for correct assembly, security, pushpin of the control bar, condition of the cables, swages and thimbles. All wires should be free to move and align with the tension direction. Close the leather protection covers.
16. Open the Velcro of central lower surface access and check cross tube junction, cover webbing, keel retaining straps, pull back wires fixings, condition and positioning of the tensioning cables (make sure they are not crossed). Close the Velcro while pushing the upper surface downward in order to give tension to the lower surface sailcloth.
17. Check the hang bracket for positioning, condition (possible twist, cracks), free movement. The butterfly nut and security ring must be in place.
18. Check that the pylon backup cable is correctly positioned and fastened. It must pass under the pull back cables, through the webbing loop, circle the kingpost and pass through the webbing loop again, before fixing on the securing bolt through the pylon. 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.
19. Check that all zippers are closed, all Velcro fastened, and that the nose bonnet is in the correct position.

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): 103 mph (165 km/h)
- Maximum Take-Off Weight 450 kg (1000 lbs)
- 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.

Over these limits, stability problems, structural failure or irreversible “tumbling” motions may occur.

Ideal handling will only be reached after about 10 flight hours and roll control will be more difficult during the first flights.

Do not fly without the nose bonnet. This streamlining has considerable effect over pitch and roll stability of the wing. Its lack alters the internal pressure of the sail, which may result in great modifications of the airfoil shape.

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.

Trim :

The neutral position of the trim corresponds to the alignment of the mobile Nicopress stop in the control window with the 0 of the scale. This setting is recommended for take-off and landing maneuvers. To increase the hand-off cruising speed, turn the control knob counterclockwise. Maximum speed is attained once the mark appears on top of the control window, facing the hare icon. Do not try to turn above this position or the control cable may turn in the reverse direction. To decrease cruising speed, turn the control knob clockwise. Minimum speed is attained once the mark appears on bottom of the control window, facing the tortoise icon.

To counter the effects of age on the sail, and the increase of billow that decreases trim efficiency, adjustments may be made. For further information consult the maintenance manual.

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 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.

Move the bar fully forwards to rotate. As the aircraft rotates, allow the bar to move back smoothly and allow airspeed to build. Once clear of any obstacles the airspeed can be set for best rate of climb.

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

ranging from 80 km/h to 90 km/h (50 mph to 56 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 100 km/h (62 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 ranging from 80 km/h to 90 km/h (50 mph to 56 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 iXess 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 greatly 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 iXess has neutral spiral stability 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.*

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. Fix the A-frame on the front tube of the trike with 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 iXess 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 VA. 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 increases the stalling speed of the aircraft to some degree, and exaggerates the slow flight and stalling characteristics. Any form of wing surface contamination such as ice or snow will result in increased stalling speeds and reduction in overall aircraft performance, sometimes to a drastic extent. **Never take off with such contamination present.** If these conditions are encountered during flight, attempt to leave these conditions as quickly as possible. If this is not possible the aircraft should make a precautionary landing as soon as it is safe to do so. During this process avoid flight at low speed and expect poor aircraft performance.

6 Appendix

6.1 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)

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