

# DISCO

## MANUAL

REV. 1



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## Congratulations!

Thank you for choosing the DISCO.

The DISCO targets the advanced class of PPG wings, and provides a new concept of agility and dynamic handling. Equipped with this newly designed reflex profile, the DISCO is designed for the wide speed range and high fuel efficiency of the Davinci PPG model, providing dynamic handling and agility for SLALOM competitions.

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 DISCO, advice on how to use it best and how to care for it to ensure it has a long life. We hope that the DISCO 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

DISCO			14	16	18	20	22	24
CELLS	NUMBER		60					
	CLOSED		8					
FLAT	AREA	m <sup>2</sup>	14.0	16.0	18.0	20.0	22.0	24.0
	SPAN	m	8.9	9.5	10.0	10.6	11.1	11.6
	ASPECT RATIO		5.6					
PROJECTED	AREA	m <sup>2</sup>	11.8	13.5	15.2	16.9	18.6	20.2
	SPAN	m	7.0	7.4	7.9	8.3	8.7	9.1
	ASPECT RATIO		4.10					
FLATTENING		%	15.7%					
CORD	MAX	m	1.92	2.06	2.18	2.30	2.41	2.52
	MIN	m	0.42	0.45	0.48	5.05	5.30	5.53
	AVER	m	1.58	1.69	1.79	1.89	1.98	2.07
LINES	HEIGHT	m	5.31	5.68	6.02	6.35	6.66	6.96
	MAIN		3/4/3/3					
RISERS	NUMBER	4	A,A'/B/C/D					
	TRIMS	mm	YES					
WEIGHT RANGE (Free flight)	MIN-MAX	KG	130	140	140	140	140	140
WEIGHT RANGE (PPG / DGAC)	MIN-MAX	KG	55-120	55-130	65-140	75-150	85-160	90-170
CERTIFICATION	EN-926-1/2, LTF/ DGAC	KG	EN926-1	EN926-1 DGAC	EN926-1 DGAC	EN926-1 DGAC	EN926-1 DGAC	EN926-1 DGAC
GLIDER WEIGHT		KG	3.50	3.65	3.85	4.10	4.35	4.6

## 2. MATERIALS DATA

CANOPY		FABRIC CODE	SUPPLIER
UPPER SURFACE	Leading Edge	MJ40 MF	MYUNGJIN TEX
	Middle/Tailing	MJ32 MF	MYUNGJIN TEX
BOTTOM SURFACE		MJ32 MF	MYUNGJIN TEX
PROFILES	Smart Nose+	MJ38 HF	MYUNGJIN TEX
	Loading	MJ38 HF	MYUNGJIN TEX
	Unloading	MJ32 HF	MYUNGJIN TEX
DIAGONALS		MJ38 HF	MYUNGJIN TEX

SUSPENSION LINES	FABRIC CODE	SUPPLIER
UPPER CASCADES	8000U 90/70	Daegu Braiding Co
MIDDLE CASCADES	8000U 130/90	Daegu Braiding Co
MAIN	8000U 230/190/130	Daegu Braiding Co
UPPER STABLE	8000U 70	Daegu Braiding Co
MIDDLE STABLE	8000U 90	Daegu Braiding Co
MAIN STABLE	PPSL 120	Daegu Braiding Co
UPPER BRAKE	8000U 70	Daegu Braiding Co
MIDDLE H/L BRAKE	8000U 90	Daegu Braiding Co
MAIN BREAK	10N-200	Daegu Braiding Co

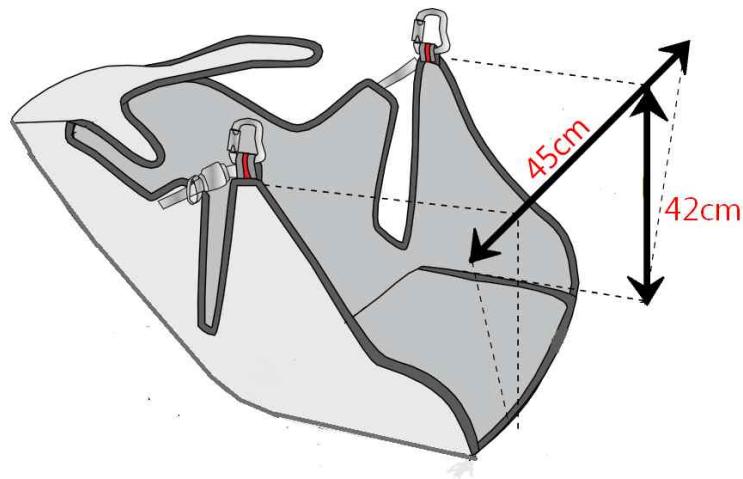
RISERS	FABRIC CODE	SUPPLIER
A, D	WEBBING 12MM	GUTH&WOLF GMBH
A', B, C	6mm Dyneema	Liros
PULLEYS	S20BB / 20BB	Ronstan

### 3. Introduction and Pilot Target

The DISCO targets the advanced class of PPG wings, and provides a new concept of agility and dynamic handling. Equipped with this newly designed reflex profile, the DISCO is designed for the wide speed range and high fuel efficiency of the Davinci PPG model, providing dynamic handling and agility for SLALOM competitions.

The DISCO has been tested by EN 926-1

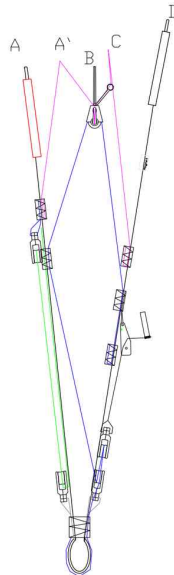
During type-testing the DISCO was tested with a 'GH' type harness. The setup is shown in the below picture.



#### 4. Risers

DISCO has 4 risers. The A riser has a red cover for easy identification. There is another line with red mailon. There is A' and is for the big ears.

The tolerance should not be more than  $\pm 5\text{mm}$  from the standard riser length.



	Standard [mm]	Trim opened [mm]	Accelerated [mm]	Trim+Acc [mm]
<b>A</b>	500	500	500	500
<b>B</b>	500	545	425	470
<b>C</b>	500	590	500	590
<b>D</b>	500	668	608	743

## 5. Lines

They come in different diameters of Dyneema and sheathed cover on the connection loop. They must be inspected every 100 hours maximum.

In the 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 brake line starts acting in order to avoid trailing edge deformation when the wing is fully trim opened. In case the brake handle comes loose during flight or any brake line is cut you can use the D riser softly for directional control instead of the brake line.

If you feel it is necessary to adjust the brake-line length to suit physical build, we recommend you ground handling the glider before you test-fly it and carry out this process after every 20mm of adjustment.

## 6. Trimmers (Accelerator)

The DISCO 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/D riser lengths are equal. We recommend performing landing and take-off with the trimmers closed. With the trimmers closed, the DISCO will reliably inflate without any overshooting.

As a result, the take-off characteristics are very smooth, straightforward, easy, forgiving, and require no special skills.

You can be accelerated in flight using the trimmers which make a low angle of attack and increase the flying speed. DISCO trimmers provide you with a more satisfying flight on windy days.

We advise you to use these trimmers carefully and do not use them in turbulent and strong thermal conditions. During full trim, conditions should be meet the dynamic reaction flight of the wing in case of collapse.

The DISCO doesn't have an accelerator system.

## **7. Pre-flight check**

To know yourself with the glider it is a good idea to perform practice inflations and ground handling in advance.

You should have no difficulties flying the DISCO 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.

## **8. Take-Off**

DISCO has easy inflation behavior at the forward/reverse launch because of its super light glider weight. To get the right-wing shape for the take-off, pull the brake until the canopy shows the perfect banana shape on the flat ground. While inflating the DISCO, you should hold both of the A risers in your hands. Smoothly and gradually inflate the wing. It does not need excessive energy and you feel the lift force very fast.

We recommend to take off with closed trimmers.

## **9. In flight characteristics**

DISCO has the best glide performance in a normal trim position with no any brakes.

In strong thermals and turbulence, we recommend gently pull both brakes to increase stability without trim released.

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

To make efficient and coordinated turns with the DISCO 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.

In the unlikely event that a brake line releases from the brake handle or breaks, the glider is maneuverable using the D-risers. By pulling gently on the D-risers it is possible to steer the glider and land safely.

#### Alternative Steering:

In the unlikely event, that a brake line releases from the brake handle, or breaks, or the brake lines are tangled up, the glider is maneuverable using the rear-risers. By pulling gently on the rear-risers, it is possible to steer the glider and land safely. Don't pull the rear-risers too much, to avoid a deep stall!

## 10. Deflations

In spite of the DISCO has great stability of the flight, strong turbulence or piloting error may cause a portion of the wing suddenly to be deflation.

### 10.1 Asymmetric collapse

The asymmetric collapse usually happens when the pilot has not foreseen this possible reaction of the wing.

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.

## **10.2 Frontal collapse**

DISCO does not come out the symmetrical front collapse by itself. It has high internal pressure with its well designed profile. However symmetric collapse may occur in strong turbulent conditions, but It could be fast recovered if you apply the brake down to 15 to 20cm. Release the brake lines, you may recover to the normal flight.

## **10.3 Full stall**

The full stall can occur when you fully pull both brakes enough a long time. 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 maneuver and not recommended as it requires very high forces.

The available brake travel before stalling the wing depends on the size and the lightweight. The DISCO has a minimum of 65cm(Max. 70cm) travel length at maximum total load. Those numbers are just a rough

indication.

It would be dangerous to use the brake travel according to those numbers, because it is not practicable to measure the brake travel during flight, and in turbulence, the stall might occur with less brake travel. If you want to use the whole brake travel of your glider safely, it is necessary to do many intended spins and full stalls to get a feeling for the stall behavior.

#### **10.4 Deep stall**

It is possible for gliders to enter a state of the 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 both brakes and push the A-risers forwards or release the trims symmetrically to regain normal flight.

#### **10.5 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 a negative spiral. This is one of the most dangerous flying situations. In order to get out of the asymmetrical stall, just release the brakes. There may follow side thrust forward with the

following wing collapse.

### **10.6 B stall**

We do not recommend a B stall with the DISCO. This technique is generally very hard to use with DISCO by the high force needed to pull down the B lines.

### **10.7 Cravat**

In case a cravat should occur from an asymmetric collapse or other maneuvers, 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 cravatted side. If a pull of the brake line is unsuccessful, pulling the stable line which is the outermost line on the B-riser may work.

If you can not do it and the rotation is increasing, you must use the parachute.

## 11. Descent Techniques

### 11.1 Big ears

The sink rate can be decreased in a controlled way by folding both wingtips. 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.

### 11.2 Spiral dive

When you hold the one-sided brake down for a long time, the glider goes into a fast sharp turn and loses a lot of height. The sink rate could be more than 15 m/sec. To get out of the spiral dive you must release the inner brake and use the outside brake to manage your sink rate. Mind that DISCO may take one more turn after releasing the brake.

## 12. Special Flying

### 12.1 Accelerated flight

The profile of the disco is designed for stable flight in flight always.

Full speed range. The speed bar has a more sensitive profile when accelerating the wing, critical sinks, or

strong winds.

Closer to turbulence and possible frontal collapse. In case of internal loss

When wing pressure is felt, it is recommended to pull the brake line minimally and slightly to increase the tension on the speed bar.

The angle of incidence of the wing. Don't forget to reset the air speed afterwards. Modify the angle of attack.

It is not recommended to accelerate near obstacles or in turbulence conditions. You need adjust the trimmer and release the speed bar in a timely manner.

'Active pilot action is required.

## **12.2 Acrobatic flight**

The DISCO HAS NOT been designed for acrobatic flight and we DO NOT recommend continued use in this type of flight. We consider an acrobatic flight to be any form of piloting that is different from a normal flight. To learn safely how to master acrobatic maneuvers you should attend lessons which are carried out by a qualified instructor and over water. Extreme maneuvers take you and your wing to centrifugal forces that can reach 4 to 5g.

Materials will wear more quickly than in normal flights. If you do practice extreme maneuvers we recommend that you submit your wing to a line revision every six

months.

### **13. Landing**

We recommend landing with trimmers to the normal slow position. Don't use sharp turns or radical maneuvers.

When you are 1-2m over the ground, you should face into wind and pilot and passenger standing upright and ready to run if necessary. Finally, you may pull the brakes smoothly to minimize vertical speed.

Don't hit the ground by your overtake the glider.

If you in windy condition, as soon as you touch the ground you have to turn around with your passenger to face the glider and move towards it during full pulling break symmetrically.

### **14. Packing your DISCO**

The DISCO needs to 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 DISCO as loosely as the packing bag 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 DISCO in a bag 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 bag

## 17. Warrantee

The producer guarantees the correctness of the declared characteristics and the paraglider's normal

performance for two years after the purchase date. The producer conducts special, and after warranty repairs and maintenance at the owners' request for an extra price. The warranty does not cover misuse or abnormal use of the materials.

We recommend inspecting your paraglider (including checking suspension line strength, line geometry, riser geometry, and permeability of the canopy material) one time at one year, or every 100 hours of flying time (whichever comes first); Those inspections must be made by the manufacturer, importer, distributor, dealer or other authorized persons. The checking must be proven by a stamp on the certification sticker on the glider as well in the manual book. Also, they will offer you spare materials like magnetic, trimmer webbing, and so on.

The Nylon fabric-reinforced on the leading edge of DISCO is specially designed to extend the life of the glider in tough and somewhat harsh environments by applying additional reinforcement in consideration of the Davinci Gliders. Even if the fabric and nylon reinforcement layer are separated by abrasion, there are no major problems with the strength and glide safety of the product itself, except for aesthetic issues.

## **18. Respecting nature and environment**

Finally, we would ask each pilot to take care of nature

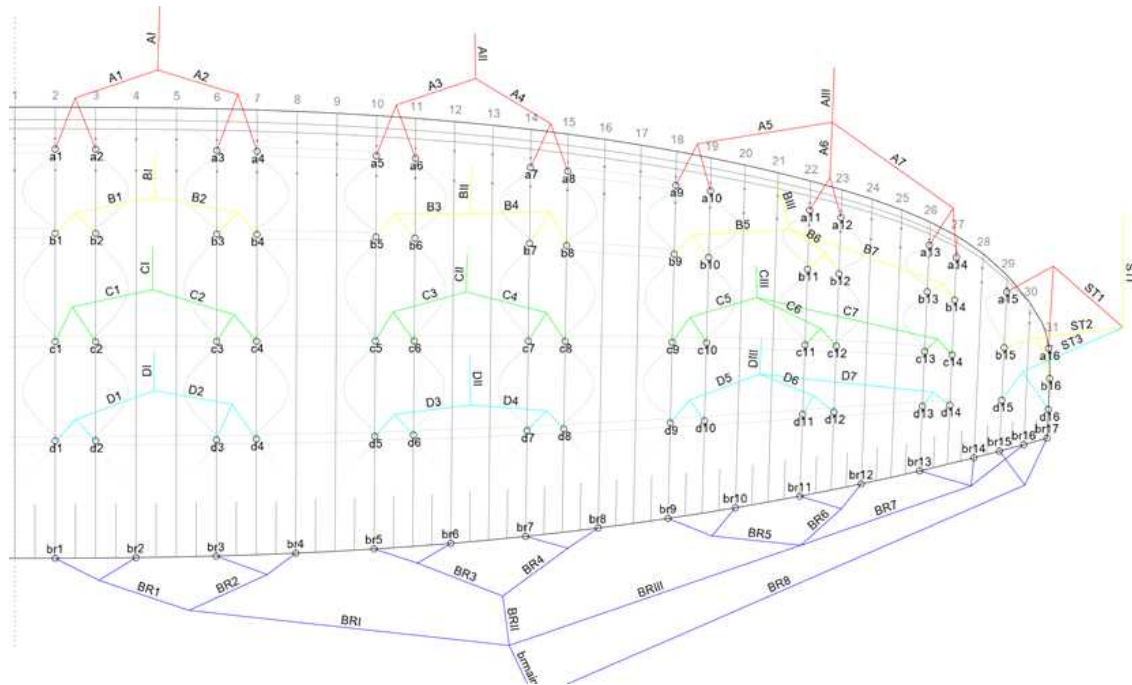
and our environment. Respect nature and the environment at all times but most particularly at take-off and landing places. Respect others and paraglider in harmony with nature.

Do not leave marked tracks and do not leave rubbish behind. Do not make unnecessary noise and respect sensitive biological areas.

The materials used on a paraglider should be recycled. Please send old Davinci gliders back to us Davinci Gliders offices. We will undertake to recycle the glider.

### Checked line sheet(with riser)

The measured values at the lower surface of the tailing edge, cll depth and spacing of the articulation points were determined under tensile load of 50N. The tolerance should not be more than  $\pm 10\text{mm}$  between the below length and reality.



## Overview

