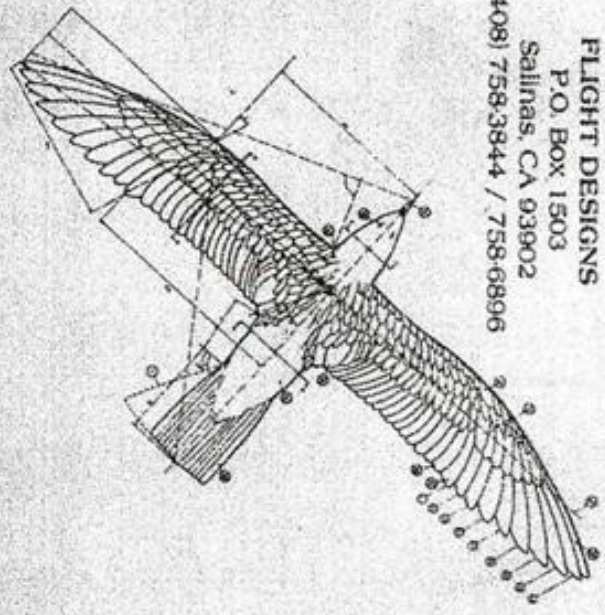
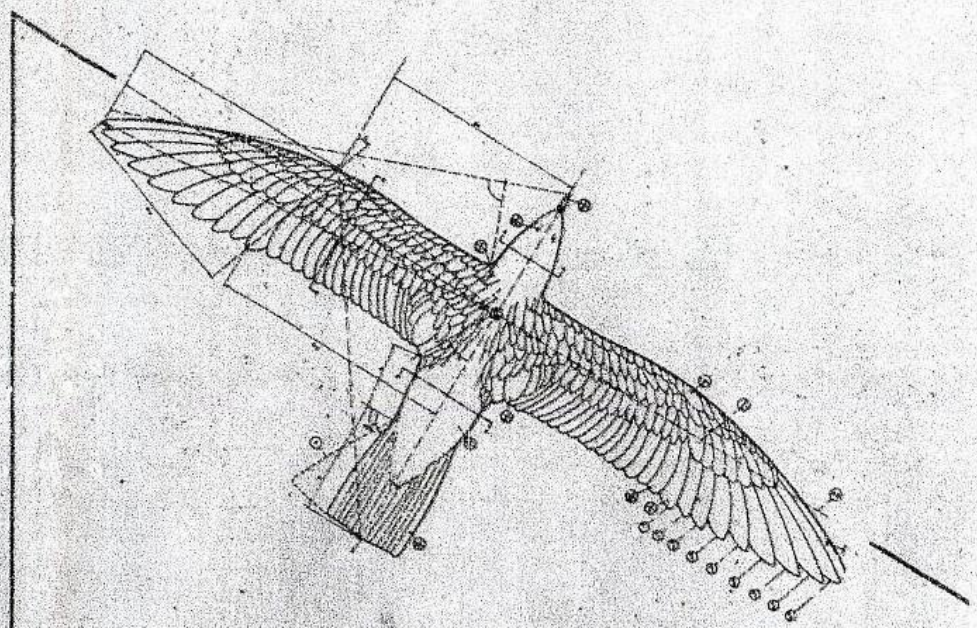


FLIGHT DESIGNS
P.O. Box 1503
Salinas, CA 93902
(408) 758-3844 / 758-6896

OUR DEALER IS:

DEMON



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P.O. Box 1503 Salinas, CA 93902
(408) 758-3844

****

SECTION 9

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MAINTENANCE LOG

Glider type:

Serial number:

DATE:	WORK ACCOMPLISHED	INITIALS

TABLE OF CONTENTS

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SECTION 1

PLACARDS

These placards are located on the keel, on the right hand side, near the control bar bracket.

THIS GLIDER WAS INSPECTED
AND TEST FLOWN ON

_____

BY

_____

DOCUMENTATION ON FILE AT
FLIGHT DESIGNS

Warning: The owner and operator must understand that due to the inherent risk involved in flying such a unique vehicle, no warranty is made or implied of any kind against accidents, bodily injury, or death. Operations such as aerobatic maneuvers or erratic pilot technique may ultimately produce equipment failure, and are specifically excluded from the warranty.

SECTION 8

MAINTENANCE SCHEDULE

EVERY 10 HOURS-
- check top and bottom surface ribs against airfoil maintenance blueprint.

EVERY 50 HOURS-
- inspect all crosstube support cable components (quick tensioner, pins, nuts and bolts on crosstube plates, cable itself.)
- inspect trailing edge lines support strap.
- inspect all batten bungie cords.
- check all tubing for possible wear damage which could occur during set-up, fold-down, or transportation.
- inspect sail mounting grommets at the leading edge 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 lock nuts connecting two moving parts together, (i.e. crosstube plates junction bolt, crosstube-leading edge junction bolt, etc.).
- if badly scratched, dinged or damaged, the control bar base tube should also be replaced.
- critical sail tears should be mended by a professional sailmaker.
- **please contact your dealer for a complete and professional inspection of your glider.

AND REMEMBER: Your care will aways pay off in the future. What you're giving yourself by following this schedule faithfully is many hours of anxiety-free flying.

ENJOY!!!

G Report to F for instructions but reverse the operation by shortening the cross tube support cable lengths. Adjust proper side rigging tension. Replace lock nut.

H Your leading edge pocket tension, at the tips, can be modified through two 1/4 inch diameter inch holes on which the sail can be mounted.
Release cross tubes tension and move both (right and left) leading edge pockets up toward the nose plate to next available bolt hole.

I Reverse Step H procedure. Pull both leading edges (right and left) down the frame to next hole.

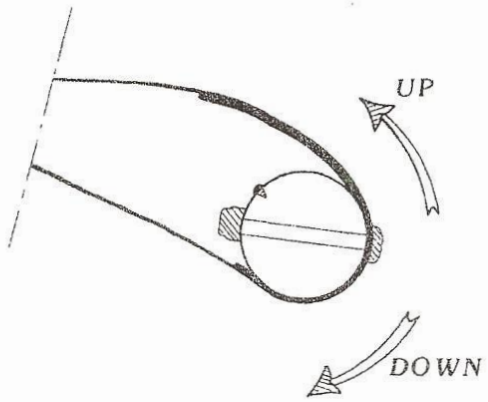
J Match all ribs and battens to airfoil maintenance blueprint provided with your **DEMON.**

K Modify keel tube rigging tension by using adjustable tang placed on the nose plate of the glider, at the extremity of the top front cable.

*L Remove washout setting screw and rotate both (left and right) leading edge tip plugs **down** (1/4" at a time) and reset tip plug screw.

*M Reverse the above described operation by rotating both (left and right) leading edge tip plugs **up** (1/4" at a time).

*NOTE: In solutions D, E, L, and M, it is understood that for the sense of rotation of the plug, only the **outside edge** of the tube is considered.



HGMA CERTIFICATION

The **DEMON** has undergone extensive testing during the winter of 1980-1981 and has satisfied not only the HGMA but also the designers and **Flight Designs** that they are strong, safe, and stable high performance ultralight gliders.

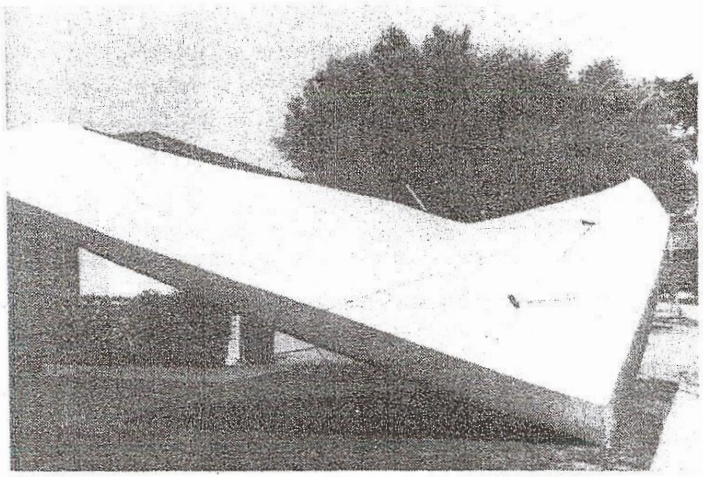
A combination of double stainless steel trailing edge lines and fixed washout tubes provide the most effective positive pitching system known to date.

However, careful test vehicle pitch experimentation was necessary to determine trailing edge line lengths and wash out tubes angle of function.

REMEMBER: Altering those overall dimensions, even to the slightest degree, will decrease your **DEMON**'s performance or, more importantly, degrade your glider's pitch positiveness.

Always fly with your entire washout system assembled and functioning.

You are able to verify the certified configuration of your **DEMON** by using the compliance verification sheet, Section 6 of this manual.



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SECTION 2

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SPECIFICATIONS DIMENSIONS

AIR FRAME:	All aluminum tubing 6061 T 6
Leading edges	18' 8" X 1 7/8" Innersleeved by 1 3/4"
Keel	11' 4" X 1 5/8" Innersleeved by 1 1/2" Oversleeved by 1 3/4"
Cross bars	2 X 9'6" X 2" X .083
Control bar & King post	1 1/8" X 5'4" and 4'6" 1 1/8" X 4' Innersleeved by 1" X .035
Span	33'2"
Nose angle	125°
SAIL:	
Area	176 Sq. Ft.
Aspect ratio	6.2
No. of battens (per side)	8 (top) 2 (bottom)
Billow	0"
Foam (closed cells)	18'8" X 1/4"
Recommended wing loading	145 Lbs. to 230 Lbs.
Stall speed	16 MPH (Maximum)
Top speed	46 MPH
Load limits positive	6.50 G's
Load limits negative	3.50 G's
Recommended USGA rating	III -V

The **DEMON** is a double surfaced, defined airfoil glider with enclosed, cable supported cross bars therefore allowed to move inside the double surface laterally and vertically and provide better handling authority.

The entry section of the air foil, around the leading edge tube, is supported by a tapered 1/4" foam sheet slid inside a shaped leading edge pocket.

TROUBLE SHOOTING CHART

SYMPTOM	1st Solution	2nd Solution
Tail heaviness (flies too slow)	C	C,M
Nose heaviness (flies too fast)	B	B,L
Right turn	A,D	D
Left turn	A,E	E
Yaw unstable (roll response lag)	F	C,H,L
Yaw stable	G	B,I,M
Roll unstable	C	A,H,L
Roll stable	I	K,M
Spirally unstable	C	H,L
Breaks left in stall	D	D
Breaks right in stall	E	E
Trailing edge flutter	A	I
Sail wrinkles	A	I
Loose rigging	A	F,G,K
Tight rigging	A	F,G,K

TROUBLE SHOOTING CHART KEY

Solution	Action
A	Check for proper assembly, twisted thimbles. Rear tensioner closed!! All ribs secured, check for trailing edge lines proper position.
B	Move control bar CG bolt back (one hole at once).
C	Move control bar CG bolt forward (one hole at once).
*D	The **DEMON** sail at the tip is bolted on a plug held in position with a stainles steel screw. Release cross tubes cable before removing the screw, and rotate left leading edge tip plug **down** (1/4 inch rotation at once) or: Rotate right leading edge tip plug **up**. Note: Reset the tip setting screw (1/8 inch drill is needed for the operation).
*E	Rotate right leading edge tip plug **down** or left leading edge tip plug up (1/4 inch rotation).
F	Three 1/2 inch adjustments in lengths are available on the cross tubes support cable through a tang placed at the cross tubes end of the cable. Lengthen the cable one hole forward and takeup the side rigging slack through the top rigging adjustable tangs. Note: After this operation, always replace the cross tubes plates junction lock nut with a new one.

****

SECTION 7

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TUNING AND MAINTENANCE

Your **DEMON**, perhaps more than any other **Flight Designs** product, has gone through an extensive test-flying program, most often in soaring conditions. Records of all **DEMONS** are kept on file at **Flight Designs**. You should therefore be in possession of a finely tuned glider, with optimal flying characteristics.

Please do not change its tuning for the simple pleasure of changing! If you are not sure, contact your dealer for help and advice.

It's recommended that any changes made from your **DEMON**'s original configuration should be noted in Section 10 of this manual. It is then easy to go back and trace occasional problems.

The trouble shooting chart you will find below offers you a first solution (first action to be taken) and then a second (or more).

Certain adjustments, like the cross tubes sweep setting, are very critical and are often creating trade-offs toward handling, performance, or, more seriously, safety.

Please investigate each problem as indicated in this chart. And remember: Never more than one change at a time: it's a basic rule in test flying, allowing to better keep track of the progress done.

We sincerely hope you never have to use this chart.

****

SECTION 3

****

ASSEMBLY FROM BROKEN DOWN FORM

Full Length Shipping Form:

The **DEMON**, by it's nature, is rather more complicated and time consuming to break down to a twelve foot shipping form. THEREFORE, your **DEMON** will probably be shipped in a full length, "ready to fly" configuration. All you have to do is remove the glider from it's shipping tube, open the cover bag, then go to section 4 of this manual for set up and inspection, removing all foam or cardboard shipping protections from all possible wear points.

12 Ft. Shipping Form:

To obtain this breakdown length, the wingbolt connecting the cross tube to the leading edge has to be removed along with a breakdown pin located halfway up the front section of the leading edge. Therefore you'll need to crawl inside the double surface glider laid flat on the ground, right side up. (Access to inside of sail is found running above the keel tube.)

Here's how to Proceed:

- Push rear section of leading edge inside sail (matching left and right sides)
- Crawl inside double surface.
- Unpad all tubing ends.
- Slide rear section around its inner sleeve.
- Match holes and remount breakdown pin.
- Reconnect cross tube to leading edge with wing bolt, saddle, then cross tube plate on top of leading edge tube. (Please note: no washer on bottom.)
- Do not over-tighten nut. Allow for pivot ease.
- Repeat same operation to re-assemble other leading edge.
- You now can crawl out of the sail and proceed to place washout tube inside the sale with bungle cord going around the leading edge tube.

- Now bolt your sale tip grommet to leading edge tip plug at marked position with lock-nut inside the sale.
- After all shipping pads removed, your **DEMON** is now ready to be fully assembled as described in section 4 of this manual.

Breakdown For Shipping:

- Carefully reverse the above procedure, padding all possible wear points.

****

SECTION 4

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SET-UP AND FOLD DOWN PROCEDURE

On your **DEMON**, great efforts went into designing the simplest most fool-proof set-up procedure.

However, by its sophisticated nature, this procedure requires a good degree of attention. Please read the following instructions very carefully. It'll make this first contact with your **DEMON** much more enjoyable.

The **DEMON** should always be stored with ribs and zipper facing up.

1. Remove batten bag, set it aside and unzip cover bag.
2. Assemble control bar, and flip glider right side up, standing on it's control bar. (Laid on the ground in winds above 12 mph.

Leading edges deflexion: Tie a thread with a long loop to the saddle on the nose plate and line it up exactly with the wing bolt (center). Measure the inward deflexions of the leading edges at the tips. (Projected distance from the thread to the axis of the tubing.)

COMPLIANCE VERIFICATION - DEMON 175

Read all explanations detailed on the next sheets before filling in the values.

GLIDER HELD IN POSITION	MEASUREMENT OF	DEMON 175	ACTUAL	OK
A	Glider's Packed Weight	75 Lbs. ± 1/2		
B	Leading Edges: - wing bolt - washout tube - outer diameter front section - outer diameter aft section	 120¾" ± 1/16 18½" ± 1/16 1¾" 1¾"		
B	Keel: - kingpost bracket bolt - tail bolt - tensioner bolt - outer diameter	 60½" ± 1/16 103 1/16" ± 1/16 114 7/16" ± 1/16 1 5/8"		
B	Cross Tubes: - overall length - from hole to hole - outer diameter	 113¾" ± 1/16 112¾" ± 1/16 2 "		
B	King Post: - overall length - cable hole from keel - outer diameter	 48" ± 1/16 3½" ± 1/16 1¾"		
B	Down Tubes: - overall length - distance from holes to extr. - outer diameter	 64" ± 1/16 ½" ± 1/16 1¾"		
B	Control Bar: - overall length - distance from holes to extr. - outer diameter	 54" ± 1/16 ½" ± 1/16 1¾"		
B	Bridle Configuration	17½" / 19"		
D	Leading Edge Deflexion	4½" ± 1/2		
C	Washout Tube Angle	20°		
C	Control Frame Sweep	3° ± 1/2		
D	Dihedral	4° /2° ± 1/2		
D	Camber of Center Line	4" ± 1		
D	Sail Span	33'4" ± 1		
D	1st Batten Cord	97" ± 1/2		
D	4th Batten Cord	60" ± 1/2		
D	Cross Tube Sweep	15" ± 1/2		

C. Glider fully assembled rested on its control bar with the nose held up for a level keel. (Check with a bubble level)

Washout tube angle: Using a gravity actuated protractor, measure the angle of the washout tube versus horizontal with the sail rested on it.

Control frame sweep: Measure the angle of the control frame versus vertical (apply a flat surface on the down tubes and measure its angle with the gravity actuated protractor.)

D. Glider fully assembled rested upside down on its king post and held level on the nose and cross tube extremity.

Dihedral: Hold a tight string from one leading edge tip to the other on the bottom and one wing bolt to the other and measure distance from string to the keel tube (perpendicular to tube)

Camber of Centerline: Depress the sail at centerline stitch right between the nose and the c.g. until snug. Measure the vertical distance from this low point to the lower edge of the keel tube.

Sail Span: Measure the sail from the furtherest outboard extremities.

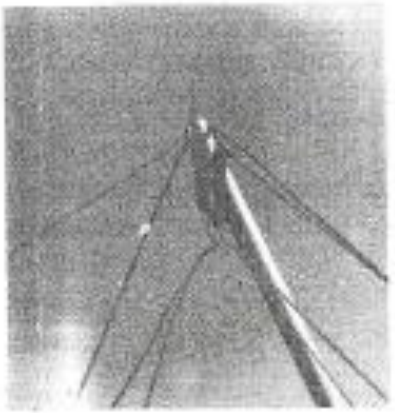
1st batten cord: Measure the distance from the trailing edge to leading edge along the 1st batten.

4th batten cord: Same along the 4th batten.

Keel reflex: Aim from the nose to the tail and check the reflex of the keel.

Cross tube sweep: Easily done when the sail is off the frame, hold a tight string from one wing bolt to the other and measure distance from string to cross tubes junction bolt.

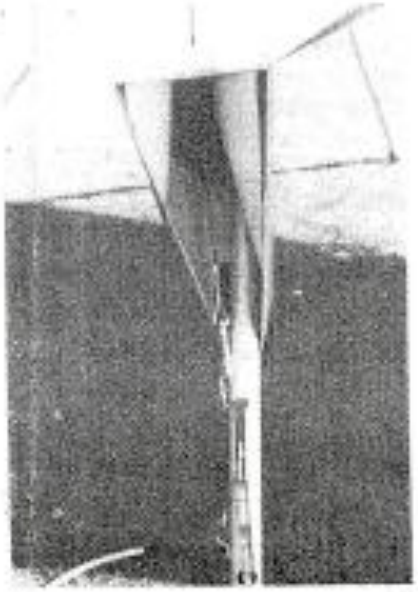
3. Connect bottom front cables to nose plate cable catch (see picture)



4. Spread both wings 3/4 of the way out (do not worry about the king post, it will erect automatically)

5. Twist the king post tube 1/4 of a turn to line up cross tube cable hole with keel tube.

6. Bring your trailing edge lines support webbing strap to the top of the king post, behind the top fitting and between the cable sleeve and the fitting. Make sure everything sits properly.



7. Bring the top rear cable end (thimble) through the webbing strap slot at the rear of the keel pocket and connect it to the rear tensioner. Note: the tensioner should be in a released position.

8. Proceed by inserting and securing all top surface ribs in their pockets, always starting from the keel out. Note: color coded batten tips. Unless otherwise specified by the test pilot with a tag on the hang strap the **DEMONS** will all be shipped on a "white on the right" basis.
Important: When inserting or removing the **DEMON's** preformed ribs, the cross tube cable should be relieved from any tension/L.E. tips on ground.

9. You are now ready to set the **DEMON'S** airfoil under the tension. To do so, reach inside the keel pocket, preferably with your left hand and grab the cross tube cable T-handle and pull it toward you, toward the tensioner and clip the cable thimble in the carabiner. (Breaking strength 2,000 Lbs.)

10. Now you can close the tensioner and secure it with the push pin and its safety.

B. Glider fully assembled, rested on its tail and control bar on level ground.

Leading edges dimensions: Measure from the center of the nose plate bolt. From this point, determine the distance to:

the wing bolt (center)
the washout tube hole (center)
Check outer diameter of front and aft sections.

Note: Any change on the leading edges of your deflexorless **DEMON** could affect drastically its flight characteristics. For a complete verification of your leading edges, remove them from the glider and add to the above checking the following:

front section, wall thickness: .058"
aft section, wall thickness: .058"
innersleeve length: 30"

Keel: measure from the center of the first nose plate bolt. From this point, determine the distance to:

Kingpost bracket bolt (center)
Bottom rear cable bolt (center)
Quick tensioner bolt (center)

Cross tubes: Measure the overall length, the distance from hole to hole, and the outer diameter.

King post: Measure the length of the tubing, the outer diamter, and the distance from top of the keel to crosstube cable hole. (center)

Down tubes and control bar: Measure their overall lengths, outer diameters and distance from holes to extremities. N.B. You should make sure all fittings, brackets, nose plates, are original **Flight Designs** material by comparing them with the pictures in your glider manual.

Bridle configuration: Hold a thread tight between the bridle attachment and grommets on the sail, without touching the sail. Determine the distance from the middle of the thread to the top of the keel tube, measured square to the sail.

Landings are easy as well. A certain degree of parachuting is possible but a faster approach is best. Intermediate pilots should be aware of the DEMON's extra glide, and adjust their approach accordingly.

IMPORTANT NOTICE:

On the DEMON, the control bar base tube position is, in flight, significantly further back than some other modern designs. At trim speeds, when flying prone, the base tube will be located approximately between your shoulder line and your chin. This can be surprising at first, but you'll find this will offer you much greater handling authority at minimum sink speeds (thermalling) and during turbulent landing approaches.

****

SECTION 6

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COMPLIANCE VERIFICATION SHEET

Your glider was fully HGMA certified as of May 1981 and was shipped out from **Flight Designs** workshop in the exact configuration it was certified in.

Hence, some alterations could have occurred due to mishandling, poorly executed repair, attempts to improve performance, etc.

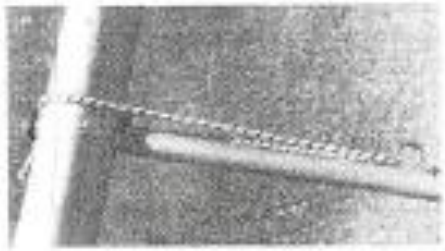
By checking your glider according to the following verification sheet, you can make sure it still complies with the HGMA requirements. Read first all measuring instructions, then take all measurements and fill in the results on the verification sheet and compare with the correct values. Have the necessary modifications done whenever your data is off.

A. Glider in the original bag with all battens and washout tubes in the original bag.

Glider weight: Weigh your glider on a good scale.

11. Insert bottom surface battens in their respective pockets. The plastic tip end goes first and lies against the leading edge tube.

12. Push the washout tube through the holes on both sides of the leading edge making sure the little black plastic stop is touching the leading edge tube.



13. Your **DEMON** is now ready for a pre-flight inspection. Cafefully inspect the entire glider. Make sure that cables are not kinked, frayed, or twisted; that tubing is straight and not dinged, damaged, or bent. All safety pins are in place. Check your suspension loop for proper placement, and hang in your harness to check bar clearance. If you wear a parachute, suspend yourself a little higher.Check flying conditions and then:

HAVE FUN!!!!

HIGH WINDS SET-UP PROCEDURE

To prevent unnecessary torque that may occur to your **DEMON** during high-winds assembly, it is best to repeat all steps from (1) to (12) described above with your glider laid flat on the ground, nose into the wind.

It is easy then to lift your **DEMON** by the nose plate, to raise it on its control bar, and to connect the lower front cables to nose plate catch with push pin and safety. Note: this operation can be performed with the rear rigging tensioner in a closed position.

FOLD-UP PROCEDURE

Simply reverse the above described (12) steps. However, here are a few words of caution: they will save you time, wear areas and dirt on your sail.

Always try to fold your wings together, in a symetrical manner, bringing both leading edges back together at the same time. If not done so, the cross tube junction plates may get between the keel and the leading edge tube, making it impossible to completely fold the glider without creating serious damage to the airframe.

In a more general manner, if anything offers you resistance during any phase of the **DEMON**'s set-up or take-down procedure be sure to stop and to investigate.

While folding down your king-post, there are two important precautions to be taken:

a) Slide the trailing edge support webbing strap down the tube.
b) Rotate the king-post 1/4 inch either direction to allow the cross tubes cable to store itself without taking "sharp corners" around the king-post hole.

While placing your sail ties, try to have the keel resting below the leading edge tube, and to place your ties without including the keel. It will save you some possible wear points.

****

SECTION 5

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FLYING

After performing a preflight inspection and harness hang check, you're ready for the first flight. The **DEMON**'s static balance is neutral when held in the takeoff position. In high winds, however, the nose tends to pitch up; this is caused by the dive recovery system. (A tradeoff here; what you lose in ground handling is more than regained in flight stability.) Instead of muscling the glider into a nose-down attitude, let it seek its own angle of attack. You'll find the glider much easier to handle. Better still, have someone assist you by holding the glider's nose wires.

When launching, the glider's nose should be just high enough to slightly inflate the sail. Light wind takeoffs are relatively easy, since the glider lifts readily as the air speed increases. The pilot, however, should not underestimate the speed needed for a good, clean takeoff; in other words, remember what your instructor had to say.

Once in the air, pilots accustomed to a high performance glider will quickly feel at home, as the glider coordinates very well with only light bar pressures and generally only small control movements by the pilot.

The intermediate pilot should choose a site and conditions which allow a straight flight path - where no aggressive control is needed - until the pilot learns the glider and feels comfortable.

In flight, the glider is responsive to lift. The **DEMON**'s low stall speed and high top-end speed, coupled with superb maneuverability, offer you the best of all worlds. The glider will stall nose first, not tending to drop a wing. 360-degree turns coordinate best with only a little pitch pressure. The **DEMON** is difficult to spin, stopping after only 1/2 turn. The nose will drop and the glider will pull out. The pilot should increase flying speed in any spin situation.