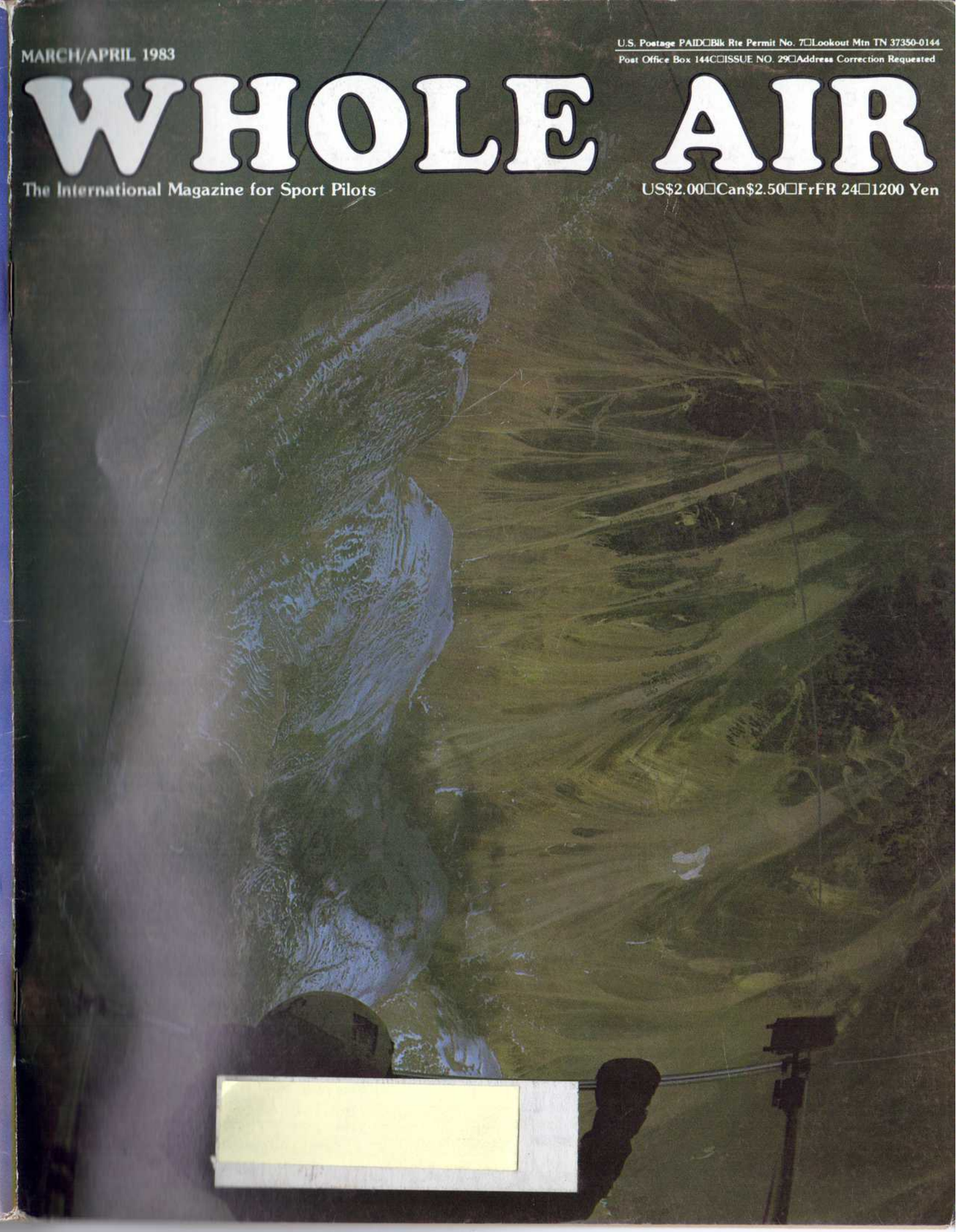
MARCH/APRIL 1983

U.S. Postage PAID□Blk Rte Permit No. 7□Lookout Mtn TN 37350-0144
Post Office Box 144C□ISSUE NO. 29□Address Correction Requested

WHOLE AIR

The International Magazine for Sport Pilots

US$2.00□Can$2.50□FrFR 24□1200 Yen



FULLY HGMA CERTIFIED

Buy any glider you want... But first fly a Vision

So you're thinking about getting a new glider? You're faced with an important decision. There are a lot of fine gliders to choose from in today's hang gliding industry.

You've read all the manufacturers' ads, heard the pitches that tell how great the product is, but you know that the proof is in the flying.

That's why we're simply asking you: Fly a VISION.

Listed below are some of the most professional and competent dealers you'll find in the world of hang gliding. They share our commitment to quality. They invite you to walk into their shop to demo the new VISION. We think you'll agree, you won't find a more enjoyable glider with such an exciting performance and handling envelope. Furthermore, take a look at the unique guarantees we designed to back up each VISION. It'll help you make a wise decision.

Just ask your dealer: he'll tell you about PACIFIC WINDCRAFT Ltd.'s full year guarantee on the VISION; he'll tell you about our free maintenance schedule and about our guaranteed shipping date; he'll tell you about the extensive testing and development program behind the VISION's sail and airframe concepts. And by the way, he'll also tell you about its surprisingly affordable price tag.

We've committed ourselves to never mass-produce our gliders. Ask your dealer about our way to craft a VISION just for you, its pilot.

So fly a VISION, chances are your search is over.

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West Redding, Ct. 06896
203-938-9546

Kitty Hawk Kites West
#1 Reservation Road
Marina, CA 93933
408-384-2622

Four Corners School of Hang Gliding
Box 38
Hesperus, Colo. 81326
303-533-7550

Lookout Mountain
Route 2, Box 215H
Rising Fawn, Ga. 30739
404-398-3541

Peak Experience, Inc.
9 River Road
Hudson, NH 03051
603-889-1555

The Hang Glider Shop
8887 N. Ventura
Ventura, CA 93001
805-649-2470

Mission Soaring
43551 Mission Blvd.
Fremont, CA 94538
415-656-6656

Sunrise Country Hang Gliding
Rekku Shibakoen Mansion 1104
Shibakoen 2-11-13
Minato-Ku
Tokyo 105, Japan

Kitty Hawk Kites East
Route 158 Bypass
Nags Head, NC 27959
919-441-4301

Morningside Glider Park
R.F.D.-2
Claremont, NH 03743
603-542-4416

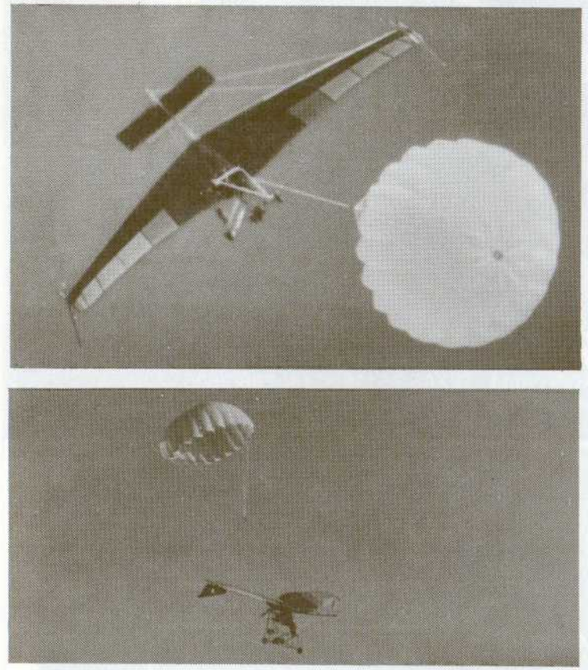
Pacific Windcraft Ltd.

1100 Madison Lane • Salinas, California 93907 • 408-422-2299

THERE'S A SURE FEELING TO QUALITY.

BALLISTIC RECOVERY SYSTEMS INC.

The Ballistic Recovery System is an emergency parachute device used by pilots of ultralight aircraft, and in the near future, on hang gliders. The BRS is designed to deploy at extremely low altitudes and deploy in minimal time, bringing the pilot and craft down together. The BRS was developed, not necessarily to replace hand thrown chutes, but to compliment them.



Why ballistics then? Two primary reasons:

1— Since most ultralight flying takes place at altitudes under 500 feet, a hand thrown chute would probably be of little value in most flying situations. Results from the Chattanooga chute deployment seminar (the *only* comprehensive test yet performed on hand thrown chutes) proved conclusively that hand thrown chutes averaged 7.4 seconds for deployment to occur. Hand thrown chute deployments have occurred at less altitudes, but in most cases, these deployments were in ridge lift of the glider was descending at a shallow angle.

Conversely, a ballistic system has documented in-air deployments of less than 1.5 seconds.

2— In throwing out a hand deployed chute, another problem presents itself . . . clearing the glider. Chute entanglement is a distinct possibility in both ballistic and hand thrown situations. A hand thrown chute requires multiple time consuming movements while looking for a clear space to throw the chute. Ultralights are notorious for having many wires, struts, etc., that could easily ensnare a chute. A hand thrown chute is surprisingly difficult to throw any distance with any kind of accuracy, especially when the pilot is in a state of panic.

A ballistic system, while not eliminating the possibility of entanglement, certainly lessens the chances. Because of the ballistic charge, full bridle and chute extension is immediate. This means the chute canopy is discharged immediately past the various obstructions on a typical ultralight.

A related advantage of the ballistic system is that a semi-conscious pilot would only have to pull an activating handle located near his body to discharge the chute. In a hand thrown situation, a conscious effort must be made, requiring concentration and dexterity at a time when little can be expected.

COMPLETE **BRS** UNIT WITH CHUTE, with cable bridle $796.00
BRS UNIT *WITHOUT* CHUTE $490.00

STANDARD FEATURES INCLUDE:
A) Activating Unit
B) Cartridge Assembly
C) Ballistic Device Body
D) Parachute Frame
E) Fabric Chute Container
F) Regular Size Chute (26 foot)
G) Standard Locking Carabiner
H) Miscellaneous Fasteners

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WHOLE AIR

ISSUE NO. 29, VOLUME NO. 6, NO. 2, 1983

PILOT'S PERSPECTIVE

WHOLE AIR Magazine is published bi-monthly by Idea-Graphics, P.O. Box 144, Lookout Mtn, TN 37350-0144.

Change of Adress & Subscription Inquiries — Send to *WHOLE AIR*, P.O. Box 144, Lookout Mtn, TN 37350-0144. Expiration date marked on mailing label in a four digit sequence, followed by two letters. The first two numbers are the year; the second two are the month of subscription expiration. Please give six to eight weeks advance notice of address change. Send both old and new address plus mailing label from recent issue, if available. Subscription rate: U.S. and Possessions, one year $9.00; Mexico and Canada, one year $13.00; All other countries, one year $17.00; Air Mail available, write for rates based on one year (only) subscription.

FEATURES

AERO TOPICS

Coming Next Issue:

Whole Air's First Annual Buyer's Guide. Don't Miss It!

Volume 6, No. 2, 1983

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On The Cover:
A change of pace view by Leroy Grannis flying with Charlie Baughman in the Snow Clouds of Telluride.

Publisher's Column

SHOCKING NEWS

On the last day of January 1983, the mails brought *Whole Air* an announcement from the company which prints the magazine. The news told of a whopping *33%* increase in our printed cost for 1983. This new higher cost begins with the magazine you are now reading.

Inescapable as this charge will be for *Whole Air*, you may see why our cover price will rise to $2.50. This change and an ad. rate increase will take effect with our Fifth Anniversay May/June 1983 issue.

ONLY FROM SOARING

Our business is communication. Our field is soaring. And unlike *Hang Gliding* magazine, we survive only by our copy sales and advertising, that is to say, we create no income from membership dues or fees. While we have covered some power, and while we intend to do so, it will increasingly be only for the promise of soaring that will come with it.

Now, we are very happy doing what we do. It is what keeps us working hard in a small industry. We *like* hang gliding, soaring flight, and the people who participate . . . people like YOU! Still, the bills must get paid.

STAGNATION

At the same time we announce these rate changes, we have come to be very concerned over the nation-wide lethargy in hang gliding growth. When you read our "Gearing Up to Tow" article (pgs. 33-40), you will discover one way *Whole Air* hopes to stimulate our wonderful form of aviation.

We think it needs stimulation. And badly. But we did not dream this up on our own. In the last two months *Whole Air* has been calling dealers and manufacturers all over the country. What we have heard is, *"Things are slow!"*

IS IT THE ECONOMY?

Many industries are slow. Unemployment is high. But you all know that too well. And it is true, the weak economy *does* account for some of hang gliding's slowness. But it cannot be the *only* reason.

ULTRALIGHTS THEN?

Ultralights are undoubtedly another, at least in an indirect way. Before there were ultralights — an era many of you remember very accurately — hang gliding was aviation's "new kid." We were closely observed, and we attracted many people who just never could afford the costs of flying conventional aircraft. We slid down sand dunes in $450 gliders, and many thousands of people gave hang gliding a go.

Before long, we got good at it. And safe. Of course, gliders jumped to over $2,000 in those six to ten years. And flight thousands of feet over tall mountains, while in our delicate-looking wings, is just too much thrill for some. Things have definitely changed.

Then ultralights came. After their first few years, they too, got good at it. Their costs also leaped, and their accident record is not today as good as hang gliding's. But still, you do not have to go too high (for those worried by that). You do not have to jump from cliffs, instead flying up at a low angle. You can learn in a two-place craft. The manufacturers have been advertising and promoting like there was no tomorrow. We can now count *six major* magazines aimed at ultralights, in the USA alone. And it seems ultralights have become the new form of what is called *Entry Level Aviation* . . . the *new* kids.

WHY NOT HANG GLIDING?

With training and purchase costs, even for new, deluxe equipment, hang gliding is *less than half* as expensive as ultralight flying. Why cannot we swell our ranks then? We have thousands of cheap, used gliders available Schools all over the USA are slow (ready to handle customers), yet are superbly skilled and well established. Training is safer than it has ever been. Equipment from the remaining quality manufacturers is better than ever. And now with the advent of aero towing, we could have hang gliding clubs literally anywhere!

WHAT'S GOT TO HAPPEN?

USHGA is concerned. Witness Vic Powell's recent push to enlarge membership. Are you helping? *Whole Air* is willing to do everything possible to help get hang gliding going. Remember, the more participants . . .

. . . the better our gliders and gear will get, as manufacturers have enough money coming in to allow plenty of R & D.

. . . the more prosperous our dealers and schools will be, thus able to better service you.

. . . the easier it will be to sell your used gear, to trade up to slick, new equipment.

. . . the more fun we will all have, showing our amazing skills to fledgling pilots, anxious to be as good.

. . . the better our two magazines will become, as new enthusiasm, ideas, and money flow inward.

The point is, the consumer base has *got* to get larger, i.e., *more new students*. Even if the growth is small, the beneficial effect will be felt all through the industry.

IS IT WORTH IT?

Only if you love hang glider soaring flight will the effort be worthwhile. Are you bothered that we will just overcrowd our sites, and our precious "space?" Doubtful. Hang gliding will just not *ever* get that big. And towing, especially aero towing, will relieve launch congestion, while helping us all rack up more air-time.

We realize more is not always better, but hang gliding as a sport is in no fear of becoming too big. However, it can get so small that manufacturers may die and go away . . . forever. Schools may wilt and quietly disappear. Sites may be lost through apathy. Exciting new developments like aero towing may never occur. And your faithful magazines may lose support and stop the powerful engine of communication.

WILL YOU LET IT HAPPEN?

Will you?? Or will you help? It will take effort from everyone involved. Bring in a new student to your favorite shop. Help work out new ideas like aero towing. As the old cliche goes, be part of the solution, not the problem. Do it now!

Thanks,
Dan Johnson

FORUM

Telluride Aerobatic Meet

Dear Editor;

Your article on the Telluride Aerobatic Championship prompted me to write ESPN for advance information. I thought that you would like to read their reply.

I, as a hang gliding trainee, am sick of having to contend with the media's continual snobbery regarding our sport. Thanks.

Timothy P. Kelly

(letter from ESPN):
December 14, 1982

Mr. Timothy P. Kelly
Pittsburgh, Pennsylvania

Dear Mr. Kelly,

ESPN is in receipt of your letter dated December 10th regarding what you read about our coverage of hang-gliding.

Unfortunately, what you read was inaccurate as ESPN has, at this point in time, no plans to cover any aerobic (sic) or hang-gliding events.

Sincerely,

Entertainment and Sports Programming Network

Dear Editor;

High praise is due you and your staff for your foresight in organizing the Jan/Feb 83 issue. I speak primarily with regards to the centerfold and the incorporation of only ads on the flip-sides of the centerfold pages. It is extremely frustrating to find a centerfold or even one page photo that's more than worthy of prime wall space, only to find that the removal of the page would forever destroy an important article (e.g., Eric Raymond over Torrey Pines centerfold in the Nov 82 *Hang Gliding* issue). This foresight was also evident in the placement of an ad flip-side to the Greg Duhon/Telluride Aerobatic Championship full page photo (Nov/Dec 82 *Whole Air*). Keep up the excellent organizational work!

However, in a somewhat negative note, I must add that I was a bit disappointed that only one photo accompanied that Telluride Aerobatic Championship article. I can make do with the rather short article but one photo does not do justice to this sport's most exciting infant frontier.

Dave Derning

Glad you like everything else, Dave. We received the Telluride report from David Stanfield just before press time, and were lucky to get the Duhon photo from Leroy Grannis just in the nick of time. We, too, would like to use more photos of such an impressive contest, but must depend on the gracious help of folks like Stanfield and Grannis. Look for more on these contests as they evolve. —Ed.

Manufacturer's Tour

Dear Editor;

Loved the Manufacturer's Tour — give me more!

L. Robinson

We will. Look for a major new effort . . . an accessory Buyer's Guide in an upcoming issue. —Ed.

Dear Editor;

I liked the Manufacturer's Tour. But where was UP? I wanted to see where my Comet was made.

Steve Crichton

UP's Tour and one from Sport Aviation Mfg (builders of the Centurion) will be presented in a future issue. Both companies had schedules that did not allow them to participate in the first effort. Thanks for the kind words. —Ed.

Dear Editor;

What a great idea! I've enjoyed your reader surveys since the first issue of WAC (*Whole Air Catalog*). I do wish you could publish monthly, however.

I would like to see more pilot reports of memorable or unusual flight.

Thanks for the opportunity to respond.

Jon Dawkins

P.S. The Eric Raymond centerspread is a knockout. Is it available in poster size?

Not at this time, Jon, but we appreciate your interest. —Ed.

Dear Editor;

The center aerial photo/calendar makes me look forward to a new hang gliding season.

Unfortunately, 58 pages of advertising and manufacturer patronizing does not.

While I am appreciative of the latest generation of hang gliding equipment, I hope that others in the gliding community are also more interested in the sport/recreation/experience of hang gliding than in the promotion and business of the manufacturers.

Scott Whittet

Smaller pilots

Dear Editor;

I would like to say to the manufacturers that we smaller pilots would like a better selection of small gliders. I see a lot of interesting ships on the market, but I'm usually off the low end of the weight scale, except for the ProStar II and the Comet.

You guys want more women in the sport . . . ? Make some pint sized gliders. We're tired of lugging ballast around!

Marcey Gillespie

You should know to also inquire about Wills' Duck 140 and Bennett's Streak 130, but your comments are well taken. —Ed.

Dear Editor;

How about some how-to articles, concentrating on techniques rather than equipment? Such as . . .

How to acquire and maintain sites, from the experience of the Tennessee Tree Toppers and their excellent sites as well as smaller clubs with more limited resources.

Andrew Millat

Thanks for the suggestions, Andrew. We have an article in the works by newly elected TTT President, Rick Jacobs. He should deliver a lot of information in the vein you've mentioned. —Ed.

ADVERTISER'S INDEX

FORUM

Dear Editor;

Please allow me to comment on the write-up of the 1982 Masters competition by Aer Stephen in the Nov/Dec (1982) issue of *Whole Air*. First, I would like to compliment Aer on his witty and comprehensive piece of reportage. Also, I would like to thank him for his expert launch directing throughout the course of the meet (another unsung hero so essential to our sport).

Now, I would like to comment on a few points in his article with which I disagree. Aer mentioned the many hours we spent in pilot's meetings, ". . . to return the tasks to basically their origin." As a point of information, I was not sent a copy of the rules ahead of time even though I requested them in a letter. When I arrived at the mountain I was told that the rules needed changing for a number of reasons. These were:

1. Last year's rules allowed a diving finish.
2. Last year's course was too short.
3. It was desirable to add some cross-country tasks.
4. It was forbidden to use the Grandfather Country Club as a landing area. In addition, the success of this year's Nationals with the racing pylons format suggested that we use the system for the Masters. Anyone comparing the 1981 Masters rules with those of 1982 will see that all the above changes were the result of our lengthy discussions.

I consider the chance we had to hash out these rules with the participation of so many competitors very fortunate. The reason for this is that there are so many factors and opinions relating to creating fair and worthwhile tasks that no one individual can solve all the problems without trial and error. I have sat through USHGA Competition Committee meetings twice yearly since 1975 and I can guarantee that we do not have all the problems worked out yet. The best interchange of ideas I have witnessed was during this year's Masters meetings. As a side note, I make the observation that every pilot ending up in the upper win/lose groups took active part in the rules discussions. These pilots seemed to realize the importance of refining the rules.

At this point, I believe anyone with meet directing experience could take the current rules and run an efficient meet providing the weather cooperated. As Aer pointed out, we were plagued by bad weather. This made my job doubly difficult, for as the time alloted for the meet passed by, I lost many of my paid officials so that I had to rely on untrained volunteers. Eventually these individuals disappeared and we had to use a shortened course and double up on jobs. Joe Foster, my Assistant Director had to man a pylon so that I had to handle his duties as well.

In light of all the above, I feel we were remarkably successful in choosing the best competitor under the less than ideal conditions. I believe the many rule changes we instituted were at least partially responsible for this success. I would like to thank all the participating pilots and workers for their efforts and forebearance. Personally, I think they were all fortunate to get a chance to take part in the intricate process of setting up a World Class Competition.

I agree with Aer's statement that we should have left the seeding until the end of the meeting — mainly so the officials could go home. I doubt if any pilot would have left before finding out who he had to fly the next day. I also agree that it is best for the Meet Director to have flown the tasks many times. I came early to do this, but weather did not permit. I do not agree with Aer's statement that an international competitor should necessarily run the Masters. International competitions tend to have a format well behind the state-of-the-art in US meets. Witness the fiasco at Beppu, Japan, the problems with the 1982 American Cup, or the proposed rules of the 1983 World Meet in Germany.

As a point of information, I have competed in international meets, I have served in every capacity a meet requires, and I have run more meets since 1975 than anyone, as far as I can determine. I instituted the system of required rounds for ending a meet at the 1980 Nationals which was recently written into the USHGA rulebook (this was another change in the Masters rules). I was also first to use the one-on-one seeding meet format in the Nationals (1980) upon the recommendation of those who experienced its success in the So Cal Regionals, despite the local pressure to use an older style format. I have been instrumental in upgrading competition since the early days when I opposed duration/spot or figure 8 tasks.

All the above may sound self-righteous, but I mention it to make the point that anyone interested in running a competition should realize the many changes we have been through and the difficulty in producing a perfect meet. Personally, I feel that weather is the biggest factor in the success of a meet. Certainly Aer and others have excellent suggestions for improving the Masters or any meet. These suggestions should be forwarded to the USHGA Competition Committee. Of course, we should all be aware that we still need more change (aerial gates with larger heats for one). I agree that we should have the rules distributed to all the competitors well before the meet. That, however, is the duty of the meet organizers, not the Meet Director. I am sure with Aer's suggestions and the rules we have developed, the 1983 Masters will be the best ever.

Sincerely,
Dennis Pagen

Dear Editor;

Whole Air is simply the *best* hang gliding publication money can buy.

Extend my subscription to 1986!!

Marty Wallace

Thanks for the vote of confidence, Marty. We're trying hard, but will always listen to reader's suggestions. —Ed.

Chattanooga community

Dear Editor;

My glider, a Comet 165, was stolen from my home atop Lookout Mtn on November 7th, 1982. Outside of mere shock, I really got depressed over what the next few months of flying would be for me. Not only did I still owe on my Comet, but I could not afford to purchase another one. I thought my airtime had come to a standstill.

I would like to thank Matt Taber at Lookout Mtn Flight Park for not letting my flying cease. Being a part-time instructor, Matt allowed me the opportunity to fly shop gliders when I wasn't working. Even though I still owed Matt for my Comet, he has still taken care of my flying needs.

Being stiff competitors with Crystal Air Sports, a Wills Wing dealer, I never dreamed what happened would have.

I was at Crystal recently, and a friend of mine wanted to go flying. Not having the time to drive to Lookout to get a glider, Randee Laskewitz told me to just go get a glider out of their shop. I have been offered the opportunity to fly gliders from Crystal also. A special thanks goes to Tom Phillips and Randee also for their friendship.

Even though my glider is not here, my airtime has not been sacrificed. Chattanooga is truly a unique and special hang gliding community.

Dave Freeman

Motors or not?

Dear Editor;

Great mag!

I have been flying hang gliders for about 11-12 years, and now more recently, ultralights in the last 2 years. The transition to ultralights has been easy. I kept destroying my motor vehicles in search of the perfect lift, be it ridge or thermal.

Now, 1983, we are on the verge of true soaring ultralights, a very unique application of both powered and unpowered (ARV) sports — this is really going to be something good!!

Much less vehicular wear and tear, set up, wait, take down and try-again-time. Ah, but much more flying — after all, that's what it's all about isn't it?

I hope to be soaring my new Mitchell Wing A-10 by mid-April.

Dr. John M. Zasadny

Dear Editor;

I'm into hang gliding, not ultralights, as you're apparently aware — you are about the only good hang gliding publication available.

Hope your subscriptions will allow you to hold out through these sparse times. Thanks.

John Coyier

AERO MARKET PLACES

INDUSTRY NEWS

Magazines Found

Hundreds of old magazines were recently found and will be made available to collectors. The treasure trove of back issues, most in excellent condition, consist of USHGA's *Hang Gliding* and *Ground Skimmer* magazines. Some date back to 1973. These magazines are quite valuable as very few remain in existance today.

Collectors wishing to complete their libraries should write to Dan Poynter (P. O. Box 4232-D, Santa Barbara, CA 93103, USA) for a complete list and prices.

"Winning at Hang Gliding" wins Golden Eagle Award

GRANDFATHER MOUNTAIN, NC — For the fourth year in a row the nation's highest award for a non-theatrical motion picture, the Golden Eagle Award, has been presented to Grandfather Mountain, this time for its latest production "Winning At Hang Gliding."

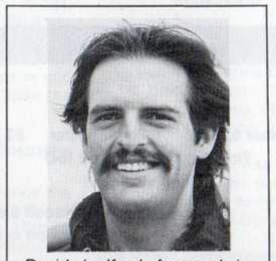
The new film shows colorful action flying scenes made principally during the Masters of Hang Gliding Championship. Modern Talking Picture Service will distribute it in all 50 states under sponsorship of Wrangler Jeans, with special emphasis on television and cablevision showings.

Hugh Morton, President of Grandfather Mountain and Producer of the film, received the Award at the December 1982 CINE motion picture ceremonies in Washington from CINE President Hartwell T. Sweeney. By winning this award, the film has become one to be entered by the USA in foreign film festivals in 1983.

Steve Moyes of Australia, a three-time winner of the Masters is featured, as is David Ledford of Asheville, NC, winner of the 1982 Masters. Ledford's glider going into a sensational stall and the Tar Heel pilot's life being saved by his small parachute has been tabbed by some early viewers as possibly the most exciting hang gliding action ever recorded on film.

Hugh Morton provided the photography and script for the movie, which was edited by Robert Rector. The film features the voice of one of the nation's best known narrators, Peter Thomas. Original music was written by Wayne Harrison, recorded at the Nashville Sound Connection under the direction of John D. Loudermilk III. Catherine Morton was Musical Advisor, and Sandy Fuller was Sound Engineer. Laboratory production was by Cinefilm Labs of Atlanta.

In its brief statement at the close of the film, Wrangler Jeans says that "Winning At Hang Gliding" is presented in behalf of the sport of hang gliding. A principal mission of the film is to explain the exciting competition tasks that have heretofore been understood only by the hang glider pilots themselves. With wide distribution, the film is expected to entertain as well as create a greater national acceptance of hang gliding as a spectator sport.



David Ledford featured in Hugh Morton's new film from the 1982 Masters meet.

Chandelle San Francisco markets Hook In! telltales

George Whitehill's Chandelle San Francisco retail shop has begun marketing "Hook In!" telltales. The bright yellow strips are printed on Dacron ribbon to serve as a reminder of the important act, as well as providing wind direction on launch.

A strong plastic tie-wrap easily attaches to your front flying wire and will not slip or slide.

They sell for $1.00, and can be ordered pre-paid or COD from Chandelle, 198 Los Banos Av., Daly City, CA 94014, or call 415/756-0650.

New Wills Wing Flight Suit

Wills Wing has introduced a new line of flight suits for hang glider and ultralight pilots. The flight suits feature accent stripes, velcro or elastic closures on sleeves, legs, and neck, and an assortment of strategically located pockets, including special pockets for in-flight glove access. In addition, bottomless "slash pockets" on the sides provide easy access to inside pants pockets.

The Wills Wing flight suits are available in a choice of colors, and can be custom made to individual pilot measurements at no extra charge. Forecast retail price is $125. Contact Wills or your local dealer for more information.

Flight Designs offers new cocoon harness bag

Flight Designs, always a leader with software products, is pleased to announce their new "Custom Cocoon Internal Harness Bag."

Standard features of the harness bag include room for a full custom cocoon harness, helmet, instruments, flight suit, gloves and much more. The container has zipper closures running full length for easy access to the harness. Three inch wide shoulder strap and handles make carrying the load a simple chore. It also offers compact storage into the boot of the harness.

Contact Ken Brown at Flight Designs, 408/758-6896.

Certified Vision now being distributed

Pacific Windcraft proudly announces their premier glider, the Vision 18 was certified by the HGMA on November 10, 1982.

Developed during the summer of 1982, a limited production of Visions began on September 1st. The glider has been distributed throughout the USA and in Canada and Brazil. It is available for demo flights at some of the most professional and reputable schools in the country.

Production of a larger version of the Vision concept (Vision 20, with 194 ft²; 64 lbs.) began on November 1st. Both sizes of the Vision introduce a new concept in adjustable airframe geometry in order to optimize the glider's performance envelope in any given flying conditions.

For further information, call the factory at 408/422-2299.

Competitive Edge CG Converter Released

Competitive Edge, a new company formed by John Lubon and Frank Stroman, is introducing a new product called the CG Converter.

It features a bright polished aluminum finish, constructed from 6061-T6 alloy. Special precision Teflon washers are used to assure less coefficient of friction for smoothness of operation.

Direct inquiries to John Lubon, Rt. 8, Enoree Hill Circle, Greer, SC 29651, or call 803/244-5886.

Flight Designs releases Fairings and Two-Seater Trike

Flight Designs announces the availability of Competition Series Fairing for downtubes, kingposts, and crossbars. Downtube fairings are available with sliding half sections for take-offs and landings.

All fairings are constructed with an inner pocket of ripstop nylon. Options include clear mylar finish, preferred on downtubes or Dacron coatings for kingpost and crossbars.

Contact your Flight Designs dealer for delivery times and prices.

To enhance the popularity of the Flight Designs trike and to benefit training programs, Flight Designs if offering to dealers a 32" wide seat for use as an introductory trainer. Available in an Experimental, Exhibition class, 51%-kit form, it is immediately available to all qualified dealers.

A specially reinforced airframe provides more than enough load capacities to support up to 380 pounds and still maintain a respectable 500 fpm sink rate, and a climb rate of 375 fpm with a stock Kawasaki TA-440 engine.

HGMA general membership meeting held

Present at the December 8th meeting of the HGMA at Delta Wing Kites were Mike Meier (Wills), Bill Bennett (Delta Wing), Bob Trampenau (Seedwings), Roy Haggard (UP), Dick Boone (ProAir), Mark West (Flight Designs).

The organization voted to create an annual "HGMA Special Merit Award." The award, a plaque, to be awarded by the directors is to be given to a person chosen at the annual general membership meeting for "Noteworthy service of contribution to the hang gliding community." The recipient of the 1982 award went to Mike Meier of Wills Wing.

The HGMA also decided to adopt the official position that the HGMA supports the existance of a "weight shift class" in competition as distinct from a Class Two or Open Class. The group will define a Class One Glider and submit it to the USHGA Board of Directors in February.

The list of new 1983 officers includes: Mike Meier as President, Dick Boone as Vice President, and Roy Haggard as Secretary Treasurer.

Bat-Sail Enterprise to handle Pioneer FlightStar

Dean Batman of Bat-Sail Enterprise, Inc., and Fred Jungclaus of Indiana Sky Sails, Inc., have joined forces to form Alpha Aircraft, Inc. Alpha Aircraft, Inc., is central Indiana's dealer for Pioneer International Aircraft, Inc., and the FlightStar ultralight.

Pacific Windcraft "French Connection"

To meet the demands of competition and cross country pilots across the country, PWC is now distributing their own "French Connection."

By exactly quadrupling the pilot's displacement under the wing, this floating hang point system optimizes the glider's speed range and improves its performance retention throughout this speed range.

Operating on the glider's pitch axis, the French Connection should be restricted to advanced and expert pilots flying HGMA certified gliders from 1979 on.

Each system comes with two webbing loops, quick links, and complete mounting instructions which must be followed very closely to insure correct installation.

Crystal Air Sports Events Calendar

MARCH 21-30 — Bennett Delta Wing demo days featuring the Streak 130 as well as other sizes. Factory rep will be present. Contact Randee Laskewitz at Crystal (615/825-1995) or Chuck Toth (615/821-2546).
APRIL 2, 3 — Real Deployment Parachute Seminar #4. Pre-registration recommended as space *is* limited. Cost: $20. Contact Randee Laskewitz at Crystal (615/825-1995).
APRIL — Wills Wing demo days extavaganza. Parties, demo gliders, and factory rep, Jim Shaw will be present. Contact Tom Phillips at Crystal for exact dates and event schedule.
APRIL 23, 24 — Hang Glider pilots are invited to come sample ultralight flying. JetWings (possibly even two-seater), Eipper MX-II (two-seat), and the new Pioneer FlightStar available. Nominal charge to cover expenses only. Contact Tom Phillips at Crystal.
MAY 28, 29 — Fourth Annual Coca Cola Sky Show at Crystal Flight Resort/Raccoon Mountain. No charge event. Balloons, ultralights, hang gliders, bands, refreshments, displays, contests, and tens of thousands of people to watch. Contact Randee Laskewitz.

1982 Odyssey Results In

The 1982 Cross Country Odyssey has drawn to a close, and was felt to be a success by the organizers, especially by creating the incentive to fly cross country. The awards were given on January 12th at a party held at Gordon Boyce's house.

Gary Larsen nabbed First Place with a 72 mile flight from Cedar City in a 185 Comet. Larsen received a trophy, a $100 cash prize, a flight bag combination back pack from Wasatch Wings, and a Larry Hall wind meter with bracket. Larsen was the Class A winner, however, no verification forms were turned in for a second place performance.

In Class B, Orange took First Place flying 77 miles from Cedar City in a 165 Comet. He won $122 from the Odyssey contest, and Ultralight Products has committed to match that making $244 cash prize winnings, plus a Larry Hall wind meter with bracket.

Karen Thorp came in second in Class B, receiving a $25 check from Freedom Wings, and a Larry Hall wind meter with bracket. Thorpe flew 52 miles from Cedar City in a 165 Comet.

Tom Gardener received a Larry Hall wind meter with bracket, finishing in Third Place by flying 46 miles in a Demon.

Bob Wilding created some excellent trophies for First Place in both classes, but failed to win his own work, although participating as a contestant. The organizers would also like to thank Wasatch Wings, Freedom Wings, Larry Hall, and Ultralight Products for their assistance.

The 1983 Odyssey is off and flying. A $100 cash prize donated by Greg Duhon is still available for the first person to eclipse the 100 mile mark.

4th Lariano Triangle Cross Country Contest Scheduled

Delta Club Como wishes to announce the Fourth Edition of the Lariano Triangle Cross Country Contest is slated for May 15th to 22nd, 1983. The officially titled International Cross Country Open Distance Champion ships are organized by Delta Club Como, and are aimed at top world cross country pilots by invitation only.

Last year's winner, Gerard Thevenot accumulated an impressive 420.5 kilometers of distance in five days of flying — nearly 100 kilometers per day (!).

For further information contact Gianluca Zunino, Via Stoppani 4, 20129 Milano, Italy, or phone (02) 49-89-461. A report of the 1982, 3rd Annual event written by Tony Masters can be found in the Sep/Oct '82 *Whole Air*.

Kitty Hawk Kites East Calendar

The following items are listed as events for Kitty Hawk Kites in Nags Head, North Carolina:
MARCH 26, 27 — Glider tuning, Pilot Psychology and Micrometeorology Seminar. The topics covered in the first-of-its-kind event will deal specifically with East Coast flying. Contact Mark Airey or Chris Lawrence.
APRIL 9, 10 — Second Annual East Coast Glider Showcase and First Annual East Coast Towing Convention. All new '83 gliders will be on demo for qualified pilots and fun flying with the new Skyting bridle. Party and fun for the whole family. Contact Mark Airey or Chris Lawrence.
APRIL 15, 16 — Wilbur Wright Fly-in at First Flight Airstrip in Kill Devil Hills, NC. Antiques, homebuilts, warbirds, & ultralights will highlight this even sponsored by the National Park Service and EAA Chapter 339. Contact John Harris.
APRIL 23, 24 — Mountain Fly-in. Contact Mark Airey.
MAY 1 — Ultralight Fly-in at Triple W Airpark in Raleigh, NC. Contact John Harris.
MAY 7 — Ultralight Fly-in at our year-old Culpepper facility. Contact John Harris.

'83 Marina Beach Steeple Chase

This year the Marina Beach Steeple Chase will be held on April 16th and 17th. The annual race consists of a 12 mile out and return course along the sand ridge on Monterey Bay.

Last years winner was Chris Bulger flying a Flight Designs Titan prototype, completing the course in 20 minutes. Cash prizes of $500.00 to 1,000.00 and trophies will be awarded.

Interested competitors please contact Jim Johns at Kitty Kawk Kites West, P. O. Box 828, Marina, CA 93933, or phone (408)384-2622. Pre-registration is suggested because entries will be limited.

"PLAY IT AGAIN, SOFTLY, SAM"

by Doug Hildreath,
Chairman,
USHGA Accident Review Committee

As R. V. Wills said in one of his early accident reviews, "The same old refrain." There is nothing dramatically new or different in this year's accident report. The same mistakes, the same misjudgements, the same kinds of injuries. But the numbers have improved slightly — fewer stalls on launch, fewer structural failures, and most importantly only 12 fatalities; and that is good.

Students were given their own separate category this year, and their stalls and fractured arms and forearms become even more glaring when listed separately. Intermediates are still flying in strong conditions, stalling in-flight (scratching), and when approaching small or congested landing areas, stalling or running into things. Advanced pilots are making foolish "little mistakes." We are approaching the point where "you tell me the rating, and I'll tell you the type of accident the pilot had." The next step is for you to find the solution and beat it into your friend's brains.

It is my distinct impression (undocumented) that the number of hang gliding pilots in the United States has leveled off or perhaps decreased slightly. USHGA membership remains constant, but I suspect pilots are moving into other sports and into powered ultralights. There may be some diminution of the enthusiasm for sending in accident reports, but those arriving are very well done and once again you all have my thanks.

There were 115 accident reports submitted this year. The stall remains our major nemesis. There were 18 stalls on launch, 19 stalls on landing, and 20 inflight or scratching stalls. The efforts put forth to diminish stalls at launch were effective in cutting in half their number (34 last year), but in-flight and landing stalls remained essentially constant. We have really not made much meaningful progress on a national scale to break this cycle and solve the stall problem. Strong weather conditions, predominantly affecting intermediates, were responsible for 11 accidents with 6 pilots being blown over the back. Aerobatics resulted in 6 accident reports. Four of these resulted in structural failures. The fifth structural failure resulted from fraying of a lower wire. One karabiner failed and one incorrectly mounted hangstrap failed.

Running into things — trees, fences, vans (and only one power line) accounted for 7 accidents. The usual scenario is a novice or intermediate pilot approaching a small congested landing area. The problem is seen in lesser extent in students attempting to avoid minor obstacles in the landing zone (driftwood, gear, wind sock, etc.)

No mid-air collisions were reported, though a few were mentioned in *Hang Gliding* magazine. I am sure that collisions and nearmisses threaten to become a serious problem. Please report them so we will have accurate statistics (even if you are a famous pilot). Incomplete glider assembly and inadequate pre-flighting were not reported. One pilot crashed following control problems referrable to the kite bag in the keel pocket interfering with the glider's turning characteristics. Landing in the ocean is devastating. Carry floatation gear, an accessible hook knife, and a large respect for the surf. When hooking in, do a hang check, step through, lift the glider and feel the tight straps, and repeat the entire process if for any reason you unhook. This year, as last, there were 3 failures to hook in.

Attitudinal problems persist in causing death and injury with aggressive pilots refusing to listen to advice and plunging headlong into trouble. Be alert to the student or novice pilot expressing concern about accident or injury — the selffulfilling prophecy.

Students are frequently injured late in the day when both thermal activity and fatigue set in. Almost all the students are breaking their forearms just above the wrist or their arm just above the elbow. Wrist fractures result from landing on the outstretched hand with the hand striking the ground or frozen to the control bar. The above the elbow fractures appear almost universally to result from the forearms and hands going outside the downtubes, the shoulders and body going inside the downtubes, and direct contact between the downtubes and the lower humerus (arm bone) causing a fracture. Of 38 student accidents, 9 involved fracture of the wrist and 13 fracture of the lower humerus. These injuries are less frequent in more advanced pilots, and another article about "defensive posturing" needs to be written. Perhaps further emphasis in ground school and/or practice on the hill of "letting go and tucking" needs to be incorporated into training methods.

Despite several concerns that single surface copies would increase student injuries, most of these fractures (13 of the 22) resulted on the traditional "mellow" gliders (see Janine Whitehill's January letter to the editor of *Hang Gliding*).

There were 11 free-flying fatalities reported to me in 1982. The gradual downtrend in absolute numbers is indeed gratifying and of course we all hope that it will continue. It may be that the above speculated decrease in the denominator (numbers of pilots flying) may mean that the rate has not changed that much, but we will take the smaller numbers whatever the reason.

The was one fatality involving a beginner auto towing. A 76 year old wire man died in a fall from a cliff (no safety rope).

There were 7 successful parachute deployments in 1982. There were 11 last year.

Towing: There were 3 towing accidents. A beginner was killed when he presumably locked out while being towed by a car in Texas. A people tow locked out, and the release failed — broken leg. A boat towed glider locked out, the boat released, the glider recovered, the G forces caused a homemade swing seat to fail, with serious injuries.

HANG GLIDING DEATHS
UNITED STATES

YEAR	FREE FLYING	TOWING
1974	40 deaths	
1975	32 deaths	
1976	38 deaths	
1977	24 deaths	
1978	23 deaths	
1979	30 deaths	
1980	22 deaths	1
1981	16 deaths	5
1982	11 deaths	1

RECOMMENDATIONS

1— Incorporate into training methods techniques to avoid forearm and arm fractures to the students.

2— Incorporate into training methods something to solve the stall problem.

3— Intermediates — respect the weather and know your landing zone. Avoid stalls in flight.

4— Advanced pilots — do not become complacent.

5— Please hook in.

You are all my friends . . . please fly safely in 1983!

—Doug Hildreath

FREE FLYING

DATE: February 20th, 1982
NAME: Raymond Knepper
AGE: 30 years
EXPERIENCE: Advanced
LOCATION: Ed Levin Park, Milpitas, CA
GLIDER: Moyes Mega
INJURIES: Massive internal
CAUSE: Low altitude wing-over, stalled at top, glider tucked, pulled out and nonlocking karabiner broke in open position; pilot fell 150 feet.

DATE: April 9th, 1982
NAME: Dale Totten
AGE: 36 years
EXPERIENCE: Novice
LOCATION: Cape Lookout, OR
GLIDER: Cirrus 5A
INJURIES: Drowned
CAUSE: Poor understanding of soaring principles and micrometeorology. Flew in poor conditions. Landed in deep surf.

DATE: May 13th, 1982
NAME: Joe Calvert
AGE: 50 years
EXPERIENCE: Advanced
LOCATION: Hensen Gap, TN
GLIDER: Moyes Maxi
INJURIES: N/R
CAUSE: Probable heart attack with resultant crash. Very conservative pilot flying easily in smooth conditions when glider suddenly "wing-overed" and dove in.

DATE: May 26th, 1982
NAME: Bruce Woody
AGE: 22 years
EXPERIENCE: Novice
LOCATION: Tetilla Ridge, Santa Fe, NM
GLIDER: Olympus
INJURIES: Internal
CAUSE: Soaring high above ridge. Witnesses departed. Presumably got low, was scratching 100 feet below launch, stall or thermal turned him into cliff. Found dead several hours later.

DATE: May 31st, 1982
NAME: Terry DeVoll
AGE: 18 years
EXPERIENCE: Beginner
LOCATION: Amarillo, TX
GLIDER: Pliable Moose
INJURIES: Severe head injury
CAUSE: Headstrong, refused instruction, obsolete glider, attempted launch in 25 mph winds, stalled, turned downwind and crashed.

DATE: June 20th, 1982
NAME: Tom Perfetti
AGE: 32 years
EXPERIENCE: Intermediate
LOCATION: Waynesboro, PA (High Rock)
GLIDER: ProAir 180
INJURIES: Massive internal injuries
CAUSE: Good conservative pilot on final approach into turbulent and thermal landing zone in early afternoon. Sudden gust pitched glider down radically from 40 feet. No chance to recover.

DATE: July 7th, 1982
NAME: Roy Hill
AGE: 50 years
EXPERIENCE: Beginner
LOCATION: Training Hill, Acton, CA
GLIDER: UP Condor 194
INJURIES: Head injury
CAUSE: Good student had good flight, on landing approach minor gust induced turn, wing-up, nose pitched down, from 25 feet.

DATE: July 15th, 1982
NAME: Joseph Frank
AGE: 33 years
EXPERIENCE: Beginner
LOCATION: Morgan, AR
GLIDER: Wills Wing SST
INJURIES: Head injury
CAUSE: Eager student flying intermediate site too soon, overcontrol during flight, slowed down on approach, stalled at 100 feet, dove in downwind. Died 2 days later.

DATE: July 25th, 1982
NAME: Fred Eiman
AGE: 28 years
EXPERIENCE: Intermediate
LOCATION: Crestline, CA
GLIDER: Stratus 5
INJURIES: Head and neck
CAUSE: Low airtime pilot with second flight in past year on borrowed glider. Severe over-control with ultimate dive into canyon.

DATE: July 31st, 1982
NAME: Bob Dunn
AGE: 23 years
EXPERIENCE: Advanced
LOCATION: Plowshare Mtn., Santa Monica, CA
GLIDER: UP Comet
INJURIES: Multiple
CAUSE: Failure to hook in.

DATE: November 18th, 1982
NAME: George Heckman
AGE: N/R
EXPERIENCE: Advanced
LOCATION: Hidden Valley, Elsinore, CA
GLIDER: Wills Wing Duck
INJURIES: (?)Head and internal
CAUSE: Soaring a new glider, began swooping close to the cliff, caught a tip, turned into cliff. (Caught tip on a bush.)

TOWING

DATE: February 22nd, 1982
NAME: Ted Walkowiak
AGE: 30 years
EXPERIENCE: (?)None
LOCATION: Frisco, TX
GLIDER: N/R
INJURIES: N/R
CAUSE: Glider being pulled by a car, "rose to 300 feet, was buffeted by a crosswind and plunged to the ground."

BLUEBOOK

EDITION NO. 27

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 may 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 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			
78	Phoenix 8 Super	Reg.	575	425
	Phoenix 12	Reg.	400	400
79	Phoenix 6D	185	675	575
	Lazor I	190	700	650
80	Phoenix 6D	215	725	725
	Lazor II	175	925	725
81	Phoenix 6D	185	900	850
	Viper	180	1000	750
82	X-180	180	1425	1350
	EIPPER FORMANCE			
78	Flexi III	Lg.	500	375
	Flexi III	Med.	600	525
	Cumulus 10	Med.	575	575
	Antares	Med.	800	725
79	Antares	Med.	850	650
	Antares	Lg.	725	725
	ELECTRA FLYER			
78	Cirrus 5	C	425	425
	Cirrus 5	B	600	525
	Cirrus 5	A	600	575
	Olympus	160	725	600
	Olympus	180	675	475
79	Dove	A	675	525
	Cirrus 5	A	775	600
	Olympus	160	825	575
	Floater	205	800	650
80	Spirit	200	900	725
	FLIGHT DESIGNS			
79	Lancer	190	775	650
	Lancer	170	850	725
80	Super Lancer	200	825	675
81	Super Lancer	175	950	700
	Demon	175	1150	1025
82	Javelin	168	1250	1100
	Javelin	208	1175	1125
	Demon	175	1325	1175
	MANTA			
79	Fledge II	B	1075	875
80	Fledge II	B	1225	1100
82	Fledge III	B	1600	1450
	MOYES			
78	Maxi II	200	600	500
79	Maxi III	200	725	700
80	Stingray	200	675	650
	Maxi IV	200	825	650
	Mega II	172	1075	825
81	Mega II	172	1250	1000
	Meteor	180	1275	1200
82	Missile	200	1475	1475
	SEAGULL			
78	Seahawk	170	550	400
	Seahawk	190	500	500
	10 Meter	---	775	750
	10.5 Meter	---	750	700
79	Seahawk	180	800	675
	10 Meter	---	900	675
	11 Meter	---	900	650
80	11 Meter	---	925	725
	SEEDWINGS			
81	Sensor 510	180	1375	1175
82	Sensor 510	180	1600	1375
	SKY SPORTS			
78	Osprey	175	675	500
	Sirocco II	164	700	575
79	Osprey 2	175	600	525
	Sirocco III	189	825	700
	UP (Ultralight Products)			
78	Spyder	176	800	575
	Condor	178	825	700
79	Mosquito	166	550	350
80	Firefly 2B	181	750	575
	Comet	165	1075	975
81	Gemini	164	1150	925
	Comet	165	1275	1025
	Comet	185	1375	1075
82	Gemini	164	1275	1075
	Comet	165	1425	1125
	Comet	185	1400	1125
	WILLS WING			
78	Alpha	185	775	575
	Alpha	215	775	600
	X-C	215	750	500
79	Alpha	185	800	675
	Alpha	215	775	650
	Omega	220	825	700
	Raven	209	925	775
80	Raven	209	1025	775
	Raven	229	1100	800
	Harrier	177	1150	950
81	Raven	179	1200	975
	Raven	209	1175	950
	Harrier	177	1225	1075
82	Harrier II	177	1300	1175
	Duck	160	1475	1350
	Duck	180	1475	1375

SPECTRA AIRCRAFT
SPORT AVIATION MFG
STRATUS UNLIMITED
PACIFIC WINDCRAFT
No used market values established at this time.

STATISTICS

The Arrow figures heavily in this "Statistics" report, as 47% of those polled were definitely interested in seeing its further development/From Sep/Oct and Nov/Dec 82

Articles announcing the prototype flights and X-C Classic entry of UP's Arrow acted as a catalyst for the earlier predictions of such craft. Now having something to get their teeth into, how would hang glider pilots respond to such equipment? *Whole Air's* Reader Response Cards asked some questions in the Sep/Oct 82 issue. The topic areas pertained to interest in ultralight sailplanes and powered, self-launchable ultralight motorgliders.

Eighty-three percent of surveyed readers were familiar with the Haggard (and team, which included Paul MacCready) Arrow. Surprisingly, due to the *Hang Gliding* and *Glider Rider* articles, seventeen percent of *Whole Air* readers were *not* knowledgeable. Higher than earlier statistics, evidently *Whole Air* continues to appeal to pilots not reading heavily in other periodicals.

With the question, "Are you interested in this type of craft if it was motorized for self-launch?" we felt the larger group would probably respond negatively. But the feelings were very evenly split. Forty-seven percent were interested, 48% were not, and 4% could not decide.

This coincided with the information taken from the Nov/Dec 82 Reader Response Cards. The questions regarding interest in craft other than hang gliders continued and response participation increased. The Sep/Oct 82 issue brought 145 cards in one month, representing 3.2% of our paid subscribers (1.0% of total readership), while by Nov/Dec 82, the number jumped to 206 for 4.6% of the subscribers or 1.4% of total readership, again within one month of issue mailing.

The Nov/Dec 82 Reader Response Cards began with a message in capital letters saying the questions were aimed at all readers now flying hang gliders.

Some 57% of surveyed readers said they have flown airplanes *or* ultralights, but only 34% have actually flown an ultralight as of the end of 1982.

An even smaller percentage, 22% of surveyed readers have ever flown a rigid wing hang glider with aerodynamic controls; 78% have had all their hang gliding experience in flex wing craft.

Just short of a third, 30% of all surveyed readers have tow-launched a hang glider; 70% still await their first such experience. This would seem to indicate that many pilots living in the flat areas of the country do not use towing as an alternative way to launch. It will be interesting to note how this might change as aero towing information and experience grow.

More pilots, 34%, have flown an ultralight, though the values for towing are reasonably close. Another similar number, 32%, have ever flown an unpowered sailplane. The close proximity of all three categories — towing, ultralight flying, and sailplane flying, 30%, 34%, and 32% — cause wonder as to these respondees all being essentially the same, more aviation-curious readers. This information was not part of the surveying, so remains speculative.

But in spite of these similarities, when the questions turned to purchases, some 44% expected that they *would* buy "something powered (ultralight or ultralight motorglider)." Another 44% said they would *not* buy any kind of power, and 12% were undecided yet. It seems reasonable that these unsure readers could also split evenly, for a resultant 50/50 audience of readers who will or who will not expect to buy something powered.

We also asked who *now* owned something powered. Twenty-four percent *do* own an ultralight — there being no ultralight motorgliders to buy at this time — while 76% do not own something powered. Again we did not survey the number of present power owners to see if they were the same ones who expected-to-buy as well as the already-own readers. Speculation *could* show interest in motorgliders to reach 74% of readership (the sum of 44% expect-to-buy + 24% already-own + half the undecided).

Again, it will be interesting to see how all this may be changed by aero towing, and the market entrance of Arrows, other ultralight sailplanes, and ultralight soarable motorgliders.

PILOT: JOHN RYAN PHOTO/AD: J. ZURLINDEN

STREAK

IT'S A MAGIC COMBINATION THAT HAD TO HAPPEN! A DOUBLE SURFACE, HIGH PERFORMANCE GLIDER, THAT LANDS LIKE A TRAINER. ALL THE LIGHT HANDLING QUALITIES OF THE X-SERIES GLIDERS HAVE BEEN PRESERVED, WITH AN OBVIOUS BOOST IN L/D AND THERMALING CAPABILITY. THE SAIL COMPLETELY OPENS FOR TOTAL VISUAL INSPECTION OF ALL GLIDER COMPONENTS. THE FLOATING CROSSBAR USES A SHOCK ABSORBING, SUPER STRONG WEBBING RESTRAINT STRAP, BATTENS ARE 1/2" DIAMETER ALUMINUM AND LEXAN FOR MAINTENANCE FREE LIFE. A SPECIAL FOAM INSERT IN THE LEADING EDGE OF THE SAIL MAKES THE CAMBER SMOOTH AND CREASE-FREE, WHILE THE STEPPED LEADING EDGE CONSTRUCTION PRODUCES OPTIMUM AIRFOIL RADII. THE SAIL IS TIGHT AS A DRUM AND EXHIBITS THE FINEST WORKMANSHIP AND ATTENTION TO DETAIL YET TO APPEAR ON ANY OTHER GLIDER. SANDWICH AND HARD FINISH CLOTHS ARE AVAILABLE AS WELL AS THE POPULAR SPECTRUM AND RAINBOW PATTERNS. ALL WEAR POINTS HAVE BEEN COVERED, AND THE PADDED CONTROL BAR AND BATTEN BAGS GIVE EXTRA PROTECTION.

WITH EVERY THOUGHT FOR PERFORMANCE, HANDLING AND PILOT CONVENIENCE,

THE **STREAK** IS DEFINATELY "STATE OF THE ART" FOR 1983.

FULLY HGMA CERTIFIED

DELTA WING KITES & GLIDERS (213) 787-6600 TELEX 65-1425 P. O. BOX 483, VAN NUYS, CA. 91408

THE STREAK

DELTA WING KITES & GLIDERS, INC.
FACTORY STATEMENTS

The Streak's exceptionally clean leading edge, high aspect ratio and low billow give it excellent sink rate performance. Double surface, enclosed hardware, minimal twist and efficient stability systems give this glider a high L/D and glide retention to higher speeds than ever before possible. Light, smoothly increasing pitch pressures and carefully optimized spiral stability make thermal soaring pleasant and efficient.

New innovative concepts featured in the Streak, include:

—A free floating crossbar that is not hinged to the kingpost but pivots from a forward point at the nose, and at the rearward point just beyond the keel pocket.
—A haul back strap that will absorb shock and is virtually indestructible. Tested to in excess of 4,000 pounds load, it also provides the quickest set-up system.
—"Boot" protected washout struts are concealed inside the sail. This is not only very functional, but yields a considerable reduction in parasitic drag.
—Half inch by .035 aluminum ribs retain camber shape, even if exposed to the most radical aerobatic maneuvers. Heavy duty Lexan reflex sections are stong and trouble free for the life of the glider, yet are more flexible than brittle fiberglass arrowshaft sections.
—Inspection and servicing of this aircraft is unequalled for simplicity and was a major consideration in the design. The sail is detached, so you can routinely stand inside it for close inspection of the A-frame components. This is a comforting thing to do after a long trip on rough roads.
—Break-down style leading edges are standard equipment, reducing the shipping length to 13 feet. No tools are required for assembly.
—Each Streak is set-up with the sail drum tight. This does not adversely affect the handling because the tight undersurface is independent and fully free floating. It does not influence the top surface which is also very tight.
—With the special hard foam insert in the leading edges, the camber is smooth and crease-free, with many advantages over the commonly used mylar. The stepped leading edge construction allows optimum airfoil radii.
—The shock-absorbing webbing restraint on the floating crossbar; the freely shifting double surface and moderate keel pocket, all combine to give very good handling. The insert-stiffened leading edges, supported by shaped tubular ribs, form a well defined airfoil section. This, along with a clean spanwise sail cut, results in excellent performance.
—The hardware is enclosed or faired as much as possible, without sacrifice of set-up and inspection ease. With a little practice all set-up procedures, which can be done "on-the-bar" or "on-the-ground," are fast and simple.
—Safety and strength were primary design criteria and this glider meets or exceeds all current HGMA Airworthiness Standards.

STANDARD SET-UP PROCEDURES

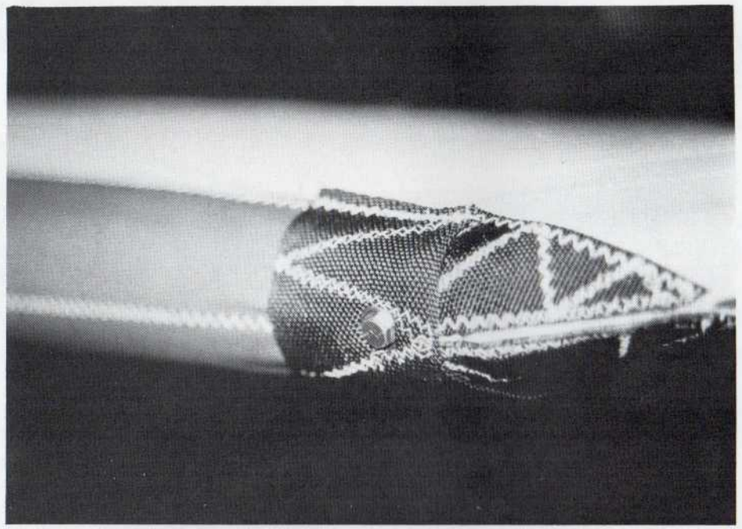
1) Assemble control bar and safety the clevis pin.

2) Attach the forward flying wires to the nose. It is secured with a wing nut and a safety ring.

3) Turn the glider over; stand it on the bar.

4) The washout strut is inserted through the tip pocket, and into the receiver mounted to the leading edge. Tension the tip with the double purchase bungee cord.

the streak



Attach the undersurface tip to the peg midway down the strut in the same way with the double purchase bungee cord.

5) Spread both wings until you feel some resistance (about 2/3rds extension).

6) Erect the kingpost, sliding luffline strap up and over nico on the front wire.

7) Insert the upper surface ribs (they are progressively shorter from root to tip). Secure with the double purchase string. Inserting the ribs before the crossbar is tightened is easier and causes less wear on the batten pockets.

8) Deploy the crossbar by pulling back on the nylon cord attached to the end of the crossbar retaining strap. It is easier to pull on the strap itself as soon as it becomes in reach. Simply follow the cord up into the keel pocket and grasp the webbing in front of the key. Pull back the strap, then attach it in the desired setting. Factory position is clearly marked. Stow the pull cord on the inside of the keel pocket. Rig the upper wires by tensioning the over-center lever.

9) Insert the undersurface battens, progressively smaller from root to tip. They are inserted through the webbing tabs along the upper surface, which in turn holds the two surfaces together, but allows them to shift independently.

FACTORY FLIGHT ADVISORY

Launch/

Due to their excellent balance and solid feel on the ground, the Streaks launch very well. It is likely to feel differently than what you are used to, so keep a few points in mind. This glider's characteristics are similar to those of a rigid wing. It is neither necessary nor advisable to "pop the nose" and fill the sail. Simply hold the wing at a flying attitude and let it stay there. Accelerate smoothly and run hard until the ship lifts you off the ground. Pitch pressure is light, so make gentle corrections.

Flight/

Hands-on experience is the only way to really learn the flight traits of a new glider, but here are a few hints. Relax and let your Streak fly itself most of the time. Use light control forces and explore the response to various combinations of pitch, roll, and yaw input. With adequate ground clearance try flying "too slow" and "too fast" for the conditions at hand, to become familiar with the range of performance and handling. Though the Streak is spin-resistant, it can be provoked with exaggerated control into a fully controllable and gently spin mode. The glider will instantly return to normal flying when pressures are released.

Landing/

Due to the high L/D you will need extra room for landing the first few times. Flying fast is not an effective method for making steep approaches because this ship retains its glide to very high airspeeds. For a steep approach "mush" the glider down to no less than 50 feet AGL (higher in rough air), then resume flying speed for a normal final approach.

The independent sail system of the Streak allows for a smooth release of energy in a balanced progression along the entire span of the wing. Once the nose is raised and the flare is initiated, the Streak simply wants to touch its tail to the ground.

(above) Sail attachment point at the tip. (Below) Jeff Scott coming in just barely short of the bulls eye.

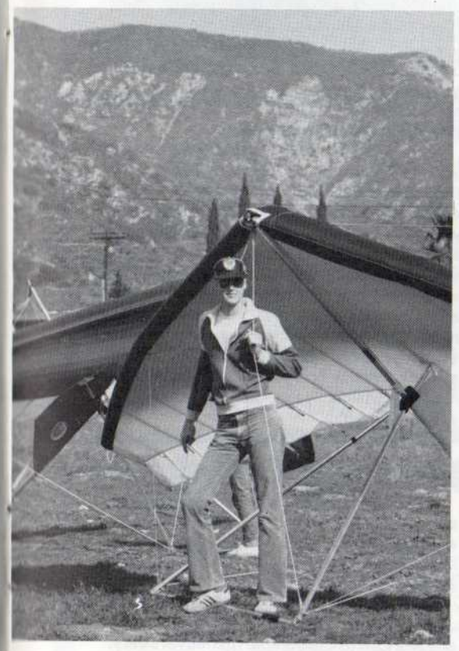
STREAK Models	**130**	**160**	**180**
Area in Square Feet	132	158	178
Span in Feet	29'	34'10"	37'4"
Aspect Ratio	6.6	7.5	7.6
Nose Angle	133°	133°	133°
Double Surface	80%	87%	87%
Weight in Pounds	56	72	82
Pilot Weight in Pounds	80 to 190	130 to 220	150 to 300

PILOT REPORTS

The following are pilot flight reports, one written by Jeff Scott, the other by Ron Young. The pilots making this report were deliberately chosen because they were not employed by Delta Wing and have not, for the past several years, flown Delta Wing equipment.

Jeff Scott, before his world tour, had been employed by Wills Wing and Flight Designs.

Ron Young is the former Chief Test Pilot for Ultralight Products, Inc.

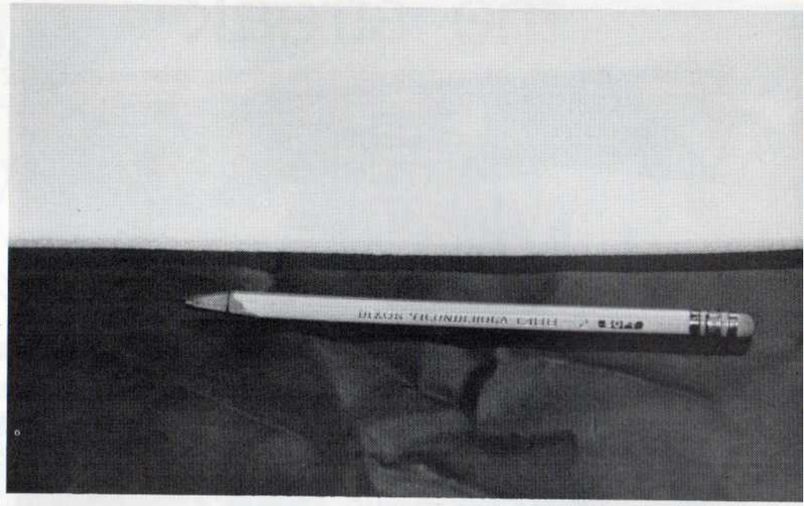


Jeff Scott reports/

Since his recent return from Australia and Europe, Jeff Scott has been putting in some hours on the Streak. Jeff is a world class pilot in all respects, in the air and on the ground. His involvement with the sport dates back to 1974.

He has flown many differing glider designs, most recently flying a La Mouette "Azur" to seventh place in the European Championships at Millau in France. The following are Jeff's comments on the Streak . . .

Recent design innovations in this concealed floating crossbar era have been few. Each year changes are more difficult to find. Could it be that hang gliders are near their optimum performance for a weight shift, foot-launchable, portable wing? Of course not! At a time when glider designers, by comparison, make the VW Beatle look bold, it's refreshing to see a glider that does not look like a Comet. The Streak, designed by Bob England (also designer of the HiWay Demon in 1980), is a unique and very well thought-out glider.



The 87% double surface is secured drum tight onto a frame with 133° nose angle. The trailing edge of the lower surface is not sewn to the upper surface, allowing it shift in flight and thus supposedly improving handling. This also allows for easy routine inspection of the airframe within the double surface.

One unique feature on the Streak that will be copied by the other companies is the stiff foam insert that is used instead of mylar along the leading edge. This foam lasts a lot longer than mylar and holds a better shape. It is also good protective padding for leading edges and boney shoulders when carrying the glider. In other airframe comments, the half inch diameter battens make batten diagrams almost obsolete.

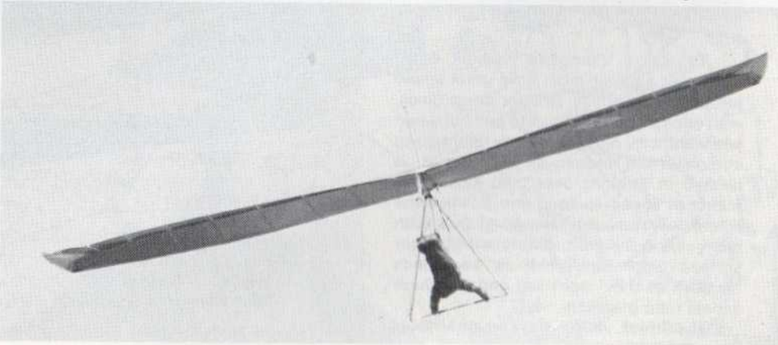
I hook in at 205 pounds. That calculated to a wing loading of 1.75 on the 160 (205 lbs. + 72 lbs./158 ft²), and 1.61 on the 180 (205 lbs. + 82 lbs./178 ft²). Being used to flying a high wing loading, I am very impressed with how well these gliders handle weight. Even on the 160, in the crowded thermals of Sylmar, my climb rate is very good. The sink rate in the 180 makes me feel 50 pounds lighter. Performance is very good throughout the wide speed range.

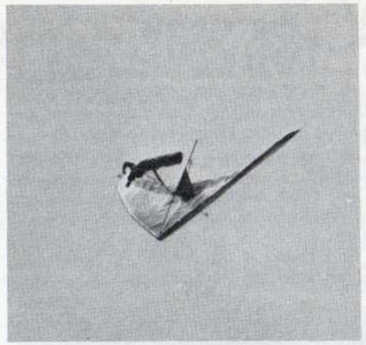
I am generally hard to please when it comes to handling. For me the 160 rates average to good, though other pilots tell me it handles great. Yaw sensitivity causes the glider to wander just a little in turbulent air and at high speeds, if all is not under control. In thermals, the glider carves a clean coordinated circle, with a slight tendency to roll-in near stall speed. My high wing loading may be the reason for this.

Handling on the 180 rates average for roll control, but after that it really shines in 360's. No tendency to roll in or out; just set the bank and fly slow; the glider will follow its nose around and around. It does especially well in tight turns. Pitch pressures remain light throughout its speed range. Even at top speed (I would quote numbers here but I do not fly with an airspeed indicator), flight is straight and true with no tendency to yaw and the sail remains clean and quiet.

Landing characteristics are very good with no tendency to drop the nose on a controlled landing.

Continued on page 24





Ron Young reports/

Two consecutive victories have distinguished aerobatic ace Ron Young as the foremost aerobatic pilot in the world today. Ron won the famed World Championship in Telluride, Colorado, and followed that with another stunning victory in the 1982 Beppu, Japan World Class Aerobatic Meet. The following are Ron's comments on the Streak . . .

The gliders I have flown in aerobatics must have a few special requirements. They above all *must* be strong and capable of pulling out of any situation with good positive reaction and feel.

I have had gliders in every angle to the ground and at many speeds at those angles. I have flown gliders that incorporate luff lines, good pitching moments, correct twist and strength, so doing aerobatics can be a learning experience and fun, instead of hair raising trips.

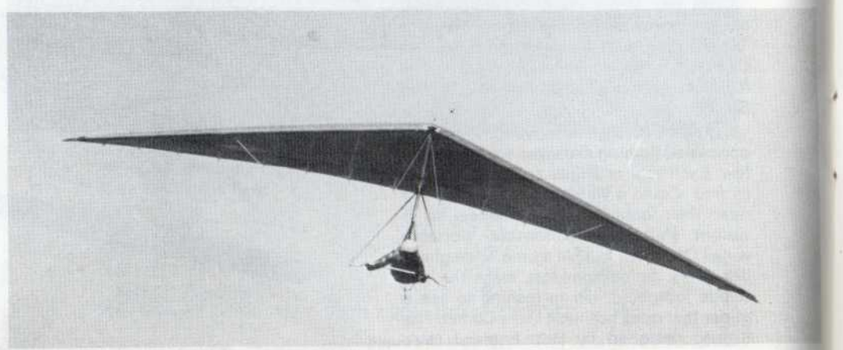
To do a complete upside down maneuver a glider must have great speed (around 70 mph) in straight down dives, with enough positiveness to pull out when you want it to, plus the energy retention to complete the maneuver, whether it is twisted or straight over. You must have plenty of speed to keep you positive the whole way through. Newer gliders with many ribs in the double surface and upper surface work very well in aerobatics because of their tight sail and flat, high aspect ratio planform.

The Streak, which I have recently flown offers me many advantages for aerobatics. It has probably the tightest sail I have seen on any glider, especially the double surface models. With only 158 square feet of sail, the Streak flies my hook-in weight of 187 pounds very well. In 90° plus dives, I have gone faster than in any of the over 2,000 gliders I have flown in the past. I was able to pull out of the dives any time with good positive feel. The only difference is the Streak has very light bar pressure until you start pulling out of the dive. You do not have to be a sky ape or The Hulk to hold it in an accelerating dive, unlike some other gliders. When I climbed straight up out of my dives, I had plenty of juice left over to complete the upside down kind of flying I like best, with as much confidence as I have ever had in my favorite gliders. Because of its desire to fly normally, the Streak is difficult to spin, but properly initiated, it can be put in a very nice nose down stalled spin. Recovery is very easy and automatic when you release the pressure.

The Streak, with is wide nose angle and large wingspan, combines with a very tight sail to have not only speed and good energy retention, but it also handles quite well. When tightened up for aerobatics, this is important for maneuvers, and even more important if you blow a maneuver when you are upside down and do not complete the maneuver, i.e., stalled. The most consistent recovery system I have used is to roll out of the mistake and, above all, *hold onto* the control bar. With a glider like the Streak, roll-outs can easily be accomplished.

All in all the Streak has proven to be a very strong, very safe glider for me in aerobatics and a real joy to thermal fly.

A word of caution on aerobatics. They are not for everyone. Please do not go out and try a loop just because you saw or heard of someone doing them. It is not just a dive and pull out maneuver. It takes a lot of slow and serious effort to accomplish upside down maneuvers. Just start easy and work up to the steeper maneuvers very, very slowly — you can get into serious trouble in a split second. In eight years of safe flying and graduating to my current ability, I never had to use my parachute. Please appreciate this fact and the eight years of work that has gone into developing my flying skills. Please fly safely!! §



cross country in HAWAII

(Centerfold) Mike Benson photographs himself flying over the island of Oahu. Under Mike is Makapuu Lighthouse. The landmark was built in 1909 after a ship went aground on Waimanalo Beach in 1906. The light is powerful enough to be seen fifty miles out to sea on a clear night. It marks the easternmost point on Oahu / Photo by Mike Benson

by Lani Akiona

Since Oahu is only 144 miles around, distance flying is limited. There was a time, though, in days not far gone when Oahu was a premier cross country site. In fact, the world distance record was held here in 1975. It was set by Bill Harris, then eclipsed by Bob Wills first, and later by Bruce Morton.

The pure source making this hot cross country flying possible is the two million year old Koolau mountain range with a little help from the ever-present Trade Winds. From Makapuu Point the Koolaus run along the coast for another 35 miles. On any good day you can put on your hang glider and "ride the ridge" for some 25 miles down to Hauula, land at Pounders and, if you brought your fins, enjoy some of the thick-lipped tubes that live there. If you have to get back to the landing area, though, you can turn around and fly the 25 miles back.

To get in on this kind of flying you will need first, a high cloud base (2,500 feet or better), an east/northeast direction for one way, or a north/northeast direction for round trip.

The local longest distance flight is still only 31 miles, earned by Mike Benson back in 1978. Mike started out at Makapuu lighthouse (the easternmost point on the island) and flew to a field at Brigham Young University. The farthest flight made during the 1981 Regionals Competition was done by D. King, who flew six tenths of a mile past Brigham Young, however he started one and four tenths miles short of Benson's starting point, thereby only narrowly missing a new cross country record.

In a way, Hawaii has everything. It has ridge soaring, thermals (although not some of the big boomers of Southern California), and cross country. It is also easy to get bored of seeing the same old place and lazy with your skills. For that reason, it is important for any pilot to venture away from their normal flying area and to see what else is happening. It is a great learning experience. I was very surprised when I met Alan Bawell, an Advanced pilot from the east who was visiting the 1981 Nationals at Slide Mountain, Nevada. Alan said he had been flying approximately three years and had 48 hours total air time. A lot of pilots from the east have fewer hours than Hawaiian pilots do, but frequently have achieved good skills for their hard work.

Why, that same year I had a student earn fifty hours in six months in Hawaii. And, on the island, that same pilot would rack up 1,000 hours easily in three years. Alan was kind enough to lend me his 147 Harrier I for a flight at Yosemite, which I really enjoyed. So, Alan, if you are planning a trip to Hawaii soon, you can use my 160 Duck.

To be so lucky to live in warm sunshine and cool breezes, we have to make some sacrifices (sort of the penalty that Dennis Pagen writes is the same result of the "gift of lift"), because it is indeed a *big drag* to wait out inconsistent weather spells which can last up to several weeks at a time. At this writing, the velocity at take-off is nearing fifty miles per hour. That is close to those winds approached during the recent Hurricane Iwa. Two days after the hurricane brought the best flying day this island had all year. Although I was in Wisconsin and missed it, there were some unreal cross country flights averaging several hours of pure joy! One pilot even got stuck out at Mt. Olomana for two hours when he sunk down into the ridge lift and had to wait it out for the needed height to get back into Greenwall. His persistance worked and he made it 20 miles down and 20 back afterwards.

I thought it was very interesting that Hurricane Iwa was the name given for our recent storm, for "Manu Iwa's" are the Hawaiian names (Manu = bird; Iwa = thief) given to the minor species of the Great Frigate birds which soar our islands, and are often times very close to us.

. . . But that is another story . . .

Pilot: Bubba Goodman
Photo: John "Jay" Crossland III

BJ Schulte

GEARING UP TO TOW

by Tom Phillips

Hang gliding has by all indications reached a crisis point. The number of active participants has stabilized or at least reached a very slow growth phase. This means that the income to manufacturers and other in the business has done the same. The reason is simple.

Joe Average, hang glider pilot, gets X hours of airtime per year. The figure of X is derived from averaging the total airtime of everyone who has flown a hang glider in a given year. Included with your basic sky bums and other full-time pilots, who may get a few hundred hours, you have to count the thousands of would-be pilots who start lessons at schools around the country but, for whatever reason, do not continue. The first group is relatively small, the other large enough to support most of the existing hang gliding schools in the country.

The middle group though, is made up of the real rank and file of pilots who have made it to mountain flying and soaring, or who are towing with some regularity.

These people are the ones who take their vacations and long weekends at flying sites aroung the U.S. They are the ones who are really concerned with the desire for airtime and how to get it, when they have the leisure time to do so.

Traditionally, these are the pilots who have bought the new "high performance" gliders every year in the hope that when they do make it to a site during their free time, the new hot ship will help them optimize their gaining of airtime. The advantage of sink rate and speed is that it will expand the parameters of what makes "soarable" conditions for the individual pilot. More performance = more soaring is the postulate.

If it is true that we have reached a plateau in performance improvements or even a flattening of the improvement curve as some manufacturers have alledged — then the future sales of new equipment will reflect this.

An advanced pilot who bought a state-of-the-art "high performance" glider two years ago, and is averaging five to twenty hours a year, is going to think long and hard about selling his/her old glider at a significant loss and buying a new glider.

At $2,000 and up (1983 prices), when the performance advantage offered may be less than five percent, the translation to increased airtime may be insignificant. Add to that the possibility that the new ship may not be as fun or easy to fly as the old one.

This will lead ultimately to either less sales for each manufacturer or less manufacturers, as some decide that their slice of the pie is not enough.

It may be the case that the whole pie might not even be enough. One manufacturer could easily supply the current demand for new gliders and the owners and staff would probably earn a reasonable income. The price of new gliders would not come down though, nor would we see improvement in performance.

At the current level of production manufacturing costs are high. At higher levels, materials could be bought at substantial savings and new materials such as graphite and sandwich cloth would be available. At the current levels costs of production severly limit research and development budgets.

The bottom line in hang gliding is airtime. To take the most extreme case, a first time student pays $50 for a first lesson. He receives five flights of 30 seconds each for a total of two and a half minutes. That is $1,200 per hour even with the most advanced training system available today. Well, students are not thinking of the cost that way, fortunately, but look at he/she later when spending the whole vacation and several hundred dollars in hopes of some unspecified quantity of airtime.

As we, here in Chattanooga, see it, there is only one solution to this problem. Believe it or not, living in Chattanooga, in the very shadow of the Cumberland Plateau — within 35 minutes driving time of some of the most outrageous sites in the world — does not guarantee gobbs of airtime. If you work a regular job, you quickly find out that is seems to rain or blow the wrong direction a lot on weekends. It also can be so marginal that while you are being drilled to the field, some one else who was either luckier or better than you is climbing to cloudbase all alone. One solution is aero-towing of gliders by ultralight tugs.

Specifically stated, to get hang gliding going again in a growth phase, we must have more participation. That means opening up the flat lands. It is no longer the image of hang gliding as a death sport that keeps participation low. It is the relatively

Continued on page 35

THE GEAR

In our gearing up stage we have chosen to use a "center of mass" system for attaching the tow rope to the glider. We have drawn heavily on the Skyting system for our bridle, and though "Skyting," as coined by Donnell Hewett, refers to a complete system for towing, the term is commonly being applied to the bridle itself.

Our prototype bridle consists of a release attachd to the heart bolt (center of gravity) area of the glider. The bridle itself is a piece of 5 mm Perlon rope tied to the released ring which passes through the apex ring and down through the released ring on a lower release at the pilot's waist. From there the bridle rope passes back and is tied to the tow rope at the apex ring. This "pulley" system forms the 2:1 mechanical advantage that is the heart of the center of mass system.

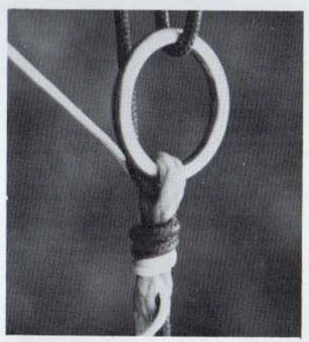
The releases themselves are actuated by the pilot as follows: The upper is tripped by a line running from the pin to the corner of the control bar, through a ring to the pilot's wrist. This allows the pilot to place his hand either on the downtube or the basetube. Actuation is achieved by a jerk of the hand. The lower release is tripped by an auto release line from the pin to the apex ring. As the top release trips, the resulting extension between apex and lower release causes the auto release line to tighten tripping the release. The pilot is left with the two releases in place but causing no interference, and the tow rope carries away the bridle. As the most obvious hazard appears to be the possibility that the bridle could tangle with the glider rigging, we are experimenting with sheathing the bridle rope to the top released ring with two feet of plastic tubing; the same sort once used on stirrup ropes to prevent the same entanglement.

Hewett uses a horse bridle release on his standard model and we are not the first to suggest an alternative. The primary fault, as Donnell recognizes, is that with increasing tow pressure, release pressure increases. Our experiences with balloon drops and chute deployment demonstrations, as well as advice from skydiving and boat towing friends, suggested the "three ring circus" type release is "bullet-proof."

The 150:1 mechanical leverage of three stacked rings keeps release pressures small. In fact our one modification, the addition of a rubber band, assures that under slack conditions such as ground handling, the release will not trip of its own weight, but will trip when actuated under no load conditions. No other change has been made to these production releases, which were obtained from our skydiving sources at High Adventure Sports.

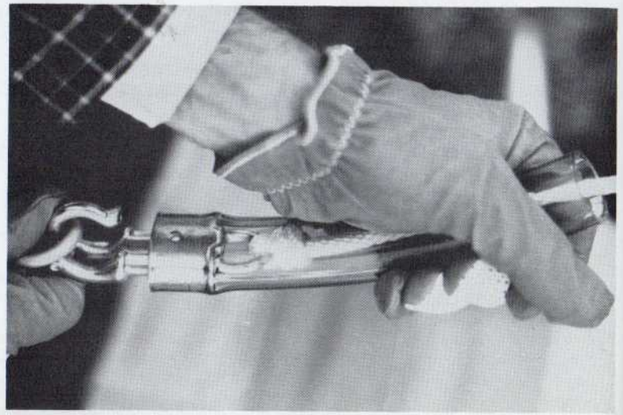
Thorough study of Skyting Newsletters 1 thru 9 has yielded many suggestions and confirmations of our own adaptation of Hewett's bridle, such as the reversal of the order of release. However, most of the people involved in some form of skyting started with one of Donnell's standard models. Their suggestions for improvements and adaptations are well worth the investment, as they are reported in the Skyting publications.

The release on the tug ultralight is a Bennett boat tow release mounted in such a way as to avoid interference with control surfaces, but still to be as in line with the aircraft center of drag as possible. An actuating line runs forward to the pilot. In the future, we expect to try another three ring circus release in this same location. Roy Haggard has reported the successful towing of the Arrow by a similar attachment to this tow point on an ultralight.



(Left Column) The three ring release and 2:1 reduction system of the Skyting bridle. (Right Column) Attachment methods to pilot and tug (lowest) Donnell Hewett's release.

BJ Schulte



low yield enjoyment pay-off, i.e., airtime.

Technologically the time is now. Ultralight aircraft have already proven that they have the power to do the job. Our bastard child (the ultralight aircraft) may finally redeem itself for all the noise and hard feelings by offering us access to the sky in unprecendented availability the way we want it — soaring.

Towing itself gave birth to our own sport as we discarded the rope and the lockouts for the hazards of foot-launch and our fabulous mountains. In the flatlands, however, a few enclaves of hardy souls persisted in towing and have refined it into an art based on avoiding lockouts by technique and skill, while achieving great soaring.

Recently, though, a new method of towing has emerged which directly addresses the lockout phenomenon. Ironically it was from a hang gliding backwater that this new idea comes. Far from the mountain haunts of the sky gods and far from the mid-Florida lake country tow experts — those who might have told him that what he was thinking of was ridiculous — Donnell Hewett's *Skyting* was able to develop and prove itself.

The spectre of land towing has struck fear in the hearts of pilots since the beginning. And yet here is Donnell still alive with an idea whose time has come. Towing from the *center of mass* has appealed to enough individuals involved in towing now that we in Chattanooga have been hearing a steady stream of positive reports. The *only* negative report is of the tendancy to over-control as opposed to locking out.

The Chattanooga community has decided to get into the game. What we have done to date has been to start with a group of interested individuals who have been, and still are, studying available data on prior experience (most notably Hewett's *Skyting* Newsletters 1-9; available from Donnell Hewett, 315 N. Wanda, Kingsville, TX 78363). We have a highly skilled ultralight pilot who has many hours of experience as a sailplane tug pilot. Also, we have some advanced level volunteers for glider test pilots.

Because we felt it was a safer, more bullet-proof design, we have used two skydiver "three ring circus" releases to construct a working prototype bridle based on Hewett's 2:1 center of mass bridle system (see photo illustrations). We have tested the design on the Crystal Air Sports Hang Glider Simulator and are satisfied that it will release as desired.

A release is installed on our stock ultralight and we are still researching its position for optimum flying characteristics.

At this time, we are still gathering data and talking to interested pilots all over the country. While awaiting favorable weather in Chattanooga, we will keep the flying community updated through future *Whole Air* reports. If you or your group is thinking of aero-towing, or indeed has already begun, we need your input. The more people get involved, the faster we will all benefit with more airtime.

BJ Schulte

SKYTING TODAY

Text and Illustrations by Donnell Hewett

Last year *Whole Air* published two articles about a new towing concept called "skyting" which claimed to be the safest way to tow hang gliders. The articles explained theoretically how lockouts could be avoided (March/April 82 issue) and listed the eight criteria a towing system must meet in order to be classified as a skyting system (July/August 82). At that time there was only one towing system which even attempted to meet the skyting criteria. Today there are several.

This article describes some of these skyting systems and illustrates how the skyting concept can be applied to essentially any form of towing. Although no attempt has been made to include every skyting system which is currently in use or under development, the examples here should suffice to give the reader a good

picture of how skyting is performed and what kind of equipment is required.

LAND TOWING

Although land towing really includes every form of towing which is performed over land (including reel towing and winch towing), we are considering here only the case where a hang glider is being towed by a rope attached directly to a land vehicle. Other names for this type of towing are: elastic line towing, static towing, dynamic tension control, and "car" towing.

An example of this kind of towing is illustrated in Figure 1. This is the original skyting tow system which was developed in Kingsville, Texas, during the summer and fall of 1979. It is still being used today in essentially its original form. Its components are described below:

CREW — As with any towing system, an experienced ground crew is essential. The minimum crew for this system consists of a driver and a spotter.

VEHICLE — Although any land vehicle can be used with this system (including car, truck, motorcycle, snowmobile, etc.) a pickup truck is best. It provides excellent rear visibility and a large load carrying capacity.

TENSION GUAGE — We use a spring as a tension guage and run a taut rope from the spring to the driver's hand. The driver can then "feel" what the towline tension is doing without taking his eyes off the road. He can then adjust the speed of the vehicle so as to keep the towline tension essentially constant.

ELASTIC TOWLINE — Our towline consists of about 500 feet of standard parachute shroudline which stretches about 50 feet (10%) under a 150 pound load. This stretch prevents the towline tension from varying so rapidly that corrections cannot be made. It provides the cushion needed for wind gusts, vehicle surges, pilot reactions, and driver response.
responses.

DRAG CHUTE — We use a 3 foot drag chute to prevent the towline from snapping back too hard whenever the weak link breaks. It also slows the descent rate of the bridle system after it is released.

WEAK LINK — Our weak link consists of a loop of #18 braided nylon twine which breaks at about 200 pounds. This corresponds to a maximum towline tension of approximately one "G." A weaker link does not allow a good climb rate, and a stronger one can be dangerous when it does break.

LEADER — We use about 50 to 100 feet of 5/16" polypropolene ski rope between weak link and bridle to help prevent the bridle from flying back into the pilot's face when the weak link breaks.

BRIDLE — We use the standard 2:1 slip-ring skyting bridle.

LATCH — We still use the original skyting latch system which releases when its sleeve is pulled. (See the inset drawing in Fig. 1).

AUTO-RELEASE LINE — Our autorelease line is attached to the keel latch. When the pilot releases his body latch by pulling on its sleeve, the slip-rings slide together, and the towline tension is transferred to the auto-release line which pulls on the sleeve of the keel latch causing it to release automatically.

ADVANTAGES — 1) Low cost. This is probably the least expensive tow system available (assuming a land vehicle can be obtained free of charge). 2) The equipment is light, portable, and compact. 3) This towing technique can be performed from essentially any runway, road, or open field (assuming it is legal to tow and the surrounding terrain is free from obstructions). 4) As with any land towing system, the pilot has firm footing on both take-off and landing. 5) The system is suitable for double tows, one-on-one competition, and team flying.

DISADVANTAGES — 1) As with all dynamic tension control systems, thension regulation is not extremely precise. Control is limited by rope stretch and vehicle movement. 2) The tow direction is limited by the direction of the runway. Cross wind take-offs are to a maximum towline tension of not uncommon. 3)

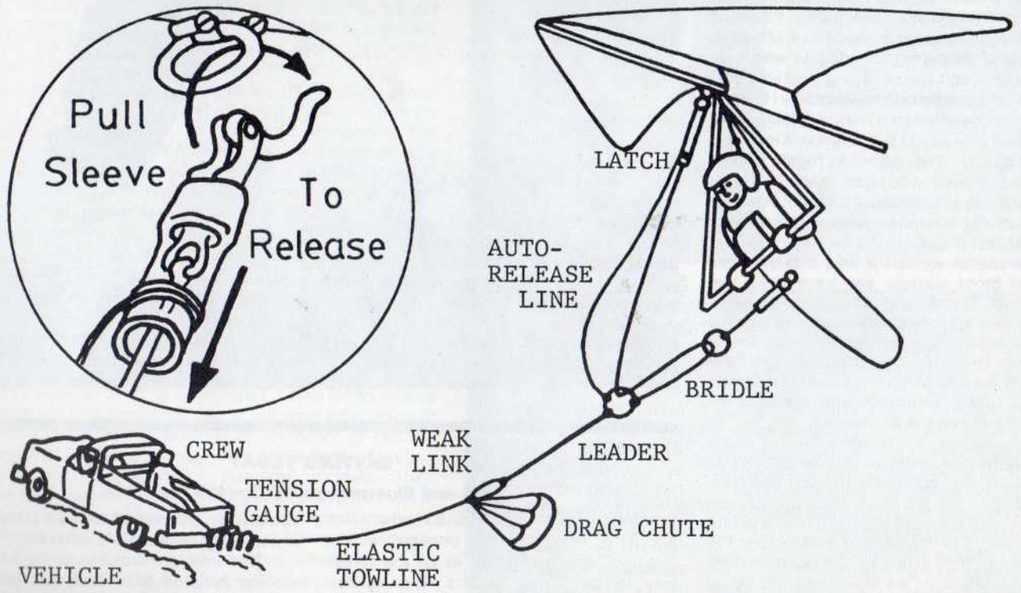


Fig. 1. Land Towing near Kingsville, Texas.

Continued on page 37

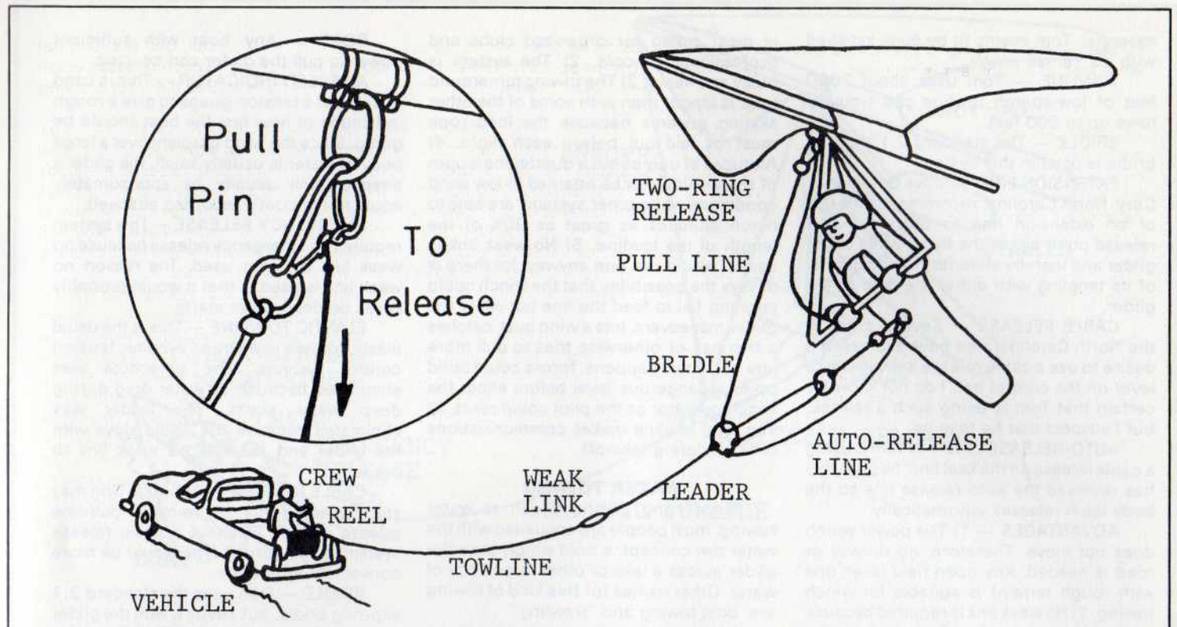


Fig. 2. Reel Towing near Houston, Texas.

Many potential sites are eliminated because of telephone lines, trees, etc., because of legal restriction on towing, and because of highway traffic. 4) Only one tow vehicle can use the runway at a time. 5) The drag chute reduces the efficiency of the system and makes it harder to traverse from side to side while flying.

REEL TOWING

In this system of towing the tension in the towline is regulated by a friction clutch which governs the rate at which the rope unwinds from a reel pulled behind a tow vehicle. Other names for this towing method are: winch (non-powered) towing, friction reel towing, break drum towing, clutch regulated towing, and "reeling."

An example of reel towing is illustrated in Fig. 2. This is the system used by Henry Wise and friends in Houston, Texas. Its components are described below:

CREW — This system requires a reel operator and a driver.

VEHICLE — Again a pickup truck is preferred unless the reel is mounted on a properly designed trailer.

REEL — The reel needs to be of high quality in order to keep the tension constant and in order not to jam or backlash during operation. It should also permit the operator to gradually increase the tension during take-off.

TOWLINE — Henry uses a non-elastic towline about 1000 feet long.

WEAK LINK — As with any true skyting system, tension is limited to one "G" by a weak link.

LEADER — Again a leader is used to prevent bridle flyback when a weak link breaks.

BRIDLE — Henry uses the standard 2:1 slip-ring bridle which he calls the "Hewett Bridle."

RELEASE — Henry has developed a "two-ring release" which can be constructed easily from readily available materials. (See inset in Fig. 2). It operates on the same basic principal as the more common "three ring release."

AUTO-RELEASE LINE — Henry has reversed the auto-release line so that it automatically releases the body latch when the keel latch is released.

PULL LINE — A pull line is attached to the pin of the two-ring release and held in the hands of the pilot. To release the bridle, the pilot simply pulls on the pull line. This releases the keel latch and the auto-release line does the rest.

ADVANTAGES — 1) The reel system regulates tension better than dynamic control does. The pilot can even make significant maneuvers without affecting towline tension. 2) The driver's job is easy. He does not have to regulate his speed according to the towline tension, he only has to keep moving faster than the glider. The reel does all of the tension regulation. 3) No parachute is needed because a nonelastic towline is used. 4) The two-ring release is rugged enough to withstand drops from any height over any terrain without a parachute to limit its fall. 5) The light two-ring release is less likely to tangle with the glider than the heavier standard release. 6) The towline is short during takeoff and long at the end of the tow flight. This reduces the problems during take-off and yet still permits high altitudes to be attained.

DISADVANTAGES — 1) Without an elastic towline it is difficult to make gradual transitions to and from tow. "Pop starts" and "slingshot releases" could happen on this system. 2) The reel can feed line out but it cannot take it in. Nor can it regulate the tension when the end of the towline is reached. 3) The two-ring release is more difficult to latch than the standard latch. 4) The pull line could be hard to relocate if the pilot ever lets go of it. In an emergency situation this could be bad.

WINCH TOWING

In this form of towing the hang glider is pulled forward by a stationary winch powered by its own small gasoline engine. Like the friction reel, the winch is designed to slip the proper amount to keep the tension constant. Flight begins with the towline fully extended and proceeds as the line is hauled in by the winch. Other names for this system are: stationary winch towing, power winch towing, and "winching."

An example of winch towing is illustrated in Fig. 3. This is the system used by Tom Pendergraft and others near Fayetteville, North Carolina. The components of the system are described below:

CREW — The only essential crew member for this system is the winch operator. However, it helps to have an assistant at each end of the long towline.

WINCH — A good power winch is

Continued on page 38

essential. Tom seems to be quite satisfied with his Yarnall winch.

TOWLINE — Tom uses about 3000 feet of low-stretch towline and typically tows up to 900 feet.

BRIDLE — The standard 2:1 slip ring bridle is used in this system.

EXTENSION LINE — Steve Goldman of Cary, North Carolina, recommends the use of an extension line to place the keel release point below the flying wires of the glider and thereby eliminate the possibility of its tangling with either the pilot or the glider.

CABLE RELEASE — Several pilots in the North Carolina area have expressed a desire to use a cable release activated by a lever on the control bar. I do not know for certain that Tom is using such a release, but I suspect that he may be.

AUTO-RELEASE LINE — If Tom is using a cable release on the keel line, he probably has reversed the auto-release line so the body latch releases automatically.

ADVANTAGES — 1) The power winch does not move. Therefore, no runway or road is needed. Any open field (even one with rough terrain) is suitable for winch towing. 2) No weak link is required because the small winch engine does not have the power to produce excessive forces. 3) The pilot can release without taking his hands off of the control bar. 4) The extension line keeps the keel line from tangling with the glider or pilot. 5) Tension regulation is better with a winch than with the dynamic control of an elastic towline. 6) Winch towing may be legal where vehicle towing is prohibited.

DISADVANTAGES — 1) The power winch is expensive. The system, therefore, is most suited for organized clubs and professional schools. 2) The system is bulky and heavy. 3) The towing turnaround time is longer than with some of the other skyting systems because the long rope must be laid out before each flight. 4) Altitudes of only about a quarter the length of the towline can be attained in low wind conditions while other systems are able to reach altitudes as great as 90% of the length of the towline. 5) No weak link is used. I would use one anyway, for there is always the possibility that the winch could jam and fail to feed the line out while the glider maneuvers, hits a wind gust, catches a thermal, or otherwise tries to pull more line out. If this happens, forces could build up to a dangerous level before either the winch operator or the pilot could react. 5) The long towline makes communications difficult during take-off.

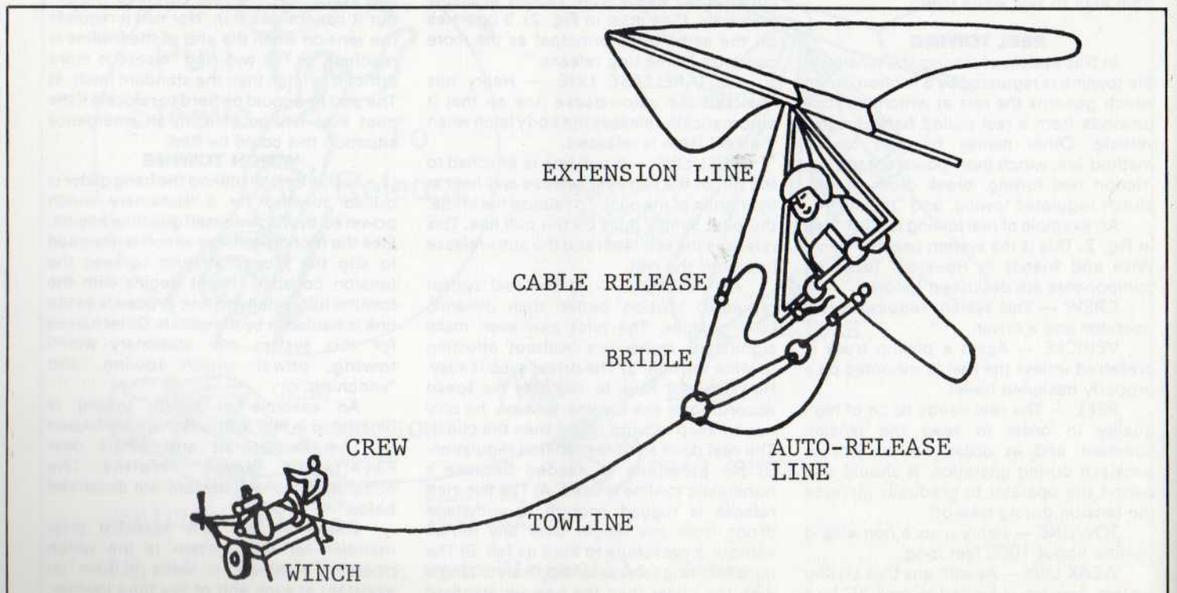


Fig. 3. Winch Towing near Fayetteville, North Carolina.

WATER TOWING

Since hang gliding began as water towing, most people are acquaited with the water tow concept: a boat simply tows the glider across a lake or other large body of water. Other names for this kind of towing are: boat towing and "trawling."

An example of water towing is illustrated in Fig. 4. This is the system used by Don Boardman III and friends on Lake Delta, near Rome, New York. The componenets of this system are described below:

CREW — Two crew members are needed to operate this system safely: a throttle man (to watcht the pilot, control the throttle, and trip the safety release) and a driver (to steer the boat safely across the water).

BOAT — Any boat with sufficient power to pull the glider can be used.

AIRSPEED INDICATOR — This is used in place of a tension guage to give a rough indication of how fast the boat should be going. Since the wind gradient over a large body of water is usually small, the glider's airspeed will usually be approximately equal to the boat's recorded airspeed.

EMERGENCY RELEASE — This system requires an emergency release because no weak link is being used. The reason no weak link is used is that it would probably break on deep water starts.

ELASTIC TOWLINE — This is the usual elastic towline used by all dynamic tension control systems. The parachute was eliminated because of water drag during deep water starts. The leader was elinimated because the bridle stays with the glider and there is no weak link to break.

CABLE RELEASE — Although Don may still be using his home-made pull-line release system, I believe a cable release system of the Yarnall type would be more convenient to operate.

BRIDLE — Don uses the standard 2:1 slip-ring bridle, but keeps it with the glider after releasing the towline. The reason for not dropping the bridle is that it tends to become tangled when drug through the water behind the boat.

BUNGEE CORD — Don plans to incorporate a bungee cord arrangement to pull the bridle back out of the pilot's way after releasing the towline. This is similar to the technique that the British use with the Brooks Bridle.

FLOATS — Obviously, any hang glider used in, on, or over the water should be equipped with floats. The pilot should also have an appropriate life jacket.

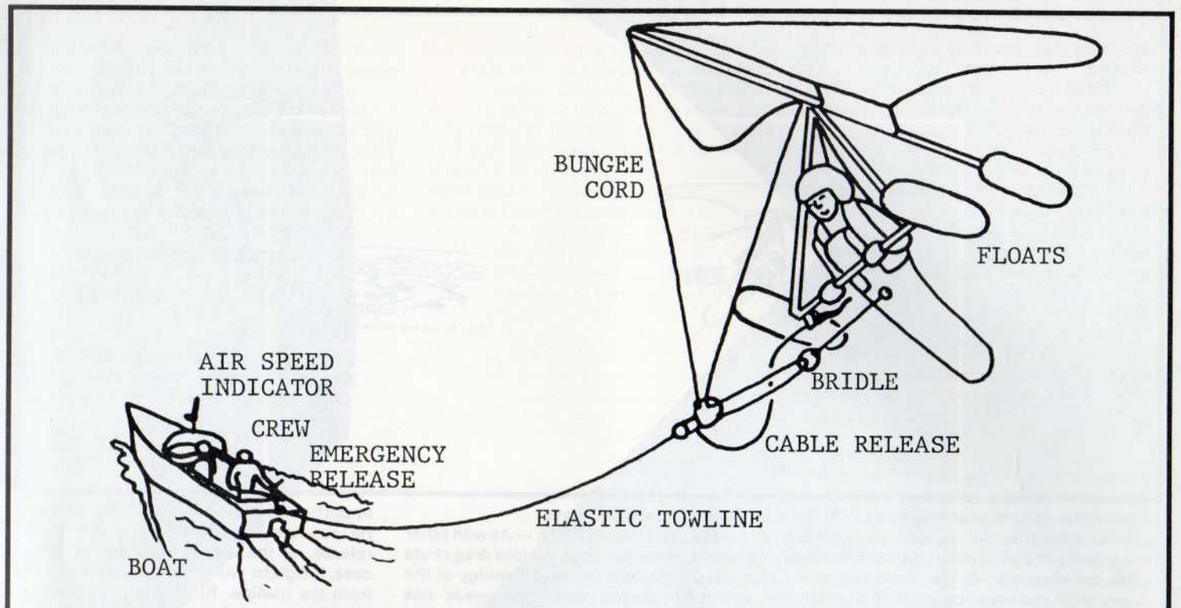


Fig. 4. Boat Towing near Rome, New York.

ADVANTAGES — 1) Safety. Water towing is probably the safest way to learn to tow a hang glider. The same crash that would be fatal on land frequently results in no injury whatsoever when it happens over the water. 2) Water provides a large smooth area over which prolonged tow flights can be made. 3) The control bar release can ne activated without the pilot moving his hand. 4) This system can be used for double tow, one-on-one competition, and team flying. 5) Flights over water are usually smoother than over land because there is usually less air turbulence.

DISADVANTAGES — 1) The cost and availability of the boat. 2) Dynamic control is less effective when using a boat that when using a car because a boat has no breaks. 3) Since the bridle stays with the glider after the towline is released, it could get in the pilot's way. 4) Water is wet and cold, especially in the winter. 5) Drowning is possible. 6) Fewer thermals occur over water than over land making prolonged free flight more difficult. 7) No weak link. Actually *every* towing system has a built in weak link. I wonder where it is in this tow system?

AIR TOWING

In air towing, the hang glider is towed by an ultralight aircraft in much the same way that conventional sailplanes are towed by regular towplanes. Other names for this kind of towing are: aero towing, ultralight towing, air-to-air towing and "tugging."

An example of air towing is illustrated in Fig. 5. I suspect that this system is similar to that currently being developed by a group of pilots in the Tennessee area. The components of this system are described below:

CREW — The only essential crew member for this system is the ultralight tow pilot, himself. However, his role is critical. He must be good enough to fly the ultralight safely while glancing from time to time over his shoulder (or in a mirror) to see how the glider is doing. He must also learn to "feel" how the glider is affecting his own aircraft in order to compensate accordingly.

ULTRALIGHT AIRCRAFT — The tow plane must have sufficient power to climb while pulling the glider. It must also have a climbing airspeed approximately equal to the flying speed of the glider.

EMERGENCY RELEASE — This is essential for aero towing. Without it there is a real possibility that the glider may force the tow plane out of control. The release could be activated by a pull line, but on an ultralight a well positioned cable release would probably be better. (The loose pull line could accidently foul in the propeller.) The emergency release is also needed for dropping the towline just before landing the ultralight.

WEAK LINK — A weak link is essential in aero towing. Local wind gusts could pull the glider and ultralight apart and the tow forces could rapidly exceed the limits of safe flying before either one of the pilots could respond. This is particularly try if a non-elastic line is used.

TOWLINE — A non-elastic towline is recommended in order to prevent a possible oscillation from developing between the two craft. A 200 foot line is probably long enough to permit both glider and pilot to make flight corrections, but short enough to keep each one aware of what the other is doing.

BRIDLE — Any good center of mass bridle system would work, including the regualr 2:1 slip-ring bridle.

THREE-RING RELEASE — The pilots in Tennessee have expressed a desire to use the three-ring release on their aero tow system. This release has a reputation of being very safe and reliable, especially when it comes to releasing under a full load.

PULL LINE — It is my understanding that a three-ring release is most easily activated by a pull line attached to its release pin. Therefore the system shown here is similar to Henry's release system.

AUTO-RELEASE LINE — As with any system that releases the keel line first, the auto-release line should be connected to the body release mechanism.

ADVANTAGES — 1) Only one person besides the glider pilot is needed for aero towing. 2) This system uses less land surface area than any other skyting system. A short runway is all that is required. 3) The ultralight automatically flies at the correct airspeed, so neither dynamic control of tension regulators are needed to maitain essentially constant tension. 4) The tow angle remains constant throughout the tow flight instead of increasing as the glider climbs.

DISADVANTAGES — 1) There is no room for a spotter in the ultralight, so the pilot must both fly the plane and do the spotting. This is inherently less safe than using a spotter. 2) The ultralight is expensive to purchase and to operate. 3)

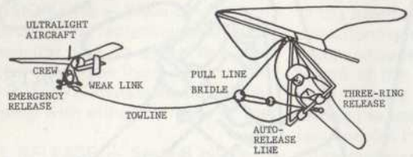


Fig. 5. Air Towing in Tennessee.

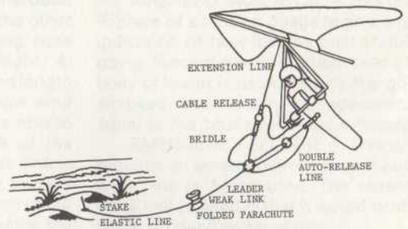


Fig. 6. Kiting on Padre Island, Texas.

Very few people could qualify as the tow pilot. Neither a non-pilot nor an inexperience pilot could possibly serve as the crewmember. 4) The glider effects the tow craft and could cause both to crash if not flown properly. In other words, glider control is more critical in aero towing than in any other form of skyting. 5) Ultralight and glider must have a compatible airspeed and the ultralight must have sufficient power for towing. In other words, many ultralights are not suitable for towing.

KITING

Unlike other forms of skyting, kiting does not require any towing. Here the wind is used to keep the glider airborne at the end of a moored line. Other names for this type of flying are: rope soaring, wind soaring, and moored skyting.

The wind obviously needs to be both strong (about 20 mph) and smooth in order to kite safely. Many coastal area are, therefore, quite suited to this type of flying. I have done enough of this moored skyting along the Texas coast to convince me that it can, indeed, be done safely and that it will eventually become quite popular in certain areas of the country.

An example of a kiting system is illustrated in Fig. 6. This is the system I plan to test on Padre Island when I go wind soaring there this spring. Its components are described below:

CREW — Because of the strong wind that is present whenever rope soaring is performed, a launch assistant is needed to hold the nose of the glider during take-off.

STAKE — We use a shovel buried in the sand to anchor the towline. (A simple tent stake will be pulled out of the sand by the tension in the towline.)

ELASTIC TOWLINE — This is essential to prevent the towline tension from varying rapidly during flight maneuvers and wind variations. We currently use a 500 foot towline, but feel that a 1000 foot line would probably be better. The longer the towline, the more room there is to maneuver and the more consistent the towline tension becomes.

FOLDED PARACHUTE — As with other elastic towline systems, a 3 foot drag chute is used to absorb the recoil energy of the stretched towline when the weak link breaks. In order to eliminate the excessive drag on the towline while kiting, the drag chute is folded and tied with a piece of light string which breaks when the weak link breaks.

WEAK LINK — The same weak link is used in kiting as in other forms of skyting. The light string used to tie up the drag chute breaks so easily that it does not appreciably affect the weak link break point.

LEADER — The same leader used in kiting as when towing.

DOUBLE AUTO-RELEASE LINE — By using a double auto-release line, the bridle is automatically released when either of its two ends are released. Since there is no emergency release designed into this system, the pilot needs as reliable a release system as is possible.

EXTENSION LINE — This is used to place the keel latch below the flying wires so there is no possibility of it becoming tangled with the glider or pilot.

CABLE RELEASE — By placing a cable release on the control bar to release the keel line, the pilot can release himself without taking his hand off of the control bar. Again, the idea is to make it as easy as possible for the pilot to release himself from the towline under all conceivable conditions.

ADVANTAGES — 1) Only one crew member is required and he can be relatively inexperienced. 2) Flights of unlimited duration can be made. 3) System is ecologically clean. No engine is used and no fuel is burned. There is certain philosophical satisfaction about flying in the flat lands solely on wind power. 4) The system is legal where land towing may be prohibited. (In our case, it is illegal to tow on the beach, but it is legal to kite there.) 5) The double auto-release combined with the control bar release provides maximum opportunity for the pilot to release himself. He can use the cable release, the body release, or the keel release and in every case, the glider will be completely released from the towline. 6) This is probably the least expensive skyting system of all. Not even a tow vehicle is required.

DISADVANTAGES — 1) There is no spotter (although one could be placed at the bottom of the towline if it were thought advisable.) Personally, I think it is inadvisable to use a spotter unless he has a tremendous amount of experience on a wind soaring system. The pilot usually knows better than anyone else when and if he wants to be released. 2) There is no safety release at the bottom of the towline. (Again, one could be put there, but it is probably inadvisable.) 3) The flying area is limited to the end of the towline. For a 1000 foot towline, the pilot could fly 500 feet to each side, possible 800 feet high, and about 100 feet forward and backward. This is roughly similar to the lift band for a small hill used in ridge soaring. 4) The required pilot skill is greater for rope soaring than for ridge soaring because of the towline. In essence, the towline acts like a large invisible mountain just waiting to be hit. Furthermore, as the pilot maneuvers forward and backward, the towline tension varies. This variation in towline tension must be mastered by the pilot in order to kite safely.

WARNING

Just in case you failed to read between the lines of this article, let me clearly state that *SKYTING IS STILL IN THE EXPERIMENTAL STAGE OF DEVELOPMENT AND SHOULD ONLY BE ATTEMPTED BY PILOTS WILLING TO ACCEPT THE INCREASED RISK ASSOCIATED WITH PIONEERING A NEW ASPECT OF AVIATION.*

PROJECT...SOARING TRIKE

All Photos by Terry Shipula

TRIKES IN GENERAL

In England and on the European continent, it is reported that trikes (generic term) substantially outnumber what could be called "standard ultralights." In the USA this experience has not yet occurred. Why?

Two reasons come to mind. First, the hang glider pilot population — most likely of the candidates to make the transition to trikes — has not yet become very excited about power, regardless of form. Sales have even been light in those flat land areas where power could help maintain skills between mountain flying expeditions. A likely explanation for this is the failure of any trike system manufacturer or user to consistently *soar* in a trike.

The second reason is the lack of two seat trikes with sufficient power, strength, and lift. Only in the last few months has Bennett released his two-seater, and Flight Designs only recently announced their offering of such a package. Yet no one so far has reported receiving N-numbers and FAA Experimental category licensing.

SOARING TRIKES

If development here in the USA began to parallel the European phenomenon with design efforts to prove the viability of soaring, then perhaps hang glider pilots would purchase systems to use with their existing wings. Price will remain important, though, as the trike will probably be regarded as an "option."

WOLFE AVIATION COMPANY

Bruce Wolfe has been producing drawings and prototypes for the last two or three years. Attention to detail and innovative procedure have combined with the desires of a soaring-oriented hang glider pilot, as Wolfe introduced his WAT, Wolfe Aviation Trike.

Engineered as a ready-to-fly power-off soarable unit for hang gliders, the WAT carries very simple and clean lines. These translate to reduced frontal area, light weight, easy set-up, and relatively low cost (projected retail *under* $2,000 without pod).

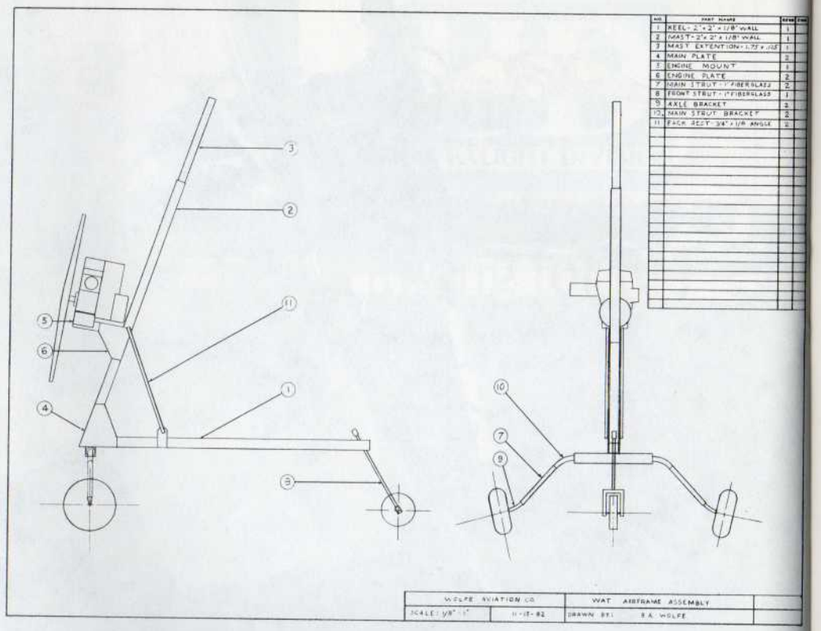
After much experimentation, Wolfe ended up with a bit over 100 pounds, when using a Cuyuna 215 direct drive. Choosing other engines could drop it just under 100, and adding a less noisy reduction drive will up the weight slightly.

Add in the effect of the fabric pod and the unit reduces drag significantly over conventional dual mast and dual side rail frame trikes. The ingenious pod unzips on each side (at contrasting panels; see photo), and folds forward for breakdown (see open and folded photos).

Steering of the nosewheel will soon come inside the pod. Also, the spar supported axles are being replaced with fiberglass rods (see blueprint drawing). The bare frame drawings present a fairly slim front view. Perhaps the design goal of a truly soarable trike is within immediate reach . . .

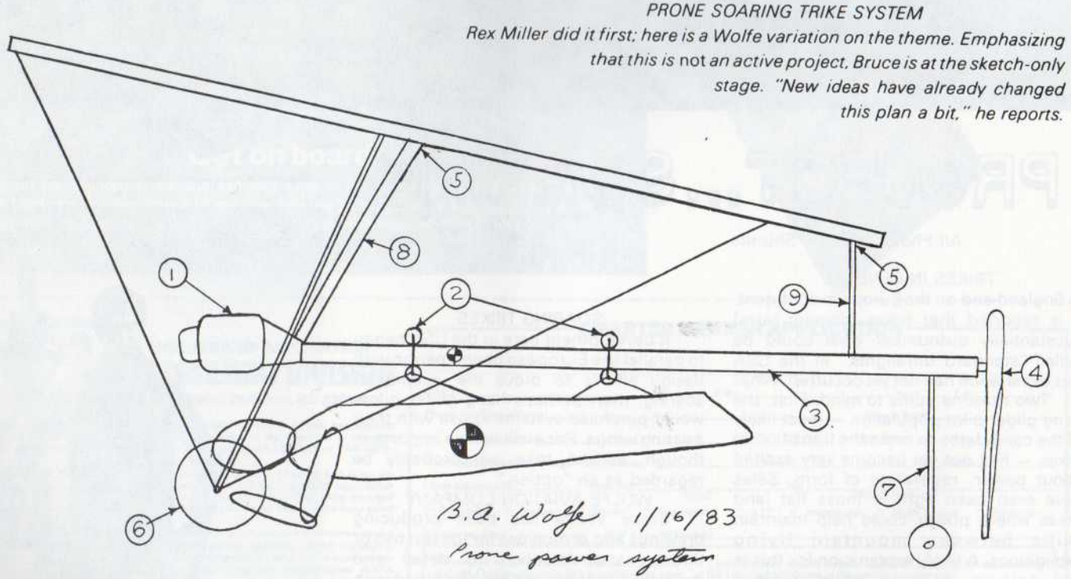
POSTSCRIPT

At a time in the future, *Whole Air* has accepted Bruce's challenge to soar his WAT with other gliders in mountain soaring conditions to compare results. As he is quite serious about achieving his goal, we hope the time is soon — this spring would be nice.



PRONE SOARING TRIKE SYSTEM

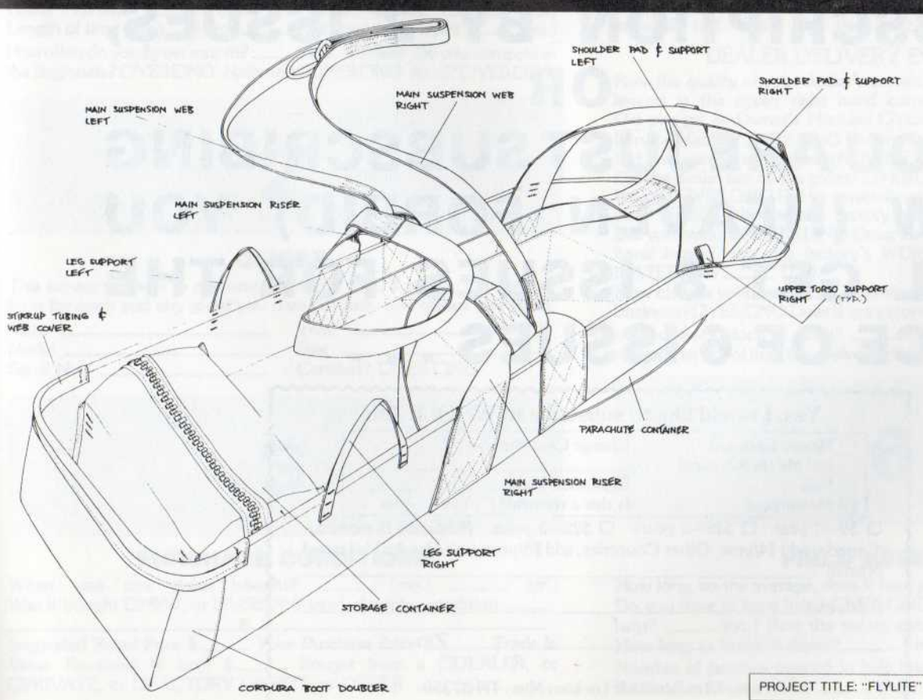
Rex Miller did it first; here is a Wolfe variation on the theme. Emphasizing that this is not an active project, Bruce is at the sketch-only stage. "New ideas have already changed this plan a bit," he reports.



"The pilot is free to move in pitch and roll, while the engine package is locked in pitch, but free in roll. The pilot's suspension system is rigid. With some more planning, it may be possible to do away with the rollers and use a standard soaring harness.

"Pitch control is by weight shift of the pilot's mass only. Roll control is by a combination of the pilot's weight and that of the engine package. Pitch would be dampened and roll would be the same, or better, as in the case of 'conventional trikes' where the trike's mass adds to the inputs of the pilot's own weight."

1) Twin cylinder engine (with electric start?).
2) Rollers, top and bottom.
3) 2" X 2" square tubing with internal drive shaft.
4) "One arm" direct drive propeller.
5) Brackets which allow roll only, with no pitch or yaw permitted.
6) Donut wheels.
7) Inverted "V" tail wheel assembly.
8) Weight bearing ridge strut.
9) Non-weight bearing ridge strut.



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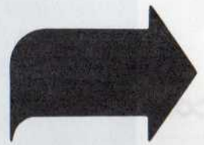

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STANDARD SCALE LEGEND
5 = Superior
4 = Good
3 = Average
2 = Fair
1 = Poor

BASIC SURVEY INSTRUCTIONS

We've tried to make the *Whole Air* Glider Owner Survey a semi-automatic answer developing system. By that we mean that most questions are a check-the-box type. Some, however, require a rating, done on a 1-5 scale, with the standard legend appearing on the upper right of each page so that you do not need to flip the pages back and forth just to see how to answer. A few ask for written comments, just notes will suffice, where your answer may represent a unique response.

Please follow the survey through in numerical order, categories 1 through 12. We estimate it will take the typical owner about 25 minutes to complete the form.

While we invite your name to qualify for the issue premiums, it is *not* mandatory. Those who do enter their name are assured of absolute confidentiality. These pilots will also receive the issue premium which applies to them.

Thank you — Ed.

1

BACKGROUND

So we know more about those of you who participated in our survey, please answer the following questions. **If you provide your name and address, we'll send you two complimentary issues or extend your subscription two issues beyond the present expiration.** *Subscribers* ***please*** *include the number on the upper left of your mailing label.*

Name (optional)_____Subscriber No._____
Address (optional) _____
_____ Zipcode_____

Age _____ Weight _____ USHGA Rating _____ (I-V)
Glider Airtime _____ (hrs.) All other airtime _____ (hrs.)
Length of time flying... gliders _____ (yrs.) any other types _____(yrs.)
How often do you fly per month? _____(no. of times) Do you compete in the Regionals? ☐YES ☐NO Nationals? ☐YES ☐NO At all? ☐YES ☐NO

2

GLIDER

This survey pertains to any **one** glider you own. You *may* complete a form for *each* and *any* glider you own but **only one glider per form.**

Make _____ Year _____
Model _____ Size _____
Serial No. _____ Certified? ☐YES ☐NO

3

PURCHASE CONDITIONS

When was this glider bought? _____ (mo.) _____ (yr.)
Was it bought ☐NEW, or ☐USED? If used, describe condition _____
_____
Suggested Retail Price $_____ Your Purchase Price $_____ Trade In Value Received (if any) $_____ Bought from a ☐DEALER, or ☐PRIVATE, or ☐FACTORY DIRECT, or OTHER _____

4

OWNER PRIORITIES

Using the legend below (**this question only**), value the following qualities of your glider by their order of importance to you:

(LEGEND -- 5 = Vitally Important; 4 = Significant, but Not Vital; 3 = Average Importance; 2 = Low On Scale; 1 = Not a Priority At All

Price _____	Set-Up Ease _____
Structural Integrity _____	Light Weight _____
Light Handling _____	Popularity _____
Quick Handling _____	Contest Successes _____
Mellow Handling _____	Uniqueness _____
Glide Performance _____	Innovative _____
Sink Performance _____	Delivery Time _____
Speed Range _____	Brand Name _____

5

DELIVERY PROCESS

How did you receive your glider? ☐IN TUBE, or ☐READY TO FLY
If **you** built from tube, was it... ☐EASY? ☐MODERATE? or ☐HARD?
Did the assembly from the tube require any tools? ☐YES ☐NO
Were all the disassembled parts included? ☐YES ☐NO
Did all the un-attached parts fit together well? ☐YES ☐NO
Was there a factory Test Flown By sticker? ☐YES ☐NO Was it initialed and dated by the factory test pilot? ☐YES ☐NO

DEALER DELIVERY EVALUATION

Rate the quality of your dealer's service (Use the standard scale in the legend in the upper right hand corner of this page.) _____ (1-5)
Did you get an Owner's Manual? ☐YES ☐NO Did you receive a glider Service Manual? ☐YES ☐NO Did you get any Spare Parts? ☐YES ☐NO
Did you receive a Rib Chart? ☐YES ☐NO
Did the dealer test fly the glider? ☐YES ☐NO Did he demonstrate set-up to you? ☐YES ☐NO Did he generally go over the glider and manual with you? ☐YES ☐NO Did the factory ask you to respond? ☐YES ☐NO Did you respond? ☐YES ☐NO Using the standard scale in the upper right hand legend, rate the factory's WORKMANSHIP _____ (1-5) and MATERIALS _____ (1-5).
How close is your dealer _____ (miles away)? Is it a full-time hang glider business? ☐YES ☐NO Does it use a storefront? ☐YES ☐NO How good is your dealer's stock of parts? _____ (1-5 standard rating) What is the average length of time to receive parts not usually stocked _____ (days)?

6

FIELD ASSEMBLY

How long, on the average, does it take you to set up your glider? _____
Do you have to have help? ☐YES ☐NO Number of persons needed to help? _____ (no.) Rate the set-up quality of your glider _____ (1-5).
How long to break it down? _____ (min.) Help needed? ☐YES ☐NO
Number of persons needed to help breakdown? _____ (no.) Rate the breakdown of your glider _____ (1-5 standard scale).

STANDARD SCALE LEGEND	
5 = Superior	3 = Average
4 = Good	2 = Fair
	1 = Poor

7

EASE OF USE

Rate the general, overall **quality** of flying your glider _____ (1-5). Now do the same for these various individual areas:

In Thermals _____ Maintaining Hands-Off Flight _____
In Ridge Lift _____ To Set Up/Maintain Approach _____
In Turns _____ To Flare _____
To Coordinate Turns _____ Generally, To Land _____
Pitch Trim _____ To Ground Handle _____
Roll Trim _____ To Lift (weight) _____

8

FLYING FACTORS

Using the standard scale in the upper right legend, rate your glider's ability in the following areas. Use your opinion derived from flying in the company of others and in being able to achieve what you wish.

Overall Strength _____ High Speed Stability _____
Light Handling _____ Low Speed Stability _____
Quick Handling _____ Handling at High Speeds _____
Mellow Handling _____ Handling at Low Speeds _____
Glide Performance _____ Straight Ahead Stall _____
Sink Performance _____ Turning Stall _____
Speed Range _____ Accelerated (Speed) Stall _____

Does your glider seem to "prefer" any particular site, or type of site? ☐YES ☐NO Please Comment: _____

9

MAINTENANCE REQUIRED

Ever had to repair your glider *from other than a crash*? ☐YES ☐NO Using the standard scale, rate the ease of maintenance _____ (1-5). Rate the ease of crash repairs, if any _____ (1-5). Did any parts fall off or break? ☐YES ☐NO Ribs bend easily? ☐YES ☐NO Are your downtubes ☐STRONGER, or ☐WEAKER than you expected, or ☐ABOUT LIKE EARLIER GLIDERS. Rate your glider's overall workmanship _____ (1-5). Was any wear noted early in your ownership? ☐YES ☐NO Please describe: _____

10

YOUR EQUIPMENT

Do you have or use:

Helmet ☐YES ☐NO Compass ☐YES ☐NO
Parachute ☐YES ☐NO Ballast ☐YES ☐NO
Variometer ☐YES ☐NO Two-way radio ☐YES ☐NO
Altimeter ☐YES ☐NO Strobelight ☐YES ☐NO
Airspeed Indicator ☐YES ☐NO 2nd Hang Strap ☐YES ☐NO

What strength is the karabiner you use? _____ (pounds)
What brand and model harness? _____
Special equipment or clothes used? _____

11

ADVERTISING RELIABILITY

Does the manufacturer of this glider advertise? ☐YES ☐NO Were the ads a factor in your knowing about and/or buying the glider? ☐YES ☐NO. Using the standard scale legend, rate the success of your manufacturer in being truthful about these areas of advertising message (No rating will signify that the ads did not address that particular area):

Delivery Time _____ Weight _____
Performance _____ Materials Quality _____
Handling _____ Workmanship _____
Set-up Ease _____ Overall _____

Other Comments: _____

CONCLUSION/SUMMARY

Using the standard scale, rate your glider overall _____ (1-5). Would you buy another glider from this manufacturer? ☐YES ☐NO If NO, please comment: _____

Would you recommend another pilot buy this glider? ☐YES ☐NO
Would you recommend another pilot buy from this factory? ☐YES ☐NO
Was the glider worth the Suggested Retail Price? ☐YES ☐NO
Was the glider worth the price you paid for it? ☐YES ☐NO
Can your glider be sold for use by a Novice pilot? ☐YES ☐NO
(*Refer to No. 8 -- FLYING FACTORS*) Comment on why your glider deserved the ratings you assigned. _____

What are your glider's BEST FEATURES: _____

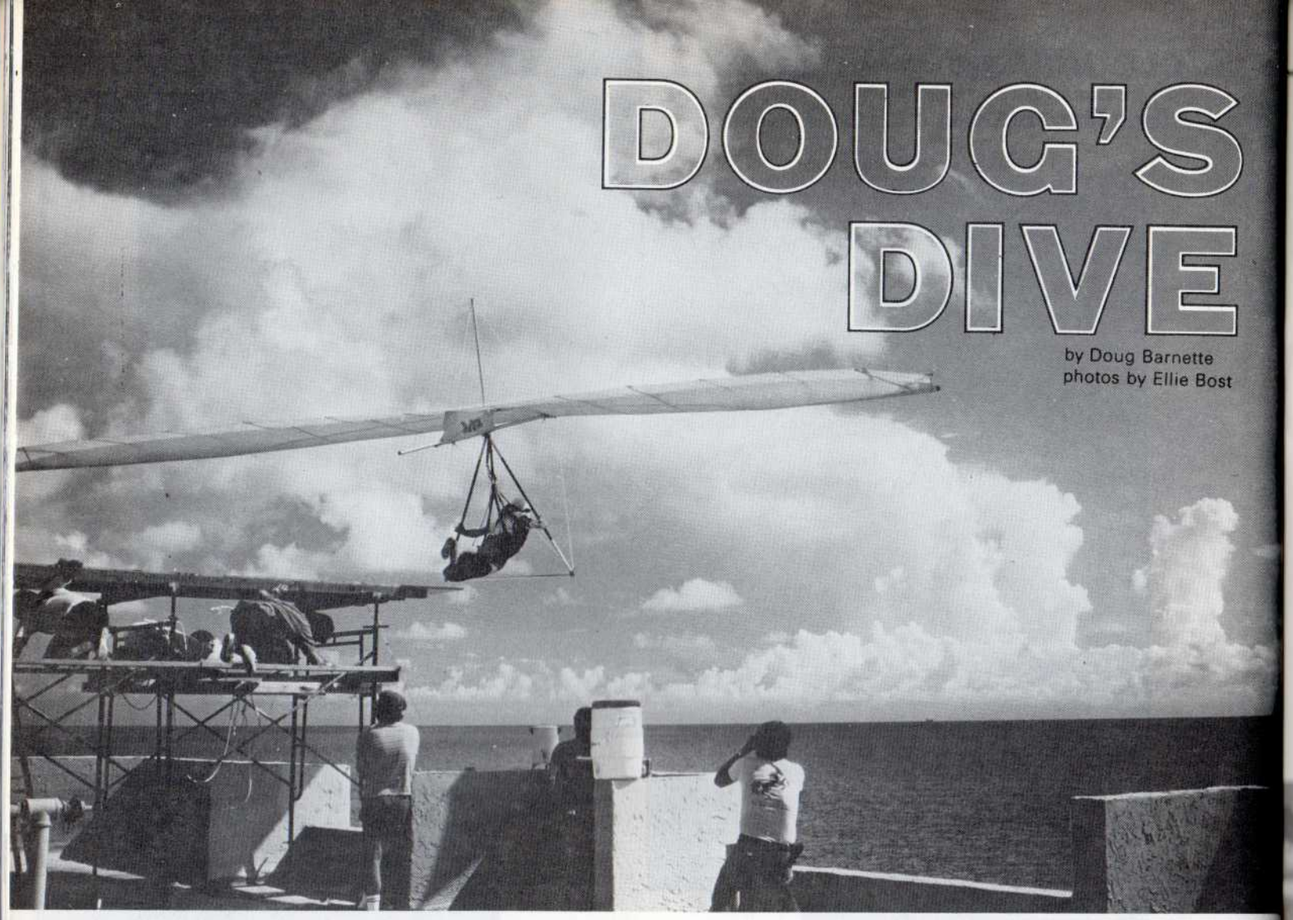
What are its WORST FEATURES: _____

Have you had any particular problems with your glider? ☐YES ☐NO
What are they: _____

Please make any additional comments you wish.

THANK YOU FOR RESPONDING!!

Send to:
P. O. Box 144, Lookout Mtn, TN 37350, Att'n: Survey



DOUG'S DIVE

by Doug Barnette
photos by Ellie Bost

Okay, I'll admit it. I was just about ready to ship my glider back home to Tennessee for permanent storage — at least until I could return there myself. After all, Miami, Florida is not exactly a hang glider pilot's paradise. Sure, there's any and every design of ultralight available for flying here, but I've already stated — I'm a hang glider pilot. And there's a difference. Give me those rocky mountain tops or grass-covered knolls.

I suppose when opportunity knocks, it really knocks hard! Ken Bruns, a Miami-based talent agent, rang me one afternoon to announce that one of his clients, Martini and Rossi of London (Bianco wine), would be arriving in Miami the next week to discuss a European television commercial featuring their product. The commercial was to include a hang gliding launch (real free-flight!) off the label of their wine bottle (to be stripped in, of course). He asked if I was interested in performing the stunt.

Indeed, the story-board displayed an eye-catching vision of run-off launches to portray smooth and exhilarating flight. During conversation with Clearwater Film Co.,Ltd., of London (the agency contracted to shoot the sequence) it became quickly evident the budget was $10,000.00 for this particular sequence in the commercial. It was up to me to actually "plan" the launches, arrange the construction of a proper launch pad, and contract a crew of launch assistants.

First thing on the agenda was a phone call to Pete Brock of Ultralite Products to order a custom-made bright yellow Comet sail. (It had to be yellow!) I don't think Pete could have made it any yellower. It was beautiful — and after several hours of laboring in the famous Miami sun, my original black sail came off the frame and was replaced with the 'commercial' version.

A 45 foot sand dune at Key Biscayne (located just next to the popular nude beach area) proved to be the perfect test flying site for my 'new' glider. First flight took me 156 yards. It flew as beautiful as it looked!

Two identical seven-story condominiums in Deerfield Beach (about an hour's drive from Miami) were contracted as the launching and filming facilities. A 12 foot high ramp was erected on one roof-top, along with a pulley system for safely hoisting the glider all the way up. The second condo, located just next door, was a perfect location for the film crew to set up the side (90°) shots. With the roof-top exactly 87 feet high, another camera was placed on the beach directly under the launch pad, (shooting vertical). The third crew strategically located themselves about 50 feet down the beach, to capture the flying and landing shots.

Assistants Steve Day, Easy Voorhees and David Dodge arrived on time at the scheduled 7:30 a.m. meeting. Ken Bruns' agency had arranged a catering service to keep us all supplied with breakfast, lunch, and all the liquid refreshments the steaming roof-top would require.

The glider was easily raised to the roof, and set-up began. While I changed into my flying clothes the agency provided, the three-man crew readied my glider for Condo Flight #1.

Getting the glider up on the launch ramp from the roof-top itself required skill and determination. The weather had cooperated thus far as a gentle 6-8 m.p.h. breeze swept in off the ocean. But even in winds that light, lifting a glider straight up (nose high) into the wind was very difficult!

Once accomplished, I hooked in, did a hang check, and psyched myself for my first condo launch.

Deerfield Beach is lined with condo after condo, so the pool and patio areas were becoming populated with eager sight-seers (hoping to see their first condo demolition). News of the happening had spread through the community since the day the condo manager had received payment for use of his facilities for a television commercial filming. And...how many hang gliding launches do you get to see in flat Florida?!

Radio communication between the three camera locations and the launch point were synchronized. It was critical that everyone be ready at the first instant on 'clear'. And with Easy on the keel, Dave on one wing and Steve on the other, we had to have time enough for them to duck out of the frame.

Steadying the glider in a nice 10-12 m.p.h. wind and feeling everything was just right — I went for it. Cameras rolling, I flew out over the ocean, did an 'S' turn and headed down the beach, landing in the white sand about a quarter of a mile away. By the time the applause had died down I had unhooked, and Easy, Steve and Dave were there for the break-down and the trip back up.

The film crew reported that they had not been able to get much of the initial takeoff because the cameras require several seconds to roll to full speed. Thanks for telling me *after* the launch.

We were ready again in practically no time, and lifted the ship back onto the construction. Wind had picked up to 15-18 m.p.h. by this time. With communications established at all points, I was off again, this time able to fly a bit further out, initiate a couple of quick turns and land beautifully, faced toward the cameras. They loved it! They didn't know you could do that in a hang glider!

Everyone was satisfied that we would be able to piece the film together in order to portray the story-board effect. We just needed to assure that Clearwater would return to London with more than enough footage.

After two more launches, with the last one being done in a 21 m.p.h. breeze, we decided to call it a day. The hard-working launch assistants received $180.00 each for their efforts. With smiles all around, we knew we all had participated in a worthy undertaking.

Schedules allowed us to skip the next three days, and film the remaining sequences on Friday. With only two assistants available for that day, Steve and David, we upped our meeting time to 7 a.m.

With all the experience gained on the first day, no one had to wonder what to do at any time. Coordination of the cameras and the launches were perfected. In between flights, they suggestd that we film 'simulated' procedures for close-ups. So by simulating the glider launch, I was able to show actual close-up flight maneuvers.

By early afternoon, it was all over. Three more run-off launches had been successfully completed, so the lab in London would have sufficient working material. Immediately after the final flight, the money was exchanged--to the tune of $1,800.00 for the actual launches themselves. Consultation, travel and glider time was paid with no questions asked.

An elaborate crew party was planned for Friday night in Coconut Grove as an additional means of thanking us for our cooperation.

Before leaving the States, the Clearwater folks called to verify that they were indeed happy with all phases of the performance, and were anxious to get the commercial ready for airing. Too bad it'll only be aired in European countries (M & R Bianco only sold in Europe).

So I'm glad I didn't ship that glider to Tennessee--the two days of 'condo flying' for a television commercial will remain a fond memory in my hang gliding career.§

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.

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616/882-5070
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SOUTHEAST MICHIGAN HANG GLIDERS
24851 Murray Drive
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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.

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14 Terp Road
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203/267-8980
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AIRWISE, INC.
15 Long Ridge Road
West Redding, CT 06896
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Quality lightwing products and services. Hang Gliding instruction novice to advanced by USHGA instructor/observer staff. Comprehensive ultralight training program (CFI-dual airtime/Pagen syllabus). Flight Designs, UP, Moyes, Pacific Windcraft, Pterodactyl, Goldwing.

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NORTHERN SUN
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St. Paul (Roseville), MN 55113

A-1 KETTLE MORAINE
Box A — 3rd Street
Palmyra, WI 53156

PRAIRIE NEWS AGENCY
2404 W. Hirsch
Chicago, IL 60622

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SOUTHERN AIR SPORTS
1101 "A" Power Blvd.
Reserve, LA 70084

LONESTAR HANG GLIDERS
2200 "C" S. Smithbarry Road
Arlington, TX 76013

AUSTIN AIR SPORTS
5508 Parkcrest
Austin, TX 78731

SKYDIVERS OF TEXAS, INC.
2553 Valley View Lane
Dallas, TX 75234

ULTRALIGHT POWER GLIDERS
Rt. 2, Box 523A
4810 County Rd. 85
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682 Calabasa Road
Watsonville, CA 95076

HANG GLIDER EQUIPMENT COMPANY
3620 Wawona
San Francisco, CA 94116

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1208-K E. Walnut Street
Santa Ana, CA 92701

FLIGHT REALITIES
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San Diego, CA 92116

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1208-H E. Walnut Street
Santa Ana, CA 92701

ELSINORE VALLEY HANG GLIDING CENTER
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Lake Elsinore, CA 92330

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Santa Monica, CA 90405

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Lake Elsinore, CA 92330

HANG FLIGHT SYSTEMS
1202-M East Walnut Street
Santa Ana, Ca 92701

WINDSPORTS INTERNATIONAL, INC.
5219 Sepulveda Blvd.
Van Nuys, CA 94538

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Ventura, CA 93001

HANG GLIDING EMPORIUM
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CANADA M1N-6J2

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CANADA J8Y-3S7

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St-Fulgence, Quebec
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1045 Rue Principale
St-Paul d' Abotsford, Quebec
CANADA J0E-1A0

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Write for more information.
See Classifieds elsewhere.

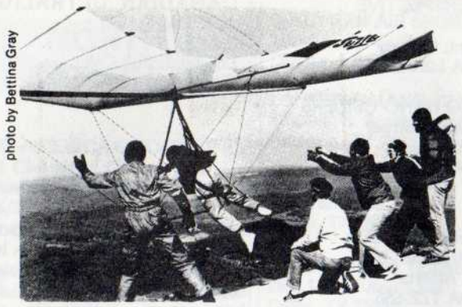

photo by Bettina Gray

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23,MXB

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22B, MXB

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29-31

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Gliders are available through Seedwings or our authorized dealers. Inquire at the Seedwing offices, phone 805/682-4250, M-F 9 to 6. All gliders have been flown and tuned by our best pilots, with less than a couple of months use. Excellent buys priced to sell.
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ProStar 160 25 hours, excellent condition, beautiful sail! $1400.00. Call 218/722-5412 or 722-1249.
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SPIRIT
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27, 28B

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27B, MXB/TFN

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RAVEN 229 — Excellent Condition. Very Clean Sail. **$600.00.** 218/724-2387.
28, 29

COMET — OLYPMUS
165 Comet, low airtime, $1200.00; Electry-flyer Oly 180, no rips, no dents, $500.00; UP knee hanger harness, $100.00; all good condition. 315/343-4600 after 7 p.m., ask for Flip.
29

EASTERN OREGON ULTRALIGHTS
Duck 180, Harrier II 177, Raven 209, SST 100 B, 224 Condor, C5B, Phoenix 6C, Phoenix 6D, Sun 3B, Spyder 168, **ALL PRICED TO SELL.** Harnesses new and used, accessories up the ying yang. Call or send $1 for postage to: Eastern Oregon Ultralights, 500 SW 11th, Pendleton, OR 97801. 503/276-2329.
29,30

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Comet 185, rainbow/black, $1400., perfect condition. Comet 185 sail only, yellow, new, $500. Makiki vario, new, small type, $55. ESS *RD* parachute, chest pack or hang glider, $285. Mainair flight deck, Ball vario, Thommens altimeter, $350. Contact Doug Barnette, P.O. Box 013635, Miami, FL 33101 — 305/326-1409.
29B

COMET
Comet 185, excellent condition, low airtime, $1300.00, Knoxville, Tenn., 615/573-6918.
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ULTRALIGHTS
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29,30

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Bennett Trike, Yamaha engine, good condition, $1100.00 or B.O., Knoxville, Tenn., 615/573-6918.
29

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ACT NOW!!
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PRODUCT LINES

CHATTANOOGA, TENN., — Right up front here, we've a couple items that should 'a made it in our "Industry News" pages near the beginning of the magazine. One good thing is . . . evidently, our effort to get hang gliding businesses, clubs, and event organizers to prepare news for possible use in the magazines has worked. For the first time since we began "Industry News," we had all hang glider news, and even overflowed. We view that as an upturn which can offset the negative overtones presented in the Publisher's Column. Another thing we're really pleased about is the fast and detailed responses to our First Annual Glider Owners Survey. By the time this is printed, we forecast right at 200 of you will have returned your Owner Response Forms. To do that within 5 weeks of *our* mailing date shows the interest in owner-derived information on equipment. We're only to glad to do it. Keep sending 'em in, there's another form in this issue, page 47. If you've already done it, bravo! but hand the form to a fellow pilot. Now, one bit worthy news which had no opportunity due to the soaring news, is from a new advertiser aiming at our readership who *are* considering ultralight flying. Perhaps **Ed Sweeney's** Hummingbird **Model 103** will prove to be superior in aero towing and other soaring oriented applications, but in any event, it's a new step up for the Nevada-based ultralight builder. Many of you know **Gemini Int'l** as they supplied a pretty viable power system for flex wings in their twin-engined, strap-to-the-control-bar, fuel-in-the-structural-frame-tubes system. Many pilots in flatland areas utilized the configuration with much better results than the Soarmaster PP-106 hardware. Now, Sweeney's company has all strutted, substantially faired "conventional ultralight" which not only carries Ed's attention to fine craftsmanship but may be clean and high lifty enough to be legitimately soared, engines-off. The 103's more powerful engines lend credence to its airtug potential. Check his literature out and see whatcha think (ad, pg 13). In a step closer to flex wings, LEAF has fitted their **LEAF Trike** with the top brands, including UP's Comet and Gemini models, as well as Wills' Harrier and Duck (which their news release humorously spelled Horrier and Dack). We gave you some info on LEAF's entry in the Sep/Oct 82 *Whole Air* after viewing it at Oshkosh. Judging from the newest photos, no major changes have occurred. LEAF uses the Bennett/Soarmaster Hiem Joint (which permits yaw action), and six inch long keel mount bracket (they warn to inner sleeve your keel first). Powered by a Cuyuna 430 with 48" to 54" prop, it ought'a climb and nearly straight up. Super fiber BMX wheels will give it rough field capability and a foot throttle again likens it to Bennett/Soarmaster, simplifying fold-down a bit. **Willi Muller**, Canada's ranking distance X-C pilot, sent a late breaking meet release for the **Eleventh** (yep, 11 times now) **Annual Cochrane Meet** slated for June 18 & 19 in Cochrane, Alberta. Two level tasks will be *either* target landing *or* cross country, we assume to give various proficiency pilots the crack at trophies, tho pilots are allowed to enter either contest. Get more poop by calling Willi at Muller Kites, 403/250-2343 or 932-2759, or drop 'em a line at 5-1303-44th Av NE, Calgary, Alta, T2E-6L5 CANADA. As we're kinda meandering around in this "Product Lines," let's go to some news from **AOPA**, parent of the AOPA Ultralight Division. Their 265,000 members make them (by far) the largest pilot organization in the world, so their news is generally aimed at GenAv (general aviation) pilots. This means we frequently have to "bump" GenAv news for items that are "closer to home." But especially as we've got home-side statistics (see "Accidents 82", pgs 14 & 15, and "Stats," pg 18), we thought you could be interested with some related numbers. First off, AOPA's membership grew slightly in 1982, a promising sign. AOPA President, John Baker comments, "Although fewer people are starting to learn to fly (GenAv aircraft that is), the completion rate (on Private Pilot licenses) is up 14.1% over the previous year. While he did not give figures for '80 and earlier, the trend is still newsworthy. Too bad hang gliding cannot yet get a grip on these kind of statistics, so we might discover more and better ways of enlarging our organization. But thanks to **Doug Hildreath's** good work, we *do* know fatalities are at their lowest level *ever* since recordkeeping began in 1974. Meanwhile, back in conventional aviation, AOPA again reports the scheduled airliner death toll in 1982 was the 3rd worst of the decade, yet the accident rate was up only slightly. GenAv (as opposed to air carriers) accidents were down 11% from 1981 — to 3,276 incidents of which 574 were fatal, with the death toll reaching 1164. In hang gliding (again, refer to pgs 14 & 15) the fatality rate was down from 21 to 12, a **43% decrease**. *Reported* injuries dropped from 133 to 79, a decrease of 41%. All this is most encouraging news for our fine-feathered sport, but we *don't* know as GenAv *does* know, if *all* accidents/injuries/fatalities are being reported, It being not mandatory (the reverse of GenAv) to report, our statistics can't have the same "confidence rating." It'll take each one of you to see to this effort, unpleasant as it may be, especially if a friend is involved. But only by knowledge and education can we continue on our ever-improving path of less accidents. A zero death goal is certainly something to strive for, even if numerical odds say it's not likely. Now, on a lighter note, **Uncle Bill** (Bennett) has announced a **photo contest**. Yep, you snap the right shot, and you can have you choice of a variometer (value $200!!) or a set of FM radios (value $160!). Here's how it works: You take the photo. Use *only* Kodachrome 25 or 64, slide film. Keep the camera in a horizontal format, as the chosen photo will appear in the centerspread position. Send the photo *NOT* to Delta Wing, but to *Whole Air* (address on cover), to the attention of PHOTO. *Whole Air* editors will pick thru 'em all, select the six best, and pipe 'em to Uncle Bill for his final pick. Of course, we'll credit you if you win, so also give us the location, pilot's name, model (it'll have to be a Bennett brand, obviously) and other pertinent information. Happy snapping! Still at Delta Wing, we feel energy that reminds us of 1976, 77 at Bennett's Place, as their Streak really seems to be grabbing new buyers. It's great to see an old survivor like Bill doing so well again. He's tenaciously hung on thru some lean times. Of the twelve USA manufacturers, Delta Wing is re-assuming a Big Three posture once again. They are also getting ready, not only with a large Streak (37' span), but (listen, girls) a baby Streak 130. Marketing Director, **Luigi Chiarani** will be conducting some Delta Wing demo days after an appearance at EAA Sun 'N Fun, March 12-19 in Florida. We assume they'll show their *low rider trike* there — we saw it and think it's a nifty configuration in triking. Nearby in Santa Barbara, Bob Trampenau's **Seedwings** is enjoying good enough times to be planning to add a new facility to their existing one. Bob is hunting something nearby as 510 sales are squeezing them out of their Castillo shop. They'll keep it too, tho. Meanwhile the Sensor is really showing its colors in new four color advertising appearing in both *Whole Air* and *Hang Gliding* mags. Congrats, Bob! Down at **UP** near Elsinore, things are crackin' along, too. First, as this is written, its Valentine's Day, Feb 14th, and UP should be attracting a mess of dealers — in town attending the Wills dealer seminar — to witness an Arrow towing demonstration. *Whole Air* will have Tom Phillips of our Towing Section there, so we'll tell ya more in "Towing, Part II." **Roy Haggard** spoke to us recently and is *very* excited about its tow characteristics. When asked about any problems or negatives he could see, he summarized by exclaiming, "Heck no, it's a piece of cake!" All UP's effort has certainly not been just on the Arrow though, as they are ready to release their long-awaited Comet 2 (different the OVR-2). They feel its handling is now, ". . . probably better than most, if not all, single surface gliders . . ." And performing at least as good as 1982 OVR-2's. They've only some final detail work on the 165 — some very slick new hardware is in the works we understand — and then they'll be applying all changes to the 185, and eventually the 135. Prices are up (as are *all* majors) to $200-300 more than the 1982 OVR-2's, except you can save 100 bucks if you order quick enough to get one of the first 100 units. Except that it will now be a Gemini M (mylar only), their popular intermediate will have no major changes. One way to afford any new glider you want is to fly 200 miles this year in a *production* UP glider. There are other details to check, but you pick up a cool $5,000 from UP if you can do so. **Wills dealers** are winging back home right now, and by the time you read this, they'll be back in the shop and doing smarter business than ever. Wills just held its 3rd West Coast Seminar with excellent attendance. They covered many aspects of running a diver biz, and we heartily endorse this effort as the industry really needs to shift into a higher gear. Doing so knowingly ain't easy (as most dealers will quickly agree). While Ducks (140 now, too) and Harrier II's continue well for Wills, they've been keeping the sewing machines warm by adding new harnesses, and now, a flight suit (see ad pg 12). Their demo day program (which they began in the industry) is once again preparing for a thorough tour. We'll have more word on this as soon as the schedule is ready. Up coast at **Flight Designs**, a similar thing is happening. New gear bags, new harnesses (see ad pg 26), new competition fairings and a two-seat JetWing trike (see news pg 14). All these things *augment* their glider line, and this seems trend-y these days. But FD is also ready with their new Shadow now. We have more planned on this in an upcoming issue. As we close we again want to stress that we need to rekindle growth in our sport. Refer to the comments in several places in this issue, by several different folks with different perspectives. The time is now, fellow pilots. Development is more difficult now than it has ever been, and new entrants are needed to fuel the research for better and better gliders and gear. **Do your part!** Got news or opinions? Send 'em to Product Lines, Box 144, Lookout Mtn. TN, 37350.