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HIWAY HANG GLIDERS (1983) LTD
Longtown
Hereford HR2 OLE

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VISION 5

OWNERS' MANUAL

INTRODUCTION

Dear Owner

Thank you for selecting the Vision 5 as your hang glider; we at Hiway are sure that you will be happy with both the quality of construction and the flying characteristics of this glider.

The Vision was the first CFX glider built in the UK specifically designed for the P1 pilot. Its ease of launching and landing combined with its forgiving handling in the air made it the ideal glider for the first time buyer.

The European Visions were a development of a joint venture with Californian colleagues from Pacific Windcraft, combining the benefits of the American version with European airframe and rigging requirements. Since that time, we at Hiway have developed and refined all aspects of the design to give you the Vision Series 5. This still retains all the delightful friendly characteristics of the earlier models but, not only does it give a wider performance range, it also has been designed to satisfy the British Hang Gliding Association's airworthiness requirements.

Happy Landings!

John Ievers
Jim Bowyer

HIWAY HANG GLIDERS (1983) LTD

SPECIFICATIONS

	VISION 5		
	Small	Medium	Large
Empty weight	52lbs	59lbs	64lbs
Sail area	148 sq ft	171 sq ft	189 sq ft
Nose angle	122 degrees	122 degrees	122 degrees
Span	29 ft	31 ft	32 ft
Aspect ratio	5.7	5.7	5.5
Breakdown length	N/A	12 ft	13 ft
Min pilot rating	P1	P1	P1
Recommended pilot weight	98 - 154lbs	115 - 195lbs	182-252lbs
Stall speed (max pilot weight)	19 mph	19 mph	19 mph
Max speed (min pilot weight)	40 mph	43 mph	43 mph

OPERATIONAL LIMITS

This glider must not:

1 Be flown by more than one person at a time
2 Exceed 30 degrees nose up or nose down to the horizon
3 Exceed 60 degrees bank angle to the left or right
4 Be flown inverted or backwards
5 Be flown with an auxiliary power unit unless installed and tested at the Hiway factory
6 Never exceed the maximum pilot weight

WARNING

The owner and operator must understand that, due to the inherent risk involved in flying a hang glider, no warranty is made or implied of any kind against accidents, bodily injury or death. Operations such as aerobatic manoeuvres or erratic pilot technique may ultimately produce equipment failure and are specifically excluded from the guarantee covering workmanship and materials described on page 12 of this manual.

RIGGING

1 Lay your Vision on the ground with the nose into wind and unzip the bag. Leave the glider on its bag and remove the battens from their pocket.

2 Undo the ties that secure the control frame and attach the bottom bar to the uprights using the pip pins provided. Ensure that the pip pins are free from dirt and grit and are operating freely. Check that the six bottom rigging wires are not tangled and are routed cleanly to their attachment points.

3 Lift the glider at the front and while supporting the control frame roll the glider over and lay it on a clean area of ground. Remove the bag from the glider and undo the rest of the ties. At this point you should place all the ties in the glider bag and zip it up completely to prevent the loss of your ties. This also prevents dirt from getting onto the inside of the bag and then onto the sail. Fold the bag neatly and place it somewhere safe.

4 Lift the kingpost and position it on the spigot attached to the keel tube. Locate the kingpost top, and after a careful check that the four top rigging wires and two reflex bridles are not tangled, place the top fitting into the kingpost. Now check that the sail is not trapped under the kingpost at its base.

5 Spread the wings by lifting the leading edge at the junction with the crosstubes. Do not lift the leading edge to more than knee height. Do not use the top rigging to spread the wings, this could cause sail damage. If there is any resistance to movement STOP immediately and check:

a The sail is not trapped
b The wires at the control frame are not tangled.

6 Sort the battens into their matching pairs and compare the profiles; if there are any discrepancies refer to the batten profile provided (see Inspection and Maintenance). Arrange the battens by their respective pockets and gently insert the curved end into the sail pocket. Do not force the batten; this could lead to sail damage or distortion of the batten. If there is resistance, lift the trailing edge and shake the sail; this will enable the batten to clear the crosstube and leading edge. When the batten is fully home, secure with the end cap or double the elastic over the end. It is recommended that you start at the keel and work towards the tips when inserting the battens. With these battens inserted you will be left with the nose batten and six straight battens. The shortest of the straight battens is the tip batten. This should be inserted carefully through the slit provided between the top and bottom surface not through the tip strut hole. Locate the batten on the peg attached to the leading edge and then double the elastic over the retainer on the batten end. The nose batten can now be inserted and located on the keel tube. The four bottom surface battens may be inserted now or when the glider is raised onto the control frame.

7 The glider may now be tensioned; reach into the keel pocket and locate the swan catch that is connected to the tensioning wires and top rear rigging wire. Steadily pull the catch back and locate in the channel on the keel, push down on the swan catch and secure with the pip pin; never leave the swan attached but not secured; this could lead to a very dramatic collapse of the hang glider. If any resistance is encountered while tensioning the wing, stop immediately and investigate. Avoid letting the wings drag over rough ground while tensioning the glider; ask somebody to lift one wing a little off the ground while you tension it if there are stones or rocks present.

8 The glider may now be fully erected. Lift the nose carefully; do not raise it too high or release your grip on the keel as a groundloop may result. Push the glider back on the control frame and then secure the swan catch onto the keel. As with the rear tensioner, never leave the swan catch partly secured.

9 Fit the nose cone and if you have not previously done so, fit the bottom surface battens and tip struts.

The glider is now fully assembled and all that remains is to complete your preflight checks before flying.

HINTS

If the wind is less than 5 mph, it is safe to leave the glider parked nose down into wind. Or, if you have the experience, tail down with the wind across the back of the sail.

If the wind is over 5 mph, parking the glider nose down may result in damage to the airframe or to the sail. In these conditions either find a noseperson to hold the glider for a short period or undo the nosecatch and lie the glider flat.

If you have laid the glider flat, ensure that it is secure and cannot lift and groundloop especially in winds over 12 mph.

PRE-FLIGHT CHECKS

Always ensure that you complete a pre-flight check after rigging your glider and then another before each flight. The following points must be checked:

a Sail ..... All attachment points sound, no tears or frays, battens inserted correctly and secured.

b Wires ..... No frays, kinks or twists. Thimbles and tangs untwisted.

c Airframe ..... All tubes straight and undented, no areas of scoring or stress.

d Nuts and bolts ..... All fastenings secure expecially the quick release points at the front and rear of the keel.

e Kingpost and reflex bridles ..... Check that the kingpost is straight and attached correctly. Check that the reflex bridles are secure and not trapped under the battens.

f Suspension ..... Check the hang strap and back up loop are in good condition, that your harness is sound and that you have clipped in.

g Helmet ..... Your helmet fits and is done up correctly.

h Obstructions ..... Take off and landing areas clear. The airspace that you are about to enter is clear.

i Weather ..... Conditions are suitable for you to fly your new glider, that the wind has not altered since you first checked conditions and there are nc indications of imminent change. If in doubt, do not fly or consult an instructor, coach or senior pilot on the hill.

THERE IS NO EXCUSE FOR FAILING TO DO YOUR PRE-FLIGHT CHECKS.

FLYING CHARACTERISTICS

You will find the static balance of the Vision 5 slightly tail heavy. In the air you will find it a very easy and forgiving glider to fly and will reward you with many hours of effortless flight in good conditions. REMEMBER you are about to fly a new glider for the first time, so go back to basics, if possible fly with an instructor or coach at your local training site. Do not rush to get soaring with the experienced pilots, take your time and progress safely and surely.

Take off

Light winds .... Using the technique you have been taught, accelerate yourself and the glider smoothly to take off speed; take care not to let the nose rotate prematurely and keep the wings level. Once into the air move from the uprights to the bottom bar to give better roll control.

Soaring winds .... Always use a noseperson; load the glider and with the hang straps tight, accelerate forwards until airborne.

Remember the only command your wire assistants understand is **RELEASE.**

In Flight

Once airborne either in prone or semi-prone, make gentle control movements at first. You will find the Vision more sensitive in both pitch and roll compared with most training gliders. If you do over-correct at first, relax, let the glider settle and then make a smooth gentle correction.

When flying prone, you will find that you will not require any pitch for making shallow turns but as you want to make tighter turns, then some pitch adjustment will be required.

Landing

The Vision's ability to glide on across the landing field will again be better than your training glider so give yourself room. The energy retention of a CFX machine is greater than a training glider so in light winds bleed the speed off gently at first and then a positive push out and up is required. Hold the flare and the glider will settle gently to the ground. In stronger winds less flare is required but do ensure that you are directly into wind, the more efficient aerofoil section of a CFX machine means that the into wind wing will create a large amount of lift and a groundloop is a possible result.

DE-RIGGING

De-rigging is the exact reverse of rigging.

1 Remove the nose cone and store in the leading edge pocket. Release the swar catch while holding the keel and let the glider lay flat.

2 Release the tensioner at the rear of the keel and then remove the battens (never remove a batten with the glider tensioned). Stack battens neatly with all the curved ends together, don't forget the nose batten.

3 Bring the wings together lifting the sail over the top as you go. Be careful of getting dirt on the sail and if the sail appears to be trapped dc not pull it hard as you may cause great damage.

4 With the two triangles of sail on the ground, gently roll up the sail in the conventional manner. Secure the sail with a tie and then repeat on the other wing; secure with another tie around both leading edges and remove the first tie. Do not pull the tops of the foam pockets over each other, this will distort the shape of the foam in the pocket.

5 Use the remaining ties to secure the sail, kingpost, tip struts, and top rigging wires in a neat and tidy manner.

6 Place the glider bag on the glider and turn it over; disassemble the control frame and fasten to the glider with remaining tie. Place the battens in their bag. Then check that the foam in the leading edge pocket is in the correct position. It should be wrapped around the leading edge, but poor packing can lead to the foam folding back on itself. Zip up the bag and your glider is ready for transport.

HINTS

More damage is done to gliders when they are de-rigged and in transport than at any other time.

Always pad your roofrack.
Every time you pack your glider, pack it with great care even if you think its only for a short journey.
Never carry your glider on the car without its cover bag.
Always use the ties.
Never drop your glider onto the ground.
Never sit on your glider.

TUNING

Your Vision will have been test flown before you receive it and should be in a good state of tune and ready for flying. During use, the airframe and sail will be run in and some retuning may be necessary.

Pitch Trim

The easiest way to alter the trim on the Vision is to move the hang point forwards or backwards. To do this, lift the main hang strap until the stainless steel pin is free to move and re-position forwards or backwards as required.

Roll Trim

If you find the glider has developed a turn and there is no evidence of damage then you will need to adjust the leading edge tension in the sail by tightening or slackening one or both wings.

Crosstube Tension

At the front of the glider above the keel and inside the double surface you will find an adjustable wire that runs from the crosstube to the noseplate. Tightening (shortening) this wire will reduce the billow and increase the glider's performance.

Reflex Bridles

These are preset at the factory and play a major part in retaining the pitch stability of the glider. They should not be adjusted except by the factory and if damaged or broken the glider should not be flown until repaired.

TROUBLESHOOTING CHART

SYMPTOM	PRIMARY	SECONDARY
Flies too slow (stalls)	H & C	C & K
Flies too fast (dives)	H & B	B & J
Right turn	H & A	D
Left turn	H & A	E
Yaw unstable (roll response lag)	F	C & J
Yaw stable	G	B & K
Roll unstable	C	A, F & J
Roll stable	G	I & K
Spirally unstable	H & C	F & J
Breaks left in stall	H	D
Breaks right in stall	H	E
Trailing edge flutter	A	G
Sail wrinkles	A	G
Loose rigging	A	I
Tight rigging	A	I

TROUBLESHOOTING CHART KEY

SOLUTION	ACTION
A	Check for proper rigging, twisted thimbles. Crosstube tensioner wires not fouled on kingpost bolts. Check for proper position of reflex bridles.
B	Move hang strap back (one hole at a time).
C	Move hang strap forward (one hole at a time).
D	Loosen the left tip batten bungee (No 7 batten) 1/4" or tighten right tip batten bungee 1/4".
E	Loosen the right tip batten bungee (No 7 batten) 1/4" or tighten left tip batten bungee 1/4".
F	Your leading edge tension can be altered at the tips. Release the crosstube tension and slacken tension by one adjustment.
G	Refer to F for instructions, but increase tension by one adjustment.
H	Match all the battens against the batten profile provided with your Vision.
I	Modify the length of the top wire at the rigging adjustor attached to the noseplate.
J	Loosen both tip batten bungees, 1/4" at a time.
K	Tighten both tip batten bungees, 1/4" at a time.

INSPECTION AND MAINTENANCE

To ensure the safety of your flying and the performance retention of your Vision, it is essential that you follow this maintenance schedule faithfully. REMEMBER your care will always pay off in the future.

EVERY 10 HOURS

Check all battens against the batten profile.

EVERY 50 HOURS

Inspect all crosstube support cable components (tangs, pins, nuts, bolts, crosstube plates, and the cable itself).

Inspect all batten bungees.

Check all tubing for possible wear and damage which could occur during rigging, de-rigging and transportation.

Inspect sail eyelets and webbing at the tips.

EVERY 100 HOURS

A complete inspection of your glider is recommended, including all rigging and components, replacement of any worn or bent bolts or nylok nuts connecting two moving parts together.

If badly scratched or damaged, the bottom bar should also be replaced.

After 100 hours of flying, it is recommended that you replace all flying wires and the crosstube tensioner wires.

MAINTENANCE GUARANTEE

The Vision is a very sophisticated machine and its airworthiness requires regular and professional attention.

Annually, from the date of purchase, the factory will inspect and maintain all the different components of your new Vision. You will be informed of all parts that are in need of replacement or repair. This service should be used annually and will help you maintain the glider in an airworthy condition.

Please contact the factory for a complete and professional inspection of your glider. **This service is free of charge.** All that is required of you is to make an appointment, rig your glider and de-rig it after inspection.

GLIDER MAINTENANCE INSPECTION SHEET

Customer´s name: _____ Purchase date: _____

Glider & size: _____ Serial Number: _____

Inspection points	New	1st	2nd
Check battens against profiles			
Check all sail attachment points (eyelets & fitting screws)			
Check all rigging components for damage and wear			
Check all tubes for straightness, wear, corrosion and fatigue areas			
Check all fastenings			
Check all batten bungee (tension & wear)			
Check hang straps for wear & tear			

Factory inspection of new glider; comments:

Signature: Date:

Factory inspection one year old; comments:

Signature: Date:

Factory inspection two year old; comments:

Signature: Date:

MAINTENANCE LOG

Glider & size: _____ Serial Number: _____

DATE	WORK PERFORMED	INITIALS