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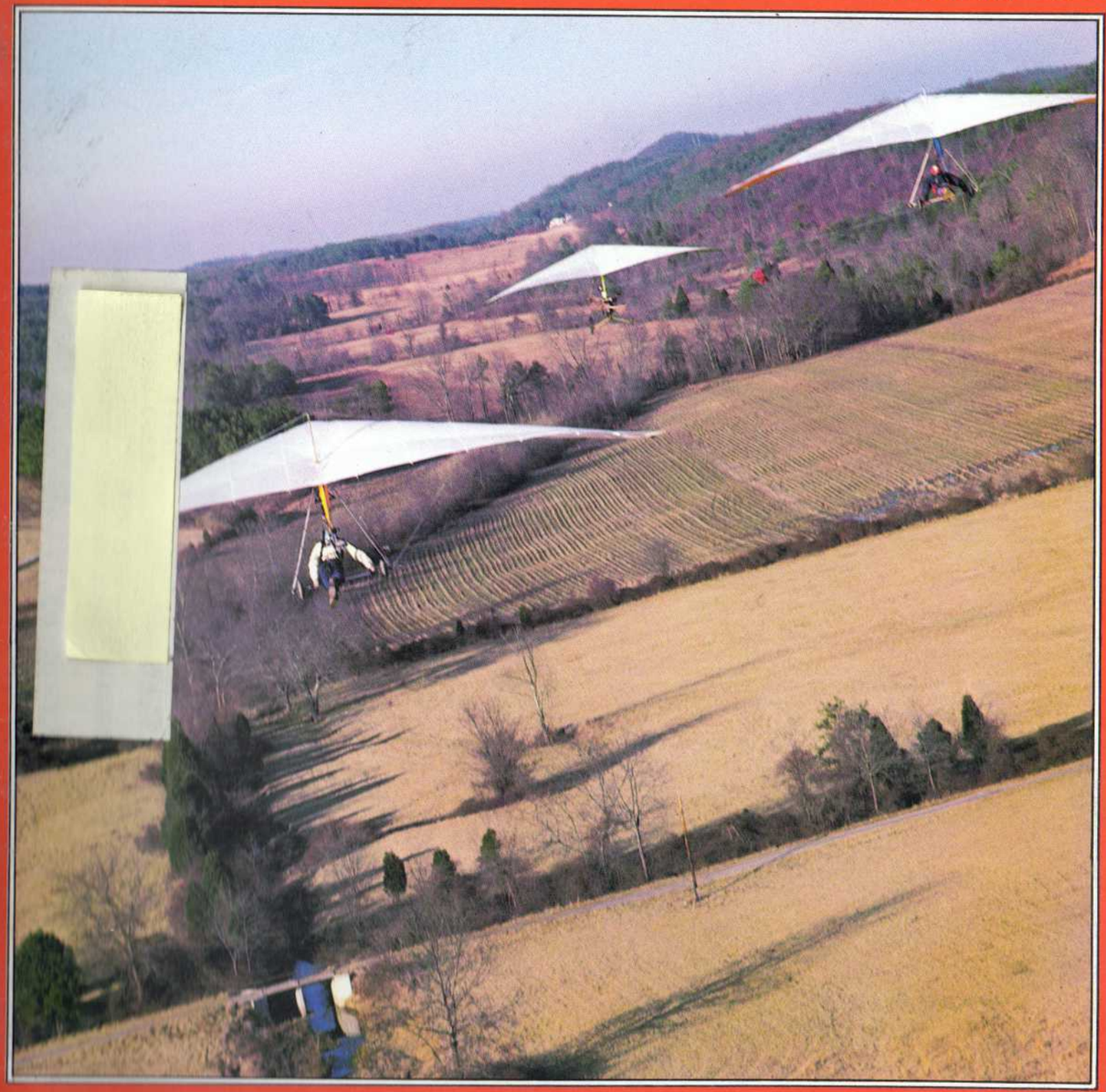
AERO TOWING — A LA FRANCE

WHOLE AIR

The Magazine of Hang Gliding and Ultralight Soaring

MARCH 1984 — $2.50



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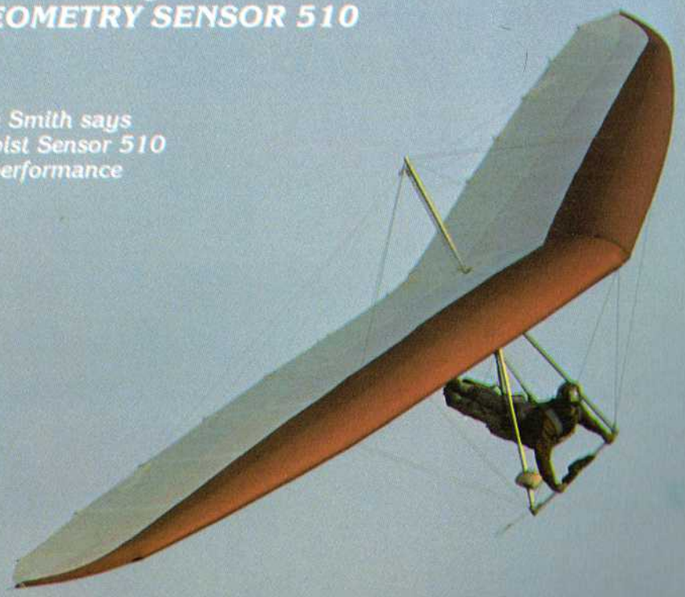
THE "CROSSBOW," A UNIQUE CANARD & TAIL GLIDER

BREAKTHROUGH IN HANG GLIDER PERFORMANCE

Introducing the new in-flight
VARIABLE GEOMETRY SENSOR 510

Champion pilot Stu Smith says the new variable twist Sensor 510 offers world class performance for glider pilots world-wide.



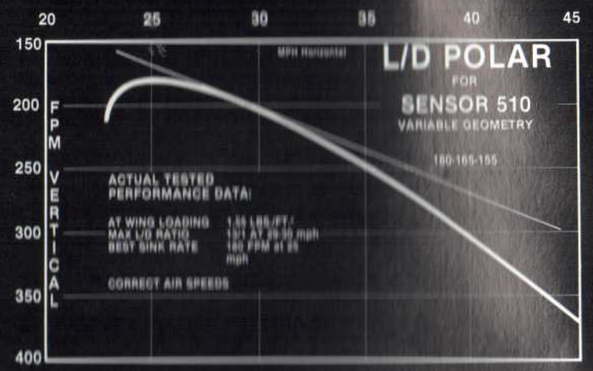
Significant improvements in performance and handling are available now on the in-flight variable twist Sensor 510. Seedwings knows that the most important aspect of hang glider performance today is drag elimination and low twist. In-flight variable twist, improved wingtip camber, mylar trailing edge cloth and additional ribs in the airfoil combine to produce a significant performance gain over other high performance gliders.

The variable geometry system allows Sensor pilots to change from easy handling to super performance with low twist. Once the pilot has cleared launch he can steadily tighten sail tension to improve performance in thermal climb as well as intra-thermal straight-line gliding.

The highly evolved Sensor has been developed, flight and vehicle tested by Seedwings for over a year. The Variable Geometry Sensor 510 is ready for you. It's the best ever made.

Prices start at $2295. Call for the Sensor representative nearest you. Dealer inquiries are invited.

MAX L/D = 13/1 Measured



Seedwings, 5760 Thornwood Drive #3 • Santa Barbara, CA 93117 • (805) 967-4848

"Now It's Possible to Maintain Your Skepticism And Still Be Seduced By a Trike . . ."

During the past 1983 season, literally thousands of European pilots of all skill levels got introduced to and adopted an entirely new way to reach cloudbase and go cross-country . . . the SKYLINES aero towing system. Its safety record? . . . 100% perfect.

This 1984 season in America, the introduction of this proven and complete soaring tool is without a doubt creating the beginning of a new era for our sport, hang gliding.

With an engineering design and finish you can be proud of — over three years of trike manufacturing went into designing the most reliable and affordable two-seat training and aero towing system available in the world today.

GLIDER FEATURES

- 211 square feet, tested in Germany to 3 times greater than HGMA requirements for a single-place flex wing hang glider.
- A quick, simple set-up procedure.
- Deformation-free hard-alloy 7075 preformed ribs.
- Mylar-faired nose section.
- 40% lower drag, due to the Torpedo kingpost system.
- All nyloc nuts secured with Locktite.
- Mylar/sandwich cloth sail tip section.

TRIKE FEATURES

- Rugged but comfortable two-seat trike.
- Folds down to trunk size in just seconds.
- Vibration-free (Lord mounts) for engine mounting, and glider-to-trike connection (also offers yaw dampening).
- 440 cc/50 hp powerplant, developing 330 pounds of thrust.
- Two throttle controls — foot pedal for precision flying and over-ride hand-operated "cruise control" throttle for safe and effective back seat instruction.
- Both electric and pull starters.
- Front wheel brake.
- Front wheel suspension.
- All nyloc nuts either safety wired or secured by Locktite.

To insure the safe introduction to the American pilot, SKYLINES is requiring attendance at a factory-sanctioned training clinic. The factory currently offers training and service centers on both east and west coasts.

For further information, contact:

SKYLINES ENTERPRISES Ltd.

SKYLINES — CALIFORNIA
P. O. BOX 4384
SALINAS, CA 93912
408/422-2781

SKYLINES — EUROPE
LA MOUETTE
·33· (80) 56-66-47
Telex #350-053

WARNING
U. S. Patent Number 8219419, issued November 18, 1982 *will* be strictly enforced.

WHOLE AIR

ISSUE NO. 34, VOLUME NO. 7, NO. 1, 1984

PILOT'S PERSPECTIVE

FEATURES

AERO TOPICS

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NOTE TO READERS & SUBSCRIBERS: This issue is titled MARCH 1984. It replaces the cover title of January/February, but represents a change in *title only*. The subsequent issue will be titled MAY 1984, and the balance of this years issues will be titled JUNE, AUGUST, OCTOBER, and DECEMBER. This title change *does not* signify any change in subscriber's copies per year, nor value received for payment.

"Is it a tow vehicle? . . . or is the glider just that heavy?"

Volume 7, No. 1, 1984
ISSUE NO. 34

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Dan Johnson

On The Cover:

A first in American towing views is seen, as Cliff Whitney (riding passenger in one two-seat Cosmos trike) captures Jean-Michel Bernasconi tugging Gerard Thevenot (forward glider) and Mark Airey (rear) in a dual tow to 1500 feet.

Publisher's Column

It's a new year in hang gliding, and hope for significant improvement abounds. Since our last (Dec 83) issue went to the printer, two potentially valuable meetings have been held. The so-called Revitalization Conferences met in mid-November and early January.

A substantial turn-out of California businessmen was represented at each occasion. Due to the distance, and the uncertainty of fruitful progress, no businesses outside of California were represented, except for *Whole Air*. As initiator of the first conference, I attended hoping to offer my two ideas, and as a sort of self-appointed representative of eastern businesses.

At this time, no concrete action has taken place. But two plans are on the table, and perhaps more importantly, the once-defunct *Hang Glider Dealers Association (HiGDA)* has been re-fueled. Another program calls for an effort to develop generic TV spots in 30 second, one minute, and three minute segments. The idea here is to generate a positive *"Try Hang Gliding"* promo that could be used by retailers in all locations. The vast expansion in cable TV networks — 9,000 channels are forecast by 1990! — offers tremendous opportunity to approach these broadcasters for freebies. And if the retailer can handle the cost, the spots could also be used for paid ads. Television's "reach" is considered the greatest of all media, and perhaps that will aid our sport.

The second idea on the table is for a group of retailers and manufacturers who recognize the value, to retain a professional publicity man. This agent has high quality contacts with hundreds of "major media" publications, and has the methods to place hang gliding in front of the public's eye with frequency, and to an enormous audience. Print media is better if you wish to target specific groups of people. The cost is not unreasonable if say 20 schools and 5 manufacturers will incorporate to share the costs. Of course, their businesses will be the ones who will receive the benefits of this effort (as they funded the cost). All articles will have a "contact address" and when readers write or call, the closest retailer will be recommended, and a literature package can be sent which includes all 25 (or more) firms.

Both plans are steps in the right direction I think, which when pursued *with* a goal of greater professionalism, *and* renewing USHGA's membership roster, *will* help our sport's economy.

Whole Air also has some new plans. In addition to a 1984 enlargement of our newsstand and bookstore sales (to over 900 possible outlets) . . . we are planning a name change, graphic improvements, and general appearance enhancements which we expect will cause many more would-be pilots to select *Whole Air* on the magazine rack. This of course, helps us, but also helps everyone who advertises, and generally will help in telling more of the world about hang gliding.

Probably with our 6th Anniversary May/JUNE issue, we will change titles to *Ultralight SOARING*. Capitalizing on the current popularity of (powered) ultralights — as well as more correctly accomodating future technological developments — we will make the magazine's cover more "Buy-This-Magazine" oriented. We'll still be *Whole Air* inside, content-wise, but need to better compete with those thousands of other magazines on the display racks.

We will also call our issues by one month name only. This is another newsstand maneuver. Like this March issue, the rest will be May, June, August, October, and December. No changes in mail dates or the number of issues received per year will result, however.

Further yet, *Whole Air* is increasing its "creative budget" to permit larger payments to writers and photographers, in the direction of obtaining higher quality reading and viewing. We've also retained new "staff writers" who will help us more completely cover the sport, world-wide.

Just like USHGA, *Whole Air* will need more support to achieve these goals. Please assist us by recommending a friend subscribe (special offer on page 31), or running an ad in one of our many ad sections (we've something for all budgets).

Here's to our sport "havin' a good one in '84!"

Thanks,
Dan Johnson

FORUM

Ups & Downs of the December Issue

Dear Editor:

I have just read your December issue. Your cover picture is beautiful; I think it's the best you've ever had.

Your editorial is self-congratulatory and inaccurate. The USHGA Board of Directors was discussing the issue of stagnation in hang gliding three years ago, and not everything being done today in the industry to try and reverse that trend is a response to your editorials of recent months.

You are correct to point out that Wills Wing supplies only one hang loop on our gliders. It has been tested to 10,000 pounds. It is, according to our tests, two and one half times as strong as the most commonly used locking carabiner (of which most pilots use only one), and approximately five times as stong as the rest of the glider. It does not require any special skills (knot tying) on the part of the pilot to use safely. We offer it in any length specified by the pilot to eliminate the need for makeshift suspension systems.

Terry Ferrer, in his article on the Nationals, refers to Chris Bulger four times as the 1983 USHGA National Champion. Rick Rawlings is the USHGA National Champion. Chris Bulger is the winner of the Nationals in the World Class.

Keep up the good work.

Mike Meier

Our editorial may have indeed seemed as though we were patting ourselves on the back. But we disagree it was "inaccurate." We never said we were the only ones to speak of decline. And we spoke positively of reform happening because of the efforts of many people, not just ourselves. Still speaking out is usually a beneficial thing, just as receiving criticism can help one "grow." We appreciate hearing all comments as it aids in our keeping proper perspective. —Ed.

Dear Editor:

In *Whole Air* of Sep/Oct 1983 (No. 32, Vol. 5, No. 5, 1983), you mistakenly listed one of the pilots who flew 132 miles from Horseshoe to Mina as Rick Schuster.

It was actually *MIKE* Schuster who made that flight, and who was understandably disappointed at being incorrectly identified. Perhaps a note of correction might be possible? After all, it was nearly as far as the world record — at least for one day!

Thank you.

Dana Schuster

Dear Editor:

Re: December '83 issue, page 8. The Shop, Hawk Airsports, conveyed concern about backup polypropylene and I would like to say that I also don't want students to go out and use polypropylene for their hang loops because they saw me do it.

I won't offer any excuses for flying with polypropylene. I will say that I haven't used it since January 1983, and that I won't use it in the future.

As far as locking carabiners being weaker when upside down, I fail to see how, when a tensile force is placed lengthwise on a carabiner, that the strength of the carabiner is affected by its relationship to the horizon.

Yours truly,

Chris Sali

Dear Editor:

Doug Hildreath, what is a "backyard instructor?" If my definition is used, I would have to come to the conclusion that backyard instructors are not needed at all. My impression of a backyard instructor is, in general, [that] they have little of no training in how to instruct in hang gliding, they don't update the little knowledge they do possess, they teach on improper-to-dangerous equipment, and they usually stop being an instructor well before the student's judgement has caught up with his newly attained skill level.

What we do need is more professionals, or professional-thinking people. The sport of hang gliding has long been considered a backyard sport, and that reputation is killing the industry. We must be accepted by the general community as a mainline sport, as an accepted recreational activity, and that can only be accomplished through professionallism.

Teaching out of a home is fine, but backyard instructors are not.

What is my definition of a professional instructor? One who is competent, informed, trained, and acts that way.

Jim Shaw

Though we doubt Hildreath meant to imply anything imprudent like the expansion of unprofessional instructors, we certainly do value Shaw's perspective. Jim's experience at delivering the Wills Wing Instructor Certification Program all through 1983 gives him insight few others have. We can only hope Shaw continues the high caliber efforts, AND we can hope Hildreath (and his fellow Directors) will continue their dedicated work, for we believe that only as a unified group can the sport of hang gliding make quality and lasting improvements to our image. —Ed.

Dear Editor:

Hi. This is just my idea for attracting new people to hang gliding.

Most of the ski resorts are desparate for business in the summer. As a result some of them have put in Alpine Slides, tennis courts et cetera.

Since the average hang gliding shop could not afford a simulator like used at Crystal Mt [sic, actually Raccoon Mountain], I think someone should approach the ski resorts with the idea.

Its operation could be run by a local hang glider shop and both would benefit.

Has anyone tried this?

G.H.
Northglenn, CO

Checking with the folks at Raccoon Mtn., we found several shops have inquired about their purchase and use of a Simulator like that at Crystal Air Sports. Several of these shops have bought a video tape which presents the idea, by example of a typical lesson.

To-date, no other Simulators are in use, but perhaps you are right, that many feel they cannot afford it. Very possibly, you have an excellent idea, and it is possible some shop may accept your challenge.

As a point of information, however, the cost of erecting a Simulator such as Crystal uses, is quite inexpensive. Apparently, less than $15,000 will build the necessary components. The problem lies with the amount of land needed (100 feet wide, 800 feet long, and with some slope; 6:1 has proven very workable). All this makes your idea sound more feasible.

Other readers with ideas are welcome to send them in to Whole Air. *We promise to print all usable ideas which might help our sport grow, and be more easily accessed by the public. —Ed.*

ADVERTISER'S INDEX

INDUSTRY NEWS

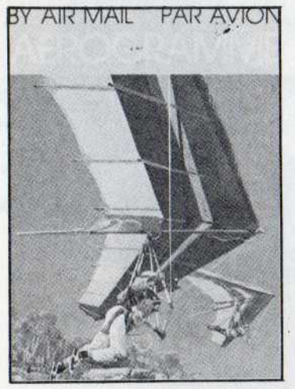
Australian Aerogramme Features Hang Gliding

One subscriber letter again proves the proverb that a picture is worth a thousand words.

It's nice to witness the attention Australia pays to the sport of hang gliding. The launch scene is reproduced in full color on the light-weight Aerogramme.

Pictured are Moyes (foreground) and UP (rear) gliders of significantly more recent vintage than ad agencies typically use (we'd say circa 1982).

Thanks to Alan Tolley of Parramatta, Australia for his subscription and this item of interest to *Whole Air* readers.



Himalayan World Hang Gliding Rally Announced

The Western Himalaya Hang Gliding Association takes great pleasure in announcing the First Annual "Himalayan World Hang Gliding Rally," to be held in the Kangra Valley of Himachal Pradesh in northwest India, May 26 to June 10, 1984. Pilots will launch from almost 8,000 feet above sea level in the foothill range of the spectacular Himalayan Mountains. The vertical descent will be 3,000 feet.

The Himalayan Rally will be one of the premier money tournaments of the 1984 competition season with a total promised purse of $15,000. It will be sponsored jointly by the makers of Four-Square Cigarettes, Air India, the government of Himachel Pradesh, and the Department of Tourism of India.

Confirmations have been received from such world-class pilots as Steve Moyes (1983 World Champion), Chris Bulger (1983 U.S. Nationals "World Class" winner), Josef Guggenmos (1979 World Champion), Gerard Thevenot (past French National Champion), and Larry Tudor (current World Distance Record holder -- unofficial). All other pilots from around the world, of intermediate flying ability or better, are invited to compete. The entry fee for early registered pilots will be waived.

The Himalayan World Rally will be directed by past Director of Competition for the U.S. Hang Gliding Ass'n, Keith Nichols. Nichols, the 1976 U.S. National Champion, will be bringing his experience and expertise as both a competitor and an administrator to India to produce what promises to be the most spectacular hang gliding tournament held to date.

The Rally organizers have put together a package arrangement that will include all ground transportation, hotel accomodations, and all meals for the sixteen day period. Air India will be carrying competitor's hang gliders at no extra charge.

The Indian government requires all competitors to fill out a form to help waive any entry restrictions that may come up. This form should be completed as soon as possible and returned with six passport-sized photos immediately. Interested pilots are urged to contact the following officials at their earliest convenience.

IN THE USA:
Keith Nichols
Apt. 12-N
160 West End Av.
New York, NY 10023

IN ENGLAND:
John Bowman
16 Boundary Road
Normanby; Middlesbrough
Cleveland TS5 7HA
ENGLAND

IN INDIA:
P. C. Sarin
Convener & Sec'y Gen'l.,
W.H.H.G.A.
S.C.O. 60, Sector 17-A
Chandigarh
INDIA 160 017

Tennessee Tree Toppers Announce Two Contests

For: Region 10 Pilots

The Tennessee Tree Toppers invite you to the 1984 Tennessee Tree Topper Regional Opener on March 17, 18, and 19, 1984.

The tasks are designed to test your cross-country skills and to utilize the excellent cross-country potential of the Sequatchie Valley.

A pre-registration party at Henson's Ramp will be held on the evening of Friday the 16th. Registration fee will be $25.00, which includes the Saturday night dinner and beer.

Come to fly and come for fun!

Meet Director:
Gary Engelhardt
Information: 404/398-3678

1984 TTT Classic

The Tennessee Tree Toppers will be holding their 1984 Tennessee Tree Topper Classic during a period beginning Sunday, March 11th through Sunday, May 20th. The format is a weekly one-on-one contest where you and your opponent select the time, place, and task.

Registration and pilots meeting will be held after the TTT Club meeting on Saturday, March 10th at the Chattanooga Nature Center at Reflection Riding.

Registration fee will be $10.00, with Awards Ceremony and prizes presented during the annual TTT "Mayhem" fly-in (dates still to be announced).

Organizers guarantee fun and a good time! For more information, call 404/398-3678 (*not* a long distance call from Chattanooga).

Airwave USA Retains Bulger, Brown, & Whitehill

Airwave Gliders of England announces the establishment of Airwave Gliders USA. Coordinating dealer network and promotional events are Chris Bulger and Ken Brown. More recently Paul Whitehill has joined the two to aid in the development of aero towing, which will be marketed itself, as well used to demo the Magic III built in England by Airwave Gliders.

Winner of both the US Nationals [in World Class] and the Masters of Hang Gliding, Bulger is ranked in the top ten in the USHGA Competition Points System. Chris recently won the South African Nationals as well. As a member of the US World Team, Chris shall bring his great knowledge of the hang gliding market to Airwave Gliders USA as well as his powerful competition record.

While working for both Flight Designs and Delta Wing Kites as a Sales Representative, Ken Brown developed a professional out look on today's hang gliding industry. Brown, winner of the 1983 Ft. Funston and Marina Races, is currently in the process of working with the HGMA on certifying the Magic III design.

Paul Whitehill, formerly of Flight Designs, made significant progress on aero towing behind that company's Jetwing trike.

For information regarding the planned towing and Magic III demonstrations, write to: Airwave Gliders USA, P.O. Box 1153, Mercer Island, WA 98040.

Delta Wing Hosting Parachute Seminar Series through April '84

Delta Wing Kites & Gliders is pleased to extend an invitation to all members of the hang gliding community to attend an educational and entertaining program series scheduled for the winter months of January through April. This series of programs will be presented at Bill Bennett's Delta Wing factory on the last Wednesday of each of the four months. The program has been running since January 25th, 1984 at 7:00 PM.

The goals of the program series will be to technically educate the pilot and advance his/her flying skills and have during the learning process.

To launch the series (in January), a parachute seminar was conducted by Rich Pfeiffer and Betty Moyer. Simulated emergency parachute deployments were performed by those who wished to practice the emergency deployment sequence. Parachutes were repacked on the premises that evening for a cost of $7.50. Hang glider and ultralight parachute technology was discussed. Also a film presentation featuring b.a.s.e. jumping was shown.

Beer and munchies are to be on sale. The profits will be donated to the 1985 USHGA World Team Fund. More programs are in the planning stages for the last Wednesday in the first four months of the year.

Come listen, learn, participate, and have a good time. No admission fee. For further information, contact Delta Wing by writing P. O. Box 483, Van Nuys, CA 91408, or call 818/785-2474 or 818/787-6600.

Santa Barbara HG Center Offers Owens Valley 8000 Flight Deck

The Santa Barbara Hang Gliding Center is pleased to announce the introduction of this state-of-the-art flight deck. The Owens Valley 8000 is a combined instrument for the demanding pilot with airspeed indicator, altimeter, variometer, stopwatch, and McCready [speed-to-fly] ring.

The vario is an analogic circular read-out instrument with an extremely slow responding time (0.7 sec.), automatic zeroing adjustment, with double modulated interval tone. A McCready ring on a rotatable and exchangeable transparent disk shows you the optimal speed.

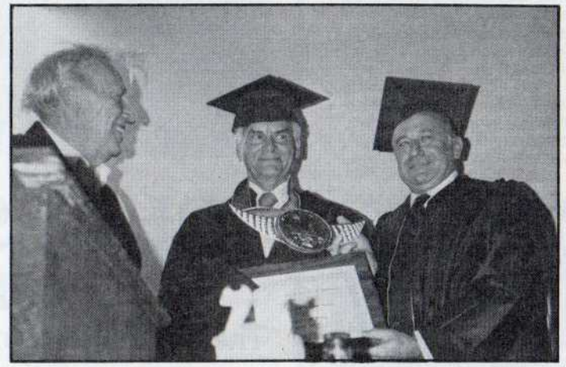
The airspeed indicator is propeller driven, and displays in half inch high digital liquid crystal numbers. The indicator has a measuring range of 0-100 MPH.

A high quality electronic altimeter also uses half inch tall numbers giving a "very calm display." The altimeter reads either in metric or english, ranging from 0-2,000 meters in one meter increments, or from 0-20,000 feet in 10 foot increments.

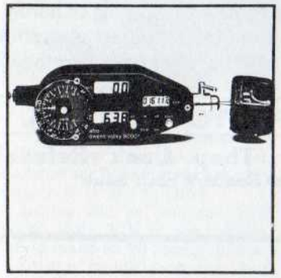
The stopwatch reads out in LCD numerals that are one-third of an inch high, and stops at 1/100 second. Overall reading range is up to ten hours.

The most up-to-date technology was installed in a very compact unit. The Afro Owens Valley 8000 carries a one year warranty, comes with mounting clamp, and is being introduced at $495.00. For additional information, contact the SBHGC at 486 Alan Rd., Santa Barbara, CA 93109, or call 805/687-3119.

INDUSTRY NEWS



Man Will Never Fly Society Chairman, Dr. Ed North (left), and Judge John Brosky (right) honor Francis M. Rogallo (center) with a Doctorate of the Limp Wing. "Dr." Rogallo, former NASA engineer, developed the flexible wing design which lead to the development of modern hang gliders. The award was given on the Society's annual meeting, held on the eve of the Wright Brothers Anniversay of Flight.



Kitty Hawk West Spring Calendar

April 27 - 29: Marina Beach Steeple Chase (coastal ridge race)

May 12 & 13: Demo days and party

June 9: Chute clinic

June 16 & 17: Mountain flying clinic

For further information on these and other events at Kitty Hawk Kites West, write P. O. Box 828, Marina, CA 93933, or call Jim Johns at 408/384-2622.

1984 Wills Wing Instructor Certification Seminar Schedule

Recent articles in both major hang gliding publications have pointed to the lack of growth in our sport. One major reason cited is the lack of new people trying, and more importantly, staying with hang gliding.

Wills Wing has long felt that competent, well informed, and enthusiastic instructors are fundamental to any effort to revitalize our sport. During the 1983 season, the Wills Wing USHGA Approved Instructor Certification Seminar was conducted at locations throughout the United States by Jim Shaw. The response from participants was an enthusiastic one; even those who did not pass the course and thus were not granted certification generally felt that the knowledge and experience gained were well worth the cost of the seminar.

Wills Wing plans to continue the seminar in 1984. If you are interested in bringing this unique seminar to your area, please call or write for more information to Wills Wing, 1208-H E. Walnut St., Santa Ana, CA 92701, or call Jim Shaw at 714/547-1344.

San Diego County Competition Schedule Announced

On March 17 & 18 the first of five San Diego County Competitions will start and be open to USHGA Intermediate and Advanced pilots. The contests are designed to introduce pilots to competition through enjoyable yet demanding tasks. Pilots will receive USHGA competition points. The entry fee is $11.00 per event, or $42.00 for all five meets. The entry deadline is March 10th, 1984, so act quickly. Call 619/450-9008, and ask for John Ryan, for more information.

April 21 & 22: Second San Diego County Competition. Entry deadline is April 10th.

May 19 & 20: No. 3 — Deadline is May 10th.

June 2 & 3: No. 4 — Deadline is May 23rd.

June 23 & 24: No. 5 — Deadline is June 10.

July 23 - 27: Owens Valley trip. USHGA Advanced rating and cross-country experience is recommended, and the entry is limited. Contact John Ryan at The Hang Gliding Center for information and cost. Again, the number is 619/450-9008.

Comet 2s Sweep Arizona X-C Contest

Phoenix AZ — In a year long (1983) contest sponsored by the Arizona Hang Gliding Association, UP Comet 2s have swept the field! It is the third year in a row that UP Comets have dominated this classic cross-country hang gliding competition.

The Arizona Cross-Country is open to all comers and has become a favorite event for top southwestern pilots. This year's winner, Bob Thompson, a world class pilot from Glendale, Arizona placed first with a flight of 113.61 miles from Flagstaff, Arizona.

Thompson launched from nearby Mt. Elden and set a course almost directly eastward following the main highway. Shortly into the flight Thompson's adrenaline really got pumped when he was attacked by a golden eagle.

"That was the biggest eagle I have ever seen," he says.

Fortunately, Bob was able to avoid the eagle's talons and proceeded onward to a new Arizona record.

Hans Heydrich and Bruce Ruefer, also of the Phoenix area, flew 97.67 miles and 86.98 miles to place second and third. Of the top eight gliders, seven were UP Comets.

In continuing support for regional cross-country competitions and local pilots, Ultralite Products has again paid top contingency money to the winning flyers — $300 for 1st; $200 for 2nd; and $100 for 3rd. Pilots interested in the 1984 event should contact Bob Thompson at 4319 W. Larkspur, Glendale, AZ 85304.

Jean Michel Bernasconi Disclaims Responsibility

As the designer of both the Flight Designs Javelin and Demon hang gliders, I am no longer willing to accept responsibility for these two glider models, as they are currently being marketed by Flight Designs.

Signed,
Jean-Michel Bernasconi

Visions and Esprits Cross the Atlantic

Pacific Windcraft Ltd., has announced the recent signing of an agreement between Hiway Flight Service of Britain, Delta Sud of France, and the Salinas, California manufacturer. The three entities will immediately undertake the marketing, assembling, and distribution of a European-built Vision and Esprit glider series. Sails will continue to be crafted by the Pacific Windcraft sail loft.

"We are quite pleased with the terms of this agreement," said Jean-Michel Bernasconi, President of Pacific Windcraft, Ltd. "Hiway has considerable manufacturing experience and a widespread dealer network that will enable them to efficiently coordinate the distribution of our products all over Europe."

He went on to explain that Delta Sud, as France's largest school, will be able to give widespread exposure to both wings throughout France and Spain.

Pacific Windcraft's unique one year guarantee will be honored by both companies.

AERO MARKET PLACES

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Special Two Year Subscription Offer on Page 31

INDUSTRY NEWS

New Hang Gliding Manager Named at Kitty Hawk, East

Nags Head, NC — After three years of successfully building Kitty Hawk Kites into one of the largest and most respected hang gliding schools in the world, Mark Airey has turned over the management of the hang gliding operation to Steve Wendt.

Wendt brings nine years of hang gliding experience to his new position as well as experience in regional competitions. In addition, Wendt has four years (over 100 hours) experience with ultralight aircraft.

Wendt's background includes four years of professional teaching and coaching experience. He came to the Outer Banks from Maryland.

Wendt's duties include management of all hang gliding operations including lessons, sales, and repairs.

1984 Fort Funston Air Race Scheduled

The now prestigious Fort Funston Air Race is scheduled for May 3, 4, 5, and 6, 1984.

Entries will be held for 100 pilots with 30% of the entries being reserved for foreign pilots.

Entry is by invitation only, but those advanced pilots with competition experience may request an entry form from the Meet Director, Walt Nielsen.

Early registration will be $75.00. Late registration will be $100.00.

The Race was won in 1982 by Dan Racanelli and in 1983 by Ken Brown.

The Fort Funston Air Race offers over $2,000 worth of cash and prizes, with over $1,000 guaranteed for the winner.

For more information contact Walt Neilsen, c/o Hang Glider Equipment Company, 3620 Wawona, San Francisco, CA 94116, or phone 415/992-6020.

First Annual Camel Challenge Results

The Camel Challenge was concluded on Sunday, October 16th, with intense hang gliding competition tasks, to make up for the previous day (Sat.) during which the contest was cancelled due to bad weather conditions. To make up for lost time on Sunday, eight-man heats were flown in finishing rounds.

The contest, sponsored by R.J. Reynolds Tobacco Co. of Brazil, took place on two consecutive weekends — Oct 8 & 9, and 15 & 16, 1983. It had been scheduled for four-man heats throughout. The tasks — duration flights and spot landings — were also changed for the final day, to pylon races followed by spot landings. Meet Directors were Gene Senter and Priscilla Goslin (Rio locals).

Saul Cohrado Beach was the landing zone, with takeoff being from atop an adjacent 2,000 foot high granite pinacle . . . a famous landmark of Rio de Janeiro.

The U.S. Team consisted of America's top two pilots, Chris Bulger from Mercer Island, Washington (1983 U.S. Nationals World Class winner), and Rick Rawlings from San Fernando, California (1983 U.S. National Champion). Bulger finished with 16th place, and Rawlings was eliminated from the competition after he fell to an accident while flying a round on the second day (Sun, Oct 9). His hang glider was extensively damaged and he escaped with a sprained neck and some hip lacerations that required stitches.

Chris Bulger expressed regret that the U.S. Team did not place higher in this meet. He felt that he and Rawlings were at some disadvantage due to the flying site which was a strong contrast to any place either had flown earlier, and due to the level of organization of the contest, plus the lack of communication.

"We were not sufficiently familiarized with the tasks," Bulger commented.

Other competing pilots were hang gliding champions from Brazil, Canada, France, Spain, Monaco, England, and Ecuador. Canadian Dean Kupchenko flew his Comet to 1st Place, with Steve Moyes aboard his Missile GT in 2nd. The other top ten were:

3rd — Pedro Lopes
4th — Paulo Nascimento
5th — John Pendry
6th — Luiz Niemeyer
7th — Beto Dourado
8th — Geraldo Nodre
9th — Gerard Thevenot
10th — Boca

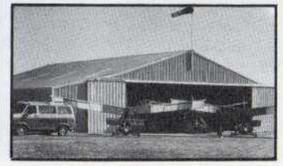
All above are Brazilian pilots except Pendry (England) and Thevenot (France). Gliders were only specified as indicated above.

Report filed by,
Hardy Snyman

LEAF Opens New Meadowlake Airport

LEAF is pleased to announce the purchase and opening of their new location at Meadowlake Airport outside Colorado Springs, Colorado. With a 75' by 88' hangar and a 30' by 40' Porta-Port T-hangar, and LEAF's existing facilities, the aircraft, part, and accessory supplier now has over 10,000 square feet of space from which to service their many customers.

For additional information, or for their complete 1983 unpowered and powered ultralight Parts and Accessories Catalog, send $1.00 (USA), or $2.00 (outside USA) to 331 S. 14th St., Colorado Springs, CO 80904, or phone 303/632-4959.



WAT Trike Goes to Rotax Engine & Adds New Pod

Wolfe Aviation, manufacturer of the only American-built monopole soaring trike, has a new model using the increasingly popular Rotax engine. The 277 cc engined trike, model named the WAT-SSI, weighs in at 120-125 pounds, with *standard* pod and 2:1 reduction drive.

The standard WAT-SSI comes with 11" wheels, but 20" zytel wheels are a $35 option, available for those who need rough field capability. The entire package folds very neatly to a size that can be carried in a station wagon or small van. The complete rig retails for $2,595.00. Dealer pricing is available, and inquiries are invited on company letterhead.

The WAT trike has had extensive changes over its two year practical development program, and represents the only U.S. trike aimed expressly at providing self-launch for a glider to achieve soaring flight in areas with no mountains. With two-seat models now on the market (from other manufacturers), the chance for an existing hang glider pilot to receive safe training to fly a trike makes usage of Wolfe's trike a very serious consideration.

The trike concept has been extremely well received in Europe where not only do many hang glider pilots fly them, but where one of every two powered ultralights is a trike.

For more information on the WAT-SSI trike and Wolfe Aviation, write P.O. Box 59, Elyria, OH 44036, or phone 216/324-7621.

Safari-Fly the Site of the 1985 World Meet

The Alpine Experience 1984, five country hang gliding safari will fly in Koessen, Austria, site of the 1985 World Championship. The other four countries in the safari are Switzerland, Italy, France, and Germany.

Interested pilots should contact Achim Hagemann at the Santa Barbara Hang Gliding Center, 486 Alan Rd., Santa Barbara, CA 93109, or call 805/687-3119.

OWNER SURVEY... UP COMET

In 1983, Whole Air ran a thorough Glider Owners Survey in two mid-year issues. The first-of-its-kind effort had excellent response with over 500 owners completing the 149 question survey. The resultant 75,000+ answers have been labored over for hours to produce this Comet report by Greg Shaw, and the Harrier report on page 32 by Owner Survey Editor, Bruce Wolfe

by Greg Shaw

"My Comet is everything I expected."

"I am very happy with my glider."

"Not light handling, but responds well to pilot inputs."

"Handling improves with time."

"Hard to fly in small thermals, but great in 'big air'."

So there you have it. Right up in front. No need to flip to the end to sneak a look at the punchline. Proof positive that Comet owners, in the privacy of their own living rooms, like their gliders as much as they claim to on the flying hill.

Let us get on to what this survey is really all about, the details, those hard little facts that can help you decide if this double-surface 'classic' should be your next ship. Each size Comet was analyzed separately, but only a few differences showed up. I will mention a specific size only when the answer is unique

THE PILOTS

Comet owners are all intermediate and advanced pilots. The percentage of hang III's increased with glider size. Smaller pilots are a conservative bunch, I guess. Only four of the seventy-two pilots surveyed used supine harnesses, but each one raved about the advantages. All but two pilots carry a parachute. The last figure I heard was 60 to 80%. Comet owners, at least, have become very safety conscious. Comet owners may have more spare cash for those useful little accessories since they are not faced with the need for a new glider every year.

Emphasis on safety extends to the universal use of helmets and back-up hang loops. The only oversight seems to be a fairly haphazard approach to carabiners. Pilots are apparently using whatever happens to be supplied by the harness manufacturer, be it a minimal 2500 lb. non-locking oval or a 6000 lb. locking D. Do not skimp! Get the strongest available. And add a perlon backup loop between the parachute bridle and the harness strap.

Varios and altimeters were used by 90% of the pilots. Half carried radios. But very few had strobes, air-speed indicators, compasses, or ballast (three to five percent). Only two pilots mentioned 'french connections'. Connections are a real buzz word here on the west coast, particularly among Comet owners. Perhaps this deserved a special question. Oddly, the handling ratings on those two surveys were no different than stock Comets. No one I have talked to regrets having one, though.

INDUSTRY SUPPORT

As you might guess there are all types of dealers out there, some big, some small, some good, some a problem. Usually full-time store-front dealers offered the best service, but not always. Parts delays varied a lot, seven to fourteen days typical. Most gliders had proof-of-test-flight stickers. Factory test flying is an industry standard these days, and that is good. Only about 35% of the gliders were test flown by the dealer before delivery, to my surprise. The dealer owes it to himself and his customer to offer this service. It should not be the new owner's job to take care of tuning problems overlooked by the factory or caused by shipping. That is why he pays his dealer a percentage. And the pre-delivery flight is the dealer's only proof against a customer arguing that the tree limb stuck through the sail must have happened in shipping. Dealers were a little better about going over set up and brekdown procedures; about 60% of the pilots got some instruction. Most, but not all (85%), got manuals and rib charts with their gliders. The rib chart, especially, is rather hard to do without.

The factory generally got high marks. Advertising claims were judged quite reliable, with only some average misleading information on set-up, handling, and weight. Just as well that U.P. sticks to boasting competition results.

THE GLIDER

Comparing the importance given to various features of the Comet to the actual ratings raises a chicken-or-the-egg sort of question. Important features scored well. Has U.P. built the perfect ship for some pilots, or have generally pleased Comet pilots tailored their preferences? Price is moderately important. Structural integrity is vital. Handling is only average, though significantly more important to small pilots. Performance is very important to Comet owners, though a little less so to small pilots (recognizing the old performance/handling tradeoff).

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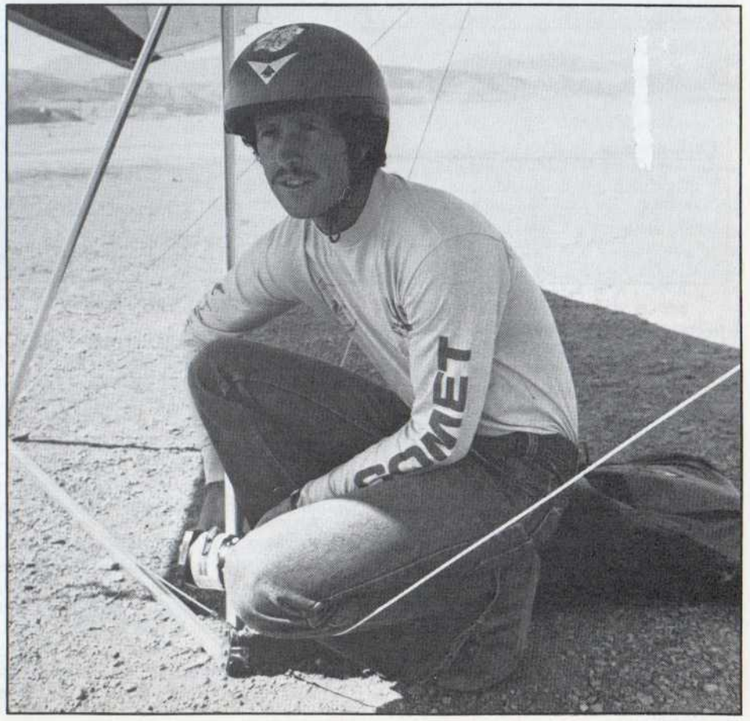

COMET — BEST FEATURES

Category	135 ft²	165 ft²	185 ft²
Performance	X	X	X
Speed Range and Speed with Glide	X	X	X
Secure and Safe	X	X	X
Easy to Fly	X	X	
Aerobatically Capable	X		
Set up		X	
Thermalling Ability		X	X
Clean Sails			X
Handling			X

COMET — LESSER FEATURES

Category	135 ft²	165 ft²	185 ft²
Landing	X	X	X
Handling	X	X	X
Slow Speed Handling		X	X
High Speed Yaw		X	
Penetration			X
Loose Wires	X	X	X
Weight	X	X	X
Set up		X	X
Weak Ribs			X

COMET — OWNER RATINGS

Quality	135 ft²	165 ft²	185 ft²
Overall Quality	4.25	4.75	4.25
Workmanship	4.25	4.75	4.75
Materials	4.0	4.25	4.75
Structural Integrity	4.75	4.75	4.75
Performance			
Glide Angle	4.5	4.75	4.25
Sink Rate	4.75	4.75	4.5
Speed Range	4.5	4.5	4.5
Flying Quality			
Thermalling Ability	4.5	4.75	4.5
Ridge Lift Ability	4.5	4.75	4.75
Turning	4.5	4.25	3.5
Turn Coordination	4.0	3-5	4.25
Pitch Trim	4.5	3-5	3-5
		(4.5)	(4.25)
Roll Trim	4.5	4.5	4.5
Hands-off Flying	4.0	3-5	3-5
Approach to Landing	4.0	3-5	4.25
	1-3	2-5	3.5**
Flare			
	(2)	(3.5)	
Landing	2.5	2-4	3.5
		3.75	
Ground Handling	3.5	2-3	2-4
			(3)
Weight	3	2-4	1-4
Overall Flying Quality	4.5	4.5	4.5
Handling			
Light Handling	3.75	2.75	2-4
Quick Handling	3-5	2.75	1-5
			(3)
Mellow Handling	4.0	3.25	3.5
High Speed Stability	2.75	2-5	3.75
		(4)	
Low Speed Stability	4.25	2-5	3-5
		(3.5)	(4)
High Speed Handling	3.75	2-5	3-5
		(4.5)	(4.0)
Low Speed Handling	3.25	2-5	3-5
		(3)	(4)
Straight Ahead Stall	4.25	3-5	4.5
Turning Stall	4.25	3-5	3-5
Stall at High Speed	3-5	3-5	4.0

* -- 2 musclemen @ 5.0
** -- 2 disappointed 1's

Set-up was important to some, not to others. Weight was average. No one felt popularity, competition record, or uniqueness had more than average importance. Delivery time scored a little above average.

Before jumping into the ratings, let me explain a little about the analysis and the ratings chart. Features were scored on a scale from one to five. The numbers quoted indicate the peak of the curve, roughly the average score. If the spread of scores was too wide, I list the range of response as well as the peak. Some features were just too subjective to get much agreement among pilots.

Overall quality was judged high, the 165 Comet taking the cup with a 4.75 rating. Materials and workmanship were also rated good to superior, with 135 pilots the most critical. Structural Integrity was rated very good.

Set-up and breakdown of the 135 and 165 rated a little above average, the 185 was good, with a fair spread of opinion. Set-up times ranged from 10 to 30 minutes, break-down 10 to 20. Worst features seem to be the control bar top fitting and the crossbar tension system which makes set-up on the ground a pain. Most notable is adequate double-surface access.

Performance is considered very good on all counts. The pack has caught up these days, but nothing is good enough to shake the Comet owner's satisfaction with glide, sink rate, or speed range.

The Comet has never won praise for sparkling handling, and the owners tend to agree, but opinion varies wildly. Most categories were rated above average, though 185 owners were least sure. perhaps due to worse previous experience. Comet 135 owners found their ships above average in light handling. One 165 owner found his glider very quick. Most 135's were judged good and mellow. Some 185's were judged trucks in the quickness department. Stall characteristics were judged generally better than average in all cases. High speed stability was considered fair in the 135, uncertain in the 165, and above average in the 185. Low speed stability was very good in the 135, confusing in the larger sizes. High and low speed handling was above average in the 135, and totally subjective in the larger gliders. Under duress, I might

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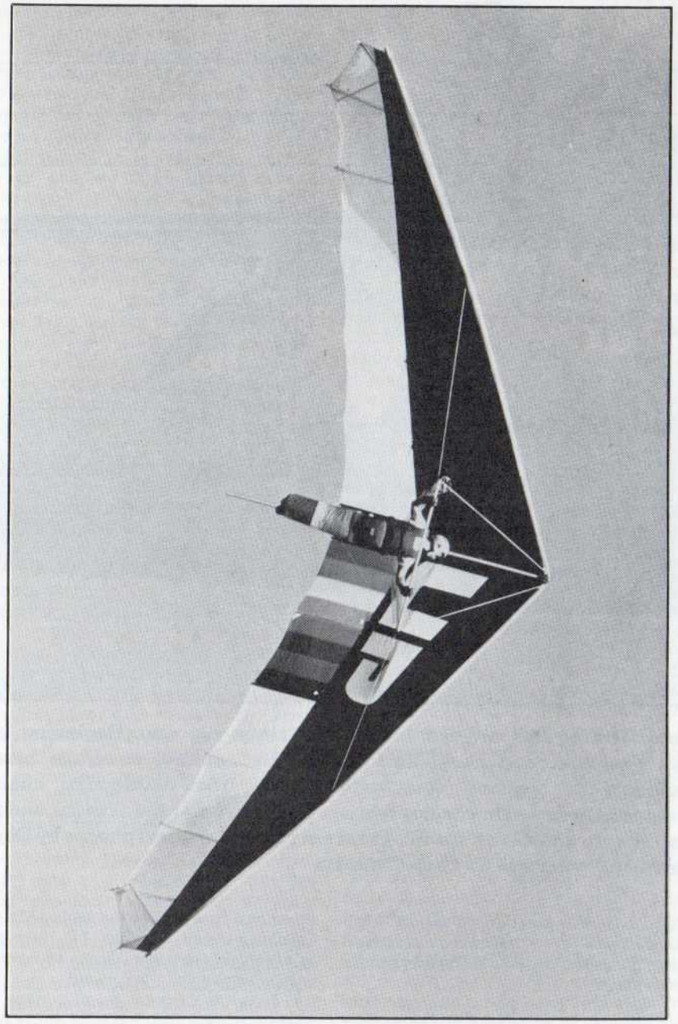


claim this all indicates a little better stability at speed on the big ships and a little brighter handling on the 135.

The Comet may be average in the handling department, but owners like what they do in the air. Flying quality in thermals, ridge lift, and turns was judged good to very good, with the exception of the 185 in turns (average). Trim, hands-off flying, and approach, also good. But flare, landing, and ground handling, not so good (with a few who could flare a wall tent and like it). Comet 185 owners were in actual agreement that their gliders flared and landed above average, so the 185 may actually be more tractable than the smaller ships.

The consensus was that the Comet is the choice for 'big air', those big, cracking thermal days where you can kick up into a good bank, let her get a good chomp on the core, then settle back with a good book and watch the scenery drop away.

Judgement of maintenance and repairs was hazy, at best. I will draw from my own experience as a glider mechanic to say it rates well above average. Wires can be detached and access to the double surface is good, aiding sail removal and crossbar inspection and maintenance. Only a few odd quirks like riveting the sail to the airframe, instead of using screws. Sixty percent of the pilots complained of weak ribs. This will continue to be a problem until the manufacturers can afford to temper ribs after shaping. And then the question of downtubes. Half the 135 owners found them stronger than average, the remainder evenly divided between average and weak. Comet 165 owners were equally divided. Sixty pecent of the 185 owners said stronger, the remainder again divided.

Early wear patterns matches what I have seen come through the shop. The rigging, particularly the upper side wires tends to rip the unreinforced sail holes. The grommet at the leading edge tip is a little weak for the tension it has to carry. The crossbar eventually wears through the nose batten pocket, particularly when the glider is left tensioned on the ground. A strip of duct tape on the pocket would not hurt. The bolts on the outboard end of the crossbar wear holes in the sail and the batten pocket. Protective duct tape and rubber nut caps on the bolts should help. Use 'hot glue' for the caps; nothing else lasts. Several owners also noted damage to the king post hole and wear on the sail from the defined tip. I have also noticed that the crossbar tension wire can be kinked against the keel if not packed properly.

Overall, Comet owners listed the following as the best features of the glider: performance (speed, L/D), secure feeling of strength, easy to fly, aerobatics thermalling, clean sailwork. One 165 owner mentioned the set-up. One 185 owner picked out handling, based on the trucks he used to fly, I suppose.

Worst features were: landing, handling, loose wires (ground handling), weight (even though the Comet is now one of the lighter double-surface ships), set-up, slow speed handling, high speed yaw. One 185 pilot felt penetration was lacking. One noted the weak ribs. One 165 owner complained about ease of inspection (try an older Duck!).

Complaints aside, every Comet owner would buy another one (many have), and would recommend both the glider and the factory to anyone shopping for a ship. Twenty-five percent did feel the list price was a little steep. Only 10% would recommend the glider to a Novice pilot, though.

The Comet was a quantum leap in performance and handling for a flex-wing when first introduced, competitive with the Fledgling. And like that ship, it has gained a strong and loyal following. It was the first popular American high performance flex-wing and it maintains that mystique. Other competitive ships have come along, but Comet owners have not been seduced away. Overall, the glider is excellent in materials and workmanship. Owners might prefer better handling, but are willing to sacrifice a bit there to get the Comet performance edge. And that is a reputation of which many other manufacturers are justifiably jealous. §

AERO TOWING a la FRANCE

Aero Towing has arrived in the USA in a big way. Beginning in San Francico, and continuing across the country, coverage here includes the Skylines' tour, with reports from developers, clinic attendees, users, other teams who are about to enter the activity, and a last-minute up-date on the FAA's recent ruling/story and photos by Dan Johnson/comments by Dick Cassetta

I lay prone, posed as though for a still photograph. The Esprit is fully loaded, but in a kind of stasis. Yet I have no airspeed. Two hundred feet away a big Fuji Robin idles quietly. A small red parachute jumps off the ground erratically lifting the white shroud line which joins my silent glider to the whirring propeller. I am about to roll off on my first aero tow.

Mark holds the Esprit's tail up, permitting a small angle of incidence. I swallow rapidly two times and, trying to sound fearless, I give the "go" signal. A last quick check at a borrowed airspeed/vario/altimeter, and I hear the fifty horses come alive.

The roll out starts, quieter and smoother than I have anticipated. It feels much like my stationary winch tows of 1979. In the gusty fifteen to twenty mile an hour wind, the forward motion almost immediately brings flight, even though I am well pulled through the bar. Mark assists on the keel. He keeps it up till he is stretched forward like the fabled Mercury, reaching ahead. Then, as I lift, his support is snatched from his hands, to bowl him over, tumbling to the ground.

Now the Cosmos aerotug leaps from earth in the style so characteristic of trikes. My ten feet of altitude must now be adjusted quickly, yet evenly, to remain above the tug by perhaps a wingspan.

Mark will tell me later that he looked up from his grounded position to see I was fully forty five degrees to the wind. The air is also spilling, rotored over a treeline a mere three hundred yards ahead. It is impossible to be steady. And my concern increases as it appears that french tug pilot, Gerard Thevenot, is headed directly at a ninety foot pine tree. We are linked. I rapidly decide that if he can hang in, I too, can deal with the bouncing flight path.

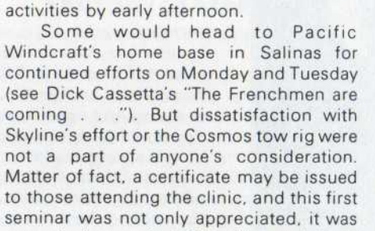
He turns slightly, generously avoiding the tall obstacle, and our climb continues. But I am flying far from smoothly. Too far above the tug — I have been instructed to place his nose on the horizon — so I pull forward. Too much. I have over-corrected. Now I am slipping below, and I have been told this is worse. Especially true when still only eighty feet up. So, I ease out on the bar. I try to keep my control inputs small, so as to tension the line and gradually climb. It also slows the tug which doubles the gradual effect of the climb. But the gusty air provides a sudden burst of lift, and perhaps Gerard has also increased power to sustain an even climb.

The Esprit climbs rapidly. I feel the tow line, which is attached only to my shoulder straps. The pull is not frightening, but substantial nonetheless. An audible "clink," and I suddenly lose my tow line. The glider slows, and rapidly assessing the situation, I conclude the release has opened prematurely. One hundred twenty feet up in somewhat rowdy air, I feel no imminent danger, but shift instantly to approach planning.

On the ground, I discover with Mark Airey's observation, that the 185 pound weak link broke, exactly as it should. Deciding to go again right away, we replace the link, I get ready, and we begin again. This tow works much better, and I release five minutes later at 2,500 feet. Enroute climb has revealed a five hundred foot per minute (average) climb rate at thirty five miles an hour (average). Speed and climb rate decrease to 200 fpm and 40 mph when I pull in to lower my height above Thevenot. They increase to 700 fpm and 30 mph as I maneuver up into the proper position. I anticipate Gerard's gentle turns and stay just to the inside. He helps constantly, understanding beginner aero tow problems thoroughly, as he has performed over one thousand such tugs.

Upon touchdown, the next man starts preparations. I was eighteenth of twenty pilots. A couple have already aero towed. Several have no prior tow experience. Gerard tugs all first flights, using his great depth of knowledge. Jean Michel Bernasconi begins second tows as the sun fades to afternoon.

By the day's end, twenty eight completed (introductory) tows, and five aborts (completely without incident) have been logged. The very first Skylines clinic has had an excellent beginning. About another eight clinic follow across the USA, as aero towing gets its biggest, best prepared, and most professional kick-off.



THE SECOND DAY

Day number two was a disappointment. Not for the french towing system. Not for the equipment. Not for lack of readiness on the part of the Skylines team of Jean Michel, Gerard, and Mark Airey. And certainly not for insufficient enthusiasm from the clinic attendees. It was the weather.

What began Saturday with positively gorgeous local weather deteriorated to overcast, heavy fog, and very wet, still air on Sunday. Several launches were false starts, as the density altitude soared as much as the ceiling dropped.

Additionally, in a scant one to three flights, a complacency or over-confidence seemed to affect many pilots. It all felt so easy. The results were several lazy runs, and inattention to the correct in-tow position. Weak links broke regularly, silently yet frustratingly attesting to the proper capability of the system.

Thevenot and Bernasconi badly wanted to go on, but the falling ceiling, and corresponding decay in participant enthusiasm, effectively forced an end to activities by early afternoon.

Some would head to Pacific Windcraft's home base in Salinas for continued efforts on Monday and Tuesday (see Dick Cassetta's "The Frenchmen are coming . . ."). But dissatisfaction with Skyline's effort or the Cosmos tow rig were not a part of anyone's consideration. Matter of fact, a certificate may be issued to those attending the clinic, and this first seminar was not only appreciated, it was respected . . . a first. One pilot exclaimed that if your certificate did not say "January 14th, 1984," that it would have far less (sentimental) value than those very first ones issued to the gang from the Bay Area.

THE FUTURE

Now the seminar tour begins. California, Arizona, Texas, Louisiana, Tennessee, North Carolina, Connecticut, and New Hampshire are currently scheduled or finished by this writing, and even more seem inevitable. The system was so highly regarded that demand will certainly out-strip initial availability . . . first of clinics and their dissemination of knowledge, and secondly of tugs, bridle lines, releases, and the other required equipment.

Certainly Skylines intends to bring in all the gear needed, but this will follow their energetic tour. Meanwhile the spread is on.

Another group involves Paul Whitehill — who was featured aero towing in the August '83 *Whole Air* centerfold — and Chris Bulger. Whitehill did experimental work in this air tow field on Flight Designs' craft, enjoying good success on several outings. Bulger, besides being well known for his remarkable competition record, is now acting as USA representative for Airwave Gliders and their Magic III.

The English have also done more work on aero towing than has the USA. The new, young Airwave USA contingent — now also involving speedy Ken Brown — plans to use the Mainair Sports aero tow system employing a 3½ inch monopole trike with 440 Fuji Robin and prop center hub pull point (similar, it appears, to Skylines system). Plans call for them to be operational by Spring '84, so a tour will utilize and teach aero towing, and at the same time offer demonstration flights on the Magic III. They, too, have promised to keep *Whole Air* informed of progress and seminar tour dates.

Plus, it is most likely that Bill Bennett will join this action, what with a more extensive towing background than anyone except Moyes. Although the discipline has changed somewhat — to airborne tow platforms — Bennett and his contemporary, Bill Moyes, are bound to jump in the foray. Yes, we might also see Ultralite Products enter the arena, as their powered Arrow, scheduled for debut at Oshkosh '84, will certainly do some tugging. And the soaring Arrow, which will follow when all hardware and manufacturing details are ironed out, is a certain candidate for *being* towed. Almost all manufacturers seem likely to "join in."

For today, though, the game is being played solely by the Thevenot/Bernasconi/Airey troupe, and they are

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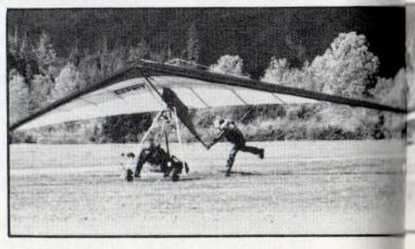


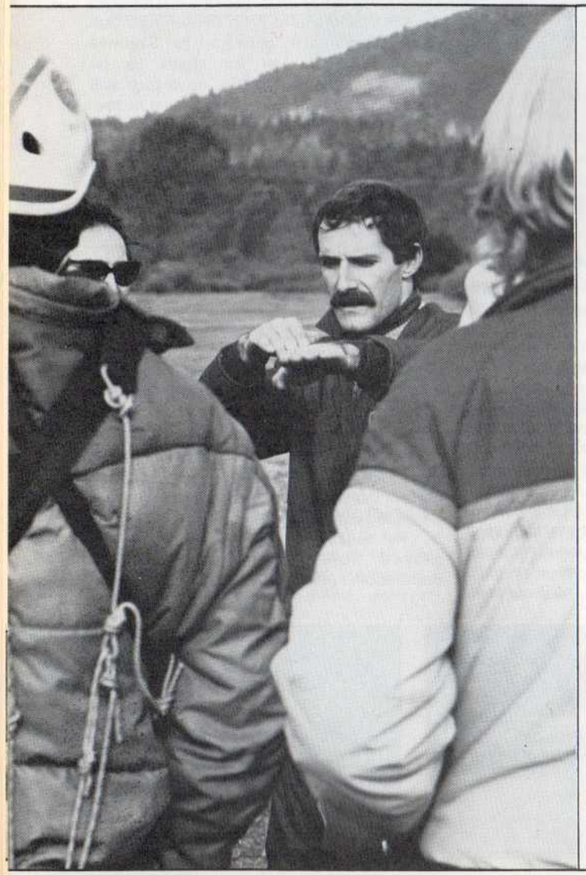
trying to handle the development with a keen eye to professionalism and safety. The Skylines group is currently de-emphasizing their commercial intentions, and *are not* suggesting whole brigades of pilots begin aero towing as soon as possible. This seems most prudent at this early stage of the game. Especially so, as the FAA appears a sleepy giant, possibly attempting to stop or retard this development but nonetheless remaining an enormous potential blockade once the agency feels *Official Action* in the matter is mandated.

Both extremes of reaction are being proclaimed as of January, however. On the negative end, FAA is purported by one west coast source to be strictly *dis-allowing* all towing of a hang glider (ultralight vehicle) by a powered ultralight (ultralight vehicle). . . *unless* the tug pilot is properly licensed and his tug aircraft is properly approved for such activity (which it probably cannot be, as an ultralight vehicle is by definition *NOT* an "aircraft"). On the other hand, Bernasconi refers information from Dennis Pagen, who has investigated the legalities (or lack thereof) with his local G.A.D.O. to find much more receptiveness than the above report indicates.

Two things are true. One is that this aerotowing drive is a powerful fighter bomber rocketing down the runway. It can offer flying to *all* of the USA. It can bring hang gliding to big metropolitan areas. It *could* double, even triple our number of pilots in a decade or less possibly. But number two is . . . *exactly because* it can do those things, the FAA will be forced to take an official stance. The final arrangement will likely fall in between the two extremes, with an exemption being granted to allow the activity under clearly defined conditions. Not unattainable requirements but mandatory rules nonetheless, like those pertaining to two-place flying in hang gliders and ultralights.

For February 1984, a round of applause is in order for the Skylines group. They are helping to really put some fuel in the engine that may lead us to more soaring in more areas by more pilots. And everyone knows now that this is desparately needed by the industry. Thevenot, Bernasconi, and Airey are not for long going to be the only ones doing aero tow clinics, but they are the first in America, and their professionalism is both commendable and absolutely vital during this delicate period.

You should at least observe their aero tow system. You may wish to participate (though the clinics are filling up fast, and *do* have a maximum number for safe, fulfilling operation). You might even want to start a club to help provide the tug one day. **But be careful!** Be mature. And be realistic. Perhaps by 1985 aero towing will be a way of life in our graceful ultralight soaring sport.



So, What Does Gerard Thevenot Know?

He has accumulated over 1,000 tows as tug pilot. His company may be able to lay claim to being the world's largest glider manufacturer (over 1,700 units in 1983, it is estimated). He has designed the Atlas, Azur, and Profil, among others. He has won all kinds of contests. And he travels the world in his role as La Mouette Director. You could fairly say he knows a thing or two or ten thousand.

He apologizes for his command of english, but even in technical matters, he can adequately explain things which his American audiences have difficulty comprehending. A discussion of "compound french connection" theory proved this to all who listened.

In the air, no apology is the least bit appropriate. All his twenty pupils for the San Francisco seminar commended his expert pilot skills. Most who participated in this first aero tow clinic felt glad and very fortunate that Gerard brought the program and his expertise from France.

Gerard explains the aero tow program as an essential element in his company. Not located particularly near a flying site, Thevenot has been routinely test flying La Mouette production gliders under tow for over a year and a half. *Two aircraft at once* (!) — on differing line lengths — he reasons it is safer, not less safe, to do this on tow. Should some error reveal itself, the test pilot can release at a low altitude rather than be forced to fly all the way to the bottom of a tall mountain.

The other members of the clinic are Mark Airey and Jean Michel Bernasconi.

For three years Mark has been manager of hang gliding and ultralight operations at Kitty Hawk Kites in North Carolina, widely considered to be the largest school in the USA, perhaps the world. Long days and tasks filled hours are as common to Mark as his knowledge of this sport is obvious. Skylines is lucky to have him and will be fortunate to keep him.

At present Skylines' plans with Airey call for him to head up the eastern location of Skylines in New Jersey. In addition to being able to service east coast dealers — from initial training of these folks to handling parts, giving advice, and generally acting as liason for the Franco-American company — Mark will further handle all import of Cosmos trike tugs and related gear. The New Jersey location is optimum as shipments will arrive in the giant shipping ports of New York City. Dealers and customers alike will find his sincere and informed attitude refreshing.

Jean Michel Bernasconi, president and founder of Pacific Windcraft only one and a half years ago, has become one of only six successful manufacturers of hang gliders in the USA. His Vision glider was perhaps the first true entrant of an "intermediate" in the double surface category. It has been rather well received in this country and in several countries abroad. Recently, Bernasconi licensed Delta Sud to build his aircraft in France.

Now Jean Michel is participating in the aero tow program as half owner of Skylines (he was approached by Thevenot). His one-time mentor and employer, Marty Alameda, achieved a good measure of success importing from France and Europe. To follow in these footsteps, Bernasconi is well equipped, as he is as comfortable using the French language as he is flying his Esprit.

A high energy individual, Jean Michel is a true catalyst in the Skylines program, joining such notable personalities as Gerard and Mark Airey together. The foundation of any successful business being its personnel, Bernasconi has undoubtedly triggered an enterprise that should not only last, but perhaps have a profound effect on the future of hang gliding in the USA.

Mark 'N Jean Mi

Jean-Michel Bernasconi seated in trike, while Mar Airey speaks to the video camera.

FLASH: *As of very early February, the report trickled down that G.A.D.O. offices* have indeed *been issued an "illegal" letter on aero towing. As of press time, this was confirmed with the Washington bureau by casual telephone conversation. So, to-date, an edict has come down. F.A.A. claims it is illegal as it represents a "commercial operation," disallowed under Part 103. This seems an indefensible position, but buys some time while F.A.A. continues to stand up to the barrage of complaints over ultralights and two-seat exempted operations in general.*

By February 14, 1984, the Skylines crew planned to meet with several officials of the F.A.A. on a casual, open table discussion style. Bernasconi will fly Pagen in for the meeting, and AOPA Air Safety Foundation Director, John Ballantyne will also attend, although not on an official AOPA business basis. Skylines' personnel will try to bring F.A.A. up to speed on the length of time this has been going on in Europe, but they will NOT be asking for F.A.A. to respond officially. *Nor will they file any petition or request for exemption. F.A.A. is simply too beleaguered over the standard Two-Place Exemption at this time to even consider aero towing. So, "tread lightly" was the best advice.*

SKYLINES' FACTORY STATEMENT

On the Aero Tow System

In order to promote and distribute in American a new air-to-air towing system for hang gliders, Gerard Thevenot, co-owner of La Mouette Inc., of France (world's largest hang glider manufacturer and 1982 World Champion), and Jean-Michel Bernasconi, President of Pacific Windcraft Ltd., California, recently announced the launching of a new company, SKYLINES ENTERPRISES, LTD.

Under extensive development for the last year and a half and tested in Germany for structural integrity, this air-to-air towing system uses a two seat trike-powered tandem hang glider, the AZUR 19, as a tow vehicle with a 440 cc reduction drive power plant developing over 330 pounds of thrust.

The SKYLINES air-to-air towing system comes complete with dual release, weak link, instructor clinics, training program, and accessory and parts back-up service.

Currently being manufactured by La Mouette, this system is successfully being used by numerous schools and clubs in Europe.

THE SYSTEM

Description, Application, Equipment

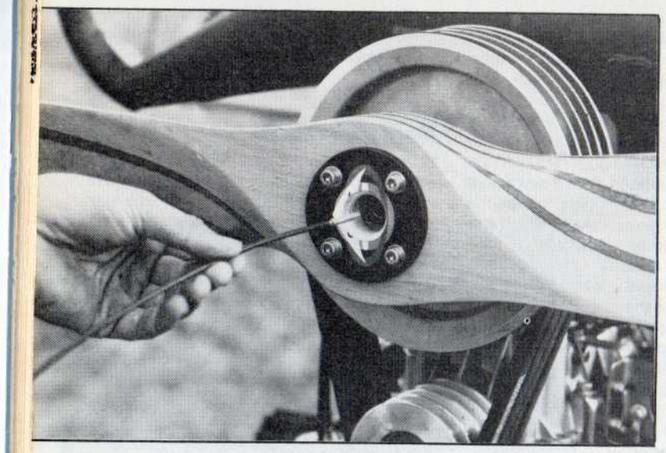
The design, development, and testing of the Skylines air-to-air towing system was aimed from the start at eliminating the highly impractical and somewhat dangerous aspect of winch, car, or boat towing, as well as eliminating the thousands of miles of driving necessary for the discovery and subsequent use of a flying site.

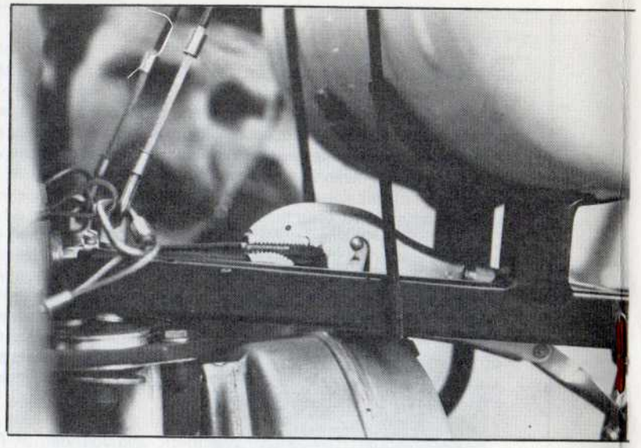
Air-to-air towing is nothing new: the Australian, Bill Moyes, pioneered (among many other achievements) this form of flight using a Piper Cub as a tow vehicle. More recently, here in America, several quite successful techniques have been experimented with, but everything remained in the testing stages.

In September 1982, after two years of research and tests concluded by a team of engineers and technicians from La Mouette, our parent company, the towing of a hang glider behind a trike-powered glider is being performed with a 100% success factor and total security.

Due to the revolutionary character of this new system, an observation period of a

Continued.





year and a half was voluntarily established in order to properly refine and to implement an entire training and instruction program. Early in 1983, Instructor's Clinics were being held and the first towing systems were officially entered on the market.

The concept of the trike-powered glider as a tow vehicle was retained for its slow speed flight characteristics as it relates to hang gliding, for its ease of use, and especially for its controllability — the tow line being installed from a point completely independent from the aerodynamic structure of the tow vehicle, thereby avoiding the instability problems experienced with standard towing systems used by sailplanes.

This unique tow line mounting location on the trike presents another major advantage: the towing pilot is in all circumstances in total control of his vehicle whatever the intensity and/or direction applied to the towing line (weak links maximum breaking strength -- 185 pounds). This system insures that controllability of the towing vehicle is completely independent from the interactions of the glider being towed. Offering further security is the system's two weak links which allow the towing vehicle to be quickly liberated in the event that its tow line gets tangled in an obstacle.

For the hang glider being towed, the achorage point is located on the pilot himself. This system has consistently proven itself over the last few years as it virtually eliminates any form of lock-outs and offers a stable form of controllability. Furthermore, with a double french connection, if the towing vehicle turns to the right and the hang glider pilot does not follow, the tow line will automatically pull the hang glider pilot to the right and therefore make the glider turn right. The correction is automatically in the right direction (same situation on the left side). Another example: in pitch, if an increase of tension happens on the towing line, it automatically will pull the pilot forward, causing the glider to speed up and therefore diminishing the tow line tension (opposite reaction for a decrease in tension). Here again you can see that from the hang glider's point of view the control system is perfectly auto-stable and therefore very safe. Another weak link is positioned close to the glider pilot offering the same safety as the tow vehicle in event of a tow line getting tangled in an obstacle.

The use of weak links is not only very important for safety, but is also very practical for two reasons. Unlike sailplanes, a hang glider can land or prepare a landing with very short notice and does not have a dangerous incidence t any time during the tow. Hence, in the event of a weak link rupture — regardless of what stage of the tow, the hang glider pilot will be able to safely control his glider to landing. Given the facts mentioned above, we think you understand our position when we tell you that this particular system of towing a hang glider behind a trike-powered glider is safe and easy.

APPLICATIONS

The most evident advantage of air-to-air towing is, of course, for recreational and cross-country pilots.

Furthermore, air-to-air towing gives that part of the population (65% in the USA and 95% in Europe) who live on flat lands access to flying in a way never before offered. This will open up an entirely new, virtually untapped flying community.

For the mountain inhabitants, air-to-air towing eliminates costly drives up and down the rare and distant flying sites too often leading to a take-off site facing the wrong wind direction and/or blocked by clouds, et cetera.

The Skylines system brings a new level of security to take-offs: a pilot can no longer stall a launch since the nature of the system forces him to lean forward and run during launch. And, of course, failure to hook in — a major cause of accidents, is no longer a dangerous problem.

For the hang gliding manufacturer (or dealer), research and development and testing can be conducted much more efficiently. A test flight can be performed in a turn-around time of ten minutes or six flights an hour! Until now, test flying averaged two to three flights per day, if the wind was right and with the serious disadvantage of setting up and breaking down every time. Air-to-air towing allows a much more accurate form of comparison between modifications as test flights are being performed in much more consistent conditions. The same advantage exists for production test flying (which in turn may hasten the delivery time to the customer).

Air-to-air towing has been used by La Mouette since 1982, and just recently by Pacific Windcraft for all the advantages mentioned above.

The benefits of this method are being recognized by the different categories of professionals of hang gliding, mostly for its great appeal in advertising and publicity contracts. Advertising for "Hollywood Chewing Gum" has been filmed using the Skylines towing system.

EQUIPMENT

Three hundred thirty pounds of thrust is necessary to safely tow a hang glider. We are therefore using the same engine on our tow vehicle as the one developed for our two-seat trike.

The biggest innovation is certainly the installation of the tow line through the hub of the prop. This allows for towing exactly in the thrust line axis and eliminates any parasitic moment.

The glider used as the wing for the tow vehicle is strong, stable, and maneuverable. In the case of two-seat trikes, the glider must offer a center of gravity adjustment to allow the vehicle to fly slowly when used solo.

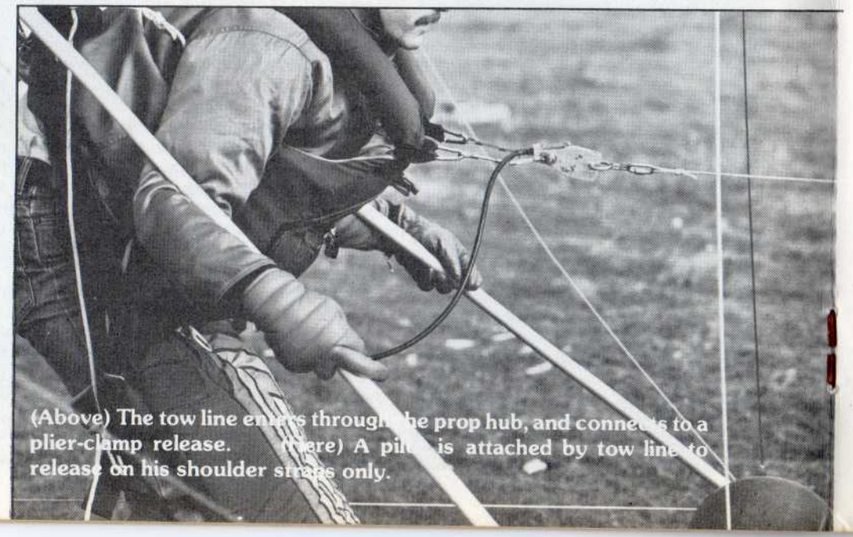
For the glider being towed, the only special equipment being seriously recommended is a double french connection for the reasons mentioned earlier.

A release system of the sailplane type is anchored to the hang glider pilot's shoulder straps.

The tow line is made out of 3.5 mm nylon, is 180 feet long and is equipped with two weak links, each located at each end of the two line.

The tow line is also equipped with a retrieval drag chute automatically deployed when the glider is released to insure that the tow line does not get close to the prop and to keep the tow line higher than the tow vehicle when descending.

A panoramic rear view mirror is mounted on the tow vehicle for clear visibility of the glider being towed. §



(Above) The tow line enters through the prop hub, and connects to a plier-clamp release. (Here) A pilot is attached by tow line to release on his shoulder straps only.

Advanced Aviation Advances On Soaring Flight

An unusual team showed up at the Skylines' clinic in Tennessee. Angel Matos and Tony Nicorvo represented Advanced Aviation, manufacturer of the Cobra ultralight. Matos is the Marketing Manager for the Cobra builder, while Nicorvo is that firm's Orlando dealer. They traveled fourteen hours by car to observe this aero tow clinic.

"Had we not heard of this seminar," Angel explained, "we would have begun our own aero towing experimentation at our company field this weekend. Since we were told that this group has it all developed, we decided the smart move was to come here and get an education. And we did."

Angel is a long time sailplane pilot, Nicorvo is a former hang glider pilot, so explaining their interest in this activity. But perhaps more important to hang glider pilots *and* ultralight pilots is that Matos sees this newest method could bring the two divergent groups together.

Advanced Aviation's two-seat model packs sufficient punch to do much the same job as Thevenot's Cosmos. They fully intend to thoughtfully pursue the matter. They promised to keep *Whole Air* informed of their progress, and the availability of aero towing equipment for their aircraft.

Boat Tow Veteran, Roland Alexander

"Well, how'd you like it, Roland?"

"... we locked out 500 times ... if that had been a base tube tow. And it is this harness tow (center-of-mass) that allows flight in these thermally turbulent conditions. No one, no experienced tow pilot, not even Steve Moyes could've stayed on tow today with a base tube tow!"

"So will this change how an old tow veteran like you will tow?"

"I've been towing behind boats primarily, off the base tube, for twelve, no thirteen years. Today is probably the time I cease towing off the base tube. Want to buy a tow bar? This is history in the making ... one of those true milestones in hang gliding."

America's First Lady of Aero Tow Flight

Sharon Strickland has made an achievement of which she can be justifiably proud. And she undoubtedly is so. But she was oh-so hesitant to have her name mentioned or her picture taken.

Still, Sharon was half-organizer (with her husband, Bones Strickland) of Skylines' first American clinic. And the two did very well under difficult circumstances. Proper plans laid were suddenly and forcibly altered leaving the Strickland's Bright Star Hang Gliders with no place to hold a clinic for about 25 eager pilots. This happened a mere 48 hours prior to the event. Yet the two were host and hostess to a clinic that appeared to have had several weeks of careful organization, so well prepared were they. Bones' highly esteemed contacts were essential in securing a beautiful place when time no longer allowed the customary application-for-use permit.

Sharon distinguished herself by becoming *the first American female pilot to aero tow!* A USHGA Certified Instructor, she began flying in June of 1979, encouraged by Bones. Her first lessons were given by Hang Glider West's Jeff Mott, and her husband continued the educational process in a cautious atmosphere. It was not long before her enthusiasm caught up to Bones' and she chose to leave a high paying job to assist her husband in developing and running their Bright Star business. Today Sharon flies with the best of them in her Comet 135, which she will certainly be aero towing.

Gerard Thevenot speaks of a "towing mentality" which will lead to greater acceptance and use of the aero tow system. While its concept is simple enough, switching from "mountain mentality" may take some discipline.

The towing mentality involves site searches that *do* call for large open fields, free of rotors and producers of mechanical turbulence, but *does not* call for this site to be proximate to a mountain. The towing mentality *has* you seeking more easily obtained launch/land strips, but *does not* have you searching out mountain launches and road access.

The towing mentality involves considering an out-landing more carefully to allow not only for a successful landing, but also for sufficient room, direction to the wind, and obstacle avoidance so that you can be towed *back out* of the field once you are located by the tug pilot. In the same vein, the towing mentality can apply to cross country work, as you *do not have to* provide yourself with chase crew or retreival vehicles, but *does allow* you to be followed by your aero tug, or contact the tug pilot by radio, once you've landed. Think of the tug pilot's attitude at the end of the day's flying, compared to the frustration of a driver who racked up hundreds of miles just trying to find you.

The towing mentality for a day's flying *does not* call for return driver considerations, for site road quality, for launch area set-up access, for set-up time before each flight, for launch slope quality, or for wind direction correctness . . . but *does* call for getting just yourself and personal gear (though *perhaps not* your glider) to the tow site, for once-per-day set-up, for reasonable wind velocity and smoothness, but *not* direction, and for the realization that many more days are going to be really flyable/soarable (wind direction and ambient instability as sole criteria).

The towing mentality *frees* you to think about gliders that *can* be wheel-launched (heavier, higher aspect), that may not have to be foldable (new construction materials), that you may not even have to transport to your regular flying site, or that you may not even have to own by yourself (you and your buddies will not have to insist on flying during the same time while it is "great").

The towing mentality may allow the hang gliding community as a group to once again *positively* consider taking "just a sled run," to think *realistically* about "a flight after a regular day's work," to think about a whole new way for the training of new students (who *may not* have liked the idea of "running off a mountain," or even the athletic nature of foot launching), and to think about the social qualities of flying sites (strips) that permit all pilots to be gathered at the same place, perhaps equipped with beverages and other amenities, and to think about flying sites that are less remote, and which offer access to large population centers.

Yes, the towing mentality may sooner-than-you-think replace mountain/foot launching/folding wing/remote flying area mentality. And all that may feel s-o-o-o-o good!

The Towing Mentality

The Frenchmen Are Coming . . .

The Frenchmen Are Coming . . .

The French have arrived!! And with them have come the Azur 19 (211 square foot) and the Cosmos Trike, complete with an electric starting, 432 cc Fuji Robin engine. Can you believe 330 pounds of thrust? Just enough to make our tow-tug an elevator operation for 25 air-hungry students.

The crispy cold air greeted us at the gravel air strip 160 miles north of San Francisco. Jean-Michel Bernasconi's clinical concept brought a wide variety of soaring "purists" and motorheads into direct contact — without any bloodshed. Available to all comers . . . thanks to Bones and Sharon Strickland's kindness . . . were two days of high plains drifting and a training certificate for both Tug Pilots and Tow Pilots. Gerard Thevenot, the designer of the Atlas and owner of La Mouette, a verteran of over 1,000 tows as a tug pilot, gave all present a feeling of confidence. He lived up to his reputation by automatically compensating for the perennial over-correction by the novices.

Pilot after pilot was carried aloft in a relatively quiet mode while the center-of-mass, double french connection set up corrected for a plethora of pilot errors. The use of sailplane release hardware and double weak links in the tow line gave maximum assurance against lock-out problems.

The weekend of learning was the beginning of a four-week cross-country odyssey, during which clinic after clinic would introduce flat landers and mountain pilots alike, to the Skylines approach to a ten minute turn-around to 1,500 feet.

As the day passed, all too quickly, the ground delays attendant to the early flights dissipated and all got their fill. New maladies arose, but never, *never* a problem that was not taken care of by the system in use. These French guys knew what they were doing!

Towards the end of one heck of a Saturday, Jean Michel, and Gerard began taking instructor candidates for demonstration tug rides. The second round of towed pilots noticed the difference in the rate of climb and the amount of take-off run by the trike, but actually, for the most part, showed better form than the first launch. The tandem high seat behind and above the Pilot Trainee allows the instructor to talk into the Trainees ear and to override any misques.

Five or six of the locals had driven up the nearby mountain flying site at about noon, waited out the cross-wind at the lower ridge, were off and up by 3:00 or 3:15, soared around a bit before landing. Their driver rolled in just about the same time as their landing.

A new meaning was given to the area call "Take-Off" — the acres and acres of flat, flat land and the relatively consistent south breeze gave both tug and glider pilots easier and quicker turn-arounds.

One pilot, losing it altogether on his second step, completely let go of the glider and believing that he was about to bash his face into the gravel, threw his arms out in front of him! The tow tug simply pulled him off the ground (on the glider's two wheels) as if he were on "Auto-Pilot" launch. Regaining his composure, he grabbed the base tube and towed up to 1,000 feet with the crowd roaring with approval. Friction taping of the downtubes prevented the re-occurrance of this faux pas.

The french connection and the center-of-mass tow attachment to the pilot's shoulder straps had saved the day, once again. It is surprising that most of those flying had never used and possibly had long avoided the use of the connection. After the straight forward introduction to its merits by Gerard, the fear was gone and its need completely understood. The tow, at 35-40 miles per hour, can quickly tire even the strongest biceps and devaluate the actual pleasure of the tow. The connection made the difference.

Moving to Salinas for the third day of the clinic, we were entertained by Don Partridge most of Sunday evening. Formally of the Owens Valley, Don is recently an instructor and promoter for Mitchell Wing West. The overcast and cold north breezes did little to dampen the continuing excitement. We concentrated more on technique of towing in tight turns, preparing ourselves for the summer flat lands, cross-country work we all expected soon.

If the Frenchman came expecting to convince those of us who seriously question the viability of the ultralight hang gliding towing . . .

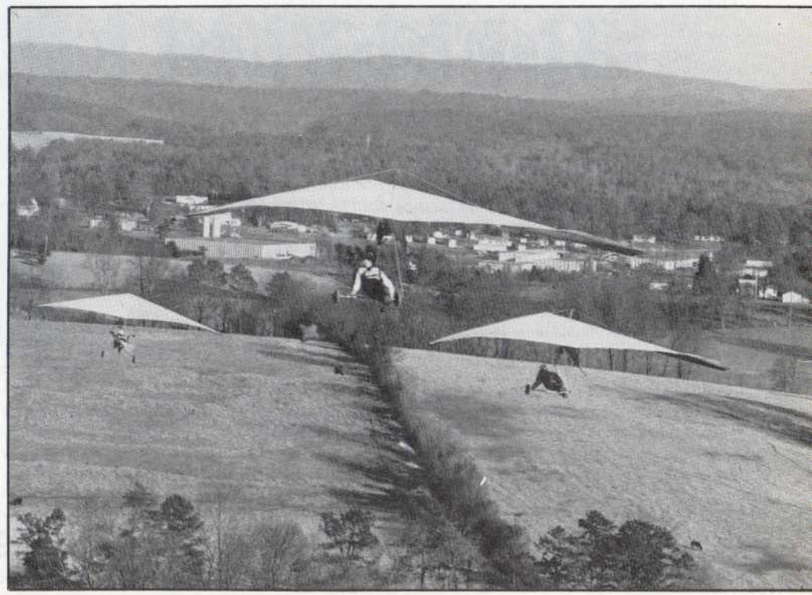
if they came to prove the tow system safety and convenience . . .

if they came to teach instructors to carry on their beliefs to the majority of the soaring public . . .

They did so, and they did it all very, very well. §

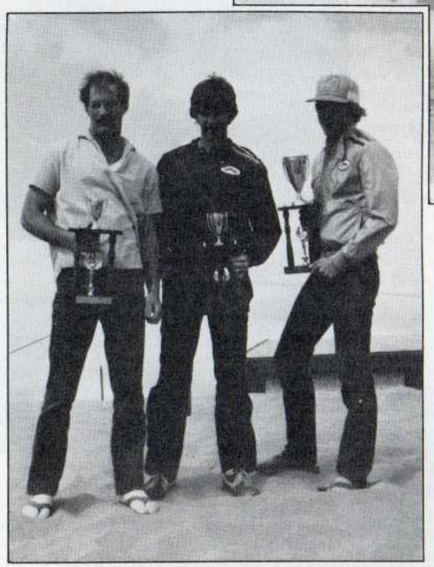
Occasionally, though not often enough, a spark is lit — not just in a few, but in an entire community. Hang Gliding has desparately needed such a spark for quite some time. Many talk about the need for such a spark, many write about the need for such a spark, but very, very few ever light such a spark. Jean Michel Bernasconi carries with him such a light. By his efforts, we may, very possibly shall, years from now, thank Jean Michel, Natalie, Gerard Thevenot and Mark for the foundation, the very beginning of our next step forward. Each of us needs to say, "Thanks!"

Dick Cassetta



(Right) Wind dummy and Kitty Hawk President, Jim Johns 'smokes' by to open the course last year. (Below) 1983 winners Ben Reese (L), Chris Bulger (C), and Ken Brown (R).

Max Peterson Photo



1983 Steeple Chase Finishers

1st -- Ken Brown (Delta Wing Streak)	20:19
2nd -- Chris Bulger (Delta Wing Streak)	22:26
3rd -- Ben Reese (Flight Designs Titan 158 Prototype)	25:03
4th -- Mark Gibson (Delta Wing Streak)	26:46
5th -- Ron Hess (Flight Designs Shadow 153 Prototype)	26:47
6th -- Lee Gardner (Pro Air Pro Star 160)	28:59
7th -- Norm Castagneto (Vision 9-20 Prototype)	1:18:29
8th -- Calvin Cox (Pacific Windcraft Vision 18)	2:43:27

STEEPLE CHASE

Each year on the central California coast, Kitty Hawk Kites - West sponsors an event called the Marina Beach Steeple Chase. The object is to traverse (with hang glider) a race course, soaring over sand dunes that generally do not exceed 100 feet and at many points drop below 5 feet. The fastest recorded race time over the 12 mile course was 19 minutes, 30 seconds, by Chris Bulger in 1982.

When conditions are good, west at 18-25 MPH, pilots can make the course with only one launch. But if for any reason you land, it is totally permissible — even encouraged — to run back up the hill for a re-launch. In 1983 times ran well over two hours for some finishers.

The turning point is located by a town called Sand City and a pylon is placed on top of the ridge at that point. Also, just beyond the pylon is a large circle in the sand that acts as a target. Instead of landing though, each pilot carries a small sand bag (bomb) with his pilot number on it. The idea is to fly past the pylon and try to bomb the target. A successful hit scores the pilot 30 seconds credit which is subtracted from his race time. All bombs must be dropped and land beyond the pylon for the flight to be scored, after which the pilot races back to Marina Beach.

Pilots have unlimited chances to fly the course and the winner is judged by the fastest overall time. Winners are usually the pilots who try the hardest and get the most flights. But to win the Steeple Chase, a pilot will often find himself racing at or below level — only on a ridge 3 feet tall. The technique is basically ridge soaring but it is sort of like being on final approach . . . for 12 miles.

To quote a pilot, John La Torre, "Marina is a unique site not only because you land on top, but [because] you take off from the bottom."

The Steeple Chase has been an annual spring event for many years and has become a proving ground for new high performance designs, and as such, brings many factory teams. It is a good place to check out what may be the new hot ships. Also, cash prizes and trophies are developing year by year. Sponsorship will exceed $1,000 for paying the top three places. This year a third day will be added for weather allowance. Dates for the 1984 Steeple Chase are April 27, 28, & 29.

So pilots, this spring, the Kitty Hawkers invite you to come on up and have some fun, even if you are a hard core high altitude flyer. You can bring your oxygen rig too, as you may need it if you cannot hang in there on a 3 foot ridge. That ground handling can kill you.

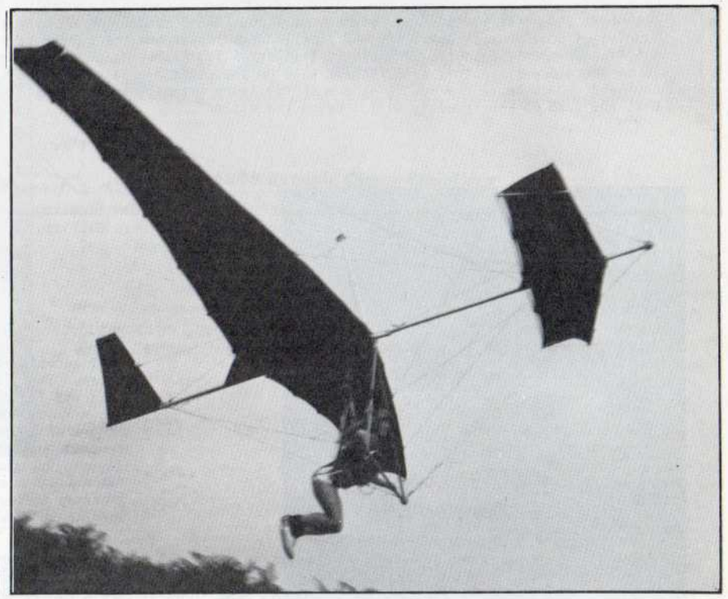
§

DISCLAIMER

The following is presented as but one designer's rather unique notion of a glider design to achieve greater performance. Whole Air *does not endorse this craft as anywhere near market-ready or market-capable, nor is that even the purpose for which its designer intended it. Instead,* Whole Air *presents "The Crossbow" as interesting, thought-provoking material for our readers.*

The unusual shape of a home-built design from an English pilot/photo by Gary Phillips/story and planform art by designer, Everard Cunion

THE CROSSBOW



THE MOTIVE

Photographs of British Skyhook weightshift controlled canards in the late seventies, and later, articles in the hang gliding press about Steve Moore's series of canards reinforced my own feeling that the canard was an idea worth pursuing, despite reports that Steve had been seriously injured during flight testing.

THE THEORY

Quite apart from the appeal of flying a glider which looks radically different from everyone else's, the important differences between the canard and the more usual "flying wing" concept, can best be described in two parts.

Firstly, the differences arise from separating the glider into specialized lifting and stability/control surfaces (applies to tailed gliders as well as canards). This leaves the designer with fewer stability and control factors compromising the wing's aerodynamic efficiency. So, it can have zero sweep-back and may have a very high aspect ratio. However, the airframe has to be more complex, with a consequent increase in parasitic drag and/or weight, which partly offsets the performance advantage gained.

Secondly, going for a canard (with the front wing fixed slightly nose-up compared to the main wing) rather than a tailed design, ensures that the front wing will stall first, and when it does the weight that it was hitherto supporting, pulls it down, diving the ship into an automatic recovery without the main wing ever having stalled. Unfortunately, this characteristic inevitably prevents the main wing from achieving its full potential minimum sink rate.

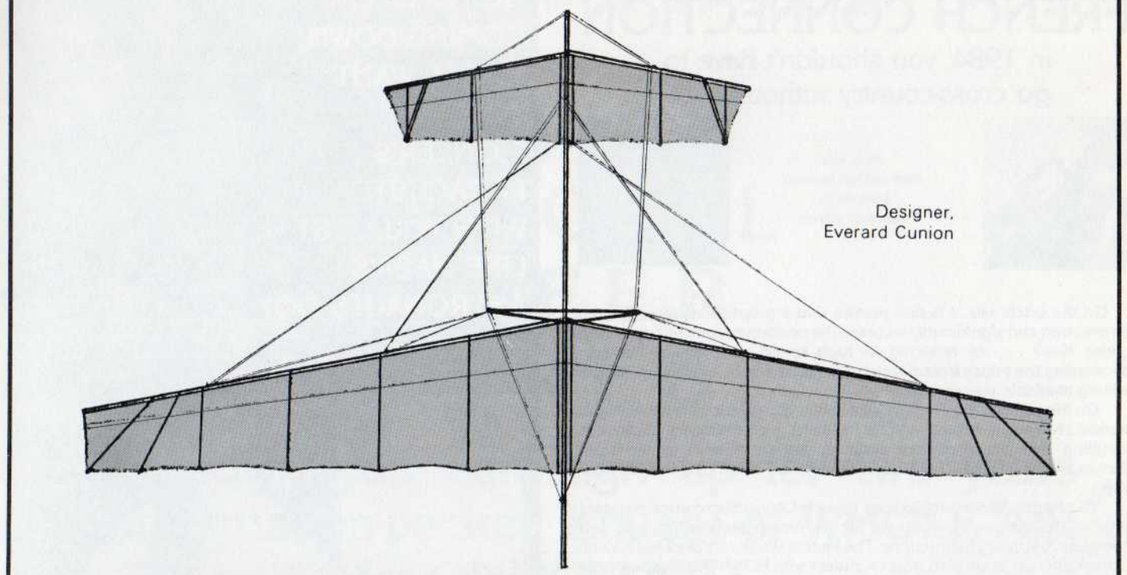
There are, of course, many other factors involved. Some come out as advantages while others do not.

THE CHALLENGE

Naturally a lot of work went into the design process. But as well as the stress calculations and aerodynamics, I found it necessary to think of methods of taking decisions on multi-faceted trade-offs that cannot be conveniently represented mathematically, and yet demand more

CROSSBOW DIMENSIONS

MAIN WING	
Span	32 feet
Sail Area	110 square feet
Aspect Ratio	9.3
Root Chord	5 feet
Tip Chord	2 feet
CANARD	
Span	12 feet
Sail Area	30 square feet
Aspect Ratio	4.8
Root Chord	3 feet
GENERAL INFORMATION	
Wing Separation (apex to apex)	8.9 feet approximately
Quarter Chord Sweep	arctan 0.15 (approximately)
[Trailing edge is a straight line.]	
Airfoil	7% camber, circular
Total Wing Area	140 square feet



Designer, Everard Cunion

than rule-of-thumb "eyeball engineering." After all, my life was going to depend on this thing!

There seems to be no way of guaranteeing that all possible combinations of events that could show up a flaw in the design have been thought of, so the test pilot can never be sure that the wing will not fail in flight. Maybe that is part of the appeal of flying your own experimental wing!

THE COSTS

The more mundane tasks such as designing the airframe details, compiling parts breakdowns for materials and parts ordering, then locating suppliers, and finally collecting it all together, amount to a large measure of time and effort for which the home constructor may not have bargained. I found that fitting in the thinking and the paperwork as well as doing a nine-to-five job was not too difficult. But the materials collection and construction stages were a real pain (especially without indoor workspace). This is true even though I had contracted out the sailmaking to FlexiForm Skysails (a well-known manufacturer in Britain). In addition I had to make the ultimate sacrifice . . . I sold my Birdman Cherokee to help finance the project.

THE RISKS

And so to Steyning bowl in the South Downs of England in May '81 for its first try-out. Running with it on the low slopes and getting feedback on the loaded sail shape from other flyers proved useful. But not right away, as it did not take off. Later that day while flying another glider I put myself out of action with a back injury.

It was not until this summer ('83) that I had recovered enough, and my circumstances enabled me to resume work on the Crossbow. This time I tested it in the rather pleasanter (if technically less than ideal) environment of the New Forest.

Partly prompted by my crash in '81, I entered a physical fitness program and determined to stay on top of things or pull out of it. The fitter you are the better? No. You can spend so much time achieving and maintaining a high level of physical fitness that your do not leave enough time to do that for which you are keeping fit.

FLIGHT AT LAST

After a number of low level "hops" and minor adjustments to the wing's twist distribution, together with accomodating my take off technique to its unusual pitch handling, I made several flights off a small hill. I found the flying characteristics different than a normal hang glider, but not in any way unexpected. Roll was good, yaw coordination was okay, and I would need to get used to the pitch. But on those first tests the glide ratio was abominable. I had been flying it in the stall mode due to miscalculating the position of the hang point.

A subsequent ground handling accident has postponed further development until next summer.

TO BE A HANG GLIDER DESIGNER AND TEST PILOT

I believe that any young man who aims towards a goal that is outside the structures of achievement that society would channel him into . . . a goal that is beyond the abilities of the vast majority of his non-hang gliding peers, will often be resented. More than the financial cost of building the Crossbow; more than missing out on thermal soaring and competitions; more than the virtual abondonment of a professional career; and more even than a broken back bone . . . it is the *attitude* of the outside world that is by far the biggest price I have paid. Quite possible others may be immune to this — and my own slightly elitist attitude undoubtedly makes it worse — but it is the *social risk* that I would wish to point out to anyone contemplating designing and building his/her own unique flying machine.

But I have found that one can have a sense of satisfaction when it flies, even if no one else is impressed.

THE FUTURE

Although the design of the Crossbow was finalized in 1980 — when double surface wings were starting to catch on in England — and three years of hang glider development passed by before its first flight, I still think that the concept of the stall-resistant, very high aspect ratio canard hang glider is viable.

OWNER SURVEY... WW HARRIER

by Bruce Wolfe

The survey for the Wills Wing Harrier was developed from 45 present and past Harrier pilots who returned the *Whole Air Magazine* owners survey questionaire. To my knowledge, the only pilots who are or were associated with Wills Wing company were a few dealers who replied. As such, this survey is composed of pilots who have nothing to lose or gain by a honest evaluation of their wing. I believe that is as unbiased as you can get.

I found it best to group the over 6,000 individual answers which comprise this survey into three categories: first the pilot; second the glider; and third the manufacturer and dealers. The survey answers are presented under the appropriate category rather than their order in the questionaire.

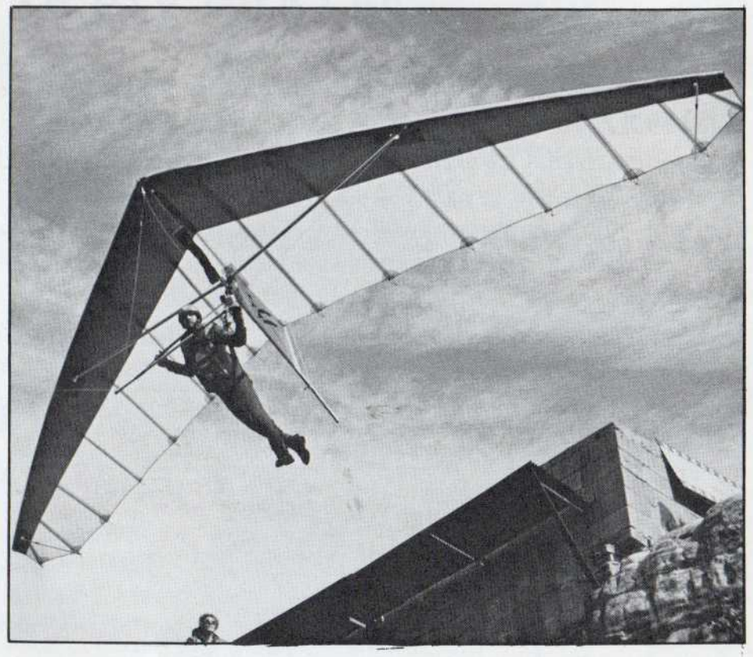
THE PILOT

It is important to know something about the pilots who have participated in this survey so the reader has an idea of the perspective from which the glider has been evaluated.

First the concrete facts. The age ranged from 18 to 55 years old, the average age being 31.5 years. This group of pilots weighed in from 120 lbs. to 210 lbs., the average weight was 160.8 lbs. The experience level was 24% Hang IV; 40% Hang III; 18% Hang II; 2% Hang I and 16% did not answer.

The airtime in hang gliders varied from a low of 30 minutes to 500 hours by an eleven year veteran. The average airtime per pilot was 79 hours accumulated in an average of 4 years of flying hang gliders. Nearly half, 47%, had an average of 79 hours of airtime in other aircraft.

There was one self confessed, full time air junky who flew every day (he lived in Utah). However, all the other pilots averaged 5 times a month.



As far as participating in competitions, only 11% flew in their Regionals and none in the Nationals. But 22% did fly in some sort of competition. I believe that local fly ins and fun mets would compose most of these 'other competitions'.

From these few facts, there are several items which are significant. First, nearly 65% of these pilots have an advanced hang rating (Hang III or IV). A quick spot check of the 16% who gave no hang rating revealed a considerable amount of airtime. With this in mind, the percentage of pilots with advanced skill levels would be closer to 75 to 80%. Add this to the 79 hours airtime average plus an average of 4 years of hang gliding involvement and this group emerges as a fairly experienced collection of hang glider pilots.

Although this an advanced group of pilots, the lack of professional or semi-professional competition activity clearly defines this group as being largely recreational pilots, rather than professional. The number of flights per month tends to support this as well.

Listed below are the owner priorites in order of relative importance as selected by Harrier pilots. The average rating appears with each priority. The rating system used was: 5-Vitally important, 4-Significant, but not vital, 3-Average importance, 2-Low on scale, 1-Not a priority at all.

4.9 Structural integrity
4.5 Quick handling
4.4 Light handling
4.2 Sink performance
4.1 Glide performance
3.7 Light weight
3.6 Speed range
Set up
3.5 Mellow handling
3.4 Price
3.3 Brand name
2.9 Delivery time
2.6 Popularity
2.5 Contest successes
2.3 Innovation
1.4 Uniqueness

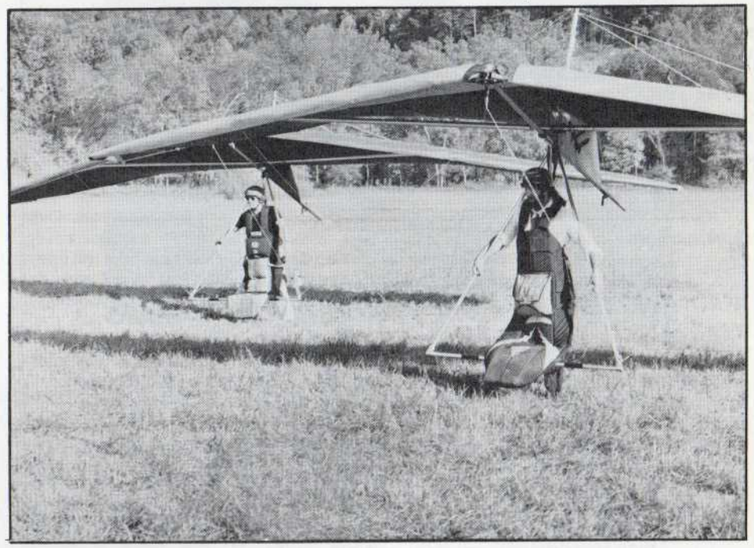
Not surprisingly, structural integrity tops the list with a 4.9.

However, the key to understanding Harrier pilots can be seen in priorities two through nine. Quick and light handling are qualities Harrier pilots value above the performance qualities of sink and glide performance. A convenience feature, light weight, is valued just slightly more than the performance feature speed range, which is tied for 7th place with another convenience feature, ease of set-up. Mellow handling rates at the bottom of this group of handling, performance and convenience qualities which, except for structural integrity dominate the top nine priorities.

Price, brand name, and delivery time rated an average priority level, while the other factors rated between average importance to very low on the scale. Contest successes came in third from the bottom, which again demonstrates the recreational outlook of these Harrier pilots.

The equipment and the percentage of pilots who used each is listed below in descending popularity.

Rank	Equipment	% Used
1	Helmet	100%
2	Parachute	95.6%
3	2nd Hang strap	88.9%
4	Variometer	82.2%
5	Altimeter	73.3%
6	Radio	37.8%
7	Airspeed Indicator	26.7%
8	Compass	15.6%
9	Ballast	8.9%
10	Strobe	0.0%



Please note the safety related items occupy the top three positions.

This brief look at the survey pilots has revealed them to be largely experienced pilots who fly for fun and recreation.

Probably because of this recreational outlook, these pilots place heavy emphasis on pleasant handling characteristics and convenience features. Performance is important of course, but not at the expense of a pleasurable flying experience.

It is with this perspective the Harrier has been evaluated.

THE GLIDER

The type breakdown of the 45 Harriers are: twenty six Harrier Is, eighteen Harrier IIs and one unknown. Size-wise there were 13 small (147), twenty eight 177's and four 187's. All are certified gliders.

The big years for Harrier purchases were 1981, when 18 (two used) of the survey gliders were purchased and 1982 when 22 (five used) Harriers traded hands. Spring and summer were the seasons for sales. The average purchase price for each year is as follows:

Year	New Price	Used Price
1980	$1,250.00	
1981	$1,430.00	$1,275.00
1982	$1,522.00	$1,175.00
1983	$1,500.00	

These averages include several cases where individuals, either dealers or friends of, reported what was probably dealer price as their purchase price. As such, prices may be a little on the low side.

The amount of time required for pilots to set their glider up ranged from 7 minutes to 20 minutes; the average was 15 minutes. One person reported needing help setting up; this pilot was just too short to reach all the required places. On the scale of five (superior) to 1(poor), pilots rated the set up at 4.2, just above good.

The breakdown time was a little quicker at 13.5 minutes with a range of 5 to 23 minutes reported. This was, as I am sure everyone would expect; a one person job. The average breakdown rating was the same as the set-up rating, 4.2.

Pilots were asked to rate the overall quality of flying their Harrier and then rate the glider for the quality of twelve individual characteristics. The scale was the same as before: 5-Superior, 4-Good, 3-Average, 2-Fair and 1-Poor.

The overall quality of flying the Harrier was 4.4, half way between superior and good. The twelve individual characteristics are listed below in order of their quality rating, highest to lowest.

4.7 In turns
To coordinate turns
4.6 Pitch trim
4.5 In ridge lift
Roll trim
In thermals
4.2 To set up/maintain approach
4.1 To ground handle
To lift (weight)
4.0 Maintaining hands-off flight
3.4 To flare
2.9 Generally, to land

Note that the quality of 10 of the 12 characteristics fall between good and excellent; and of these, six were rated 4.5 or above. Notice that handling characteristics top this list.

The two lowest rated characteristics both concerned landing and were rated a little better than average to just a little

below average. There were several notes by pilots who expressed difficulty landing the Harrier.

Pilots were next asked to rate their gliders ability in fourteen specific areas. Comparisons with other gliders and the ability to achieve what the pilot wanted were the basis for this evaluation. The rating system was the same one used throughout the survey.

Here is a list of those 14 areas in decreasing order of ability.

4.8 Quick handling
4.7 Light handling
4.5 Strength, overall
4.3 Handling at low speeds
Straight ahead stall
4.2 Handling at high speeds
4.1 Mellow handling
Turning stall
Sink performance
4.0 Low speed stability
3.8 Speed stall
3.6 Glide performance
Speed range
High speed stability

Listed in the top two positions are areas of handling; quick handling immediately followed by light handling. Both are within a few tenths of the highest rating possible; for most practical purposes these two areas verge on excellence according to Harrier pilots.

Notice also that here, 10 areas out of 14 are rated between good and excellent.

Glide, speed range and high speed stability are at the bottom of the list and share the same rating. Some pilots commented that once the bar was pulled in, down you came.

Pilots were also asked to evaluate the maintenance required in several different areas.

Forty three percent of Harrier pilots reported having to make some sort of repair that was not related to an accident or a crash. The ease of these repairs was rated at 3.9 (4-Good). Ease of repairs due to a crash was 3.8. One third of those responding had something fall off their glider that should have stayed on. Over half, 59%, said Harrier ribs bent easily. When asked what they thought of the down tubes, one half said they were stronger than previous gliders, one quarter thought they were the same and 20% felt their downtubes were weaker.

The overall workmanship was rated between good and excellent, specifically 4.3 (4.0 "good" — 5.0 "superior").

Pilot split evenly over experiencing any wear early in their ownership, half did and half did not. Of those who did, the most common complaint was wear points on the sail during transportation. Other complaints included elongation of leading edge holes at the nose plate (2 complaints), batten bungees breaking and other miscellanious minor problems.

The most serious complaint was by one pilot who was the victim of a series of events. His comment in its entirety follows: "Due to sending wrong size glider, factory did a 4 week rush job, batten pockets pushed through, needed factory repair, and sail had no insignia. Also end caps fall off. After repair of sail, factory returned sail without mylar." In the 45 surveys, this was the worst anyone had to say about the Harrier or the company.

This comment also touches on the next section, the manufacturers and dealers.

MANUFACTURER AND DEALERS

There were 45 Harriers involved in this survey and all but 7 were purchased new. Forty one gliders or 91% were purchased from dealers, the remainder was evenly split between purchases from private sources and factory direct.

Concerning the delivery process of their glider, 27% reported receiving their glider in a tube. Of those who had to assemble their glider from the shipping tube, 92% rated the process easy and 8% said it was moderately esy. One third said they needed tools for the assembly, the rest did not. Ninety one percent said all the parts needed were present and fit together well. The remaining 9% was missing something and had some trouble fitting the parts together.

H.G.M.A. certified gliders are supposed to have a sticker which is dated and signed by the pilot who test flew the glider. Of those responding, 98% said their Harrier had the sticker and 95% said it was dated and signed.

Full time dealers represented 67% of all dealers and 60% of all dealers operated with a store front, the rest did not. The average distance the owner lived from his dealer was 99 miles. Pilots rated their dealer's stock at 2.7, a little below average, and the average delivery time for parts not in stock was 16 days. The overall rating for the dealers was 3.8, just a little below a good rating and well above average.

The following accessory items were received with each Harrier by their new owner. Ninety five percent received an owners manual, 53% a service manual, 93% spare parts and 95% a rib chart. These figures include the used gliders as well as new purchases.

Asked whether the dealer test flew their glider, 77% said yes. Some pilots however, said they preferred to test fly their own glider, even though the dealer offered to fly it for them. Eighty one percent of the dealers showed the owner how to set up the glider and 70% also went over the owners manual and glider in general with the owner.

Pilots were questioned if the factory asked them to respond about their purchase and two thirds said Wills Wing did question them and of these 93% did respond.

Factory workmanship was rated between good and excellent at 4.4 and the materials used by the factory was rated similarily at 4.6.

Advertising is the last item considered under manufacturer and dealers. Wills Wing does advertise, of course, and 67% said this was factor in knowing about and/or buying the Harrier.

Pilots were given eight areas and requested to rate how successful the

Continued,

manufacturer was in being honest about those areas. The scale is the same as used before; 5-Excellent, 4-Good, 3-Average.

4.6 Handling
4.4 Quality, Materials
4.4 Worksmanship
4.4 Performance
4.3 Overall
4.3 Weight
4.2 Set up
3.1 Delivery time

Owners felt that Wills Wing's honesty was good to excellent in all areas of advertising, except delivery time, which was rated average.

CONCLUSION

Owners were asked to sum up their experiences with their Harrier through a number of final questions.

The overall rating for the Harrier was a bit above good at 4.3. Questioned if they would buy another glider from Wills Wing, 98% of those answering the question (2 did not answer) said yes. All but one pilot said they would recommend another pilot buy this glider and all 45 (100%) said they would recommend another pilot buy from the Wills Wing company.

Ninety one percent felt the Harrier was worth the retail price, while 98% thought it was worth the price they actually paid.

To the question, "Can your glider be sold for use by a novice pilot?," 70% said yes, and 30% said no.

Answers to the question of "What are your glider's best features were diverse, but the most common answer by far was handling. Second most common answer was sink rate, followed by a variety of other qualities such as structural integrity, easy launching, and others.

For the worst features of the Harrier, landing was the most often cited, with L/D at speed the second most common. Battens bending or breaking, wear during transportation, and bungies breaking were other items cited.

Some qualities showed up under both headings, such as weight and stability. These were listed as some of the best or worst features, depending on the pilot.

The final question of the survey was "Have you had any particular problems with your glider?" Followed by a request to list such problems. Although 53% said they did experience some problems, all had been covered previously and were minor problems. In short, no new information was brought to light.

My congratulations to the reader was has successfully completed this article. Some may think it dry, however, if you found the reading less than exciting, you should have tried condensing the 6,000 plus bits of information from which this article was developed. Consolation may lie in the fact that you have received the most unbiased, complete survey about the Harrier to-date. §

Goldmarque Shadow & Gyr — Lark's 100.35 Miles on an S4

by Noel Whittall

A machine in England which the keen pilots are watching closely is the "Shadow" [no relation to last year's — now discontinued — Flight Designs Shadow]. A product of a small Yorkshire firm called Goldmarque Sports, it is an apparently orthodox CFX [Concealed, Floating Crossbar] model, but has some really neat hardware details which result in a quite light and clean airframe. The company is also fairly new, and its fortunes have so far been based on production of one model, the "Gyr," which is about the only glider aimed directly at the intermediate pilot on the United Kingdom market. The Gyr has done outstandingly well, and now some of the hotter League pilots are looking long and hard at the Shadow.

I flew an early Shadow and did not like it much because it required very deliberate inputs to persuade it go 'round corners. It turned out that "my" example was fitted with the wrong base bar on the control frame which resulted in about three inches too much dihedral. With the correct rig the handling is super. The Shadow felt as if it had a rate of energy conversion better than that of other flexwings I have flown. I did not feel that it was the fastest glider I have flown, but it certainly seemed to accelerate better than any other that comes to mind.

The outstanding flight in England for last year (1983) was not made on either a Magic or a Shadow, but on the latest version of Solar Wings' Typhoon, the S4. Hundred mile cross country flights are still remarkable in any part fo the world, but in our crowded little island, they are indeed exceptional, since cloudbase is rarely a mile high. Bob Calvert managed one in 1981, and no one joined him until September 6th, 1983, when Colin Lark achieved 100.35 miles over the fat farmlands in the south of the country.

Colin launched from Frochester, a 300 foot downland site in Gloucestershire, and covered the one hundred miles in a little more than 3½ hours before landing close to the Sussex coast near Brighton. It was a flight he had been aiming at for a couple of years, and made an auspicious start to his new job as outside Sales Manager for Solar Wings. Most of the flight was made below 3,500 feet above sea level on a classically good thermal soaring day. §

BLUEBOOK

EDITION NO. 31

The BLUEBOOK is a service of *Whole Air* magazine. The prices which appear below are designed to be *guidelines* for evaluating the worth of your glider or one you many wish to buy. We *do not* intend for these figures to be considered the final authority. *Please* consult your local qualified dealer for information pertaining to these values in your particular area. The prices *do* vary widely in differing geographical locations.

Dealers: Please contact *Whole Air* Magazine about your input to the BLUEBOOK. The figures come from collected reports of *actual sales* of used gliders in all areas. They are then averaged for purposes of simple presentation. To keep from having disparity in these prices from area to area, we need input from more dealers. Your input is welcome and will be used and appreciated. Send to the attention of BLUEBOOK.

Year	Model	Size	Clean Price	Avg. Price
	BENNETT DELTA WING			
79	Phoenix 6D	185	600	500
	Lazor I	190	625	575
80	Phoenix 6D	215	650	650
	Lazor II	175	850	650
81	Phoenix 6D	185	825	700
	Viper	180	925	675
82	X-180	180	1275	975
83	Dream	165	1175	1025
	Streak	158	1600	1350
	EIPPER FORMANCE			
79	Antares	Med.	775	575
	Antares	Lg.	650	650
	ELECTRA FLYER			
79	Dove	A	600	450
	Cirrus 5	A	700	525
	Olympus	160	750	500
	Floater	205	725	575
80	Spirit	200	825	650
	FLIGHT DESIGNS			
79	Lancer	190	700	525
	Lancer	170	775	600
80	Super Lancer	200	750	550
81	Super Lancer	175	875	575
	Demon	175	700	600
82	Javelin	168	825	675
	Javelin	208	875	675
	Demon	175	975	725
	MANTA			
79	Fledge II	B	975	600
80	Fledge II	B	1125	1000
82	Fledge III	B	1500	1350
	MOYES			
79	Maxi III	200	650	625
80	Stingray	200	600	575
	Maxi IV	200	750	575
	Mega II	172	975	750
81	Mega II	172	1150	925
	Meteor	180	1075	950
82	Missile	200	1275	1075
83	Missile	180	1425	1375
	PACIFIC WINDCRAFT			
83	Vision	18	1400	1225
	PROGRESSIVE AIRCRAFT			
81	Pro Air, Series I	160	1225	1100
82	ProBreez	180	1075	1000
	ProStar I	160	1300	1175
83	ProStar II	160	1575	1450

Year	Model	Size	Clean Price	Avg. Price
	SEAGULL			
79	Seahawk	180	725	600
	10 Meter	---	825	600
	11 Meter	---	825	575
80	11 Meter	---	850	650
	SEEDWINGS			
81	Sensor 510	180	1100	1075
82	Sensor 510	180	1425	1275
83	Sensor 510	165	1675	1525
	SKY SPORTS			
79	Osprey 2	175	525	350
	Sirocco III	189	750	325
	ULTRALIGHT PRODUCTS			
79	Mosquito	166	450	200
80	Firefly 2B	181	675	500
	Comet	165	1050	725
81	Gemini	164	925	775
	Comet	165	1175	925
	Comet	185	1250	900
82	Gemini	164	1075	925
	Comet	165	1375	1075
	Comet	185	1400	1150
83	Gemini	164	1225	1075
	Comet 2	165	1625	1500
	WILLS WING			
79	Alpha	185	725	600
	Alpha	215	700	575
	Omega	220	750	625
	Raven	209	850	700
80	Raven	209	875	700
	Raven	229	850	725
	Harrier	177	975	800
81	Raven	179	1025	875
	Raven	209	1050	850
	Harrier	177	1075	950
82	Harrier II	177	1225	1000
	Duck	160	1400	1250
	Duck	180	1325	1125
83	Duck	160	1500	1300
	Attack Duck	180	1650	1450

AIRWAVE GLIDERS
PACIFIC KITES
SIERRA WHITEHAWK
SPECTRA AIRCRAFT
SPORT AVIATION MFG
STRATUS UNLIMITED

No used market values established at this time.

DIRECTORY

READER: This source listing is provided by *Whole Air* and all participating dealers. It will provide you with a geographically organized listing (by time zone, north or south) of reliable businesses with which to deal, and from whom everything from lessons to equipment can be obtained.

NORTH EASTERN

ECO FLIGHT HANG GLIDERS & MICHIGAN MOTOR-GLIDERS
493 Lake Street
Benzonia MI 49616
616/882-5070
Visit our Frankfort area shop in Michigan's hottest soaring area. USHGA and FAA Certified Instruction. Wills Wing, UP, Flight Designs, Sensor, Pterodactyl, Manta, Windsurfer represented.

AERIAL TECHNIQUES
Route 209
Ellenville, NY 12428
914/647-3344
Come visit Ellenville. Learn to fly at our new training facility or challenge the mountain with your thermalling and X-C skills. Complete inventory of gliders, accessories, and replacement parts. Quicksilver ultralight sales and instruction. Open all year.

SPORT FLIGHT
9041B Comprint Court
Gaithersburg, MD 20760
301/840-9284
We're the pros in the mid-Atlantic area. Representing the most major brands. Complete line of accessories. Repairs. Beginner through Advanced foot launched.

SOUTHEAST MICHIGAN HANG GLIDERS
24851 Murray Drive
Mt. Clemens, MI 48045
313/791-0614
Dealer for: UP, Delta Wing, Soarmaster and the incredible Eagle. Tow instruction on the Yarnall Sky Hook. New Soarmaster Trike Gear in stock.

MOUNTAIN WINGS
Box 1022/Main Street
Kerhonkson, NY 12446
914/626-5555
Ellenville area's newest and largest shop, just off Route 209. Product line: Flight Designs, Delta Wing, Manta, Seedwings, ProAir, Stratus, Pacific Windcraft, UP, Ultralight Flight, Kasperwing, Lazair. Comprehensive instruction programs/audio visual aids.

AIRWISE, INC.
15 Long Ridge Road
West Redding, CT 06896
203/938-9546
Stormville (NY); 919/226-6712
Hang gliding equipment by UP, Flight Designs, Manta, Pacific Windcraft, Delta Wing, Moyes. Ultralight line: FlightStar, Ascender, Mitchell A-10, Kasperwing, FoxBat, Mirage and Phantom. Quality service, certified instruction.

MORNINGSIDE FLIGHT PARK
Rt. 12, RFD #2
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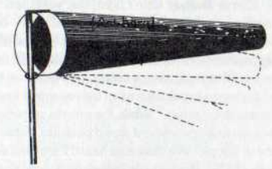

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PRODUCT LINES

CHATTANOOGA TENN. — Well, well, well . . . the year ended and we are not obliged to report any new losses for which we are most grateful. But we've lost 1983 since our last issue and, frankly, most of the sport's businesses breathe a collective sigh, as if to say, ". . . glad *that* year's over; it was a tough one, and 1984 is gonna be better." Well, we'd sure like to think that is a lot more substantive than just "blue sky-ing" our future. And we may well have the determination to make it so. This last January, *Whole Air* paid many visits out in the great southwest. We have a proposal on the table for USHGA, and the feeling of many of our sport's leaders needed to be known. That's a whole other story, folks, but the required high energy visits gave us a wonderful chance to 'feel the pulse' of our little industry and its level of success/accomplishment. After visiting **every manufacturer** in the USA, and seeing *most* of the more influential shops, we can say, 'Good riddance '83 — come on '84!' Not only was '83 a doldrums type of year (one heavyweight said biz was down 40% [!] over '82), but the expression of desire and drive to make '84 *come alive* was strong and obvious. *That* made *us*, breathe a sigh of relief — for no magazine can be an island to itself. Enough of this philosophical babbling, though, let's get on with the *good stuff* that has so many readers go directly to this page. **Team Bennett** is sparkling with new promise. Their **light Dream** is catching on like a prairie fire in the dry season, as they report "signing" **Hang Gliders West, Mission Soaring, Chandelle, Windsports,** and others. The new lightweight-er is essentially the same Dream, but besides less weight (49¾ lbs., they say) it sports the new nose and tail fittings designed by Uncle Bill. A very nice piece of hardware, we thought, small and functional, and sure to end those comments like "standard Delta Wing hardware." They've also got a nice control bar mount bracket allowing the glider to easily be de-rigged on the ground. More good news is that the **Streak**, in addition to the new nose, tail, and control bar fittings, also comes *standard* with a streamlined aluminum kingpost, an extended keel pocket (*they* call it a keel "blade"), and a nose cone. *Plus, at no cost* to those who desire them, you can get streamlined aluminum downtubes, which will then come with a ⅞" basetube. By the way, replacements for the faired d-tubes are a reasonable $30 each. Further Mr. Streak has a new sail cut, giving it esthetic enhancements, and they now have Surfcoate sailcloth in 4 colors: yellow, raspberry/magenta, green, and of course, white. All this new-ness is accompanied by an expected 10% price increase, eh? No! None. Still $2250, which suddenly makes the Streak a more reasonable buy, price-wise alone. While we're at Delta Wing, and since **HGMA** seems to be always meeting there, we'll report that at the November 16th meeting, the august group reviewed and accepted a documentation package on the **Moyes Missile GT 190.** That brings to mind the attempt at contact we made with **Moyes Delta Gliders.** Calling their Covello phone number for Moyes — California, we got Steve's aussie-sounding recording machine a few times, then to discover the man behind the machine was back in Australia (their summer + our winter = competitions, we'd bet). A live gentlemen finally ended our insistent ringing one day to tell us the above, and to agree to pass on a message, so we've little else to report on Moyes here and now. But still thinking of both certification and "foreign" manufacturers, we want to report continued development on **Airwave's** attempted market entry to the USA. After winning the South African Nationals on his loaned-from-Seedwings-plus-airfare Sensor 510, **Chris Bulger** didn't fight, but switched ...to Airwave. He's now their main man in America. And the earliest **Magic III's** are beginning to arrive. So, relative to HGMA, **Ken Brown** — who along with **Paul Whitehill** is on the Airwave team — plans to assume responsibility for documenting the Magic III certification to HGMA standards. A competition could ensue, we speculate, as **Airwave** joins the frenchmen of **Skylines** as "foreigners" trying to break into what we reported (quite erroneously, it appears) as "the immense American market." While the efforts snowball in our Land of the Free to pull the industry back up to its prominent world position, these other companies are planning how to get a piece of the pie. We have also heard **Firebird of Germany** has some plans "to sell 500 units in the U.S." We feel our industry can use the keep-you-on-your-toes feelings all this may generate. But so long as we're on the subject . . . we spent a lot of time in January/February with the energetic gang from **Skylines.** Co-owner **Gerard Thevenot** of **La Mouette** travels the world, and may well qualify as a truly *World Market Manufacturer.* In comparing numbers, we were shocked to discover that not only is America recovering from a kind of slump, but we're likely not the biggest hang gliding country in the world. Germany *and* France *each* are very similarly sized as the present U.S. — we're speculating about 12-15,000 "regular" flyers, slightly less than half of which are USHGA members (*come on you guys . . . 'get joined' again!).*Gerard was also surprised, exclaiming, "No wonder those [American leading] manufacturers only build ____ gliders per year!" Well, possibly such situation is why **UP** continues a growing diversification into such fields as sailboards, and now finally for 1984, powered ultralights. Yep, UP is heavily into their (powered for now) **Arrow** project. Matter of fact, the effort has brought some very interesting organizational changes for the builder of the Comet/Gemini/Comet 2. First **Peter Brock** has moved into a new discipline, primarily putting time into designing on the Arrow. He's eminently qualified for such, having long experience at hardware, engine, fabrication design from his successful days at BRE — Brock Racing Enterprises. So his old title, GM — General Manager — has now been taken by **Chris Price.** *Of course,* part-owner, **Roy Haggard** stays; he'll be busy, too. The group plans not only to continue to do good things in hang gliding, but to make a well-thought-out, carefully planned and executed entry to the topsy-turvy world of ultralights. UP is well aware of the state-of-the-industry for the power guys, and seems to us to have their eyes wide open as they prepare to debut the **Arrow** at **Oshkosh '84.** A lengthy discussion with Pete assured us, however, that UP will learn a great deal with the powered Arrow — working out hardware details . . . funding the program and justifying same with the engined version — BUT THEN, go right into the **soaring Arrow,** which Brock says really identifies where their heart is. We wish UP *great success* with the Arrow, partly 'cause the hard work deserves, but also (selfishly) because we want them to pursue the soaring Arrow ultralight sailplane . . . *Whole Air* has *long* supported such development. Another fellah with abilities in the sailplace direction is **Bob Trampenau.** Of course, many of you have now read his interview in *the other magazine,* but maybe don't know that **Seedwings** really isn't anymore the microscopic manufacturer that many think it is. With sales in '84 *up again* (*double* that of '82, and up 33% from '83), Trampenau's getting a new address and may be incrementally closer to one day building that ultralight sailplane we'd like to see. With their own sail loft facility, and a sum of 4,000 square feet, Seedwings is growing. Write 'em now at 5760 Thornwood; Santa Barbara, CA 93117, or call at 805/967-4848. As of January 24th, Seedwings was 15 gliders backordered, and we can nearly see Bob's smile 2500 miles away. He's also grinning as he announced that flying his gliders in the **SoCal Mfrs League Meet** will be none other than **Stu Smith** (of course, and "watch out competitors"), **Don Gordon, Rich Pfeiffer,** and obviously, **Bob Trampenau.** It's a good line-up and we wish them — and all teams — the best of flying. Not far away in Simi Valley, **Dick Boone's Progressive Aircraft Co.** is cooking too. Their address is the same, but their glider is looking radically different. Actually, we lied. It doesn't look so different, but the explanation of what's going on and how is sure different. In our April issue, we'll be attempting to describe the theoretical changes in Dick's new **Pro-Dawn.** Before he let us look at it in November, he gave us a one-hour lecture on the design goals. Good thing, too, or we'd have jumped to many wrong conclusions. Then, in January, we saw several subtle changes, and now in February, there are still more. But these are subtle as we said, and the Dawn will go on the market this spring, it sppears. It's neat, we think, with some wonderful potential for dramatic changes down-the-road. We'll try to do justice in our next magazine . . . watch for it. Pro Air Co. also has a **Trainer Breez.** Lighter, smaller bar, easy to handle, and convertible to standard, certified **Breez,** the glider is offered at a special price to dealers operating Certified Schools. Sounds like a good deal and Boone's support of "proper," professional dealerships is appreciated! Up coast at **Pacific Windcraft,** things are jumping. The **Skylines** affiliation is well reported (see pgs. 18-25), so we won't bore you with repetition, but the PWC glider operation is humming along as well. Somehow, Jean-Michel's charming wife, **Natalie Bernasconi** has taken care of management while JMB has been touring/towing the country. That may not seem too tough in the winter except she's also been preparing to deliver a baby at the same time. And she did! The Bernasconi's have just been blessed with a healthy baby girl, **Collette** (hope we spelled that right). Congratulations Natalie and Jean-Michel. *That* reminds us of **Wills Wing** where Mike & Linda Meier had a similar joy not long ago with little "AJ," who didn't quite care to say "hi" at our January visit, tho we ooohed and aaahed trying to elicit a response. At Wills, the **Skyhawk** is now released (many of you probably read a report in *HG* mag), and the **Harrier II** is thus discontinued along with the huge **Duck 200.** Harrier demand ". . . has declined steadily over the last year and a half. . ." so the Skyhawk will fill the need for a beginner and recreational glider. The big Duck had similar demand decrease, not unusual for its massive size. Also gone is the Bulletman harness. Ducks in 130/160/180 sizes are doing very well, tho, further spurred on by a win by **Bill Floyd** at the **Torrey Pines Air Race** in November. He overcame challenges from team flyers representing UP, Bennett, Seedwings, and Moyes (Steve himself flying a Missile GT). Generally besides Duck success, the WW'ers are "stoked to the max" over their Skyhawk. We didn't get to fly one but they say its a lightweight, economical, easy-to-fly recreational soaring glider. They say it looks to be a cross between a Raven and a Harrier, and besides ground handling and launching well, they claim, ". . . it's the easiest glider to fly that we've made since the Raven. It is also, without question, the most fun." An exact production schedule was not announced in their end of November newsletter. On an ending note is a happy note. Per an article in (Britain's) *Wings!* magazine, **Rick Masters' Cross Country Pilots Ass'n** has made progress and the article confirms news that the **1984 XC Classic** WILL be held. Masters is reported as saying UP, Seedwings, Delta Wing, and Moyes are *eager* to help with expenses so it will happen. Rick has a lot of news about Owens Valley flying. We encourage you to at least write the CCPA, and perhaps join up so as to receive their newsletter. If you plan to EVER fly Owens, or if you at least want flying there to continue, you oughta consider helping 'em out. It's not expensive and the cause seems worthwhile. Got news of opinions? Send 'em to "Product Lines" at Box 144, Lookout Mtn., 37350.

1984 Owens Valley Cross Country World Championships are scheduled. Arriving under the auspices of the **Rick Masters'** Cross Country Pilots Ass'n, the competition will take place June 30th thru July 11th, 1984. Contact the CCPA at P. O. Box 458, Independence, CA 93526. Fees are set at $250, with CCPA membership required. Send resume for review.