

# *BALLAD MANUAL*

# **BALLAD**

19, 21, 23, 25, 27, 29



REV.2 JAN 2023

## Congratulations!

Thank you for choosing the **BALLAD**.

This manual will help you to get all information about your glider. We strongly recommend that you read this manual carefully in order to be aware of any general limitations, performance characteristics, take off and flight characteristics, landing procedures, dealing with emergency situations and general maintenance.

This is information about the design of the **BALLAD**, advice how to use it best and how to care for it to ensure it has a long life, We hope that the **BALLAD** will give you a lot of satisfactory flying times.

**-DAVINCI GLIDERS TEAM-**

### **WARNING!**

**THIS IS NOT TRAINING MANUAL. ATTEMPTING TO FLY THIS OR ANY OTHER PARAGLIDER WITHOUT PROPER INSTRUCTION FROM A CERTIFIED PROFESSIONAL INSTRUCTOR IS EXTREMELY DANGEROUS TO YOURSELF AND BYSTANDERS.**

DAVINCI GLIDERS are carefully manufactured and inspected at the factory. Please use the glider only as described in this manual.

Do not make any modifications to the glider.

As with any sport - without taking the necessary safety precautions, paragliding can be dangerous.

## 1. Technical DATA

BALLAD			20	22	24	26	28	30
CELLS	NUMBER		44					
	CLOSED		10					
FLAT	ASPECT RATIO		4.8					
	AREA	m <sup>2</sup>	20	22	24	26	28	30
	SPAN	m	9.8	10.3	10.7	11.2	11.6	12
PROJECTED	AREA	m <sup>2</sup>	17.3	19.0	20.8	22.5	24.3	26.0
	SPAN	m	7.8	8.2	8.5	8.9	9.2	9.6
	ASPECT RATIO		3.51					
FLATTENING		%	13.4					
CORD	MAX	m	2.58	2.71	2.83	2.95	3.06	3.17
	MIN	m	0.52	0.54	0.57	0.59	0.61	0.63
	AVER	m	2.04	2.14	2.24	2.33	2.42	2.5
LINES	TOTAL METERS	m	300	316	331	345	359	372
	HEIGHT	m	6.7	7.0	7.3	7.6	7.9	8.16
	NUMBER		228					
	MAIN		2+1/4/3/1					
RISERS	NUMBER	3	A+A'/B/C					
	TRIMS		130					
	ACCELERATOR		150					
PILOT WEIGHT (FREE FLIGHT)	MIN-MAX	KG	45-70	50-75	65-85	80-105	95-125	105-140
PILOT WEIGHT (PARAMOTOR)	MIN-MAX	KG	45-115	50-120	65-130	80-140	95-160	105-180
CERTIFICATION	8G EN926-1	KG	EN926-1					
	5.25G DGAC	KG	DGAC					
GLIDER WEIGHT		KG	5.6	5.7	5.8	5.9	6.0	6.1

## 2. MATERIALS DATA

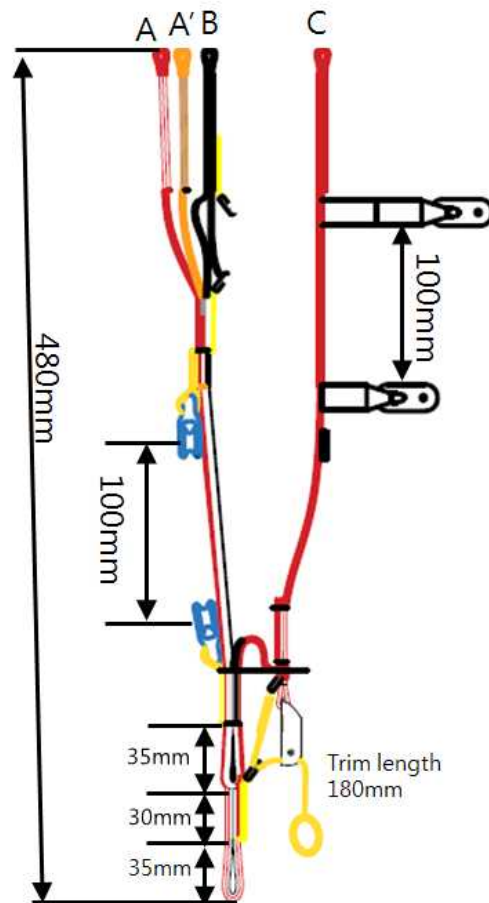
CANOPY	FABRIC CODE	SUPPLIER
UPPER SURFACE	30D FM	DOMINICO TEXTILE CO
BOTTOM SURFACE	30D FM	DOMINICO TEXTILE CO
PROFILES	30D FM(NON WR)	DOMINICO TEXTILE CO
DIAGONALS	30D FM(NON WR)	DOMINICO TEXTILE CO

SUSPENSION LINES	FABRIC CODE	SUPPLIER
UPPER CASCADES	DSL-70	LIROS
MIDDLE CASCADES	PPSL-200	LIROS
MIDDLE CASCADES	PPSL-160	LIROS
MAIN	7343-280	EDELRID
MAIN STABLE	6843-160	EDELRID
MIDDLE BRAKE	PPSL-120	LIROS
MIDDLE BRAKE	PPSL-200	LIROS
MAIN BREAK	10N-200	EDELRID

RISERS	FABRIC CODE	SUPPLIER
MATERIAL	WEBBING 20MM	GUTH&WOLF GMBH
PULLEYS	RIELY	LW RILEY PTY LTD

### 3. Risers

BALLAD has 3 risers. The A riser has a red cover to easy identification. There is another line with red mailon. There is A' and is for the big ears.



	Non Accelerated [mm]	Accelerated [mm]	Trim [mm]
A	480	380	480
B	480	430	500
C	480	480	570

#### **4. Lines**

They come in different diameters of Kevlar and Dyneema with sheathed cover. They must to be inspected every 100 hours maximum.

In case of Brake lines, it was cut a little longer, so every pilot can adjust it according to his personal taste.

But you must always leave 10cm before the brakes line starts acting in order to avoid trailing edge deformation when the wing is fully accelerated. In case the brake handle comes loose during flight or any brake lines is cut you can use the C riser softly for directional control instead of brake line.

#### **5. Adjustable Brake Pulley Position**

The brake line pulley position can be adjusted according to pilot preference to suite the power unit's hang points height. There are 2 settings: Upper and Lower. The upper setting (as set by the factory) is for low hang point motors whilst the lower setting is for units with higher hang points.

If you use the lower pulley, you must lengthen the brake lines accordingly. Moving to the lower pulleys requires the addition of 5cm to the overall brake line length (measured from the mark on the brake line).

To change the pulley position, remove the brake line

from the pulley by taking off the brake handle. Re-route the brake line through the other pulley before attaching the brake handle at the new adjusted length.

## **6. Accelerator system**

The accelerator has being limited in travel up to a safety point, however you can gain 8-12 km of extra speed.

You have to adjust the harness to the speed system so you can use all the speed travel.

To do so you have to be seated in the ground meanwhile you are in your harness and adjust the lines by pulling up the risers with tension. Another person help to do this is recommended. Make sure also that the pedal is not pulling down the risers when you are not using it.

Once all the gear is rigged you have to test the whole speed travel in calm air.

The use of the speed system reduces the angle of attack and the canopy may be more sensitive to collapses therefore do not use near the ground or in turbulent air and in case you are hit by turbulence remove your feet off the pedal bar as quickly as possible.

## 7. Trimmers

The BALLAD is supplied with a trim riser set. The 'neutral' or standard position is when the trimmers are pulled all the way down and A/B/C riser lengths are equal. We recommend performing landing and take-off with the trimmers closed.

The standard trim setting is ideal for climbing under power and when the air is turbulent. Brake pressure is lighter and the handling at its best in the standard trim setting. To increase cruise speed you can use the speed system, release the trimmers, or do both. Using the speed system has exactly the same effect as releasing the trimmers so it is safe and possible to fly with the trimmers in the standard position whilst using the full range of the speed system.

Unlike the majority of reflex PPG wings, to increase cruise speed you can use the speed system, release the trimmers, or do both.

It is not necessary to release the trimmers before accelerating. Using the speed system has exactly the same effect as releasing the trimmers so it is safe and possible to fly with the trimmers in the neutral position whilst using the full range of the speed system.

In turbulent air the reflex profile is very stable. It will resist reasonable levels of turbulence with a high



resistance to collapse without pilot input. The faster the wing is flown the more inherent stability there is, as the reflex has a greater effect. In mild turbulence it may be best to not attempt to fly the wing actively and let the profile absorb the turbulence itself, indeed small applications of the brakes can reduce the inherent stability of the profile. However in very strong turbulence, we recommend to return the trimmers to the neutral position (pulled down) and flying the glider actively. This way, you will be in the best position to react correctly should an incident occur.

## **8. Pre-flight check**

To know yourself with the glider it is a good idea to perform practice inflations and ground handling with and without the motor.

You should have no difficulties flying the BALLAD for the first time in suitable conditions, but as with all new equipment.

When you have the new glider, the below points should be inspected.

- Check the lines are clear and not twisted.
- Connection points between the glider and harness.
- All harness buckles are closed.
- The karabiners are fully closed and not damaged.
- The sewing, condition of the lines and connection of the lines are right

- Internal damage to ribs and diagonal ribs.
- Damage to the top and bottom panels and seams between panels.

## **9. Take-Off**

Whilst inflating the BALLAD, you should hold both of the A risers on your hands. Pilot run in an upright position and just increases throttle of the engine.

In strong winds it is desirable that an assistant holds the front of the trike from tipping over. When BALLAD is at an angle of 70 - 80 degrees, pilot should gradually slow it down by brakes. Once the wing will come to the "normal" angle of attack, while continuing to run, slightly pull the brakes (20 - 30 cm) to reduce the runway. Don't stop running until your feet have left up to the ground and you feel surely safe climb out.

We recommend to take off with closed trimmers.

## **10. In flight characteristics**

BALLAD has long brake travel length and increased brake pressure.

### **10.1 Speed control**

You can change speed by using the trimmers and speed bar. By pulling the trimmers to the closed point and brakes are pulled approximately 30cm, the BALLAD will

achieve its best minimum sink rate.

## **10.2 Turn control**

To familiarize yourself with the BALLAD your first turns should be gradual and progressive.

To make efficient and coordinated turns with the BALLAD first look in the direction you want to go and check that the airspace is clear. Your first input for directional change should be weight-shift, followed by the smooth application of the 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.

## **11 Deflations**

### **11.1 Asymmetric collapse**

Turbulence may cause a portion of the wing suddenly to collapse. Asymmetric collapses should be controlled by weight shifting away from the collapse and applying enough brake to control your direction. And you should use the brake to re-inflate the glider.

### **11.2 Frontal collapse**

BALLAD comes out of symmetrical front collapses by itself. But it could be fast recovered, if you apply the brake down to 15 to 20cm.

If your wing collapses in accelerated flight, immediately release the accelerator and manage the collapse using

the same methods described above.

### **11.3 Full stall**

Full stall can occur when you fully pull the both brakes. To recover to the normal flight you must release both brakes. After this usually comes a front dive with a possible front deflation. An asymmetric recovery (one control released faster than the other) from a full-stall can cause a big dynamic collapse. The full-stall is a hazardous manoeuvre and should be only done under the right safety preparations.

### **11.4 Deep stall**

It is possible for gliders to enter a state of deep stall. This can be caused by several situations including; a very slow release from a B-line stall; flying the glider when wet; or after a front/symmetric deflation.

When you meet this situation you should fully raise up the both brakes. and push the A-risers forwards or speed bar to regain normal flight.

### **11.5 Asymmetrical stall**

It can take place when you pull one of the brakes too hard, or while spiraling at a small speed in turbulence you increase the angle of attack. Rotation in the asymmetrical stall is called negative spiral. This is one of the most dangerous flying situations. In order to get

out of asymmetrical stall, just release the brakes. There may follow side thrust forward with a following wing collapse.

### **11.6 B stall**

The BALLAD has a very clean stable B stall. To enter the B stall, the pilot has to pull the first 20cm slowly until the glider loses forward speed and starts to descend at around 6 m/s vertically. Do not release the brake handles during B stall. If you pull too much B-line the glider may horseshoe and move around a lot. If this happens, release the B risers.

To exit the B-stall the B-risers should be released symmetrically and in one smooth, progressive motion. The glider will resume normal forward flight without further input. Check you have forward flight again before using the brakes.

### **11.7 Cravat**

In case a cravat should occur from an asymmetric collapse or other manoeuvres, it is important to keep your flying direction by applying some brake on the opposite side and weight shift. You can also use strong deep pumps on the brake to the cravated side, If you can not do it and the rotation is increasing, you must use the parachute.

## 12 Descent Techniques

### 12.1 Big ears

Sink rate can be decreased in a controlled way by folding both wing tips. While holding the brakes you should symmetrically pull the outermost A-risers.

In order to return to the normal flight, you should release the A-risers and pull the brake short times until wing tips regain pressure.

Spiraling is not permitted with big ears, because of the increased load on the remaining lines so that they can be physically deformed.

### 12.2 Spiral dive

When you hold one sided brake down for a long time, the glider goes into a fast sharp turn and loses a lot of height. **We recommend you don't to get into the sink rate over 10m/s.** The sink rate could be more than 15 m/sec. To get out of the spiral dive you must release the inner brake. Mind that BALLAD may take one more turn after releasing the brake. While spiral diving, the pilot experiences considerable overload up to 3 - 4g, so you can lose orientation.

## 13 Landing

We recommend to land with trimmers to the normal slow position.

When you are 1-2m over the ground, you should pull

the brakes smoothly for minimize vertical speed.  
Don't hit the ground by your overtake the glider.

#### **14. Packing your BALLAD**

Spread the BALLAD completely out on the ground. Separate the lines to the each side. The BALLAD must be folded cell to cell to keep the plastic reinforcement at the leading edge lie flat on each other and don't get bent. Try to pack your BALLAD as loosely as the rucksack allows, because every fold weakens the fabric.

Avoid packing the glider where it is wet or abrasive conditions(sand, asphalt pavement, concrete)

#### **15. Maintenance and cleaning**

Cleaning should be carried out with only pure water. If the glider comes in contact with salt water, clean thoroughly with fresh water. Do not use solvents of any kind, as this may remove the protective coatings and destroy the fabric.

#### **16. Caring tips**

- Do not expose your glider to the sun any longer than necessary
- Keep it away from water and other liquids
- Do not let the front edge hit the ground

- Keep your glider away from fire
- Do not put anything heavy on your glider, do not pack it in a rucksack too tightly.
- Regularly inspect the canopy, lines, risers and harness. If you find any defects, contact your dealer or the manufacturer. Do not attempt to repair the paraglider by yourselves.
- If you detect a damaged line, inform the dealer or manufacturer about the line number according to the line plan
- Keep your BALLAD in a rucksack in a dry well-ventilated place under neutral temperature and humidity conditions
- If you do not use the glider, then once a month you should unpack it, ventilate it well, and then pack it back in the rucksack.

## **17. Warrantee**

The producer guarantees the correctness of the declared characteristics and the paraglider's normal performance for two years after the purchase date, but no more than 200 flying hours. The producer conducts special, and after warranty repairs and maintenance at the owners' request for an extra price.

We recommend to inspect your paraglider (including checking suspension line strength, line geometry, riser geometry and permeability of the canopy material) one



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time at two years, or every 150 hours of flying time (whichever comes first); Those inspection must be made by manufacturer or dealer.

