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WHOLE AIR

The International Magazine for Sport Pilots

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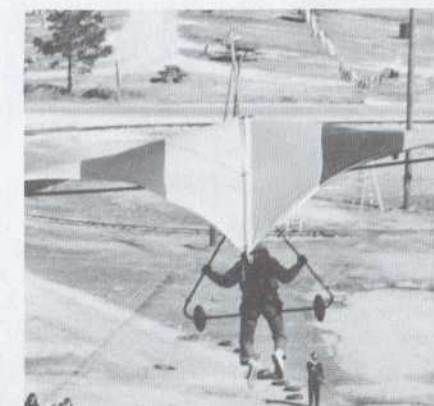
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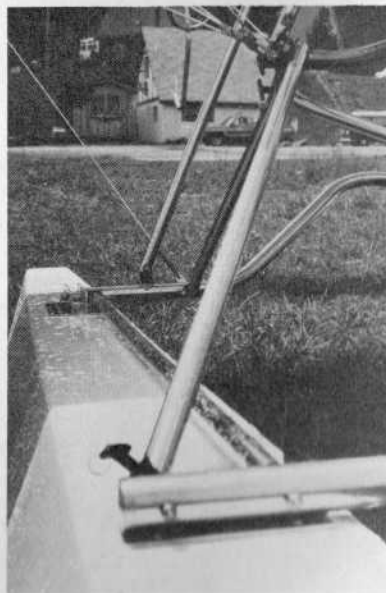
meaning rough jagged beaches, winds over ten mph and choppy water conditions (up to 2½ foot waves), then you need all the benefits that have been built into the **Florida Pontoon Company** floats. They were designed to give exceptional stability due to the deep keel, cathedral hull, full chines and a venturi section behind the step, which make them very stable even in cross wind conditions. The features allow for more favorable and forgiving control on take-off and landing, and are particularly needed by amateur sea-plane pilots.

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WHOLE AIR

ISSUE NO. 21. VOLUME 4, NO. 5, 1981

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Volume 4, No. 5, 1981

ISSUE NO. 21

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Chris Smith

On The Cover:

An extraordinary pilot's view as Chattanooga, Chris Smith, takes it way past 90°

The slack rearwardmost harness lines are caused, not by an incipient stall, but by body arch under positive G-load.

Publisher's Column



The mountain moves. Like the dissipating evening thermal, power withdraws from *Hang Gliding* magazine and the USHGA. This will not happen instantly, but will definitely occur.

After our visit and investigation at EAA's major Oshkosh convention, *Whole Air* also has some new editorial changes in the making for 1982 and beyond. As some of our readership calls for less power, as many others say power is fine but should bring soaring flight, and as many ultralights stray further from the essence of ultra-light and ultraslow, we at *Whole Air* see new directions.

We will continue to observe ultralight development. We think the research in this sister-movement will bring rewards to soaring enthusiasts. Air-to-air towing has soaring flight as a primary objective. Trikes mount on the finest in soaring wings for flight "when the wind doesn't blow" or when mountains are too far away for frequent visits. And one day we hope to see a self-launched, powered hang glider soaring machine, whose sole use of an engine is to bring earthbound pilots closer to beckoning thermals.

Abandoning power completely would be to throw away these potentially exciting ways to get high. Leaving power progress to ultralight airplane builders will not bring the same results as if we pilots demand soaring machines and the glider manufacturers stay interested.

Think about a design for 1983. A tiny engine is completely faired, possibly in

the double surface with the crossbar. Maybe 2 quarts of fuel. Hinged propeller blades to streamline drag. Minimal landing gear at ultralight weight. Precise handling for nudging into marginal thermals. Performance of modern, ribbed superwings. Strength and design integrity which can relax a pilot on turbulent (thermally) days. A safety record with previous design which can be applied to this newest hybrid. Fully aerobatic models. Foot-launching and landing capabilities taken for granted. Slow take-off and approach speeds. Easy breakdown, low (or no) noise, cartoppable. Is this a Weedhopper or Pterodactyl? Good grief, no! Is this a Comet or Harrier? Hardly. Can the two technologies get together as a hybrid? Ask anyone who still believes in Yankee ingenuity.

This is why *Whole Air* will continue to follow power closely. To see if it can enhance the soaring flight we support.

Ultralights will go in many directions. Enclosed cockpits for stronger climbs and faster airspeeds. Heavier, smoother, maybe two seater aircraft. Others will become more simple, packing easier, lighter weight. They will thermal or ridge soar exceedingly well because that is why someone will build them. And hang gliding will have brought benefits to all aviation from airplane pilots to its own veterans, by having given birth to ultralight, ultraslow flight in the space age.

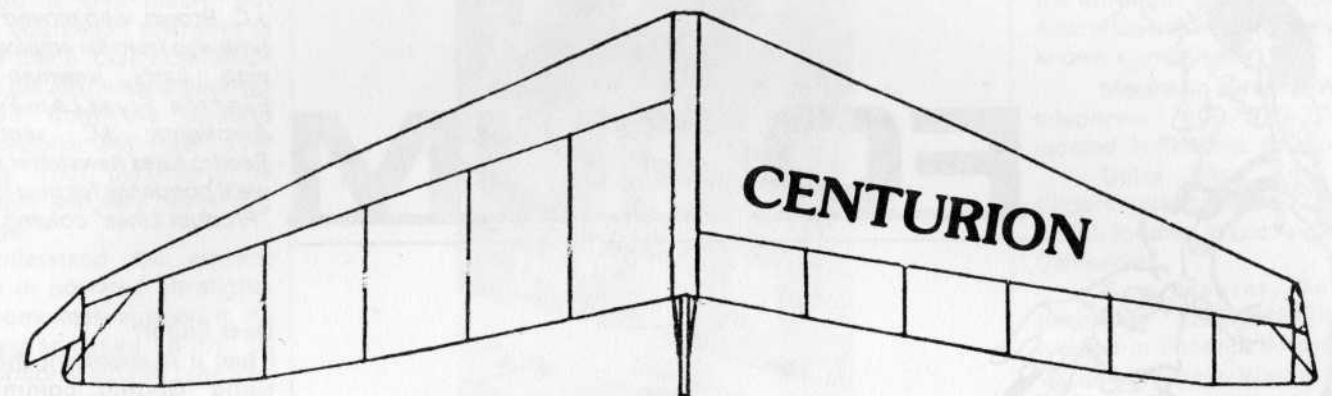
Whole Air will record this progress. Our heart is in soaring flight. Yet we can leave no stone unturned in the pursuit of any avenue which will lead us to the cumulus laden skies. It is precisely this rationale that keeps towing in our pages.

Some will complain that we are too diversified, covering hang gliding/ultralights/and towing, but we feel a responsibility to keep these doors open. Our menu of articles and pictures is aimed not at purists, not at motorheads, nor at manufacturers of equipment, but at pilots.

So, while *Whole Air* may feel closest to *Hang Gliding* magazine, we will maintain a "mix," serving the role which melds the power in *Glider Rider* to the soaring of *Hang Gliding*, and spicing it with a bit of towing for the best to all sport pilots. Quality is our key goal. Both in form and content, and with your support and that of the industry, we will achieve it. Do it your way ... with *Whole Air*, the magazine aimed at sport pilots.

Thanks,
Dan Johnson

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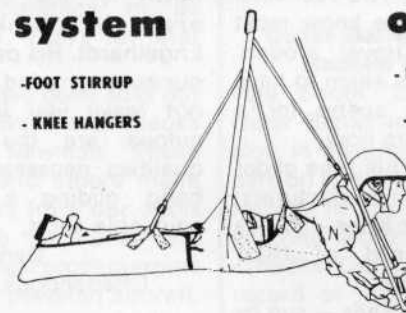
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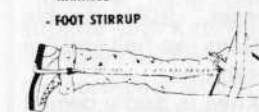
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FORUM

"Pilot Report" Comments

Dear Editor:

I feel you should put more airtime in the gliders you evaluate. In your report on the Stratus VB, I felt you short-changed the glider in several areas, such as energy retention. I personally feel the Stratus VB will glide with or possibly outglide the Comet. As for energy retention, the two VB's I have flown clearly outperform Harriers and Comets. In fact, I consider the Stratus VB to be the most aerobatic ship I have ever flown.

Ric Lee
Sandy, Utah

Dear Editor:

Thanks for the great report on the Stratus VB. I've been flying one since mid-April and have flown all the flying sites in N.W. Illinois with it. After flying Maxi's and Mega's for the past three years, the Stratus was a whole new ball game. But I must take exception with you on the handling. My Stratus flies silky smooth, the roll pressure is far less than any glider I have flown. It is the only glider I've flown in bumpy little thermals that was fun to do so. Pilots who are con-

sidering the Stratus but are afraid to fly one, I say go ahead, once you get used to it, it is a pussycat.

Leon Farster
Dixon, Illinois

Elsinore Ultralight Meet

Dear Editor:
Foot-launched flyers of Elsinore fully supported the "First Elsinore Ultralight Meet." The meet was held in an excellent location away from the mountain. Also the power pilots were courteous enough not to land in the our foot launch landing field. Thank you!

Over 40 foot launched gliders landed at the power meet. Many had over 4,000 feet above the festivities. After crossing the lake and traveling three to five miles. Dave Gibson put on an excellent aerobatic display in his Comet. Trailing smoke he did near loops and thrilled the crowd.

Fun was had by all of the purists, and power people alike. There were nightly parties, flying stories swapped and much beer consumed, and a good time for all. We wish to thank the power

people for the respect they showed us.

R.Z. Friend
Elsinore, California

Dear Editor:

Maybe you'd like a brief introduction to the current flying scene in New Zealand. We have approximately 500 pilots -- about 100 real keen crazies -- so we know most guys as we travel around. Same old faces seem to have been on the scene for a number of years now.

We have two full time glider designers and manufacturers:
1) Pacific Kites -- you've probably heard of their Vampyre by now.

2) Flight Sails -- run by the Bird brothers, Warren and Graeme. Flight Sails have just produced the "Shark", a no keel pocket, 90% double surface. Goes like hell and I've just ordered one.

Pacific Kites is partly owned by U.S. guys, Marty Waller and Tommy Namias and Bob Schutte.

Well, the best of lift to my fellow flyers.

A. Limmer
Taradale, Napier
New Zealand

We appreciate the news from New Zealand. Send more! Also, we've heard from Whole Air Advisory Panel Member, J.C. Brown, who moved some time ago from his employment with Larry Newman and Electra Flyer/American Aerolights. J.C. sent the Pacific Kites newsletter which we'll condense for next issue's "Product Lines" column. --Ed.

Dear Editor:

I feel it is important that the Hang Gliding community recognizes those individuals who are doing our sport a service.

I am a Novice pilot who has just finished formal training at a local flight center. Going from training flights at a familiar mountain site to unsupervised jumps at a new hill can be quite a nerve racking, and in some cases, unsafe experience.

There is a need for the Novice and Hang II pilots to be made to feel comfortable enough to ask all those embarrassing questions which need to be answered. In this light, I would like to join the many other beginning pilots, who have flown in the Chattanooga area, in thanking Gary Engelhardt. His patience with our questions and his ability to not leave you feeling ridiculous are the kinds of qualities necessary to make hang gliding a safe and enjoyable sport.

Dennis Michels
Chattanooga, Tennessee

Dear Editor:

Nice article on the tow bridles. However, you left one out -- the Hewitt bridle. It is a unique design, but needs further testing and evaluation. Interested? Contact Donell Hewitt, A & I University, Physics Dept., Kingsville, Tx. I know he would welcome some help in testing.

Henry Wise

Constructive Criticisms

Dear Editor:

I began receiving your mag as the *Whole Air Catalog* and enjoyed it very much. But when you began charging (a whole five bucks), I decided I could get all the hang gliding I needed from the existing publications. Boy was I ever wrong. Your publication is excellent and very refreshing change.

I understand the current boom in powered ultralights and completely support it. As an experienced pilot of conventional aircraft I see it as the way of future sport aviation. It bothers me though to see these people hiding behind the name of hang gliding to keep the FAA off their backs. Luckily, (per the FAA NPRM) the Feds have not been taken in and have drawn a reasonable distinction between the two activities.

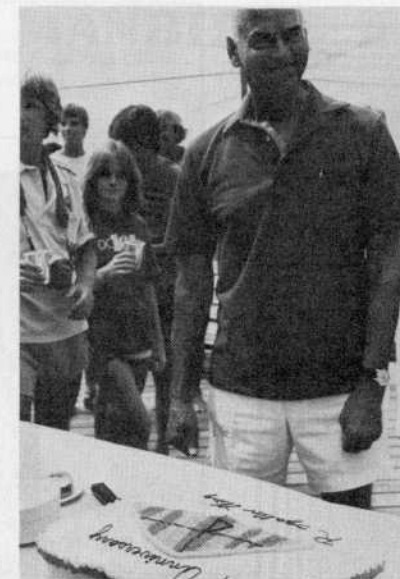
I do have a complaint. Your July-August edition almost totally ignored current hang gliding activities even though many things have occurred. Please try to keep hang gliding coverage your first priority (towing should be considered part of this). The soaring aspects of ultralight aviation are being reduced to small areas of coverage in all publications. Don't let that happen!

I feel we have been sold out by people like Tracy Knauss and Larry Newman. These gentlemen and others made many Dollars from our sport only to grab the money and run when larger profit margins appeared in powered aircraft.

The word is that the American Cup won't happen because of the lack of a sponsor. Bull! If Tracy needed the Cup, it would happen. Keith Nichols found a major sponsor for the boring Nationals and Tracy couldn't find one for something as exciting as the American Cup?

Please keep foot-launched soaring your first priority. Don't sell out! Congratulations on a fine magazine.

Bob Caldwell
Louisville, Colorado



"Rog" Rogallo gets ready to cut cake for "Rogallo Wing" 33rd Anniversary Celebration at Kitty Hawk Kites. Photo by Chuck Sellers

NAG'S HEAD, NC -- Francis M. Rogallo and area hang gliding enthusiasts celebrated the 33rd anniversary of his invention of the "Flexi-Wing" here on Saturday, August 15, 1981.

The "Flexi-Wing" also called the "Rogallo Wing" is the design breakthrough that makes construction of today's hang glider and ultralight aircraft possible.

Hang Gliding enthusiasts gathered at Kitty Hawk Kites to enjoy refreshment and hear Rogallo describe the research that led to his invention.

John Harris
Kitty Hawk Kites
Nag's Head, North Carolina

Outer Banks Soaring Record Broken

Pete Soule, 22, broke the Outer Banks record for time aloft in an unpowered glider here on Friday, July 31, 1981. He was in the air four hours and fifty-two minutes.

The first Outer Banks soaring record of nine minutes and forty-five seconds was set by Orville Wright on October 23, 1911.

Soule, a hang gliding instructor with Kitty Hawk Kites, launched his hang glider from the northeast face of Jockey's Ridge at 6:54 a.m. and after soaring at altitudes from 200 to 250 feet above sea level, landed safely at 11:52 a.m.

Soule said he didn't have breaking the record in mind, "until I saw flying conditions were so good; I decided to go for it."

Conditions were ideal for almost the entire flight with steady, 15-30 mph north-northeast winds. Soule did say that after he had been up for about an hour, "the wind died for 15 or 20 minutes, and I had to struggle to keep it in the air."

He added that during the flight his thoughts were mostly about maintaining control of the glider, but "the sun rise and cloud formations up there were beautiful."

Soule took his first hang gliding flight in November of 1980.

Soule flew a Super Lancer 180 to his record breaking flight. The Super Lancer is made by Flight Designs, a California based hang glider manufacturing firm.

Mike Dudgeon
Kitty Hawk Kites
Nag's Head North Carolina

Phoenix Aircraft Ready to Market the Hummer

Phoenix Aircraft is happy to announce that it has entered the ultralight market. Phoenix Aircraft is owned by three well known companies:

Mountain Green West; telephone 602/275-7708, located in Phoenix, Arizona.

Delta Wing Kites & Gliders; telephone 213/787-6600, located in Los Angeles, California.

Soarmaster, Inc.; telephone 602/948-7494, located in Phoenix, Arizona.

Mountain Green West is one of two companies licensed to build the Hummer. Delta Wing Kites & Gliders is the oldest and biggest hang glider manufacturing company in the U.S. and perhaps the whole world. Soarmaster is an established power pack manufacturer in the ultralight industry.

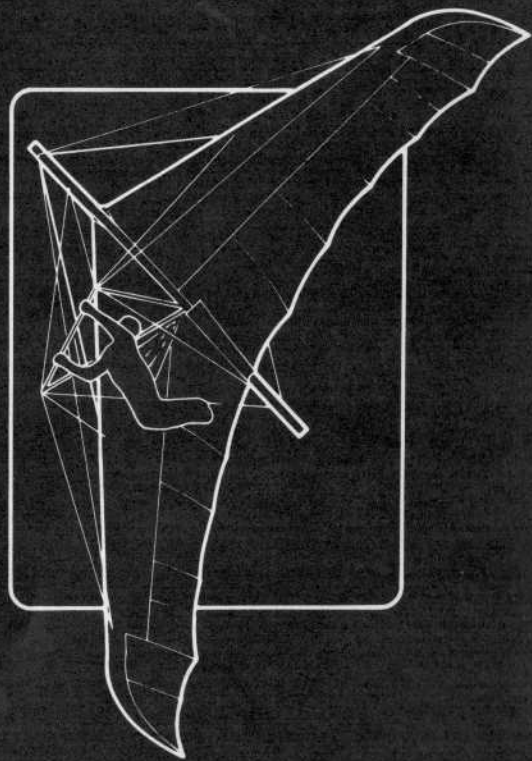
All three companies will actively participate in supplying parts and components to Phoenix Aircraft for the Hummer. We believe that his is the first time that three major companies in the ultralight business have pooled their resources to market a product.

The Hummer has been a well accepted flying machine since its introduction by its designer, Klaus Hill, and has earned it acceptance in the ultralight market.

Phoenix Aircraft, Inc. is located in Phoenix, Arizona. Until telephone and mail box information is available please contact any of the three companies listed above at their location for further information and dealership programs. Mountain Green West has been producing Hummers for two years very successfully and under the umbrella of Phoenix Aircraft, expanded service will be available to customers as well as immediate delivery of the Hummers.

We at Phoenix Aircraft are very excited about the future and the future of the Hummer.

Phoenix Aircraft
Phoenix, Arizona



The Stratus V-B has had over five and one half years of creative research and design manufactured into the structure and sail.

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FORUM



Tomcat singled out for Oshkosh Design Award

After two and a half years of research, the H.M.81 Tomcat went into production in January, 1981.

The Tomcat is the brainchild of Waspair's President, Robin Haynes.

Robin is no newcomer to this business. He has designed 43 different types of airplanes over the last ten year, of these 14 have been produced and approximately 2400 sold.

The Waspair company was situated in London, England until the summer of '79 when Robin and his wife, Vice-President, Pauline, decided to move the entire operation to

its present location in Sacramento, California.

At Oshkosh, Wisconsin, the largest aviation event in the world, it was a great honour to have the Tomcat singled out for the award of "Most Outstanding New Design."

Having achieved such a prestigious award, the Tomcat has gained world-wide recognition. The skill and brilliance of the designer will continue to astound aeronautical enthusiasts.

On behalf of Robin Haynes, the management and staff of Waspair Corporation, thank you E.A.A. for the honour.

Waspair Corporation
West Sacramento, California

Integral Reduction

Airdelta-Hiro proudly presents the world's first purpose built ultralight engine with integral reduction system. It is offered in 22 and 30 hp versions which share the following features:

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Electric start.

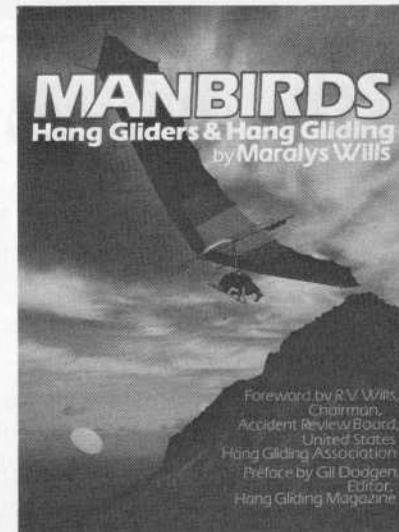
Water cooling for reliability, unequalled power to weight ratio.

water heated carburetor intake to prevent icing, and

Cast alloy anti-vibration mounting supplied.

The 22 hp is in limited

production now, and both versions will be available in quantity from the beginning of 1982. Built in Milan, Italy by Hiro Motors, a company that makes only high performance two stroke engines, this unit provides a power to weight ratio that far outstrips the converted industrial motors that are currently available. The water cooling means that they can be fully enclosed in the aircraft if necessary. For further information contact Windcraft Marketing at 13 Worcester Terrace; Clifton Bristol, England



From Prentice-Hall:

MANBIRDS: Hang Gliders & Hang Gliding

BY MARALYS WILLS

A fast paced, entertaining new book, written with humor, insight, and a rare appreciation of individual achievements. *Manbirds* takes the reader from hang gliding's exhilarating, fumbling past to its soaring present.

- ★ 8 pages of color, 150 black-and-white photographs
- ★ "How to Fly" written by Chris Wills, M.D.
- ★ 40-page appendix, including world-wide flying sites

"Maralys Wills said, 'above all, I want the book to be interesting.' It was that and more ... Chris Wills' story of the filming adventure in Greece was more interesting and exciting to us than the finished movie ... a valuable addition to the literature on hang gliding."

Francis M. Rogallo

"Few people are as qualified as Maralys Wills to chronicle the modern history of foot-launched aviation ... her personal involvement has allowed her to tell the story with rare insight and understanding."

Mike Meier

"Manbirds is the first book on hang gliding written from the pilot's point of view. Maralys Wills is of hang gliding. She has a feel for what the sport is and the ability to write it down well ... Manbirds will help you cherish your own personal discovery of flight and will help non-flyers understand what the words 'hang gliding' mean. ... Excellent."

Chris Price

"A technical, historical, sentimental, humorous look at hang gliding ... amazing shots of fragile, homemade gliders by pioneers of the sport, as well as breathtaking color plates of some of the most beautiful photographs ever taken ... the first complete compilation of world-wide hang gliding champions."

Dean Tanji

"Of the thirty or more books I've read on my sport, *Manbirds* stands alone as a true and accurate reflection of hang gliding and its participants. The evolution of our attitudes and techniques as well as the psychology of hang gliding is brought out by interviews with all the sport's greats ... very contemporary ... I will happily recommend it to my students."

Ken DeRussy

"A must for everyone interested in hang gliding ... gives the history and flavor of the sport, as well as authoritative tips and instructions on equipment and flying. But it deserves a far wider audience, because it is a wonderful, true adventure story of pioneering — presented in a fast-paced, very readable style ... Maralys Wills was uniquely involved in the incubation of hang gliding and in the subsequent developments. No outsider could have captured so well the essence of this great period when man joined the soaring birds almost as equals instead of as interlopers ... a sensitive and exciting book that you cannot put down — and which later you will find continually resurfacing in your mind."

Paul MacCready

Available in book stores and your local hang glider shops

FORUM

COMING NEXT ISSUE

A report on the Masters of Hang Gliding, from Grandfather Mountain.

Pilot Report: The Spectra Aolus

Floatage The answer to good handling stiff wings?

Book Review: Markowski's "Ultralight Aircraft"

Views of Beppu A World Meet in Japan.

More Trike Update Flight Design's model

More towing information

and much more.

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Blind Lawyer's Hang Gliding Adventure

Wan Yeo may be the first blind man to experience the sensations of hang gliding when he co-piloted Noel Whittal's craft from the summit of Great Whernside, Yorkshire at 2300 feet above sea level.

The soaring flight lasted almost a quarter of an hour during which time the glider maintained a clearance of about 1,000 feet above the valley, eventually landing at the foot of the hill. Before launching, Wan had undertaken a short programme of ground training which included being suspended from

the balcony of the old chapel from which Noel runs his motor spares business.

Sponsorship of Wan's courage will result in the Leeds association of Friends for the Blind benefitting by about £600 towards their "Tandems for the Blind" appeal. A further £2,300 is still needed if the target of another six bikes is to be reached this year.

Wan, who has previously

flown and landed a sailplane with only the verbal guidance of an instructor, stated during a Radio Leeds interview that the hang glider was altogether more sensitive and responsive, giving him a much greater sensation of the nature of the air.



Wan Yeo and Noel setting off and flying up and away. Photo by Phyl Croft.

BACK ISSUES

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JUL/AUG 80

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

NO. 12
MAR/APR 80

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

NO. 13
MAY/JUN 80

Safety Advisory Tech Panel Premier. Editorials on Glider Reports. New Pilot Report: Raven. Dual Sites - Montana and New York. Winch Towing.

NO. 11
JAN/FEB 80

Statistics of Injuries Part I. "Can America Compete?" by Tom Peghiny. Motorized Premier. "Getting Radical." Glider Reports: Falcon 8 and Maxi. Interview with Bill Bennett. Tow Premier. Florida Sites. Interview with Eagle



No. 20
JUL/AUG 81

Summer Oshkosh Issue. Mario Manza's Bowspar. 1981 Nationals by Gary Wood. Float evaluation: glass vs. foam. Paris Air Show/John Lasko. Interview: Paul Poberezny. Tow bridle review by Ed Quirk.



No. 19
MAY/JUNE 81

Third Anniversary Issue. Flying Cerro Gordo. Stratus VB Pilot Report. Ultralight Owner Survey, by Glenn Brinks. What Do Ultralight Pilots Want? By George Worthington. Southern California Flying Sites.



No. 18
MAR/APR 81

Interview with national champions of America and Canada. Ontario flying sites. Eleven people in the industry comment on the Trike. Pocket thermals. Editorial on Sun 'N' Fun meet.

NO. 17
JAN/FEB 81

Suspension System Tests. Sites of Hawaii. Pilot Report: Wills Harrier. Interview with Dick Turner. Cable Flight Simulator. Locked out of control. Certified Glider List.

NO. 16
NOV/DEC 80

Masters, Nationals, Cup by Starr Tays. Ultralight Aircraft Report: Eipper Quicksilver. Pilot Report: U.P. Comet. Towing Lockouts. Sneak Preview: Harrier, Viper, and ASG-23.

NO. 15
SEP/OCT 80

"Thermals and Thermalling." Pilot Report: Moyes Mega 2 Interview: Don Miller. First Ultralight Report on Sky Sports Humbug. Oshkosh 80. "Inz & Outz" by Michael Jones.

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Statistics of gliders and models. Premier of Co-sumer Action Line. Heckman Interview. Parachute advice. All USGA Directors addresses.

MAR/APR 79

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

MAY/JUNE 79

"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.

JULY/AUG 79

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

SEP/OCT 79

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

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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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No. 19 No. 20

Dear Editor;

As promised, here are the results from the The Jack F. Grimm Texas Cup World Class Hang Gliding Competition, in Buffalo Gap, Texas. It was a great success, enjoyed by the pilots, and everybody went home with something.

Trophies were awarded to all competitors, and Round or Heat money gave financial encouragement as the contest proceeded. This also explains the small disparity in prize winnings (see table). The cash distribution was the largest ever paid within the sport. All were amazed that this level contest could be organized on such short notice. A commitment was made for the Jack F. Grimm Texas Cup event to be held annually.

Winner Steve Moyes was in Chattanooga following the event. He attested to the quality of the meet, and said conditions were surprizingly strong at the small (350 foot) hill, with 25 mile an hour winds and 600 fpm thermals, allowing gains to 5,000 feet and more. Special flights included X-C treks by Eric Raymond and Bob Deffenbaugh when they flew more than 45 miles away to Sweetwater, Texas.

Michael Winston Williams,
Competition Organizer
Odessa, Texas

RANK	COMPETING PILOT	SEED	WINNINGS
1st	Steve Moyes	#2	\$4260
2nd	Sterling Stoll	3	\$1760
3 tie	Mark Bennett	5	\$1090
---	Bob England	6	\$1090
5	Roy Mahoney	16	\$650
6 tie	Ron Young	9	\$460
---	Steve Stackable	10	\$550
8	Jeff Scott	8	\$480
9 tie	Jeff Burnett	1st	\$340
---	Gene Blythe	4	\$430
---	Jerome Fack	11	\$430
---	Bob Deffenbaugh	12	\$340
13 tie	Jeff Huey	7	\$150
---	Jim Lee	13	\$240
---	Eric Raymond	14	\$150
---	Stu Smith	15	\$150
17 tie	Warren Richardson	25	\$90
---	Steve Burns	24	\$180
19	Gary Scheer	18	\$90
20	Mike Dillon	22	\$70
21	Bill Misiazek	23	\$70
22	Loren Prescott	21	\$50
23	Steve Brenner	19	-0-

Introducing the Tri-Flyer

We are agents for all the current trike power units but are aware that some pilots enjoy building their own units. For these people the TRI-FLYER is a great project. Designed to incorporate the very latest features of trike

design, it is easy to build and sports performance to match the best. The kit of parts contains everything needed and all the major components are pre-fabricated and ready to fit. The work involves cutting, drilling and assembling, and is well within the capabilities of the average

enthusiast.

Features include:

- Ultralight frame, split axle, single tube keel and strut.
- Wire braced for stress relieving shock absorption.
- Folding air frame with rapid detachable wheels.
- 250 cc Robin long life engine.
- 2.34 to 1 triple belt reduction drive.
- One piece integrated propeller hub and drive pulley.
- Single piece double bearing block mounting.
- Full air re-start capability.
- Hand throttle, choke, kill switch and pull start mounted in easy reach of the pilot.

Our unique design allows the Trike Flyer to be completely folded for transportation. A simple quick release rear catch allows the main strut to fold down thru the folding seat frames; this means the Tri-Flyer can be simply put into the back of any small van/vehicle or it can be carried on the roof rack of an ordinary car, with the main strut folded down but the axle legs left opened out.

We are interested in finding overseas agents to handle this product and interested parties should contact us at the address below.

John Hudson,
Mainair Sports,
Shawclough Road,
Rochdale Lancashire,
ENGLAND OL12-6LN

Dear Editor:

BEFORE YOU GET TOO EXCITED ABOUT AIR TOWS...

I had occasion to be towed by the experiemental tug, air tow system, that you have been reading about, and I have seen the Fledge towed in the same way.

As was pointed out, because both tug and glider have similar mass, both tend to affect each other. The glider acts as a long tail for the tug,

and the tug works like a long canard for the glider.

The Fledge tows very well, primarily because a Fledge, like many rigid wings, uses tip rudders to yaw the plane thru the turn, thus producing a roll (yaw induced roll). Therefore, when the tug turns to the right, the Fledge is yawed to the right and a nice roll follows.

However, when a Rogallo style, weight shift wing is turned by means of roll induced yaw (you move right, the glider rolls right, and lifts and yaws thru the turn). When the tug turns right, the glider is yawed (by the tow line) to the right, but unlike the Fledge, has a *strong* tendency to roll out, or left, the opposite way. It was my experience, once the glider started to roll out or lock out, that with all my weight (200 lbs.) high sided, the glider (Comet 165) would not respond and roll in.

The primary corrective action to overcome an impending lockout is to speed up, slacken the tow line, and get back in line behind the tug. Apparently, the tug must maintain 30-35 mph in order to fly safely; this is fast towing and even with the fast Comet, bar stuffed, I could not gain on the tug, and the inevitable lockouts required early release. By the way, on my last attempt, the safety release at my end failed, and I was just short of stuffing it in at blurring speed, when the tug cut me loose (Thanks, Jay!). The required high speed pull out deformed the battens in the Comet.

The answer is probably a slower tug. At any rate, I STRONGLY suggest that experimentation with air towing rogallos be undertaken with great caution and a quick trigger on a fool-proof release system.

Jerry Noland
Santa Cruz, California

Wills Wing is...

DESIGN AND ENGINEERING



Glider design at Wills Wing incorporates both sophisticated engineering analysis and extensive "seat of the pants" development by some of the industry's top pilots. The result is a quality aircraft of sound structural and aerodynamic design with exceptionally pleasant and positive flight characteristics.

TESTING AND CERTIFICATION



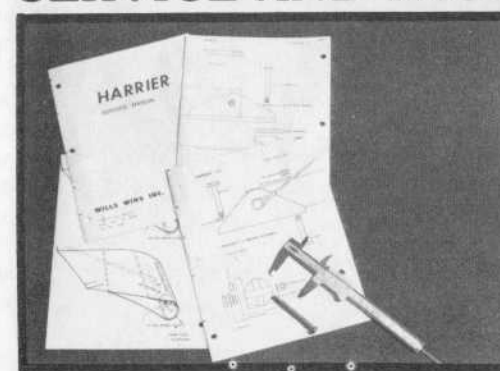
All prototypes, whether destined for production or not, are tested in accordance with the HGMA airworthiness standards. Over the years, this has provided a large base of empirical engineering and aerodynamic data for use in development of new glider designs. Following such testing, extensive further evaluation is conducted throughout a wide range of normal and abnormal flight modes and conditions. Adjustments and refinements are made in this stage before the first production unit is manufactured.

PRODUCTION AND QUALITY CONTROL



Glider production involves the care and attention to detail of trained professional craftsmen working with precision tools and jigs. As a final check, each glider is subjected to a comprehensive flight test. Low speed lateral response, turn coordination, pitch response and stability, speed and turn trim, and production quality are carefully checked before the glider is authorized for shipment. This process is then repeated by the dealer prior to delivery of the glider to you, the customer.

SERVICE AND FACTORY SUPPORT



Wills Wing has pioneered the concept of a full service network of factory supported professional dealers. Each Wills Wing dealer is supplied with a factory service notebook, and receives monthly dealer bulletins which include service updates. Dealers may also attend annual factory service seminars and participate in factory sponsored "Demo Days" and tuning seminars. Our goal is to service your needs as quickly, completely, and professionally as possible.

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GOLDEN AGE?

By NOEL WHITTALL

About the only people in England who positively welcome Northerly airstreams in Summer, are Yorkshire hang glider pilots. While vacationers on the beaches shiver, and anorak salesmen enjoy an unseasonal boom, we are able to soar the edge of the North Yorkshire Moors, near Middlesborough.

With a vertical drop of around a thousand feet, a road to the top, a ridge run of about five miles, easy top landings and countless acres of open countryside in all directions, this is probably the best

Northerly site in Britain. The only shortcoming is that often just when the day really gets thermally active, a sea breeze front comes through which usually switches the wind off the ridge, while killing the thermals stone dead.

You will appreciate that the depressive effect this has on the pilots is compounded by the fact that the pub in the village closes almost simultaneously with the lift disappearing, so they are unable to seek solace in a jug. (English pub hours were imposed during the 1914-1918 'War to end Wars,' when it

was discovered that the workers liked boozing much better than making things to kill Germans with. Since then the liquor licensing authorities do not seem to have noticed that we are again on speaking terms with the Germans, and the Japanese economic miracle has in any case relieved our worker of most of their work. Consequently we still cannot buy a beer at 2:01 p.m. on a Sunday!)

Now at least some of the North Yorkshire Sailwing Club members have found an acceptable solution: soar in the



Harry Unsworth on his new Typhoon/Tripacer outfit waits for a homebuilt bi-plane from another era to clear the grass strip one spring evening in Yorkshire. Photo by Noel Whittall - 1981



Genial Len Gabriels about to demonstrate his simple Solo-engined 210 cc trike to customer Don Greenbank. Photo by Noel Whittall - 1981

mornings and trike in the afternoons. I tried it myself last week and added another dimension -- a fifty mile cross country flight home in the evening. Pure magic. A really satisfying day which exploited two aspects of ultralight flight to the full. And while I was droning along following out Great North Road at about 1200 feet, I had ample opportunity to reflect on the new delights and dangers of this trike-ing game.

It is rare indeed that one is conscious of being part of a Golden Age. For most of my life I believed that the sort of flying I wanted to do had finished a couple of generations before. I had subconsciously adjusted to the fact that I would never be Wilbur or Orville, and that even Waldo Pepper needed a pilot's license. Yet here I was, self-taught and unregulated, buzzing along quite legally. It will not last. It cannot last; but while it does, it's sweet indeed.

That morning I had been throwing my old Solar Storm around in rough broken thermals stirred up by a 30 mph breeze. It is a strong, certified glider and I

never have any concerns about its structural integrity when soaring. The type has been load-tested to +6G's and I am convinced that I will never reach that figure alone.

With the added weight of my Hiway 250 Trike though, I am by no means as confident. The aircraft immediately surrenders half its effective strength, and becomes little more than a 3 G machine. Still acceptably safe, but hardly the margin to allow aerobatics. Yet I see trike flyers doing radical 360's and stall turns, and now on page 14 of the May-June *Whole Air* performance claims are made for the 'Sky King' which seems to me to be a recipe for almost guaranteed airframe failure. No doubt the brothers Yancey will be keen to correct me if I am wrong, but the impression I get from their Forum contribution is of an over-powered contraption festooned with camping gear being forced into full-power max-G 360's by its overweight pilot. Certainly the outfit may be persuaded to perform 36 foot diameter circles, but surely only one or two before the airframe revolts at

being thrust so rudely into its own prop-wash vortices and spreads fishing poles, guns, six packs and pilot over quite a wide area.

On the subject of safety, now let's hear it for the humble pinewood propeller. The most efficient or robust it may not be, but as a thrust provider for trikes it is unsurpassed on safety grounds. Almost since airplanes were invented, people have made a practice of pushing portions of their bodies into revolving airscrews: frequently this has been terminal. More ultralights mean more airscrews are available for people to feed themselves into, and you can bet that Joe Public will take full advantage of this facility. That is fact. Now softwood propellers smash up a fraction before the more robust parts of the human frame do, which is reason enough to continue to use them.

Please consider these two actual recent cases:

1. Pilot flying prototype trike waves to friends on ground: allows arm to swing back and enter prop arc. Prop shatters. Pilot (wearing ski-gloves) suffers severely bruised fingers but can still count to ten without needing an abacus. Metal or glass prop would undoubtedly have severed fingers at least.

2. Pilot testing trike engine on the ground, and without glider fitted. Had not locked the trike frame solid, and with engine running full out it collapsed upon him. Pine propeller smashed on pilot's unprotected skull. Approximately 100 stitches in head, but back at work a week later.

So before switching to a more "efficient" prop bear the potential hazard in mind as well.

Before my longsuffering audience becomes convinced that I am now totally power-oriented, let me throw a simple idea to help pilots just converting from seated to prone flying: put a ring of colored tape around the control bar base tube exactly on the centre line. This makes a useful reference to use during those tricky initial hours of soaring when it is all too easy for the novice to drift off to one side of the bar and then unconsciously compensate for the pull by moving his legs off centre the other way.

I am off with the Dales Club to the South of France in a week or so, and I hope my next contribution to *Whole Air* will be a report of fabulous thermalling in those sun-baked Alps.

STATISTICS

After a great deal of reviewing the figures (see table) we feel we know more about an identified group of aviators but one about which little is truly known --- pilots interested by power development but whose main flying challenge comes from soaring flight.

The survey was suggested by George Worthington's article in the May-June *Whole Air*. It was a lengthy survey requiring responses to 26 categories. You were able to value these areas for change in ultralight aircraft in general, by a One through Seven scale. One was most important to you; Seven the least crucial of the seven top concerns.

Because it was power (we speculate), and because of the length/complexity, and with less time between summer *Whole Air* issues, the response remained marginal. We can consider only a 60% or so confidence factor in a survey of 54 correctly and fully completed survey forms. A sum of 378 "votes" were cast in the 26 categories, each with seven possible values.

The full table is presented that you might draw your own conclusions. We only will supply a few more bits of demographic information about our readership.

Borne of a pure hang gliding audience, our mixture now includes just under half pilots who wish to follow power, or currently participate. The stronger half are soaring pilots. In the whole group just under half are qualified novice pilots, the larger half being advanced/experts. Thereby it is obvious that *Whole Air* has a rather small part of the "great majority."

The (not very typical) average *Whole Air* reader is about 33 years old, mostly employed in high technology or management fields, often in the transportation industry, earning mid-twenties as median income. We consistently hear that our review of equipment is the Number One topic we furnish. Not surprising, as 51% plan an '81 glider purchase with another (mostly different) 51% who just bought

or plan to buy an ultralight or trike.

However, the scene is well defined by three importance groupings shown below. Primary shows a very hang glider-esque selection: soaring capabilities, less noise, no big brother regulations desired, g-load values, in-air restart capabilities, engine reliability. Secondary choices basically support

those primary evaluations, right down to good votes for foot launch capability. And the least useful improvements must have been contributed by some readers with no hang gliding experience, as the minority voting involved more airplane pilot concerns than hang glider values.

But ... speculate for yourselves. Thanks for your input.

PRIMARY	SECONDARY	LEAST USEFUL
Engine Off Soaring Capability	Greater Crash Survivability	Pilot Comfort from Elements
Lower Noise	Longer Engine Life	Greater Pilot Visibility
Less Likelihood of FAA Regs	More Portability and Storeability	Cockpit Fairings
Positive/Negative G-Load Limits	More Rough Field Landing Ability	Higher Speed Capability
In-Air Restart Capability	More Small Field Capabilities	Passenger Carrying Capability
More Engine Reliability	Lower Net Weights	Greater Climb Rate
	Lower Rate of Cost Increases	More Miles Per Gallon
	Greater Foot-launch Capability	

AREA OF DESIRED CHANGE	No.	Count	Score	#1's	#2's	#3's	#4's	#5's	#6's	#7's	Count	Score	Rank	Rank
Higher Speed Capabilities	1	2	3	0	0	0	0	0	1	1				
Rough Field Landing Ability	2	25	76	0	2	2	7	5	2	7	5 (tie)			
In-Air Restart Capability	3	29	113	0	6	6	7	3	3	4	3 (tie)	5th		
More Miles Per Gallon	4	4	17	0	0	2	1	1	0	0				
More Gallons Per Air Hour	5	7	20	0	1	0	1	1	3	1				
Small Field Operation Ability	6	19	70	0	4	2	5	3	2	3				
Engine Off Soaring Capability	7	42	205	12	12	3	2	4	5	4	1st	1st		
Increased Climb Ability	8	5	15	0	1	0	1	0	2	1				
Pilot Comfort from Elements	9	0	0	0	0	0	0	0	0	0				
Increased Pilot Visibility	10	1	1	0	0	0	0	0	0	1				
Better Portability & Storeability	11	21	80	1	3	5	3	3	3	3	6 (tie)			
Less likelihood of FAA Regs	12	25	126	10	3	3	2	3	2	2	5 (tie)	3rd		
Reduction in Net Weight	13	17	55	0	3	4	0	2	3	5				
More +/- G-Load Capability	14	29	125	8	3	2	3	6	4	3	3 (tie)	4th		
More Cockpit Fairing	15	1	1	0	0	0	0	0	0	1				
Better Engine Reliability	16	27	111	3	2	8	3	5	5	1	4th	6th		
Lower Rate of Cost Increase	17	14	46	1	1	2	3	1	2	4				
Higher Absolute Altitude Ability	18	4	20	0	1	2	1	0	0	0				
Longer Engine Life	19	19	90	4	2	2	8	2	1	0				
Smaller Turn Radius Capability	20	9	29	0	0	3	0	3	2	1				
Better Repairability	21	10	25	0	0	0	2	2	5	1				
Easier Buildability	22	5	22	1	1	0	0	3	0	0				
Passenger Carrying Capability	23	4	13	0	0	1	1	1	0	1				
Lower Noise	24	36	159	7	7	7	2	4	4	5	2nd	2nd		
Greater Crash Survivability	25	21	96	8	2	2	0	2	5	2	6 (tie)			
Greater Foot-launch Capability	26	10	31	1	1	0	3	0	1	4				



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UP COMET 185

A kick to the right and the big 185 COMET goes to work for Eastern top-ranked competition and X-C pilot, Matt Wagner. The 185 COMET delivered a big win to Matt in the first Southeastern League (a series in which Matt was overall champion last year). The 185 COMET also brought Matt a cool 55 mile "flat land voyage" in late April.



BIG WINNERS

Matt and his 185 COMET are an unbeatable team. They offer this advice: "If you want to win big in competition, you simply must fly a 185 COMET. The track record eclipses that of any other competition level glider. Whether you fly in South Africa or in the Southeastern USA, the 185 COMET is the best ship the U.P. team as ever built." "In Tennessee's 1981 Southeastern League, seven of ten top finishers were flying COMETS. In the 1981 competition season, COMETS seem destined to the same sweeping victories that the model achieved throughout 1980. That's why pilots everywhere are choosing COMET as their opportunity to win big in 1981." Matt continues, "My new 185 COMET will out-throttle the 165 I flew till recently. I feel it has a better L/D at the same wing loading, and I find better minimum sink and greater speed range than I've ever had. It can make you a big winner in 1981. If you hook in at over 200 pounds, you have a single choice to win big . . . the 185 COMET."

SPECIFICATIONS 185 UP Comet

area	20' 4 3/4"
leading edge	8' 7"
keel	120
nose angle	0
billow	78 lbs.
weight	9 /side
battens	34.8'
wing span	6.6
aspect ratio	150-250 lbs.
glide ratio	10:1+
minimum sink	180 fpm
speed range	15-50 mph
stall speed (indicated)**	15 mph
max L/D speed (indicated)	21 mph

*INCLUDES ALL FLYING GEAR: HARNESS, HELMET, VARIO, PARACHUTE, ETC.
 **ACTUAL STALL SPEED APPROXIMATELY 6 MPH FASTER.
 Send \$2.00 for complete info/photo package.

MOTORIZED

The long awaited N.P.R.M. has been released and the FAA is now awaiting response from the Ultralight and Hang Glider community.

We have a golden opportunity to have a hand in making the rules that will govern us. The purpose of a Notice of Proposed Rule Making (N.P.R.M.) is to allow a period of time for comments, suggestions, and input before rules are officially made. The N.P.R.M. deals in two areas; one is the definition of an ultralight and the other is the operating parameters. An interesting note is that both Hang Gliders and Powered Hang Gliders are included in the same category. The definition of an ultralight vehicle under this proposal would be:

those vehicles powered or unpowered intended to be used for manned flight:

1. by a single occupant,
2. that weigh less than 155 pounds (dry, empty weight),
3. with a fuel capacity of 15 pounds or less (approximately 2.5 U.S. gallons),
4. and which have no U.S. or foreign airworthiness certificate.

The proposed operating parameters of ultralight vehicles would include:

1. No person may operate an ultralight vehicle except between the hours of sunrise and sunset.
2. No person may operate an ultralight vehicle within an airport traffic area, control zone, terminal control area or positive control area unless that person has appropriate prior authorization from the air traffic control facility having jurisdiction over that airspace.

3. No person may operate an ultralight vehicle over any congested area of a city, town, or settlement, or over any open air assembly of persons.

4. Each person operating an ultralight vehicle shall maintain vigilance so as to see and avoid aircraft and other ultralight vehicles and shall yield the right of way to all aircraft. No person may operate an ultralight vehicle in a manner that creates a potential hazard with any aircraft or other ultralight vehicles.

5. No person may operate an ultralight vehicle except by visual reference with the surface sufficient for the safe operation of that ultralight

vehicle.

6. No person may operate an ultralight vehicle when the flight visibility or distance from clouds is less than that prescribed. (The distances prescribed are basically those prescribed for V.F.R. operation of aircraft.)

7. Each person operating an ultralight vehicle under this part shall, upon request, make the vehicle available for inspection by FAA (including inspection of the vehicle in operation at the launch and recovery site) to determine compliance with the requirements of this part.

With these proposals in hand I went to a local Fly-In last week and asked the ultralight pilots what they thought. I also polled the licensed pilot types as to their opinion of this N.P.R.M. The results were quite interesting. The ultralight pilots and licensed pilots all seemed to be in agreement that the rules were quite fair with one or two exceptions. What they disagreed most with was the empty weight of 155 pounds and the fuel limit of 2 1/2 gallons. However, they all felt as though they could live with the fuel requirements easier than the empty weight. I almost sensed a feeling of relief from the group as we talked, in that we will soon be a legitimate form of aviation, no longer held in a grey, limbo area of uncertainty. The licensed pilots seemed to be relieved to know that ultralight pilots will fly by the same rules of the road. It appeared to me that, all in all, the feeling was very positive toward the N.P.R.M. I asked the ultralight owners what effect this N.P.R.M. would have on them. Most felt that the effect would be positive because the rules would be the same everywhere. One fellow cited an incident where he was refused permission to fly at an airshow because he could not demonstrate the foot launch capability of his craft. But a week later at a different airshow, with different FAA people, he was allowed to fly. This type of uncertainty will be done away with in the new rules. So it seems that this N.P.R.M. is not a restrictive piece of rule making but rather a set of guidelines to allow the ultralights and hang gliders to blend easily and safely into the mainstream of aviation.

Now for my comments. The FAA has, in my opinion, honestly examined this

whole issue and recognizes that powered hang gliders (ultralights) and hang gliders are new and unique vehicles similar to airplanes, but significantly different enough to justify placing them in F.A.R. Part 91 and Part 101 under the description "Ultralight Vehicles." I feel that one additional point should be added to the description of Ultralight Vehicles and that is a wing loading factor. The essence of ultralight flight is the low and slow aspect of it. By not having a wing loading requirement, ultralights capable of 200 m.p.h. are possible. However, they will take off at 60-70 m.p.h. Witness the "Cri-Cri" for example. Although it fits the weight requirement it certainly is not an ultralight, but a small airplane. It also requires a much higher level of pilot skill.

The wing loading requirement will define stall and top speeds of these vehicles and the pilot skills necessary are not as demanding. I support the PUMA position of 3 pounds per square foot. We already have all the rules for faster, more demanding airplanes, if that is what anybody wants.

This is a proposal and whether it goes through in its present form will be determined by the comments and criticism received by the FAA.

Do not feel that because you are just one person, that you do not count as much as do the special interest groups. You can speak for yourself, if you like. Tell them what you like or do not like. Be civil in your tone and content, and you will find the FAA is a reasonable group of people with whom to work.

Comments should be sent in duplicate before November 24th, 1981 to:

Federal Aviation Administration
 Office of the Chief Counsel
 Att'n: Rules Docket (AGC-204)
 Docket No. 21631

800 Independence Avenue S.W.
 Washington, DC 20591
 If you would like a copy of the N.P.R.M., write to:

Federal Aviation Administration
 Office of Public Affairs
 Att'n: Public Information Center (APA-430)

800 Independence Avenue S.W.
 Washington, DC 20591
 Or call (202) 426-8058
 Be sure to give the notice number of the N.P.R.M., which is 81-6.

"How much is the FAA going to ask for to enforce these regulations?"

by Dick Heckman,
USHGA Region 10 Director

The long awaited NPRM is out. Several articles have already appeared outlining its provisions. At the USHGA Board of Directors meeting in August, we spent a lot of time dissecting each paragraph and analyzing its effect on hang gliding. Then we prepared a statement which will be the USHGA's official position on the NPRM. This statement is being sent to all USHGA members with a request to prepare their own letter stating their positions in their own words.

For those who are not yet members of the USHGA, I will paraphrase our statement and point out my ideas on why we have said what we have.

1. Hang gliders are not ultralights and should not be classified for regulatory purposes as the same vehicle. Hang gliders are unpowered, foot launched, air vehicles. They are akin to conventional gliders. Ultralights are powered, lightweight air vehicles. They are more like airplanes. They should be separated for regulatory purposes.

2. It is not clear that there is any reason to regulate hang gliding. The USHGA self regulation program has been working well and has required compliance with the relevant portions of Part 91, Subpart B (Operating Rules) of the FAR's for many years.

3. Part 101.49 of the NPRM provides no right-of-way for ultralights or hang gliders. This means that if somebody in a Cessna 172 runs you down from behind while you are cruising 300 feet above a ridge, you are liable, and your estate is liable. I personally would like to think that my life insurance stood some chance of going to my wife instead of lawyers under these

circumstances. Since hang gliders fly so slowly, it is not at all clear that even with warning and evasive action taken by a hang glider that it would be clear of another aircraft, in particular the wake turbulence associated with even a Cessna 150. It is also possible that we could be harassed out of the air by a disgruntled airplane pilot and have no legal recourse. ★★ Request that hang gliders have the same right-of-way precedence as regular gliders presently have and that ultralights have the same precedence as airplanes.

4. Part 101.47 of the NPRM excludes flight over congested areas. Many of our present flying sites have landing areas in urban development. Whitwell in Chattanooga's Sequatchie Valley, for example, requires flying over a small residential area. Is that a congested area and who determines whether it is or not? Hang gliders, with their low speed and light weight, maneuverability and soundlessness, present neither an intrusion or a safety hazard to any persons or property on the ground. ★★ Request that Part 101.47 be re-worded to read:

"No person may operate a hang glider or ultralight over any congested area of a city, town, or settlement, or over any open air assembly of persons or property, or at an altitude insufficient to ensure a safe landing."

5. Flying between the hours of sunset and sunrise is prohibited. This is the same wording as applied to any airplane without lights. You may want to request permission to fly with lights or extend the permissible flying time to one hour after sunset. The justification for late flying would be that any soaring conditions existing at that time of day would be ridge lift with little possibility of being above 500 feet. Sufficient light exists up to one hour after sunset to permit safe hang gliding operations.

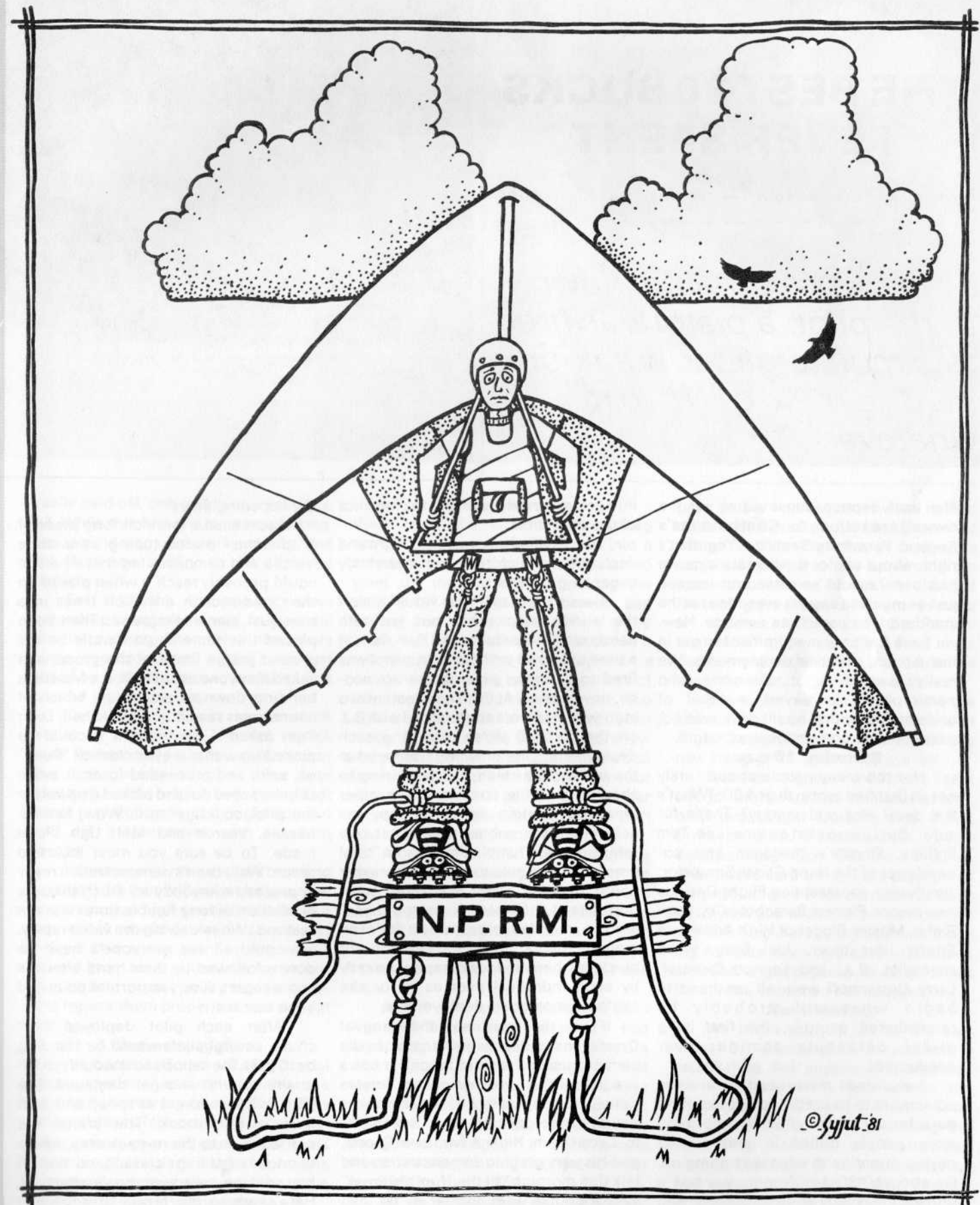
6. Tandem flying is indirectly prohibited by the definition of an ultralight vehicle as single place. I guess you could do it legally if you had a private license and you registered your glider and got an N number for it. I would

suggest that you point out the advantage of using tandem for teaching in some circumstances.

For ultralights, it is my feeling that it might be useful to suggest that the definition of an ultralight include a minimum wing area criteria as does the international definition of a microlight. This was done by the FAI as a way of insuring that this class of vehicle (with minimal regulation) would always be slow, easy to see, and not be capable of building up much kinetic energy, therefore not be a hazard to people or property on the ground. This helps minimize objections to this class vehicle by other members of the aviation community and by lawmakers concerned with the general public. The international definition of a microlight is: One or two place, up to 150 kilogram (330 pounds), with a minimum wing area of [weight (kg)/10] square meters, but in no case less than 10 square meters. For those of you who have heard of the Cricket ultralight that was at Oshkosh (see story, pages 40-42, this issue), you will recognize that a 140 mph cruise, 50 mph stall, airplane was not quite what anybody had in mind for an ultralight requiring no licensing or certification.

It is important that you send a letter to the FAA and one to your Congressman. You could also send to your Congressman a copy of your letter to the FAA with a note why you feel that this is important. A key point is that it is not clear that this level of regulation is even required! A definition of hang gliding is perhaps needed, and maybe a requirement that we follow Part 91, Subpart B, which we already do, but the rest of the detail is not necessary. A point with Congressmen is, "How much is the FAA going to ask for to enforce these regulations?"

Send your letter to:
Federal Aviation Administration
Office of the Chief Counsel
Att'n: Rules Docket (AGC-204,
NPRM No. 81-6, Docket No. 21631)
800 Independence Av. SW
Washington DC 20591



THE BEST 20BUCKS I EVER SPENT

Article by Chuck Toth — Photos by BJ Schulte

"...then at a time unknown to the pilot, a pistol was fired to simulate glider break-up, mid-air collision, or whatever..."



The lead caption above sums up the overall reaction to Chattanooga's Second Parachute Seminar! Yea, that's right, about two or three years ago, we had a parachute seminar and learned just as much as anyone every does at the standard type parachute seminar. Now, we have the proper equipment to get in the air and practice deployments. We really learned a lot. *Everyone* who participated, achieved a level of understanding that up till now, was not possible with conventional exposure.

Saturday, 10 a.m.

Not too many people about, surely not all that had sent in their \$20. "What's the deal? Hot and muggy? That's for sure." But I like to start on time... so, Tom Phillips, Crystal's manager and co-developer of the Hang Glider Simulator; Jim Reuter, representing Flight Designs new owner, Pioneer Parachute Co.; Leon Riche, Master Rigger of High Adventure Sports; our timer, Joel Berg; video specialist, B.J.; and Launch Director, Larry Guttenhoff were all on hand to *begin* what will probably be remembered as truly, the first hang glider parachute seminar ever conducted!

I explained the procedure and the equipment to be used, Leon gave a short parachute talk and by that time more and more people drifted in and started paying attention to what was going on. By about 10:30-11:00 a.m., we had a crowd. Everybody showed and we split

into groups to help facilitate the logistics of the operation.

Tom Phillips gave a demo flight and deployment which really got everybody eager to get started.

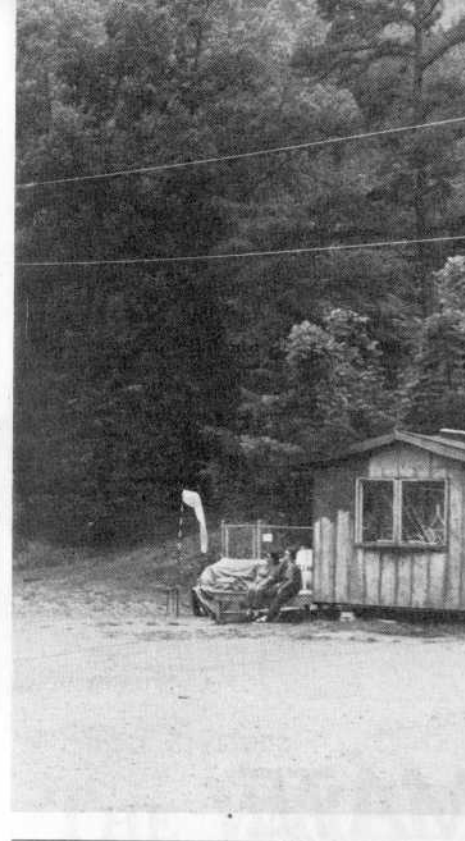
Here's the plan: Pilots would run off the launch ramp, prone out, get both hands on the basetube, and fly-- then, at a time unknown to the pilot, a pistol was fired to simulate glider break-up, mid-air, or whatever. At this same instant two stop-watches were started, and with B.J. on the *CASMO Video* recording each deployment. One timer was stopped at the *instant* the chute was beginning to show out of the container. The other timer kept running until full canopy was achieved. By subtracting what we referred to as "fumble time," from "total time" we were able to get a pretty *exact* chute opening time. Now, y'all must understand that these "opening times" are not intended to be correct for each manufacturer's product, only for our purposes here and for comparison *only* by each individual pilot as he or she made successive deployments.

From the few times the gang at Crystal made deployments prior to the seminar using their simulator, I made a prediction that, what we called "fumble time," would actually be longer than the actual chute opening time. But thanks to Leon from High Adventure Sports, and his very graphic demonstration and talk this morning, all the "fumble times" save a couple were shorter by far than

the "opening times."

Leon used a ten inch long piece of 1" diameter plastic tubing as a chute handle and demonstrated that a person could probably reach it when placed on their mid-section a million times in a row, just standing around. Then Leon placed this same chute handle on the ground just in front of the group, and asked if anyone could walk the two steps bending down to pick it up, which of course, was readily accomplished. Leon then asked if we thought it could be picked up with our eyes closed? "Sure," we said, and proceeded to do it, when Leon reached out and picked it up before the pilot could get to it. Wow, fumble, fumble, search and feel. Ugh. Point made. To be sure you *must* look and reach. Well, Leon's demonstration really impressed everybody so much that, my prediction of long fumble times was not realized. While viewing the video replay, we could all see everyone's head go down, followed by their hand after the pistol report. A very important point had been learned.

After each pilot deployed their chute, several pilots would be standing by to grab the canopy so it would not fall to the ground and get damaged. The pilot pulled in to get airspeed and then land, and un-hook. The chute was carried over to the re-pack area, where Leon was holding "class," and boy oh boy, did he have everyone's attention. Here's where the group arrangement



really paid off, one had to wait hardly at all. While this first group was repacking, the second was up the hill jumping, and the third was tending to the deployed canopies.

For this, the first repack, Leon helped up along all the way, but we still did the packing. Then, when the whole cycle was completed, again, Leon just stood by and watched while each of us packed it all ourselves.

The whole job was made much easier by Leon's very efficient repack area. He had it all set up to repack four or five parachutes at one time (see pictures), with help if required. Most pilots just stopped and thought about it and did it themselves with excellent results.

I never saw so many people hurrying up that 110 foot hill so fast before. The excitement was high as we all wondered if our repack would deploy and save us! I believe this is the point where we all gained that aura of confidence in our parachutes, in our ability to use them, and repack them properly. It was a great feeling.

Saturday night

We cooled off at the CASMO pool party and quenched our thirst with an ice cold barrel of beer while watching BJ's video replays of the scores of successful deployments over and over. I think it was at the pool party that someone suggested intentionally screwing up a repack to see what would happen.

Sunday morning

Well, Leon did it with a brownbag special. He just stuffed a chute into a standard grocery bag, rolled it up and went up the hill. Well checking the data told us that the brown bag special was the quickest of the entire affair, but Leon explained, "...because it would catch air more quickly than a container pack due to the looseness of the material." Quick, but not too convenient! Again a point had been made. If you just pay attention to a few important points, like straight shroud lines, clear air channel, etc., then your repack will *work!* Of course, always refer to your repack manual that came with your chute for the proper sequence.

Along about lunch time on Sunday the weather was taking its toll, as more and more of these *hot* pilots were standing around, already swapping tales of their better deployments, rather than walk up the hill again. Can you imagine? I think we created a monster. Ha. I hope so.

As the day and we mellowed out I was just blown away by what I had experienced this weekend. A much more avid interest in the workings of that mysterious lump on our harnesses, have definitely been demonstrated. In fact, from the numerous queries of "When you gonna do it again," and phone calls since, we are planning the next seminar for mid-October, 1981.

As we wrapped it up, Jim Reuter



gave us his impression of what he had observed. Based on his background of design and development of many very sophisticated parachute systems, from space capsules on "down," he thought that using the *Crystal Simulator* as a tool to observe and record the "actual sequence" of events that lead to a deployment in the hands of the ultimate user, the pilot, was a major breakthrough.

Everyone was imbued with the seriousness and professionalism that Flight Designs was using to develop a new hang glider parachute system.

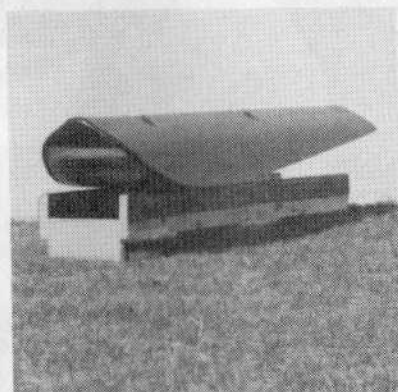
From the eight or nine letters I sent out to the parachute manufacturers, only two, Flight Designs and D.A.R. Enterprises, responded. Very disappointing! Don Rumble of D.A.R. Enterprises sent a very nice example of his product on a Price harness for us to try. Myself and two other pilots deployed the D.A.R. and we all agreed that those big handles were very easy to find and afforded a good grasp to pitch it out hard. Nice colors on the canopy.

Next seminar

We invite you join us for the next event of deployment. A pattern is established. Ask anyone who attended the first one if it was worth the investment of \$20 and the time. Then you'll want to consider attending the upcoming seminar on Halloween weekend, October 31st, November 1st, 1981. Welcome divers! Please... send a reservation and deposit (\$10 each).

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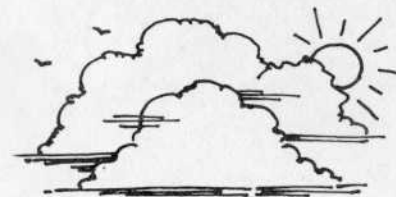
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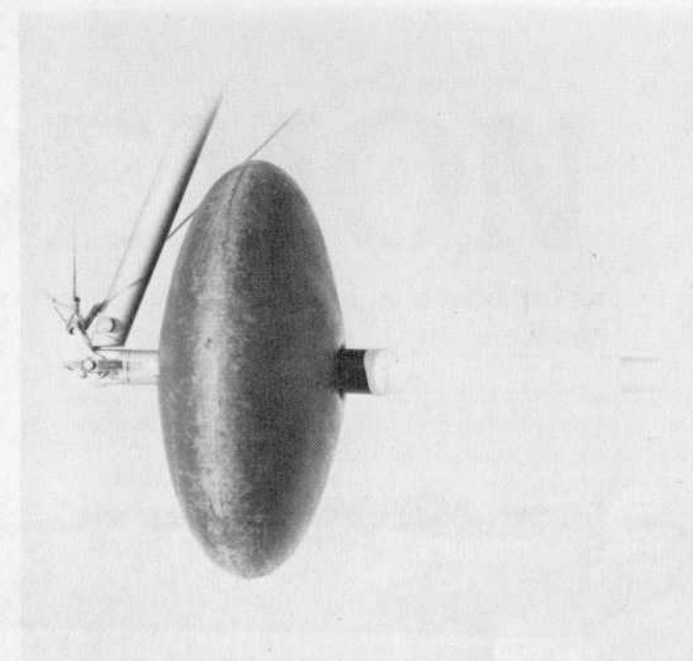
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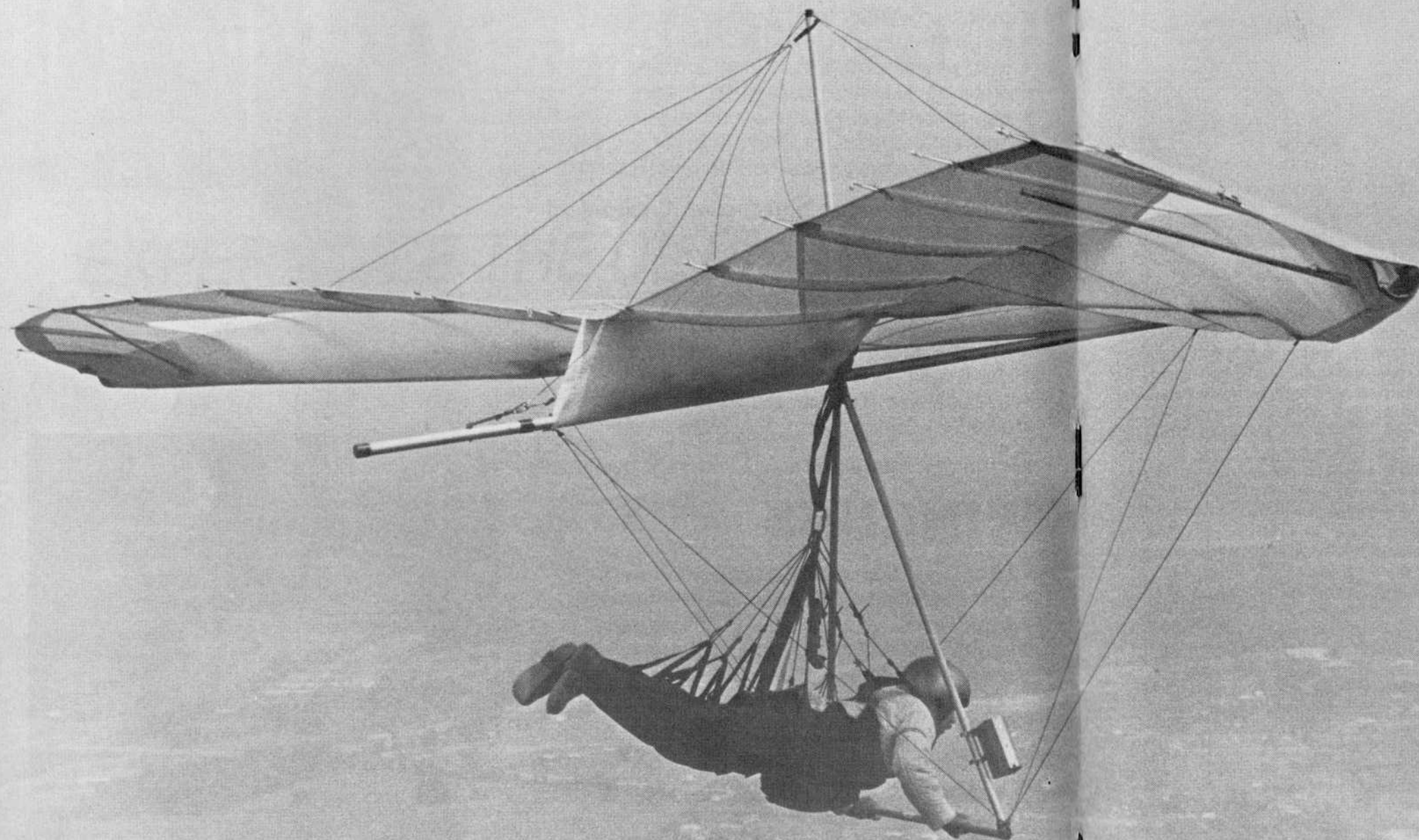
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Flight Designs **DEMON**

Imported from Hiway in England, and modified for American pilots/Article by Dan Johnson
Photography by BJ Schulte

PREFACE

First impressions can be deceiving. I first saw the Demon at the 1980 American Cup. That was the Hiway Demon from England. It had many of those characteristic appearances of European designers

Next I toured the west in early March and saw Jean Michel Bernasconi at Flight Designs. He was given the task of modifying the Hiway Demon so that it better suited the American market, as defined by Flight Designs. The Salinas manufacturer has acquired the position as an importer of hang gliding equipment (Lancer, Atlas, GPA helmets, and other accessory items), and the Demon from Hiway is an extension of this endeavor. But Flight Design learned some lessons along the way. An erratic flow of Lancers, for whatever reasons, brought owner, Marty Alameda to move into his own production of the Lancer. This went so strongly that manufacturing became a mainstay of Flight Designs, and the company had moved up the ranks very rapidly till today they can be regarded as one of the top four or five glider suppliers in the U.S.

When I inspected the "prototype"

Demon last March, it had several subtle differences from the August 81 model, and one more salient characteristic. The sail on that English Demon was quite tight, both upper and lower surfaces. The American edition, by comparison to that first one, has a relaxed sail, not drum tight. A point that stuck in my mind was that Bernasconi sought mostly to improve handling. I seized on that looser sail as one key way as to how Flight Designs might have achieved better handling response. I questioned, however, if that was not a trade-off done to the detriment of performance, specifically glide angle and top speed. A call to Marty brought the reply that, "The sail will draw up in flight," and to notice the pre-load in the leading edge.

Some subtleties of design really leave me wondering, and I then wish I had an engineering background with which to answer my own questions. Alas, I am only educated in aerodynamics as a pilot of some experience, and I have to ask a lot of questions. But this all contributes to why first impressions can be most deceiving. As the old proverb goes, "You can't judge a book by its cover."

PILOT REPORT

CONTROL

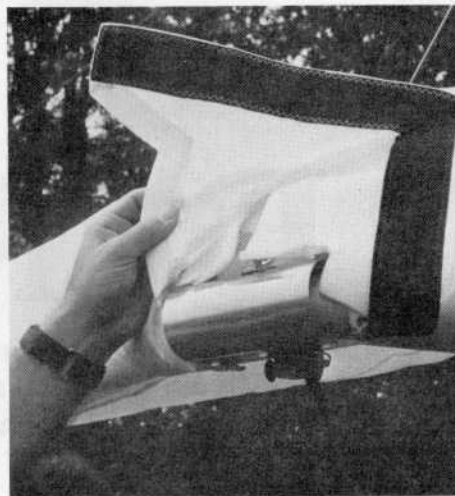
Authority of control is very good on the Demon, earning very high points in this category. One reason why I feel strongly about this is roll-out. I have generally found that the superwings of 1981 are dynamically roll neutral enough that they all share a quality which has them roll-in easier than they roll-out.

While the Demon cannot match the light roll pressures of the Harrier (lightness is most definitely a factor in roll authority, I feel), it exhibits more authority in roll-out. This can be rather important if you are scratching in some bumpy ridge air. What you start you must be able to stop, or reverse.

In the lower speed range, bar pressures actually got rather heavy, and when Tom Phillips flew this Demon, he felt its roll was very heavy. The ship was trimmed a bit slow, I felt, and Tom may have deepened that by his greater weight, then feeling excessive roll pressures. Yet, in my experience I have found the Demon to roll with slightly lighter than moderate pressures and to have good authority throughout the speed range of the glider.

Scratching close was straight-forward enough. The predictability of the Demon control is easily discovered in such conditions. You must plan turns earlier than a very few gliders, and have more latitude than most other designs, by that meaning roll rates on the Demon are better than average though not as fast as the quickest ships. On one of several soaring flights, I had to hang in very close to the tree tops. Fortunately, one, I had a previous hour long Demon flight, and thereby knew what roll rate I had available, and two, I had the ridge to myself so traffic was not a worry.

Thermalling efficiently offered a greater challenge on the Demon. The glider's moderate roll rate, and greater roll-in/out stability also made it a bit perplexing as to how I should flat turn it. Kicking my feet to the high side momentarily in conjunction with a bicycle handle bar yaw movement can flat turn some designs (Maxi, Harrier) quite well. This was dramatically less so on the Demon. Increasing the bank was also more effort in the ship, again, I



imagine, due to the roll stability. Before it sounds like the Demon is unacceptably tough to thermal, let me set the record straight.

On a day when thermal activity was pronounced, the action within the first 500 feet had the thermals drifting off in two directions over 45° divergent. Only four of us were able to lift through this and go to cloudbase, that situation lasting over an hour. In that air, I prefer to do short, connected, and very flat, opposing 180°s as a way to confine my movement within small, indistinct thermals. The Demon suffered under this control application.

Once above the 500 foot mark, however, the thermals took on better definition and cloudsuck was present at 2000 feet and up to cloudbase at 2750 above. In those still somewhat broken thermals, a constant direction turn seemed best, and the Demon excelled. It holds a turn very comfortably and precisely. I believe it does so because pitch control is quite easy and predictable, with light pressures. It definitely betters the Comet in this area. In fact, in general, the Demon out-handles the Comet. Several pilots have agreed on this judgement.

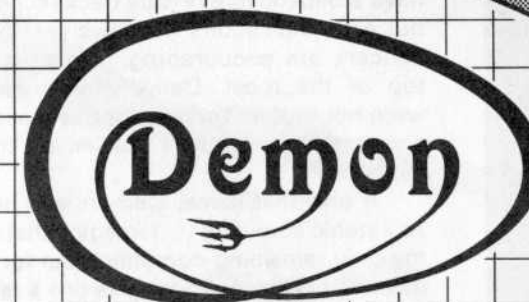
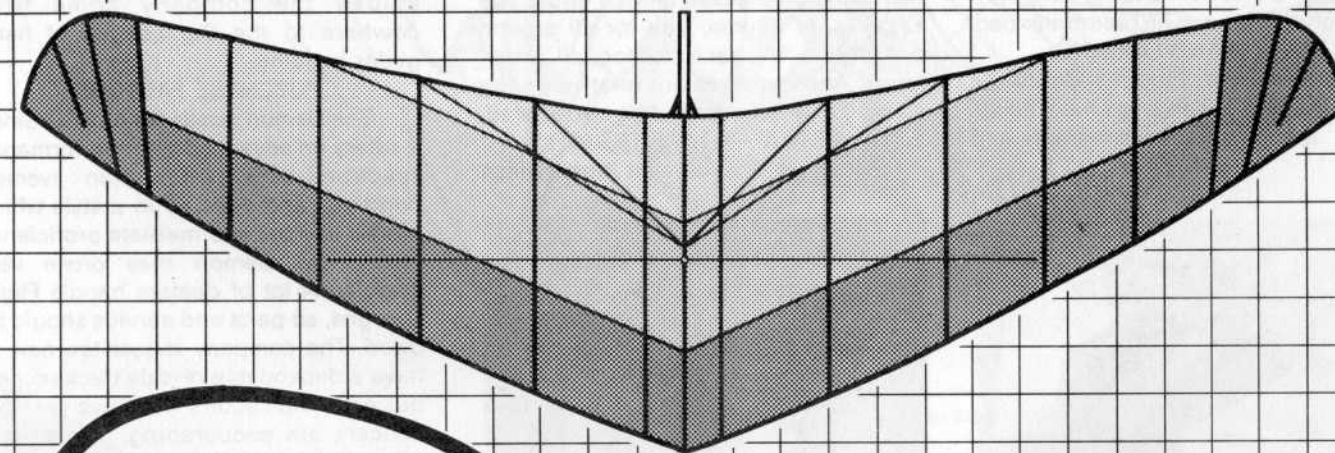
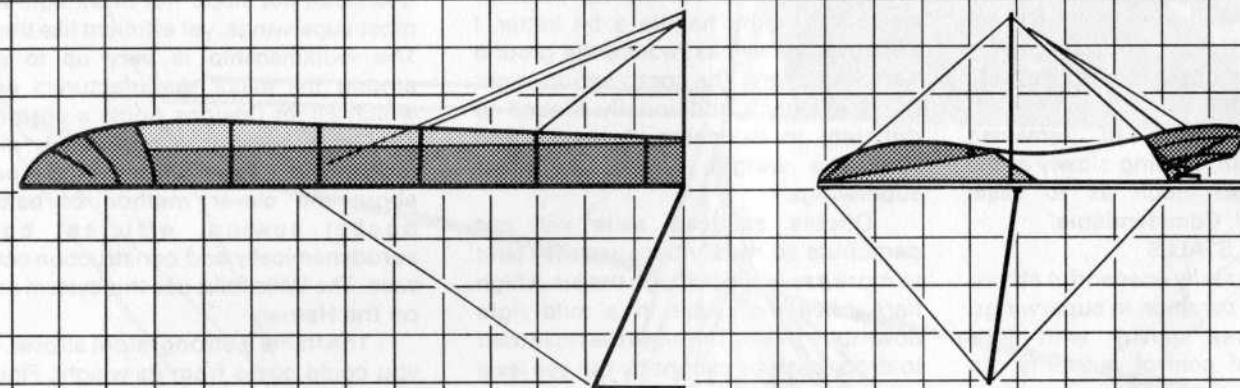
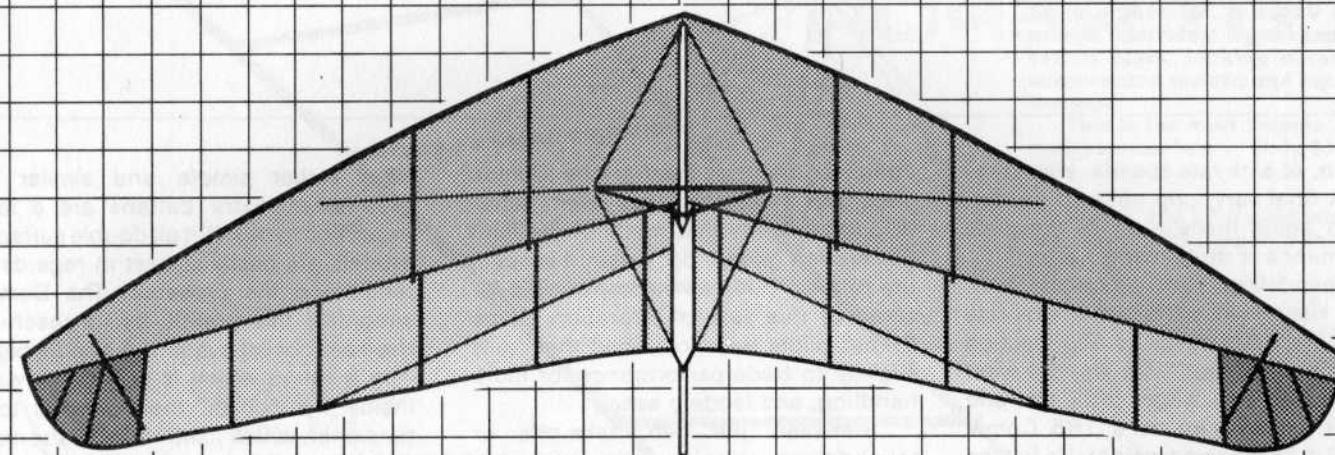
PERFORMANCE

In my first two soaring hours (three flights), I was not sure of the performance of the Demon. Conditions just did not permit the sort of comparisons I like, and I had further started with a preconceived notion. Recall I thought performance had been

traded for better handling when I viewed the sail slackness on current Demons. One fact flew in the face of that perception. The sail seemed very clean at all speeds that I had tried. Glide performance and sail cleanliness have a high correlation in my experience. Also, I had done very satisfactorily in flights with other superwings and good pilots. Still I had a nagging feeling that glide and sink were just not present, in the quantities I imagined. I had remarked to several other flyers that I felt perhaps the Demon was a state-of-the-art superwing, but for an intermediate pilot. After all, it handled well, but was more stable than some other designs. It had all the "trick" features. It was heavy but balanced well, launching easily. And it landed very easily, but more on that later. So if it lacked a tad in performance, that was an expected compromise, making it less demanding of advanced skills. I still feel that an intermediate can handle this ship.

However, in the cloudbase flight described above, a short, over-the-back X-C flight resulted. I flew with this issue's cover pilot, Chris Smith, who was on his Harrier. This jaunt gave me new appreciation for both sink and glide performance, especially the latter. We soared cloudsuck which was strong enough, but a large space existed between cumulus build-ups. The Demon skated very well (perhaps better than the Harrier; it was a very subjective evaluation) between lift areas, with the bar back to my chest. Normal bar

Continued on Page 32



© - Syjut '81

PILOT REPORT

position, at sink rate speeds, was at my chin. A final very long glide to an out-landing again made me feel the glide performance is quite respectable.

A good friend and advanced pilot, Denny Haldeman, did a better sink rate check than I had obtained. His reaction was very satisfactory in a wonder wind (smooth, steady ridge lift). He and another skilled pilot on a 185 Comet hooked in at the same weight. He felt the sink rate was very comparable. The Demon in the test is a 175 square foot model.

As I have already said the glider moves out very well. Acceleration is not as rapid as the Harrier, but top speed is excellent, though perhaps not quite as good as the Comet. At a bar-to-the-knees control, the sail remained remarkably clean, moving slowly at the tip, but not so much as to seem inefficient at all. Commendable!

STALLS

Stalls were really uneventful affairs. As seems to be common in superwings, stall break was mushy with little deterioration of control authority. No poor characteristics were discernable in stalls from high or low speeds, or from accelerated stalls in turns up to 60° bank. As I have always maintained, this can mean an easier landing and slow approach speeds can be recommended.

LAUNCH AND LANDING

The Demon is without a doubt the easiest landing superwing I have flown. On all landings, I have maintained

complete control. Further the Demon does not have the nose-over, carry-through severity that many of the Fifth Generation gliders do. Again, I suspect the relaxed sail may be responsible for some of this ease of operation. Some Comet pilots have loosened their sails slightly to trade performance for more handling, and landing ease.

Between the two, take-offs or touchdowns, launch can be more demanding. The glider is heavy. I found it a strain just picking it up (in its bag). Of course, the weight dwindles once airborne. A lighter Demon, if structurally as sound, might handle a bit better, I suppose, as well as reduce the ground handling chore. The combination might improve launch, additionally, I found no difficulty in launching, however, and find the weight typical of most superwings.

Double surfaced sails will not parachute so readily because they tend to more easily slip through the air. A high flare once did result in a mild right downtube tweak. This time the nose tried to drop, but was caught by the eye level weeds in which I had out-landed. (They looked so short from up there . . .!?)

GROUND HANDLING

As stated above, the heavy weight of the Demon increased launch effort. The same is, of course, true for all ground operations. The bar is not too tall, which helps. And the wires are relatively snug so no Comet-clunk need be considered.

SET-UP—TAKE-DOWN

Most of the current superwings

have rather simple and similar rig assemblies. Extra battens are a lone exception to this. But all double surfaced models are pesky at best in regards to tensioning the crossbar. The Demon simplifies this greatly by its reach-in-the-keel-pocket-system. A handle helps grip a fitting which is pulled rearward inside the pocket, then clasped to a tensioner, which itself reduces the most difficult pull pressure. The kingpost erects itself when the wings are spread.

FRAME AND SAIL FINISH

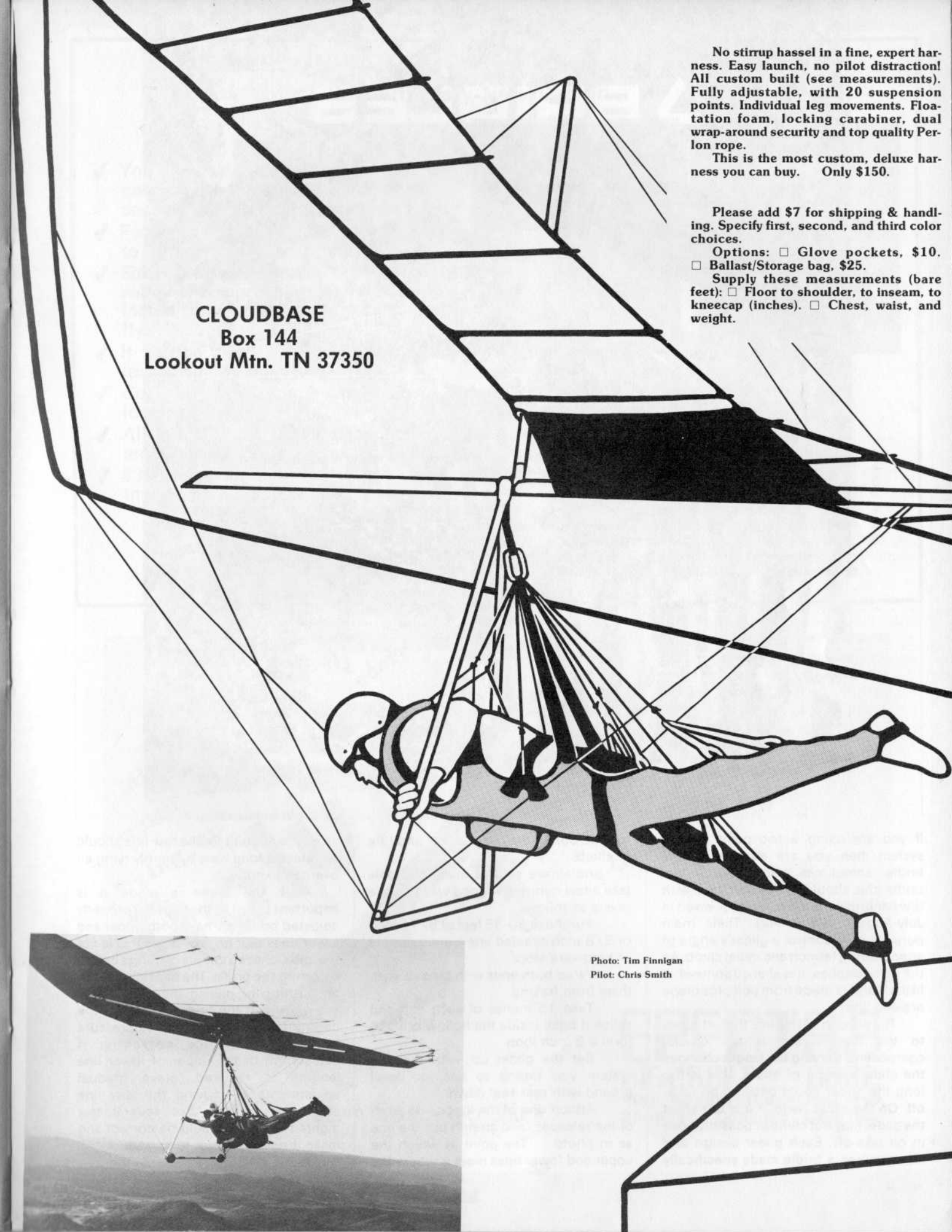
I have spoken about the sail already. It is clean but slack, not drum tight like most superwings, yet efficient like them. The workmanship is very up to par among the major manufacturers with which Flight Designs holds a position. The nose cover is a particularly nice touch, and I have written in the past about the clever method of batten pocket sewing, efficient both aerodynamically and construction cost-wise. The Wills folks use this system now on the Harrier.

The frame is strong, stout all over, as you could guess from its weight. Finish is typical Flight Designs, very smooth and polished, without clutter and unnecessary hardware. It is this simple attention to detail that undoubtedly has helped the company come from nowhere to the Big League of hang glider building.

PURCHASE FACTORS

The Demon retails for \$1850. Since it offers an advanced pilot performance spectrum with better than average handling, and does so in a style which places it in the intermediate proficiency realm, the Demon may prove very popular. A lot of dealers handle Flight Designs, so parts and service should be good. The company is just too new to have a dependable re-sale track record, but early indications from two year old Lancers are encouraging, though not top of the roost. Delivery timetables were not supplied in time for this report, check directly with a dealer or the factory.

If only that name, Demon, was not so satanic sounding . . . I imagine that is my only remaining complaint, but for a devil of a ride, you must give one a test flight.



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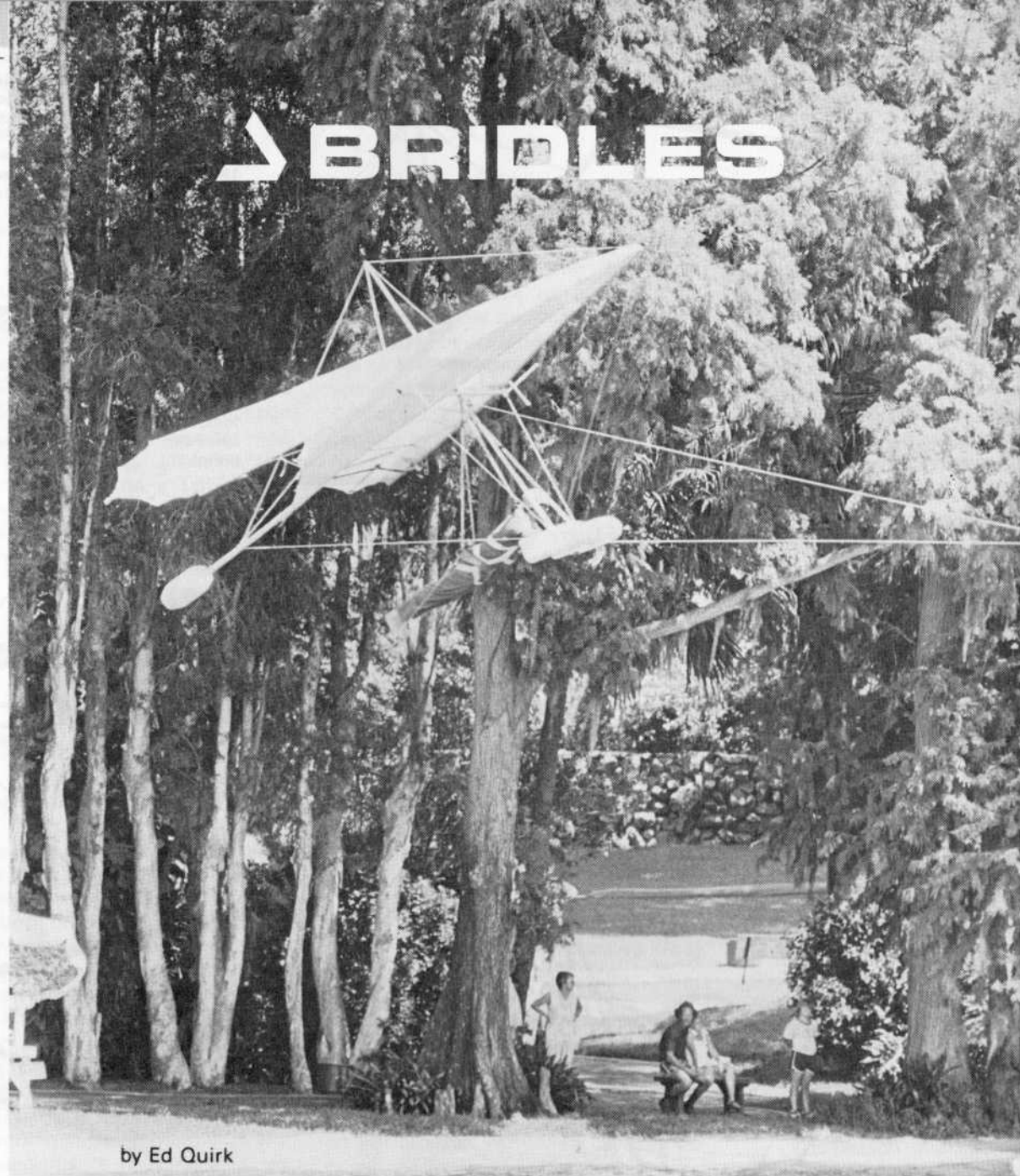
Please add \$7 for shipping & handling. Specify first, second, and third color choices.

Options: Glove pockets, \$10.
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Supply these measurements (bare feet): Floor to shoulder, to inseam, to kneecap (inches). Chest, waist, and weight.

Photo: Tim Finnigan
Pilot: Chris Smith

BRIDLES



by Ed Quirk

If you are using a two point release system then you are also using a V bridle, sometimes also called a tow bridle (this should not be confused with tow bar bridles, such as were reviewed in July-August *Whole Air*). Their main purpose is to control a glider's angle of attack during launch and initial climb. As the name implies, it is shaped somewhat like a V and is made from polypropylene braided line.

The portion of this line that attaches to the top release is the crucial component. Varying the length changes the glider's angle of attack. If it is too long the glider could pitch up on take-off. On the other hand, if it is too short the glider may not climb or possibly nose in on take-off. Each glider design and size requires a bridle made specifically

for it to obtain the best control and rate of climb.

Bridles are easy to make and only take a few minutes. A good way to make one is as follows:

Purchase 30-35 feet of 5/16 inch or 3/8 inch braided line from a marina or hardware store.

Wrap both ends with tape to keep them from fraying.

Take 15 inches of each end and splice it back inside the hollow braid to form a 2 inch loop.

Set the glider up, with the tow system you intend to use, on level ground with rear keel down.

Attach one of the loops into each of the releases, and stretch out the line as in photo. The point at which the upper and lower lines meet is where the

attachment point for the tow line should be. Make a loop here by simply tying an overhand knot.

After the bridle is made it is important to test fly the glider. A properly adjusted bridle will have both upper and lower lines taut on take-off. If this is not the case, check a couple of things before adjusting the bridle. The pilot should not be pushing or pulling the control bar excessively. If the bridle is correct the control bar will have light bar pressure and will reference correctly. If adjustment of the upper or lower line lengths is required, make gradual adjustments by moving the tow line attachment point. After several test flights the bridle should be correct and make it notably easier to tow up.

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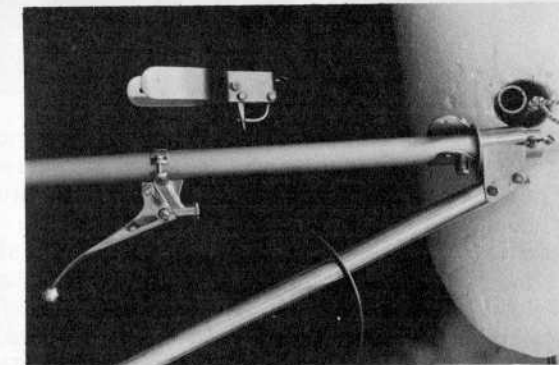
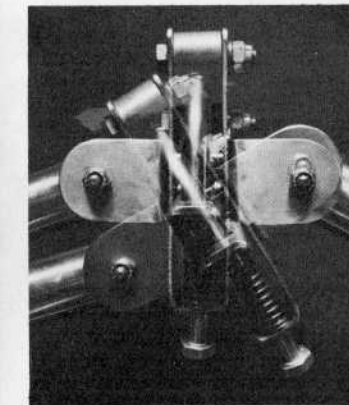
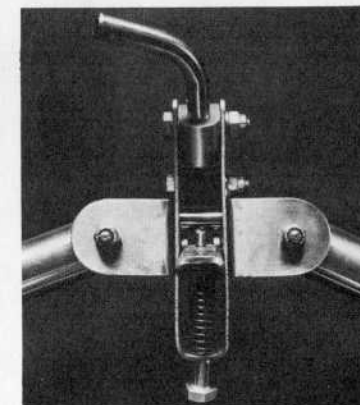


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TRIKES

In the March/April Whole Air, we ran an in depth article on the trike form of power for hang gliders. By survey we discovered it was one of the best read evaluations we have ever presented. It had a single drawback, but a big one...it offered no pilot report on flying the trike. That is the purpose of this update.

PILOT REPORTS: BENNETT DELTA WING TRIKE (Yamaha 100 Power) on WILLS WING HARRIER 177

On the first day of September, we had an interesting assemblage of pilots ready to go take first flights on what many feel is the only reasonable form of powered hang glider.

Tim Morley is Field Service Representative for Wills Wing. He is an excellent, advanced hang glider pilot with over 800 hours logged and experience in Quicksilver and Pterodactyls.

Tom Phillips is manager/co-owner of Crystal Air Sports, another advanced soaring pilot with Quicksilver and Humbug (now Vector 600) time.

Chris Smith, manufacturer of the very popular Spaghetti harness under the tradename, Cloudbase, is another advanced soaring pilot with considerable aerobatic experience. Chris has flown the Quicksilver.

Dan Johnson, the last hang glider pilot, has experience in the Eagle, Quicksilver line, Humbug, Hummingbird and the Teratorn. He is also a Certified Flight Instructor in airplanes.

None of the group had ever flown the trike. All were very familiar with the

Harrier, but none has any recent significant seated posture experience. Following are brief first day expressions of the flight.

(Tim Morley) First off, I like it; I thought it was enjoyable. It had been about four years since I had flown a glider seated. As near I could remember it was the same, though. The only difference was that I could push out and never cause a stall. An approximated measure by vario showed 200-300 fpm climb. Working thermals came quite naturally. I felt at home using lift with the power on.

I did not notice any tendency for the trike portion to yaw when power was applied. Certainly it was nothing that could not be compensated for; it responded well. The power off glide ratio of the craft was definitely decreased as a result of the drag increase, I believe. Take off and landing were as expected, yet on take off, when rotation was accomplished, it caused an initial rapid ascent, which might lead you to reduce power, which is *not* a recommended maneuver!

DISCLAIMER

Tim Morley's expressions regarding the trike are personal views. Though he does represent the Wills Wing company, Wills Wing Inc., does NOT endorse the adding of any trike system to their gliders. Their reasons are: 1) that they have not subjected any trike system used in conjunction with their designs to load and pitch testing, and 2) that since they are not producing a trike and did not manufacture this system, that they have no control over quality.

(Tom Phillips) The trike's 65 pounds seemed to enhance the already light roll handling, suspended as it was below the Harrier's tall bar. Pitch was heavier as the trim position was a full arm extension, and pressure built rapidly as the bar was pulled into my chest. It was a strain to

hold it that way.

The climb rate of the Yamaha powered unit was unimpressive, but adequate when compared to the Cuyuna (430 cc.) trike flying nearby. However, in thermals the unit coordinated well for a nice climb as I expected from my Harrier. Take off and landing held no real surprises other than their ease of execution. The much talked about yaw response of the unit was definitely present, but presented no problems.

(Chris Smith) The best thing is you can add it to your hang glider. You accumulate flying time flying your glider, so why switch to something else? Hang gliders fly real well, anyway and it is not that different with power added to it. Why have to learn to fly something else?

The yaw is noticeable but did not seem to interfere. With more air-time, it might be more easily felt, but I doubt it. It turns very nice. I prefer the weight shift to rudders and twist grips. If you prefer a hang glider on a hill, why not prefer it with power? Why fly something not as fun to fly?

It flies quite fast, and uses a high angle of attack, so it creates a sort of instability, unnerving near the ground. The Quicksilver by comparison, is more stable near the ground.

It thermals pretty much like a hang glider, but lost some sense of feeling to the effect of the engine's thrust. Electric start and brakes would be nice additions.

(Dan Johnson) The trike is more hang glider flying than ultralight. It is also somewhat more demanding than any of the ultralights I have flown. At this point I feel you need to be an experienced Intermediate pilot, and yet proceed very slowly.

Once some experience is gained, let's say 20 take off/landings and 2 hours airtime, I think flying the trike will be quite comfortable. It could offer more maneuverability than any of the ultralights I have flown, and has excellent potential as a hang glider soaring machine. It would need some drag clean-up before that could be said, however. It has more speed potential than many ultralights, yet still landing very slowly.

Set up/take down is much simpler, as is transporting the craft. It is less expensive than most ultralights, is ready to fly, plus you retain the best soaring wing with the easily removed trike disconnected from the glider.

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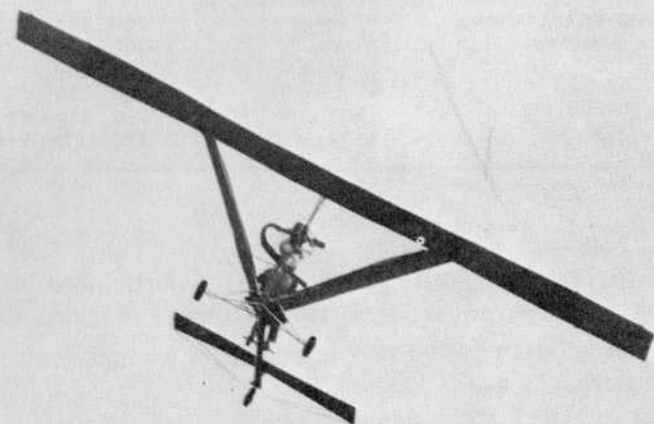
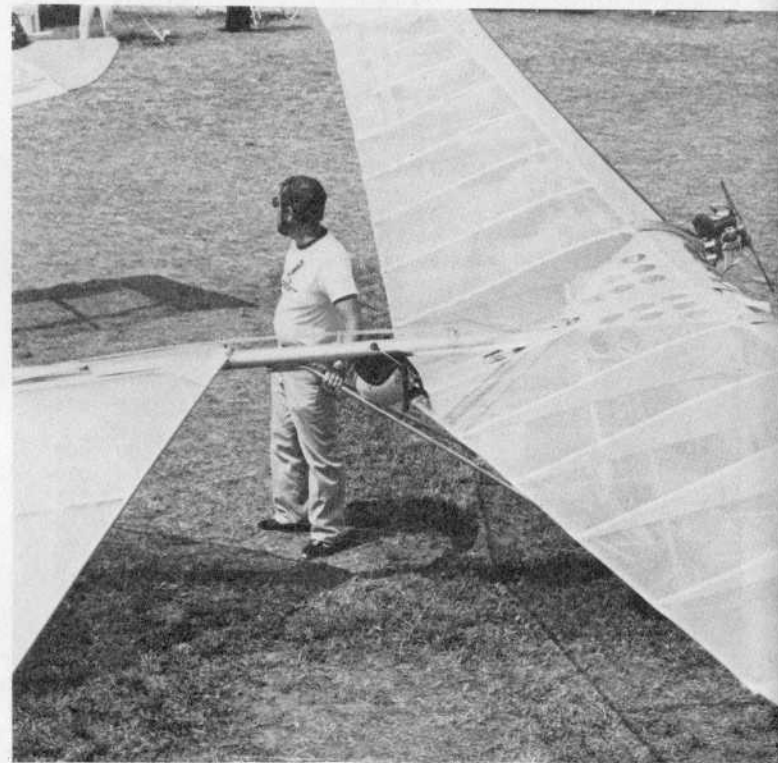
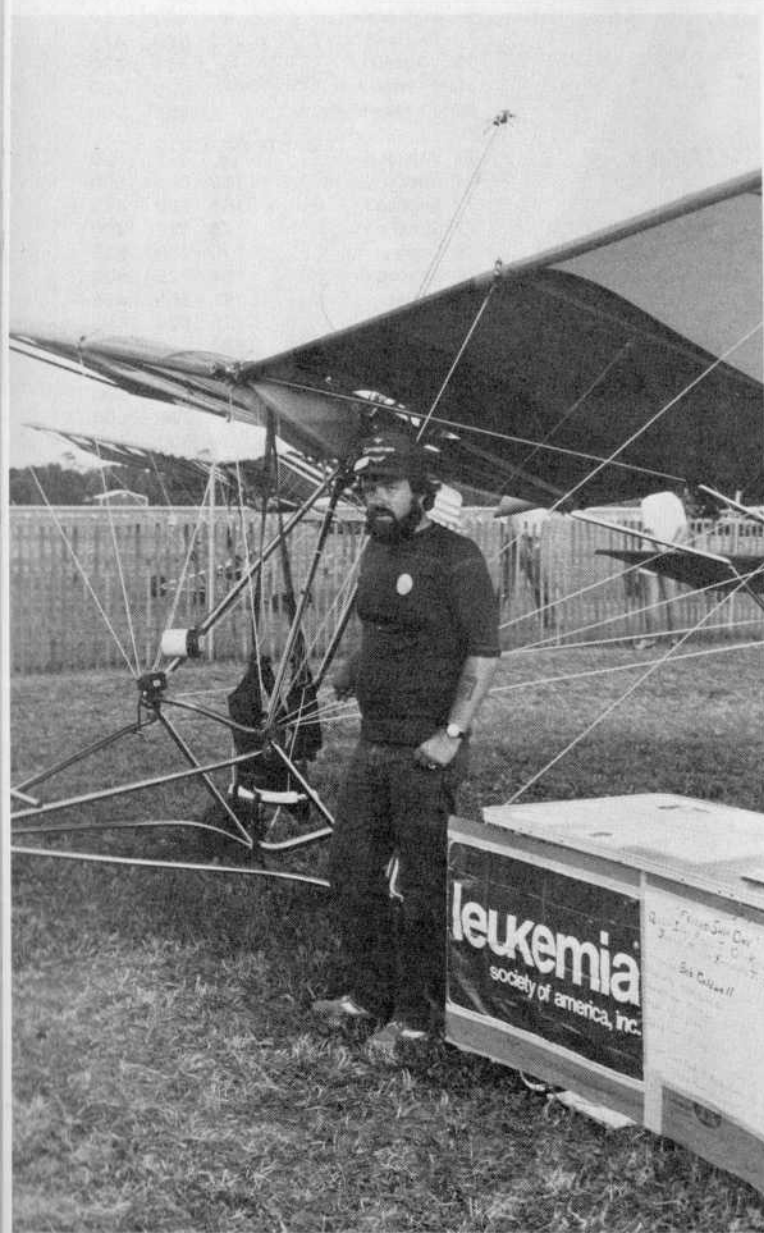
These prices are designed to be guidelines for evaluating your glider or one you wish to buy. We do not intend for these figures to be considered the final authority. Consult your local qualified dealer.

MANUFACTURER	YEAR/MODEL	SIZE	CLEAN PRICE	AVG. PRICE	MANUFACTURER	YEAR/MODEL	SIZE	CLEAN PRICE	AVG. PRICE
BENNETT DELTA WING	77 Phoenix 6C	Jr.	550	450	SEAGULL AIRCRAFT	77 Seahawk	170	600	450
	77 Phoenix	Sr.	425	400		77 Seahawk	190	550	450
	77 Phoenix 6C	Reg.	500	425		77 10.5 Meter	---	625	525
	77 Phoenix 8	Reg.	650	375		78 Seahawk	140	675	625
	78 Phoenix 8 Super	Reg.	675	450		78 Seahawk	170	675	525
	78 Phoenix 12	Reg.	650	525		78 Seahawk	190	675	525
	79 Phoenix 6D	---	185	725		78 10 Meter	---	800	750
	79 Lazor	---	190	775		78 10.5 Meter	---	800	750
	80 Phoenix 6D	---	215	875		79 Seahawk	180	850	625
	80 Lazor II	---	175	875		79 10 Meter	---	825	700
CGS AIRCRAFT	77 Falcon V	---	185	650	79 11 Meter	---	825	700	
	77 Falcon V	---	220	600	80 11 Meter	---	925	850	
	78 Falcon 5 1/2	Med.	750	625	SKY SPORTS	77 Bobcat III	Lg.	675	600
	79 Falcon 8	Med.	900	800		77 Merlin	160	600	500
EIPPER FORMANCE	77 Flexi II	---	185	525		77 Sirocco I	156	600	475
	77 Flexi III	---	185	575		77 Sirocco I	175	575	400
	77 Cumulus 10	Med.	550	525	78 Osprey	175	700	525	
	78 Flexi III	Lg.	800	600	78 Sirocco II	164	725	600	
	78 Flexi III	Med.	750	600	79 Eaglet	191	550	425	
	78 Cumulus 10	Med.	675	500	79 Osprey 2	175	625	550	
	78 Antares	Med.	875	600	79 Sirocco III	189	850	725	
	79 Antares	Med.	875	600	ULTRALIGHT PRODUCTS	77 Firefly	174	650	500
	79 Antares	Lg.	925	675		77 Dragonfly Mk. II	196	700	550
	ELECTRA FLYER	77 Cirrus	3	600		400	78 Firefly	154	800
77 Cirrus		2	500	300		78 Spyder	176	850	675
77 Olympus		160	575	525		78 Condor	178	900	775
78 Cirrus 5		C	600	475		79 Mosquito	166	1000	850
78 Cirrus 5		A	600	500	80 Firefly 2B	181	775	700	
78 Olympus		160	625	550	80 Comet	165	1500	1375	
78 Olympus		180	625	550	WILLS WING	77 SST	100C	625	575
79 Dove		A	700	575		77 SST	100B	625	550
79 Trainer		---	400	300		77 Universal	100A	525	500
79 Cirrus 5		A	650	625		77 X-C	185	600	550
79 Olympus	160	725	650	78 SST		100C	700	650	
79 Floater	---	205	775	78 Alpha		185	825	775	
80 Spirit	---	200	1050	78 Alpha	215	825	775		
FLIGHT DESIGNS	79 Lancer	---	190	900	78 X-C	215	800	775	
	80 Lancer	---	175	975	79 Alpha	185	800	750	
	80 Super Lancer	---	200	1025	79 Alpha	215	800	700	
MANTA PRODUCTS	79 Fledge	IIB	1200	1000	79 Omega	220	950	875	
	MOYES DELTA WING (U.S. MOYES)	77 Maxi I	---	200	700	79 Omni	187	975	750
78 Maxi II		---	200	800	79 Raven	209	1075	800	
79 Maxi III		---	200	850	80 Raven	209	1100	925	
80 Stingray		---	200	850	80 Raven	229	1075	925	
80 Maxi IV		---	200	950	80 Harrier	177	1450	1400	
80 Mega II		---	172	1275	975				
AMERICAN AEROLIGHTS	80 Twin Eagle	---	3400	3100	EIPPER MICROLIGHT	80 Quicksilver	CM	3450	3125

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.

NOW ALSO . . . Used ultralights will make their entry to the Whole Air Bluebook. Dealers . . . send your ultralight sales, too!

Clockwise from top. The "darling of the show" Cricri from France. Lazair wings and tail protect the green grass from thousands of eager spectators. Outstanding New Design award winner, Tomcat. Bob Caldwell poses by his Friend Ship One, Yamaha powered Quick, which he is flying from Mexico to Canada raising funds for the Leukemia Society. Opposite page. Only a few of the ultralights which became airborne each evening.



OSHKOSH 81

A daily three hour long air show unmatched elsewhere in the flying world/Article and photographs by Dan Johnson

The Big Event. An aviation metropolis. The Walt Disney World of Air Shows. A half million spectators and pilots tramping down the grass around thousands of fascinating aircraft. The result of this curiosity? Patches of still green grass, once protected by the shape of the airplane's wings and fuselage, continue to describe departed crafts in a sort of living silhouette. It may take a full year for the pastoral fields of Oshkosh to recover.

With its 29th Edition, the EAA Convention and Air Show at Wisconsin's Wittman Field proves to the aviation world that it is conclusively the Granddaddy of Sport Flying Events. No other can come forward to challenge that title.

The statistics are staggering. 500,000+ total visitors in eight days. 1600 total (show) aircraft on display. 11,000 aircraft moved in and out of Oshkosh, easily qualifying Wittman Field as the world's busiest airport for one week. 1340 visitors came from 59 countries. 35,000 campers in the campground. Services of every imaginable kind are available from aircraft parts for fifty year old machines to hair styling shops to every major aircraft manufacturer to 25+ different snack and beverage concessions. Forum tents hold 200 people each, seven are in use simultaneously all day long every day, and workshop tents help

homebuilders weld, form fiberglass, and even effect design changes. Everyone who arrives for their first visit to this sport aviation extravaganza blinks in awe at the sheer size of it, and each swears he or she will return in following years.

I was no exception. When I had the pleasure to present Founder, Paul Poberezny, with the *Whole Air* in which his interview appeared, I told him I also would return in 1982. He received the remark as though it was the first time anyone had ever said so, smiling warmly and shaking my hand vigorously. I wondered how many times each year he hears that conviction to return. The satisfaction evidently does not wear out.

Oshkosh is a family affair, presenting not only anything and everything a sport pilot could want, but fun for all. Playgrounds and toys for youngsters. Bands, movies, stage shows, and good times for teenagers. Shops, special events for women, and a welcome-anywhere attitude for Moms. Technical lectures for engineers. Amazing displays of every kind for tourists. More incredible shapes, sizes, and ages of more airplanes than any museum could ever hold. And a daily air show, three hours long, which is unmatched elsewhere in the flying world.

The ultralights had the entire field to themselves from 7-9 each morning, commencing the parade which ran till

dark. As the day passed, everything took to the air, from early vintage crafts like the Curtiss-Wright Silver Streak to the F-15 Eagle military jet to beautifully restored Beech Staggerwings to Rutan's Vari-ezes to huge squadrons of Warbirds and on and on. Fly-Bys included low passes by the Australian Boeing 747, B-25 Bombers, Ford TriMotors, P-51 Mustangs, powered sailplanes, large numbers of homebuilts, ones-of-a-kind, the miniature BD-5 Jet, tiny aerobatic Crickets from France, gyrocopters, and ultralights. How can anyone mesmerized by flying pass up this event?

You practically need a bicycle to see it all. Akin to touring any large display, like the Smithsonian in Washington DC, or the Museum of Science and Industry in Chicago, you cannot take in all of Oshkosh in a day, perhaps not even if you stay all week. I had to miss many events thinking, "...well, next year I'll see that." The stage is set. I made motel reservations for Oshkosh 82, and waited in line to do so. Matter of fact, the first three lodges I tried were already sold out, a whole year in advance.

How did the ultralights fare in this spectacle of sport flight? Well, as EAA Ultralight Director, Dave Starbuck, put it, "The grass is the brownest of all in the ultralight area. You see it distinctively from the air." This is in spite of the ultralight's location, at the extreme south end of Oshkosh's Magnificent

Mile, where the "new kids" are given their own runway and flight area. One must pay entrance (\$4) to the event, and purchase a "Pit Pass" to the Flight Line Area (\$7), then walk the better part of a mile to find the ubiquitous ultralights.

It is not fair to say the ultralights "stole the show." Though their number again out-gained all other divisions, up to 159 officially registered, a 69% jump from 1980 attendees, nearly the same number of Warbirds were present. Custom and Classic crafts had several times more each. Yet with only two on the field, the tiny little Crickets (or Cricri as the French say it) were likely considered the darlings of Oshkosh 81.

Paul Poberezny remarked that the present day Crickets were a future model for ultralights. And indeed, Eipper President, Lyle Byrum, was fascinated by the aerobatic and lightweight (under 150 pound) airplanes, musing openly that Eipper could be headed in that direction. Designed by Michel Columban, who is an engineer for the aviation giant, Aerospatiale, the Cricri has an all metal construction and is stressed for 9Gs positive and half that negative. They are driven by a pair of Finnish 11 horsepower Valmet single cylinder engines perched out on the nose of the plane. The \$6,000 kit will consume 500 man-hours to build. So being an ultralight weight-wise does not mean quick-to-fly as is more the case in the ultralight industry today.

The controller strike, which began early in the convention, did not interfere as you could imagine. Considering Wittman Field's distinction as the world's busiest airport, no appreciable slow down was evident. Our air-shipped July-August *Whole Air* magazines arrived as scheduled, allowing wide circulation at this major convention. Failure to end the walk-out seemed only to do harm to the tenuous position of PATCO, as pilots and visitors all over the grounds could be heard voicing agreement with yet another tough stand by President Reagan.

P.U.M.A. met at Oshkosh, showing a mellowing of attitudes, which one member described less euphemistically as "apathetic." The fierce competition present among ultralight manufacturers has perhaps begun to take effect on PUMA members. The primary topic of conversation was predictably reaction to, and planning for the NPRM issued in very late July.

Of main concern regarding the Notice of Proposed Rule Making is the 155 pound weight limit and flight over congested areas or open assemblies of people. The former is a rather sticky issue as very few ultralights can squeeze under the 70 kilo limit. Very likely they will organize to push for change to 100 kilos (about 220 pounds).

Will someone champion the cause of the individual pilot? It is doubtful that this group will carry the challenge as

several manufacturers were wondering why no pilot certification was written into the proposed regulation. Talk about re-inventing the airplane seems more imminent than ever as regulation comes to ultralighting, both powered and unpowered.

Awards were presented in the EAA tradition. Mike Loehle came out smelling sweeter than 2 cycle fuel as he picked up the marbles winning both the Grand Champion award and the Outstanding Craftmanship award for his beautiful black, tailed Easy Riser Aeroplane. He arrived a scant fifteen minutes before the judging began, having spent the previous 60 hours non-stop preparing for the contest. It paid handsome returns. Reserve Champion was taken by a Hummer; Honorable Mention by a Goldwing; and Outstanding New Design by the Tomcat. Some consternation was generated by these wins going toward crafts with N-numbers, designs which are not foot-launchable, and a design which seems to fading fast in public reception. But that's how the judges saw it at Oshkosh 81.

Unprecedented large crowds, beautiful weather every single day, no damaging winds, no injury causing incidents, and more ultralight credibility than ever before sums up Oshkosh 81. Next year will undoubtedly continue what is nearly a trademark slogan, "...bigger and better than ever!"



Once hang gliding's largest manufacturer, Larry Newman may be starting a new trend in ultralight aircraft, with his Falcon.

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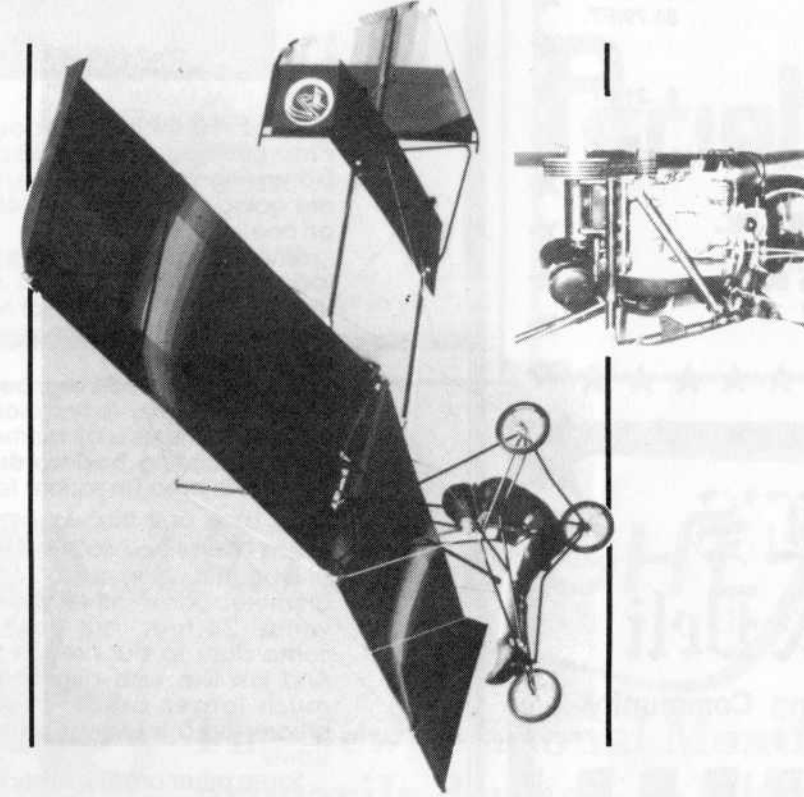
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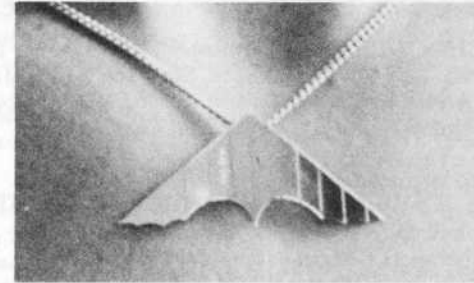
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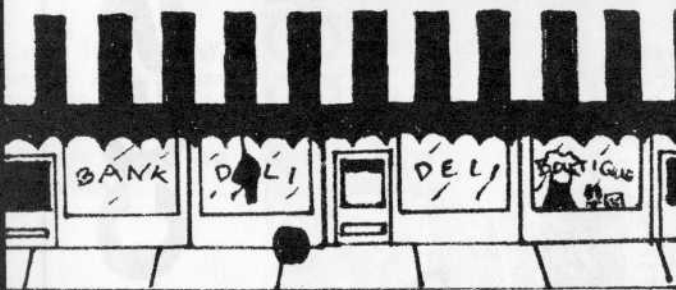
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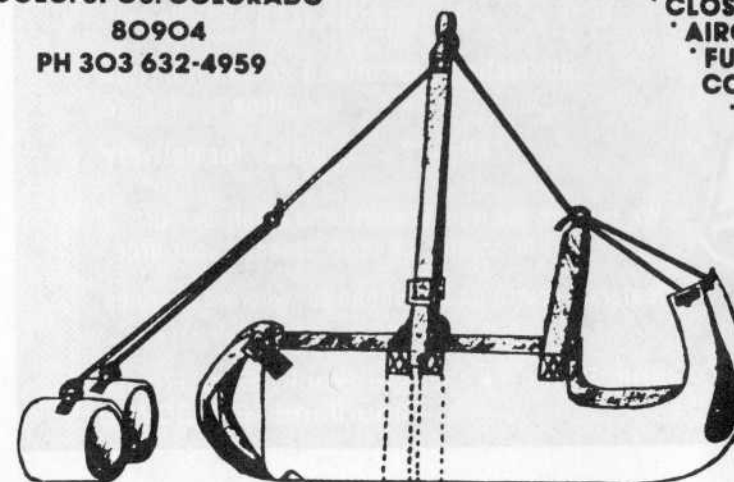
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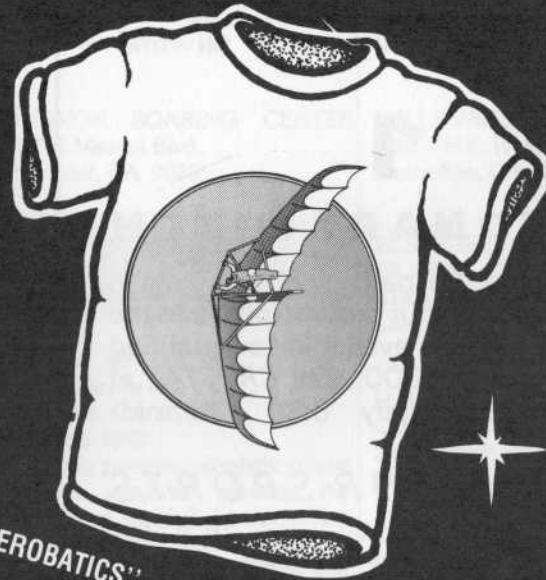
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21/22-23B

EXCITING NEWS

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 - C) Students while training.

The premium charges (subject to completion of an available application) are as follows:

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- 2) Flat annual charge of \$100.00 per training site.
- 3) One time \$20.00 charge for powered training student, or \$8.00 for foot-launched training student, for the entire training program.
- 4) Flat annual charge of \$50.00 per instructor. Also, we are able to offer an accident policy for students which will provide \$25,000 coverage for loss of life, medical expenses, and other extensions caused by a hang gliding injury for a flat charge of \$25.00 during the entire training program. [This is a **super** program.]

I think the programs I've outlined are very attractive and offer the protection for which you have been looking. If you are interested, please contact our office to obtain an application, so we may forward you a quotation immediately. If you have any questions, let me know.

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PRODUCT LINES

CHATTANOOGA, TENN. --- ***STOP PRESS FLASH First returns on the '81 Nats. Comet contest streak broken. Rich Pfeiffer on Sensor - 1st; Jeff Burnett on Sensor - 2nd; Bruce Case on Harrier - 3rd. More details elsewhere. *** Lots of news this time on contests. Nope, not the results or pilot tales. But the organization of, including financing, sponsorships, and that sort of stuff. Matt Wagner flew in the 1981 Eighth Annual Cypress Gardens Tow Championships, and reports it may be the last one. Yep, the oldest continuing contest in hang gliding (towing) is allegedly not going on schedule for 1982. Per Wills road rep, Tim Morley, this was announced over the PA system during the contest. Unless they can find a sponsor, the Cypress Gardens World Tow Meet is off. Sound familiar? It's the same problem the American Cup ran up against. Cypress personnel have written a great number of potential money suppliers but have yet to receive a positive response. Tracy Knauss, another able promoter, has been halted in several attempts to gain some backing for his Cup. So how did Michael Winston Williams do it? Who? Williams is the organizer of the First Annual Grimm Buffalo Gap Foundation Hang Gliding Competition. It boasts the largest prize purse in hang glider history. Some \$11,000 in prize money has been placed in escrow. This is a potentially touchy situation as prize money has not always been available at the time of intended distribution. But Chris Price, selected as Competition Director, has reportedly been to the site, met the sponsor, and carried photostatic proof of the funding to USHGA, who will be sanctioning the event. With a \$4 Grand First Prize, this is most assuredly big-time, insofar as hang gliding pro competition goes. The source of the bucks is a fellow named Jack Grimm. According to Michael Winston Williams, Grimm is looking for the Titanic, a fair sized project of its own you might say. The flying will take place on his mesa, and he has no plans to gain as a result of his contribution. Matter of fact, he may even limit spectators. He sells no products that he wishes to promote (like Blue Stratos, Coca Cola, or Budweiser). Our query about why he is doing this informed us that, "It's for the good of the sport." Buffalo Gap is about 10 miles south of Abilene, and offers a 350 foot vertical. A maximum of 40 pilots and a minimum of 24 will be invited (only), and they will be forced to pay \$1 each, a fee generated solely to satisfy USHGA sanction requirements. Several (unknown exact number) regional Texas pilots will be invited and the balance should be the Big Names of competition as selected by Price. Registration days Sept. 2 & 3, 1981; preliminary competition (not open to the public) slated for Sept. 4; and days of competition the 5th, 6th, and 7th. True, it was rather short notice but still a most welcome trend in these days of disappearing meets. How did Williams get such a deal? "I just called up Jack and told him my idea. You'll be hearing my name more, it's Michael Winston Williams, and this is not the end of my efforts. This great sport needs more dynamic leadership working on this sort of thing," said Williams in a phone interview the end of August. Aerial Techniques has an upcoming contest on the 3rd thru 11th of October. Cash prizes are \$1200, awarded at \$100 each for the longest flight of the day and a \$250 reward for accumulating the most miles. The Ellenville Annual X-C Open continues this trend of X-C contests begun by the Tennessee Tree Toppers in 1978, and now joined by So. Cal. School's contest, of course the famous Owen's X-C contests and many other regional/local efforts. Whole Air views this style of contest as more pilot oriented, and not so subject to financial hardships as full blown spectator events. Aerial's entry fee is a modest \$10 which provides a barbecue/beer fest on Saturday, Oct. 10th. The

launch window will open at noon daily with local rules and regulations in effect. Get more info on this by calling Dan Chapman at 919/647-3344. I guess this proves the Aerial gang is not totally burned out on contests after having hosted the 1980 Nats. We wish them good soarable air, and some long mileages. Other news involves the major USHGA/Hang Gliding decision. As Managing Editor, Glenn Brinks, put it, "USHGA has done a 180° on power." In a mid-August Board of Directors meeting, votes were counted and power was out. Passing that hurdle brought the group of leaders to the newly released NPRM (Notice of Proposed Rule Making). Whole Air is delighted to pass along the National Association's decision to request that the government separate their definition of hang gliders from ultralights and leave hang gliding alone, doing what they like with ultralights. Guess that sizes up the sentiment, and we're glad that the suggestion has been made to resist the need for regulation of hang gliders. We know our readership will largely be supportive of that position. Write your Congressman and the FAA --- see examples on pages 21 and 22 of this issue. In other industry news, Ed Vickery has sold Sky Sports to Steve Ostertag from Rochester NY. According to Ultralight Flight (Mirage), President, Frank Riley, who once worked for Sky Sports, the new manufacturing operation will be based at Paul Yarnall's Canandaigua airport. Riley reported that Ostertag will be building Sky Sports new Peregrin (an old glider name, from a design by Tom Peghiny -- though not the same ship). Riley says it's a fast state-of-the-art design and was expected to fly at this year's Nationals at Slide Mountain. Best of luck, Steve, and welcome aboard; hang gliding can use all the new blood it can get. Keep Whole Air informed of your progress up there in the Northeast U.S. While we are real happy about the Peregrin, we were saddened to hear Bill Bennett was hospitalized for serious internal complications which nearly took the life of our longest term leader in the sport. Fortunately, he was reported recovering from the trauma and we wish "Uncle Bill" a speedy and thorough recovery. Bennett has always remained a staunch pillar of the sport, and is widely respected around the world for his successful promotion of hang gliding. We hear his company, Delta Wing, has a new diver, the 200 SX which was also to fly at the 81 Nats, but at press time no further details had been received. In talking with patent-holder, CGS Aviation's Chuck Slusarczyk, we found he has completed the static load tests of the wing spar and spar connect fittings for his new Hawk airplane. It went over 6½ G's with no permanent deformation. This follows his change to a new airfoil, university developed specially for ultralights. Chuck has also signed up Cloudbuster, Viper, and the Snoop for CGS engine packs, a logical move for these ultralight builders to side-step licensing of their own engine designs in regards to Chuck's new utility patent. Whole Air began a new distribution program for its 100+ dealers allowing special prices on larger orders of magazines. The idea, suggested by Wills prez' Rob Kells, and Chandelle San Francisco co-owner, George Whitehill, involves the dealership using magazine sales at general stores in their sales area as a way to distribute their school and sales literature. Response was good from several prominent shops and more is expected as this excellent method of inexpensive local advertising takes hold. An Instructor Certification Program is slated for Region 10 under the leadership of USHGA Director, Dick Heckman. Scheduled for the end of October '81, please contact Dick or Lookout Mtn Flight Park for details. Got news or opinions? Send 'em to Product Lines, Box 144, Lookout Mtn., TN 37350+0144.

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