WHOLE AIR MAGAZINE
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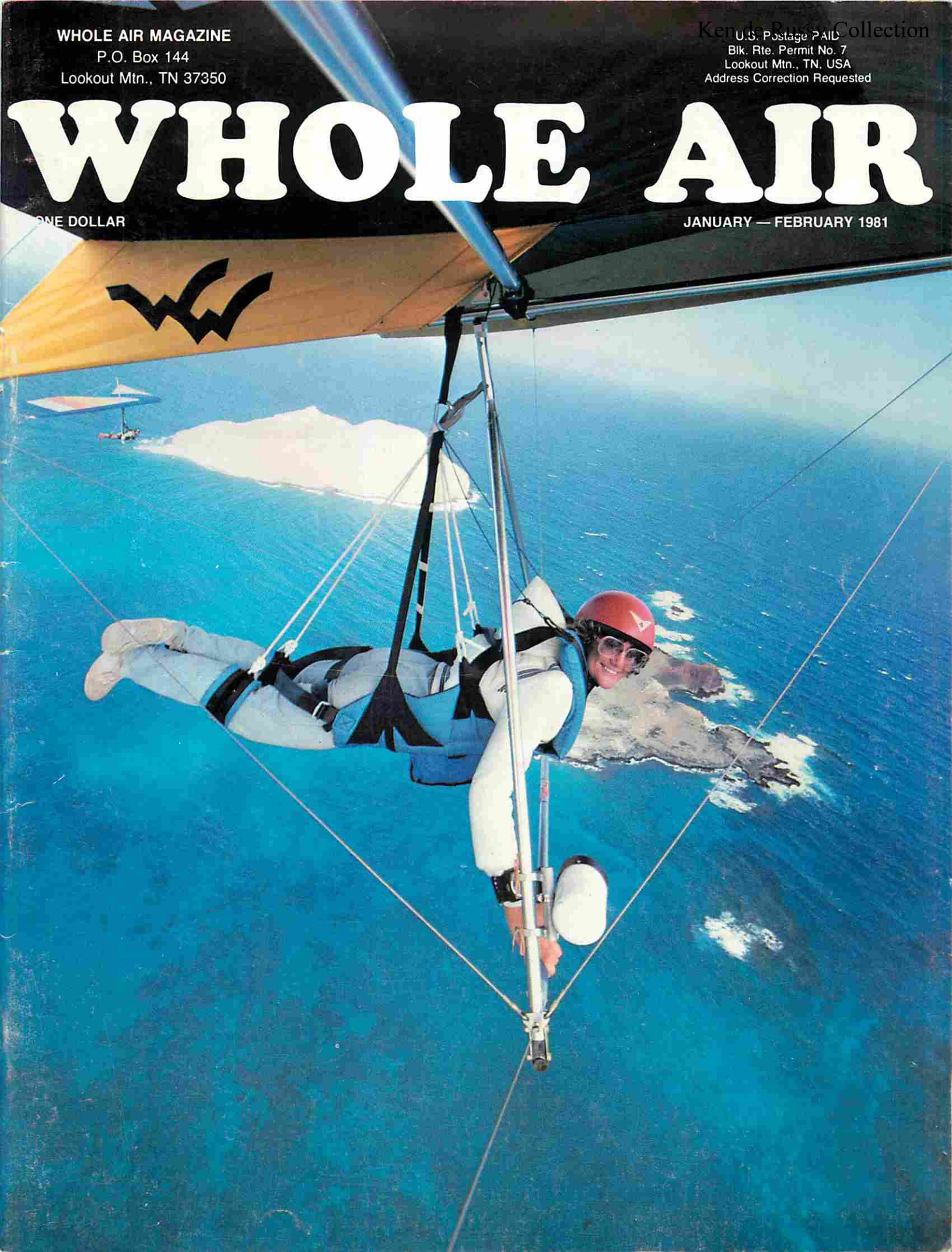
WHOLE AIR

ONE DOLLAR

JANUARY — FEBRUARY 1981



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Choose our "Quicksilver," designed by Eipper eight years ago and still the world's most popular microlight, the "Seaquick," which turns lakes and rivers into runways, or "Doublequick," the ultimate in twin-engine power and performance. Every Eipper gives you all the advanced technology, rugged dependability and special features — like our "Variable C.G." flight control system and tricycle-tail landing gear system — that make flying easy and set us above the rest. A pre-manufactured bolt-together kit, each Eipper has a sturdy anodized tubular aluminum airframe, pre-finished stabilized dacron flight surfaces, double-swaged aircraft cabling throughout, adjustable kingpost tensioning system, forgiving landing gear system and dependable, gas-sipping powerplant. The Eipper name means distinction in original design, integrity and leadership in the microlight industry.

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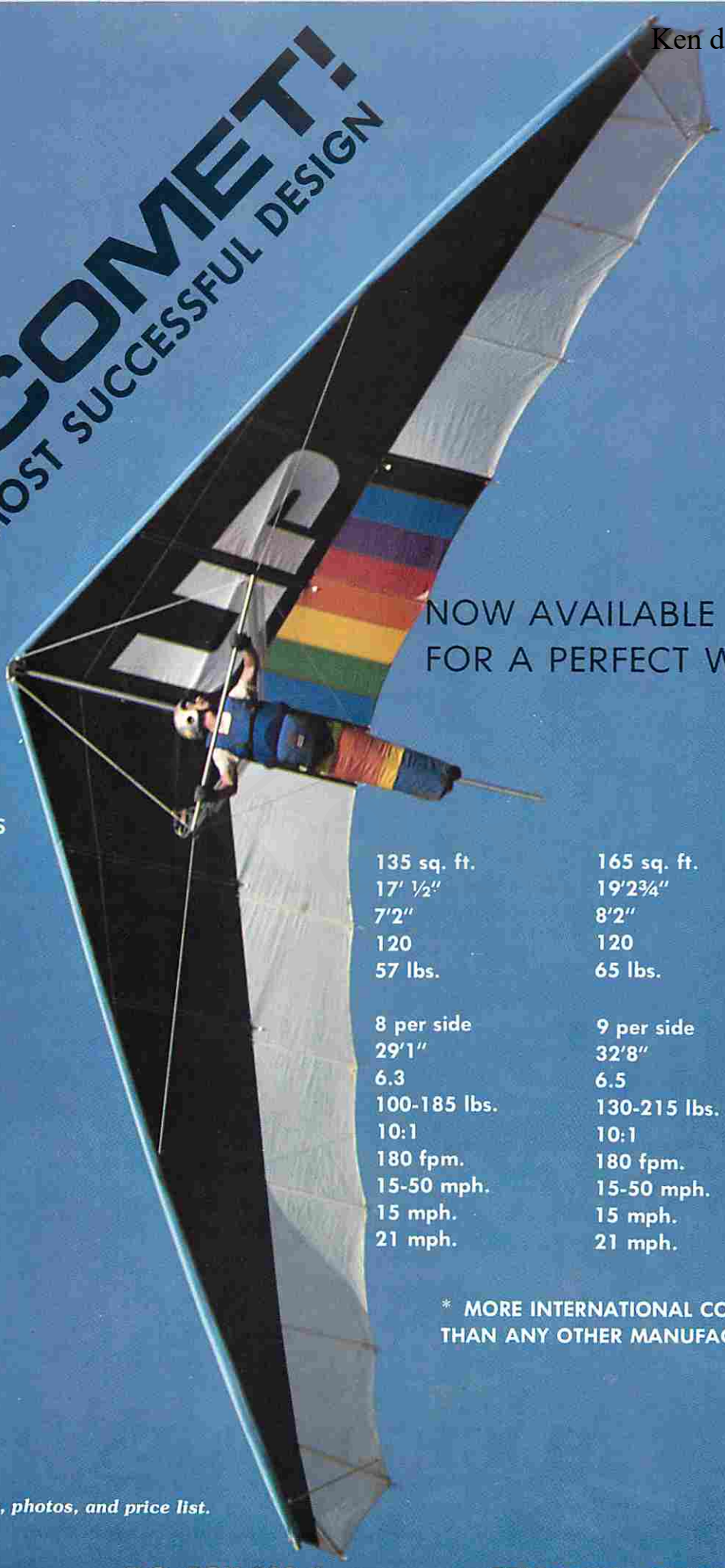

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1981 SPECIFICATIONS	135 sq. ft.	165 sq. ft.	185 sq. ft.
Area:	135 sq. ft.	165 sq. ft.	185 sq. ft.
Leading Edge:	17′ ½″	19′2¾″	20′4¾″
Keel:	7′2″	8′2″	8′7″
Nose Angle:	120	120	120
Glider Weight:	57 lbs.	65 lbs.	78 lbs.
Battens (Composite tubular):	8 per side	9 per side	9 per side
Wing Span:	29′1″	32′8″	34′8″
Aspect Ratio:	6.3	6.5	6.6
Pilot Wt. Range:	100-185 lbs.	130-215 lbs.	150-250 lbs.
Glide Ratio	10:1	10:1	10:1
Minimum Sink:	180 fpm.	180 fpm.	180 fpm.
Speed Range:	15-50 mph.	15-50 mph.	15-50 mph.
Stall Speed:	15 mph.	15 mph.	15 mph.
Maximum L/D Speed:	21 mph.	21 mph.	21 mph.

* MORE INTERNATIONAL COMPETITION SUCCESSES THAN ANY OTHER MANUFACTURED.

Send $2.00 for more specs, photos, and price list.

U.P., INC. P.O. BOX 582-6 TEMECULA, CALIFORNIA 92390

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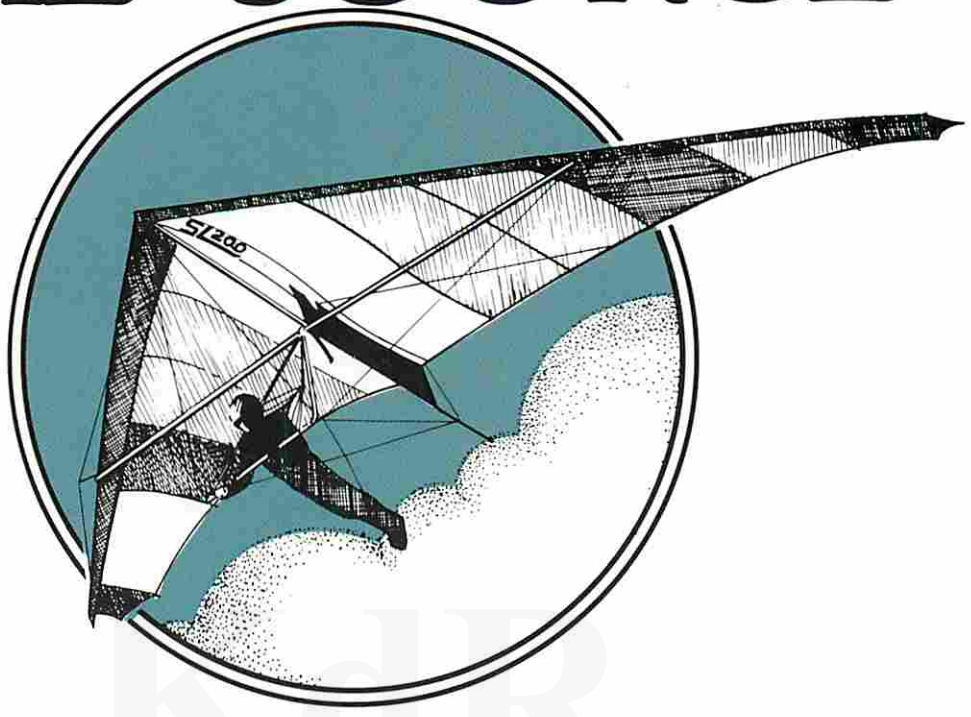


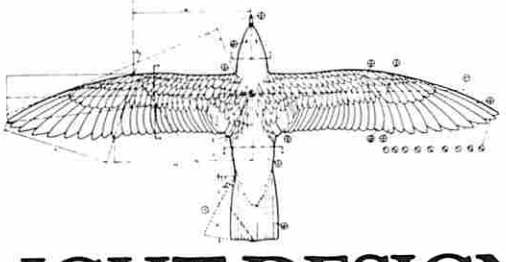
The Source
A source is a place you can count on as a reliable center for products, information and services. At Flight Designs, we've taken some unique strides in the ever-expanding business of hang gliding so we can offer the best of services to the recreational aviation consumer.

The Clearinghouse Approach
Our basic concept of operation is to provide the hang gliding community with a consistent and reliable source for new developments and the best available values in gliders, instruments and accessories, whether manufactured in-house or distributed by us.

New Ideas, New Products, New Technology
Affordable recreational aviation is what hang gliding is all about; technology catches up with the Wright Brothers. We're in touch with hang gliding's future, and we plan to be an integral part of that growth, today and tomorrow.

The Bottom Line
Our policy of maximizing the price to performance ratio in all our products so we can offer the consumer true value for their dollar has always been and will continue to be the bottom line at Flight Designs.

The Proof is in the Performance.



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Flight Designs delivers the goods. We're jam-packed with the stuff you want at bottom line prices!

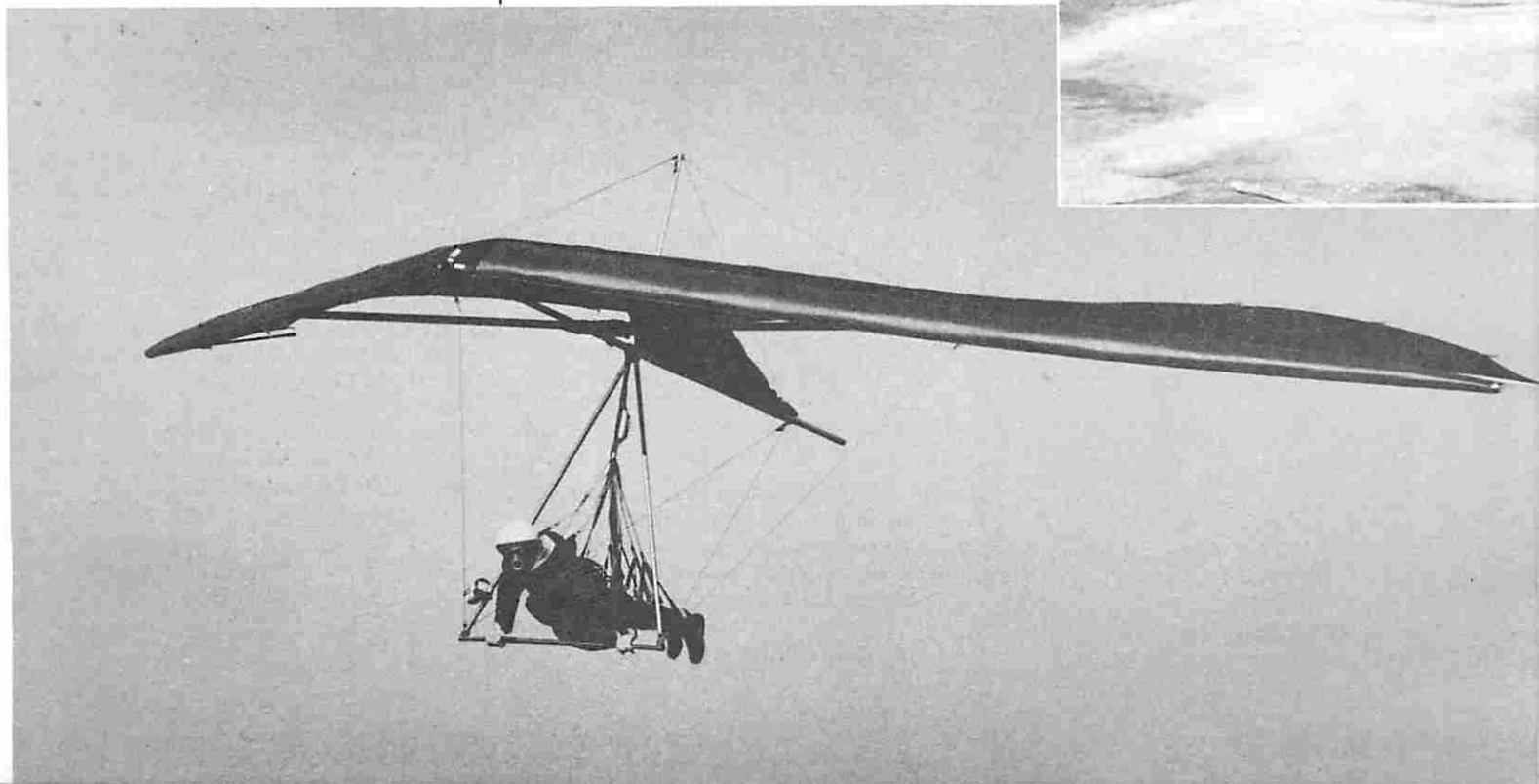
WHOLE AIR

ISSUE NO. 17 VOLUME 4, NO. 1, 1981

PILOT'S PERSPECTIVE

ULTRA LIGHT TOPICS

FEATURES



Volume 4, No. 1, 1981

ISSUE NO. 17

Publisher
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Idea•Graphics

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Advisory Panel
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Chuck Slusarczyk
Roy Haggard
J. C. Brown
John Lasko
Tom Price

ON THE COVER:
Another beautiful LeRoy Grannis cover photo! This one shows Lani Akiona flying high over Rabbit Island, Hawaii. Lani also contributed a very nice flying sites article, this issue . . . it starts on page 28.

Publisher's Column

Welcome with us in 1981. As **Whole Air** nears the end of our third year of publishing, we are proud to set some new standards for our selves which will benefit you, the ultralight consumer.

We have a new look overall, which you need to inspect to appreciate, thanks largely to Editor Starr Tays and Art Director Regena Wehunt. It coordinates with **Whole Air** on our cover, as we leave "WAM" behind with other fond memories of years gone by.

Very noticeable is more high quality color for your viewing pleasure, as **Whole Air** now wraps itself in eight pages of bright photography. Our solid supporting advertisers have seen the appeal of eye-grabbing messages. These pages are more costly, of course, and that in itself tells you a couple of things.

First, the "color companies" are succeeding, proving **their** quality in a highly competitive business. Secondly, as communication through **Whole Air** can justify more expensive displays, more of our inside pages can be released for editorial content. Very simply, this means more and longer articles, something you loyal readers have requested. We are here in 1981 to deliver on those wishes. Thanks to Eipper, U. P., Flight Designs, USHGA, Bennett and Wills.

It is common in many publications for advertising to absorb 50 to 75 percent of all space, leaving a paltry 25-50 percent for the articles and photos you pay for. In the 1981 **Whole Air,** we are producing nearly 60 percent editorial content, an unprecedented amount. This has been a long term goal and we are very happy that enough readers and advertisers alike have helped make this a reality. Keep your suggestions and support coming.

Our expansion of material continues in all three important modes of flight—foot launch, towing and ultralight power. We know all of you do not necessarily care for all three modes, but tolerance of another pilot's desires is mandatory if we are all to share the sky in our ultraslow craft, for surely it **is** true that we have low speed aerodynamics in common. The whole ultraslow phenomenon is making deep inroads into "conventional aviation."

Go purchase a current (February '81) copy of Private Pilot magazine and see what they have written. Or write the E. A. A. and check out their new Ultralight Division. Notice the activity within the F. A. A. regarding our air movements. The list goes on, but the fact remains, ultralighting may be the aviation of the 80's.

We at **Whole Air** love what we do, and we hope it shows in the pages that follow. Nevertheless our guiding light has always been constructive criticism from our readers, and we want that to continue. Send us both your subscriptions and suggestions—we could not be more interested . . . in **you.**

Thanks,
Dan Johnson

Hang Gliding Safari in magnificent Switzerland

Where the launch sites (up to 12,000 ft MSL) are easily accessible via superb system of mountain cable cars. The ultimate in mountain flying and convenience. Cross-country flights over spectacular scenery. Switzerlands No. 1 pilot and instructor, Walter Schoenauer, will provide you with a step by step introduction to the most challenging and exciting flying sites in the Alps.

US$ 2330.00 per person (land only)* for 14 days Hang Gliding adventure includes:

- For expert pilots seeking the ultimate in adventure and convenience (six per Safari).
- Transfer from airport to hotel and flying sites plus return to airport.
- Mountain transportation.
- Total service from landing to launch (the flying is up to you).
- 13 nights plus breakfast in modern hotels offering all the amenities expected.
- Personalized introduction to High Alpine flying and weather.
- Movies.

*Roundtrip airfares from NYC between US$ 500.00 and US$ 700.00 and subject to change at any time. Check with your local travel agent for fares from your home city and be sure to ask about APEX fares.

Safaris planned for 1981

• June	20 to July	4
• July	18 to July	31
• August	15 to August	28
• Sept.	13 to Sept.	25
• Oct.	3 to Oct.	16

Design: Heller + Steinhard, Zür

Airmail

Clip and Airmail to:
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Kurfirstenstr. 61
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Switzerland

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FORUM

Dear Editor:

As an avid reader of your publication, I would like to commend you on your dedication to the exchange of information concerning our sport. To further this ideal, please allow me to comment on a few subjects that appeared in the Nov./Dec. issue.

First, I would like to add a bit to Mike Meier's well-thought-out response to the question regarding harness adjustment posed by Bill Walter of Asheville, NC. Mike states that all his experience is with stirrup harnesses and this experience leads him to recommend that a pilot remain standing during the entire launch sequence. I agree with this method for a stirrup harness (I cringe every time an intermediate pilot fishes for his/her stirrup in the rolling air near launch). However, for a knee-hanger harness I recommend getting prone as soon as possible. This is because a knee hanger harness holds the pilot higher in the bar than does a stirrup harness when the pilot is standing. Consequently, roll authority (and stability) is decreased. As an example of this latter point, I have flown somewhat sensitive gliders standing up in my knee-hanger harness and had a hard time keeping the craft from rolling unintentionally. This is an undesirable tendency close to the ground during launch or landing. For the same reasons, I recommend a stirrup harness for pilots serious about spot landing. I fly a knee-hanger harness for the advantages on launch (I don't have to worry about the stirrup). With a little practice a pilot can learn to lie prone while keeping the hands on the down tubes (uprights) and still controlling very well. For a discussion of proper harness adjustment, see Page 87 of my book, *Hang Gliding for Advanced Pilots.*

Another question by Bill Walter concerns the "filled sail technique" of launching. This method consists of letting the sail fill or billow before the launch run is begun. This results in an easy, efficient take-off. The "filled sail technique" works best in light, thermaly conditions with a steep launch and forgiving glider. It is the standard technique in much of the western U.S. However, in stronger winds with accompanying turbulence, I recommend a fairly low angle, a good hard run and of attack (just slightly positive), a good hard run and plenty of airspeed until safely away from the ground or trees. This latter technique is most appropriate for the majority of Eastern sites in soaring conditions.

Cal Tax of Miami asks if a hang loop will test full strength if it's looped together in a chain type arrangement with another loop. The answer is an emphatic no. This has been tested in depth by climbing and parachuting enthusiasts. As I have written in depth in the past, knots and hitches in a hang strap will weaken it. The only solution is to use a strap of an appropriate length or Purlon rope. The knots tied in the rope should be a double grapevine.

Finally, I'd like to correct a point in Dan's report on the UP Comet. In two places Dan mentions a lag in roll response at slow speed due to the lower side wires loosening up. Since the wings are still supporting the same weight regardless of the glider's angle of attack or speed, the side wires cannot become looser. In fact, if anything, they get tighter since the tips load up more at slow speeds. The cause of the lag in roll response at low speeds is a classic case of adverse yaw. This inescapable aerodynamic factor is to be expected in a wide-nosed, stiff sailed, deflexorless design (bowing up of the leading edges promotes yaw). In my estimation, the Comet has amazingly good slow speed handling considering the above design parameters.

Sincerely,
Dennis Pagen,,
State College, PA

Response from
Dan Johnson:

While I appreciate Dennis' very constructive criticism, and agree his argument is valid, it is also inescapable that the control bar "clunks" loosely at lower speeds. How does this occur if not due to the lower wire looseness?

Dear Editor:

GLA, Inc., of 841 Winslow Court, Muskegon, Michigan, 49441, announces the completion of its research and development program in several areas of the evolvement of its Minibat sailplane, which is available in kit form.

The most notable accomplishments to date include the development and testing of the Minibat learn-to-fly program, which includes a tripod mount for flight school type simulation training with the Minibat. Additionally, the interchangeable wing tip extension panels have been successfully flight tested. The four-foot extension panels increase L/D to 30:1, with no additional control surfaces required.

Flight testing of the sustainer engine is nearly complete.

Additional information can be secured by contacting the company.

Dear Editor:

It's not often that we, the consumer, have the opportunity to report that a distributing network is doing fine. On approximately September 26, I forwarded to Wills Wing my visual component of my Colver variometer. On October 6, which is less than 10 days, by UPS collect, I received a brand new Colver visual component with a billing including shipping and C.O.D. costs of $30. I am truly amazed at the response time and the very inexpensive billing. A mighty cheer for the people at Wills Wing and Colver.

Yours,
Richard A. Cassetta
President,
Pilot's Supply, Inc.

Dear Editor:

Flight Designs would like to publicly announce the addition of Thierry Guignard to their 1981 staff.

An Electro-Mechanical Engineer originally from Lausanne, Switzerland, Thierry moved to California in 1979 and began development of a fully computerized testing vehicle. Thierry still holds the unofficial altitude gain world record, under tow, with 5,700 feet.

Thierry Guignard's experience in towing and in the powered field will be a great asset to Flight Design's 1981 program.

His primary assignment will be to certify Flight Designs' new line of Gliders for 1981 along with some design work on power related equipment.

Congratulations to Thierry Guignard and to Flight Designs' new Marketing Director, Jean-Michel Bernasconi!

PULL TEST OF FLIGHT DESIGNS' NEW HANG GLIDER HARNESS:

Performed by:
G.O. Security Parachutes, Inc.
San Leandro, CA
Report No. 0330-3
Issued: 25 Nov. 1980
Page No. 1

TEST NO. 1—Shear test on leg straps where they are sewn to the double thickness of para-pak with single X box formation.

Test Method: Straight pull.

(A). Pulled to 200 lbs. (Result no-damage.)

(B). Pulled to 300 lbs. (Result no-damage.)

(C). Pulled to 550 lbs.. (Result no-damage.)

(D). Pulled to 650 lbs. (Result some stitch damage.)

(E). Pulled to 950 lbs. (Result para-pak torn.)

Dear Editor:

Here's some information from the Owens Valley for your Products Lines and Calendar sections:

The competition scene in the Owens Valley looks like this for 1981:

June 20-28—The third annual X-C Open (for all foot launched gliders some spots still open).

June 29-July 3—The second annual X-C Qualifier the 5 longest Class 1 flights over a closed 68 km/42 sm course will qualify for the 1981 Classic.

July 4-12—The fourth annual X-C Classic (foreign prospects please coordinate through a national representative.)

The Cerro Gordo Cup—7 continuous days between July 13 and August 2. (Exact week to be determined by the competitors.)
This contest will be for the world's 10 best cross-country hang glider pilots based on the current holders of the official and unofficial, class 1, 2, and experimental world's record plus the top pilots from the 1981 X-C Open and Classic. The single longest flight for the week will hold the Cup until the next year. The pilot with the most miles for the week will receive a suitable trophy.

We are forming the Owens Valley Hang Gliding Center to serve the needs of all pilots wishing the fly the Owens. The Center can provide all necessary ground support, including transportation and retrieval, advanced instruction, record documentation, barographs, radios, oxygen, local wind dummies and arrange accommodations. We are also dealers for most major glider manufacturers, including UP, Wills Wing and Manta.

For further information and prices on any of the above, please contact:

Don Partridge,
Star Route 4, Box 3A,
Bishop, CA 93514
(714) 873-4434

Goldwing Ltd. is pleased to announce the addition of Reklai Salazar to their management team. Salazar will work in the capacity of General Manager at the new Goldwing factory, located at Amador County Airport, Jackson, California.

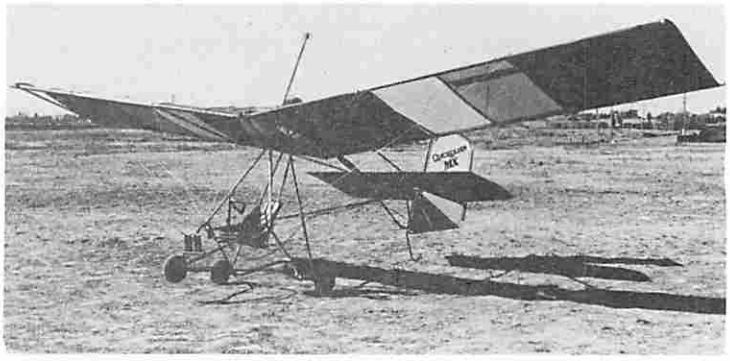
Twenty-eight-year-old Salazar has been flying ultralights for 8 years, and has logged well over a thousand hours in powered and non-powered ultra-lights. He had been a hang gliding instructor and dealer for several years when he joined the powered ultralight industry in its formative stages, became Vice-President of Weedhopper of Utah Inc., and then recently became an independent consultant to the microlight industry.

Designer of the Goldwing, Craig Catto, offered this comment: "Very few people in the world have the ultralight experience, both in the field *and* in manufacturing, that Reklai has. Goldwing will benefit greatly by his progressive management ideas and his focus and concern for customer service."

Goldwing Ltd. began production of their powered ultralight kit on October 1, 1980, and offers the growing ultralight market a state-of-the-art, composite structured, high-performance flying machine.

REKLAI SALAZAR

FORUM



NEW "QUICKSILVER MX" BY EIPPER OFFERS FULL THREE-AXIS CONTROL

San Marcos, Calif.—The new Quicksilver MX microlight aircraft by Eipper-formance, Inc., of San Marcos, Calif., combines the exciting flight characteristics of the company's world famous Quicksilver microlight with conventional three-axis aircraft style flight controls.

Pitch and yaw control are achieved with control rods running to the elevator and rudder surfaces and linked to a yoke-mounted control wheel-stick combination. Roll control is achieved by wing-mounted spoilerons activated by foot pedals. The spoilerons may be used independently for quick roll rate or simultaneously to create steep descents at low airspeeds or to make precision landings.

The Quicksilver MX Multi-Axis control system has been extensively flight tested by Eipper-formance staff and by an independent aeronautical engineering firm to ensure safety, ease of operation, dependability and low maintenance. The system is a proven one.

"The Quicksilver MX was designed to answer the thousands of inquiries from pilots who want the economy and ease of flying that our microlights offer, but who prefer standard aircraft controls over the weight-shift system used in the basic Quicksilver," Eipper-formance president Lyle Byrum said. "The MX offers a new dimension of flying excitement without compromises."

The aircraft is sold as a complete bolt-together kit that assembles easily over a week-end with just simple hand tools. No welding or other difficult tasks are required and, since all parts are individually identified and a comprehensive owner's construction/flight manual is provided, assembly is error-free.

All flight surfaces are made of colorful stabilized dacron sail cloth. All sewing and reinforcing are done at the factory, so all the builder needs to do is slip the flight surfaces into place.

The Quicksilver MX features a sturdy padded pilot's seat,, an airframe of aircraft grade anodized aluminum and chrome-moly tubing for strength and durability and stainless steel, double-swaged structural and control cables that are coated with weather resistant white vinyl plastic.

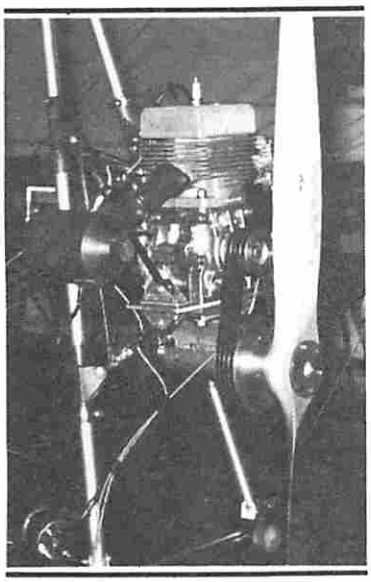
Power is supplied by an economical Yamaha 15 h.p. engine that turns a 48-inch hardwood propeller. Also available is the Doublequick MX, which utilizes a twin-cylinder 28-h.p. independent dual-ignition powerpack that gets the airplane to altitude quickly and quietly. A sleek tricycle landing gear makes landings and ground handling easy.

For more information contact local Eipper-formance dealers or: Eipper-formance, Inc., Suite "I" 1046 Commerce, San Marcos, CA 92069 (714) 744-1514.

GET MOTORVATED... WITH A CGS POWERHAWK!

The dates were October 25 and 26, 1980. The event was the Blue Stratos World Invitation Powered Ultralight Championships. They claimed the largest paid attendance and the largest purse paid to competitors in any ultralight competition. The color of the day was green. Green with envy.

Competitors included some of the top names in hang gliding, a variety of aircraft and powerplants and one lone Easy Riser with a little ... motorvation ... a CGS POWERHAWK!



Everyone started out on an equal basis, but it rapidly became apparent that the Riser had a distinct advantage. Owner and pilot, Terry Presley had wisely chosen the CGS POWERHAWK 150 as the driving force to put him in front and keep him there. Whether it was fuel economy, speed or rate of climb, the CGS POWERHAWK powered Riser was the obvious leader.

That's not the beginning. This has been going on for quite a while. Ask Gary Ingram, Tullahoma Grand Champion, or Terry Fuller with Best Ultralight at Marion, Ohio. They know all about the high static and dynamic thrust that will get that Riser or Mitchell Wing or Fledge into the air fast. For more information, send $5.00 to CGS AVIATION.

Get Motorvated! Get the CGS POWERHAWK and be Number One!

CGSAVIATION 4252 PEARL RD., CLEVELAND OH. 44109 • (216) 398-5272

COMING NEXT ISSUE

In the March-April WHOLE AIR Magazine

"Hang Glider or Ultralight?" A complete evaluation of Trike units for powering a hang glider . . . with opinions from many well-known names in the industry.

Dual Interview American and Canadian National Champions, Tom Haddon and Michel Tremblay

"Aero Medical Factors in Hang Gliding." Pocket thermals and other phenomenon.

More Flying Sites

Don't miss the March-April WHOLE AIR

Subscribe Today!

Order form on page 54 or use free Reader Card.

FORUM

Dear Editor:
GOLDWING BEGINS PRODUCTION

Brian Glenn, President of Goldwing, Ltd., announces production has begun of Goldwing ultralight aircraft kits.

Designed by Craig Catto, one of the earliest pioneers in the modern revival of powered ultralight aircraft, the Goldwing uses conventional 3-axis controls in an unconventional configuration. Design features include foam/fiberglass composite construction, a main and a canard wing, ailerons and spoilers, and winglets with split rudders. Because the goldwing is capable of being foot-launched, no licenses are required for the plane or pilot.

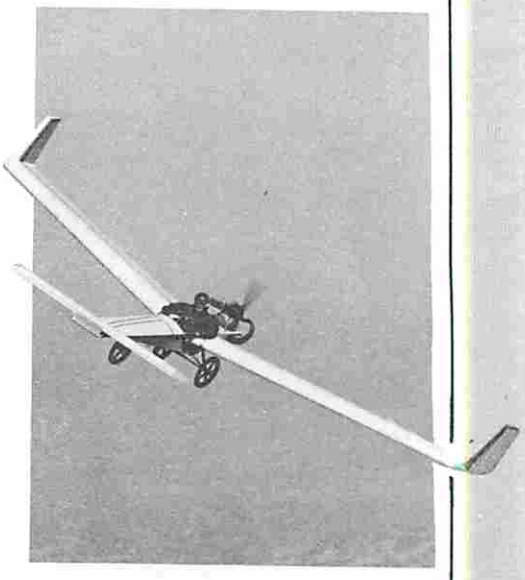
Extensive stall and spin testing has shown the Goldwing was able to be flown with full aft stick without stalling, and it was proved to be very spin-resistant.

The Goldwing is aimed at a market of ultralight enthusiasts and private pilots looking for a safe and affordable, state-of-the-art, fun flying machine that has the speeds of an airplane and the versatility of a powered ultralight.

Flight demonstrations are given every week-end at the Amador County Airport (40 miles southeast of Sacramento, CA).

Introductory price for the easy-to-build kit is $3,495 and a $6 info pac or a free info sheet is available from Goldwing, Ltd., P.O. Box 1123, Jackson, California 95642.

Sincerely,
Reklai Salazar,
General Manager,
Goldwing, Ltd.

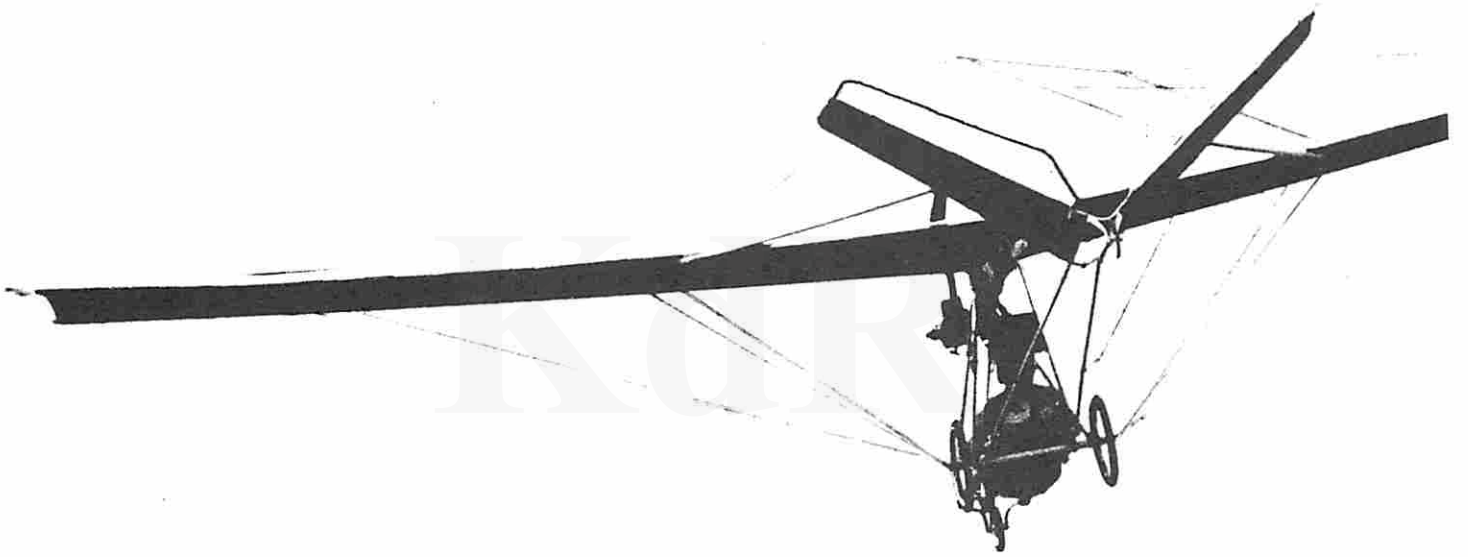


Wingspan	30 ft.
Total wing area	128 sq. ft.
Weight	185 lbs.
Power	2 cylinder, electric start, 25 H.P.
Fuel capacity	6 gal.
Useful load	250 lbs.
*Take off roll	150 ft.
*Rate of climb	600 f.p.m.
*Cruise speed	60 m.p.h.
*Fuel consumption	1 gal./hr.
Load factor	+ 6, — 3
Glide ratio	18/1
Set-up time	10 minutes

*(Measured with standard aircraft instruments, under standard conditions.)

The Ultimate Ultralight . . .

THE HUMBUG



- FULL 3 AXIS CONTROL
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P.O. Box 507
Ellington, Conn. 06029
U.S.A.

INFO PACK: $5.00

FORUM

Dear Editor,

Whole Air pilot reports are the very best, honest and complete.

What about the Seedwing Sensor? I feel a need for your pilot report before I buy one. I will fly it first, but don't feel qualified to check it out as thoroughly as you do.

I would appreciate your comments.

Your magazine is great.

Sincerely,
Richard Tone,
Pescott, AZ

Editor's Reply: Plans are already made to check the new Seedwing release, the 510 out while in California this spring. Watch for the upcoming report, Richard.

Dear Editor,

Enclosed is some information on my new glider company.

Progressive Aircraft Company is a manufacturing company engaged primarily in the manufacture of high performance hang gliders and certain types of hang glider related products. The company's philosophy is to produce a limited number of hand-made high performance units designed to appeal to the advanced and expert hang glider pilots. The company products will be innovative, using all the most recent design advancements and all sales will be directly from the factory at prices comparable or below other manufacturers' models. The company plans to utilize its expert staff of design engineers and master machinists to provide the hang gliding community with a truly superior product that will satisfy the needs of the most demanding pilot.

For more information on our company write to me at:
6474 E. Sibley, Simi Valley, CA 93063.

Sincerely,
Dick Boone, President,
Progressive Aircraft Co.

Dear Editor:

You blew it. On Page 22, upper right corner of the November/December issue is a photograph of a kite with double-curved leading edges, airerons, and an incredibly raked forward hangbar. Since it also has a tall, skinny kingpost it couldn't be an ASG-23. It certainly isn't anything from the HGMA because the nose angle could be about 150. Please end the

suspense and tell us something about it, the usual who, what, when, where and how high. Is it somebody's personal pet or is it possible competition for the Fledgeling?

Otherwise, it was a great issue.

STEVE MOORE.

Editor's Reply—Here is a reprint of Mario Manza's "fixed wing" you asked for Steve. Mario is an independent designer from Kettering, OH.

Your question prompted us to add a new section to the magazine, a "for those who do it themselves area." We would like to present the newest concepts in design, not just those recognized or manufactured already. A place where you as our readers can scrutinize maybe tomorrow's realities, either from print or from viewing someone's prototype.

Please send us your ideas and designs, and any questions about a design you may have.

Stay tuned.

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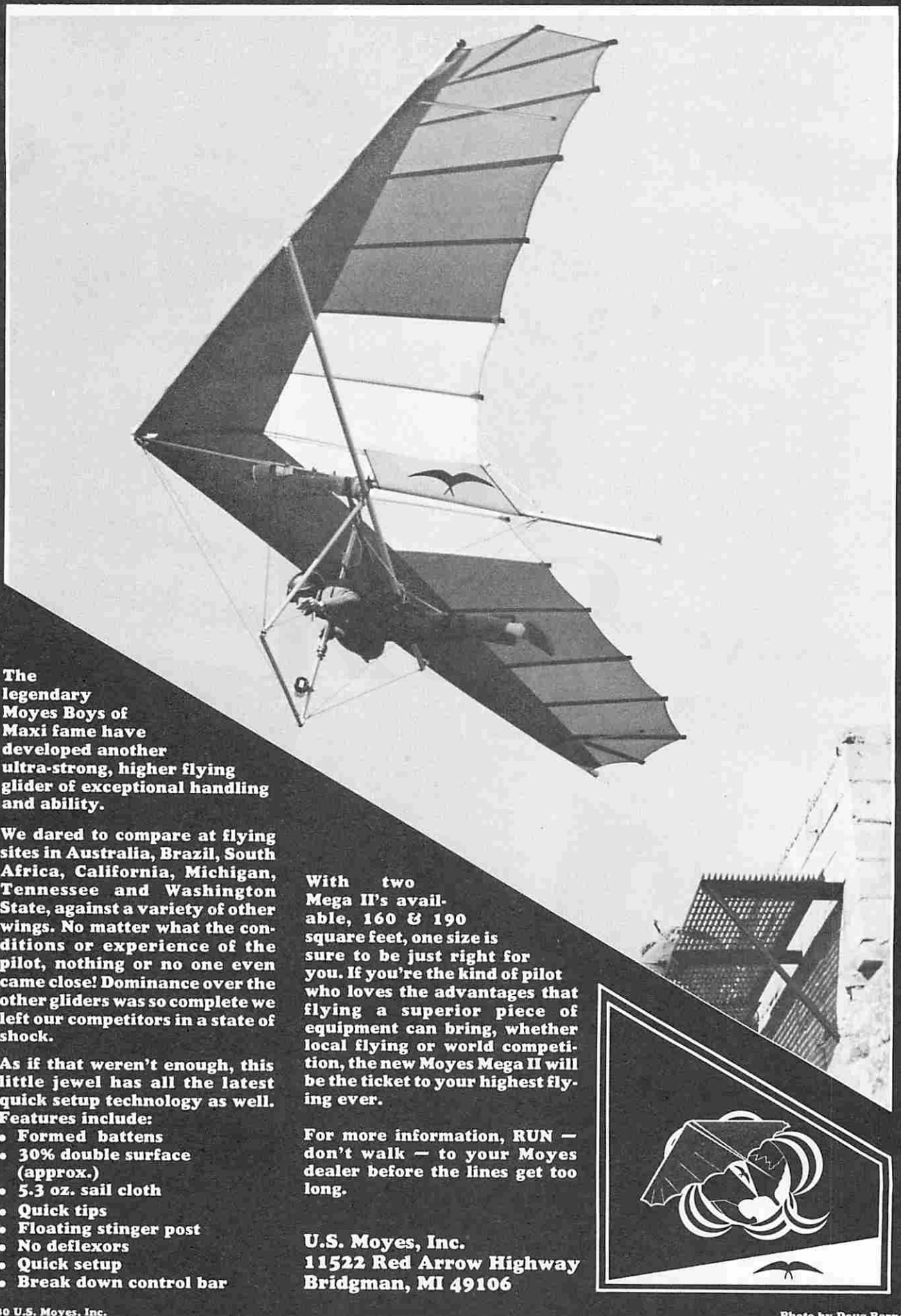

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- **Quick setup**
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For more information, RUN — don't walk — to your Moyes dealer before the lines get too long.

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Photo by Doug Barnette

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* Chest, waist, and weight

YOU CAN LEARN FROM THIS

. . . Mother Nature's Sucker Punch!

By NOEL WHITTALL

Personally, I blame the depressed state of the dollar. After all, for years us poor Brits couldn't even afford to cross the Atlantic, let alone bring our hang gliders and enjoy ourselves with clear consciences.

Things are a bit different now. Through some mighty socio/economic convulsion, the logic of which eludes me, we are able to make our personal contribution to the energy crisis by flying to America in comfort if not luxury, and at bargain prices. This means we can sample a feature of hang-gliding which is notably lacking in England . . . trees.

Other people land in trees all the time. Not you and I, my friends, wily and experienced pilots all—just other people. For us, those trees are the green scrub that we discount from a thousand plus while lazing on the Wonder Wind. They look like cabbages or broccoli and suggest the benign comfort of a green mattress layering the earth. And should the unthinkable ever happen, then "Almost as good as a parachute," you remember having heard it said. "Just pick a big one and flare out into the top of it before climbing down in an orderly and gentlemanly manner."

Admittedly I watched a Brazilian ace spear the saplings at Crystal a day or so earlier, and it looked neither orderly nor gentle, but after all those Latins are a bit hot-blooded, aren't they? And 360-ing on take-off just because you're doing your best for your country in competition is rather going to extremes. As I remarked to my compatriot John while we were dismantling his glider in the woods atop Lookout, "Luck has nothing to do with it." A little more experieence and a little more thought and he would have made it to the landing field like the rest of us. Anyway, that's mostly irrelevant because you and I are hardly novices any more, and we know it is only relative beginners and non-English speaking visitors who and in the trees.

Of course, it is purely by the way that I saw an American flier who had put in countless hours of airtime just the previous week, make a spectacularly unrehearsed landing in the Sequatchie Valley, but we'll not count that, as it was a take-off accident really, even if it did end up in the branches. And it's not as if he flew prone like us normal tree-proof veterans.

Discount, my friends, the narrative of grizzled local veterans who tell of five or six daredevil excursions into the woods—surely those must have been back in the days of the old Rogallo standards, when billow was measured by the bunch and each take-off run was also a landing approach.

Yorksire Dales clubmen John Wilkins and Harry Unsworth plan a forest rescue.

No, no, fellow aviators, there is simply no need for the thinking pilot to hit the leaves here in 1980.

You really believe all that? Then like me, Pal, you're nicely set up for Mother Nature's Sucker Punch.

O. K., then, it's owning up time—how's this for a plausible scenario? Off down to the point in rowdy but flyable air, the while thinking "Ho Ho Ho, this is just like the rough stuff we're used to at home." Arrive back at the Gap having in your estimation skillfully and intelligently fought a stiff headwind sufficiently to leave several hundred feet clear. Hit six hundred down on the vario for absolutely ages, but don't wholly believe it because Mr. Ball becomes a little temperamental when his batteries are low, and surely no one would have the nerve to pull the sky out from underneath me in quite such a churlish manner. Leave a finite period for the grim truth to dawn.

During such crises we icy nerved aces don't panic. After all, if there are big "downs" then surely it just shows that there must be big "ups" next door. Normally yes. This time, NO.

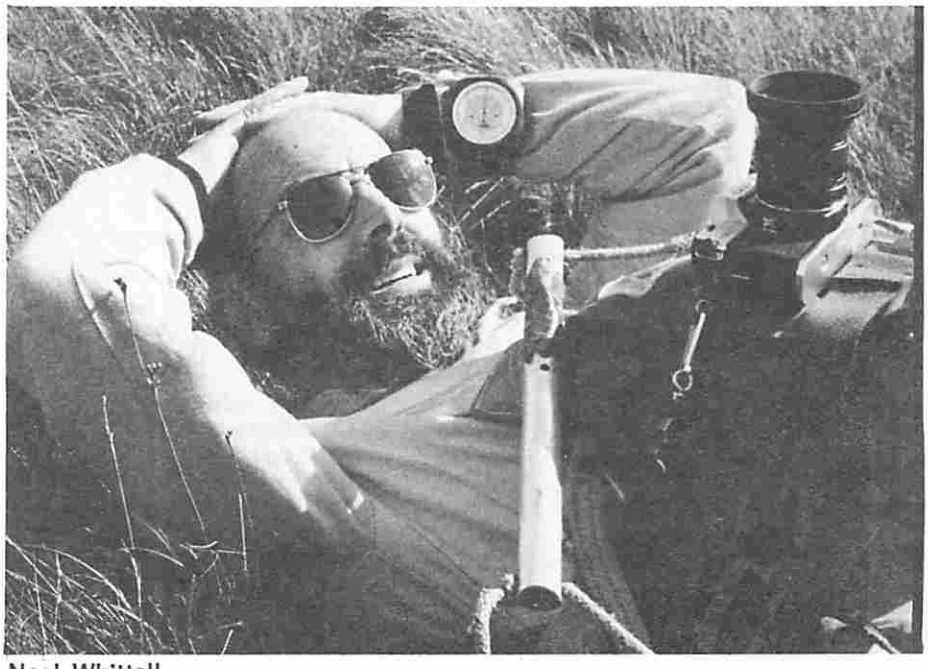
The thinking pilot perseveres, scraping for morsals of lift over the trees; gaining the occasional fifty feet and losing the odd hundred now and then. Not to worry—the BIG SAVER thermal will be along any minute now. For us dogged Knights of the Sky the truth dawns slowly. We might actually have to land out. Inconceivable but true. Plenty of time yet—sort out a big green field—the one with that guy de-rigging will do fine. He is not being eaten by blood crazed cows or shot at by hostile natives. The decision is made, and with steely resolution I make a preliminary approach.

Now for the Sucker Punch . . . the first strong lift for ten minutes! Somebody loves me—here's the saver thermal, a just reward for sheer cool airmanship—a few quick corkscrews and I'll be a couple of hundred above the Top. That was the theory anyway. In practice I found slightly less than half the thermal before falling out of the other side. The landing field was still visible. Occasionally. Through the trees.

It is doubtful if all the trees in Dade County, Georgia, have been inventoried. Should they ever be, it will be found that remarkably few are pine trees. It is actually quite difficult to find a pine tree in Dade County, let alone hit it with a hang glider, but persevere, my friends, it can be done. The main distinction between pine trees and the regular variety is that gliders usually drop straight out of pine trees. I write from experience.

The resulting altered airframe was easier to fit into the bag for the filght home, so the outcome of this venture was not necessarily all bad. The double vision only lasted a day or so; the blood-filled eyeballs I have managed to pass off as a punk aberration, and the ribs only hurt if I breathe.

And the score for the week stands at Mother Nature 5, pilots nil.



Noel Whittall

HGMA CERTIFIED GLIDERS

December 10, 1980
Dear Editor:

A number of hang glider manufacturing companies have been making references to certification in their advertising that the HGMA feels may be misleading to the public. .The HGMA would like to request your cooperation in discouraging this practice. There are generally two problem areas:

1) A manufacturer will use superlatives in his advertising such as "Strongest glider ever certified," etc.

2) A manufacturer will imply that a glider is certified or is soon to be certified. For example, three sizes of a glider are advertised, the glider is advertised as HGMA Certified, when only one size has been certified. Or the manufacturer makes statements such as, "Certification in process," or, "Full certification pending."

To address these problems, the HGMA has adopted a set of advertising policies for its members. These require that:

1) No comparative or superlative statements be made in advertising with regard to HGMA certification.

2) No statements be made about certification unless the glider advertised currently possesses an HGMA Airworthiness Certificate.

3) All references to certification in advertising state only that the glider is HGMA certified, and the year in which it was certified. (The year is important because the standards get more rigorous each year.

4) If more than one size is advertised, it must be specified which sizes are certified, unless all sizes are.

The HGMA would like to ask that you impose these same requirements on all advertisers. I have enclosed a list of currently certified gliders, and you can call me at any time if you have any questions on this matter. Thank you.

Mike Meier
HGMA Secretary
(714) 547-6366

LIST OF HGMA CERTIFIED GLIDERS
Dec. 15, 1980 Page one of one
Supercedes all previous and undated lists

1977
ASG 21, AA, A, B, C
CGS Falcon 20
Phoenix 8 Jr., Regular
Olympus 160
Seagull 10 meter
Sunbird Strato
UP Spyder 154, 168, 180, 192
Wills Wing SST 100B, 100C, 100A, 100M, 110G, XC 185, XC 220

1978
Mariah 150, 170, 190
Cumulus 10 20'
Flexi III 18', 20', 22'
Olympus 140, 160, 180
Cirrus 5 A, B, C, D
Fledding IIB
Moyes Maxi Mark IIB,
Moyes Midi
Moyes Maxi Mark III
Owl A, B, C
Seagull Super Seahawk 170, 190
Seagull 10.5 meter
Sirocco 156, 175
Sirocco II 164
UP Firefly 150, 174, 193, 220
UP Condor 151, 178, 194, 224
Highster 164
Ultimate Hi Starship 100
Wills Wing Alpha 155, 185, 215

1979
Phoenix 6D 185, 215
Lazor 170, 190
Antares 18', 19', 20'
Electra Floater 205
Sunbird Nova 170, 190, 230
Seagull 10 meter, 11 meter
Wills Wing Alpha 155, 185, 215, 245, Omega 180, 220, 260, Omni 187 (200)
Raven 209
Highster 170, 190
Flight Designs Lancer 4B 170, 190
Super Lancer 180, 200
UP Firefly 2B 149, 181, 216
UP Mosquito 166
Sirocco III 168, 189
Moyes Maxi M III SP
Sensor 210 E 183

1980
Wills Raven 149, 179, 209, 229
UP Mosquito 146, 196
Delta Wings Lazor II 155, 175, 195
Electra Flyer Spirit 180, 200, 220
Moyes Mega MK II
Seagull Sierra 180, 200
UP Comet 165
Wills Wing Harrier 177
Waspair Super Gryphon 175
Monarch Products Monarch II

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BLUEBOOK

EDITION NO. 17

These prices are designed to be guidelines for evaluating your glider or one you wish to buy. We do not intend for these figures to be considered the final authority. Consult your local qualified dealer.

Manufacturer	Year	Model	Size	Clean Price	Avg. Price
BENNETT DELTA WING	77	Phoenix 6C	Jr.	550	450
	77	Phoenix 6C	Sr.	425	400
	77	Phoenix 6C	Reg.	500	425
	77	Phoenix 8	Reg.	650	375
	78	Phoenix 8 Super	Reg.	675	450
	78	Phoenix 12	Reg.	650	525
	79	Phoenix 6D	185	875	775
	79	Lazor	190	900	775
	80	Lazor II	175	1075	925
CGS AIRCRAFT	77	Falcon V	185	650	500
	77	Falcon V	220	600	475
	78	Falcon 5½	Med.	750	625
	79	Falcon 8	Med	900	800
EIPPER FORMANCE	77	Flexi II	185	525	475
	77	Flexi III	185	575	500
	77	Cumulus 10	Med.	550	525
	78	Flexi III	Lg.	700	600
	78	Cumulus 10	Med.	675	500
	78	Antares	Med.	875	750
	79	Antares	Med.	875	750
	79	Antares	Lg.	925	875
ELECTRA FLYER	77	Cirrus	3	600	400
	77	Cirrus	2	600	300
	77	Olympus	160	575	525
	78	Cirrus 5	C	500	475
	78	Cirrus 5	A	600	500
	78	Olympus	160	625	555
	78	Olympus	180	625	550
	79	Trainer	—	400	400
	79	Cirrus 5	A	650	625
	79	Olympus	160	725	650
	79	Floater	205	900	775
FLIGHT DESIGNS	79	Lancer	190	1050	1000
	80	Lancer	175	1150	1100
MANTA PRODUCTS	79	Fledge	IIB	1200	1000
MOYES DELTA WING	77	Maxi I	200	700	625
	78	Maxi II	200	925	800
	79	Maxi III	200	975	875
	80	Stingray	200	1000	900
	80	Maxi IV	200	1075	950
	80	Mega II	172	1400	1200

Manufacturer	Year	Model	Size	Clean Price	Avg. Price
SEAGULL AIRCRAFT	77	Seahawk	170	550	450
	77	Seahawk	190	550	450
	77	10.5 Meter	—	625	525
	78	Seahawk	170	675	525
	78	Seahawk	190	675	525
	78	10 Meter	—	835	750
	78	10.5 Meter	—	825	750
	79	Seahawk	180	950	625
	79	10 Meter	—	875	700
	79	11 Meter	—	975	700
	80	11 Meter	—	1000	850
SKY SPORTS	77	Bobcat III	Lg	675	600
	77	Merlin	160	600	500
	77	Sirocco I	156	600	475
	77	Sirocco I	175	575	400
	78	Osprey	175	700	675
	78	Sirocco II	164	725	700
	79	Eaglet	191	550	425
	79	Osprey 2	175	625	600
	79	Sirocco III	189	950	850
ULTRALITE PRODUCTS	77	Firefly	174	550	500
	77	Dragonfly Mk. II	196	700	550
	78	Firefly	154	800	700
	78	Spyder	176	850	675
	78	Condor	178	900	825
	79	Mosquito	166	1200	1075
	80	Firefly 2B	181	975	850
WILLS WINGS	77	SST	100C	625	575
	77	SST	100B	625	550
	77	Universal	100A	525	500
	77	X-C	185	600	550
	78	SST	100C	700	650
	78	Alpha	185	825	775
	78	Alpha	215	825	775
	78	X-C	215	800	775
	79	Alpha	185	950	750
	79	Alpha	215	1000	850
	79	Omega	220	1000	875
	79	Omni	187	975	950
	79	Raven	209	1075	1000
	80	Raven	229	1200	1150

NOTE: DEALERS! Write to us to participate in the Used Glider Bluebook. We would like to get your input on prices, to better represent all parts of the U.S.

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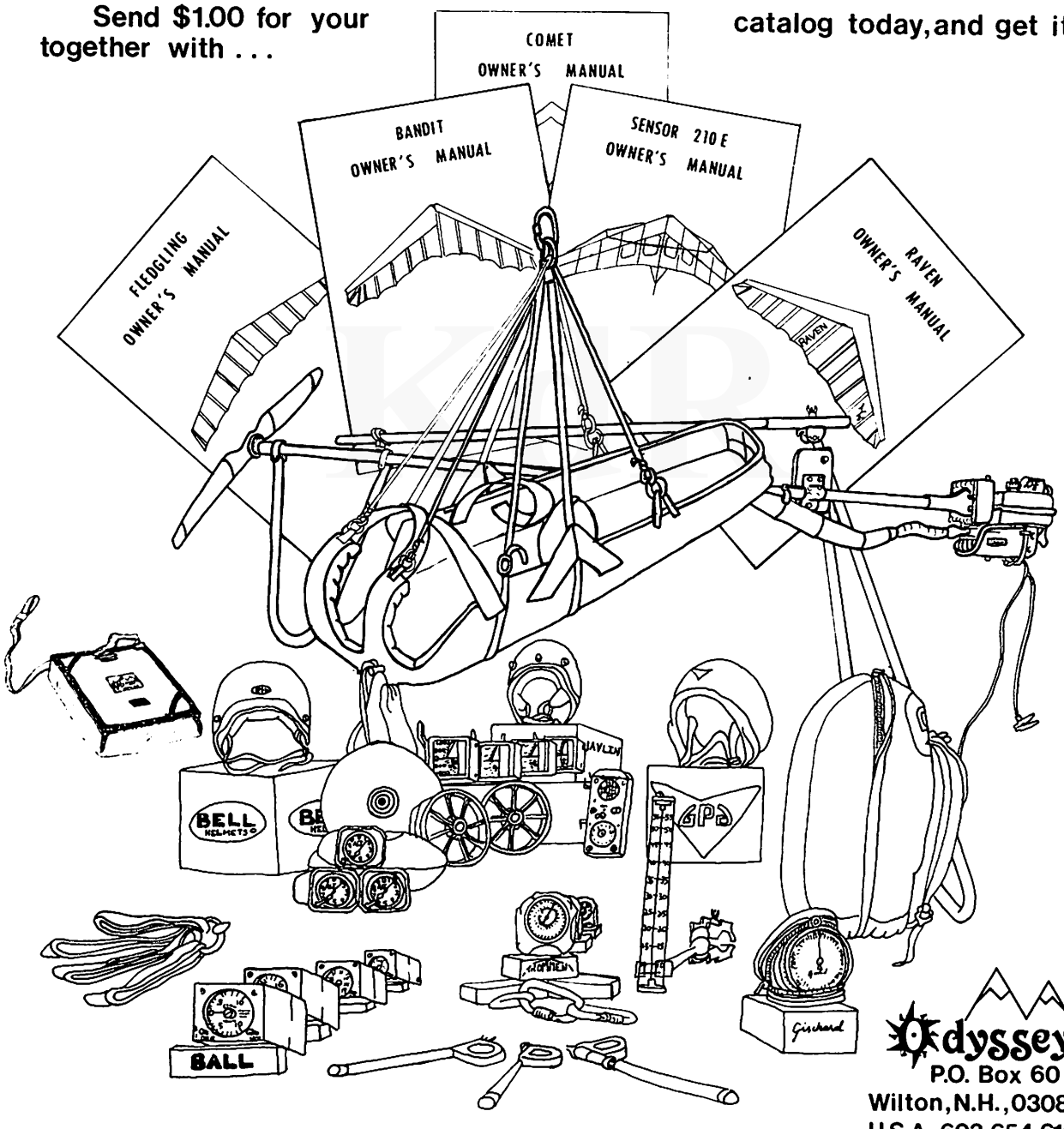

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MOTORIZED

Chuck Slusarczyk
President, CGS Aviation, Inc.

While sitting around trying to decide what subject to write about this month, some customers came into my shop and expressed an interest in ultralight aircraft. During the ensuing discussion, many questions were raised by the potential customers. They had handfuls of literature, brochures and pamphlets from various ultralight companies and were doing the smart thing—asking questions before buying. However, they had some misconceptions about a few things and didn't even consider a point or two about the aircraft they were looking at. So what I'll attempt to do here is give a little guideline of some questions to ask and points to ponder before plunking down any hard-earned cash. I'd like to say at the outset that as far as I know, there are no inherently dangerous ultralights currently flying. Whether canard, conventional tailed or tailless, **any** design can be made unsafe by improper thrust line center of gravity placement or poor maintenance practices. Find out how long a design has been flying and how many are in service. This will usually answer any questions of inherent design safety.

1). Construction Time. a) Does the aircraft require complete building? That is, cutting, drilling, bending and fabricating parts from raw materials provided. b) Partial building. That is, all major parts are bent and formed and require bolting and/or riveting parts together. c) Assembly Kit. Essentially a knocked down kit. Everything is built and just requires assembly, something like Christmas toys. However, usually add 25 to 50 percent to the construction assembly time quoted if it's your first airplane.

2). Transportation and Storage. How does the airplane fold up or disassemble? Will you need a trailer or can it be car topped? Can it be stored in a garage or does it need its own box?

3). Performance. This is probably the most touchy one, since performance can be a relative thing, and can mean different things to different people. Some folks like speed. Some like a high rate of climb. Some like a really maneuverable fast reacting ship. However, if a person lives in the Midwest, a good rate of climb is a real consideration. Grass strips and tree-lined runways are a fact of life, so decent climb is a necessity, not a luxury. One point to bring out here is that speed is usually a function of drag and climb is a function of weight. A fast airplane doesn't necessarily climb fast and a fast climber doesn't necessarily fly fast. Unfortunately you can't always believe performance claims. The best way is to watch various ultralights fly side by side at the same fly in. You just might be surprised. Another point is pilot weight. I weigh 200 pounds and am usually one of the heaviest pilots flying at meets. If you weigh 190 or more and are considering a certain aircraft, ask to see it fly with your equivalent weight in it. An airplane that might look like it's climbing OK with a 130-pound pilot may just barely get a 200-pound pilot out of ground effect; and, on a hot day, might not even take off. If you have a dealer close by and all they have is a 150-pound pilot, ask him to put a 50-pound sack of sand on his lap to simulate a 200-pound pilot and show you the performance with your weight equivalent. You wouldn't buy a $50 car without seeing if it ran first, and you owe yourself that much when spending approximately $3,000 for an ultralight. Ask for names of customers and call them. See if the performances **claimed** are the performances **delivered.** A satisfied customer is always a good recommendation.

If you plan on flying more than 100 hours a year, a larger engine might be better due to lower rpm's and longer time between ring jobs, but they may cost more. Be sure that repair parts like pistons, rings and gaskets are available. Check on the cost of spare props, overhauls, tune ups, and if a reduction drive unit is used, the life of the belts or drive train and maintenance required.

4). Controls. Unfortunately this is the area that as an industry I feel needs more standardization. Some methods for controlling ultralights are pure weight shift for pitch and lateral control; weight shift for pitch with independent twist grips for lateral; weight shift for pitch with a stick for lateral; overhead control stick full 3 axis control; side stick 2 axis, etc. The same with throttles—some are motorcycle twist grip types, some are mouth operated, some are push pull choke type cables and some on a quadrant type control. I feel (and it's only my opinion) we should settle on aircraft methods of controls to standardize our type machines with that of general aviation practices. The same with nose wheel steering. Backward steering can possibly be confusing to someone who is a pilot and is accustomed to the push right,, go right concept.

5). Fuel Systems. Can you see or easily determine the fuel remaining after airborne, or must you rely on keeping track of the time? This may not seem important, but usually out of sight, out of mind. Fuel capacity. Do you need to haul 15 gallons of fuel around when you have a 2-hour bladder? Type of fuel. Is it readily available or is it something that cannot be found at most airports or gas stations, like alcohol, for example.

6). Landing Gear. Wheel size can be a factor if operating on rough terrain. Large diameter wheels roll over clumps and cow flops easier. Small diameter wheels are great for smoother fields and airport operations. You can even put wheel pants on small wheels and dress up your airplane. Look at spoke thickness on large wheels. Bicycle type spokes usually don't hold up when a side load is applied. Steerable nose or tail wheel (in my opinion) is a must! You might not need it for take off all that much, but it sure is nice when taxiing around or taxiing a long distance. Butt clearance. Is your backside only a couple of inches off the tarmac? This could be hazardous in rough terrain where a small stump or protrusion could contact your backside. Ten inches is usually a minimum clearance between your butt and the ground. Anything lower could invite a problem.

7). Noise Level. How loud is the airplane to you and people on the ground? Most pilots wear ear protection, so the noice level is no real problem to them. However, if we are going to be good neighbors and keep many of our flying sites, noise is a definite consideration to bear in mind for the folks on the ground. Many radio-controlled model airplane fields would no longer be in existance if modelers hadn't installed mufflers on their models.

Many times choosing what ultralight to purchase is like buying a car. It just looks good to you. So find the ones that look good and start asking questions. Till next issue,

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SAFETY

TESTING SUSPENSION SYSTEMS FOR STRENGTH

In the last five years there has been a great deal of progress made in the design of hang gliders. Modern gliders offer both superior performance and superior safety. Through the combined efforts of the manufacturers, there now exists an extensive set of testing standards for measuring the relative airworthiness of various glider designs. We are seeing fewer incidents of design-related accidents in the sport.

One area of equipment that has not been included in this systematic testing is the area of suspension systems. Harnesses and hang loops have, for the most part, not been considered as part of the aircraft. No standards currently exist for the design or manufacture of hang gliding suspension systems. As the equipment related safety record of hang gliding improves, those accidents which are related to equipment defects or failures become more dramatic. Fatal accidents involving suspension system failures seem particularly tragic and unnecessary.

Recently Wills Wing, Inc. began conducting preliminary tests on various suspension system components to determine which design and construction techniques wielded the strongest systems. Tests were conducted by Mike Nash and Tim Dunlap. The results of these preliminary tests are presented here.

HANG LOOPS

A common design for the hang loop to which the pilot attaches his harness utilizes 1-inch tubular nylon webbing sewn together with a three-point running "w"' stitch pattern with some amount of overlap. The webbing is rated at 4,000 pounds breaking strength, so a loop which was good for the full strength of the webbing would be good for 8,000 pounds. A series of loops sewn with different amounts of overlap and different types of thread were tested:

1-INCH TUBULAR HANG LOOPS

Dacron Thread

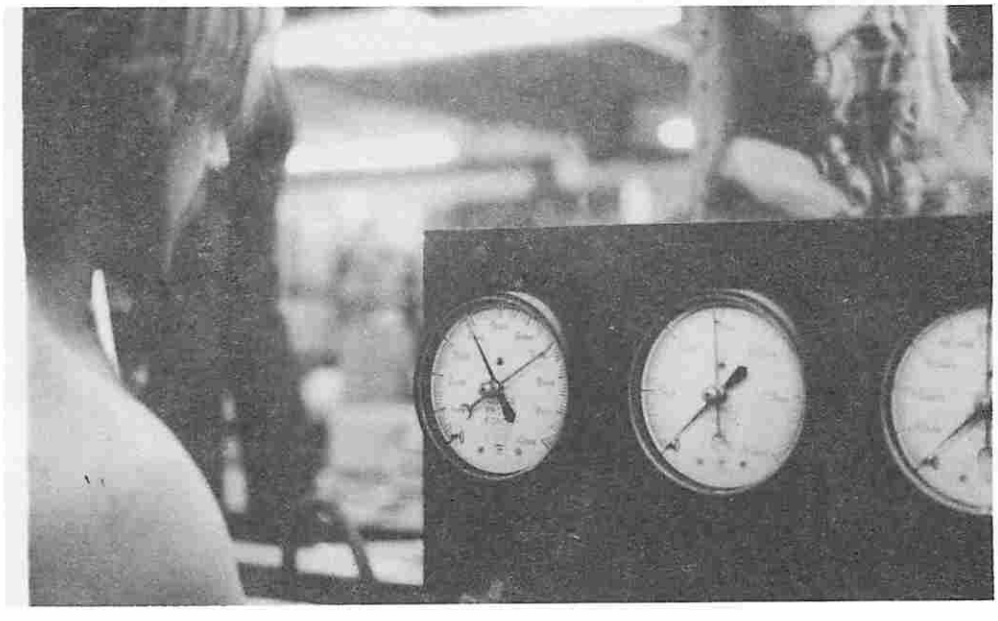
Overlap	Breaking Strength	Failure Mode
4 inches	3,100 lbs.	Threads sheared
5 inches	3,400 lbs.	Threads sheared
6 inches	3,500 lbs.	Threads sheared
7 inches	4,200 lbs.	Threads sheared

Nylon Thread

Overlap	Breaking Strength	Failure Mode
4 inches	4,500 lbs.	Threads Sheared
5 inches	5,500 lbs.	Threads Sheared
6 inches	5,900 lbs.	Threads Sheared
7 inches	6,500 lbs.	Threads Sheared

Nylon No. 5 cord (Requires special riggers sewing machinet)

Overlap	Breaking Strength	Failure Mode
4 inches	5,500 lbs.	Broke Webbing
5 inches	5,650 lbs.	Broke Webbing
6 inches	6,300 lbs.	Broke Webbing



Note that the use of Nylon over Dacron thread, and the increase in the overlap from 4 inches to 7 inches more than doubles the strength of the hang loop, and brings it to more than 75 percent of the full rated strength of the material. The use of nylon cord No. 5 produces the same strength with a six inch overlap.

GLIDER MOUNTED HANG LOOPS

In the past, most gliders were sold without a suspension loop, and pilots provided their own. Currently a number of gliders are being made which come from the factory with a suspension loop. One construction technique for such a loop, used on the Harrier and Raven, utilizes one-and-three-quarter-inch flat webbing rated at 6,500 pounds, sewn with a 7-inch or 10-inch overlap with No. 5 nylon cord in a three-point running "w". This loop is secured to the keel with a quarter-inch bolt through a grommet in the webbing.

A recent column expressed concern over this method of attachment, stating that the installation of the grommet would weaken the webbing. Testing has shown that this is not the case. The grommet is installed in the overlap portion of the loop, and none of the tests produced a failure at the grommet. The test results were:

RAVEN HANG LOOP

Seven-inch overlap. Nylon No. 5 cord broke webbing at 9,450 pounds (73 percent of rated strength of material).

HARRIER HANG LOOP

Ten-inch overlap Nylon No. 5 cord broke webbing at 10,200 pounds (78 percent of rated strength of material).

CARABINERS

The next component of the suspension system is the carabiner. We tested the SMC locking carabiner which is rated by the manufacturer for approximately 5,500 pounds.

We broke one at 4,000 pounds. Note that this is one of the highest quality carabiners available and that it is only good for about 40 percent of the strength of the factory installed hang loops tested above.

HARNESSES

The final component of the suspension system is the harness itself. A number of harnesses were subjected to strength tests on various components.

LEG LOOPS

Leg loops were tested on six different harnesses from three different manufacturers. Breaking strengths ranged from 1,150 pounds to 13,000 pounds.

MAIN SUPPORTS

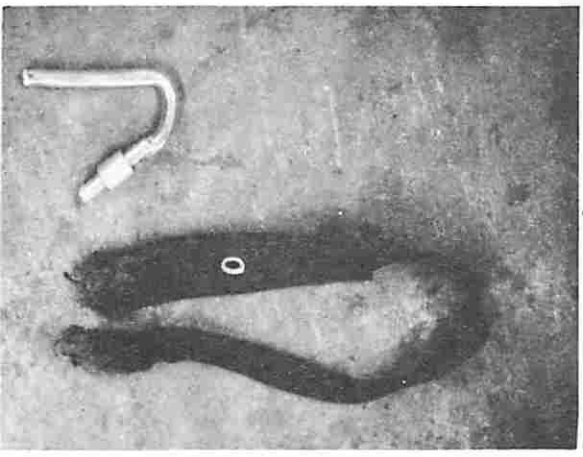
Main supports straps showed breaking strengths of 1,200 pounds to 2,000 pounds. It was determined that the use of adjuster buckles in main support straps weakens the main support. Further testing will be done to determine how much.

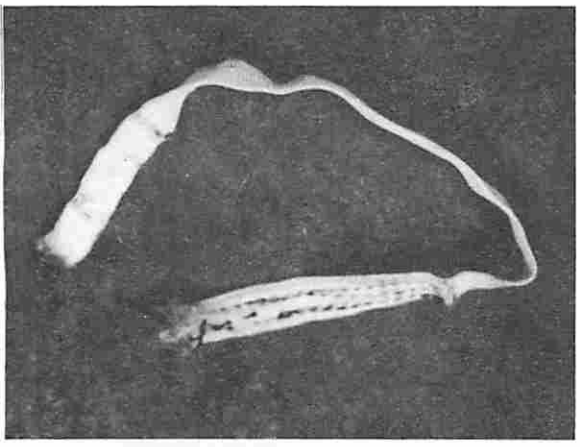
HARNESS BODY

The harness body tested failed at 3,200 pounds when pulled across the body from main to main . This was a harness without any webbing across the front of the body. This would indicate that the body could support a load of 6,400 pounds prior to failure.

FURTHER TESTS

The results of these preliminary tests indicate the need for further testing. In the future, we would like to test the strength of an assortment of carabiners, both locking and non-locking. Since many pilots adjust





their suspension systems by tying knots in their support straps, or by tying two or more hang loops together, we would like to test the relative strength of loops and straps with knots.

Perlon rope is also commonly used both in harness construction and as a primary or back-up hang loop. We plan to test various sizes of perlon with some of the more commonly used knots.

We would also like to test a larger selection of harnesses and would welcome contributions. Since the testing is destructive, don't send us anything you plan to use again. We would be particularly interested in testing older harnesses and hang loops, as we currently have no information on the effects of age on suspension components.

Finally we plan to test components under shock loads to determine if the manner in which the load is applied could effect the breaking strength.

CONCLUSIONS

A few conclusions are apparent from the preliminary testing:

1) Design and construction techniques can cause the strength of a suspension component to vary over a considerable range.

2) Most hang loops are as strong or stronger than most carabiners, if properly made.

3) Good hang loops, and good carbiners are probably stronger than most harnesses.

4) No suspension system is any good if you don't hook in. (Actually we knew this before we did the testing.)

Until a testing and certification program is developed for suspension systems, each pilot must take responsibility for his own system's strength. Unfortunately there are no simple tricks you can do to guarantee the safety of your system. You must look at each component individually. A lot of attention has been focused recently on the use of back-up hang loops. This is an excellent practice, but only effective if both loops are properly designed, manufactured and mounted. Recently a pilot in the Northeast fell to his death, apparently because his hang loop was cut apart by a component on the glider, due to improper mounting. At the Nationals in Ellenville soon after, the meet director and safety director insisted on applying a universal rule that all pilots must fly with back-up hang loops. No standards were imposed regarding carabiners or harnesses. As a resut, several pilots were seen adding a 6,000-pound safety to a 10,000-pound hang loop, and then ran off the hill clipped in with a 4,000-pound carabiner. Undoubtedly, many of the other competitors were flying around in 2,000-pound harnesses.

RECOMMENDATIONS

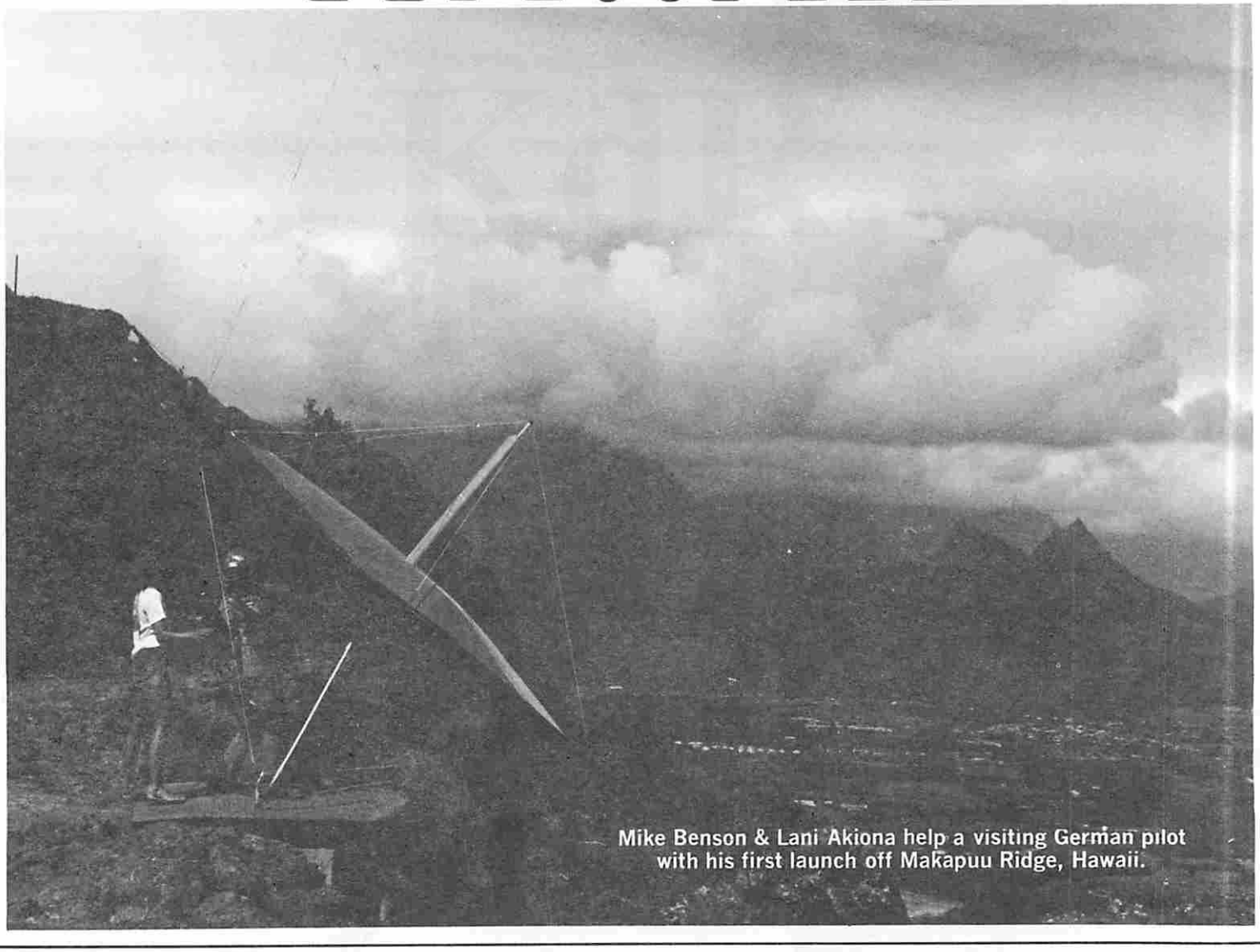
1) Write to the manufacturer of your harness and hang loop and ask what testing has been done on the various components of the system.

2) Use a good hang loop, with a good safety. Make sure they are properly mounted and clip into both.

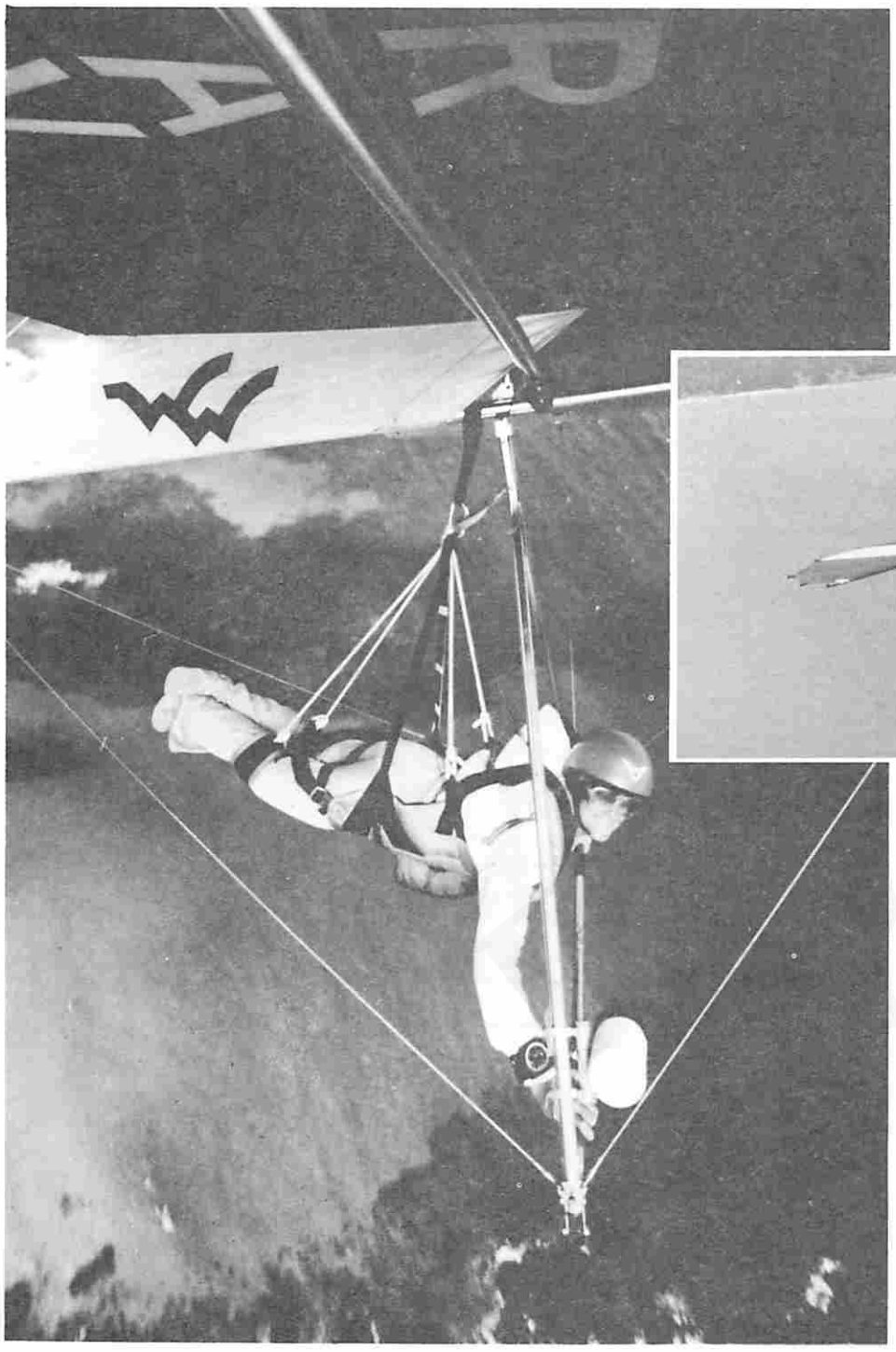
3) Replace all main support straps and hang loops once a year or immediately if you notice any wear.

4) Use a GOOD locking carabiner.

HANG GLIDING IN HAWAII



Mike Benson & Lani Akiona help a visiting German pilot with his first launch off Makapuu Ridge, Hawaii.



by Lani Akiona

This information is an effort to make your vacation in Hawaii joyful, meaningful, and more expedient if you come to fly. There are certain things that pilots need to know when reaching a new flying site and undoubtedly it is much more fruitful if the people there will help. We would like to aid in your plans should you choose Hawaii as a near future vacation area and hope that the following will be of some use.

Makapuu Ridge is Hawaii's most popular, exquisite, well-known *soaring* site. I underline soaring because indeed, most all of the flying at Makapuu is soaring. However, after getting used to the FAT of Makapuu, most pilots search out thermals for altitude gains and cross country flying.

On an average day, 1,500-foot gains are possible even in a standard. Light north days bring flights of 17 miles down and back.

For those interested, a sketchy map is available by just sending a self-addressed, stamped envelope to Tradewinds Hang Gliding.

On Maui there's also some excellent flying and recently soaring in the shearline. Maui was the site chosen for the first Hawaii regionals held 7/80 and we had ten pilots who competed.

Rental gliders are available on Oahu from Tradewinds Hang Gliding and on Maui from Maui Soaring Supplies see ad in WAM for pilots not wishing to ship their gliders air freight. As always, it's best to bring your own harness and instruments.

HAWAII SITES

MAKAPUU RIDGE

Location: Eastern part of the Koolau Mountain Range, Island of Oahu.

Launch: 1,040 feet. Vertical cliff. One person, nose wire-assist launch. Very few self-running launches.

Direction: 0-70 degrees.

Rating: Current USHGA Advanced rating. This is a must!

Membership: Hawaiian Hang Gliding Association.

Fee: $10 for visitors/3 months. (Includes glider inspection and key to gate.)

Winds: 3-25 mph for flying.

Optimum months: Late August through mid-November. Soarable every month. (However, many blown out days in spring.)

Set-up Area: Good. Grass or flat ground. Occasional rotors make it necessary to watch your glider.

Landing Area: Specific area designated for hang gliding by the City and County of Honolulu. Located between ocean and busy highway with no obstructions on approach.

Directions to Top of the Ridge: First need to obtain clearance and key to locked gate, or; it's best to take an experienced, local pilot with you the first time, who will outline the ridge for you and help you launch. Take H-1 East (same as Kalanianaole Highway) from Waikiki to Hawaii Kai. Left turn on Lunalili Home Road (just past shopping center). Go to the third stop light and turn right—Hawaii Kai Drive.

Go up the hill and take the first street, turn left. The gate is approximately 100 yards on the left, nestled in between new houses. As the road is single lane blacktop covered, be sure to beep your horn loudly when approaching and around corners to avoid unpleasant surprises. When you get to the top, the hike with your glider is only about 50 feet. The view is breathtaking and spectacular. Even your drivers won't mind.

Directions to Landing Area: H-1 East (Kalanianaole Highway) to Sea Life Park. Go to second or back entrance and park on mountain side of highway. This is the breakdown area and must be kept clean to keep using. Gliders land across the street.

Oahu Contact: Mike Benson, Vice President of HHA and clearance official. Always willing to do inspections on day of arrival if possible. Call (808) 396-8557.

Reminder: All gliders shipped to Hawaii must be safety inspected before flying Makapuu Ridge. Wait to do assembly at inspection.

Other Rules of the Ridge: (1) helmets required (2) secondary suspension loop required (3) most current HHA glider inspection (4) no cloud flying (5) no tandem flying (6) no aerobatics between Kalanianaole Highway and the ridge.

HAPPY FLYING

Oahu Training Sites

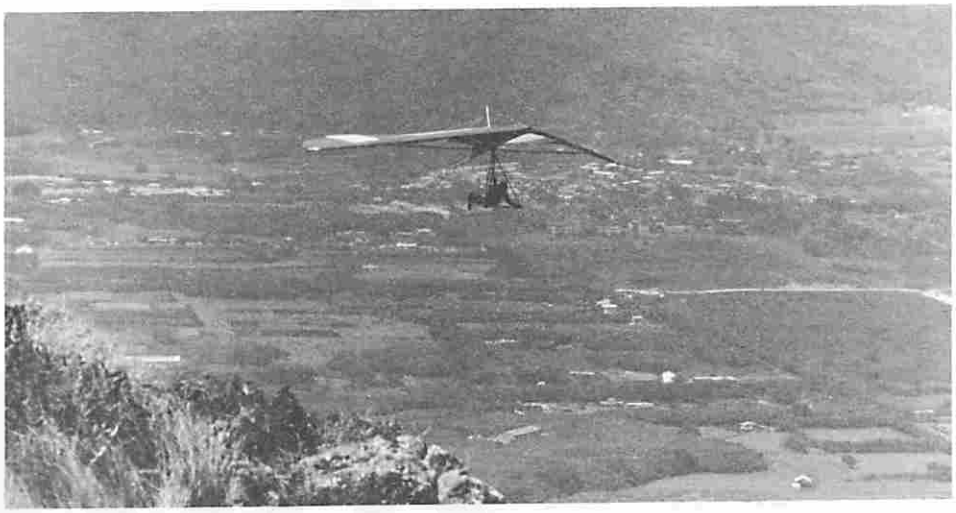
Beginners, Novices and Intermediates: There are several sites available ranging from small sand dunes (several locations) to a 300-foot hill. All take Tradewinds directions and 5-25 mph. To get to each of these sites, you must go through private property and the land owners are not always happy to see hang glider pilots. Rather than list the directions and specifics, I think that it would be much wiser if anyone desiring to use any of these sites on Oahu first contact a local instructor to avoid hassles.

Dillingham (on Oahu)

Location: NW tip of the island.
Take-Off: 1,000-foot cliff launch.
Direction: 350-050 degrees.
Rating Required: USHGA Intermediate or Advanced.
Memberships: None.
Fees: None.
Best Winds: Light to moderate, north-northeast.
Best Time to Fly: Same as Makapuu.
Glider Set-Up: Grassy slope.
Directions to Top: 1 hour tough hike. Make contact with the person(s)) listed below.
Landing Area: Beach area or farmer's field.
Directions to Landing Area: US 93 or Farrington Highway to Dillingham Airfield.
Important: Sailplanes also fly this area regularly. Please make local contact for up-to-date instructions.
Contact: Cy or Roy Yamanoha (808) 637-9291.

HALEAKALA CRATER

Location: Summit of Haleakala, Island of Maui.
Take-Off: 10,000 feet, self-running launch.
Directions: S, SE, SW, NW, W.
Winds: Light and variable or tradewinds up to 20-25 (if not gusty).
Rating: Current USHGA membership.
Membership: Hawaii Hang Gliding Association.
Fee: $5/3 months. Possible glider inspection fee.



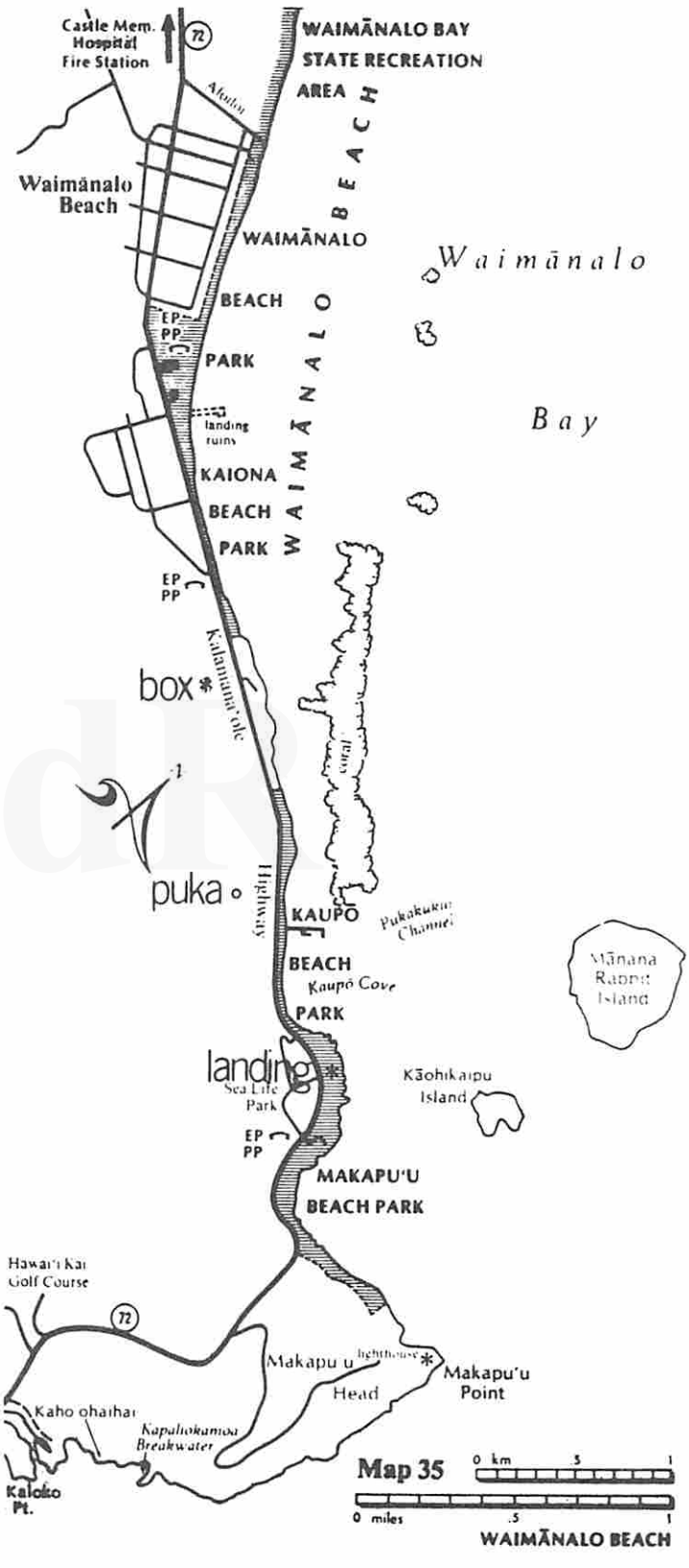
Flying Season: All year round. However, the crater clouds in during the day so flights are EARLY morning. Winter is very good.
Set-Up: Lava rock.
Landing Areas: Beaches, fields. Site official will point out acceptable areas.
Directions to Top: At this site it is of the utmost importance that you first obtain your clearance with the contact listed below. To reach the site you must pass through a dozen miles of national park. It is illegal to launch from an area on this drive. Even the launching places themselves are on property used by the FAA or the University of Hawaii, which has two observatories. We must be very careful when flying Haleakala Crater to keep the site open and it is under strict local control.
Conditions: Often 12 mile sledrides to beach. Some soaring in shearline.
Maui Contact: Dave Darling, state examiner (808) 878-1271.

Other sites on Maui . . .
POLI POLI STATE PARK

Excellent training site.
Take-Off: 4,000 feet on lee side of Haleakala Crater. Gentle grassy slopes with running start.
Direction: West.
Wind: Light and variable to Trades.
Landing Area: Pasture.
Average Flight: Ground skimming to several hundred a.g.l. Some thermals. Usually five minutes time and one mile distance.
Rating: Current USHGA.
Membership: Hawaiian Hang Gliding Association.
Fee: $5/3 months.
Flying Season: Year round—all day.
Contact: Dave Darling (808) 878-1271 for directions and information.

FERNS

Good intermediate, advanced site with take-off 2,200 feet above training slopes at Poli Poli. Because of the altitude it's often necessary to fly early in the morning when there are no clouds. Road to take-off is very rough.
Launch: 6,200 feet with running take-off.
Distance: 3 miles approximately.
Altitude Gains: Highest is 1,000 feet a.g.l.; average is 500-800 feet a.g.l.
Direction: West.
Landing Area: Pasture at 4,000 feet.
Pilots must be current USHGA and HHA members. Clearance is necessary before flying.
Contact: Dave Darling (808) 878-1271.

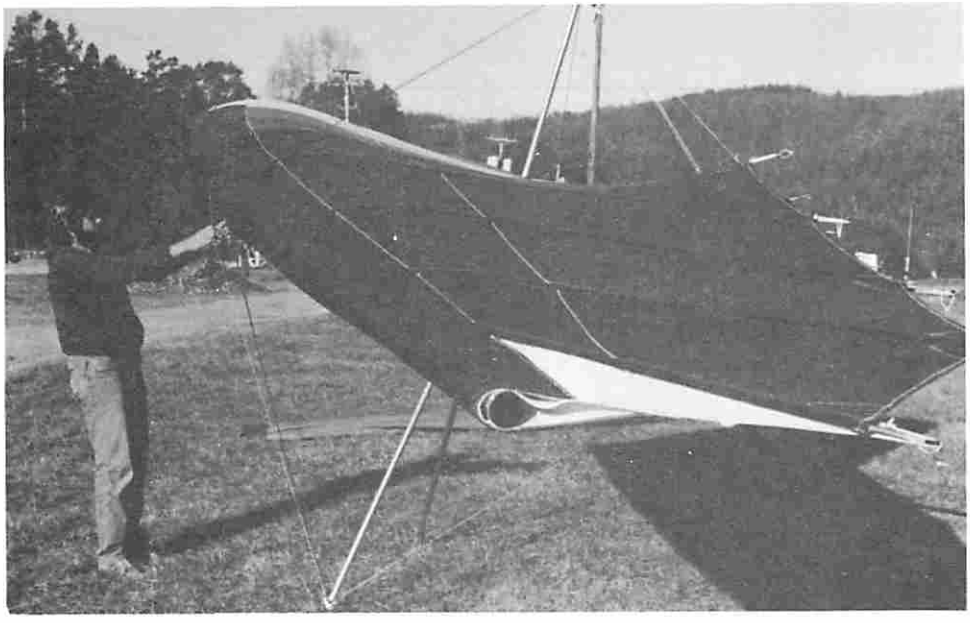


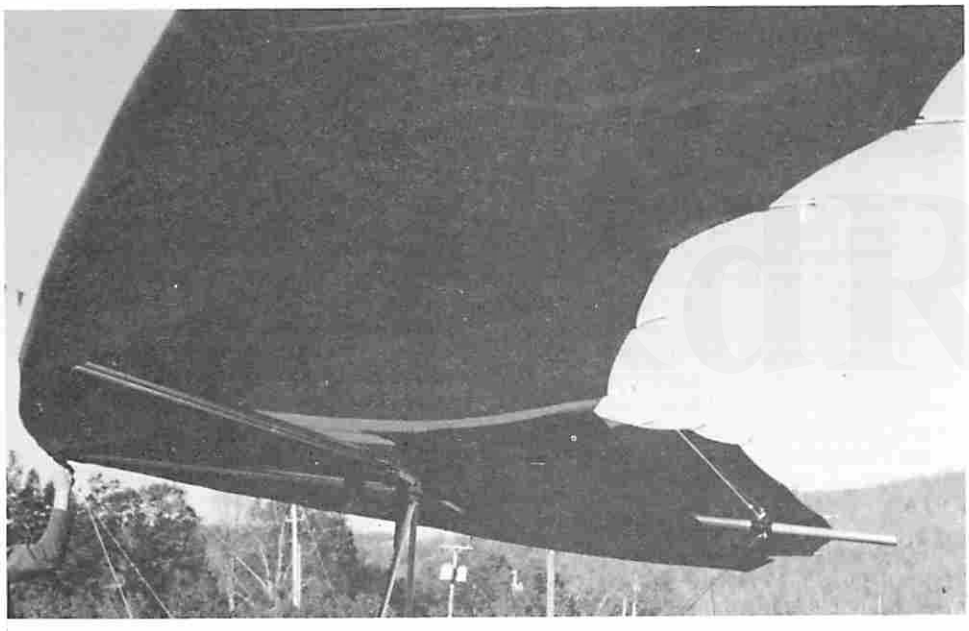
WILLS WING HARRIER

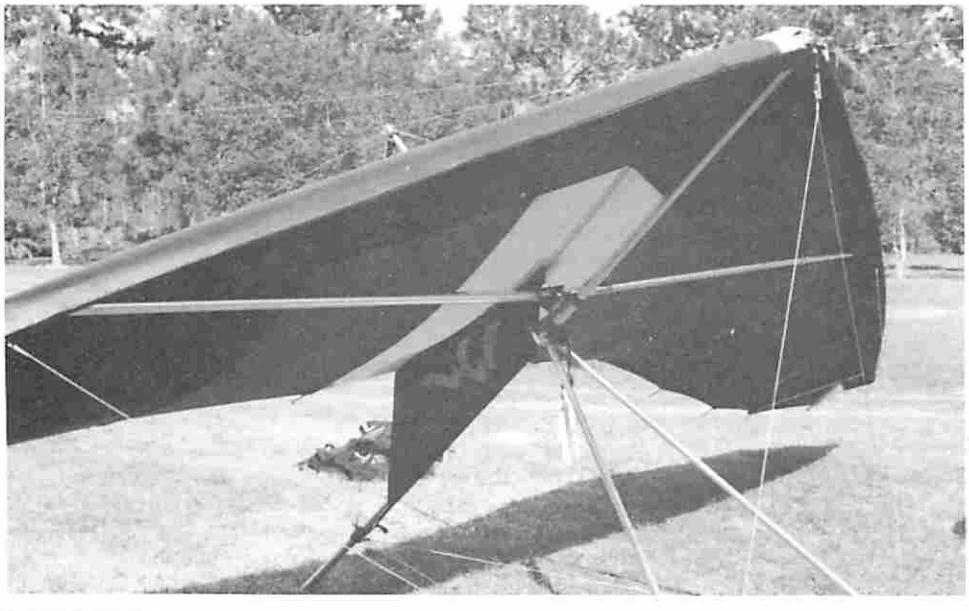
My first encounter with the high performance glider from Wills was to be on a pre-production prototype in early September. It was a pleasant, mildly soarable day at Hensen Gap NW (a Tennessee Tree Topper site). I was to take a flight on a factory Raven 229, while observing Rob Kells and George Whitehill as they flew two Harriers. Whitehill was taking his first flight.

So here I was at a home site, in a 229 (square foot) glider that I knew well. It has a marvelous sink rate, better than most ships I had flown alongside lately. Yet I was struggling, working every little micro-thermal that filtered up slope, just to stay even with the Harriers. They seem un-cuffed, able to scant around with ease, tapping the energy of one of those bullet thermals to zoom up with me, then striking off for a distant point again. Of course, Rob and George are rather skilled pilots, both flying today in practice for the '80 Nationals, for which they had qualified. Still . . .

After an hour, George flew in closer and hollered, "Want to fly this thing?" How had he yelled that so loudly in the sweeping wind? Or was I just extra attentive for that question? I knew I was slated to get a ride on the orange and white ship that Whitehill flew first. To make sure he was heard, I shouted "Yes!" at the top of my lungs. We headed for the landing area.







Prior to my launch I had been gathering pointers from the two Regional winners. I was a bit nervous. Not only a new hot ship, but I wanted to do a good job while flying near these two and about fifteen other local pilots.

The prototype had somewhat loose side wires, a factor changed to snug cables on production models. But I had flown the Comet, and had figured out how to deal with slack rigging. The launch went well in spite of my butterflies. I turned immediately in the light ridge air, and in that first maneuver discovered something. Transition from a Raven to a Harrier is no more difficult than climbing from a Cessna 172 to a Cessna 182 (nearly the same flight characteristics). This became a better analogy as I spun a 180; turning south down the ridge. I was moving much faster than a Raven prefers, and climbing out as though the Harrier had an engine attached. I nearly looked to see if this might be the case. Unbelieveable climb was felt in air that was 8-10 mph with a 40-degree cross.

The handling was better than I expected. Credit must be recognized for the designers of today as they have made high performance, double-surfaced gliders handle very nearly as well as the more slack sailed floaters of a year earlier. I just had not expected it. Here I was, five minutes into the flight, and I felt like I had hours on the Harrier. Still, there's much to discover. I must grab a thermal and see how it reacts.

CONTROL

The Harrier does not quite measure up to the Raven in ease of roll, but has so much authority in roll that it is a comparable sensation. As with the Comet, handling is remarkably good for so tight a sail, also double-surfaced. Adverse yaw in both ships is more noticeable than on floaters. A trade off is good stable tracking at all speeds. The Harrier is more solid in roll than the Comet due, I believe, to the tighter side wires. Both ships have about the same roll rate, which is quite rapid.

In pitch the 130 nose angle of the Harrier, and the differences in double-surfacing give the Harrier light pressures throughout the speed range, and the Harrier has little stiffness at slow speeds. Pitch and roll coupling at zero sink are superior to most other state-of-the-art designs.

PERFORMANCE

This quality is usually the apple of the buyer's eye. But it must be said that current technology is not really creating more total performance than was available in the recent past, but more useable performance. In that good handling is retained while the performance was boosted, it can be said that a net increase was effected.

Glide angle shows a half point gain over any ragwing ships flying prior to summer 1980. But as with the Comet, this increase is most obvious at high twenties airspeeds. Flying at this speed is very comfortable and productive from a performance standpoint.

The Harrier's twelve-square-foot advantage over the Comet, and again, subtle differences in double surfaces, nose angles and perhaps cambering, give the Harrier an edge in sink rate. This is slight enough, however, to make comparisons difficult.

PILOT REPORT

The table is turned on top end where the Comet comes out ahead, very likely due to the same reasons that the Harrier could win the sink rate contest. Low speed performances are about the same, except that the Harrier offers crisper handling at the bottom end. It may also accelerate quicker, though once again, the closeness of the two gliders makes for harder evaluating.

STALL

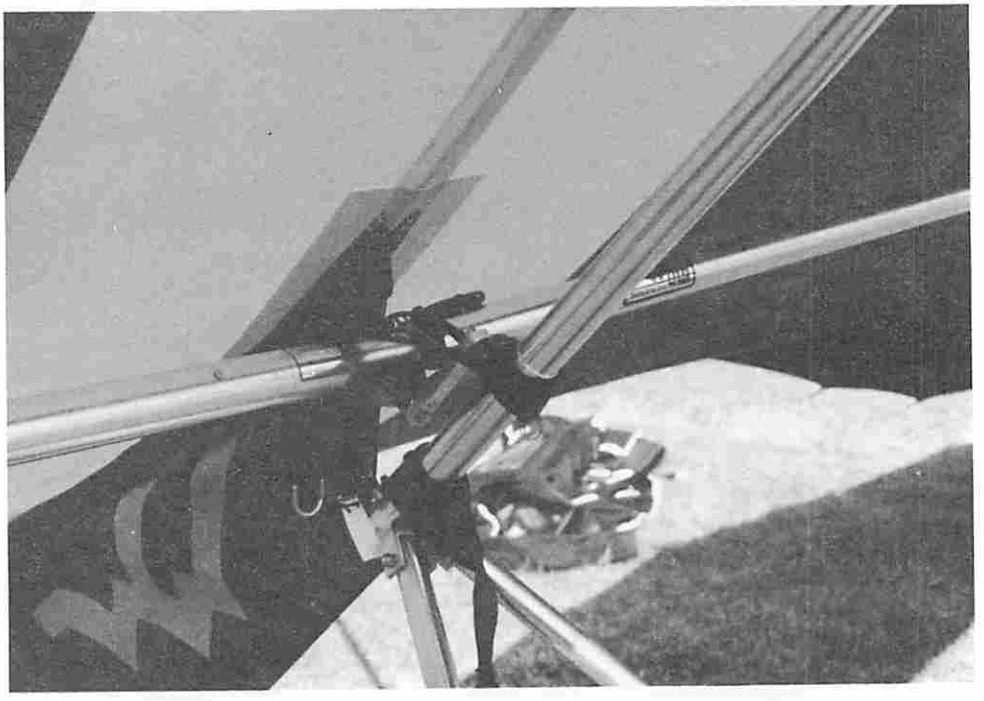
In this area, the Harrier is probably superior to the Raven, as the break from faster speed stalls is not so sharp. This is true even from quite high airspeeds with sudden and full toward bar trend. At low airspeeds, as with the Comet, it is difficult to full stall the Harrier without very rapid bar movement. This encourages me to use the slower speed approach to a landing which I prefer.

LAUNCH AND LANDING

As I said, I have only had a single sled run on the Harrier, so I have only that experience at running off with the glider. Because of the ease of shift in the crossbar and sail, you need to be steady on the start of your run. But the control is not nearly so demanding as the Comet, again due to the snug versus slack side wires. In soarable air, the Harrier behaves as a proper glider should, inflating quickly, due to its nearly inflated sail even at rest.

Landing is considered difficult on both Harriers and Comets, if we can judge by about six pilots with experience in each glider. I questioned them on several occasions to find that the primary reason for landing problems relate to in ground effect glide, and the uncertainty as to exactly when the full flare the crafts. Then, too, if your flare is not sustained long enough the nose can fall through more easily.

For my own feelings, I found the Harrier and Comet to have similar qualities though I had different experiences. I had been told the Harrier was tough to land. So I was quite " psyched up" for that phase of flight.



It went very well. I had been told the Comet was easy to land. Yet on the first three landings I nosed over rather hard, one time even bending a downtube slightly. In retrospect I feel both land alike and the explanation of my differing performances was concentration, or the lack of it. Inticipating the landing by working hard on a good ending has caused a series of satisfactory, if not perfect, touchdowns. Obviously, the Harrier does not parachute very efficiently.

GROUND HANDLING

The Harrier is moderately heavy compared to all gliders I have flown, although typical of very late model, high performance craft. But it offers very good static balance to offset the weight. Only one reason makes the Harrier harder to ground handle and this could easily affect take-off in places where a long run is required. The control bar is quite tall. For me, the base tube only has six or eight inches of clearance and though I have never stumbled, it is only because I consider the situation. However, the snug wires and balanced weight make the Harrier easier to ground handle than the Comet.

SET-UP—TAKE-DOWN

All the new state-of-the-art machines of today take longer to assemble than earlier ships. This is due to more battens, tighter bungie fasteners, crossbar installation, and in the case of the Harrier, I find it hard to reach the nose for insertion of the nose batten. This is due to the tall control bar and the wide nose angle.

TANDEMING AND TOWING THE HARRIER

Exploring a couple areas left untouched by the factory, we looked at two other ways to fly Harriers. Gary Englehardt, flight school director at Crystal, has been doing quite a bit of tandem flying on a Raven 229. He chose to try the Harrier on a flight with his lady friend, Patty Wilson. Gary tips the scales at 195, Patty at 115 in winter clothing, plus instruments and bag. Gross weight was 375 pounds. Gary reported that the roll pressures remained acceptably light, however, an increase in adverse yaw tendency was present, especially when rolling out to bank the opposite way. The bar was rather narrow for adequate tandem control motion, more narrow than on a Raven. In air performance did not degrade significantly. Another pilot, local expert Chris Smith, reported that the trailing edge curve (washout) remained the same as when Gary soloes the same ship.

Floridian Campbell Bowen is a deeply experienced tow pilot. He flew Tom Phillips' Harrier with Emerson-Bailey tow bar in December 1980. His reports were very encouraging on towing the Harrier. . Specifically he had three comments on Harrier tow characteristics.

Bowen says the craft tracks very straight, as opposed to the Raven for example. He amplified that by saying that the Harrier yaws around the rope, and "doesn't seem to care where the nose points." Further Campbell said the Harrier can outfly the boat in 15-20 m.p.h. winds, as estimated that day by white cap formation. His only other comments were about off tow qualities: "Excellent."

But the Harrier gains points over the Comet here due to four less battens (it has no double surface battens on the bottom sail) and the lack of several velcro closures which are part of the process involved in enclosing the Comet's crossbar. As with the UP glider, the Harrier sets up on the control bar, which I prefer to ground based set ups (or on-the-nose set ups) like the Mega or Atlas.

FRAME AND SAIL FINISH

The Harrier has received extensive attention to frame finish, and in my opinion, generally betters even the smoothness found on the Comet. Several pilots in the Chattanooga area have chosen the Harrier due to the sheer bruteness of the airframe. The only factor that gets an upturned eyebrow is the use of a tensioner on the lower riggin. This is just another example, perhaps, of how we cling to "the way things used to be."

While much of the above has been perceived on a series of Harrier soaring flights (I've had a single sled ride), that first hour and five minutes was perhaps most satisfying. I was so new to the ship, yet so relaxed. I'll finish that flight now.

Of the flock of local pilots soaring, perhaps 22 by now, I didn't count, I was powering up and past the field at will with two exceptions; the team of Patty Bentz on a Raven 179 and Danny Haldeman, who was flying the other prototype Harrier. Patty is a skilled pilot who is always near or at the top

of the pack. Today was no exception. And Denny's flying on the Harrier was similar to mine. We would both rise up through the ranks to where Patty was perched. A distant point would intrigue us or things just felt like some wingovers back down to the ridge. Then back up . . . and down . . . and up, anytime we wanted.

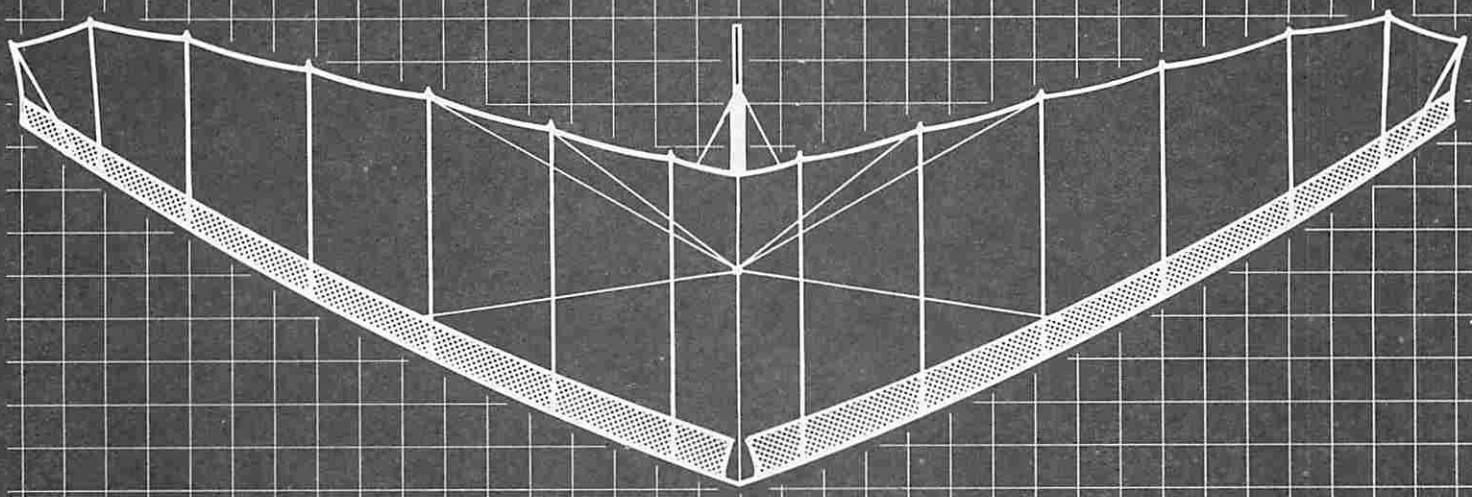
Finally as the light began to fail, the lift weakened, and the crosswind angle began to increase. Many pilots planned their exit and left for the two landing fields, Denny in the other Harrier among them. The thermal lift gone, the ridge lift dissipating, we all clung closer to the rocky face of the cliff. A tiny bowl 200 yards to the right of launch faced directly into the 70 north cross. On short, quarter mile ridge runs, we could all experience a slight boost at that point.

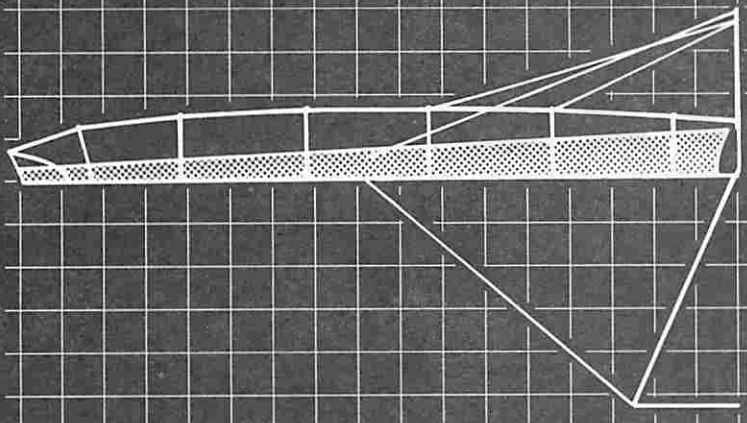
The Harrier sail is built entirely of 5.3 ounce cloth with abundant use of "doublers," which are nine-ounce cloth. When the sail is fully stretched by the tension of the crossbar assembly, the wing is drum tight. The leading edge is reinforced with a thick mil mylar and is sewn to close up the usual openings of a leading edge (as is the Comet sail). Sail craftsmanship is even above that seen on a Raven.

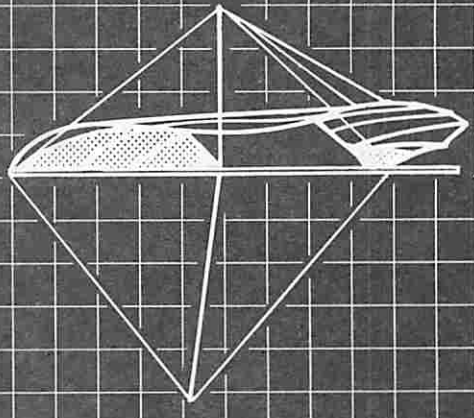
PURCHASE FACTORS

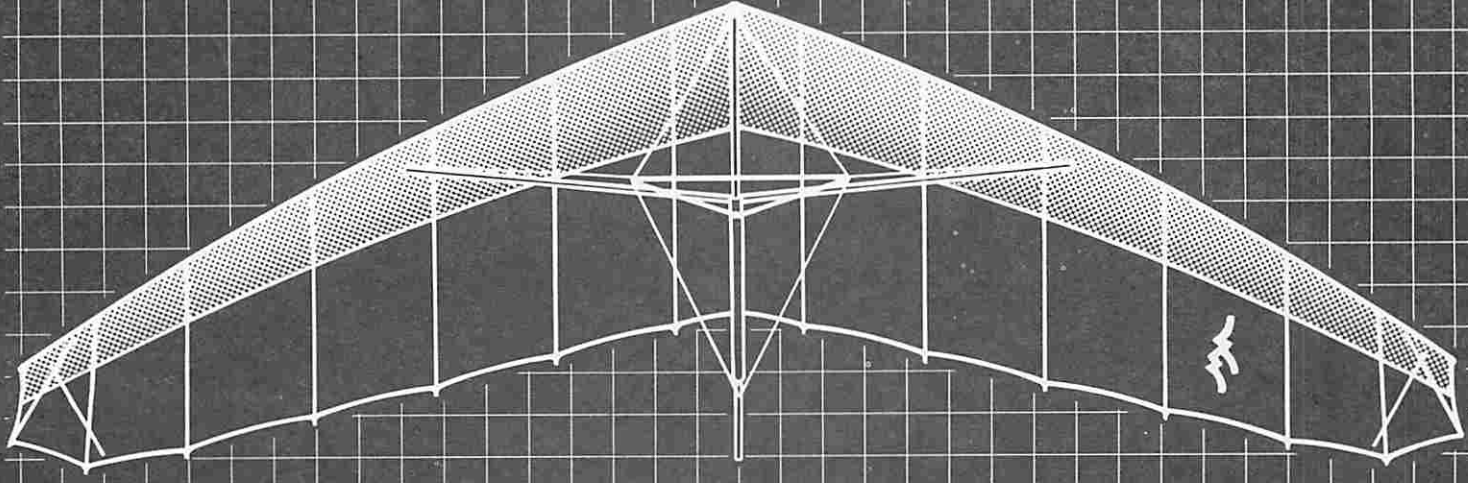
The Harrier is the most reasonably priced supership available in early 1981, at a retail of $1,675. This means that not only will you take less of a beating in purchasing your Harrier, but that you expect satisfying ramifications when the time comes to resell your Harrier. The two-thousand-dollar gliders of mid-1980 were selling for $1,200-$1,400 in late 1980, representing a 60 to 80 percent depreciation within only six to eight months. The Harrier should not have so much immediate loss.

harrier









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"MOYES MAGIC"

"AEROBATICS"

"EAT MY VORTEX"

These are exciting, full color, hand silkscreen printed designs; not rubbery iron-ons! All shirts are U.S. made, heavyweight, 50-50 blend fabric.

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AN INTERVIEW WITH DICK TURNER

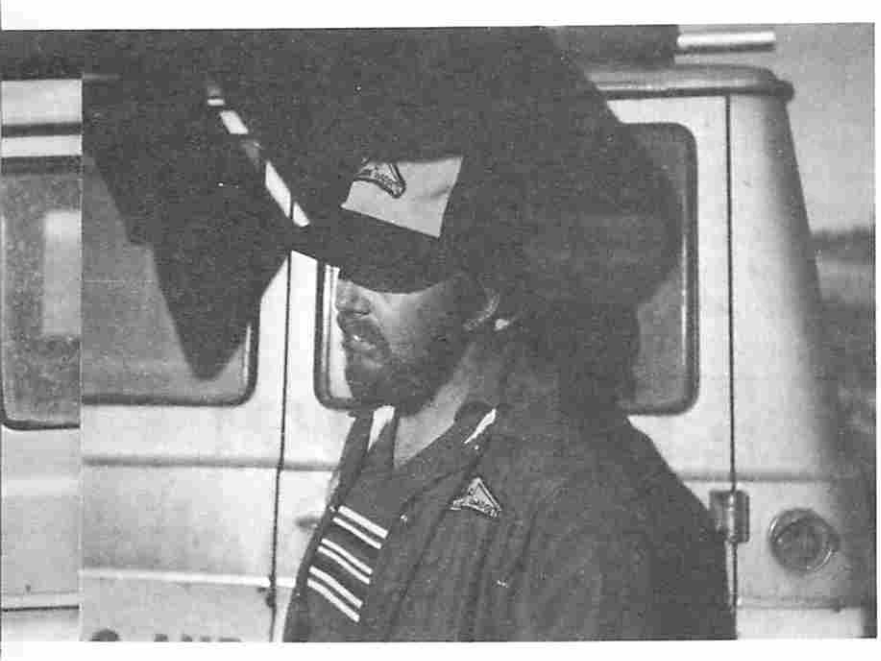
"In the eyes of its membership, an organization is expected to lead, guide, and administer. It is expected to be knowledgeable and support the many and varied causes of its membership. At times one could almost liken it to, "I paid my dues, and want to let George do the work," or, "Let the organization save us." This is really not enough. The success of any organization depends on several things — leadership, whether it be at the international, national or chapter level, the recommendations of the leadership being weighed on the minds of its members and the members participating in making changes for the welfare of all."

PAUL H. POBEREZNEY,
President, EAA

By STARR TAYS

The quote by Mr. Poberezney seemed a very proper way to start an interview with a spokesperson from **our** national organization, the USHGA.

That spokesperson is Dick Turner. Aside from his duties at USHGA (he is both a Regional Director for Region 6 and an Executive Committee member), he is an active flyer and owns a glider retail shop in Kansas City.



★ — Why did you want to become involved with the USHGA, Dick?

D — When I first became involved as a Regional Director 2½ years ago, I, coming from the flatlands of Kansas, thought they were a "west coast" organization, a sentiment I'm sure is shared by many others even today. I thought they couldn't be responsive to the needs of the entire country. I wanted to get involved to make sure our presence in Kansas was felt.

★ — Once you started attending USHGA meetings did your feelings about them change?

D — Yes, drastically. For one thing, to go and represent your sector costs money. The organization, as old as it is, still functions off of volunteer directors. I make no money.

The organization is still a labor of love for all involved. You have to **want** to be involved.

Another thing I realized was that the people in USHGA have a much broader view and scope on the whole realm of hang gliding. The organization **has** to look out for hang glider pilots from Maine to California. It is in their best interest, as an organization who is being watched closely by the FAA, to do so. By this thinking we can remain a self-regulated agency much longer. This is one reason we have become affiliated with motorized ultralights.

Some pilots think the USHGA is a really large organization which they cannot relate to. But it isn't really. Of course it has grown as the sport has, but we still only have 10,000 registered members.

★ — How does that compare with the total number of people who are flying hang gliders in the U.S.?

D — That's a hard one to get a handle on — how many pilots there really are. Different numbers keep floating by from the manufacturers and different consumer groups. The number we hear most often is 25,000. But that number doesn't accurately represent the dedicated pilots; meaning those that stay **actively** involved throughout a given year.

One thing is for sure, the more pilots the FAA thinks we have the better. It would be harder for them to impose a harsh or unusual injunction against us if they thought they would receive 25,000 letters of protest for doing so.

★ — What kind of growth rate does USHGA have?

D — It is currently holding at 3-4 percent which has been steady for many years. A lot of new people are getting into the sport, subsequently, they show up on our membership roster but, you don't notice that half again as many are dropping out. We don't really expect this situation to change much. This ought to quell the fears of those who wonder if there will be room to fly soon. Besides we have found here at our local club in Kansas City that the more people that join, the more new sites we open.

★ — Speaking of local clubs brings to mind something I heard asked once and that was, "Why should I actively support a local and national organization?" which I thought to be a cogent question. Can you comment?

D — Something we did for your local and our chapter club, the Tennessee Tree Toppers is one example of why one should join both. Up until now it has been unpublicized but we as a national organization helped you obtain your SW site in Sequatchie Valley.

★ — How did you do that?

D — We helped you get a million dollar insurance policy which the landowner asked that you have, before the site could be flown. Sequatchie SW was an unusually large policy though, we usually only insure for $500,000. The USGHA has helped open 121 sites across the nation by procuring such insurance policies.

★ — Does USHGA make any money off of the insurance policy and the arrangement thereof?

D — No, other than what paperwork we charge for, the service is free when you join the USHGA.

★ — How does USHGA define the position of Regional Director?

D — They expect them to be a clearing house and to dissiminate information coming from USHGA. Each director should be in touch with what's going on in their particular area and what their pilots' problems and opinions are. Some local problems can become national problems and vice versa, so we need to be aware of **all** problems.

★ — Who, if anyone, helped you get organized as an organization?

D — When hang gliding and USHGA were first getting started, people were "crashing and burning" everywhere, people needed help.

The most likely organization to have helped us, the way we are the most likely candidates to help the motorized people, was the SSA (Soaring Society of America). We asked them for help . . . but they wouldn't help us. They were only interested in sailplane sports, and didn't have that high of an opinion of someone who **jumped** off a mountain.

There was so much to learn, and still is, and no one to be a guiding hand. How many people got hurt running off a cliff in a downwind before we figured out you **don't** run off in a downwind.

USHGA is definitely from the school of hard knocks.

★ — Are you getting organized among yourselves? I mean, do the Regional Directors work closely with the Executive Committee members or is their still a communication gap?

D — Yes. Our biggest problem is getting the pilots to communicate with their Directors. It is mush easier and faster for you to call them with your comments or problems rather than waiting for them to second-guess what is on your mind. Also, some of our Directors have such large areas, geographically speaking, that it is hard for them to keep in touch with everything and everyone.

We try to use the magazine (Hang Gliding) as a vehicle for communication, but as you know in news publishing when you deal with a 2-month lead time in publication, many things that are relevant now will not be as relevant at the time of publishing.

★ — I would like to go on to the subject everyone has an opinion on or has wondered about: How closely involved is the FAA with hang gliding and/or USHGA?

D — The FAA has been watching us for a long time. The only advisary issued so far is 6010, which says they will advise us and help us, generally keep an eye on us.

With the invention of the powered ultralight several years ago, they issued a directive saying the ultralights must fly by FAR, part 91, which is the flight rules. They have been "promising" us for some time that they were going to issue a MPRN, which is a notice for rule change involving both hang gliding and powered ultralights. tralights.

"USHGA is definitely from the school of hard knocks."

It hasn't been issued yet because the FAA has been busy with other problems, such as airplanes running into each other. It looks like it may be just around the corner though.

★ — Do you have any idea what this MPRN will change about our present structure?

D — The FAA hasn't really said anything specific, just generalties. Everything they have been coming up with involves only powered ultralights. But the last time, we, as an organization, had contact with them they were looking at hang gliding and powered ultralights as the same animal. That is why USHGA is watching that phase of the sport so closely, until they can get organized and branch away into their own form of self-regulation.

Until such time, we must help monitor their activity, so if, the FAA imposes a rule which was made explicitly for powered crafts, we won't be affected merely through association. Although both machines fly and use some of the same technologies, the same exact rules do not necessarily apply to them both.

★ — One question posed by a friend recently seemed an appropriate one to ask you. It was, "Since you are our sports watchdog and therefore must be monitoring HGMA activity, how do you rationalize them certifying a known divergent glider and not certifying a European glider design such as the Atlas, which isn't known to be divergent?" Where is the fairness?

D — If you tried to certify that same divergent glider today, it wouldn't happen. It passed or was certified according to yesterday's standard of measure. Like I said before our sport is still evolving. The more we learn the better and safer our designs become.

The Atlas was not excluded from certification because it was from Europe. There is a list of compliances that **any** machine must meet in order to be certified.

Also, please remember that the HGMA and the USHGA are two separate entities.

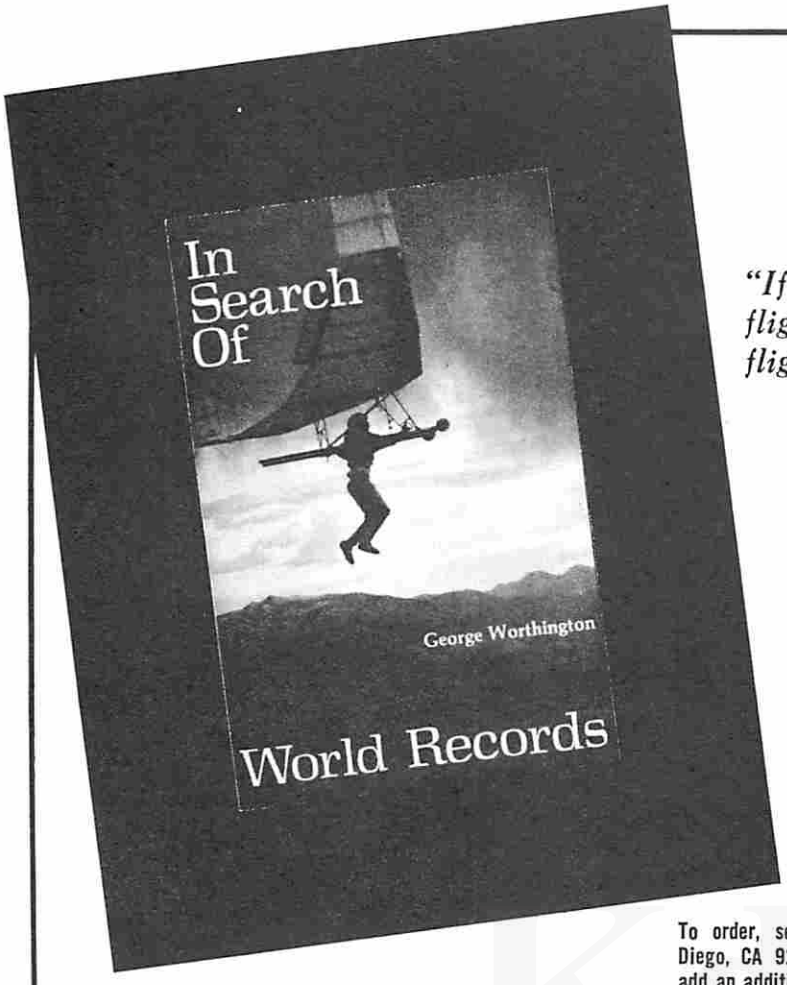
★ — Yes, but you as our "mother" organization concerned with our safety must be involved with them somewhat.

D — When we know a controversial certification is being reviewed by the HGMA, such as the Atlas, we send a representative of USHGA to the meeting. In fact, I was present at the Atlas certification meeting. In this particular case the HGMA had a question about their test results and asked them to re-test and re-apply. The manufacturers of the Atlas didn't do this, and the last word I heard on it was that they were selling so many of their gliders in Europe they didn't necessarily care that it was certified in the U.S.

★ — Dick, one final question. What do you see in the future for hang gliding?

D — Hang gliding is such a fledgling sport that we will be learning things for many years to come, in organizational abilities and in glider design and piloting abilities. I don't think any of us have come close to the state-of-the-art that we will evolve to.

★ — Thank you, Dick.



IN SEARCH OF WORLD RECORDS

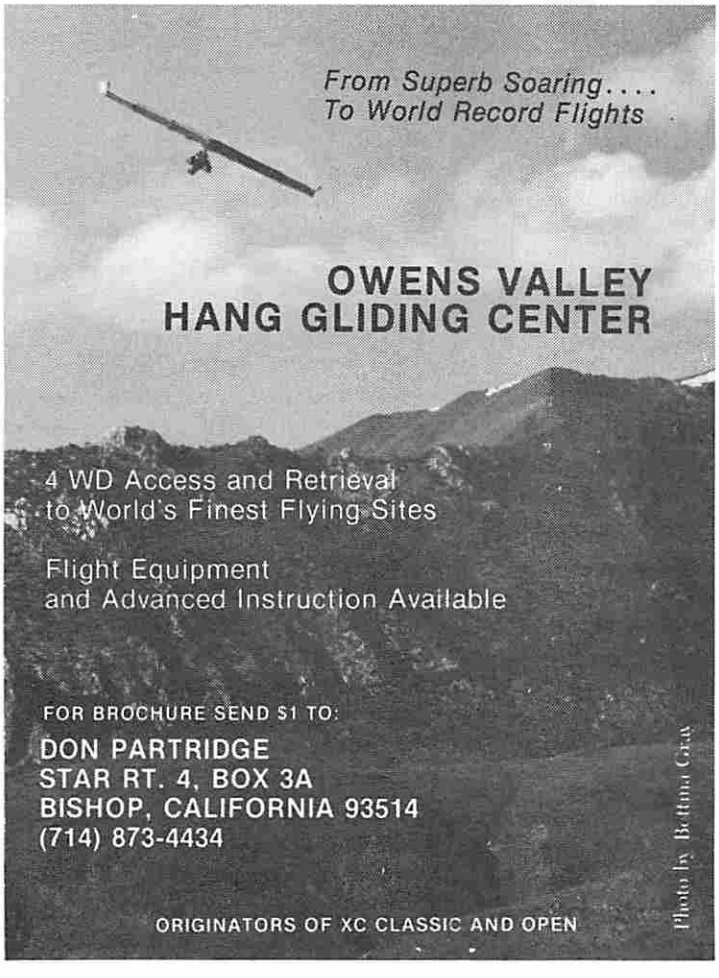
"If any of man's known modes of motorless flight can be said to most approximate the flight of birds, it is hang gliding."

On July 22, 23 and 25, 1980, George Worthington, author of a new book entitled **"In Search of World Records,"** set three new world hang gliding records.

The three records were, in order of being set, altitude gain of 8,500 feet in a fixed-wing hang glider called a Mitchell Wing, a 105-mile straight distance record in the same craft, and an 111-mile straight distance record in a flex-wing hang glider called a Moyes Mega.

Consequently, again in the years 1977 and 1978, Worthington holds all the available male world records.

To order, send check or money order to Hang Gliding Press, Box 22522-H, San Diego, CA 92122. Prices are $9.95 for soft cover and $12.95 for hard cover. Please add an additional $1.50 for postage and mailing.



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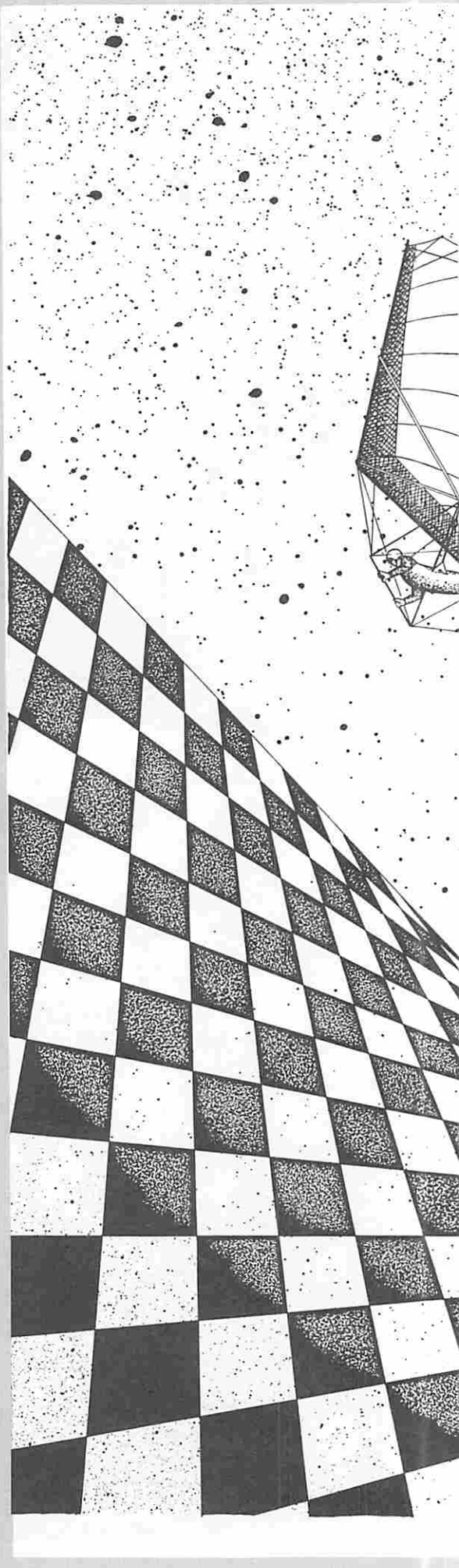


By Dan Johnson

Four-inch-thick Funk & Wagnall's dictionary defines Sim-u-la-tor as "(a device which has) the appearance or form of (realness) without the reality."

At Crystal Flight Resort, in Chattanooga, a simulator is now situated or rather superimposed over the primary training hill. This contraption can deliver 25 seconds of intense experience in very real flight to a person so un-initiated that they may never have seen a hang glider before. It begins with a launch some 110 feet above the landing zone, and about 700 feet back upslope. A 30-foot-long launch ramp terminates 20 feet above ground and within 10 seconds of flight the student finds himself or herself 60 feet off the surface.

On the first flight of the lesson, it is common for the student to partially or fully stall the glider. Just like with the real McCoy, the nose falls thru having a need for airspeed. But reality is interrupted, as the craft and would-be pilot are saved from a severe nose-in by the track cable, like a father"s strong arm rescues a stumbling child.

As the student approaches the landing area, an instructor provides reassurances over a bull horn, and helps prepare the pilot for the landing phase.

"Everything looks good, you're completely in control."

Or, if after a stall, "Don't worry, nothing can go wrong, prepare to land."

"Start slowing the glider by pushing forward gently on the bar."

The instructor, though, is more an educator than saviour, as reality is still suspended. Whether the pilot effects proper control only matters in the learning process of the student. Regardless, the glider will flare smoothly and convincingly, placing the pilot on his or her feet in the landing zone, which is a foot deep of amazingly soft sawdust.

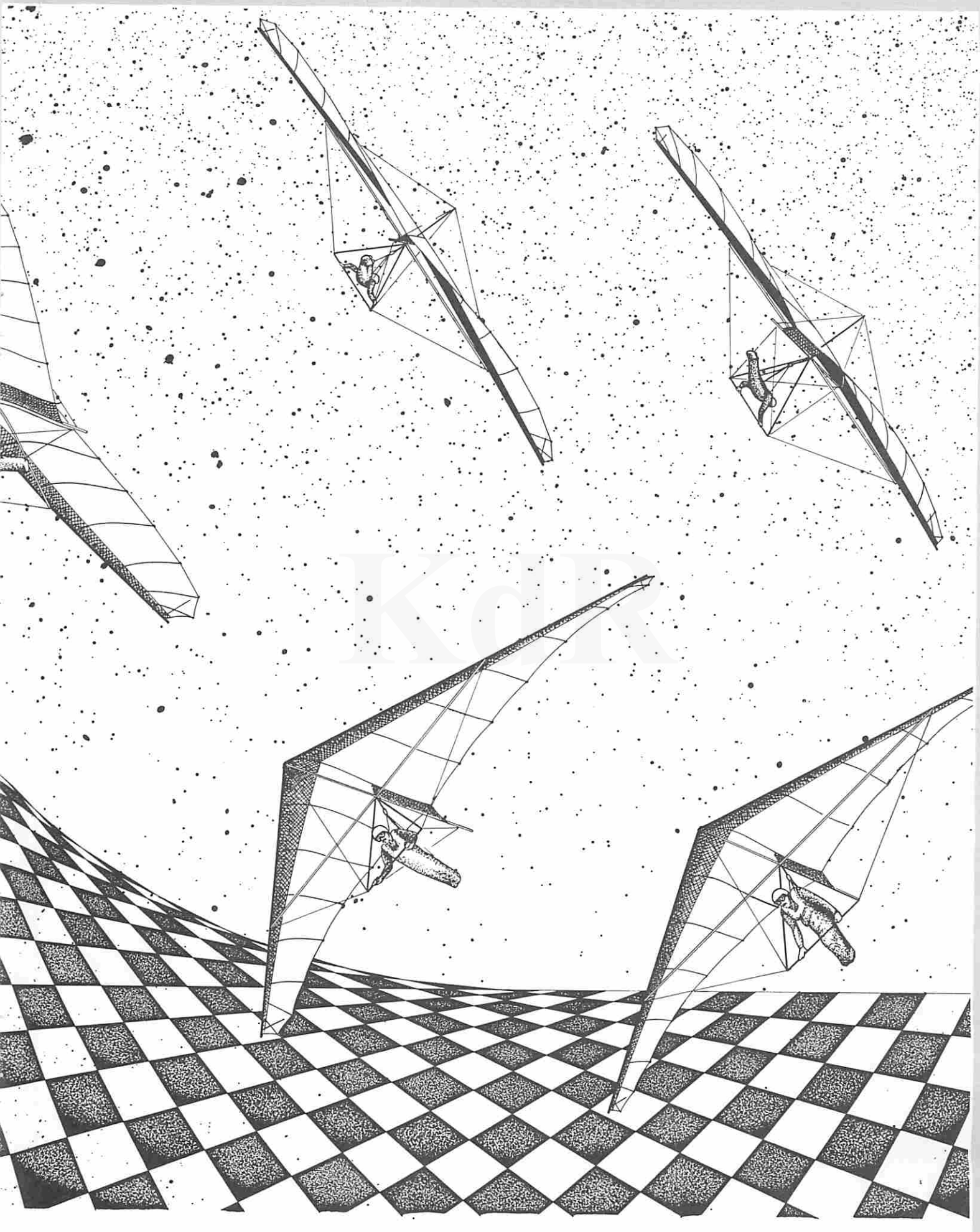
So far, the reaction has been unanimous from 60 persons who have flown the Simulator, "That was **really** fun!!" Others have said, "I can't believe I really flew like that," or "So that's what it's like . . . that wasn't scary." And in the case of experienced pilots, "This thing is absolutely amazing!"

In several situations the student could not fully recall all that had just happened. We do not find this unusual as the same effect is common for early flights from our training hill.. However, it is far less disconcerting when a student "blanks out" on the Simulator than when free-flying, as the results are never disastrous.

ORIGINAL THINKING

The idea for a cable-supported hang glider is not new, nor was it original with myself and Crystal's other partner, Tom Phillips. While I remember having the idea prior to being inspired by the dreams of other businessmen, and before a drawing appeared in the summer 1974 issue of **Hang Glider,** I will not claim to have first discovered the idea.

But, largely due to the inventive efforts of Phillips, the first and only full environment cable-supported simulator is now in operation to the public. The invention is also written up and documented in a package which today rests on the desk of a Washington, D. C., patent firm. A function patent is expected following the customary patent search.



SAFETY FIRST

The equipment is really very simple, though our first notions were enough incorrect that nearly every component of the system has been changed to assure excess strength, more fluid operation, and so that all loopholes in the safe operations were closed up. At this point we say it is 95 percent safe, leaving five percent to the unforseen possibility that someone will somehow discover some way to endanger themselves. However, to offset even this chance, a minimum of two certified instructors are employed.

Crystal's Simulator has been test flown in a wide range of exploratory methods. Simplest, yet most encouraging, is an effort where the test pilot nudges the glider to begin a flight, then removing his hands from the bar, just trotting along to stay with it. In flight, no directional control is used, and this continues till the pilot has his feet on the ground. Zero pilot input required. Evaluation flights have been done in 25-mile-an-hour, 90 degree crosswinds, downwind, zero wind, and as a gust front approached. The result is satisfyingly the same, though downwind landings are faster, as you might expect.

The glider has been violently whip stalled within 40 feet of the ground. Even when a tail slide developed, no impact occurred. Further the glider has been moved to the departure end of the launch ramp, where the test pilot pushed out as far as possible. From there the pilot merely stepped off, in other words, maximizing the take off error. Results: uneventful. Launches have also been made 90 degrees sideways, which then turned backwards in zero airspeed. Pulling in on the bar brings about an increase in speed and subsequent straightening of the glider, resulting in normal flight.

REALITY MAINTAINED

Above are the incorrect applications. But, just like a modern free-flying ship, the cable supported glider works best when flown in the correct manner. We are pleased to say that a knowledgable student who tries his or her best can expect to genuinely fly the glider, while being able to perform perfect launches, turn applications (limited, of course, by cable travel), even stall recoveries and flares to full stall, feet down landings.

All this is possible without interference from the track cable. Of the 200 yards of flight, easily 100 yards can be flown with the cable unloaded. This means that the glider is providing enough lift to truly fly, the bridle and transport pulley trailing along behind and the track cable floating overhead. On days with the wind from the right direction, an experienced pilot can easily fly the glider right up into the track cable.

DESIGN CRITERIA

At each end of the flight, however, the glider is "on the cable." This is so as the craft (a Swallowtail vintage) precisely matches the performance dictates of the cable's angle, length and height. The importance of this combination is insurmountable. An attempt with a later design (Wills SST) failed miserably. Engineering is underway to define cable angles, lengths and glider performances of any dimensions, which could fit virtually any description of site.

The idea was to create a system which could permit all ranges of flying needs, from those who "just want a ride," to the sincere student. For the latter, the Simulator is used first to inspire and further enhance anticipation, later for a form of reward, and most importantly, to permit close contact training (student within eyesight and earshot of the instructor) in such regimes as launch control, roll control, stall recognition and recovery, and flare timing. The Simulator is best used in a program of intermeshed training with free flight. It has also been used with excellent results for beginning powered ultralight students, those planning on flying weight shift crafts, but who have had no experience in hang gliders.

ACTUAL PRACTICE

The Simulator is used as a training device, not a thrill ride. Just as with conventional hang gliding, adequate excitement is already present, so that our concern is one of a desire to educate the general public to hang gliding as a reasonable activity in which to participate. Whether the student is a "tourist" seeking exposure to determine "what all the talk is about," or a prospective pilot bent on learning how to fly, the Simulator provides a safe alternate to hours of ground schooling followed by flights of extremely short duration from shallow slopes and at a very reasonable cost. But the first flight is nonetheless a lesson.

For the tourist, the experience is long enough to describe some of the beauty and thrill of hang gliding, yet safe enough so the rigors of training can be by-passed, all at an expense the tourist will spend. The result is the tourist leaves Crystal with a healthy view of the sport, some real experience, and a mental attitude that understands why we do "jump from mountains."

For the student, immediate gratification is found for someone contemplating learning to fly. In addition, the educational process is begun on an exciting, yet safe, plateau. Self-discipline is still mandatory, of course, to develop proper free flying skills, but the Simulator is more a learning accelerator than a "crutch."

SUMMARY

We are about as excited over this revolutionary development as we can stand to be. We have always wanted but never had the ability to do what is possible with the Simulator. We continue to learn and amass information.

Extended wear testing, further experiences with all ranges (and sizes) of students or tourists, and investigations into systems of other dimensions, are goals we want to accomplish prior to marketing the Simulator to flight schools and other businesses which have expressed strong interests. These tasks are expected to be finalized by mid-1981.

Students wishing to avail themselves or friends of Simulator experience are invited to contact:

Crystal Flight Resort,
Route 4, Cummings Highway,
Chattanooga, TN 37409,
(615) 825-1995, 9-4.

Flight schools and other interested businesses should forward their intentions for employing a Simulator, with a brief resume, to:

SIMULATOR,
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LOCKED OUT!

by Mike Pleskovich

It's windy. The pop-off seemed a little hot, but signals were read, corrections were made, and the glider is now climbing smoothly. A second flight correction becomes necessary as the glider drifts to the right, and the pilot eases his body to the left. The glider seems to cock to the right as it continues to climb, and the pilot now pulls in and forces his feet to the left more aggressively. He strains to hold his awkward position while the left wing arcs to vertical seeking the path of right turn, the pull of the rope redirects and accelerates all motion earthward. The boat stops, but the pilot is falling to the wrong side of the control bar, and the entire situation succumbs to the whim of gravity.

CAUSES

Lockouts are common and occur frequently although they are not typically as severe and complete as in the above example. Any kite will lock out if it is allowed to stray even a short distance to either side of the boat's wake, regardless of conditions. But a sure-fire formula for inducing these phenomena involves towing a tight-sailed, high aspect, short-keeled kite nose high into strong gusty, cross-wind conditions.

DEFENSES

Most lockouts are not at all serious and can be corrected by the pilot, alone. An alert pilot will immediately react to the perception of any lateral acceleration by first pulling in forcefully to get the nose down (i.e. more control) then kicking his feet to the appropriate side opposite the direction of the lockout, almost simultaneously. This is actually a quite normal response, but it must be done vigorously and without delay. To be safe, a good pilot will also spread his legs signalling the boat driver to slow down. The driver can then turn in the direction of the lockout in order to facilitate the slackening of the rope as well as the probability of recovery. But if all these steps are not taken within seconds, it is usually advisable for the pilot to release.

A serious lockout is one close to the surface or one in which the keel has reached a position beyond forty-five degrees of vertical. After that, forces become tremendous and have reportedly jammed release mechanisms because of the abnormal (sideways) direction of the resultant pressures. At this point, a static line must be released by the pin-man in the boat. When using a long (1000 feet+ rope in windy conditions, its weight and drag through the water will continue to aggravate the lockout, but the overall reduction in tension should be enough to return the kite's releases to working order. A new approach to this dilemma involves a release which swivels to open toward any direction of pull, developed by Bobby Bailey of Leesburg, Florida.

THE WINCH

Many believe that a winch system eliminates lockouts. If it is working properly and operated wisely, this may be so. But remember that during pop-offs, the winch is manually held immobile. To aid a bad start, the winch operator must shift his lever to the free wheeling position while the pilot and boat driver take the same evasive steps described earlier. Drag and weight of the rope should not enter into this scenario because, customarily, only about 200 feet of rope are payed out for a winch-start.

Obviously, when greater lengths are permitted, these factors return into play. Now, add to this the drag of a "freewheeling" winch—however minimal—and we're back in trouble. Like a fishing reel, winches occasionally backlash or allow the rope to "sink in" and snag when wound too loosely. Then the only way the rope can be "pinned" is with a knife.

POINTS TO REMEMBER

In conclusion, lockouts are going to happen. They can be aggravated by misinterpretation and panic, or minimized through preparedness and understanding, but they must be respected. Of the numerous precautions which might be suggested for safe towing, the following are felt to be particularily pertinent toward preventing serious lockouts:

1. Fly with experienced crews only.
2. Avoid severe conditions.
3. Avoid towing over land or near obstacles.
4. Practice gentle pop-offs, nose low.
5. Be alert to abrupt changes/signals.
6. Stay within the bounds of the wake.
7. Release quickly when recovery seems unlikely.
8. Use a swivel-type release.
9. Use a well-maintained winch.
10. Keep a knife handy in the boat.

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We still wish to invite all dealerships who realize the value of advertising to send in their names and information, for the Directory to place in front of our thousands of readers. Many of these pilots have told us that they didn't know such and so dealership sold a brand in which they were interested. Others found a place to take lessons much closer to home than they thought possible. All in all, the Directory is a top reference source, and none others like it exist.

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PRODUCT LINES

CHATTANOOGA TN --- As I write this, the wind howls, the rain falls, and the weatherman is warning of a major snowfall throughout much of the country. How can this be a season opener issue, then? Hmmmm, betcha its only the blink of an eye before we hear griping about the heat. Well that'll mean more thermals, anyway, and it's coming soon enough. Among things shaping up is a confrontation between pilots who care and the FAA bureaucratic machine, as the Fed plans to issue its NPRM (Notice of Proposed Rule Making). It sounds like the long awaited document will not, I repeat not, differentiate between non-powered and powered. Whose fault is it that the FAA is breathing down our back? Who cares? Just get ready to reply. NPRMs have been shot down when the response was solid enough. That doesn't mean a bunch of "hate letters", but reasoned replies as to why such rule making should not be enacted. You get to choose for yourself. It's the American Way. Up New England way, Tom Peghiny has been calling in developments on his new company, Flight Unlimited, an Odyssey, Inc., subsidiary. Lotsa good things underway. First is news from abroad as Odyssey gets involved with Pacific Kites of New Zealand. Marty Waller, one of the company's new owners (a four man team actually), says they acquired the firm from Rick Poynter. Their first offering is the classy Vampire (see cover of January Hang Gliding). We reported this would be marketed in the US by Flight Designs, but the powers that be say "Odyssey" instead. This ship looked to many, who saw and compared it at the 1980 Cup, to be true state-of-the-art, even when contrasted with Comets, Harriers, Vipers, ASG-23's, and Demons. Parent company, Odyssey is moving southward, where it will share near-addresses with Peghiny's Flight Unlimited. The new location is within five miles of two excellent ridge sites. Odyssey's got a new cocoon called the Cross-Country, a prone harness featuring an integrated, streamlined, parachute and ballast container system, with optional internal glider bag storage. Jeff Burnett will join the flight conglomerate as national sales rep., and competition team leader. Flight Unlimited is located at Pilgrim Airport, near the U of Mass., Amherst. Find it on your New York sectional. The airport has a 3,000 foot turf runway facing east/west. They've also gotten a 5,000 square foot hangar out of the deal. Flight Unlimited will do HGMA work for Odyssey on the Vampire but the heart of the new firm is Peghiny's new ultralight. Tom's finally chosen the name Cyclone for his conventional pusher monoplane. It features powerful three axis control, with true STOL (short take off and landing) capabilities. 32 foot span, aspect ratio of 8.5, full flying T-type tail (just like on latest model aircraft), Xenoah 20 horse engine with reduction unit driving a 56 inch prop. Bill Figueiredo will do structural analysis of the Cyclone. Moving westward we come next to CGS Aviation where owner Chuck Slusarczyk is going to apply his long years of motor experience to his own airplane. It's a logical move for the leader in powerplant supply. He says it's to be very state-of-the-art craft, drawing on the experience he's had with other planes (mostly Mitchell Wings, Fledges, and Easy Risers), and will be designed expressly for power, not a hang glider with engine added. No word as to when it should make its debut, but we won't be surprized if we see something at Lakeland for the EAA's 1981 Sun'n'Fun. Moving almost directly south to Chattanooga, report of one of the first contests of the season comes from Mark Poling, Tennessee Tree Topper's Competition Chairman. The big Southeastern club will host a meet March 28 & 29 at the club's Sequatchie Valley sites. Hensen Gap (facing NW) and Whitwell (facing SE) will both be used, assuring flying almost all days. The meet will be open to all weight shift gliders, but you gotta have a Tree Topper clearance. The meet will have an intermediate (Hang III and under) class, and open class. Open class tasks will be correlated to the Region 10 Nat's Qualifier on Grandfather Mtn at the end of May. A small entry fee will help cover prize money. For more info, contact Mark at Crystal Air Sports, Rt. 4 Cummings Hwy., Chattanooga TN 37409. In noteworthy events also in the Scenic City area, the Crystal Air Sport Motel has chosen a winner for their prestigious Crystal Award. The fortunate fellah is local pilot, Ted Liston, who had an amazing aerial journey late last Spring of only 20 miles but over some tough terrain affording nearly no landing areas (see Product Lines in the May-June 80 Whole Air). Ted will have his name and the year of his feat forever etched on an exquisite crystal Seagull which will remain on display at CASMO. He'll also pick up a $50 cash prize for his most notable flight from a Tree Topper site. Ironically, Ted has just "given up his wings" (for a while anyway) to pursue his education. Chuck and Shari Toth judged for the prize and ask, "Who's next, for '81?" Now again moving westward, we arrive at Eipper where the Quicksilver MX that we told you about in this column last issue has made its way into the marketplace. Eipper got some "great press" on this model in the Feb '81 issue of Private Pilot, and we have a picture in this issue's Forum column. Eipper has also delivered the Blue Stratos Special Quicksilver to organizer Keith Nichols. Our reporter said this one had special modifications which allow more complete breakdown so that Keith can carry it on the airlines as excess baggage for only $28 more. Factory rep, John Lasko, says Eipper is quite pleased with initial tests of the Cuyuna engine on the Quick, measuring 600 fpm climb. This surpasses the Xenoah which they had been looking over. Eipper also may be able to tie in with Coca Cola USA for some big time publicity as the soft drink company markets its Mello Yello product. More on this later. Up the coast and inland slightly at Ultralight Products, the wheels of production roll on, making the Comets more common sights at sites everywhere. They've completed work on a small Comet (about 136 squares, we're told) and it should be in production very soon. We'll be visiting them for their dealer seminar and interviewing main man, Gene Blythe, for his feelings on trike units (mounted on Comets, of course) for our up-coming Trike Special (in the March-April Whole Air). Back west a bit to Wills, we can announce their East Coast Dealer Seminar on April 8-9-10, 1981. Wills Wing is the first major manufacturer to offer seminars for both coasts, a very professional move. A Demo Days will follow while company officials are still at Kitty Hawk Kites, and then more Demo Days at Crystal Air Sports during the week of April 13-18. Welcome, one and all, to both businesses to check out Ravens and Harriers. Up coast, north of L.A., Bill Bennett has become the West Coast distributor for Soarmaster's Trike unit. Obviously thus, Delta Wing is high on our list of places to visit in conjunction with our Trike Special next issue. Their trike-equipped Vipers won first place (in class) at the Arizona Air Race recently and we can't wait to get a ride on one, thereby evaluating Vipers and trikes in one swoop. Up north toward the Bay Area, Flight Designs is moving faster with a fairing set they're marketing. Company prez, Marty Alameda, says these are nearly indestructible, made of a mylar-Dacron fusion. They can be folded away with late model quick set-up gliders with no damage. They are available on a custom order basis so call 'em at 408/758-6896 for info. Flight Designs also has a new glider ready, the Sabre. It's a "Seahawk type glider" especially for training and beginning pilots, with a reasonable price. Popular as the Seahawk is/was, the Sabre may do very well indeed. Last word is from our EAA contact and friend, Dave Starbuck (EAA Ultralight Division Director). He says that in a recent meeting, the new organization discussed use of FAA certified flight instructors to help assure future Ultralight Instructors know their stuff about Federal Aviation Regulations, especially Part 91 (Operations) and the applicable portions of Part 61 (Certification). Dave also delivered a sad report of a fatal ultralight mid-air over Phoenix. The sky is getting crowded there as 100 crafts can be airborne at the same time, frequently. Please, please everyone ... fly carefully in '81! Got news or opinions? Send 'em to Product Lines, Box 144, Lookout Mountain TN 37350.

Ken de Russy Collection

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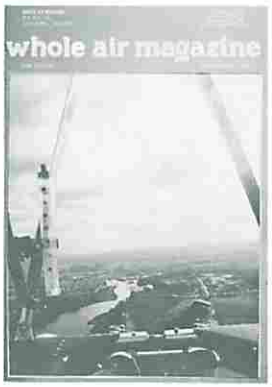
More Motorized. Thunderstorms. 1980 Nationals. WAM Interview: Pete Brock. Pilot Report: Sierra. Minibat sailplane kit. Sites: Bay Area (No. Cal.). Lookout Mtn. League



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Interview with Tom Price. Glider Reports: Firefly 2B and Lazor II. So. Cal. League pictorial by Bettina Gray. Tow Sites of N. Carolina. Regulation.

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The Crestline Nationals. Interview — Rob Kells. Sites Premier — Tennessee. Glider Report: Seagull Seahawk. WAC Dealer Directory.

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More Action Line. Graphite article. "The Ravens of Grandfather." Premier Glider Report — Wills Omega. Supine advice. The pilot band "Flyer."

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"Hang Glider Performance" by George Worthington. More Art by Baker. Government Regs. Premier of Forum. Bird Flight by Paul Burns. Safety Tips and more Product Lines.

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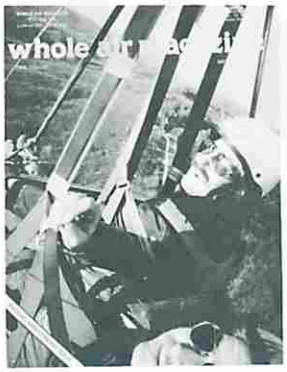

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"You Can Learn About Flying From This. Euro Market Premier. Dual Glider Report: Lancer and Sirocco III. Sites — Michigan. "The American Cup."

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More Action Line. Hang Glider Art by Don Baker. "The Comeback" by Paul Burns. "Solar Powered Ultralights" by Hank Syjut. Parachute seminar at Crystal

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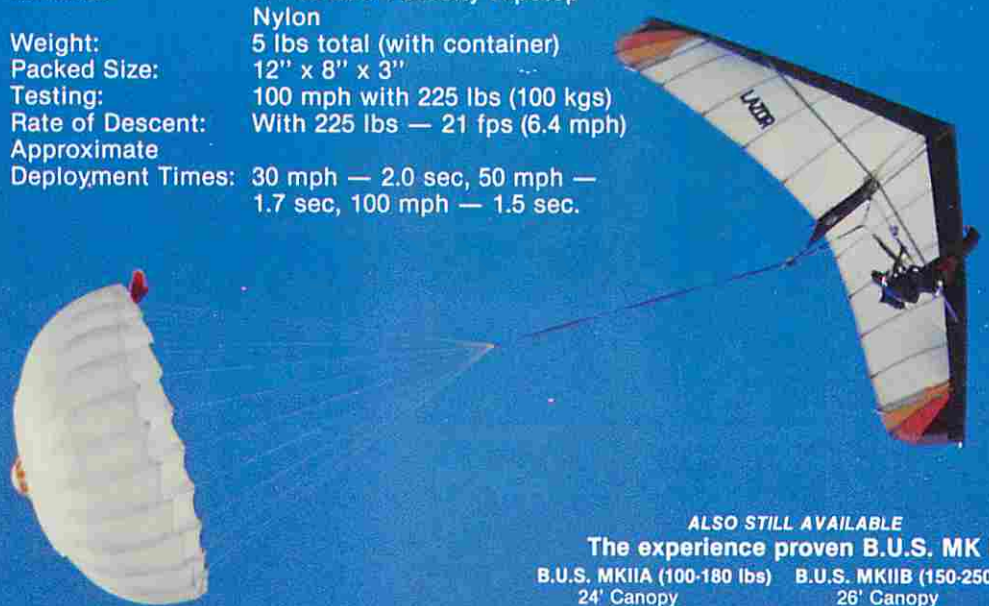
Rate of Descent:	With 225 lbs — 21 fps (6.4 mph)
Approximate Deployment Times:	30 mph — 2.0 sec, 50 mph — 1.7 sec, 100 mph — 1.5 sec.



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