

THE UP GEMINI

Owner's Manual

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WARNING: Prior to flying any hang glider, the pilot should read thoroughly the appropriate owner's manual for complete operating, maintenance and tuning instructions. The pilot should not fly any glider unless he is rated to do so, or under the direct supervision of a certified instructor. REMEMBER, PRODUCT LIABILITY INSURANCE IS UNAVAILABLE TO HANG GLIDER MANUFACTURERS. YOU ARE REMINDED THAT YOU FLY ANY GLIDER AT YOUR OWN RISK!

UP Gemini

GENERAL OPERATION LIMITATIONS

The UP Gemini is H.G.M.A. certified as a utility class hang glider and therefore has the following flight limitations. This glider must not:

- (1) Be towed
- (2) Be flown by more than one person at a time
- (3) Exceed 30° nose up or down to the horizon
- (4) Exceed 60° bank angle left or right to the horizon
- (5) Be flown inverted or backwards
- (6) Be flown with auxiliary power unless designed, installed, and tested by the factory.

Flight operation must be limited to non-aerobatic maneuvers. This glider requires a U.S.H.G.A. Hang II qualified pilot.

The recommended pilot weight range is as follows. The figures given below include harness, helmet, clothing, vario, etc.

164 Gemini

125-200 lbs.

For this glider, the stall speed with maximum pilot weight is 23.4 mph. The top speed with minimum pilot weight is 37.5 mph.

PRIOR TO FLYING THIS GLIDER, THE PILOT SHOULD THOROUGHLY READ THE APPROPRIATE OWNER'S MANUAL FOR COMPLETE OPERATING AND TUNING INSTRUCTIONS. THE PILOT SHOULD NOT FLY ANY GLIDER UNLESS HE IS RATED TO DO SO OR UNDER THE DIRECT SUPERVISION OF A CERTIFIED INSTRUCTOR.



UP GEMINI
SPECIFICATION SHEET

Area	134	164	184
Leading Edge	17'1 1/2"	19'2 3/4"	20'4 3/4"
Keel	7'2"	8'2"	8'7"
Nose Angle	118°	118°	118°
Billow	1°	1°	1°
Weight	48 lbs	57 lbs	71 lbs
Battens	6/side	7/side	7/side
Wing Span	28.8'	32.5'	34.4'
Aspect Ratio	6.2	6.4	6.5
Pilot Weight Range *	95-165 lbs	125-200 lbs	150-230 lbs
Glide Ratio	8.5:1	8.5:1	8.5:1
Minimum Sink	210 fpm	210 fpm	210 fpm
Speed Range	14-45 mph	14-45 mph	14-45 mph
Stall Speed (Indicated) **	14 mph	14 mph	14 mph
Price ***	\$1,595.00	\$1,595.00	\$1,720.00

* Includes all flying gear: Harness, Helmet, Vario, Parachute, etc.

** Actual stall speed approximately 6 mph faster.

*** Price subject to change without notice.

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UP IS WHERE IT'S AT!

ULTRALITE PRODUCTS, 28011 FRONT STREET, RANCHO CALIFORNIA, CA 92390 U.S.A. • P.O. BOX 582 • (714) 676-5652 • TWX 910-332-1306

UP GEMINI GENERAL INFORMATION

The UP Gemini is one of the most versatile flex wings available. It is designed to be VERY easy to launch, thermal, and land, without sacrificing performance. This is achieved by utilizing fully cambered pre-formed ribs with exactly the right amount of washout to yield easy handling and a very forgiving stall. The superior glide ratio and extended speed range can be attributed to the deflexorless leading edge, the pre-formed ribs, and the minimum billow of the UP Gemini.

SUMMARY OF SELECTED FLIGHT CHARACTERISTICS

- (1) Stalling speed is 23.4 with maximum pilot weight.
- (2) L/D is 8.5 at 26 mph indicated.
- (3) Maximum speed is 37.5 with minimum pilot weight.
- (4) Acceleration from 10% over stall to 30 mph is 1.1 seconds.
- (5) Time of roll from 45 to 45 is 1.8 seconds.
- (6) Approved aerobatic maneuvers: NONE.
- (7) Positive ultimate load factor is 6 G's at maximum wing loading.
- (8) Negative ultimate load factor is 3 G's at maximum wing loading.
- (9) This glider may not be towed.

If there are any questions regarding operation, flight characteristics, or maintenance of this glider, DO NOT FLY IT! Immediately contact your dealer or flight representative for specific advice. If this is not possible, call the factory in California (714)-676-5652. Hours are 9:00 am to 5:00 pm, Tuesday through Friday.

GENERAL FLIGHT CHARACTERISTICS

AND SUGGESTED TECHNIQUES

The flight characteristics of the UP Gemini are completely straightforward. The glider has no surprises.

- (1) Takeoff: Hold the glider where it balances statically and keep that angle of attack. Give a good run. You're off! The UP Gemini is very easy to launch in both calm and windy conditions.
- (2) Thermalling: This is also very straightforward. Maintain a 10 to 50 degree bank angle depending on the nature of the thermal. The roll and yaw are superbly coupled, therefore the glider can be easily thermalled with minimum effort. The Gemini responds well in turbulence, and is not displaced easily by strong gusts. The Gemini is probably one of the least tiring gliders to fly. It simply doesn't require the pilot to make many corrections, especially after entering a thermal. Once the glider assumes the desired angle of bank, it remains without much further input.
- (3) Landing: This is a fairly simple matter. The UP Gemini retains energy quite well, but can be mushed, without a tendency to drop a wing. Relatively steep approaches can be made to a landing area or a target utilizing the mush mode. It is not recommended that the Gemini be mushed all the way to the ground. Simply set up an approach back from the intended landing area and mush down to a comfortable altitude. The glider should then be allowed to accelerate to normal flying speed or slightly above, and then ground skim into the target. It is vitally important that the pilot assume a vertical landing position with hands at least half way up the control bar downtubes so that a full flair can be achieved. Since the Gemini can be flown at a high angle of attack, a hands on control bar base tube, instead of downtube during final approach will result in the glider flying well past the pilots intended touch down point. When landing the Gemini in light wind, a full flair is required. Once the flair is begun, the Gemini's control bar should be extended as far as possible and held. In higher wind however, only a slight flair is necessary for a perfect landing.

UP GEMINI SET-UP PROCEDURE

The UP Gemini may be set up in either of two manners. The first or "upright" technique is with the control bar set in flight position at the beginning of the procedure. This allows the glider to be set up off the ground. This is acceptable in lower wind conditions, and it is effective in keeping the sail clean. In higher winds, however, the second or "laydown" procedure is preferable, in which the glider is left on the ground until ready to launch. In this procedure, the control bar is set into position last, and it prevents possible damage to the glider in the event of a sudden gust.

"UPRIGHT" SET-UP PROCEDURE:

- (1) Place the glider in its travel bag on the ground with nose into the wind. Open the bag and assemble the control bar. Note: The machined fittings at the top of the control bar have "flats" on the inner surfaces. When both downtubes are pulled out into flying position, these "flats" touch in the center, increasing the stiffness of the control bar. WARNING: BE SURE THAT BOTH DOWNTUBES ARE PULLED OUT INTO FLYING POSITION SIMULTANEOUSLY. If one downtube is pulled out before the other, a misalignment will occur inside the small stainless steel pivot box to which the downtubes are attached. This will cause the steel pivot box to be canted to one side or the other and prevent it from mating properly with control bar mount box on the keel.
- (2) Mount the control bar in the control bar mount box and secure with quickpin.
- (3) Turn the glider over and set it on the mounted control bar. Remove the travel bag. Carefully slide the center nose batten into place. When properly installed the forward end will rest on the keel, not the noseplate. NOTE: This rib is installed "tail end first" from the nose of the glider. Warning: Do not pull the nose down so that the keel only is parallel with the ground! If the tips of the leading edges stay on the ground and the aft end of the keel comes up, severe misalignment occurs. BE SURE THAT THERE IS A TIE STRAP AROUND BOTH THE LEADING EDGES AND THE KEEL (BETWEEN THE KINGPOST AND THE AFT END OF THE KEEL) WHILE INSTALLING THE NOSE RIB. FAILURE TO DO THIS CAN PUT A SEVERE BENDING LOAD ON THE KEEL JUST BEHIND THE NOSEPLATE, AND IT WILL PRODUCE FATIGUE OR POSSIBLE STRUCTURAL DAMAGE TO KEEL AT THAT LOCATION.
- (4) Remove all remaining straps holding the glider together. Slide the bridle suspension loop to the top of the kingpost, this is most easily done by sliding the loop upward with the front landing wire as the kingpost is erected the bridle loop is secured in place over the nico stop immediately in front of the kingpost head. The kingpost can now be rigged and secured as outlined below.
- (5) Carefully walk each wing out to its approximate flying position. Attach the rear landing wire from the top of the kingpost to the tang on the top rear portion of the keel. This is easier when the wings are spread, as tension is reduced on the rear landing wire. NOTE: This cable also supports the trailing edge bridles. BE SURE that the loop on the bridle is over the top of the forward landing wire and placed just above the nico stop next to the kingpost head. Check to make sure the rear landing wire is not tangled up.

UP GEMINI SET-UP PROCEDURE

(continued)

in either the bridle lines or other landing wires. Also, BE SURE THAT THE BALL LOCKS ON THE QUICKPIN ARE SECURE and cannot pull back through. Check this by pulling on the quickpin.

- (6) With both wings extended and keel and wingtips resting on ground, insert the battens and secure the batten tensioners. Insert the battens in sequence from wingroot to wingtip with a gentle pressure, until each batten meets slight resistance, then lift sail at trailing edge and gently shake in order to billow it. This enables the batten to be completely eased into place over the crossspar. DO NOT FORCE! The battens are secured in the rear by a loop of 205 braided nylon line that also has knotted into it a small finger loop to pull with. The method used to tension the batten is as follows; first attach the end of the large loop opposite the pull loop around the plastic batten end. Next, insert a finger through the small loop and pull the large loop back again around the batten end a second time which will put full tension on the batten and sail.
- (7) Install the straight "tip tensioner batten". To install it properly, look through the leading edge pocket at wing tip and guide the batten end with round black ball into the leading edge batten receptacle.
- (8) Swing the defined or "fixed tips" out into position, insuring that they are seated properly against stop. The bungee material will hold the defined tip in place during flight.
- (9) Remove the wingnut, bolt, safety pin, and standoff from the keel just ahead of the control bar mount box. Pull the crossspars back to position and replace the 5/16" bolt into the keel from the bottom. Next put the standoff on the 5/16" above the keel and attach the crossspar pivot tang just above the standoff. Now secure the wingnut and safety pin. Do not overtighten the wingnut or the pivot tang will not be free to move. Overtightening the wingnut can cause difficulty in initiating turns.

KING POST: Check the stainless steel bottom fitting and make sure it is not bent. Check the heart bolt. If it's bent, replace it. Check the plastic king post head. Replace with aluminum retrofit if any cracks are evident.

ALTERNATE OR "LAYDOWN" SET-UP PROCEDURE

The only difference in this procedure is the point at which the control bar is placed into position in the control bar mount box. After the control bar is assembled it is not fitted as in step #2 in the "UPRIGHT" set-up procedure, rather it is positioned after rotating the fixed tips into place in step #8. Thus the glider can be placed back on the ground in case of windy conditions simply by removing the quickpin in the control bar mount box and lowering the control bar and glider to the ground. The first seven steps are the same except as noted above. Then continue with step #8.

- (8) (Continued) Fitting the control bar is the next step. In winds over 15 mph, UP recommends that the glider be left on the ground until ready to fly. This will eliminate any possibility of damage to the glider from blowing over. It only takes a few seconds to lift the Gemini up and insert the top of the control bar into the mounting box, so leave the glider safely on the ground until you are ready to fly. To fit the bar, lift the glider by the nose and step under it using hands and shoulder to support the keel. Pull the control bar forward with your foot until the rear flying wire cables are taut from control bar to keel. Then rotate the apex of the control bar upward until the pivot box at the top of the control bar mates with the mounting box on the keel. Use one foot on the control bar base and a shoulder on the keel. Insert the quickpin, fastening the two assemblies together.

Note: The control bar quickpin may be inserted immediately prior to tensioning the crossbar (or removed immediately thereafter when breaking the glider down) to provide easier access.

UP RECOMMENDS THAT THE QUICKPIN BE LEFT OUTSIDE THE CONTROL BAR MOUNT BOX WHEN THE GLIDER IS STORED IN ITS BAG IN ORDER TO PREVENT THE POSSIBILITY OF DAMAGE TO THE SAIL AND THE "T" HANDLE DURING TRANSPORT.

UP GEMINI TUNING INSTRUCTIONS

Slight turns are tuned out of the UP Gemini by using one of three techniques. Usually performing the first method alone will solve any problem. If not, these three methods should be performed in the following order:

- (A) Batten Tension: Subtle turns are tuned out of the glider by tightening the batten pocket ties on the side of the sail to which the glider turns. This slightly reduces the twist (washout) in that wing thereby minimizing drag on that side of the wing.
- (B) Sail Tip Tension: This technique will correct only very subtle turns. Asymmetrical sail tension can cause slight turns. Note that the knots tied at the tips of the leading edges all slip slightly on the first flights. This is because the loads on the sail are much greater in flight than when the glider is first set up in the shop. After the knots have slipped and are "set" they won't move anymore. Sometimes, however, the knots don't slip exactly the same amount, causing one wing to have slightly more twist than the other. The result is a slight turn. The turn can be tuned out by decreasing the sail tension on the side to which the glider turns, or by decreasing the sail tension on the opposite side. The correct amount of tension can be determined by breaking the glider down to a point where all the battens are removed and the leading edges are folded in with no straps or ties around the glider. By pulling on the tip of the sail as hard as you can, you should be able to pull the sail tensioning loop about 5/8" to 7/8" past the point where it sits on the hat washers. The loop should come almost to the end of the leading edge tube.
- (C) Asymmetrical Batten Bending: If the glider still has a turn after performing "A" and "B" of this section, the two tip battens should be slightly recambered. Do this only as a last resort. Twist in the wing can be controlled by the amount of camber in the last wing tip ribs (excluding the straight "tip tensioner batten"). Slightly increase the camber in the tip battens on the side to which the glider turns, 1/4" - 1/2" difference at the high point of the airfoil section (ribs). Since the trailing edge is supported solely by the ribs, increasing rib camber actually lowers the trailing edge, thereby reducing the twist in that wing.

Pitch trim is accomplished by simply moving the hang loop forward or aft on the grip tape which is on the keel. Stock position is right in from of the kingpost. If one desires the glider to fly slightly faster, one simply moves the hang loop forward.

UP GEMINI PREFLIGHT PROCEDURE

The nature of the UP Gemini is such that most of the preflight checkpoints common to other flex wings are obscured in the design process of eliminating parasitic drag. A thorough preflight procedure is mandatory with all aircraft, however, and the best technique is a circular walk around the glider.

Start at one location the noseplate, for example, and check each assembly point available for inspection. Keep in mind that the TWO MOST CRITICAL set-up factors are the small quickpin that secures the rear landing wire from the top of the kingpost to the tang on the keel and the 5/16" bolt that secures the crossspar pivot tang to the keel. As stated in the set-up procedure, BE SURE THAT THE BALL LOCKS ON THE QUICKPIN ARE SECURE AND CANNOT PULL THROUGH.

A general outline of a preflight would be to sight the leading edges from the noseplate. Walk toward the tip, feeling the tubing along the way. Check the knots and condition of the tension line where the sail is attached at the wingtip. Check the battens to make sure that they are properly secured. Check the bridle attachment points, both at kingpost and trailing edge grommets. Be sure that bridle lines are not wrapped around batten ends, and that no other entanglement has occurred. Check the control bar for proper assembly and installation of safety pin through the bolt at the bottom corner. Are all flying wires in good shape? (No kinks or tears in coating, twisted thimbles, etc.) Check the plastic king post fitting at top of the king post. If any cracks are present, DO NOT FLY! Call your dealer for retrofit keel pocket head instructions.

GEMINI BREAKDOWN

Gemini breakdown should be done in reverse of the set-up procedure. Again, the "T" handle quickpin should be left free of the control bar mount box when the glider is stored in its bag, to prevent the possibility of damage.

SEMIANNUAL INSPECTION

Every few weeks or after every 20 hours of flight, take a much closer look at the components of the Gemini. Check for wear on bridle lines and tension lines at the tips. Very carefully check the crossspar pivot tang and the bolt at each end of it. These are moving parts and will eventually show wear. If there is any visible sign of wear, replace the part. Basically, take extra time to examine your glider, and replace anything that is worn.

UP GEMINI - MAINTENANCE (Continued)

SPARS

Examine your spars for dents, wear spots, corrosion, and bends during every pre-flight check. To maintain the structural integrity of the spars on your glider, always use a well-padded glider rack on your support vehicle. Ideally, the rack should support the glider in three places over the entire length. If a glider has been cared for poorly, the spars should be replaced.

HARDWARE

- (1) For all practical purposes, Ultralite Products' hardware is indestructible in hang gliding (flight) applications. "AN" bolts, however, are not indestructible and bending them even in light crashes is common. Check them periodically to be safe. Discard and replace any bent bolts. Use the "washout tip template" on the last page to check for possible damage to the "fixed tip receptacle" fastening bolt. This bolt can be bent if the glider has been poorly ground handled, blown over, or landed on a tip. If this bolt is bent it should be replaced BEFORE the glider flown again.
- (2) All bolts, of course, should show exposed threads above the locknut during preflight.

BATTENS

When inserting battens, place them in their pockets smoothly and gently to avoid wear on the sail and on the batten ties. Pushing them rapidly into the pockets on an angle will wear out the stitching on the edge of the pockets, not to mention possible damage to the sail itself. It's not a bad idea to occasionally feed some talcum powder into the batten pockets. This will result in smoother batten installation.

TRANSPORTATION

- (1) Supporting the glider with a sturdy well-padded rack will really pay off. As stated earlier, a three-point support system is ideal.
- (2) Use the travel bag. Take the extra minute to roll your sail carefully.

UP GEMINI - MAINTENANCE

Your new UP Gemini will require very little in the way of maintenance if you care for it properly in your day-to-day use. Here are some general points to follow in maintaining your new Gemini.

SAIL

- (1) If you must wash the sail, wash it with a light detergent only. Better yet, wipe the sail down frequently with a soft, damp, cloth and that will keep detergent washing to a minimum.
- (2) Acetone or white gas can be used to remove stubborn stains without harming the sail.
- (3) Rinse very thoroughly after cleaning with any detergent or solvent.
- (4) To renew the luster of Dacron, you can use a product called "Sail Bright", available from marine hardware stores.
- (5) Apply repair tape to any rips or tears in your sail. This will prevent fraying on the edges where the tear is located. However, do not worry about small tears continuing unless they are located at stress points.
- (6) Keep an eye on all the grommets and all areas of the sail that take extra abuse.
- (7) The best thing that you can do for your sail is to always use the bag. Do not transport your glider atop an auto even for short distances without one. Keep your Gemini covered when not in use. (Long exposure to sunlight is very damaging to most synthetic materials like Dacron, Nylon, etc.).
- (8) Be careful and precise when you repack your glider after each flight. KEEP ALL OF THE LITTLE PIECES OF FOAM PADDING that arrived with the glider when it was new; tie everything off the same way. A few extra moments when you take down the glider will give you untold hours of noiseless flight.

CABLES

- (1) Naturally, any frays or kinks in your cables should be examined with great care and any frayed cables should be replaced immediately.
- (2) Many expert pilots replace their flying wires every 75 hours regardless of wear. It's not a bad idea. Each cable has a breaking strength in excess of 800 lbs. Actual non-aerobatic in-flight loads seldom exceed 100 lbs. Inspect the thimbles. If elongation is evident, 300-400 lbs. load has been applied to the cable, usually resulting from a crash landing. If you fly around salt air or water, look very carefully at the cable, nicos, and thimbles for signs of corrosion. If you must constantly set your glider up and break it down in rough, rocky areas, you will need to replace your cables more frequently than someone who flies the dunes. Use your best judgement. Those cables hold your frame together!

ULTRALITE PRODUCTS

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RANCHO CALIFORNIA
CALIFORNIA 92390 U.S.A.
(714) 876-3652

Material Mylar, cardboard, or other stiff material

Finish —

Drawn by *L. Brown*

Date 3-18-81

PART Wash-out tube template

PART #

Place this edge along bottom of keel

