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**DELTA WING**  
**LITE DREAM**  
**145, 165, 185, 205, 220, 240**  
**OWNER'S MANUAL**



FAX 818 787 6611

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## **DISCLAIMER**

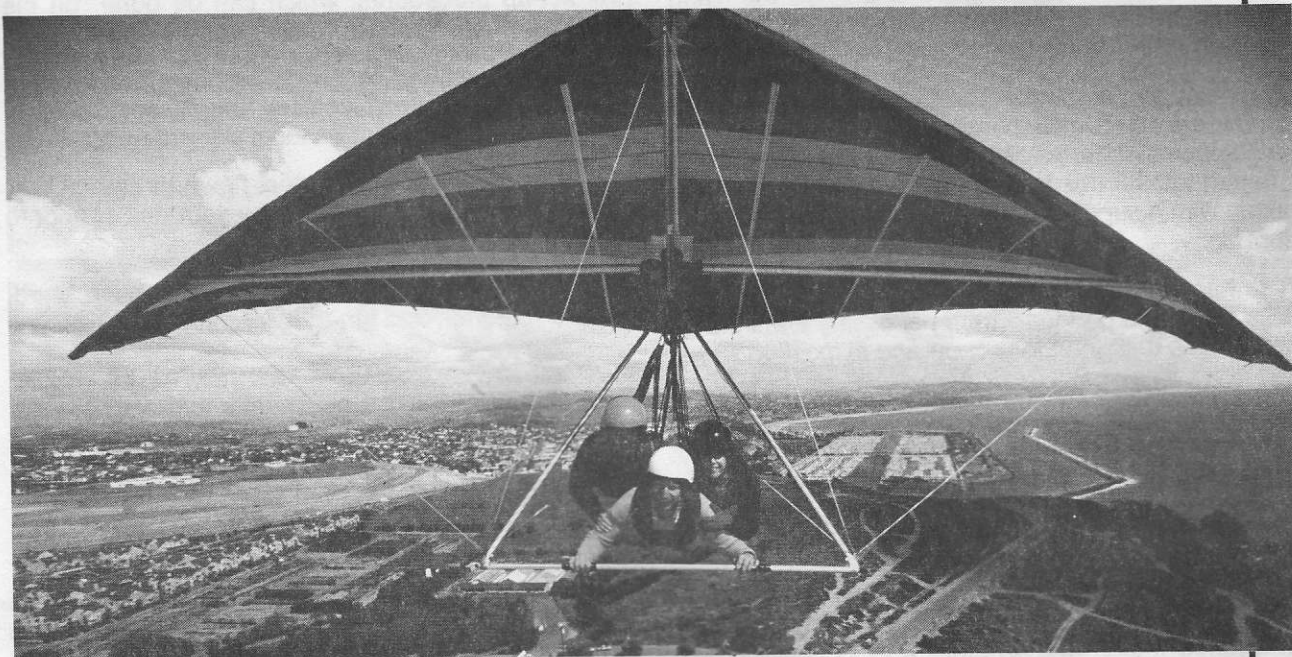
**WARNING** - The owner and operator must understand that due to the inherent risk involved in flying a hang glider, no warranty is made or implied, of any kind, against accidents, bodily injury, or death. Operations outside the recommended flight envelope such as aerobatic maneuvers or erratic pilot technique may ultimately produce equipment failure, and is specifically excluded from the warranty.

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## **TABLE OF CONTENTS**

<b>DESIGN FEATURES</b>	<b>4</b>
<b>SPECIFICATIONS</b>	
<b>and HGMA Compliance Verification</b>	<b>4</b>
<b>OPERATING LIMITATIONS</b>	<b>5</b>
<b>ASSEMBLY PROCEDURE</b>	<b>5</b>
<b>BREAKDOWN</b>	<b>7</b>
<b>BREAKDOWN FOR SHIPPING</b>	<b>9</b>
<b>PREFLIGHT INSPECTION</b>	<b>9</b>
<b>FLIGHT TECHNIQUE</b>	<b>9</b>
<b>TUNING</b>	<b>10</b>
<b>PERIODIC INSPECTION</b>	<b>10</b>
<b>HARDWARE SPECIFICATIONS</b>	<b>11</b>
<b>PARTS</b>	<b>11</b>





# **DELTA WING LITE DREAM**

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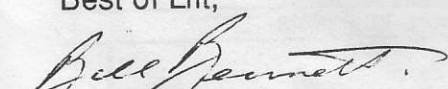
Dear Pilot:

The Lite Dream was designed for the beginning through advanced pilot. Its ease of handling and slow flying capabilities allow the beginner to progress rapidly and safely to upper level skills. Its efficient span and large radial tips provide a remarkable sink rate, glide angle, and speed range.

Safety and strength were primary design criteria and this glider meets or exceeds all current HGMA Airworthiness Standards. It is essential that this manual be read carefully before assembly and flight. Stability systems, pre-flight procedures, and periodic inspections should be understood and practiced.

We at Delta Wing wish you the finest of flying. We are ready to provide any assistance necessary to expand your flying experience. You have purchased a STATE OF THE ART glider! The rest is up to you.

Best of Lift,

  
Bill Bennett

## DESIGN FEATURES

The Lite Dream was designed to provide the flying community with a high performance glider that can be used for training as well as high altitude soaring.

The pivot-arm mounted crossbar, and freely moving radial tips provide responsive, light handling. The foam insert stiffened leading edges supported by shaped tubular ribs form a well defined airfoil. This, along with a super-clean sail results in excellent performance.

The hardware is strong and simple, made of stainless steel, and padded where necessary to minimize wear. It is designed for set-up and inspection ease.

All set-up procedures, which can be done "on the bar," or "on the ground," are very quick and simple.

Positive handling, forgiving flying qualities, light weight, and a small control bar all contribute to making the Lite Dream an ideal training glider.

All Delta Wing gliders are test flown by the factory, and in addition, are test flown by your dealer prior to delivery to the purchaser.

The Delta Wing Lite Dream is a highly refined, easily cared for, and fun-to-fly recreational glider.

## SPECIFICATIONS and HGMA Compliance Verification

NOTE: These specifications are intended only as guidelines for determining whether a given glider is a certified model and whether it is in the certified configuration. Be aware, however, that no set of specifications, however detailed, can guarantee the

ability to determine whether a glider is the same model, or is in the same configuration as it was when certified, or has those performance, stability, and structural characteristics required by the certification standards.

LITE DREAM MODEL	145	165	185	205	220	240
Sail area (Square Feet)	145	165	185	205	220	240
Span (Feet)	29.1	31.5	34.4	34.4	35.3	37.0
Nose Angle (Degrees)	120	120	120	120	120	120
Weight of glider without coverbags (lbs)	46	49.5	55	59	65	73
Pilot proficiency rating	Beginner			Novice		
Recommended pilot weight range (lbs)	80-170	120-210	140-210	160-230	180-400	225-500
Stall speed @ Max. recommended loading (mph)	25	26	28	28	24	24
Max. speed @ Min. recommended loading (mph)	38	38	38	38	38	38
Number of ribs (per side) not including nose rib	7	8	8	8	8	9
Washout struts	NO	NO	YES	NO	YES	YES
Leading edge length, nose plate anchor hole to:						
crossbar attachment	114.25	114.25	134.25	134.25	148.25	148.25
end of leading edge	205.0	219.5	239.5	239.5	252.5	257.00
Leading edge tube outside diameter at:						
Nose	1.625	1.875	1.875	1.875	1.875	2.00
Crossbar	1.75	2.00	2.00	2.00	2.00	2.125
Rear sail attachment	1.50	1.75	1.75	1.75	1.875	2.00
Crossbar length, pivot arm bolt to:						
Leading edge attachment	101.0	101.0	118.5	118.5	132.0	132
Crossbar outside diameter	1.875	2.0	2.0	2.0	2.0	2.0
Keel length from nose bolts to:						
crossbar pivot arm bolt	55.75	55.75	62.5	66.5	68.5	67.5
pilot hang loop	57.5	59.5	67.5	68.0	71.5	75.0
Keel outside diameter	1.5	1.5	1.5	1.5	1.75	1.75
Sail chord at:						
3 feet outboard of keel	80.0	84.0	90.0	100.0	106.0	109.0
3 feet inboard of tip	42.0	42.0	42.0	42.0	42.0	44.0
Location of Information Placard	Keel, below nose plate					
Location of Test Flight Sticker	Keel, below nose plate					



# OPERATING LIMITATIONS

Flight operation should be limited to non-aerobatic maneuvers, i.e. those in which the pitch angle will not exceed either 30 degrees nose up or down from the horizon and in which the bank angle will not exceed 60 degrees.

All models should not be flown faster than 46 mph

(Vne).

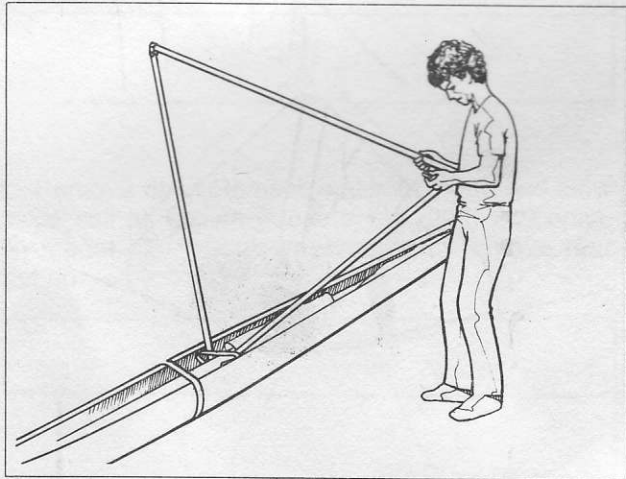
The Lite Dream is not certified for towing. Towing certification standards do not currently exist. If it is used for towing, the glider must be fitted with a factory approved towing system. Floats are recommended for towing over water.

# ASSEMBLY PROCEDURE

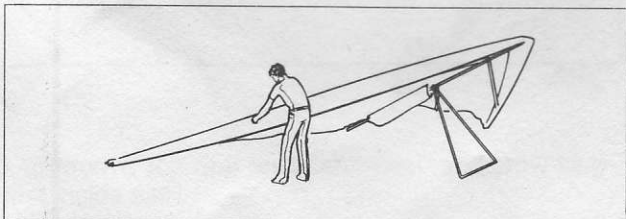
Your Lite Dream was delivered to you by your dealer. He has assembled it from its factory shipping carton and test flown it, and has shown you how to set it up for flight. The following assembly procedure is used in the Delta Wing factory, and

has proven to be very efficient. It also minimizes wear and tear on the airframe and sail. We recommend you follow the steps in order for the easiest assembly.

1. Lay the glider on clean floor or grass area and position it zipper up. Open zipper and remove middle sail tie.
2. Remove control bar bag, and assemble control bar. Make sure the wing nut is secured with a safety ring.

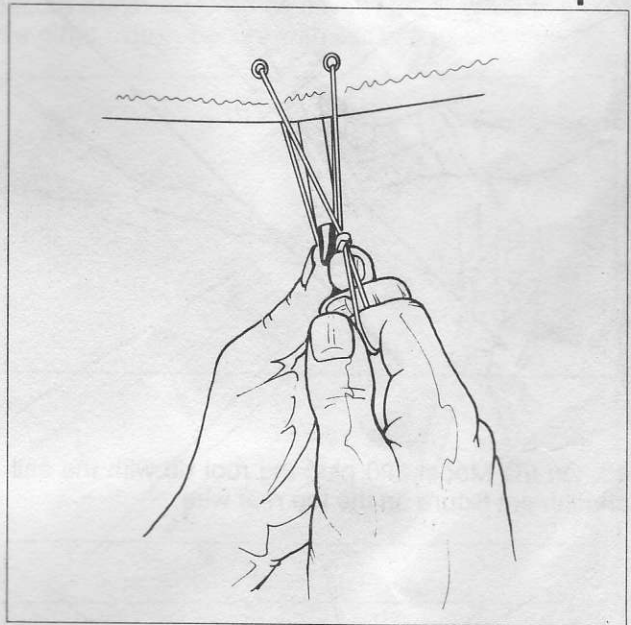


3. Lift glider onto assembled control bar and remove cover bag and remaining sail ties.
4. Open wings carefully, making sure that the sail is free and the framework doesn't bind from asymmetrical spreading. In windy conditions, position the glider so that it is pointed crosswind when the wings are spread.



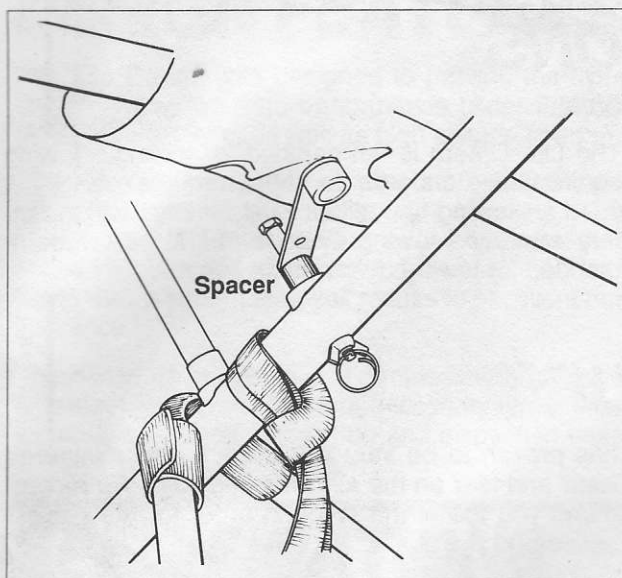
5. Mount the kingpost. Do not attach top rear wire to keel at this time.

6. Insert ribs and secure with string catch. Do not install front nose rib at this time. The ribs tipped in black are for the left side, those tipped in white are for the right side.

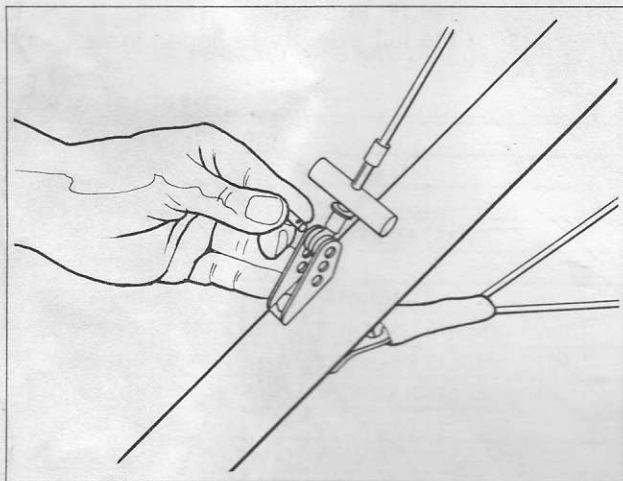


7. Install the washout struts at the tips (Models 185, 220, and 240 only).

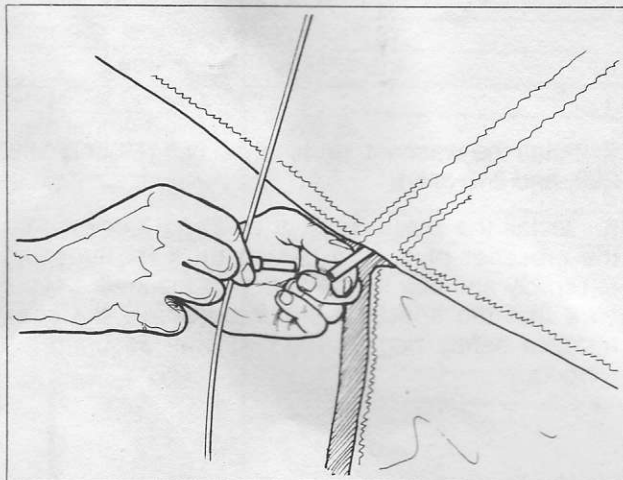
8. Install the crossbar pivot bolt and hardware on the crossbar pivot arm. Push back the crossbar assembly and bolt the pivot arm to the keel. Make sure that the spacer is mounted above the keel. Install a safety ring on the bolt after securing the wingnut.



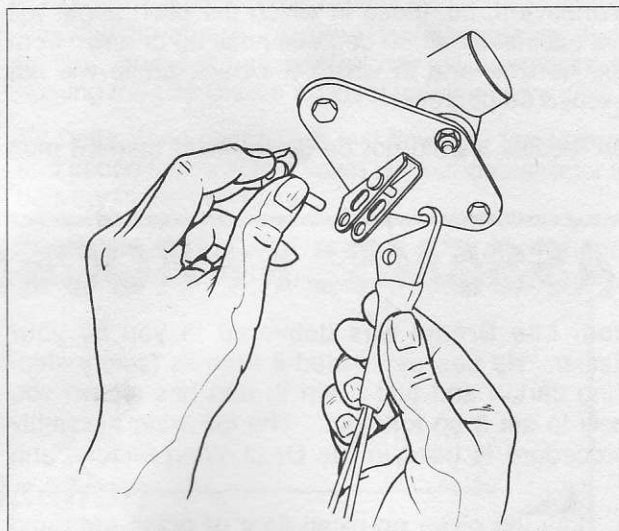
9. Attach top rear wire to keel with pin and secure with safety ring.



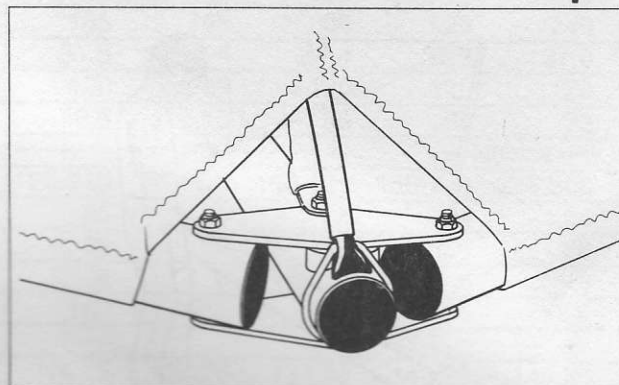
10. On the Model 220 plug the root rib with the sail attachment fixture on the top rear wire.



11. Mount lower front wires to nose plate bracket.



12. Install front nose rib, positioning tip of rib on top of the keel. Secure with bungee.

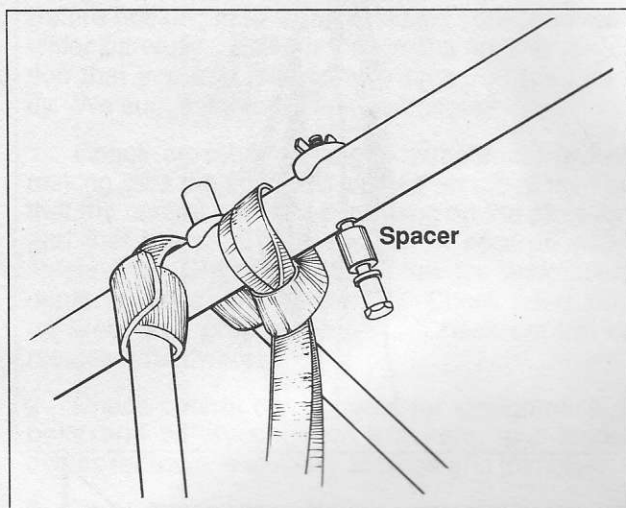




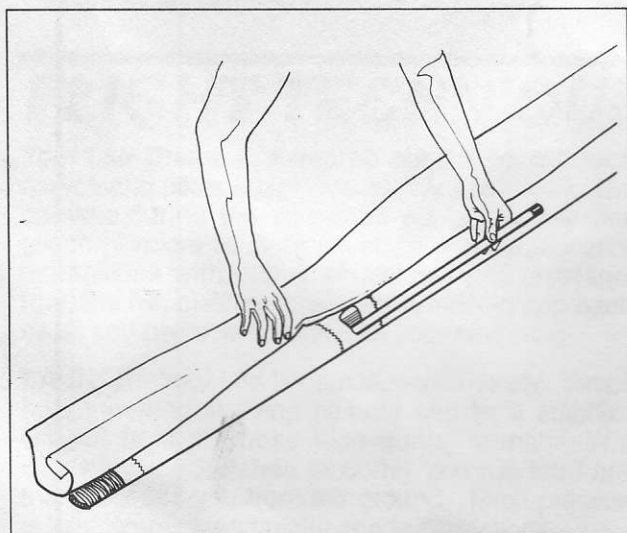
# BREAKDOWN

Breakdown is in the reverse order from the assembly procedure. Special care is recommended in folding the sail and stowing the hardware in order to minimize wear and abrasion.

1. Remove the front nose rib.
2. Release the lower front wires from the nose plate fixture.
3. Remove crossbar assembly from pivot bolt, and stow the bolt in the keel as shown. Stowing it in this way minimizes chance of sail abrasion.

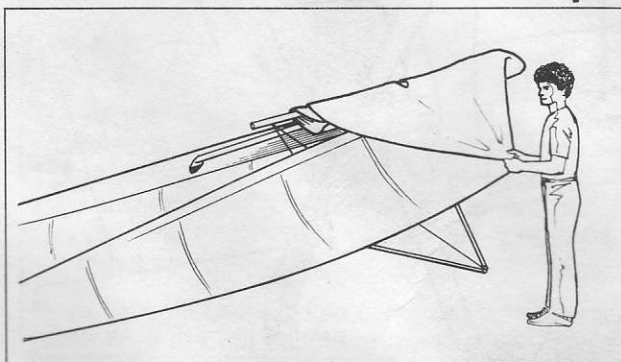


4. Remove ribs. Remove washout struts and stow inside sail as shown (Models 185, 220, 240 only). On Model 220 it is not necessary to remove rear root rib.

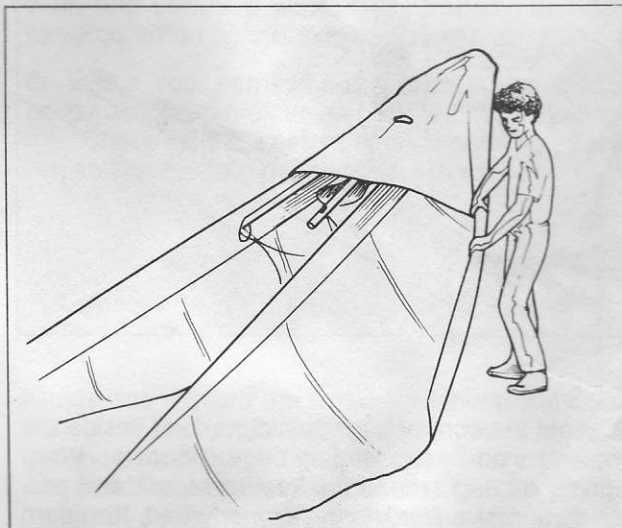


5. Remove top rear wire from keel, and stow king-post inside sail.

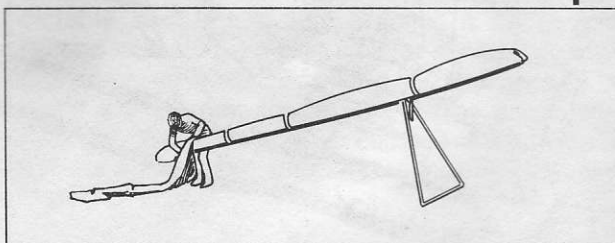
6. Fold the wings together, pulling the sail over the top of the leading edges so it does not pinch in the folding frame.



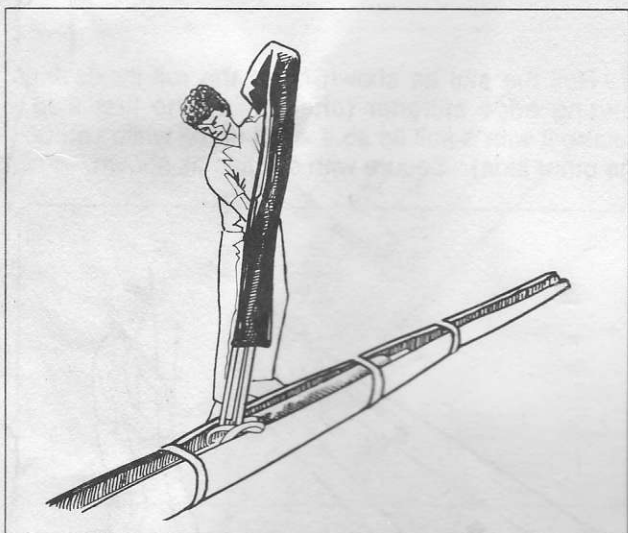
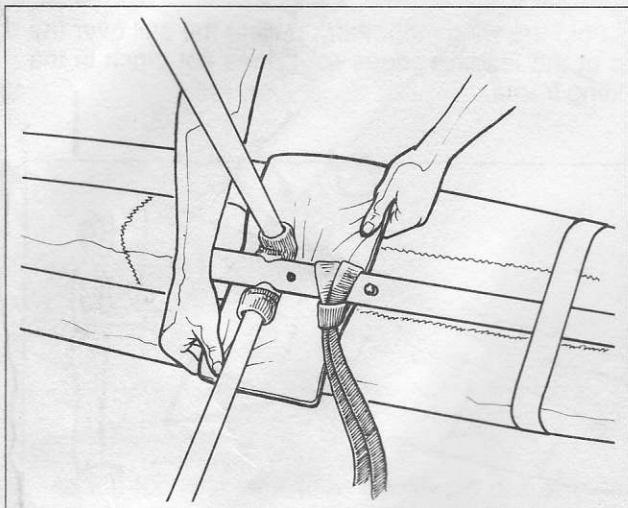
7. Roll the sail as shown, stow the roll inside the leading edge stiffener (after rolling the first side, secure it with a sail tie so it won't unroll while you do the other side). Secure with sail ties as shown.



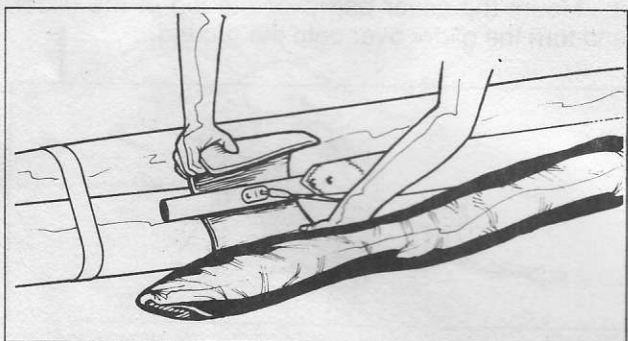
8. Mount the cover bag over the top of the glider, and turn the glider over onto the ground.



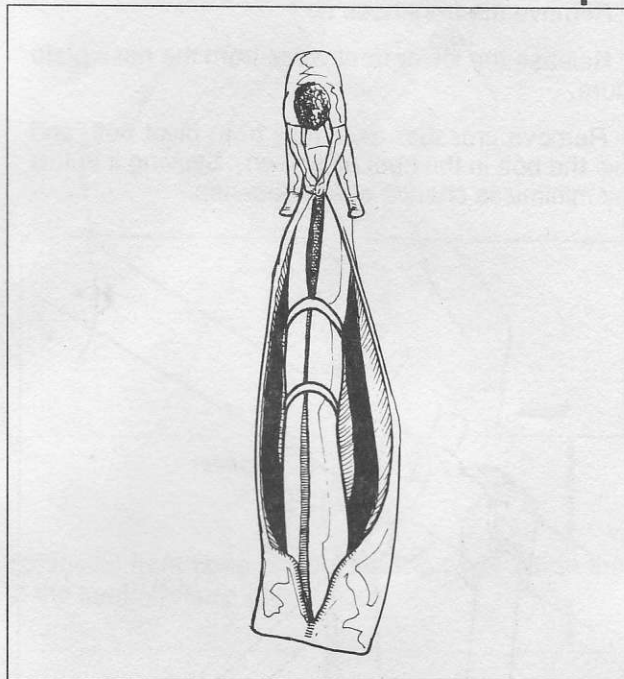
9. Install padding around keel at the control bar bracket as shown. Disassemble the control bar and cover it with the protective bag.



10. Fold the control bar against the keel, inside the "shell" formed by the leading edge stiffeners. Wrap padding on bag around the keel to secure and protect all abrasive hardware. Properly tied, the foam leading edge stiffeners enclose all hardware and wires.



11. Stow ribs in their bag and stow the bag inside the glider bag, zip it up, and carry it to your vehicle. Wipe that smile off your face!





## BREAKDOWN FOR SHIPPING

All Lite Dreams may be broken down to a 12 foot long package for shipment. The procedure consists of dismounting the sail at the tips and removing the rear leading edge tubes.

On 145, 165, and 205 sizes the rear leading edge tubes may be removed as soon as the sail is dismounted from the tips.

On 185, 220 and 240 sizes, a retaining pin must be

removed from the sleeve which joins the front and rear leading edge tubes. On the 185, this pin is located on the outboard side of the leading edge/cross bar junction. On 220 and 240 sizes the pin is located on the inboard side of the leading edge/cross bar junction; it is also necessary to remove the bolt joining the cross bar to the leading edge before removing the rear leading edge tube.

## PREFLIGHT INSPECTION

Before hooking in to launch, inspect your assembled glider carefully. Establish a routine for this inspection that you can follow every time you prepare to fly. We suggest the following procedure.

1. Check crossbar pivot arm attachment to keel, making sure the spacer is located on top of the keel, that the control bar is free to swing on the pivot arm, and that the pivot bolt and nut is secured with a safety ring. Check crossbar tubes for straightness, dents or dings, and scratches. Check hang loops for wear and proper location. Check control bar mounting hardware.

2. Check control bar uprights for straightness, all bolts and safety rings on brackets, and inspect cables for frays, especially at nicos and thimbles.

3. Check lower nose wire attachment at nose plate, making sure pin is properly seated. Sight down the keel from the nose plate to check for straightness. Walk along leading edge toward one wing tip and inspect for tears. At the junction of the crossbar and the leading edge, check cable for frays and thimble condition. Continue walking to tip, while inspecting sail condition.

4. At the wing tip check that sail is properly anchored to tip, washout struts properly installed (on 185, 220, and 240 only), and inspect along trailing edge toward root. Check that all ribs are properly secured, and that bridle lines are free. Check top of sail for wear.

5. At keel check the cable connections. Make sure bridle lines are not caught on rib tips, or tangled at top of kingpost. Continue walk to opposite tip, checking ribs and sail condition.

6. Check washout strut (if applicable) and sail attachment at tip as before, and walk along leading edge toward the nose.

7. Check the cable attachments on this side as well, and continue walk to control bar, checking cable condition on this side of control bar.

8. Check your harness suspension straps, carabiner, parachute container and bridle before putting it on. Check your helmet. Check everything. Establish an inspection routine and do not vary it.

## FLIGHT TECHNIQUE

Your Lite Dream requires no special control techniques and pilots adapt to it quickly and easily. Use caution during the transition period to any new glider. Explore its flight envelope and maneuvering capabilities with plenty of altitude and clearance from the hill, making conservative landing approaches as you become familiar with your new wing.

**LAUNCH:** Your Lite Dream launches easily. Simply hold the wing at flying attitude and let it stabilize. Do not hold the nose high during launch. With wings level, accelerate smoothly and run hard until the glider lifts you from the ground. Pitch pressure is light, so relax and make gentle corrections.

**FLIGHT:** Hands-on experience is the only way to really learn the flight characteristics of a new glider, but here are a few tips: Relax and let your Lite Dream fly itself most of the time. Use light control

forces and explore the responses to various combinations of pitch, roll, and yaw input. With adequate ground clearance try flying too slow and too fast for the conditions at hand to become familiar with the range of performance and handling. Use caution during all of your flying, but especially when exploring a new glider's capabilities. An early and orderly familiarization will pay off in longer, higher, safer, and more enjoyable flights.

**LANDING:** Your Lite Dream lands easily and predictably, and with a little practice it will become second nature to the pilot. There is no tendency to drop a tip or nose-in as long as approaches are made with normal speed followed by a firm flare. Although the Lite Dream is capable of parachuting, it is not an optimum approach to making good landings.

## TUNING

Your Lite Dream was test flown at the factory and delivered to your dealer in good flying trim. In time the sailcloth will stretch, cable thimbles will elongate slightly, and flying trim will change slightly. Adjustments may be made to compensate for slight trim variations, as follows:

**PITCH:** First check the ribs for proper shape (compare against the rib pattern in this manual). If they are correct, careful positioning of the hang strap will compensate for pitch trim problems. Always be sure the hang strap is looped around the keel and not allowed to move forward or aft from its set position on the keel between the king post and the control bar fixture. If further trim correction is required, contact your dealer or the factory. Use a back-up loop and be sure it is free in all harness positions.

**ROLL/YAW:** Prior to making adjustments, check for any twisted wires, tangs, equally tensioned ribs, and symmetrical leading edge sail tension. Make sure that the ribs are properly cambered (use the rib pattern supplied in this manual) and are matched, side to side.

## PERIODIC INSPECTION

A complete periodic inspection should be done on your Lite Dream at least twice each year, or after each 30 hours of airtime, or whenever you suspect it to be damaged. This inspection can best be performed by your local qualified Delta Wing dealer. The inspection should include the following:

1. Remove the sail from the frame and inspect it thoroughly. Repairs on tears, holes, and worn seams should be done only by a qualified sailmaker.
2. Inspect all spars for dents and scratches. Check carefully at ends of sleeves and around bolt holes for signs of damage. Replace any questionable components with genuine Delta Wing parts.
3. Inspect all cables for frays and kinks, and cable ends for elongated thimbles or tangs. Replace as necessary.
4. Inspect bolts for corrosion or stress damage. Replace worn or damaged lock nuts.
5. Check ribs for deformation.
6. Reassemble with new parts where necessary, mount sail and check for proper sail tensions. Perform a careful preflight check.

Some components require special attention:

1. The hang loops should be inspected every time you fly. They should be replaced at the first sign of wear, or at least once a year.
2. All cables, including reflex bridles, should be replaced once a year or at the first sign of wear.

If a turn persists, compensate with leading edge sail tension adjustment. To correct for a left turn, increase the sail tension on the left wing as follows: release the velcro closure on the left wing tip retaining webbing and slip the webbing off the end of the leading edge tube. Remove the tip plug extension sleeve. Remove the tip plug stop pin from the leading edge and replace it in the hole closest to the tip. Reinsert the tip plug, pull the tip retaining webbing over the end of the tip plug, and resecure the velcro closure. If more adjustment is necessary, there is probably a slight bend in the leading edge or keel, and it should be removed, inspected, and if damaged, replaced.

For stability in extreme conditions, your Lite Dream is equipped with reflex bridles (and washout struts on Models 185, 220, and 240). In flight, the bridles should be slightly slack so they do not affect normal handling or performance. Under no circumstances should they be removed, modified, or lengthened beyond design specifications.

3. The nose wire attachment hardware, control bar tubes and brackets, and keel should receive special attention after a hard landing as they absorb most of the force of a nose-in. In case of damage replace parts as necessary and carefully inspect the rest of the glider.

4. If the leading edge foam inserts seem to be losing their stiffness or dirt entrapment within the pocket is evident, they may be removed from the dismounted sail. While cupping the edges as if forming a long tube, pull firmly on the insert while the sail is held at the tip. Install the inserts in opposite fashion. Small tears in the inserts may be mended with mylar or fiberglass strapping tape, and in the case of replacement always replace both sides to keep the glider in trim.

5. Fresh water is usually sufficient for washing your sail. If further cleaning power is necessary, use only approved dacron sailcloth cleaners.

6. Dirt entrapment degrades the glider bag zipper and can make inserting ribs difficult. An occasional application of teflon or silicon spray to the zipper and ribs will reduce stickiness.

7. The sun is your sail's worst enemy, protect it as much as you can. DO NOT leave your glider assembled in the sunlight. The ultraviolet rays will quickly reduce its strength. It is recommended you replace your sail after 200 flights. The degradation of all nylon, dacron and synthetic parts by the sun is extremely rapid.



Remember the sun has the same devastating effect on your harness straps, hang loops, parachute bridle, etc. KEEP THEM OUT OF THE SUNLIGHT!!

Replace them at prescribed times, even if they look good.

If you have any questions about the maintenance of your glider, contact your local Delta Wing dealer, or contact the factory directly, either will be happy to serve you.

## HARDWARE SPECIFICATIONS

**AIRFRAME TUBING:** All structural tubing is 6061-T6 seamless drawn anodized aluminum. Material is inspected for flaws before use.

**RIGGING:** All wires are 3/32" stainless steel 7x7

cable, lower wires coated, upper wires uncoated. Two nicos per end.

Reflex bridles use continuous coated 1/16" stainless steel 7x7 cable, with single nicos.

## PARTS

**Bolts** -- All AN or AN grade

**Tangs** -- Stainless steel 304 14 ga. minimum, standard Delta Wing, single and double hole.

**Hinge Plates** -- .070" H.T. stainless steel, standard Delta Wing

**Pivot Arm** -- 1/4" 6061-T6 aluminum, standard Delta Wing

**Nose Plate** -- 1/8" 6061-T6 aluminum, standard Delta Wing

**Control Bar Brackets** -- Stainless steel, standard Delta Wing

**Nose Catch Body** -- 304 stainless steel

**SAIL:** Stabilized dacron sailcloth; weights 3.8, 5.9, and 9.0 oz.

1/4" foam used as leading edge stiffener.

