ATOS-VRS LIGHT Operations Manual

Version 1.0, 10.6.2015

Operations Manual



Read First - Then Fly!

Congratulations and welcome to the ATOS family! With the ATOS-VRS LIGHT you have acquired a high-quality aircraft. In order for your ATOS-VRS LIGHT to give you the expected fun and, above all, for you to be safe in the sky, it is essential that you study the following operating instructions carefully. If you have any difficulties or questions, your A.I.R. team or the nearest ATOS dealer will be happy to help and advise you at any time.

The AIR-Team.

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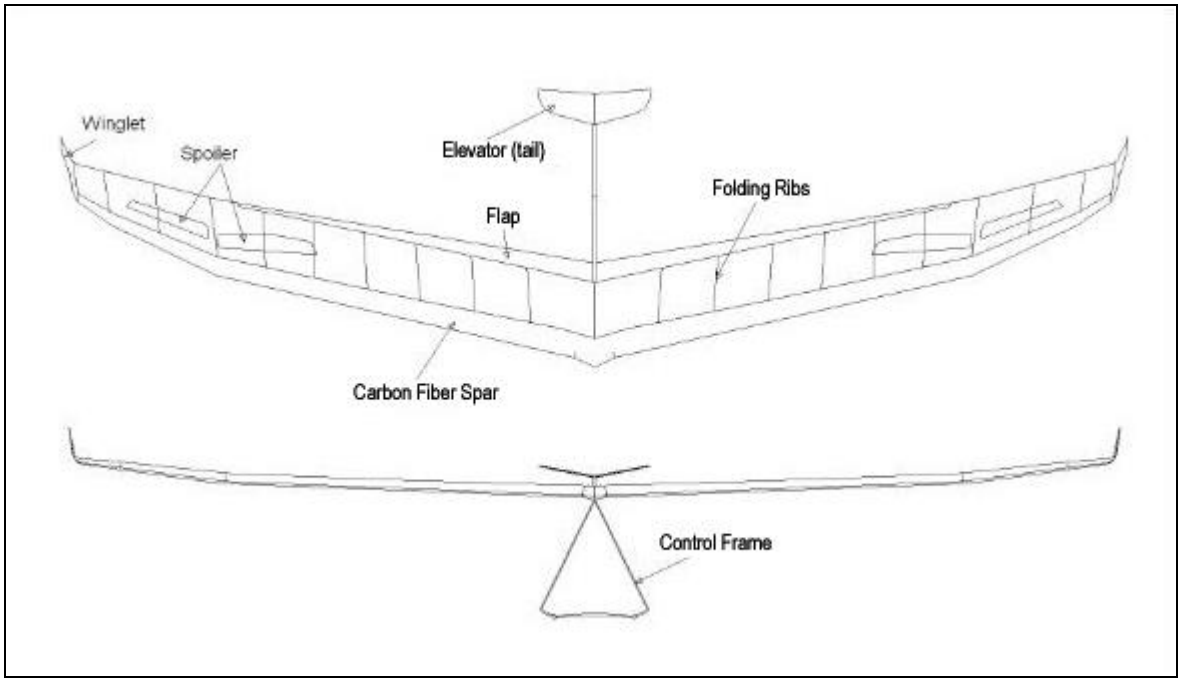
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1 General

The ATOS-VRS LIGHT is a class 5 rigid wing. It is a real all-rounder and is suitable for use in competitions as well as for beginners. It is especially appropriate for lighter pilots up to a body weight of around 165lbs. The ATOS-VRS LIGHT uses self-supporting CFRP spars to which folding ribs are attached that hold the sail and ensure the profile of the wing. The ATOS-VRS LIGHT turns by spoilers that are attached to the upper side of the sail. They are controlled by moving the control bar side to side. Pitch is controlled with weight shift. To increase pitch stability, the ATOS-VRS LIGHT is equipped with an elevator.



2 Transport

2.1 By Car

The carbon fiber spar is sensitive to point loads. It is important the contact surface with any rack is as large as possible during transport. A ladder and several padded rungs is a good choice. If there are only two contact surfaces, the rack pad should support at least 8 inches of the spar. AIR has spar supports especially designed for roof racks. Straps to secure the glider should not be overly tight. Just enough to keep the glider from moving. It is better to place two straps next to each other instead of one on top of the other in order to achieve a larger contact surface here as well. Wide straps are also better. A waterproof cover bag is recommended when the roads are wet and especially in salty areas. If wet, the ATOS-VRS LIGHT should be dried as quickly as possible to avoid mold stains on the sail and corrosion of the metal parts. The spars and ribs can also absorb small amounts of moisture if they are wet for long periods of time.

2.2 By Rail

In principle, the same principles of transport by car apply to transport by railway. Point loads on the spar must be avoided. Strips of foam mat can be placed inside the bag to cushion the spar from hard metal beams. The transport shells designed for car racks can also be used as cushions for railway transport. Before flying, these shells can be hooked together and placed as far back as possible on the keel inside the sail and secured there.

3 Set Up

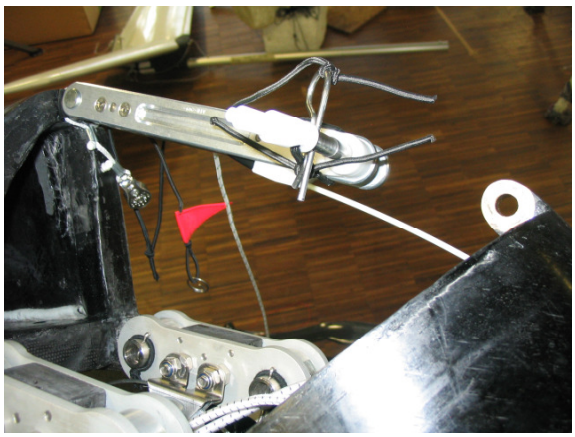
3.1 Procedure

1.) The ATOS-VRS LIGHT should not be laid directly on rocky surfaces, as this can lead to pressure points and damage the carbon fiber structure. If setting up on rocky terrain, try to place the ATOS-VRS LIGHT so that it does not rest in one spot in the middle, but rather rests on supports at each end. The load is then distributed over 2 points. In very rough terrain, the nose end should be placed on top of your harness.
2.) Unzip the glider bag, remove the tail wings and winglets.
3.) Connect the base tube to the downtubes.
Take care not to drop the control frame as it could damage the sail, spar or rib 1. Stand behind the control frame and first thread the flap cord into the guide on the basetube. Connect the downtubes to the basetube using quick pins.
4.) Put the ATOS-VRS LIGHT on the basetube by reaching into the hole at the nose of the spar with one hand and guiding the control frame with the other. Make sure that the control frame does not tilt to the side. This can damage the first rib on the spar. Be sure the wing is stable resting on the control frame. If the glider falls over, the upper control frame bracket connection or the basetube can be damaged.



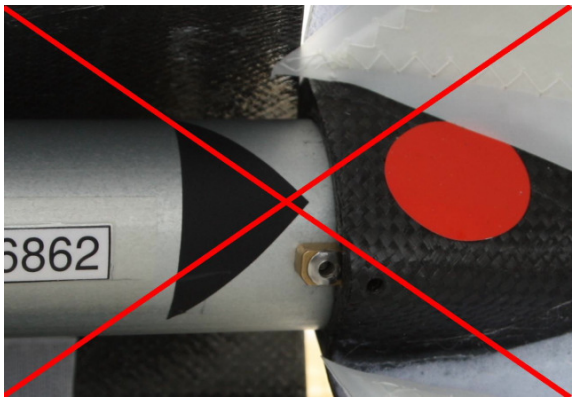


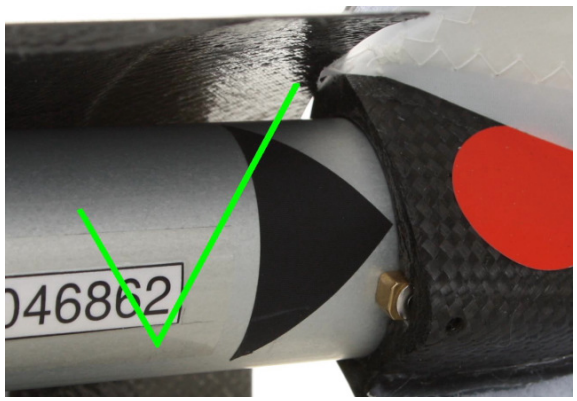
5.) **If using two transport bags:** attach the right spar, insert and secure the main bolt. **Attention**: Close the linch pins and place the safety bungees under the lynch pins.
6.) **If using two transport bags:** connect the safety string from the right spar to the keel.
7.) **If using two transport bags:** connect the control cables, close the snap shackle and secure the threaded quick link.
8.) Take the outer aluminum wing tubes out of the D-spar.
9.) From a wing tip, spread the wings until the keel touches the ground.
10.) Insert the GRP rod on the nose fitting into the guide on the right D-spar.
11.) Insert the connector into the metal stud, then the stud into the plastic guide
Insert and push the plastic pin with the broad end down onto the bolt.

12.) Lift the right wing wing tip until the nose fitting engages. When lifting the wing, make sure that the other wing does not slip backwards.
13.) Secure the bolt with a safety ring.
14.) Remove the Velcro straps and wingtip bags and stretch the sail outwards
Take care not to bend the spoilers - they can break!
15.) Insert the aluminum outer wing tubes (green - right, red - left). Open the sail on the wingtip and insert the wing tube. Reach through the hole under the spoiler with the other hand and insert the tube into the D-spar. **Important:** Insert the tube as far as it will go, so the triangle mark is flush with the spar.





16.) Insert the winglet into the outer tube, making sure that the spring catches engage.
17.) Pull out the carbon shells and press onto the Velcro so the shell is connected to at the wing tip and D-spar
18.) Reach inside the sail from the wingtip and connect the outermost three ribs.
19.) Unfold and attach the outermost rib on the carbon fiber spar by reaching into the access holes in the sail. Secure the outermost 4 ribs with bungees.



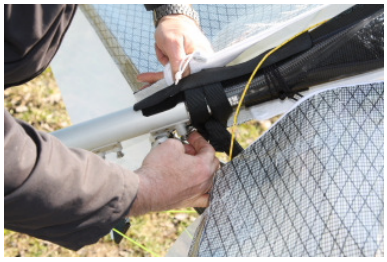


20.) Insert the wing tip rod.
21.) Velcro the sail to the winglet.



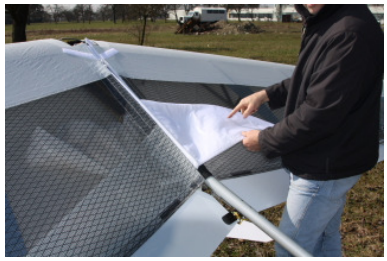
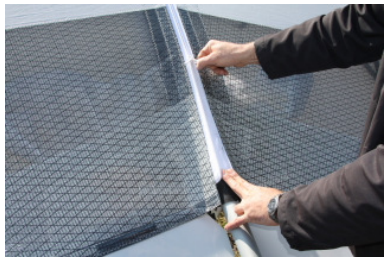


22.) Repeat steps 15 to 21 on the other wing.
23.) If using split bags: hook up the pulley block of the tensioning rope to the sail. 24.) Begin to tension the sail, but only partially.
25.) Before fully tensioning the sail, check that the outer 3 ribs are still securely inserted and secured. Check that the aluminum wing outer tubes are correctly inserted up to the triangle mark, the carbon shells are correctly positioned and the wind tip rods are still seated.
26.) Tension the sail carefully up to the mark on the rope. Check that the rope is correctly routed through the block and tackle. Make sure the rope is secured in the cleat.
27.) Connect the sail ring to the keel and use the lever to attach the other side. Make sure the push button behind the control frame attachment is out, keeping the lever engaged.





28.) Mount the tail unit. Tighten the bolt hand-tight using the assembly wrench.
29.) Wind up the tension rope and stow it in the tail bag. Then place the bag as far as possible under sail trailing edge near the keel.
30.) Close the upper sail zipper.

31.) Insert the flap pivot pins into the flaps, set the flaps to the take-off position.
32.) Connect the spoiler to the spoiler lever with the bungee.
33.) Visually inspect the wing and all the control surfaces.



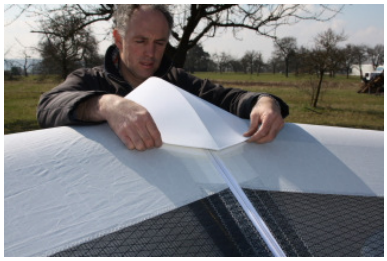


34.) Close the bottom surface zipper of the sail.
35.) Pull on each side control cable to ensure each spoiler activates smoothly and fully. Check control cable routing and that the spoilers are functioning properly.
36.) Attach the side control cables to the downtubes using quick pins and cover with the rubber tube as a back up.





37.) Attach the nose cone. **Important:** The Velcro must match up to the Velcro on the sail. Check for a tight fit.




3.2 Pre-Flight

A pre-flight check must be carfully completed after each assembly! It is best to circle the aircraft completely from the nose so nothing will be missed.

1.) Visual check: Excessive wrinkling of the sail or a wavy trailing edge indicates an assembly error.
2.) Check the spoiler lever for ease of movement. Check the bungee holding the lever to the spoiler.
3.) Check that the control cable runs freely. (**Important:** The control cable must go straight through all the retaining rings on the backside of the D-spar.)
4.) Visually inspect the control cable for wear, especially around the cable pulleys.
5.) Check that the outer wing tubes are correctly inserted up to the marking triangle, remember red - left side and green - right.
6.) Check the tail assembly, is it secure and does it move when activated?
7.) Open the zipper on the underside of the sail and check the pilot hang strap.
The end to which the carabiner attaches must be inserted through both loops.
8.) Remove the nose cone. Check all control cables. It is important to ensure that a control cable is not twisted with the connecting cable and that no signs of wear are visible on the cables or pulleys. The circulating cable in particular should be carefully checked for broken strands in the area of the central pulley on the keel.

Important: If damage to any cable is found, do not fly! A damaged cable must be replaced before flying! Close the lower sail zipper.

9.) Check that the nose fittings are secured with lynch pins and bungees.
10.) Check the main pin lock: Check all the safety rings. All lynch pins must be closed and the safety bungees must be placed around the main bolt and pushed under the lynch pin.
11.) Attach nose fairing.
12.) All push pins on the control frame must be secured with a rubber tube cover.
13.) Test the spoilers by lifting a wing or moving the control frame. The spoilers should move easily and deflect 80-90°. The outer spoiler should deflect at least 70°.
14.) Place the flaps in the take-off position (see 6.1) and check whether the linkage rope shows signs of wear. The rope must run freely in the rope pulley. Also check the return rope and the bungee coming out of the keel for wear. The right and left flaps should have the same deflection slightly pulled and should not touch each other in the 0° position (flaps not deflected) and should be in contact with the keel.

The glider bags, wingtip bags, etc can be stowed in the D-spar. Doing so will give the ATOS only a slightly rear-heavy static balance. However, it should be noted that this will change the trimming speed (see also chapters 5 and 6.4).

4 Disassembly

In principle, dismantling is carried out in the reverse order of assembly.

Important! It is essential to unhook the control cables from the downtubes before de-tensioning the sail. Since the sail slides outward when you de-tension, the cables will tear the sail!

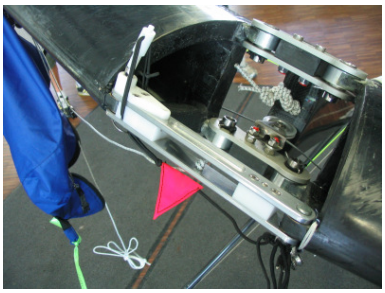
1.) Remove the nose cone.
2.) **Unhook the control cables from the downtubes.**
3.) Unzip the bottom surface of the sail.
4.) Unzip the upper surface of the sail and remove the tail bag.
5.) Remove the two pieces of the tail wing and place them in the tail bag along with the nose cone.
6.) Disconnect the flap pivot pins from the flaps nect to the keel.
7.) Loosen the sail tension lever on the keel, then unhook the sail ring.
8.) Disconnect the sail tension rope from the cleat and slowly release the sail tension.
9.) Separate the sail velcro from the winglet,
10.) Unhook the 3 outermost ribs, fold in the last rib on the carbon fiber spar. Open the Velcro on the rear edge only as far as necessary and fold rib 8 (outermost rib on the spar) through the next inner one on the spar. Lay the ribs against the spar. Do not lay the glider on the ribs when it is folded up.
11.) Loosen the wingtip tension rod and place it in the sail parallel to the trailing edge.
12.) Slide the carbon shells onto the D-spar.
13.) Detach the winglet from the outer aluminum wing insert.
14.) Remove the wing outer tube. Check again whether the carbon shell is completely on the spar or it may be damaged during packing.
15.) Fold the sail with ribs against the D-spar so that the flap is on the underside of the D-spar. Attach Velcro straps.
16.) Be careful not to bend the spoiler!

Best practice is to first fold over the outer segment of the inner spoiler so that the white sides of the spoiler come together. Then place the outer spoiler on top of the inner one.





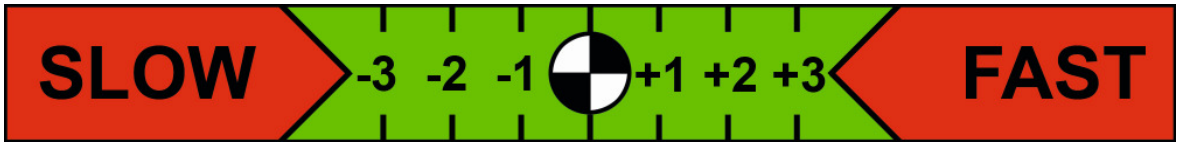
17.) Check whether the tip rod is still parallel to the trailing edge in the sail, otherwise the shell may be damaged during further packing.
18.) When transporting in one cover bag, open and cover the wing. For split transport: Pull the bag over the wingtip of the glider.
19.) Repeat steps 10.) to 19.) on the other side.
20.) **For split bag transport:** Loosen the rope pulleys of the tensioning mechanism on the sail and Pull tension cord taut to prevent rollers from tangling.
21.) Remove the beta plug on the nose fitting and the plastic pin with the narrow end down put on the metal stud.



22.) Lay the left wingtip on the ground, grab the right wingtip and move it forward and upward until the metal bolt on the nose fitting falls out of the guide.
23.) Bring the D-spars together.
24.) Put on the keel protector pad.
25.) Stow the outer wing aluminum tubes in the D-spar.
26.) **For two bag transport:** Unhook the control wire on the right-hand D-spar.
27.) **For two bag transport:** Unhook the keel connection on the right and secure.
28.) **For two bag transport:** Remove the right spar, then replace the main bolt.
29.) Place the glider bags over the D-spars.
30.) Turn the bar and lay it on the ground. (Caution: Pay attention to the ground. On rocky terrain, the nose of the glider should be placed on your harness.)
31.) Detach the basetube and stow it inside the D-spar.
32.) Stow the downtubes in the padding attached to the keel protector.
33.) Put tail wings, mount and winglets in their bags.
34.) Zip closed the glider bags..

5 Positioning the Hang Point

The pilot hang point scale is located on the right side of the keel in front of the downtube connection to the keel.



Before your first flight, the hang point should be set using the table below. To do this, loosen the Velcro on the hang strap, move it and then reattach the Velcro at the new location. Make sure that the end to which the carabiner is attached is inserted through both loops. Place the desired value in the middle of the hang strap.

The values given are guides and should be adjusted to the pilot's individual preference after the first few flights (see chapter 6.4).

Attention: The values in the table are set WITHOUT the glider bags inn the D-spar. With bags in the D-spar, the hang point must be set about 0.2 inches further back. Since the ATOS-VRS LIGHT reacts sensitively to changes in the center of gravity, AIR recommends stowing the glider bags in the harness for the first flight.

Pilot weight including harness [lbs]	121	132	149	165	182	198	209
Position	+3	+2	+1	0	-1	-2	-3

6 Flight Characteristics

6.1 Launching

6.1.1 Foot Launch

The ATOS-VRS LIGHT is statically slightly rear-heavy on the shoulders. However, after the first few steps and with sufficient airspeed, it stabilizes at an angle of attack favorable for take-off. **When taking the first steps the nose must be actively held down. Choose an angle of attack too flat rather than too steep, and slightly pull in on the control bar. With a low angle of attack, the Atos is less susceptible to crosswinds. In addition, the wingtips are further away from the ground, the spoilers are more effective during the first steps and the risk of a stall is minimized.**

Before the first flight or as training, it is recommended that you practice your take-off run on level ground. Since the spoilers are so effective, the wing can be controlled even in gusty conditions. This should be practiced on a level or slightly sloping practice area in appropriate wind conditions .

A flap setting of approx. 10-15° is a good setting for take-off. In this position, the flap bungee sticks straight out of the keel.

Tips for strong wind:

1. Keep the angle of attack low enough that the wing rests lightly on your shoulders. If the angle of attack is too low, the wing is difficult to stabilize.
2. Have a helper hold the wing on the D-spar inside the spoiler wires or at the nose. If the helper holds the wing further out and pulls down, the pilot has no way of reducing the angle of attack and can take off uncontrollably. Basically, if a helper is needed, the conditions are borderline. If in doubt, do not fly!

6.1.2 Winch Towing

The ATOS-VRS LIGHT tows best with flaps set at 10-15°. With this flap setting you can fly slower. This flap setting lets you climb better in headwinds and makes take-off easier. During the tow, be sure to maintain sufficient airspeed (basetube approx. at the forehead). Flying too slowly means loss of performance and less of a safety margin!

Caution: Stalling (falling below the minimum airspeed) can lead to a "lockout" or spin even while on the rope.

Caution: Always begin with the tow rope over the basetube. Do not engage the rope under the basetube until at an altitude where a complete landing circuit can be flown.

6.1.3 Aerotowing

When aerotowing with no wind, start with a 10-15°. With wind, a flap position of 5° is better, as it allows you to more eaily match the speed of the tug. The directional stability of the ATOS-VRS LIGHT is also better at this flap setting.

Important: Do not get caught on tow lower than the tug! The ATOS pitches very strongly when flying into the downwash and the propeller gusts of the tug. If the tow plane climbs steeply after take-off, you must climb immediately to avoid being caught in the downwash of the tow plane.

Caution: If the tow rope is too short, the aerotow cart can suddenly turn to one side. This is due to the approach vortex and the propeller wash of the tug reaching the glider before it reaches a proper airspeed. If this happens release immediately.

6.1.4 Tow Line Break

If the tow rope or weak link breaks, it is fine to land with the flaps in the take-off position, as long as there is sufficient landing field distance available. Be sure to maintain good airspeed and disconnect any rope remaining with you before landing.

6.2 Flying

6.2.1 General

The ATOS has a high level of overall stability. Control movements should be made smoothly. To initiate a turn, move the control frame until the desire bank angle is achieved, then return to the neutral position. Pulse-like movement adds no advantage in terms of maneuverability and results in greater drag due to full deflections of the spoiler. When a spoiler deflects, there is a righting moment, so you have to pay attention to airspeed, especially when changing direction. When turning, you should pull in slightly so as not to accidentally fly too slowly.

The spoilers create a high yaw moment when deployed more than 50%. This is an advantage when you want to change direction quickly, such as circling in a thermal. In high-speed flight, a full deflection of the spoiler will result in large yawing. Be aware that when entering turbulence, a yaw oscillation can be induced by alternating full spoiler deflections. The oscillation will immediately cease if you center the contol bar. At speeds greater than 40 mph with flaps set at 70° and at speeds greater than 47 mph with a flap setting of 0° to 15°, use smaller spoiler deflections.

In order to check trim speed and not to exceed the maximum certified speed of 62 mph, you should fly with an airspeed indicator.

6.2.2 Flap Positions

1. Take off: Flap deflection approx. 15°. The flap bungee looks straight out of the keel.

2. Thermaling: flap deflection approx. 15°
3. Best glide: flap position 0°
4. Fast flight: flap position 0°

In turbulent conditions, the flaps should be slightly engaged. This increases the righting moment of the wing and thus safety.

6.2.3 Variable tail (optional)

The ATOS-VRS LIGHT can optionally be equipped with a variable tail unit. The movement of the tail is linked to the operation of the flaps. If the flaps are off, the tail unit is in the lowest position, giving low bar pressure). As the flap cord is pulled, the tail unit moves up a little before the flaps deflect. This allows the pilot to tilt the tail a little in turbulent air, which increases the bar pressure or wing righting moment, thereby increasing safety. On a VRS equipped with a carbon fiber keel, the tail tilts until the flaps reach about 70%. At this point the tail returns to the lowest position enabling easier flaring for landing.

6.3 Landing

For landing, the flaps should be set between 15° (strong headwind) and 70°, since the lowest minimum speed is reached in this area.

The easiest way to regulate glide path is with the flap fully deflected and varying your airspeed. During your first landings, it is recommended you set the flaps at a sufficient height to fly a spacious approach adapted to the conditions. The period for flaring is long. However, it is advisable to flare late and vigorously to avoid climbing out.

Mistakes to Avoid:

- Flying the approach too fast in combination with large control movements leads to yawing.
- Adjusting the flaps during the landing approach without looking at the targeted touchdown point.
- Airspeed too low. Recommended approach airspeed is 31 - 43 mph.

Important: To lock the flap rope in the cleat, throw the rope forward over the basetube. In this position it cannot come loose even if the rope is accidentally pulled.

Important: Pay particular attention to moving your hands to the downtubes with the landing flaps pulled. Never change your hands in a turn, only on a straight final approach!

Attention: With the flaps pulled for landing, the basetube does not have to be pushed as far forward in order to stall. Although this makes it easier to flare when landing, it can also lead to an unwanted stall near the ground if you are not careful. For this reason, always approach with a little extra airspeed, let the glider settle over the ground and, when the minimum airspeed is reached, push out.

6.4 Trim Speed

Caution: At low trim airspeeds there is a risk of causing a stall with even slight movements (see also chapter 6.5.1).

The optimum trim speed is between approx. 25 and 31 mph with a flap setting of 10-15°. To familiarize yourself with the glider, a slightly higher trim speed is recommended for the first few flights.

Attention:
For the first flight assume that the glider is not trimmed perfectly. Select good launch conditions and start with an aggresive run and proper angle of attack. Only check trim speed when you are sufficiently high enough to recover from an accidental stall.

Once you have become familiar with the glider, the trim speed can be gradually adjusted starting from the basic setting (see Chapter 5). To do this, the hang strap is moved in 0.2 inch steps as described in Chapter 5 until the basetube is positioned between the tip of your nose and forehead when flying at trim. Moving the hang strap forward increases trim speed, moving it back decreases trim speed. The basetube must never be in front of your head in steady level flight.

If the glider bags are stored in the D-spar leading edge, the trim speed increases by about 6 mph. This equates to a 0.2 inch forward change in hanging position. In this case, the hang strap must be moved backwards by 0.2 inches.

6.5 Unusual Flight Conditions

6.5.1 Stall/Spin

Depending on size of the pilot, stalled flight begins when the basetube is pushed in front of the head. Approaching stall may be noticed by a shaking tail unit. In addition, the control forces become "soft". If this occurs, the basetube should be placed in the neutral position or pulled in slightly. The ATOS-VRS LIGHT generally gently recovers.

If the basetube is pushed above your head, there is a risk of stalling. In level flight, the ATOS-VRS LIGHT goes into deep stall, nods and recovers as soon as the base is pulled into neutral. However, when turning and in turbulent air, there is a risk of one wing stalling, which can result in the aircraft tipping over the wing and then spinning. This flight condition is dangerous and should be avoided under all circumstances, as it can overload the structure.

When a stall begins, bring the basetube to the neutral position or pull in a little.

6.5.2 Tuck/Tumble

The glider can roll over (tuck) in turbulent air. The glider breaking or complete loss of control is then possible. In turbulent air, always fly with a sufficient airspeed reserve. For added safety, pull the flap a little, even in fast flight, about 5-10°. If conditions for flying are too turbulent, fly out of the turbulence immediately and land if necessary.

Important: The glider structure can be overloaded by flying too fast in strong turbulence. The maximum certified speed is 62 mph, but you should not fly this fast in strong turbulence.

6.6 Motorized flying

The ATOS-VRS LIGHT light is not for suitable for motorized flying.

7 Maintenance

7.1 General Information on Maintenance and Servicing

The ATOS-VRS LIGHT is made of mostly fiber composite materials. In contrast to aluminum and steel, carbon fiber materials show a different fracture behavior. Mostly due to their ductile behavior, metallic materials allow damage detection through deformation. However, dynamic loads can make it difficult to detect cracking.

In the case of composite fiber materials, damage caused by deformation cannot be detected. Other methods of damage detection must be used, such as checking for soft spots on the carbon fiber surfaces. Also cracking and delaminations are indications that immediate repair is needed. For these reasons, in the event of damage, contact an AIR-authorized test center and have a glider check performed.

In general, a comprehensive glider check should be carried out at an authorized AIR test center every 2 years. In between, however, it is essential to carry out the following maintenance work yourself. If anything is unclear, contact the manufacturer or an ATOS dealer.

7.2 Adjusting the Controls

7.2.1 Spoilers

The spoiler ropes are located on the backside of the spar and activate the spoiler. After the first few hours of flight, the knots and control ropes settle and slightly stretch. The stretching has no impact on flight safety, but should be addressed to keep the handling crisp. Align the wing horizontally and shorten the spoiler ropes on both sides. To do that undo the knot on the spoiler lever's shackle, tighten the rope and tie it again. Attention: Don't forget the safety knot.

After adjusting the spoiler ropes, check the adjustment of the stopper rope, which limits the maximum deflection of the spoiler (see chapter 7.2.2).

7.2.2 Spoiler Stops

In order to keep the loads reasonable on the spoiler rib and spoiler lever, the spoiler rope has a stop. The maximum spoiler deflection is limited by the stopper rope, which is attached between the control cable and the control rib pulley. At full deflection of the spoilers or during a hard landing in which the control frame is deflected sideways, the spoiler stop rope prevents excessive loads.

Pulling the spoiler string should deflect the spoiler lever 80° to 90° to the sail surface. In this position, the stopper rope must be tight. If the stopper rope is too short, the deflection of the spoiler is too limited, which has a negative effect on roll time. The stopper rope must be adjusted to the appropriate length by adjusting the knots. If the stopper rope is too long, spoilers and sails can be damaged by over deflecting.

The maximum spoiler deflection should be checked before each flight by lifting the wing leading edge or shifting the control bar to each side as much as possible.

7.2.3 Variable Tail (optional)

The variable tail unit is connected to the flap rope. Both work together in such a way that when the flap string is pulled at the control bar, the tail unit begins to move up before the flap deflects.

The tail unit is adjusted as follows:

1. Bring the flaps into fast flight position (trailing edge of the flaps 27 mm below the keel)
2. Tie the tail cord to the flap cord so that the trailing edge of the tail bracket is 16 mm above the keel tube.

After knotting both lines, check whether the flap can be fully deflected. At full deflection, the knot in the flap rope must not touch the control bar.

7.3 Maintenance Intervals

7.3.1 Control Cable Loop

The roll control cable connects via pulleys on the keel to each downtube connection. The cables controlling the spoilers are connected to this loop. The loop must be checked for wear before each flight. The thimbles and areas where the cable contacts the pulleys must be checked. Replace the cable if individual strands are broken or in the case of very heavy wear.

7.3.2 Spoiler Rope, Stopper Rope

The spoiler ropes and the stopper ropes (see chapters 7.2.1 and 7.2.2) must be checked for wear before each flight. Cable connections and where cable contacts pulleys should be the focus of the inspection. Replace the rope if the cable sheath is damaged or if the rope shows significant wear.

7.3.3 Control Cable

The steel cable (diameter 2 mm) between the front lower tensioning and the spoiler cable must be checked for wear every 50 flight hours. The thimbles and the contact surfaces with pulleys in particular should be inspected. Replace the cable if individual strands are broken or in the case of heavy wear.

7.3.4 Pulleys

All rope pulleys must be checked for wear every 50 flight hours. Rope pulleys must run smoothly, the running surface must not show any signs of damage and the rope must not be able to be brought out of the guide in such a way that it is possible for the rope to become jammed on the side of the pulley. Replace if there is any evidence of damage or excessive wear.

7.3.5 Checking the Ribs and Rib Connections

The ribs should be checked visually and mechanically. Try to gently squeeze the ribs with your thumb and forefinger, if you find a soft spot on the laminate, it is damaged. Another sign of a weak point is a cracking noise under load. If cracks are found in the laminate, it must be repaired before flying.

Particular attention should be paid to the connection of the ribs to the spar. Weak points on the rib connection can be discovered by loading the rib up and down at its end when it is unfolded (use approximately 100 N of pressure at the rib end). In this way, a possible crack formation in the transition area to the spar on the connecting plates can be identified.

The spoiler lever rib should be carefully checked. The connection joint between the spoiler lever and rib is esecially important to check for any damage.

The ribs should be checked every 50 flight hours or after any overloading. If a wingtip touches the ground on a landing, be sure to check the winglets as well. Check the outer ribs and rib connectors for damage.

7.3.6 Main Bolts & Safety Bungees

The main bolts at the nose should be checked every 100 flight hours or after about 50 flights. They should be dismantled, cleaned and greased as they serve as pivot points. After mounting, make sure their bungee is placed around the main bolts and slid under the lynch pin.

7.3.7 D-Spar

If the D-spar is subject to high point loads such as exposure to a rocky set up area or improper transport, the D-spar should be examined for damage. Check the leading edges by pressing the shell with your thumb for softness or a crack. A cracking or crunching sound when pressure is applied to the leading edge or back wall of the D-spar indicates damage. Contact the manufacturer or a testing center authorized by AIR for repair. Do not fly the glider until the damage has been repaired.

Particular attention should be paid to the spar straps. They run above and below the bridge and from the nose to the outer wing. If damage is identified in these areas, it is essential to ask the manufacturer for advice. The same applies if the spar has been subjected to heavy mechanical loads in this area, e.g. due to improper transport or a crash.

7.3.8 Sail Tension

If the sail tension appears too loose after set up (e.g. folds in the sail), the wing sweep and the connections on the ribs can be adjusted. This may be necessary, especially after the first few flight hours. The sail tension can be adjusted using an Allen key using the threaded sleeves at the end of each rib. It is important to ensure that the threaded sleeve is not unscrewed too far. At least 3 threads must remain in the threaded sleeve.

7.3.9 Connection Sail/Keel

The webbing that connects the sail to the keel at the trailing edge must be tight when set up. Check this each time you set up. If the webbing is loose, the wing sweep may change in flight. Flight characteristics and safety could be compromised. The straps must be tight. When readjusting, make sure that the straps are looped back in the buckle.

7.3.10 Flap Rope, Flap Pins Connection

Before each flight, the flap string and the lines connecting the flap pins must be checked. These are exposed to strong mechanical loads and must not show any signs of damage. The flap string and cleat must be checked before each flight. If strings or cleats are worn, they must be replaced.

7.3.11 Flap Return Bungees

If a flap does not return to the stop on the keel tube, the bungee at the front end of the keel must be adjusted and replaced if it is severely worn. Check before each flight.

7.3.12 Sail

After 20 flight hours on the sail, all seams, eyelets and straps must be checked. The zipper must be easy to close. For a long life, dry storage and low UV exposure are especially important. The straps with which the sail is attached to the keel must be tight; adjust if necessary! (see chapter 7.3.9) No harsh detergents should be used to clean the sail. It is best to use only water without pressure. Any mechanical impact leads to faster aging. Do not clean in the washing machine or rub hard with a cloth.

7.3.13 Elevator Adjustment Mechanism (optional)

The ATOS-VRS LIGHT is optionally equipped with an adjustable tailplane, which is controlled via a cable. This must be checked for damage in the area of the exit opening from the keel tube before each take-off. In case of heavy wear (torn sheathing) the rope must be replaced.

In addition, stretching the rope and tying the knots can affect the tail plane. The following settings must therefore be checked before each flight:

1. Flap rope loose: The trailing edge of the landing flap must be 27mm below the keel tube. This flap position is defined as 0° flap position.
2. If the flap cable is pulled further to the take-off position (the transition between the return bungee and the flap cable is at the keel outlet opening), the tail unit must be fully deflected. Flap position about 10°.

The slide that controls the tail unit is mounted on the top of the keel by means of a guide roller. This can be seen through the opening on the top of the lower half of the tailplane bracket and must be checked every 50 hours. If the lateral cheeks show heavy wear, the roller must be replaced.

8 Storage

During storage, as well as during transport, care must be taken to ensure that the spar lies flat. The wing should be supported in at least two places. It should be stored in an area open to the air and not placed directly on the ground where condensation can form, which can result in mildew stains on the sail and corrosion on metal parts. To dry a wet glider the glider bag must be removed and the wings spread out, simply opening the zipper is not enough.

UV light shortens the life of the sail, but even the fiber composite materials of the spar, ribs, spoilers and flaps can also be affected. For this reason, only expose the ATOS-VRS LIGHT to direct sunlight for as long as necessary.

9 Environment

Hanggliding takes place in nature. Caring for nature should therefore be of interest to every pilot. Take-off and landing areas must be kept clean. It is also important to avoid disturbing animals.

10 Disposal

The ATOS-VRS LIGHT essentially consists of the load-bearing CFRP structure, the sail and metal tubes and fittings. All these parts require professional disposal. Unwanted ATOS-VRS LIGHT gliders can be given to AIR. They are disassembled and professionally disposed of.

11 Operating Limits

Maximum speed is 62 mph with flaps at 0 - 15°

Maximum speed is 62 mph with flaps at 70°

Stall is 18 mph with 208 lbs takeoff weight

Stall is 21 mph with 274 lbs takeoff weight

Minimum sink is 21 mph with 208 lbs take-off weight

Minimum sink is 25 mph with 274 lbs take-off weight

Best glide is 27 mph with 208 lbs take-off weight

Best glide is 30 mph with 274 lbs take-off weight

Safe load factor 0 - 4 g

Take-off weight range 187- 286 lbs

Recommended pilot weight including harness 132 - 209 lbs

12 Technical Specifications

Wing span: 39.7 ft
Aspect ratio: 12
Flaps settings: 0 - 80°
Wing area including tail unit: 131 sq ft
Glider weight: 76 lbs

If you have any questions, we're happy to help. We look forward to any tips and suggestions. Further information and security notifications can be found on our homepage at: http://www.air-atos.de

Your A-I-R team wishes you many pleasant and above all accident-free flights.

13 Air Sports Equipment Identification Sheet