

LUNA Paramotor Wing Manual

BGD is a world leader in the design and production of free flight equipment. For many years BGD have developed products with world beating performance for pilots who want the best. We apply our competitive knowledge to design top quality products that combine the highest performance with the safe handling our customer's value and respect. BGD pilots confide on our quality and reliability.

BGD's world class status is based on the skills and expertise we have developed in combining aerodynamic design, cloth and materials technology. All BGD products are developed and made with the same skill and attention to good design that are synonymous with the ultimate performance and precision required by airports.

As a Pilot of an BGD LUNA paramotor glider you have chosen one of the safest aircraft of its type available but it must be understood that flying can be a dangerous activity . Properly trained people flying in a responsible and disciplined manner should only do it.

Congratulations on your purchase of the BGD LUNA.

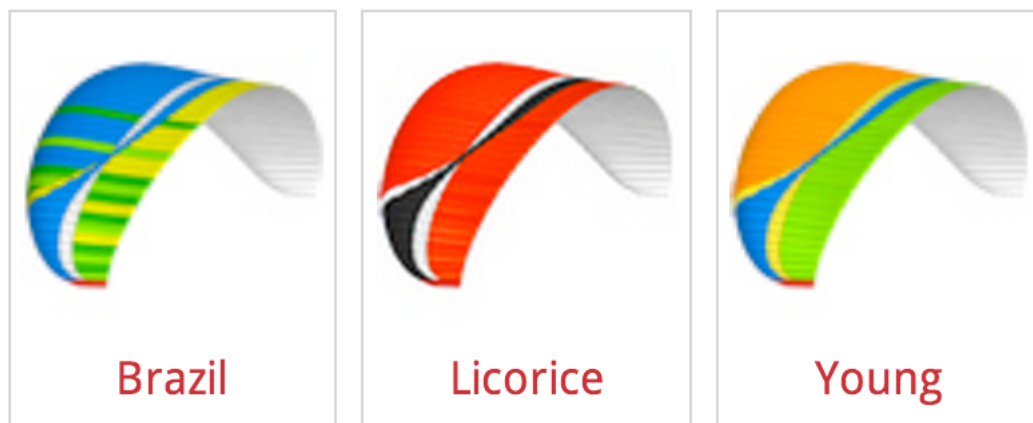
The LUNA is the high quality Paramotor wing, designed to a high standard of safety and stability, but it will only retain these characteristics if it is properly looked after. Please read this manual carefully from the first to the last chapter to ensure you get the best out of your LUNA.

This manual has been prepared to give you information and advice about your paramotor glider. If you ever need any replacement parts or further information, please do not hesitate to contact your nearest BGD dealer or contact BGD directly.

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COLOR OPTION



Quick Summary.

1. When you pull the trim tab the trimmer down it automatically adjusts to the neutral position. This is when all the risers are the same length. The Neutral position is the best position for launch and landing.
2. Launching is best done by pulling just the main A risers (without the big ears risers).

Introduction

The LUNA is an easy to fly paramotor glider suitable for intermediate and expert pilots. Exceptional stability and passive safety combined with speed, excellent handling and good performance make this a wing, which is real pleasure to fly.

This paramotor glider must not:

- be flown with more than maximum certified total load.
- have its trim speed adjusted by changing the length of risers or lines.
- perform aerobatic manoeuvres.
- be flown in rain or snow
- be flown in strong turbulence, unstable air or higher wind conditions

Preparation

- 1) Select a suitable take-off area determined by wind and terrain, clear of any obstacles that may catch in the lines or damage the canopy.
- 2) Unroll the canopy so that the paramotor glider has the bottom surface facing upwards, the openings at the downwind end of the take-off area, the trailing edge and the risers at the upwind side.
- 3) Unroll the canopy to each side so that the leading edge openings form a semi-circular shape, with the trailing edge drawn together as the centre of the arch. The risers should be drawn away from the canopy until the suspension lines are just tight.
- 4) Check your Paramotor and engine and get it ready according to the manufacturers advices
- 5) Very high attention must be paid to the danger of injury to the pilot and bystanders from a rapidly rotating propeller, which can break and inflict injury at some distance and the dangers inherent with flammable fuel and other combustible or fusible materials.

Pre-flight Inspection

The LUNA is designed to be as simple as possible to inspect and maintain but a thorough pre-flight procedure is mandatory on all aircraft. The following pre-flight inspection procedure should therefore be carried out before each flight.

- 1) Whilst opening out the paramotor glider check the outside of the canopy for any tears where your paramotor glider may have been caught on anything like barbed wire or even have been damaged whilst in its bag.
- 2) Check that the lines are not twisted or knotted. Divide the suspension lines into eight groups, each group coming from one riser. By starting from the riser and moving towards the canopy remove any tangles or twists in the lines. Partially inflating the canopy in the wind will help to sort out the lines.
- 3) It is particularly important that the brakes are clear and free to move. Check the knot, which attaches the brake handles to the brake lines. Several knots should be used here or they may get entangled in the brake pulleys. Both brakes should be the same length and an assistant holding the upper end of the brake lines together can check this, whilst the pilot holds the brake handles. The length of the brake lines should be such that they are just slack with the wing inflated when the brakes are not applied; Do the same with the lines of the "tip steering system". After checking the brake lines lay them on the ground. Both risers should have the trimmers in the recommended take-off position.
- 4) Always check the buckles and attachments on the harness and Paramotor. Ensure the two main attachment maillons/karabiners from the harness to the main risers are tightly done up, as well as the eight shackles which attach the risers to the lines.
- 5) Before the pilot attaches himself to the harness and paramotor he should be wearing a good crash helmet, and boots, which provide ankle support. Put on the harness ensuring all the buckles are secure and properly adjusted for comfort. Your paramotor glider is now ready for flight.
- 6) The engine should be warm and able to deliver full power.

Flight Characteristics

This manual is not intended as an instruction book on how to fly the LUNA, you should be a qualified pilot or under suitable supervision, but the following comments describe how to get the best from your LUNA.

Take-off

The LUNA is easy to inflate in light or stronger winds and will quickly rise overhead to the flying position. The best inflation technique is to hold only the central A risers.

Bring the trimmers on the correct position pushing down on the appropriate ring(installed on the belt of the trimmer) until it arrives at the stroke end.

a) Nil Wind – Inflation is best done by taking only the central A risers in each hand. In nil or very light wind, stand with all the A lines taut behind you, then take one or two steps back (do not walk all the way back to the canopy) and then begin your launch run pulling gently and smoothly on the A risers. As soon as the canopy goes beyond the 45° of rotation, increase the throttle up to 30% of that required to take off so allow the engine thrust to assist the canopy to reach the overhead position. Maintaining gentle pressure on the A risers always helps in very calm conditions. Have your hands ready to slow down the canopy with the brakes if it starts to accelerate past you. During the take-off run it is important not to lean forward but stay straight and lean on the engine thrust.

b) Reverse Launch – In winds over 10 km/h it is better to do a reverse launch and inflate the canopy whilst facing it using the central A risers.

Never attempt to take off with a glider that is not fully inflated, directly overhead or if you are not fully in control of the pitch/roll of the wing.

Climb

Once in the air you should continue flying into wind whilst gaining altitude. By setting the trimmers to the take-off position you will achieve a good climb rate. Do not attempt to climb too steeply or too quickly by using the brakes. If you use the brakes plus the engine's full thrust acting on the pilot, this could contribute to make the glider more prone to stall. Furthermore, in the event of an engine failure the resulting backward pendulum motion of the pilot and the forward dive of the wing may bring you back to the ground very hard.

Do not initiate turns until you have sufficient height and airspeed.

Under certain circumstances it is possible for the pilot to induce oscillations. This is caused by a combination of the engine/propeller torque and pilot weight-shift and/or brake inputs. To stop oscillations it is best to reduce the power slightly and ensure that you remain static with weight-shift and brake inputs. Once settled, you can once again apply full power.

Straight Flight

Once you have gained safe height after take-off and wish to fly a distance, you can turn onto the right direction, fully open the trimmers and let off the brakes.

The reflex wing aerofoil enables to use a wide range of trimmers and speed-system action. Fully opened trimmers and maximum speed-bar increase the speed and stability of the wing. In this configuration it is better to use the "tip steering system" than the brakes so as to achieve a more efficient turn and not to lose stability characteristics of the reflex profile.

It is advised to use the speed-system with fully or half opened trimmers.

For an efficient use of the thermals, the trimmers should be setting in slow position (certified) to decrease sink and steering forces.

Active Piloting

Active piloting is a flying technique that will help you fly with higher safety and enjoyment. Active piloting is flying in empathy with your paramotor glider. This means not only guiding the glider through the air but also being aware of feedback from the wing, especially in turbulence. If the air is quite smooth, the pilot should fly without acting on the brakes, the reflex profile ensure the stability of the wing but when accounting some stronger turbulence feedback should be continuous and needs to be assessed by the pilot through the brakes and the harness. The LUNA is highly resistant to collapse without any pilot action at all, but learning how to fly actively will increase this safety margin even further. It is not allowed to fly the paramotor glider in strong turbulence or high winds. This may spin, cravatte or collapse the paramotor glider and may make it uncontrollable resulting in a crash which may hurt or kill the pilot.

Maximum symmetric control travel at maximum weight in flight is 70 cm.

Turning

The first turns should be gradual and progressive, the first input for directional change should be weight-shift, followed by the release of the outer brake and a smooth pull on the inner brake until the desired bank angle is achieved. To regulate the speed and radius of the turn, coordinate your weight shift and use the outer brake.

Never initiate a turn at minimum speed or under full power in a steep climb as you may risk entering a dangerous spin .

Tip Steering System

To use the "tip steering system" first locate the main brake handles onto their keepers (to avoid tangles) then use the small handles for directional control. Turns executed in this way will be slightly wider, but strength needed to initiate the turn will be smaller and there will be no decrease in speed.

You can also use both commands together, holding the main break in each hand move a finger inside the ring of the small handles of the tip steering control, in this way the turns are tighter. The latter technique is recommended by BGD in case of turbulence and flying near the ground because, with the main brakes in the hands, the pilot can react readily should an incident occur.

For take-off or landing and In stronger turbulent air only the main brakes should be used.

Landing

Bring the trimmers on the correct position pushing down on the appropriate ring (installed on the belt of the trimmer) until it arrives at the stroke end.

Flying downwind of the landing field at an appropriate distance (longer if the wind is weak and less if the wind is strong) from the preferred touch down point (aiming point) with an altitude of about 40 meters, turn into the wind bring the engine to idle and glide heading towards the predetermined place for landing. At this point, if you are sure of being able to land safely in the predetermined place, you should switch off the engine, otherwise you should increase the throttle and make a go around and repeat the approach.

When sure for landing switch off the engine, fly your final descent with speed until you are a little more than a meter above the ground. Apply the brakes slowly and progressively to slow the glider down until the glider stalls and you are able to step onto the ground.

If you land with the engine running there is a considerable risk of damage propeller, catch lines in it or even suffer injuries.

Rapid descent maneuvers

BGD must point out that these manoeuvres should only be learnt under the supervision of a qualified instructor and always used with caution. Please keep in mind that properly analysing the conditions before launch will help avoid the need to use these techniques.

Wing Tip Area Reduction (Big Ears)

The 'baby A riser' allows the LUNA to be 'big eared'. The big ear device does not allow you to fly in stronger winds, but is a device which allows the pilot to descend quickly without substantially reducing the forward speed of the canopy (as is the case with B lining). To engage big ears the pilot will grasp the 'baby A riser' (one in each hand) at the karabiner and then pull the riser out and down until to collapse the tips of the glider. It is very important that the other A lines are not effected when you do this as it could cause the leading edge to collapse. Steering is possible by weight shifting with big ears in. If the big ears do not come out quickly on their own then brake gently one side at a time until tips regain pressure.

Never try to pull big ears during powered climb, as can lead to increase of the angle of attack and a dangerous parachutal stall.

Never try to pull the Big Ears in with the speed bar on already. This can lead to a major asymmetric deflation.

Do not combine Big ears and spiral dive as the high forces applied to the lower lines could exceed the breaking strength of the lines leading to equipment failure!

B-Line Stall

For emergency situations only is B-Line stall a fast descent method. With both hands through the brake handles, the pilot takes hold of the top of the B risers, one in each hand, and pulls them down. Executing a B-stall on LUNA is hard due to specific suspension lines location in stabilizers area.

This will stall the canopy and forward speed will drop to zero and the descent rate should be around 6 m/sec. When pulling the B-Lines too far the glider may horse shoe and start to oscillate a lot. Make sure you have plenty of height. For exiting the B-Line stall you should release the B riser fairly quickly as the pitching movement of the canopy is necessary to get it flying properly again - releasing too slowly may result the glider entering a deep stall. Always release the riser symmetrically as an asymmetric release from a B line stall may result in the glider entering a spin.

The pitching movement on exiting the B stall is small but necessary. We recommend you do not apply brake to the glider until you are sure that the wing is flying fully again; let the reflex profile to dampen the movement of pitch.

This manoeuvre is useful when losing a lot of height quickly is necessary, perhaps when escaping from a thunderstorm. It should not be performed with less than 100 m of ground clearance.

Spiral Dive

A normal turn can be converted into a strong spiral dive by continuing to apply one brake. The bank angle and speed of the turn will increase as the downward spiral is continued. Once in the spiral you must apply a little of outside brake to keep the outer wing inflated and pressurized. No spirals with descent rates of more than 8 m/sec should be executed – even then but you will enter high G-Forces which may be disorientating and stress your body – also pay high attention on the altitude. LUNA is a very agile paramotor glider, so entering spiral dive happens very quickly and can be surprising for the less experienced pilot. Be careful to enter the spiral gradually as too quick a brake application can cause a spin or enter an 'over the nose' spiral. Because of centrifugal force due to the strong rotation generates an important there is a G-forces that make it difficult to sustain a spiral dive for long, as will place high loads on both pilot and glider to degree of losing consciousness by the pilot.

Care should be taken when exiting from any spiral dive. To pull out of a steep spiral dive release the applied brake gradually, or apply opposite brake gradually. A sharp release of the brake can cause the glider to surge and dive as the wing converts speed to lift. Always be ready to damp out any potential dive with the brakes. Also be ready to encounter turbulence when you exit from a spiral because you may fly through your own wake turbulence, which can cause a collapse.

If the dive is not stopping after releasing the brake, assist the glider with the outer one.

Incidents / Recovery Techniques

The LUNA is designed to the highest safety but it still may enter unusual flying attitudes under certain circumstances. These may be caused by pilot input, turbulence, unusual loads, Stalls etc.

Deep Stall / Parachutal Stall

It may happen that a glider keeps its normal shape on a very slow release of the B- lines, but stays descending vertically and without moving forward. This is called 'deep stall' or 'Parachutal stall'.

The chance that this will happen to any BGD glider is very small, but if it happens, you should immediately raise both brakes fully and the glider should return to normal flight. If after some seconds still nothing happens, push the A-risers forwards or apply the speed bar to get back normal flight.

Be sure that the glider flies normally again (check your airspeed) before using any brakes again.

Please keep in mind that just a few centimetres of pulled down brakes can keep your wing in the stall. If you use wraps – release them immediately in these cases

Deflations

As a paraglider is a flexible wing, hitting turbulence may cause a portion of the wing to collapse suddenly. If you get a collapse, at first you should take care to keep control of your direction. Try to stay away from the ground or obstacles and other pilots, or at least not to fly into them...

Asymmetric collapses can be controlled by weight shifting away from the collapse and applying a small amount of brake to control your direction. This at most of the time should be enough for the wing to recover fully.

A glider which is already deflated is in fact a much smaller wing, which means that wing loading and stall speed get higher. This causes the glider to spin or stall with less brake input than it would when full open. Be careful in your attempts using brakes to stop the glider turning towards the collapsed side as you might stall the side of the wing that is still flying. If you cannot stop the glider turning without getting close to the stall point then let the glider keep on turning while you re-inflate the wing after the collapse.

A deflation, which does not immediately reinflate, then pump long smooth but progressive on the deflated side. About 2 seconds per pump seems to work fine. Pumping too short and fast will not re inflate the wing and pumping too slow might take the glider close to, or beyond, the stall point.

Symmetrical collapses should re inflate without pilot input, but 15 to 20cm of brake applied symmetrically will speedup re inflation.

If your LUNA collapses in accelerated flight, immediately release the accelerator to slow down to trim speed and control the direction using a bit of command - the glider will re inflate and return to normal flight.

Cravats

When a part (normally the tip) of your wing gets stuck in the lines, this is called a 'cravat'. This can make your glider go into a spiral, which may be difficult to control. The first action to get out of this situation is to stabilize the glider into normal flight by maintaining control of your direction and then pull down the stabilo line (B-riser) until you feel tension to help release the tip. You must be careful with any brake inputs or you may stall the opposite wing.

If this does not work, a full stall (symmetrical or asymmetrical) is the only other option. This should not be done unless you have been taught how to do so and it can only be done with a safe amount of altitude. Remember if the rotation is accelerating and you are unable to control it, you should use your reserve parachute whilst you still have enough time and altitude.

IMPORTANT: A bad preparation on launch, aerobatic flying, flying a wing of too high a level or in conditions too strong for your ability, are the main causes of cravats.

Aerobatics

The LUNA is not designed for Aerobatic and therefore these manoeuvres should not be executed. The LUNA has been designed as paramotor wing and is not suitable for aerobatic manoeuvres. The LUNA is not certified for aerobatic flying.

Aerobatic flying may put abnormal stresses on the glider and lead to loss of pilot control more so when these difficult manoeuvres are executed wrong,
Also official certification standards for aerobatic flying have not been set up yet.
BGD strongly recommends you do not undertake this style of flying.

Storage & Servicing

Storage & Care

- a) If you have to pack away your canopy wet, do not leave it for more than a few hours in that condition. As soon as possible dry out the canopy. Do not use direct heat sources to dry canopy as it is inflammable.
- b) Always store the canopy in a dry, airy place, which is not exposed to sunlight (UV).
- c) Never let your canopy freeze, particularly if is damp.
- d) The LUNA is made from high quality materials, which are treated against fast weakening from Ultra Violet radiation. However it is always wise to minimise the exposure to U.V. radiation as this weakens the fabric of the canopy, and long exposure to harsh sunlight can severely compromise the safety of your canopy. Therefore once you have finished flying put away your canopy from UV exposure. Do not leave it laying in sunshine unnecessarily. If you are concerned about any aspect of the integrity of your paramotor glider please contact your nearest BGD dealer or talk to BGD direct.
- e) Do not treat your canopy with chemical cleaners or solvents. If you must wash your canopy use a soft cloth dampened only with warm water. If your canopy gets wet in sea water, wash it with warm water and carefully dry it.
- f) Small tears in the top or bottom surface (not normally the ribs) of a canopy can be repaired with a patch of self-adhesive spinnaker nylon.
Tears no longer than 100 mm can be repaired in this way providing they are not in a high stress area. If you have any doubt about the airworthiness of your canopy please contact your dealer or BGD directly.

Servicing

It is important to have your glider regularly serviced.

Your LUNA should have a thorough check every year or every 200 flights, whichever is the earliest. BGD offers an inspection service every winter. This is a comprehensive service which checks line lengths and strength, fabric porosity and tear strength and a variety of other tests and we strongly advise all pilots to take advantage of this.

Please ensure you return this manual with your glider with the number of flights and hours flown written in the Certificate of Service.

NB. The manufacturer will only accept responsibility for paramotor glider lines and repairs where the manufacturer has produced and fitted such lines or carried out repairs.

See you in the sky!

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Technical data

Luna

Linear Scaling factor
Projected Area
Flat Area
Weight excluding bag
Height
Number of main lines
Cells
Flat Aspect Ratio
Root Cord
Flat span
Projected span
Free Weight Range
Motor Weight Range
Min speed
Trim Speed
Top Speed
Min sink
Best glide
Certification

22	27	
0.91	1.00	
19.08	22.75	Sq m
22.0	26.7	Sq m
6	7	Kg
6.4	7.005	m
3/4/3/2	3/4/3/2	A/B/C/D
52	52	
5.35	5.35	
2.478097313	2.73	m
10.85	11.95	m
8.64	9.52	m
60 - 85	80 - 105	Kg (PTV)
80 - 115	105 - 150	Kg (PTV)
23	23	Km/h
39-55	39-55	Km/h
65.0	65.0	Km/h
1.1	1.1	m/sec
9	9	
DGAC	EN + DGAC	

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	A	B	C	D	E	K	KK
1	7035	7005	7120	7285	7335	8400	6633
2	7015	6975	7100	7255	7315	8120	6588
3	6965	6930	7065	7220	7280	7965	
4	6965	6930	7075	7230	7280	7845	
5	6980	6940	7075	7210		7750	
6	6960	6910	7055	7190		7605	
7	6940	6910	7050	7160		7518	
8	6950	6920	7070	7170		7498	
9	6865	6850	6970	7060		7400	
10	6805	6810	6920	7000		7300	
11	6785	6790	6900	6970		7255	
12	6670	6690	6770			7190	
13	6640	6660	6720			7175	
14	6650	6650	6680			7220	
Stab	6396	6406	6456				

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	A	B	C	D	E	Brake	KK
1	6561	6487	6592	6728	6778	7339	6067
2	6531	6456	6567	6704	6756	7179	6022
3	6496	6419	6535	6666	6716	7066	
4	6494	6417	6532	6662	6710	7015	
5	6452	6386	6507	6625		6917	
6	6425	6361	6478	6593		6839	
7	6395	6340	6455	6559		6809	
8	6407	6355	6468	6566		6832	
9	6326	6289	6392	6462		6778	
10	6271	6240	6339	6402		6727	
11	6248	6222	6316	6371		6673	
12	6124	6114	6194			6595	
13	6081	6063	6131			6537	
14	6082	6044	6082			6530	
Stabi	5846	5850	5890				

TOTAL TRIM LENGTH: 155 mm
 - POSITIVE TRIM LENGTH: 140 mm
 - NEGATIVE TRIM LENGTH: 15 mm

SPEED-SYSTEM LENGTH: 170 mm

<i>RISERS CONFIGURATIONS</i>	<i>A</i> _(mm)	<i>A'</i> _(mm)	<i>B</i> _(mm)	<i>C</i> _(mm)	<i>D</i> _(mm)
Speed-System Not Activated / Trimmers "0"	500	500	500	500	500
Speed-System Not Activated / Trimmers Down	500	498,7	497,5	491,2	485
Speed-System Not Activated / Trimmers Up	500	511,7	523,3	581,7	640
Speed-System Activated / Trimmers "0"	330	358,3	386,7	443,3	500
Speed-System Activated / Trimmers Down	330	357,1	384,2	434,6	485
Speed-System Activated / Trimmers Up	330	370	410	525	640

Materials

Lines

Upper cascade:

A, B, C, D, E lines – *Liros DSL70 green*

K lines - *Liros DSL70 yellow*

KK lines - *Liros DSL70 green*

Middle cascade: *Liros TSL140*

Lower cascade:

A lines – *Liros TSL 280, 220*

B lines - *Liros TSL 280, 220*

C lines - *Liros TSL 280, 220*

D lines - *Liros TSL 280, 220*

KR1 lines – *DSL350*

KR2 lines – *DSL70*

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Maintenance Book

Initial inspection

Model:

Size / Größe / Taille: S , M , ML , L

Serialnumber / Seriennummer / Numéro de série

Colour / Farbe / Couleur:

Date of test flight / Datum des Überprüfungsfluges / Date du test en vol:

Company signature and stamp / Händlerunterschrift und Stempel / Cachet et signature de la compagnie:

Glider Checks (every 2 years or 150 flying hours)

Check No 1:

Date / Datum: _____

Type of service / Art der Serviceleistung / Type d'intervention:

Stamp - Signature / Stempel - Unterschrift / Cachet et signature:

Check No 2:

Date / Datum: _____

Type of service / Art der Serviceleistung / Type d'intervention:

Stamp - Signature / Stempel - Unterschrift / Cachet et signature:

Check No 3

Date / Datum: _____

Type of service / Art der Serviceleistung / Type d'intervention:

Stamp - Signature / Stempel - Unterschrift / Cachet et signature:

OWNER RECORD / HALTER LISTE / LISTE DES PROPRIETAIRES

Pilot No 1 Owner / Halter / Propriétaire

First name / Vorname / Prénom:

Family name / Nachname / Nom de famille:

Street / Straße / Rue:

City / Wohnort / Ville:

Post code / PLZ / Code postal:

Country / Land / Pays:

Telephone / Telefon:

email:-----

Pilot No 2 Owner / Halter / Propriétaire

First name / Vorname / Prénom:

Family name / Nachname / Nom de famille:

Street / Straße / Rue:

City / Wohnort / Ville:

Post code / PLZ / Code postal:

Country / Land / Pays:

Telephone / Telefon:

email:

