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Since the Raven's introduction more pilots have soared for more hours on Ravens than on any other glider. When the lift is marginal, and a superior sink rate with "right now" response at low speeds is important, Raven pilots are soaring; gaining experience in the most challenging and rewarding conditions, becoming better pilots, and having more fun!

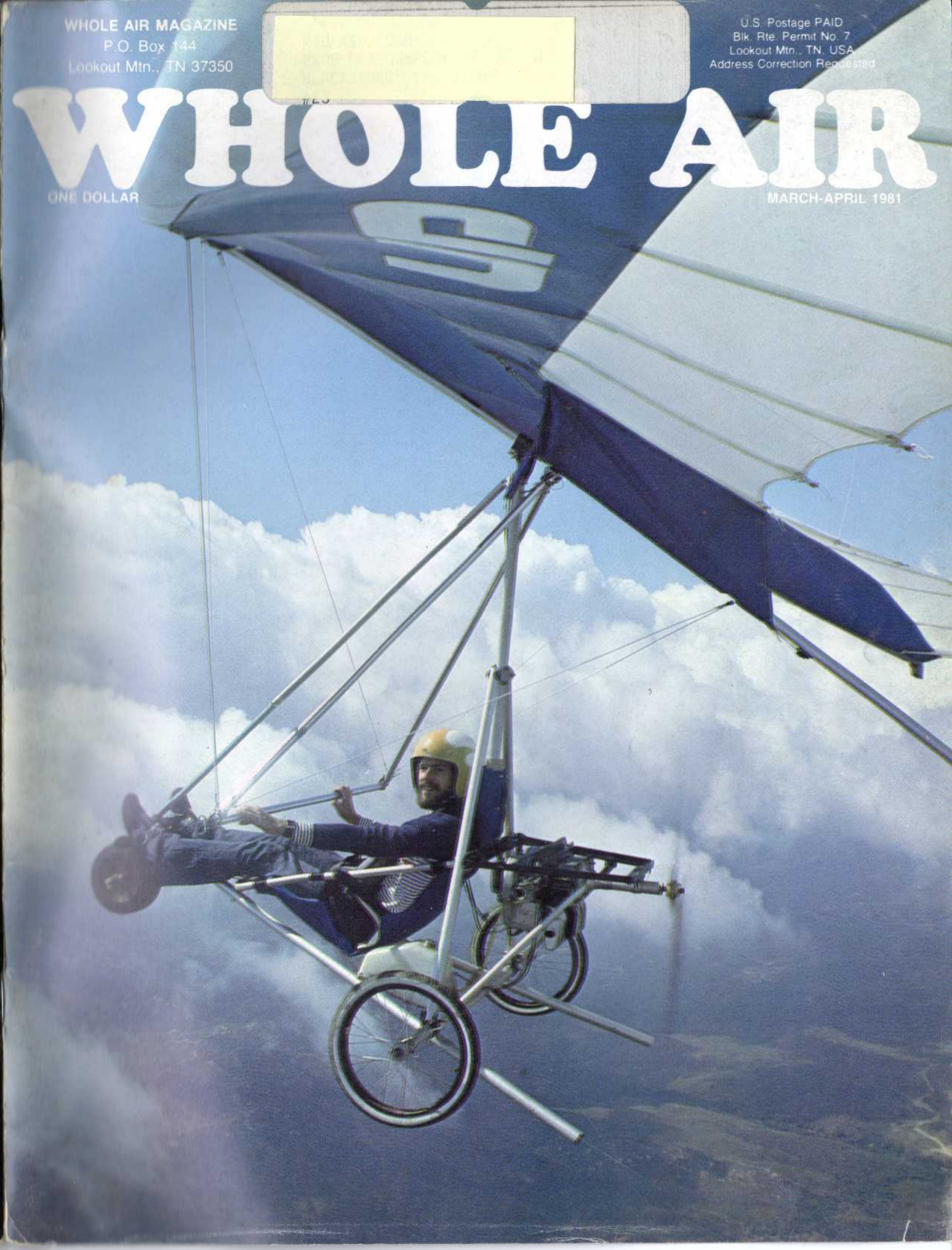
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MARCH-APRIL 1981



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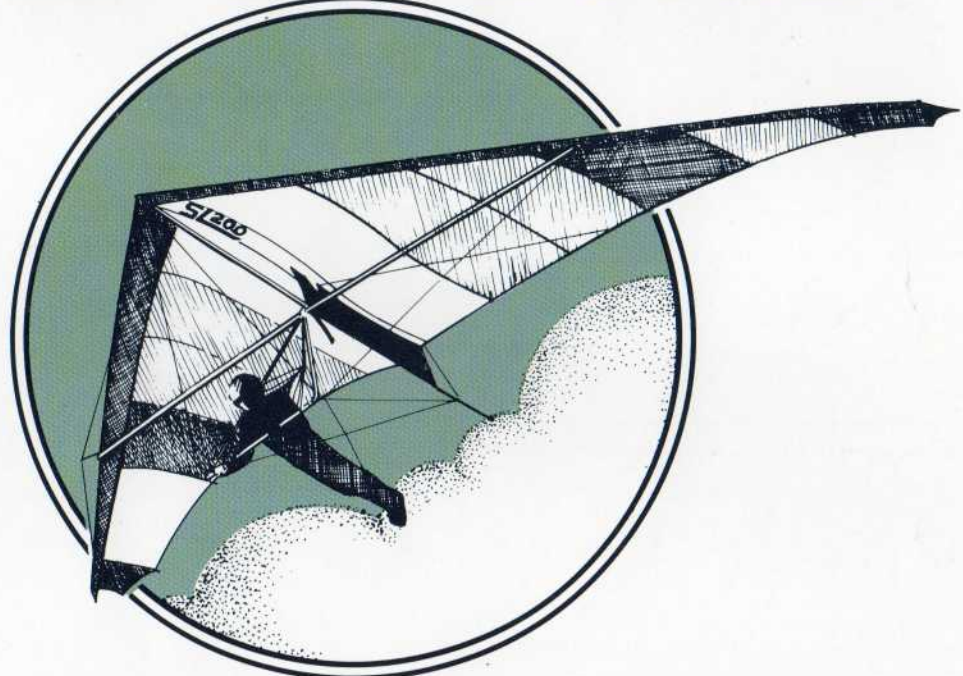
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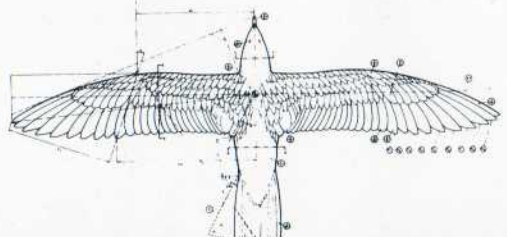
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Area:
Leading Edge:
Keel:
Nose Angle:
Glider Weight:
Battens
(Composite tubular):
Wing Span:
Aspect Ratio:
Pilot Wt. Range:
Glide Ratio
Minimum Sink:
Speed Range:
Stall Speed:
Maximum L/D Speed:

	135 sq. ft.	165 sq. ft.	185 sq. ft.
Area:	135 sq. ft.	165 sq. ft.	185 sq. ft.
Leading Edge:	17' 1/2"	19' 2 3/4"	20' 4 3/4"
Keel:	7'2"	8'2"	8'7"
Nose Angle:	120	120	120
Glider Weight:	57 lbs.	65 lbs.	78 lbs.
Battens (Composite tubular):	8 per side	9 per side	9 per side
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WHOLE AIR

ISSUE NO. 18 VOLUME 4, NO. 2, 1981

PILOT'S PERSPECTIVE

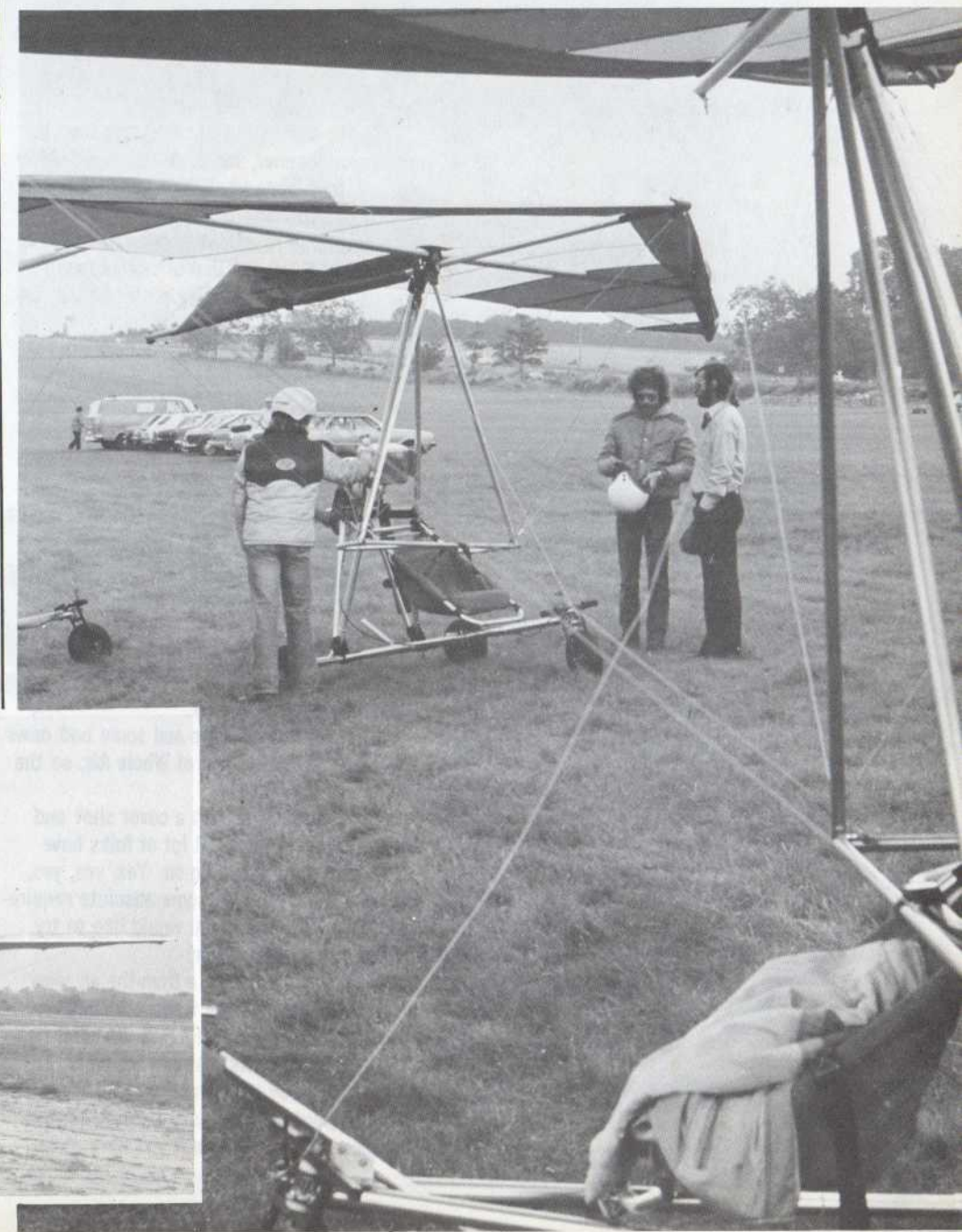
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Volume 4, No. 2, 1981
ISSUE NO. 18

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J. C. Brown
John Lasko
Tom Price

ON THE COVER:

Mike Quinn flies a Soarmaster Trike with a 165 Comet wing 7,000 feet over Elsinore.

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Publisher's Column



First off, thanks for stunning response to our season-opener, Jan./Feb. '81 issue. After a recent tour of nearly 9,000 miles from Florida to San Francisco, I am gratified by many favorable reactions to our efforts. It is that sort of feedback that drives us to try ever harder to do this thing professionally and enjoyably.

We still have some confusion over the relatively late mailing of the first issue of the year. Recall, we told you last year that the January-February issue is mailed in late February deliberately. The next two issues will emerge in less than two months, till the mid-year issues are mailed early in the first month of the cover date.

This procedure compacts six yearly offerings in the warmest ten months of the year, avoiding the low-activity winter. We, like manufacturers, make good use of this "break" to prepare fresh ideas and formats for your enjoyment in each new year.

I have some good news and some bad news. We think positively here at **Whole Air**, so the good news comes first.

Want to supply us with a cover shot and stake a claim to fame? A lot of folks have asked us if they could do so. Yes, yes, yes, you can? But, we have some absolute requirements. Please note if you would like to try making a **Whole Air** cover.

1) The photo **must** be a from-the-air view.
2) The photo **must** be framed vertically, meaning the camera position on its side. Horizontally framed shots just will not work, no matter how good they are.

3) The photo cannot be submitted for use elsewhere. **Please inform if you have given**

your submission to anyone else. We are still stinging over our "look-alike" last cover.

4) The pilot must be in the photo and, most preferably, looking at the camera, also preferably with a pleasant expression.

5) We would really like to see another aircraft or two, relatively close.

6) The slide **must** be perfect. No scratches or flaws can be present, as we must enlarge an average slide 900-1,000%. This magnifies any errors to bigger-than-life size. We strongly encourage using only Kodachrome 64 film.

7) When you send us a slide or slides, we must be allowed to retain possession. So, if you want a copy, please have it made, and send us the original. Duplicate slides are **not** acceptable for front cover use. This no-return policy is a new one for all our photos, artwork and articles. If you wish a copy, make one, and forward the original to us. Sorry, but we can no longer return submissions.

If you have any questions about this procedure or these requests, please contact us at our address. Otherwise, good shooting!

Now the bad news. You are all aware of the recent Postal Service 20 percent rate increase. That and other postal increases since we began three years ago, and our fatter, higher quality (heavier) magazine have tripled our mailing costs.

We have **never** raised any of our prices, choosing to fight staggering inflation by continuing to be more efficient, and by selling more advertising and magazines to cover the rising costs. But it is a losing battle.

If we are to continue our steady march to become a fully "slick" magazine for hang gliding-ultralighting and towing, we must raise our cover price. We really have had to do this for nearly a year, but tried to avoid the unpleasant task. Inflation and the postage increase finally won out, however.

So, effective July 1, 1981, the **Whole Air** magazine will cost \$1.50 each. This also spells a subscription price increase as well, one year will cost \$7, and two years will cost \$12. Canadian prices are \$2 and \$3 more each.

Obviously, you can up your subscription at our current cheap rates. If you act before July 1, 1981. We invite you to do so.

Thanks,
Dan Johnson

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

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

Safaris planned for 1981

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



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Yes I am interested in your Safari from _____ to _____ and would like to receive your brochure with complete details.

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FORUM

Dear Editor:

Nerve gas, hollow-point bullets, napalm, laser guns, neutron bombs, hang gliders . . . hang gliders!

So that's what the Ultralight Movement needs (not to mention the peoples of the world), an American Eagle with M-16's mounted on it!

In case anyone missed it, the military is now testing four Ultralights—the Petropactyl, Mitchell Wing, Quicksilver and Eagle at the China Lake Naval Weapons Center.

I realize the world is full of ironic paradoxes: The grandest desire of the world's very first aviators, after once achieving flight, was to sell their machine to the highest bidder in the market place. Graphite developed for the nose cones of nuclear warheads permits a man-powered aircraft to fly the English Channel. A coal-fired power plant, its acid rains destroying whole aquatic chains of life, drives life-saving medical equipment and powers computers plotting the future food needs of the world.

I for one see a P-51 Mustang, in civilian colors, 500 mph, on a clear day in Reno, as a dazzling creation of man's ingenuity and imagination. The same plane painted olive drab is a tool of death.

But oh the glory and adventure! Imagine the parcel post truck arriving with your new war surplus WW III (?) MX13 Avenger

—rocket powered, solid graphite construction, rigid cybernetic harness, dual chrome flutators, slotted seeyalaterons, radar altimeter, and ray guns . . . this was the one that pulled the Peru Comp. This was the one used on the demonstrators at the University of Wisconsin in '84. Olive drab.

And maybe the Ultralight industry could use an economic boost. The drab boys will buy our low-speed tech and return it in the form of what? Every Ultralight manufacturer is going to want to create new jobs, expand the business, send the children to the university. All that is asked is a contribution to the War Machine.

Do you believe the past will repeat; that the past rules the future?

Do you believe life is composed of a *balance* of good and evil?

Do you believe good needs evil to propel it? I think I finally discovered the best use for the space program. Load the rockets with all the bombs and gases and plagues and fire it into the sun.

Maybe they'll figure out a way to kill with paintings and poems, and the arts will flourish! But if hang gliding is our art, may it spawn peace. I'll boycott the gliders being sold for war and make a homebuilt one the color of the sun!

Mike Potvin,
522 Sioux,
Winona, MN 55987

Dear Editor:

This letter is to inform you that the winner of the 1980 Region 6 Cross Country Challenge was Roy Mahoney with a flight of 26 miles from the Heavener site. Roy was flying an UP Mosquito 196. Other notable flights in 1980 were Yogi Dicks with a flight of 17 miles, Oliver Gregory with a flight of 11 miles and several other 8-10-mile flights.

Sincerely,
David Morton,
President
Fort Smith Hang
Gliding Association

Dear Editor:

Just like to compliment you on the evolution of your magazine. You are well on the way to becoming the best of the American publications.

A couple of comments, if I may. When you do a glider evaluation, instead of a full page of planform, why not half and use the other half for specifications.

I know it is easy to suggest work for others, but I'm sure there are many of us who would love to know what's new in Germany and France. The current world champion is German, yet I've yet to see anything in print about their gliders and flying scene.

Anyhow, keep up the excellent work.

Martin Polach,
Calgary, Alberta

Dear Sir:

Thank you for the two magazine samples you so promptly mailed me; they convinced me that a subscription was in order. Enclosed please find my money order for \$7 U. S. funds to cover one year.

The quality of your cover shots is impressive; keep it up.

The glider evaluations were very informative to me, as I live in an isolated area and cannot see the new crafts at the local corner shop. I did notice though that there was very little negative comment. Were the gliders evaluated so good that they had so few negative points? Set-up in strong winds, vulnerable areas when ground handling, etc.)

You have apparently gone to a bit of trouble to reply to queries in "Forum." This type of thing is very helpful to the average pilot who does not fly with the competition experts.

The list of certified gliders and Bluebook are eye-openers. You would be shocked at the price of used gliders in this area!

I trust your dedication will pay off in increased sales and subscriptions. Keep up the good work.

Best of lift,
Carroll Redden

Dear Editor,

With Flex Wings exceeding 70 pounds, it's time for eastern pilots to stand up and be counted.

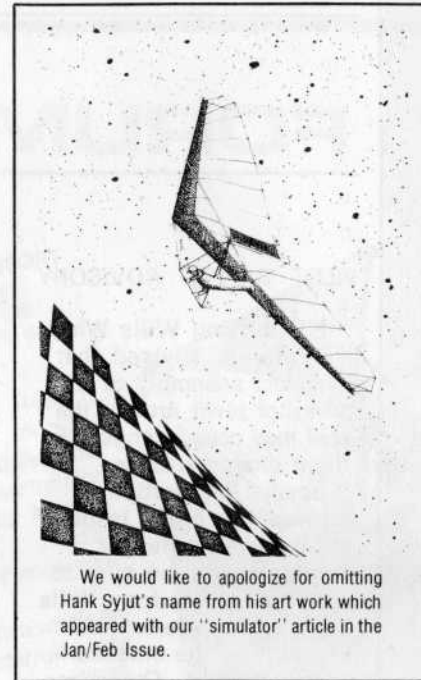
We're not pack mules! We have six flying sites in our area and all must be hiked at certain times of the year. Why haven't designers offered 2024 or 7075 tubing? This could eliminate sleaving and excessive wall thicknesses. I'd pay "almost" anything to get more airtime, wouldn't you?

Dwight Fisher,
Elmira, New York

Dear Editor:

Sterling Stoll won \$500 for his incredible 65-mile flight from the "E" in Elsinore to Indio, CA. Sterling flew a 165 Comet and eclipsed Rich Pfeiffer's flight of 58 miles of the year before in a Mosquito to Palm Springs. This year UP is posting \$1,000 for the best XC flight in the So. Cal. area. UP's philosophy is to support top local pilots who cannot compete in major events. A pilot can fly on any day from any site. Rules for entry are available from Rich at So. Cal. School of Hang Gliding.

Sincerely,
Pete Brock



Dear Editor:

We at L.E.A.F. have all read your article on testing the suspension systems for strength, on hang loops, supports and harnesses, etc. We found the article extremely informative and well presented. We do, however, have an important question to ask.

It has always been our understanding that the dacron thread that we use (and presumably all manufacturers) is weatherized and maintains its strength. Whereas the nylon thread is not, and therefore effected and weakened by the sun and normal exposure to the elements. Were all the loops, etc., that you used in the testing new or "aged?" If they were all

new, it might be a good idea to re-do some of your tests with loops taken off of gliders that have been flown for a while, thereby having loops both sewn with dacron and nylon that have been exposed to the elements for testing. We feel that the results may be more interesting than the ones published.

Well, let us know what you think, especially in regards to the thread being weatherized, as this is an important point to make. Hope to hear from you soon.

Cordially,

Kaye-del-Mare Wilson,
Office Manager,
Leading Edge Air
Foils, Inc.

LETTER TO ULTRALIGHT PILOTS

"The First Annual Sequatchie Valley Four-Legged Ultralight Aircraft Race"

On Memorial Day weekend, May 22-25, the community of Dunlap, Tennessee, will host an ultralight race and airshow. Sponsorship is by our local Jaycees and all proceeds will be used for local charities.

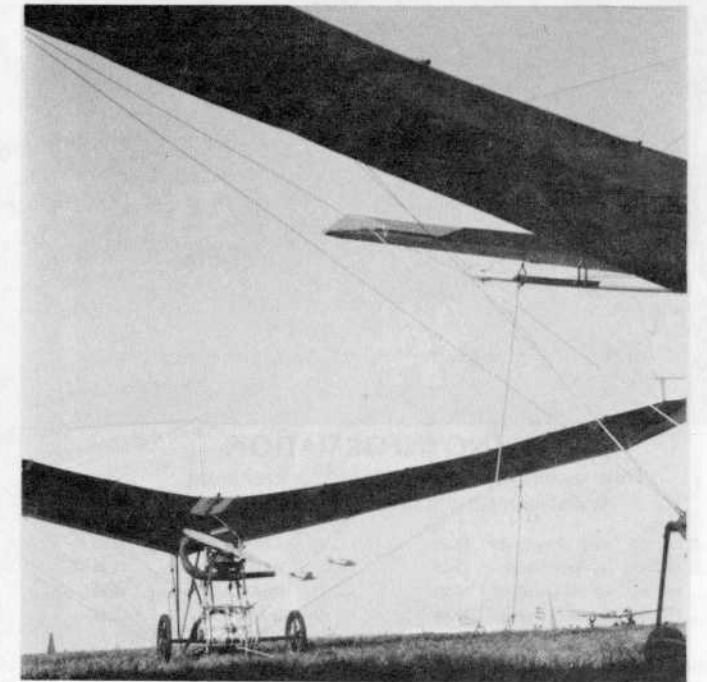
The race will be in four legs, two out and return flights, the longest leg being approximately 25 miles. This will cover the majority of the length of the Sequatchie Valley. Scores will be tallied on completion time plus fuel consumption penalties. This is a three-day event with your best score being used. A \$250 first prize will be awarded, along with other cash prizes.

The Sequatchie Valley is the most unique valley in the Eastern United States, beginning on the Tennessee-Alabama line at the Tennessee River, going

northeast 65 miles. It has all the natural beauty of green fields, stark cliffs, caves, springs, waterfalls and cascades of rock framed by 1,000- to 1,500-foot ridges and topped by six peaks 2,000 feet above the valley floor.

Plan to attend this unique competition. Evening seminars are planned to keep pilots informed and up to date on our sport. Camping will be available for pilots (no hook ups), food concessions will be on the grounds. Motel and restaurant facilities are close by.

Individual liability insurance, available through USHGA or EAA, and pilot ratings will be required for registration. The registration fee is \$20. Early registration is requested and necessary for motel accommodations.



We will need to know when you register your aircraft type, total fuel capacity, liability insurance, rating, and if motel or camping reservations are needed. Make check or money order out to "Four-Legged-Race."

For further information or to register, please contact:

Bryan Burnside,
P.O. Box 152,
Dunlap, Tenn. 37327 or
High Adventure Sports
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_____ HG102 Lg. Hang Glider	9.50	_____ HG106 GO FOR IT saying	12.95
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_____ HG104 Sm. HG Earrings	10.00	_____ HG108 Tie Tack Sm. HG (not shown)	7.95

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Dealer Inquiries Invited

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FORUM

PILOT SAFETY ADVISORY

Pilots flying Wills Wing Harriers are advised that incorrect assembly of the crossbar pivot arm to the keel may cause dangerous flight characteristics.

Special instruction stickers are being issued to all dealers. Harrier owners should be sure to obtain a sticker from Wills Wing or their dealer and install it on the crossbar center section. Owner's manual corrections are also being issued.

1) The crossbar MUST be BEHIND the pivot arm, this proper assembly puts about five degrees of negative sweep in the crossbar, and provides a restoring force to center the crossbar over the keel. Improper assembly, with the crossbar ahead of the pivot arm results in zero

sweep in the crossbar and allows the crossbar to "lock" off center, resulting in a profound and dangerous loss of control.

2) The pivot arm wingnut and safety MUST be installed on the BOTTOM of the keel. Improper installation of the wingnut on top of the pivot arm allows the possibility that the wingnut may hook the bolt head on the bottom of the crossbar plate if the crossbar shifts far enough off center, and lock the crossbar to one side. The resulting flight mode could be an unrecoverable spiral dive.

Each of these mistakes has been made once, to our knowledge. In one instance, the pilot was barely able to recover control. In the other, a parachute deployment was required.



WILLS WING DEALER SERVICE SEMINARS

Wills Wing is in the process of holding their annual Dealer Service Seminars. The West Coast Seminar was held February 17th through 19th in Santa Ana, California. A cocktail party and reception was held the night of February 16th.

The East Coast Seminar will be held April 8th, 9th and 10th at the facilities of Kitty Hawk Kites in North Carolina.

Topics covered at the seminars include: Glider tuning and service, financial planning and management for the retail dealership, promoting pilot safety, successful sales techniques and design and certification methods.



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COMING NEXT
ISSUE

In the 3rd Anniversary
May-June
WHOLE AIR
Magazine

SPECIAL!

WHOLE AIR in association with **HANG GLIDING** and several other aviation journals, initiates the first "No Punches Pulled" reports on popular ultralight aircrafts. Factual, honest reporting at it's best . . . and you, the consumer will help.

"Sites"
of Southern California.

"Pilot Report" on the
Stratus VB.

Preliminary report on the
X-C Classic from the
Owen's Valley experts.

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FORUM

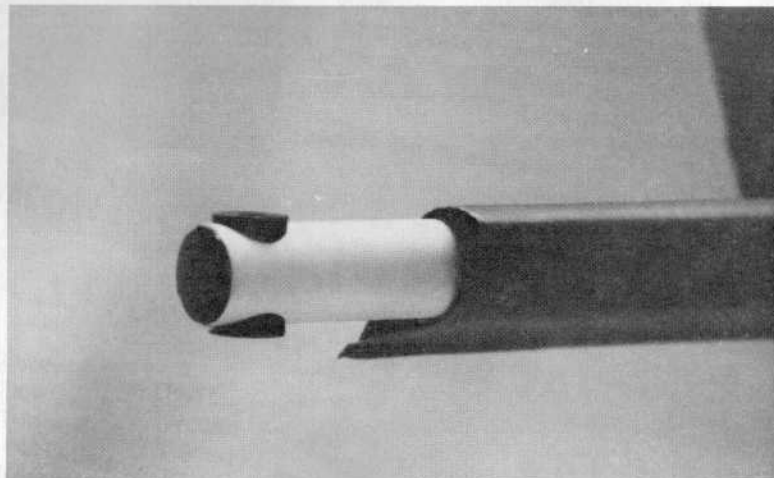
Dear Editor,

Please enter the following in your calendar of coming events.

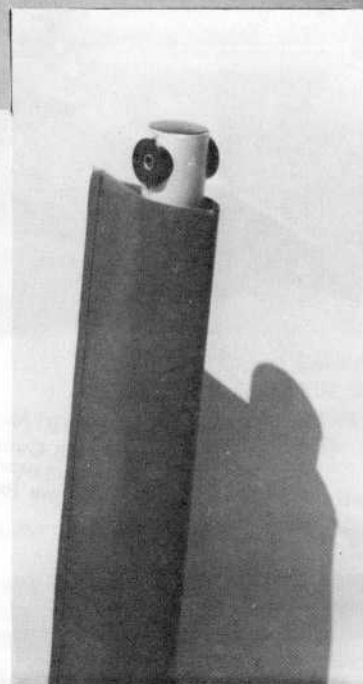
July 25-30: Announcing Oshkosh Primer—the first annual Cannon Ball Rally at Marshall, Michigan. The events are: An x-c rally and the 250 Cannon Ball Poker Run from Marshall to Petoski, Michigan, with 50-60-mile check points. There will be evening entertainment, lots of free flying and a trophy and

prize money presentation after the 250. Registration, \$20. Entries close July 1. Hosted by Aero Float, 260 N. 30th St., Battle Creek, Mich. 49015. Everyone invited to fly to Frankfort afterwards and ride the ferry across Lake Michigan to Oshkosh '81.

Fellow Enthusiasts,
Garry G. Ballard
Dick Leonard
Aero Float Flights
260 N. 30th St.
Battle Creek 49015

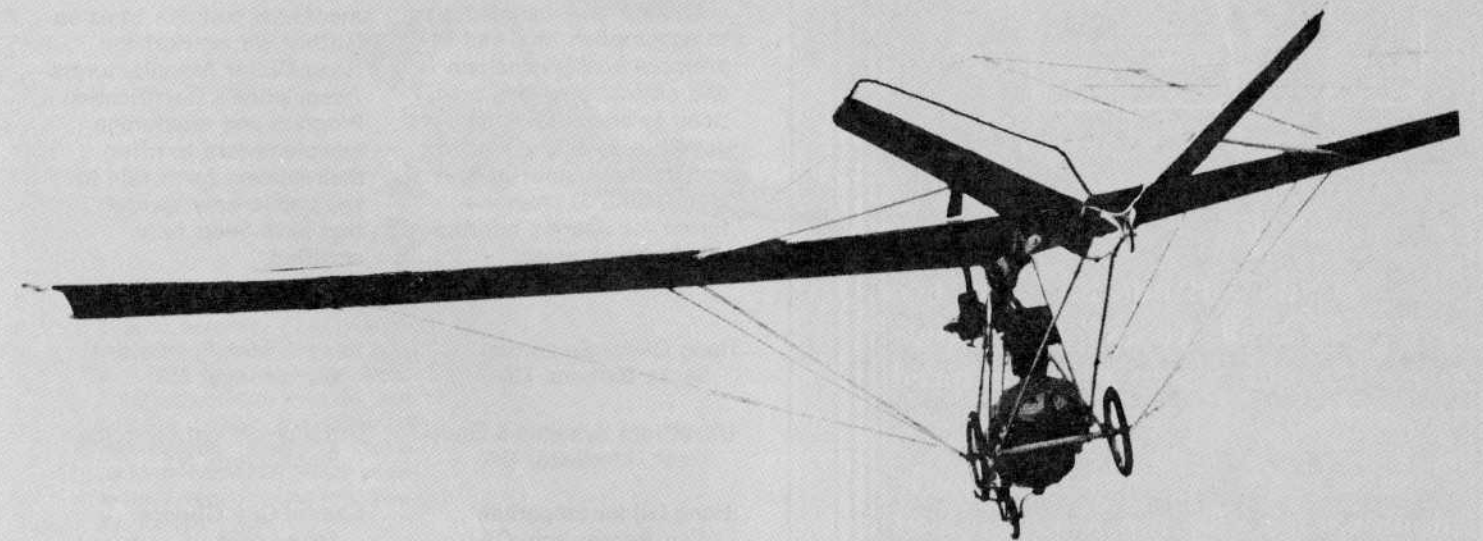


Flight Designs is proud to announce that we have crossbar and kingpost streamline fairings available for only \$67. We have them to fit 1 3/4" - 2" crossbar tubes and 1" - 1 1/8" kingposts. Available in a rainbow of colors. When ordering, please specify second color choice.



The Ultimate Ultralight . . .

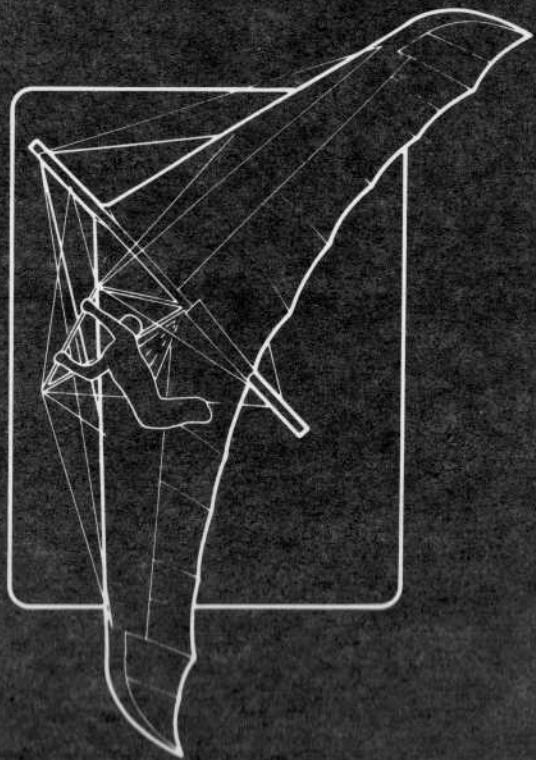
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The Stratus V-B has had over five and one half years of creative research and design manufactured into the structure and sail.

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FORUM

The New HGDA

The Hang Glider Dealers Association was formed February 19, 1981 with the following stated purpose: "The Purposes of the Association are to develop improved methods in instruction and servicing of hang gliding equipment and to act as a liaison between consumer and manufacturer to accomplish this, and 2) promote professionalism and ethical business practices in businesses engaged in sales and instruction in the sport of hang gliding and 3) provide a forum for sharing information in these areas."

With this in mind, we wish to declare our support for those manufacturers who fully support those dealers providing professional service and instruction, and encourage manufacturers who are not supporting professional dealer networks to implement new policies to do so. Further we support the Hang Glider Manufacturers Association's Certification Program and encourage manufacturers to offer their dealers for resale to the public only aircraft that have been fully certified.

Hang Glider Emporium
Santa Barbara, CA

Ultraflight Systems & Equipment,
Modesto, CA

Hang Glider Emporium
San Bernardino, CA

Hang Gliders West
Ignacio, CA

Aerial Techniques
Ellenville, NY

Mission Soaring
Fremont, CA

Treasure Valley Hang
Gliders, Boise, ID

Chandelle San Francisco
San Francisco, CA

Superfly Hang Gliders
Grants Pass, OR

Hang Flight Systems
Santa Ana, CA

Crystal Air Sports
Chattanooga, TN

So. Cal. Hang Gliding
Van Nuys, CA

Hang Glider Specialties
Cucamonga, CA

Ultralight Flight Systems
Binghamton, NY

Capitol City Gliders
Lacey, WA

Sky High Sports
Anchorage, AK

Northern Sun
St. Paul, MN

Golden Sky Sails
Golden, CO

Buffalo Skyriders
Albuquerque, NM

Jerry Noland & Crew
Santa Cruz, CA

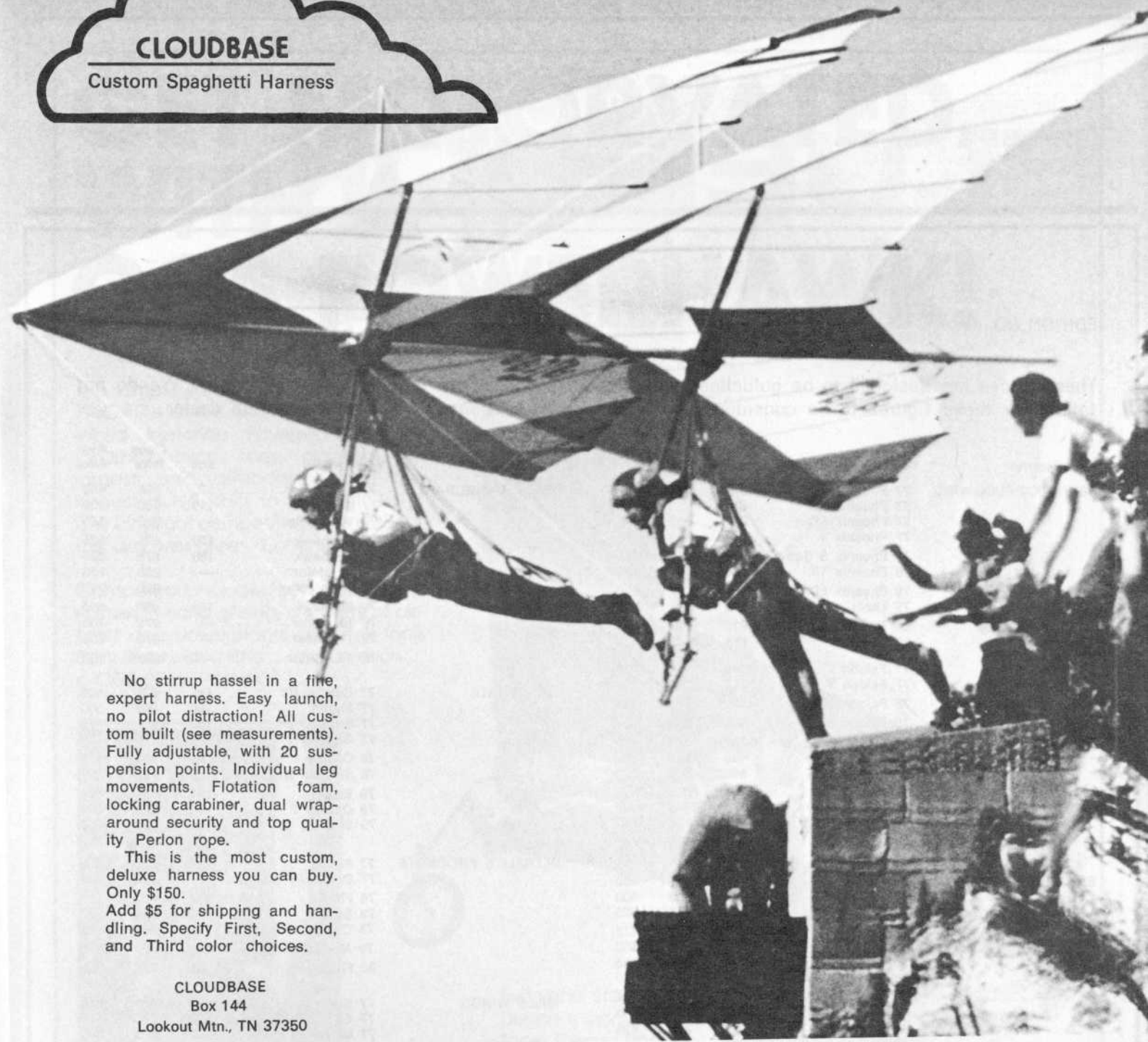
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Supply, Sherwood, OR

Wasatch Wings
Draper, UT

Sunflight of Florida
Orlando, FL

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- * Floor to inseam
- * Floor to kneecap
- * Chest, waist, and weight



BLUEBOOK

EDITION NO. 17

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

Manufacturer	Year Model	Size	Clean Price	Avg. Price	Manufacturer	Year Model	Size	Clean Price	Avg. Price
BENNETT DELTA WING	77 Phoenix 6C	Jr.	550	450	SEAGULL AIRCRAFT	77 Seahawk	170	550	450
	77 Phoenix 6C	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	170	675	525
	78 Phoenix 8 Super	Reg.	675	450		78 Seahawk	190	675	525
	78 Phoenix 12	Reg.	650	525		78 10 Meter	—	825	750
	79 Phoenix 6D	185	800	650		78 10.5 Meter	—	825	750
	79 Lazor	190	900	775		79 Seahawk	180	950	625
	80 Phoenix 6D	215	1075	775		79 10 Meter	—	975	700
	80 Lazor II	175	1075	925		79 11 Meter	—	975	700
CGS AIRCRAFT	77 Falcon V	185	650	500	SKY SPORTS	77 Bobcat III	Lg	675	600
	77 Falcon V	220	600	475		77 Merlin	160	600	500
	78 Falcon 5½	Med.	750	625		77 Sirocco I	156	600	475
EIPPER FORMANCE	79 Falcon 8	Med	900	800	77 Sirocco I	175	575	400	
	77 Flexi II	185	525	475	78 Osprey	175	700	675	
	77 Flexi III	185	575	500	78 Sirocco II	164	725	700	
	77 Cumulus 10	Med.	550	525	79 Eaglet	191	550	425	
	78 Flexi III	Lg.	700	600	79 Osprey 2	175	625	600	
	78 Cumulus 10	Med.	675	500	79 Sirocco III	189	950	850	
	78 Antares	Med.	875	750	ULTRALITE PRODUCTS	77 Firefly	174	650	500
	79 Antares	Med.	875	750		77 Dragonfly Mk. II	196	700	550
79 Antares	Lg.	925	875	78 Firefly		154	800	700	
ELECTRA FLYER	77 Cirrus	3	600	400		78 Spyder	176	850	675
	77 Cirrus	2	500	300		78 Condor	178	900	825
	77 Olympus	160	575	525		79 Mosquito	166	1200	1075
	78 Cirrus 5	C	600	475	80 Firefly 2B	181	975	850	
	78 Cirrus 5	A	600	500	WILLS WINGS	77 SST	100C	625	575
	78 Olympus	160	625	555		77 SST	100B	625	550
	78 Olympus	180	625	550		77 Universal	100A	525	500
	79 Dove	A	800	575		77 X-C	185	600	550
	79 Trainer	—	400	400		78 SST	100C	700	650
	79 Cirrus 5	A	650	625		78 Alpha	185	825	775
79 Olympus	160	725	650	78 Alpha		215	825	775	
79 Floater	205	900	775	78 X-C		215	800	775	
FLIGHT DESIGNS	79 Lancer	190	1050	1000		79 Alpha	185	950	750
	80 Lancer	175	1150	1100		79 Alpha	215	1000	850
MANTA PRODUCTS	79 Fledge	IIB	1200	1000	79 Omega	220	1000	875	
MOYES DELTA WING	77 Maxi I	200	700	625	79 Omni	187	975	950	
	78 Maxi II	200	925	800	79 Raven	209	1075	1000	
	79 Maxi III	200	975	875	80 Raven	209	1225	1075	
	80 Stingray	200	1000	900	80 Raven	229	1200	1075	
	80 Maxi IV	200	1075	950					
	80 Mega II	172	1400	1200					

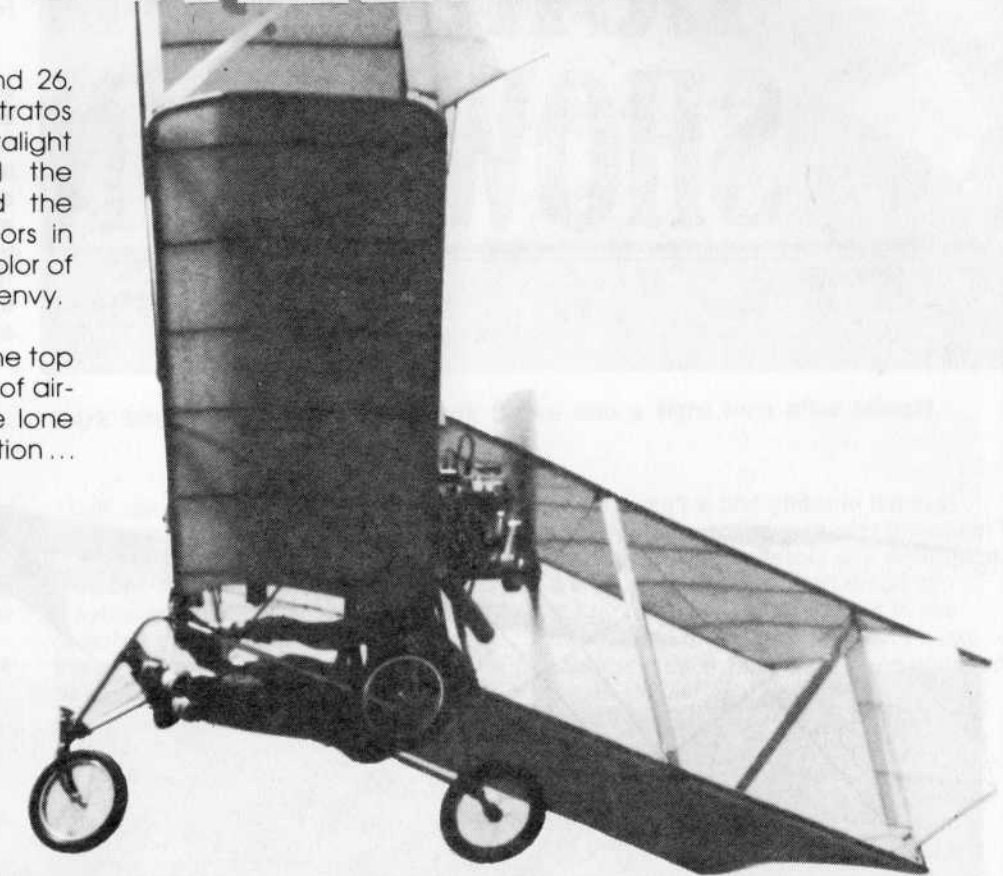
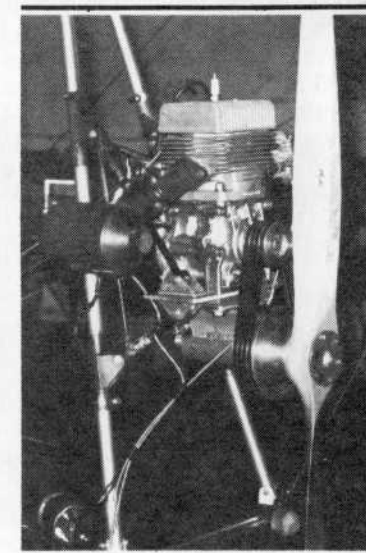
NOTE: DEALERS! Write to us to participate in the Used Glider Bluebook. We would like to get your input on prices, to better represent all parts of the U.S.

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

GET MOTORVATED... WITH A CGS POWERHAWK!

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

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



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

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

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



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EUROPEAN SHOWDOWN

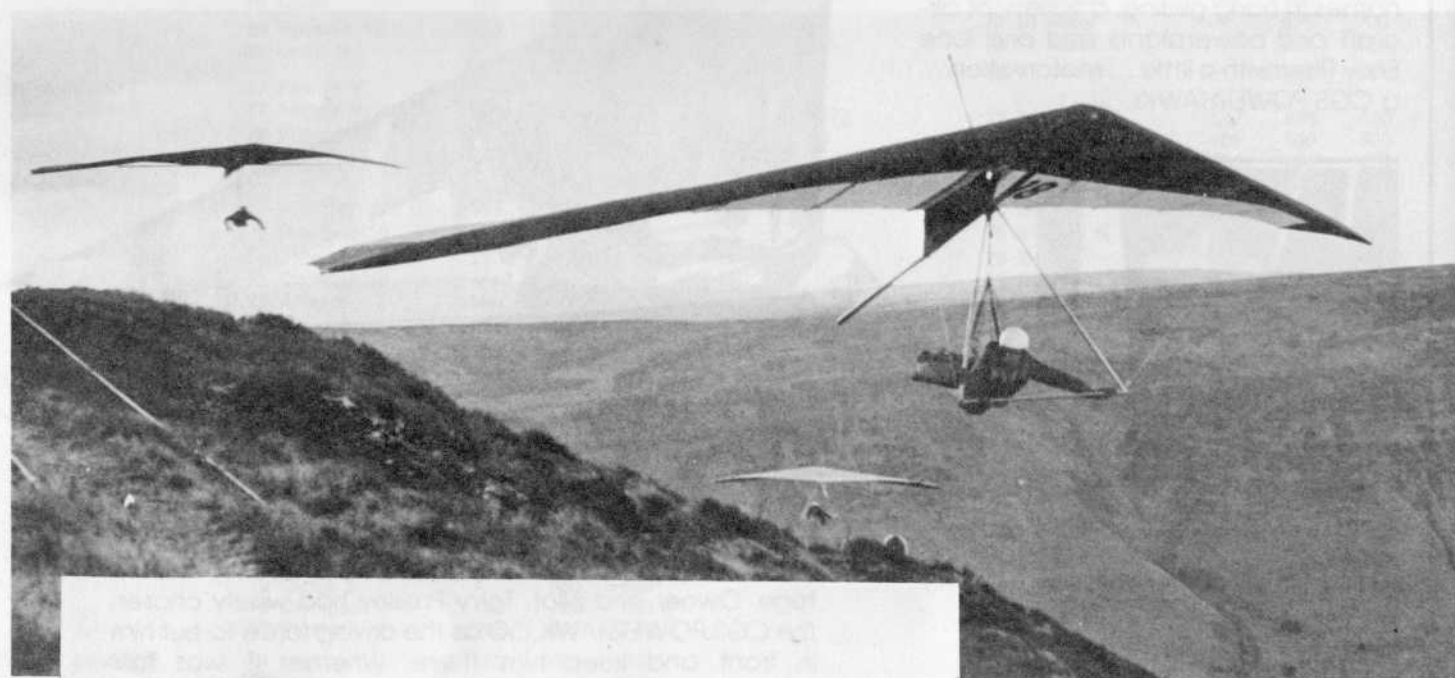
Noel Whittall

HAY BLUFF—11th JANUARY 1981
How would you like to see teams of three of all the pace-setting gliders of the new generation flown competitively against each other by the nation's top pilots before you put your dollar down for your 1981 machine? Sounds like a dream, eh? Well, at this big site by the beautiful Wye valley near the border between Wales and England, the dream came true.

Lined up to settle the honors in the bitter cold were all the main British manufacturers, plus the La Mouette team from France.

THE CONTENDERS

The design of most of the gliders bears some witness to Haggard and Brock's success with the Comet. Double surfaces and floating crossbooms are now the norm. Leading edges are usually stiffened or padded in one way or another, and the resulting flying machine is very fast indeed compared with the flexwing of just a few months ago. It is also rather heavier on the shoulder and takes longer to rig, but there is always a price to pay for progress.



Brian Milton, competition chief, addresses a group of assorted skeptics including, left to right, Hubert Aupetit (Editor of "Vol Libre"), Geoff Ball, Mark Silvester, Derek Evans, Robert Bailey, Bob Harrison, Grinning Trevor Birkbeck, Jim Brown, Milton, Mike Hurtley, A. N. Other.

THE TEAMS

Airwave Comet. The U.P. glider manufactured under license by a specially formed British company. Superb workmanship. Pilots: Robert Bailey, Jim Brown and Andrew Wilson.

Flexi Form. One of the smaller outfits: Run by Hughie McGovern and Mike Hurtley, a genial and refreshingly original pair who turned up with a mixed bag of gliders consisting of last year's Hi-Lander, this year's double-surfaced "ESP" (Extra Special Performance?), and a crossboomless tailed device provisionally called the Sea-Lander, of which more later. Pilots: Bob Harrison, Geoff Ball and Mike Hurtley.

Hiway Hang Gliders. The Wales-based firm made internationally famous with the Super Scorpion. Fielding a team of DEMONS, a double surface machine first seen in prototype form at Chattanooga last October. Pilots: Graham Slater, Jo Binns and Alan James.

La Mouette. The Atlas builders, headed by designer Gerard Thevenot. Their X-RAY has a typically Atlas planform coupled with an extensive double surface and buried crossboom. The shiny Mylar-surfaced external leading edge finish is attractive. Pilots: Thevenot, Renaud Guy and American Cup top-scorer Graham Hobson, their British agent.

Skyhook. One of the earliest English manufacturers, and probably the first to use preformed battens. Designer Len Gabriels' SABRE is the latest in a long line of class machines, its double surface airfoil controlled by no less than twenty-eight battens on the large model. Their competition results do the glider rather less than justice as they fielded a team of only two. Pilots: Mark Silvester and John Clark.

Solar Wings. The TYPHOON is their double-surfaced flagship, achieving good sales early in the season. Strong team of pilots: Johnny Carr, Trevor Birkbeck and Keith Cockcroft.

Southdown Sailwings. Ian Grayland's LIGHTNING displays some effective original features apart from the now mandatory double surface: Billow-shift is accommodated by a floating crossboom only—the deep keelpocket is eliminated. However, the essential side area is neatly provided by streamlining the rearward sloping Kingpost with a triangular sailcloth fin. Apart from giving directional stability, this also cuts drag and looks appealingly different. Team led by British Champion Bob Calvert, with Mich Maher and Keith Reynolds.

THE TASKS

Scheduled as a two-day meet, the Saturday was blown out by gale force winds. Fortunately Sunday was bright and clear, with a light northerly breeze producing marginally soarable conditions.

Thus condensed into one day, the contest consisted of three simple tasks calculated to test minimum sink, speed and speed range. Each task was flown in heats of three fliers, with points awarded on the basis of 900 for a heat win, 600 for second and 300 for third.

Round one was a pure height gain contest: The pilots simply had three minutes in which to gain height, then a horn was sounded and height order determined the score. Things were often extremely close and the judgment of the independent observers was sorely



Mark Silvester swings the Skyhook Sabre into a tight turn after takeoff.

tried, but after all the heats the Demons and Typhoons were equal with three first places each.

Round two was a ridge race to round a pylon and return. Simple on the face of it, but the light quartering wind meant the course had to be flown intelligently or there was a danger of being DSO'd for passing below the finish clock. Again the Demons and Typhoons shared equal first, although only 300 points ahead of the Comets and Lightnings.

Round three tested speed range: fly as fast as possible to cross a line away from the ridge, then remain in the air as long as possible before bottom landing. The first time was then divided into the second, the highest resulting figure determining the winner.

Again there was a tie in the round for first place, but this time it was the Lightnings which tied with the Demons. When the scorers had completed their bitterly cold day's work, the provisional results looked like this:

1st—Hiway Demon Team	7,500 points
2nd—Solar Typhoon	6,600 points
Equal—Southdown Lightning	6,600 points
4th—Airwave Comet	5,400 points
5th—La Mouette X-Ray	4,200 points
6th—Skyhook Sabre*	3,600 points
Equal—Flexiform	3,600 points

*Only two fliers.

THE CONCLUSIONS

From the foregoing it may look as if the Demon is a "good" glider and the rest poor by varying degrees. Rubbish.

There wasn't a bad glider in the sky, and the average clubman surely wouldn't have been able to detect any difference. It was all so close, but all credit to Hiway for having their gliders in the finest state of tune on the day. Flying conditions over here have been poor for weeks on end, and no doubt all the manufacturers would have benefited from some extra airtime on these 1981 models, many of which are only just beyond the development stage. Surely Gerard Thevenot will find a little more speed in the X-RAY during the next month or so, and maybe a COMET with a few more square feet to accommodate a pilot the size of Robert Bailey was all that they needed to finish much higher up the list.

Oddly enough, one of the stars of the day was one of the lowest scorers—curiously named the Flexiform Sealand. This is a bowsprit glider with very little washout, instead gaining its pitch stability from a pronounced "tail" incorporated in the center section. Reputedly its handling is superb, and it scores not only by looking distinctive but also by being anything up to 15 pounds lighter than the current generation of Comet-inspired designs. That's a formidable consideration when you have several hundred feet of hill to climb as we often do over here! With any luck I will be able to give some flight impressions of this and some of the other models when next I write from this side of the Atlantic.

SUN 'N FUN '81

"TIME WILL TELL"

It was Saturday in the late afternoon. It had really been the only good day all week, at least so far as the Ultralights had been concerned. Wind and rain made the weekdays unflyable, and Sunday to follow was the break-down and go-home day. A very interesting thing occurred.

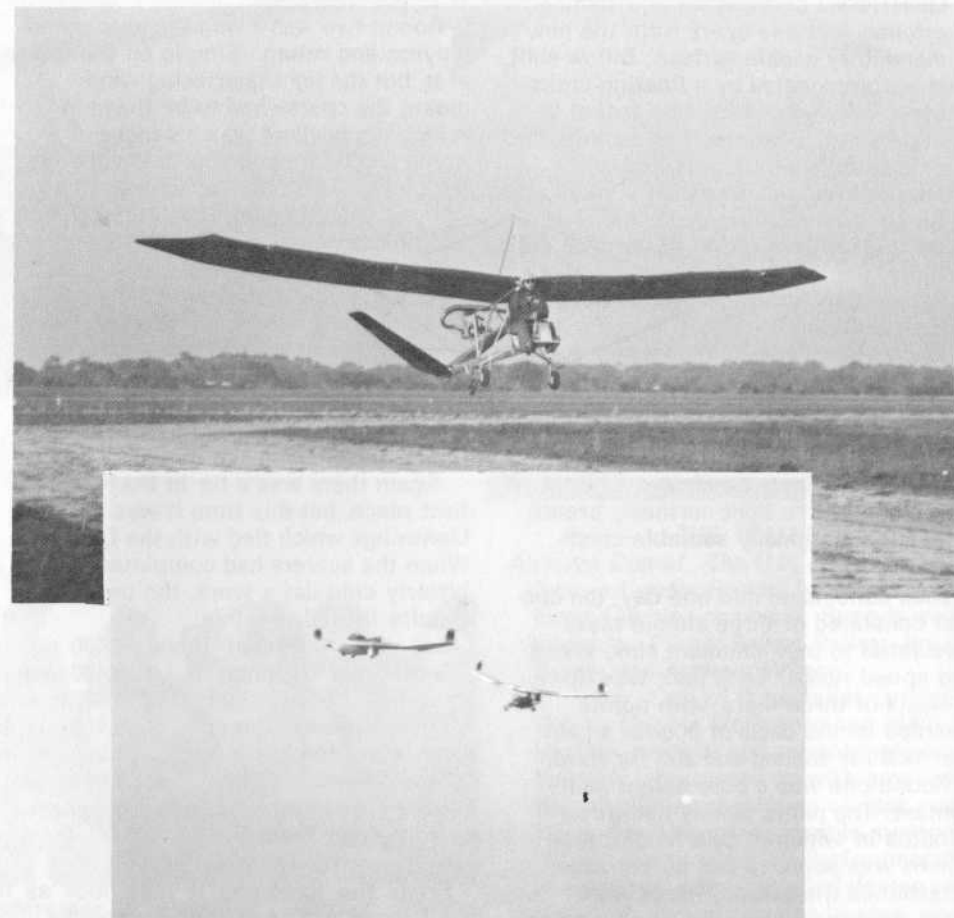
I had been scrambling to get some good photographs of Saturday's crowds and activity before the sun got too low for adequate light. But an oversight (leaving my camera in the airplane across the airfield) had me beginning the effort late in the afternoon. It had been a long, sunny day and the crowd was thinning, to my dismay, as I wished to have people standing around the aircraft I was photographing.

The shutter clicked away regardless as I made my way to the Ultralight flight area. Then as we arrived, an interesting thing happened.

Crowds still gathered about the various Ultralights, thick as bees on a hive. What . . . I wondered? I thought the crowds were leaving, yet here I could barely take pictures, indeed, because of the people. Huh! One more time now I had been impressed with the magnetic draw of Ultralights. Even the exotic P-51 Mustangs, miniature BD-5 Microjets, far-out Quickies, and nostalgic Ford Tri-motors could not hold attention like the "enfants terrible" of sport aviation—the Ultralights.

Appeal is powerful. Twenty-eight of them are airborne simultaneously. One rolled off with two large men aboard. And yet EAA officials muttered under their breath about their disorganization.

Try as everyone might, the Ultralights do appear scattered and fractionalized. Heavy competition is obvious in the sheer numbers of manufacturers. What to do? How about a P.U.M.A. Huh?



Professional Ultralight Manufacturers Association, or P.U.M.A. It started once at Tullahoma (where it was just P.U.A.), gasped to life and coughed quietly asleep for a few months. Now reborn with spring, it is back with one new letter and several new \$250 apiece members.

Revived, with by-laws, some good and needed goals, apparent direction, and the same leaders, the P.U.M.A. decided to have a limited number of associate members, that is, non-voting members. Limited to one (*Glider Rider*), the P.U.M.A. is worried over having too many publishers. Why? Wouldn't they rather have several? At \$250 a member, why not have more, especially if they cannot vote? Something about too much press influence, whatever that means.

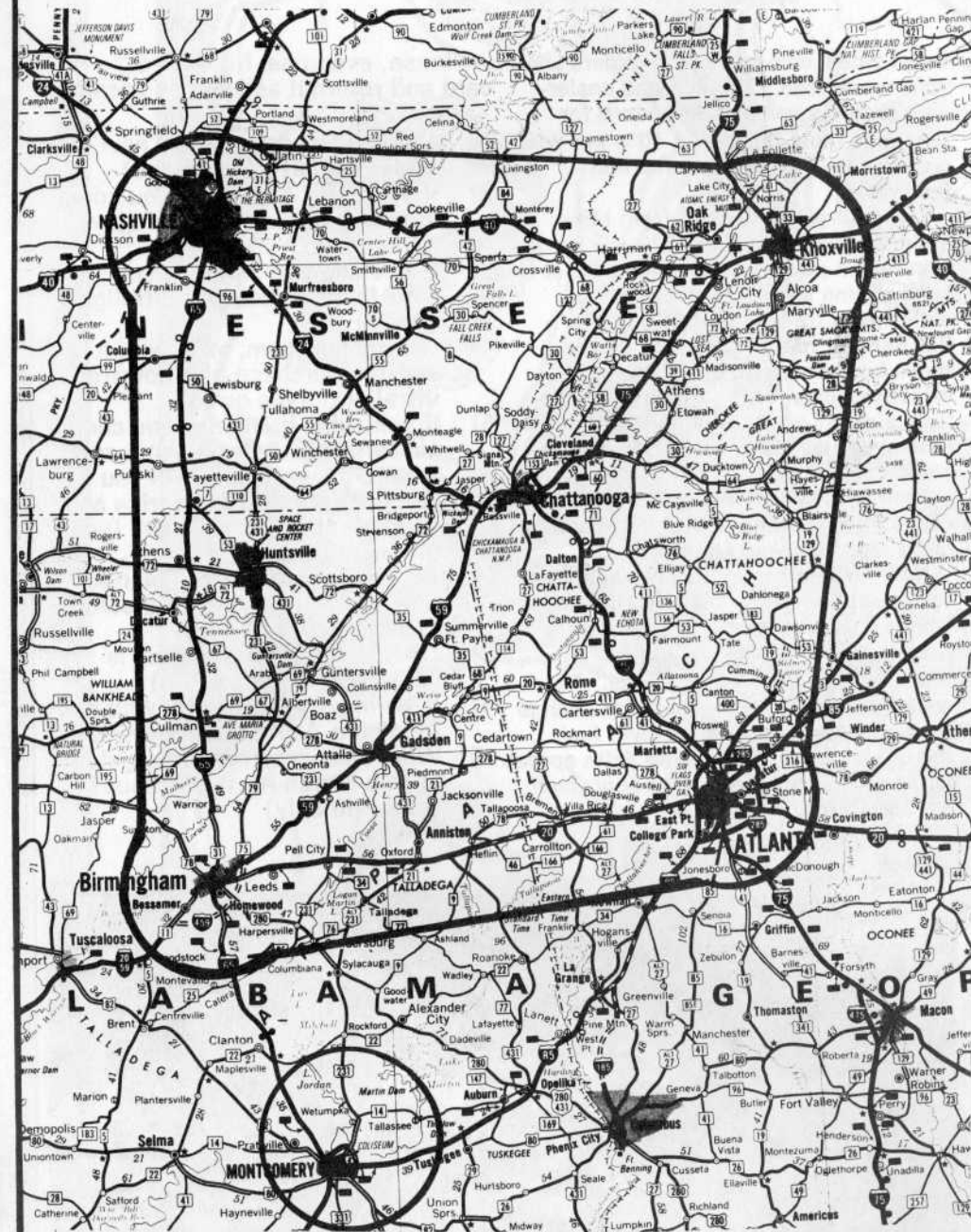
I would attribute to this group some of the paranoia I remember from earlier days in hang gliding. Many manufacturers aiming at a still small count of consumers, the numbers of which all expect to rise inexorably to large masses, clamoring over a place in line to buy airplanes. Will it happen? Time will tell. And time will probably reduce P.U.M.A. membership, as inefficiencies take their toll.

Maybe then more publishers will be welcome, to offer more publicity to waiting readers, and to fork over \$250 each to swell the treasury. Time will tell.

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STATISTICS

HANG GLIDING STATISTICS

by Dan Johnson

After a brief but conspicuous absence our very popular column of statistics returns.

In this edition, we present some interesting figures on hang gliding/ultralight dealerships as generated by the dealer questionnaires requested of Wills Wing outlets in preparation for the second annual Wills Dealer Seminar. We felt that the consumer would appreciate this information about the sources of hang gliding goods and services.

Of all dealerships answering (40 responses to about 120 questionnaires mailed), 58% have a storefront establishment. Of those with actual stores, the size averaged 1,600 square feet, and they paid an average monthly overhead of \$1,480. While I felt there might have been some confusion over what exactly was overhead, a lot of money is still involved, and this could help explain why dealers with stores want to sell at retail.

The average flying experience of the main person at all dealerships was six years, and 92% are Advanced (Hang IV) or better pilots.

Not too surprisingly 93% have flight schools and 92% use USHGA certified instructors. The average number of instructors per dealership is 2.7 persons, while the average number of employees is 3.4 persons.

When asked about training tools and aids, 65% reported using radios, 87% use audio-visual aids, all use ground schools, 66% use a simulator of some description, 46% use tandem instruction, 89% use wheels and 59% take training through the advanced levels.

These schools train an average of 24 students per month and are able to sell gliders to 24% of their students. Of

these sales, 60% were new gliders and 40% were used. The average dealership projects sales of 59 gliders for 1981, and most reported a 50% per year growth rate in sales over the last few years.

I was surprised to note from Mike Meier's tabulations that 71% sell or plan to sell power. It now seems that hang gliding shops are the primary outlet for ultralight aircraft sales. Bill Bennett has said that he views these businesses as being the most effective place for the training of ultralight aircraft pilots. A significant number of dealerships, 36%, offer financing of one sort or another.

Thanks to Wills Wing and their dealers, who also represent most other manufacturers, for these statistics.

Now, Whole Air will again begin to ask questions of our readers (this means YOU!) for use in future "Statistics" columns. In the past we had the questions right on our Reader Cards. But to conserve space, we are going to change formats. From now on, you will find the questions in this column, with spaces for answers only on our free reply mail Reader Cards.

Please, everyone, fill out your card and return it as soon as possible.

1. Will you be purchasing a new glider in 1981? (yes or no)
2. If yes, what brand are you considering most seriously? (one name only)
3. Do you now fly, or have you ever flown a powered ultralight? (yes or no)
4. Do you now own, or do you foresee the purchase of a powered ultralight? (yes or no)
5. If yes, what brand are you considering most? (one name only)
6. Again, if yes to #4, will you consider purchasing a trike as a form of ultralight aircraft? (yes or no)
7. Do you now, or do you plan to use towing as a launch method? (yes or no)
8. Do you think hang gliding is "dying out?" (yes or no)
9. How many people read your copy of *Whole Air*? (one number only)
10. What was your favorite article in this March-April '81 issue? (one title only)



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MOTORIZED

Chuck Slusarczyk
President, CGS Aviation, Inc.

This month instead of an article on a specific phase of motorized flying, I'm going to relate some of my impressions and opinions of the first major ultralight meet of the year. The annual Sun 'N' Fun, held in Lakeland. It was a bitter sweet affair for me.

Along with the good times, I had the misfortune to bang up my Easy Riser and damage a wing. More on that later. As expected, the amount of participation in the ultralight area probably doubled since last year. However a great amount of the increase was due to new companies manufacturing ultralights. Unfortunately the home builders, building "one of" designs showed more innovative talent in new designs than the new manufacturing companies. They based their design efforts on rehashing one of two basic designs, the Quicksilver and the Humbug. The Quicksilver, probably the most imitated design going, is getting competition from the imitators of the Humbug. It was difficult to tell Quicksilvers or Humbugs from their clones without a program.

The cloning was so good in some cases I'm sure parts would interchange. This is a sad commentary. I personally have more respect for the "one of" homebuilder who uses innovation, imagination and pride to create a new design than companies whose major tool of the trade is a camera and tape measure. A fellow who deserves mention is a perennial participant in sport aviation whom I first met 5 years ago at Oshkosh.

This southern gentleman represents the finest goals of home building. I won't reveal his age, but it's over 60 and he's been building and designing airplanes for 50 years and the fact that he is still flying after all these years attests to his ability as a designer. Sandy Hudson was very much in evidence as he stands over 6' tall, wore

a pair of bib coveralls and a green metal flake helmet. His homebuilt was an ultralight constructed from wood with a fabric covering. It is powered by a 10 hp Briggs and Stratton engine on one side and a 18 hp Briggs on the other. When asked why the engines were different, Sandy would act surprised, and with a twinkle in his eye, replies very seriously, "Gosh, I hadn't noticed!" His real reason was that he hadn't had time to install another 18 hp on the other side. The sound these engines made in flight was music. They sounded to me like an OX-5.

The P.U.M.A. (Professional Ultralight Manufacturers Association) held various meetings through the week and made some real headway. The thing I was most pleased with was the PUMA's definition of an ultralight. After much discussion it was agreed to define an ultralight as a "single place craft with an empty weight of 100 Kilos or less (220 lbs.) with a wing loading of 3 pounds per square foot or less. These parameters allow for growth for those who want slightly heavier craft, and will allow those who want to build light to do so. Since most ultralights weigh 140-200 pounds now, the additional weight will allow more pilot safety by being able to use a somewhat heavier but more reliable engine, build more crash protection around the pilot and use heavier members in the prime structure. Also voted on were standards for safety, operation, instruction, and advertising. This organization is a move in the right direction.

Speaking of safety operation, I was very disappointed in the flying conduct of some of the pilots. It ranged from discourteous to dangerous. Not to mention this fact would be in effect condoning it. I saw off-

field flying where pilots were below tree level flying over ponds and around trees. One pilot consistently flew low in the pattern and would bank sharply left to right. If he had an engine failure, he left himself no room for emergency procedure. This is bad pilot judgement. Another took off with controls not functioning properly and had to land immediately. Here is a poor pre-flight. Now I bring up my incident, where I damaged my Easy. This was the first time in 4 years of flying that ship that I ever damaged the wing. I've banged the draggers and bent landing gear but never hurt the wing. I was preparing to take off on the active runway which had a 90° cross wind from the left. Ultralights were all around; landing, taking off, and flying. I cleared the pattern and started to roll concentrating on the cross wind when just as I started to get light, a huge shadow appeared to my left. I thought someone was landing on me and swerved right. This allowed the wind to get under my wing and forced me to ground loop dragging my wing and damaging it. When the wild ride was over an official in a Jeep drove up to see if I was ok and told me someone had taken off behind me or flew low over me during my take off run and asked if this is what startled me. Fortunately, I was not hurt, but my bird was. The eyes of the world are upon us and it is up to us to conduct ourselves in a safe professional manner. If you want to be a cowboy get a horse. Names of unsafe pilots should be taken as soon as they land and they should not be allowed to fly at the next meet. We must police our own ranks before big brother does. Enough of my soap box, if any one has any comments please let me know.

Next month we will have a subject of a lighter, more technical nature.

Fly Safe.



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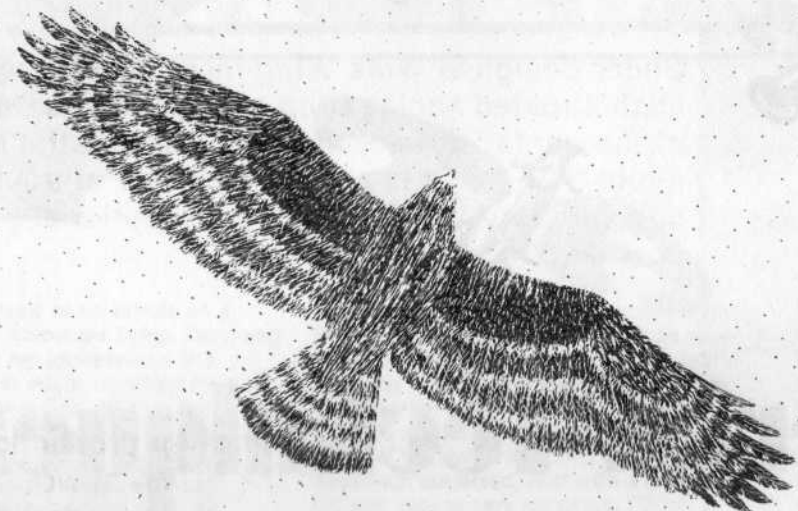
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FISH & WILDLIFE COMMISSION



Paul M. Breeden

TO MAKE A NEW RULING

Dear Editor:

While the discussion of FAA regulations seems to be coming to a head, there is still another restriction in the making. If you and I do not act now we stand to lose 89 million acres of beautiful flying area.

In Washington sits a large book put together by refuge managers across the nation. This refuge manual (master plan) will go before a committee and soon become fish and wildlife policy. The refuge manual will cover everything from pay scale for rangers to the policies covering public use of refuge land. As it stands now, hang gliding will be banned from the 400 wildlife refuges in the U.S.

The fundamental problem, as with the FAA, is the pigeonholing of hang gliding with other forms of recreation. The dis-

crepancies between a bicycle and a motorcycle, a canoe and a motorboat, cross-country skis and snowmobiles are synonymous with the difference between a foot launched hang glider and a motorized ultralight or airplane. To be sure, a motorized ultralight has no place in a wildlife preserve any more than model airplanes and dirt bikes.

The idea of the refuge manual is to set a precedent for future policy. There is a definite need for good policy and regulation in our wildlife refuges. Our record is not unblemished, and Yosemite does not help. The responsibility rests in our heart and helmet. Hang gliding does not interfere with the preservation of nature. Only in our quiet non-polluting aerial canoes can we fully observe and appreciate our feathered friends in their natural element—the air.

Everybody has a favorite story of a magic and privileged moment shared

with nature's flyers. Maybe the time you hovered motionless with a Kestrel for 10 minutes or the day a Red-tail provided a flight saving thermal at 500 feet. The incredible beauty of that long awaited sunrise sled ride at Half Dome. Let's preserve our privilege to fly over the most beautiful land in our country.

The biggest problem is that any comment must be received in Washington by April 27. Shift your weight and pick up your pencils now.

Send your comments to:
Refuge Manual Coordinator
Division of Refuge Management
U.S. Fish and Wildlife Service
18 and C St., N.W.
Interior Building, Room 2340
Washington, DC 20240

Chris Kendall
Mike Potvin
Winona, MN

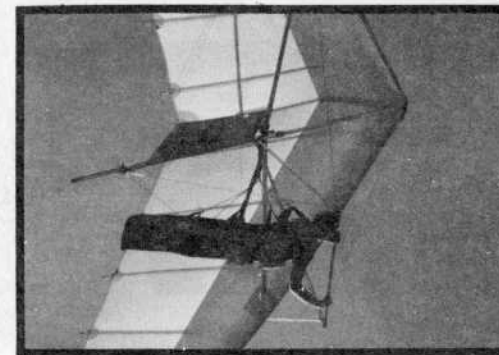
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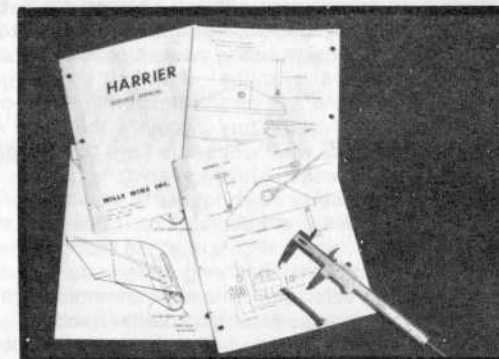
All prototypes, whether destined for production or not, are tested in accordance with the HGMA airworthiness standards. Over the years, this has provided a large base of empirical engineering and aerodynamic data for use in development of new glider designs. Following such testing, extensive further 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.

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POWERED ULTRALIGHT OR HANG GLIDER?

SOARMASTER TRIKE

By DAN JOHNSON

The advertisement from the first American firm to engage in "trike" manufacture (Soarmaster) asks the question, "Powered Ultralight or Hang Glider?"

During these times of burgeoning ultralight growth it does seem to be the question to ask. In Lakeland for the EAA's seventh annual Sun N' Fun Fly In, a proliferation of manufacturers reminded me of the 1975 era of hang gliding. In those years, everyone who could buy some tubing, bolts, cable, and Dacron became a manufacturer. They scrambled for a limited market with such zest that those still involved must assume a very conservative posture to be credible. Everyone bragged of new performance but until Bob Wills' Swallowtail, and Roy Haggard's Dragonfly, so such real gains were discernable.

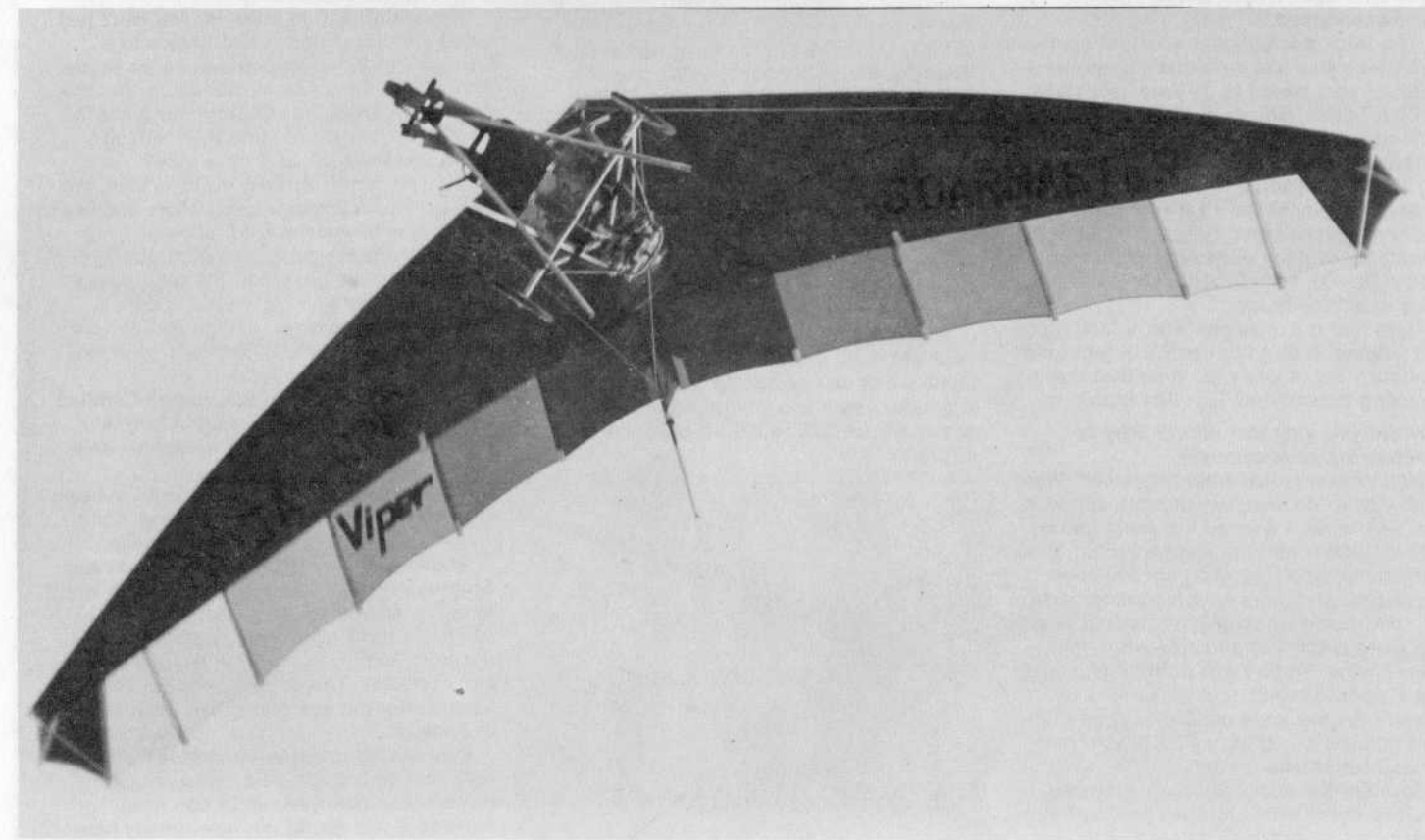
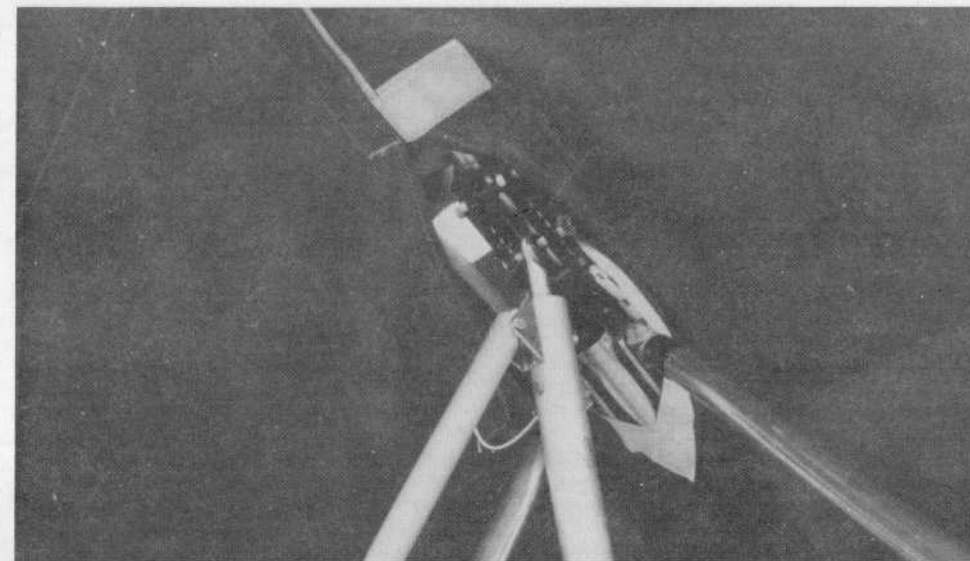
Now, in ultralighting, the scenario is surprisingly similar. Among ready-built craft, few real steps have yet been taken to design brand new ships with good performance gains. Just bolt on a larger engine and be the temporary climb-out king till the next guy discovers the same engine.

So, what does this have to do with trikes, you ask? Maybe everything, my friend. I am sorry I did not get to view the lone trike present at Lakeland, as it flew with the rest of the ultralights. But the fact of the matter is modern 1981 hang gliders are capable of greater performance than most ultralights yet, with comparable or better handling. So with a single bolt (and a trike), a Comet or Viper or Harrier or Demon, or Vampire can be an ultralight.



These latter designs have a lot going for them as they compete with existing ultralights.

Foremost is their ability to be both glider and airplane, a supreme order of ultralight specie. Secondly, they can deal with the weight of engines, and landing gear vastly better than their gliding predecessors. The 1981 Stiff Wings even prefer higher wing loading not suffering performance losses as the weight increases. Thirdly, they offer good handling in a very simple package, uncluttered by the common jungle of wires, struts, and control cables found on current ultralights. Fourthly, they set-up, take-down, package, and transport more cleanly than any ultralight I've seen. Fifthly, if you mount a 1981 HGMA certified glider on a trike you are receiving the most thoroughly tested ultralight package available, even tho extensive testing has not been done on a fully assembled trike. At least the wing has proven state-of-the-art stability.



Sixthly, you may already own a trike-able glider, thus saving a pocketful of money if you now wish to have an ultralight as well. You don't even have to give up your glider.

It all sounds pretty positive, doesn't it? So why not order today? Several persuasive arguments exist to suggest you should wait a while longer.

One, trike technology is not very advanced. Even in England, where trikes have been the rage for over a year, flaws still exist. This is not to say they aren't heaps of fun; it's just that as with most ultralights, you are a test pilot proving the systems by your continued use. This was also true in hang gliding until only recently (about two years ago).

Two, trikes are not for everyone. They definitely require more than basic hang glider skills, so first you probably need experience in an easy to fly ultralight.

Three, if you do wait, your reward will be a system refined far beyond the present. Not that the basic idea is incorrectly designed, but many details could be improved. As in England where every glider manufacturer began building trike units, several American companies are working on their own efforts, applying liberal amounts of good ole Yankee ingenuity.

Four, while many gliders can and will work on trikes, the new Stiff Wings do the best. If you don't already own one such design, you would probably be best advised to not buy a trike until you do own one. Oh sure,

they can be transferred easily enough, it's just that if you spend \$2000 for a trike, then decide you need a Comet for it, too, you will have spent the same as most ultralights. Of course, that's up to you..

Mainly, I want to emphasize that the situation is a Buyer Beware environment. If you do not positively know what you are doing, don't do it. Also, don't take my word for all of this. Ask everyone who purports to know, and carefully assess all findings.

To make that process a lot easier (as I did the same), following are comments from eleven of the most respected names in the hang gliding/ultralight industry. Not all of them are trike experts, but they have opinions which are credible because of their "insider" positions.

WHAT THE EXPERTS SAY

Bill Bennett granted **Whole Air** an interview on the subject of motorized in general and trikes in particular. His long years in this business and his recent entry into the ultralight would give him a vantage point few others can claim. His company, Delta Wing, has become the west coast distributor for the Soarmaster trike.

Bill, you were once involved with motors some time ago. Tell us about that and why you discontinued.

The back pack engine was just another idea that we've had here that's been three or four years ahead of its time, like mylar leading edges, double surfaced sails, and floating crossbars.

The engine was introduced in 1971 and 1972, and it failed for two reasons. The hang gliding movement wasn't ready for power, and the gliders weren't ready for power. I don't believe any of those old standards would fly with any of the power packs we have available today.

Ours had a ducted fan with a McCulloch 101 engine. It was fine really. In fact you'll probably find in years to come that they'll be using ducted fans just like ours.

Why did you stop that effort? Why not continue the development?

Well, that was just what happened. What I decided to do was just sit back and wait. You see, when I entered the hang gliding field in 1969 I went out and promoted, gave exhibitions, attended sport shows, spent thousands of dollars on advertising, even TV advertising which I don't believe anyone has done since. I told people what hang gliders were. While I was doing this, people like Eipper, Seagull, and Wills, who used to work for me, were out building up their own companies, at what I felt was my expense at that time.

So, with the acceptance of motorized, I decided that I would just set back and hold a wait and see attitude. When the time and product were ready, when everyone else was spending their time and money as I had done previously, then I would just step in and either buy their systems or develop my own.

And you've decided that now is that time?

Yes, I feel it's right now. In Europe many of the League competition pilots are not in contests because they're out flying trikes enjoying themselves.

When Soarmaster came out with their trike, they asked for many people's involvement, and I thought this was the time.

I had not been at all favorable to the earlier Soarmaster system (PP106). They were sort of second generation engines, the back pack was first, now we're into the third. The trike is a viable system.

Why the Soarmaster Trike, Bill?

They were into it first, they had gained a lot of experience with engines, propellers, thrust lines and so forth. Soarmaster is a leader company. Others are followers, others are starting to build trikes, Marty Alameda, Manta, Brock, everyone is.

Then why not a Delta Wing trike?

There possibly will be. But at this time, when I make an agreement with anybody, I'm going to honor that agreement. I would like to see it come to a point we've discussed where I build the trike frames and Soarmaster can concentrate on engines, props, and reduction units, etc.

How do you see trikes fitting into your long established hang gliding business?

I think they are the best thing since button-up boots. The reason is there are many pilots who've given up hang gliding for several reasons who are now coming back in, because of motors. There are many general aviation pilots who can no longer afford the cost of light aircraft use.

A very good example is that an eleven year old, cast aside hang glider like the Quicksilver can be selling like gang busters. A couple years ago you could buy one anywhere for \$200-\$300. It looks like an airplane.



But isn't that a drawback of a trike, that it doesn't look like an airplane?

Anytime you see the two perform together, and the Quick is a fine airplane, the trike runs circles around it. The Quick in no way compares with the new wings on a trike.

Will the trike appeal to the airplane pilot?

I think it appeals to everybody. A powered unit which sells for only \$1950 seems extremely cheap to an airplane pilot. They are very willing to pay this price.

A lot of people want to fly, but hang gliders frighten them because they see that sooner or later they will have to step off a three thousand foot cliff. Even if they know

training begins further down. They can't rationalize doing that. But flying up to that height or higher, with power, doesn't have any terrors for them.

What trike hazards do you know of?

The thing that I am really paranoid about is that someone is going to walk into the bloody propeller. We can't be held to ransom for this because general aviation has had propellers for 75 years, and people hurt themselves. They will continue as long as we have propellers. I don't know any way to prevent it. We can't put cages around them. We've just got to use common sense.

If not propellers, what other hazards, to the operator for example?

I don't think we have too many to worry about. With the thrust line where it is, with pendulum stability, with parachutes, with a low mass, we have a better situation than just normal hang gliding.

The main thing to learn is, you can't just bring a motor glider in and flare it to a landing. It's better to come in under power. There is a difference in technique. But the difference is only for hang glider pilots. An airplane pilot may not find this difficulty.

What level pilot should fly a trike?

It's comparatively easy to fly a trike. We are apt to see more women pilots and more older, less physically able, pilots.

One of the big problems with ultralights is the training period. When the pilot leaves the ground, he's on his own. Tandem training is being done, discreetly because of the FAA's attitude, and it will open the door to many more pilots.

What load testing has been done? Certified gliders are tested of course, but how is the situation changed by the addition of a trike?

To be honest, I don't know. And I believe not enough testing has been done. It's a whole gray area, with little information.

That's why I waited, and why I went with Soarmaster. They did what they could with gliders I and others supplied. They did some load and pitch tests, tests of aerodynamic loads. I don't think anyone else has done any. The others have assumed Soarmaster did and that it had been done in England.

One saving grace is parachutes. An ultralight can be brought down by a chute. A ballistically deployed chute can even salvage a mid-air, which has already happened. We are developing such a parachute.

What further testing that is not being done, can be done?

It's being discussed already at the HGMA meetings and at USHGA meetings because they now have a separate division for power. **Is the HGMA going to take on the testing of these things?**

I think they are looking towards it with great trepidation. They didn't want to do hang gliders but it was absolutely necessary. I think we all see the results of it now. We may have to get into it.

For the moment, to know that the glider itself is certified, is at least that much protection. The only gliders I recommend be used on a trike are certified gliders.

Thank you for this interview, Bill.

You're welcome.



TRIKE

With Bennett, our list of would-be advisors appears below:

Pete Brock, is owner of Ultralight Products, manufacturer of the wonderfully successful Comet. He has an equally good track record in the racing car industry (see an interview in *Whole Air*, July-August 1980).

Gene Blyth, the right hand man running U.P., has many years in the business. He once held the world cross-country flight mark, and has flown in numerous competitions.

Rob Kells, president of Wills Wing, is widely known as hang gliding's most successful aerobatic pilot.

John Lasko is Promotions Manager for Eipper, the largest ultralight manufacturer in the world. John snapped the cover shot of the November-December 1980 *Whole Air*, and promises another this year.

Rich Grigsby, co-owner of the Southern California School of Hang Gliding, is one of the world's most successful competition pilots, flying a great year in 1980. He is a former editor of *Hang Gliding*.

John Ballantyne, president of the newly formed EAA Ultralight Division, operates Ultrasports, which uses the industry's first practical simulator, his own simulator, his own design. John is also a Master rated hang glider pilot.

Glenn Brinks, Managing Editor of *Hang Gliding*, is a former writer for several cycle and auto magazines. He currently writes the Power Pilot column in *Hang Gliding*.

Jean Michel Bernasconi, marketing director for Flight Designs, lays claim to have flown more models of hang gliders than most other pilots and has similar experience on several trike/glider combinations.

Marty Alameda, a commercial pilot who also is owner of Flight Designs, has a long aviation background. He has recently traveled to Europe where he viewed their trike developments.

Steve Pearson, half of the very successful Wills Wing design team of Meier and Pearson, is part owner of Wills. The team is creator of the Alpha, Raven, and Harrier.

Larry Cook, marketing vice-president of Eipper, is one of three principal owners of the world's largest ultralight manufacturer, builders of the successful Quicksilver line.

WHAT THE EXPERTS SAY

(Pete Brock) You feel somewhat disoriented, as the trike torques or yaws relative to the glider. This is on the Soarmaster unit. But an experienced hang glider pilot could easily deal with the trike.

As to the strength of the main connection, a thing called a Heim joint, it is amply strong. The same part, a swivelling universal sort of joint, is used on race cars where where the application works it much harder. It transmits 400 horsepower to very wide tires, yet handles that load well.

(Gene Blythe) After five hours I feel quite comfortable in the Comet trike. You must land it more like an airplane than a hang glider, especially relative to the flare out. And in the air, there is some disorientation at first, though it is quite maneuverable. I feel the construction is sufficiently strong.

(Rob Kells) I think they have a long way to go yet. I still feel motorized in general is too formative for Wills Wing involvement. It looks like fun tho. I believe I'd like to, but have not yet flown a trike.

(John Lasko) Whenever you encounter turbulence, the p-factor (a propeller induced yaw) would cause a twisting of the trike carriage. The foot throttle is a problem area,

as you must keep your foot steady. Also the throttle does not lock in position. Your horizon reference is hampered as the wing is so high above.

While they fly well enough and are fun, I don't see them appealing much to airplane pilots and they don't feel as secure as a well built ultralight.

(Rich Grigsby) They possess a pendular instability. An oscillation can be set up which could upset pitch stability.

Bob Bailey, from Great Britain, spent some weeks with me recently. He has been selling trikes in England for a year. He felt they were good at first but is now feeling some doubts. He feels the excitement is dying down, and he is worried over less experienced pilots doing maneuvers which gets them in over their heads.

(John Ballantyne) I have logged twelve hours on a Phoenix 6D, the original package used by Soarmaster to evaluate trikes and flex-wings. If you must power a flex-wing, it is the best way to go. But it's like powering a sailboat. It is fun to fly. But handling has some unique problems with which the pilot must deal. It's no harder than flying a glider, there are just more things of concern.



(Glenn Brinks) It's a hell of an idea. They fly differently than an ultralight, just as an ultralight flies differently than an aircraft. It still needs developmental work. The one I flew was an early prototype, and the bar was out too far. The foot throttle is hard to keep steady. However you have much more control authority than on the Soarmaster PP106 add-on power pack.

(Jean Michel Bernasconi) I think the self-contained landing gear is the most headache-free way to go. Trikes mount the set up on modern 1981 wing designs. The low thrust line allows good pitch stability. You notice no great decay in performance, especially sink rate, with the trike attached. I've flown a trike with a Comet, Viper, Super Lancer 200 and 220, a Bandit, and the Demon 175 and 192. These have been on

With only a few notable exceptions, "Hang Glider" in Britain means flexwing, and until last year flexwings and petrol engines enjoyed at best an uneasy relationship.

I witnessed various experiments in the early days when there were two basic choices: The power unit was fitted to either the pilot or to the airframe. The first type consisted of a form of squashed birdcage containing an under-powered ceiling fan which was claimed to be a "glide extender." This strapped to the pilot's back and was, I believe, commercially available in the States circa 1973. These machines required a particular blend of courage and stoicism to operate as although the influence on the glide angle was almost imperceptible, the physical effect on the pilot was quite marked. Reflect a moment: You have a two-cycle engine strapped between your shoulder blades, driving an imperfectly balanced propeller. When the engine starts you need a pronounced list to port to counteract the torque, plus a backward lean to balance the slight thrust. So far so good. Now pick up your hang glider and perform a controlled launch. Fortunately around this period it was discovered that a couple of dollars worth of plastic battens would extend the glide rather more effectively than an engine clamped on your back vibrating like a passion-crazed gorilla, and I made a conscious decision not to buy.

A year or so later the second type emerged, eventually to be refined and developed as the "Soarmaster." I must admit I always had reservations about the wisdom of high thrust lines, but was open to persuasion on this point. After all, the things did work and some heroic flights were made over here, notably by Len Gabriels, Gerry Breen and Brian Milton. No, for me it was the throttle which killed the system stone dead. I had read about the mouth control, but had discounted it. I support my subconscious had visualized some dainty pastel-colored plastic device carefully kept stored in antiseptic solution like

Hiway, Soarmaster, and Flight Design trikes. The steerable nose wheel can be a problem on rough terrain. The foot throttle may be convenient but is nearly impossible on rough ground. You have no in-air start capability. We are working on these negative aspects for our trike.

(Marty Alameda) I've just been in Europe and can report the Great Britain economy is very depressed. Nothing is growing. 70-80% of the hang glider business is export to the continent. There is a set number of pilots, so all the would-be trike buyers have bought them already. But the Pound is expensive so export development is poor. The trike kept Hiway alive last year.

The engine is the name of the game in trike or ultralight manufacturing. Trikes have

a water-pic, and popped between the lips seconds before take-off in the style of a boxer accepting his gumshield on the bell. Then one day I watched a typical hang glider pilot fishing his power unit out of the assorted junk in the trunk of a typical hang glider pilot's car. At the end of a wire there emerged a weird wooden artifact which looked as if it had been wrought in a developing country by a particularly incompetent native craftsman who was still at the learner stage. It contrasted strangely with the shining duralumin and crisp dacron of the flying machine, and seemed to have absorbed a lot of two-cycle oil, lint and and grit.

POWER PROGRESS

Noel Whittall

While the engine was being bolted into position I noticed the wooden thing lying on the ground at the end of its wire. There was abundant evidence of livestock having recently occupied the field, but fortunately the wooden thing wasn't trodden on more than twice.

His preparations complete, the pilot started up and grasped the wooden thing in one ageing leather glove. "So that's the throttle," I thought. "I wonder where it fits." He transferred it to his mouth and took off.

I am prepared to accept that the occasional fracture of arm or leg are part of our sport. I draw the line at that dreadful throtle which seemed to represent the sort of health risk normally associated with a cut-price bordello in one of the more depressed Central America republics.

to be heavy to be strong enough, which implies a big engine, which in turn requires a rigid frame. Flight Designs trike is more light weight, flexible (suspension) and uses a raked nose wheel for improved castering. We are experimenting with a hand throttle.

(Steve Pearson) Intuitively, just looking at the set up, it seems to be the best way to put an engine on a flex-wing.. I believe it needs more pitch dampening. The very low CG could hurt stability in unusual attitudes. New wings on trikes mean they have received more testing as aircraft than most ultralights have.

(Larry Cook) I believe the trike "fad" will pass. They will not make significant inroads into conventional ultralight sales. I don't believe I care to fly one.

Then last year came the TRIKE. Simple. Civilized. An engine of adequate power safety coupled to gliders of proven safety and the pilot insulated from rude conflict with the elements by padded seat and balloon tyres. The motorcycle of the sky had arrived. No longer need we sit around lying to each other on nil-wind days—we could now fly. Well, that's the theory anyway. Certainly whole new fields of experience in the area of flight are opened up. The scope for wrong decision making is greatly multiplied: Before it was just a matter of being on the wrong hill. Now you have the choice of whether to fit the power unit or not, quite apart from which site to go to. The only certainty is that no matter what you decide, it will be just too far to the alternative to make the move worthwhile.

Yes, my flying friends, think long and hard before embracing the Trike. Think of the exciting new selection of things to accidentally leave behind in the garage—gasoline, wrenches, spark plugs, puncture kits, service manuals—the list is endless.

Consider also the new realms of in-flight anxiety which will be opened up unto you. As a free-flight hang glider pilot it is possible that occasionally you may reflect on whether the man who manufactured your karabiner was truly dedicated to his job, then you'll find a nice little thermal and stop worrying. As a powered Trike flier you will have unlimited opportunities to let your mind dwell on minutiae such as the failure rate of spark plugs (remember how many you used in the lawnmower last year?) At six thousand revs per minute that's a hundred sparks a second. . . . You can watch the wires vibrate, feel the propeller coming loose, see metal fatigue in action! Yes, it such is a whole new world up there.

In fact it was exactly when I was doing mental probability studies about the failure rate of Champion N-5's that I ran out of fuel a thousand feet above the North Yorkshire Moors, but that should be another story.

WHOLE INTERVI

AIR EWS TWO NATIONAL CHAMPIONS



TOM HADDON

American

By STARR TAYS

Have you participated in any other competition in any other sports fields?

No, other than sports involvement in college, I have never competed professionally.

How exactly did you get involved in hang gliding?

A friend of mine, Glen Hockett, who is also a competitor, ordered a kit from Free Flight 6½ years ago. We jointly put that together and then he went to Kitty Hawk and took lessons from John Harris. I went with him the next week-end. He showed me what he had learned and we sort of taught ourselves from that point on.

What was your first glider?

My first glider was a UP Standard which was in kit form also. I bought it a few week-ends after flying at Kitty Hawk.

On which glider do you have the most airtime?

A Seagull 10 Meter

What's your total airtime?

I really don't know. I quit keeping a log about four years ago. I would guess that I have somewhere between 500-600 hours.

Why did you stop logging your flights?

Because I lost my log book. That was so depressing I decided not to start it up again.

Tom, how did you prepare for the Regionals and the Nationals?

I didn't do anything really. Actually the whole season was pretty surprising for me. I barely managed to get enough money and a glider in time for the Regionals in Southern California. Also I didn't even qualify in Southern California until the last flight of the contest. That flight was against Peter Brown. A win or loss on that last flight determined whether or not I was going to the Nationals. I didn't do anything really extraordinary in preparation for any of the meets I flew in last year.

The thing that really prepared me for competition, but was not an intentional effort in that direction, was being a test pilot at Seagull. I flew every day all through that winter, so my skills were pretty sharp.

How did you view your chances of winning, relative to other pilots?

I always feel like I have a good chance, as good as anyone else. Otherwise it seems rather pointless. I think attitude is a big factor in any competition. For some reason I had an especially good attitude at the Nationals, real relaxed relative to other meets where I have felt just a little uptight. This one felt much easier.

When did you realize you had a chance of winning?

About one-third of the way through I realized I was close. The Saturday before the last day of the meet I had 7 wins and 1 loss. I lost my very first round. I guess it was at that point that I thought with only 2 flights left, and if I won the first one, I might win the meet.

Evaluate the Nationals as a test of pilot skills.

I think the 1979 Nationals held at Crestline and the 1980 Nationals in Ellenville could be called valid contests. They weren't great contests, but the thing that made them valid contests was the one-on-one heat system coupled with the close quarters situation.

They weren't great contests because there wasn't enough airtime and the course this year could have been more challenging.

In competition how important is the glider?

This year gliders were very important, because we took a quantum leap in performance. There are years however, when there is a greater equality between gliders, so therefore they aren't as important as the pilots who fly them and their skill.

This year you definitely had the edge if you flew a Comet and it was painfully obvious.

Any comment on competing fellow pilots?

(Laughing) Yes, I definitely think Rich Pfeiffer should be banned from the USHGA

and shouldn't be allowed to compete this year because of his flight over the Rose Bowl.

No, seriously, it was fun traveling with them, flying different meets. I really enjoyed that.

Any last words?

My philosophy is to enjoy what you're doing, if not, move on. Which is why I don't think I will be competing this year. My desire to do so is a lot less. When I first got into hang gliding I was drawn to it and enjoyed it **because** of the adventure. Then, there was the ego gratification. Now having been a part of it, and realizing some of my goals, a lot of the adventure has gone out of it for me.



MICHEL TREMBLAY

Canadian

By Andre L. Guindon

Michel Tremblay just won his first real hang gliding competition and in so doing, became the Canadian National Champion. He won in grand fashion, beating the best Canadian pilots at their own game. He had a faultless competition, winning not because others flew badly, but because he flew better than anyone else.

But who is this guy anyway? How come no one outside Quebec ever heard of him before? Well, if you never heard of him before it is only because you were not paying attention to motorcross racing. Before turning his attention to hang gliding, Michel did no less than twelve years of motorcross racing. His track record speaks for itself:

- He won the first competition he ever entered (he was then 12 years old).
- Provincial champion (Quebec) class 125 cc, 250 cc and open (1975, 1976, 1977.)
- Provincial champion (Quebec) ice racing (1977.)
- Provincial champion (Quebec) dirt track (1977.)
- Won the Quebec motorcycle jump challenge (1978.)

- Canadian junior champion (1971.)
- Indoor short track Canadian champion (1977.)
- Won the Canadian moto-cross Grand Prix (1976.)
- 21st world trial championship (1977.)

Few pilots can walk into a competition with such a background, and fewer yet will be able to tell their grandson (pardon me, their grandperson) that they were national champion in two disciplines that have so few things in common.

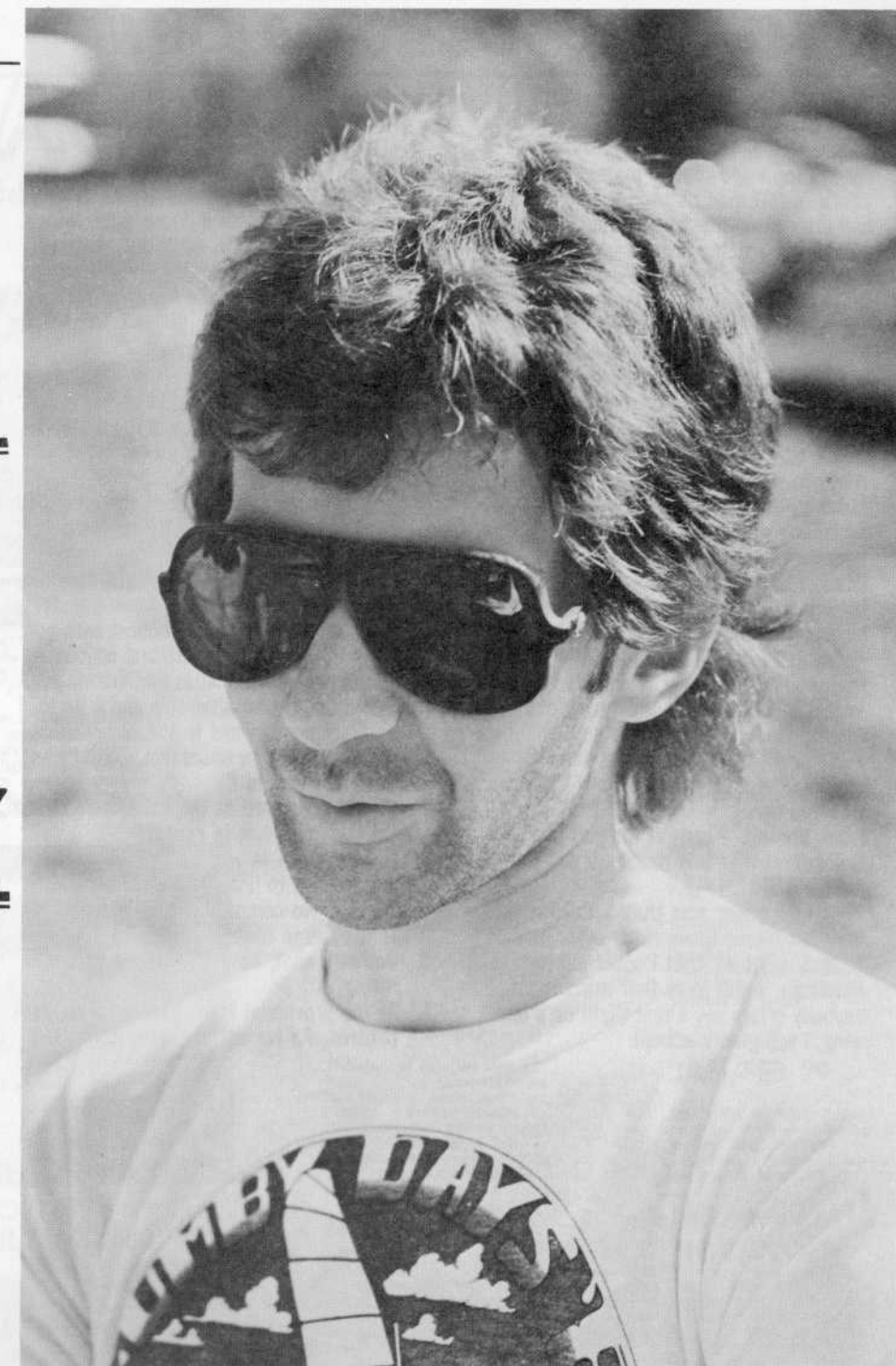
I met Michel in his home a week or so after his victory in Mount St. Pierre (Canadian championship 1980.)

Q. How did you go from a motorcycle racer to a hang glider pilot?

A. It is hard to say when or why the actual transition was made. I raced motorcycles full time for quite a few years and it had literally become a full-time job. My whole life was revolving around motorcycle competition and I was becoming more and more boxed in. Add to that the fact that I was less and less able to be competitive on the racing budget given to me. All in all, motorcycle racing was no longer what I wanted it to be. I was ready for something else.

Q. And that something else was hang gliding?

A. Yes.



INTERVIEW

Q. How exactly did you get into hang gliding?

A. In two stages. First in 1975 I was in California for a pre-season motocross training camp. A few months before that trip I had discovered the sport through a **Popular Mechanics** article. Then a friend and I bought a Quicksilver in co-ownership. At that time the Quick was the best performing hang glider readily available. So in March, 1975, I followed a one-day course at Escape Country. Next I rented a glider for a day. At that point my experience was a whopping 20 flights. By midsummer the Quick, which was bought in a kit, was ready to fly. On a downwind day we decided to try man-powered towing. The technique was simple: A rope, two or three volunteers and that was it. What was bound to happen did happen and we wound up with a broken glider. By this time the motorcycle competition season is in full swing and I just did not have the time to fix the glider or to fly again. So I was in fact grounded until the spring of 1977, when by luck I bumped into guys who had just bought a few S.S.T.'s as their first gliders. Don't ask me how, but I talked my way into trying their glider. That was it, I was hooked. I bought the half of the Quicksilver that was not mine and we were off.

Q. Your first glider was then a Quicksilver?

A. Yes, but I have flown many other models. In fact, anything that I could get my hands on. I still have that attitude. If anybody offers me a test flight on a new wing, I will gladly accept.

Q. On which machine do you have the most airtime?

A. Hard to say. I have roughly 30 hours on the Quicksilver, 30 on my Atlas and maybe another 20 hours on a dozen other wings.

Q. Then you have about 80 hours' airtime?

A. Yes.

Q. Let's come back to the Canadian National in Mount St. Pierre. How did you prepare for the meet?

A. Nothing special. I didn't know what task to expect so I concentrated on being able to get the maximum out of my Atlas. I was mainly concentrating on the 180's and 360's; I wanted to be able to make then as efficient as possible regardless of the condition. Our local flying site is just a small bump, so you are turning and scratching all the time. It is not spectacular, but you really get to know a glider in a short time. To be honest with you, I was thinking of the National way back when I ordered the Atlas earlier this year. Then I bought an altimeter and a vario. I was looking forward to the competition, but it was not an obsession. What was important was to fly.

Q. So there you are at the Canadian National, not knowing what to expect?

A. Exactly. That is why I was telling anyone who wanted to listen—even a few who didn't—"No complex for the perplex." That became sort of my motto.

Q. But as a pilot, how did you see yourself fitting in?

A. At the provincial level I knew I was competitive. As far as the pilots from the

western provinces, I didn't know. Rumors had it—I should say "Legend had it"—that those guys were born with feathers and that any landing farther than a foot from the bull's eye had them contemplating suicide. Nevertheless, being the incurable optimist that I am, I was hoping to be competitive, possibly in the top six.

Q. When did you realize that you had a chance of winning?

A. Well, I realized that I could fly with the others in the first round when I smoked Simon Michell, Randy Rouck and the Canadian legend himself, Willy Muller. It was also in that first round that I realized that the landing points would separate the men from the boys. Going back to your question, it was in the fifth round that I realized that I could win it all. At that point I was first and the pressure was really on.

Q. Do you think that a competition like we had at the Canadian National is a true test of pilot skills?

A. Competition is a good way of evaluating the judgment and consistency of a pilot. Judgment because a pilot must make decisions in flight and to do so must be able to correctly evaluate the conditions he is flying in. The decision must be immediate and once taken you have no option but to live with it. Consistency because you cannot have a bad round and hope to be in there. Another thing that is essential is concentration. You must think of what you are doing, think of what you did and think of what you will do. Competition flying is a thinking man's sport.

Q. In competition, how important is the glider?

A. In Mount St. Pierre, it was fairly important since it was not in any way a "thermal" competition. There is no question that to be competitive you have to have a state of the art glider. The fact is, the great majority of the pilots competing had a glider that was capable of winning.

Q. Any comments on the pilots?

A. As a social experience, the Canadian National was absolutely fantastic. Being able to share the air with pilots from other parts of the country was pure pleasure. Many of the pilots that were there we knew only by name and by their competition record.

Q. One last word?

A. Being the Canadian National champion is nice, but that is not what is the most important. The National was a way of re-evaluating Michel Tremblay as a competitor and I must admit that I am pleased at the way things turned out. I am also very happy to see that money is not as important in hang gliding competition as it is in motorcycle competition. The sport is much too beautiful. It would be sad to let it become a matter of dollars and cents.



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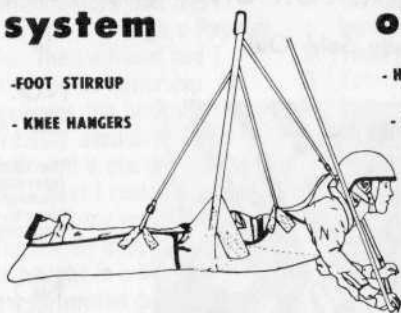
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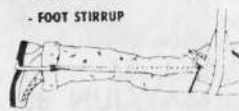
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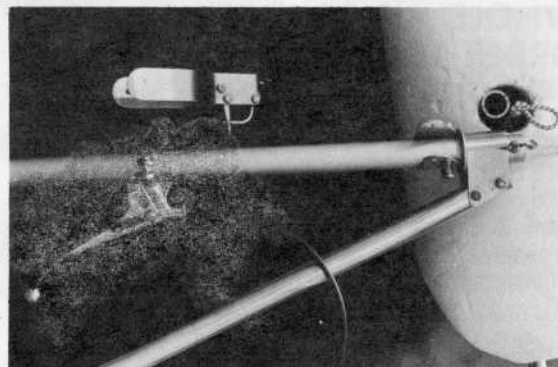
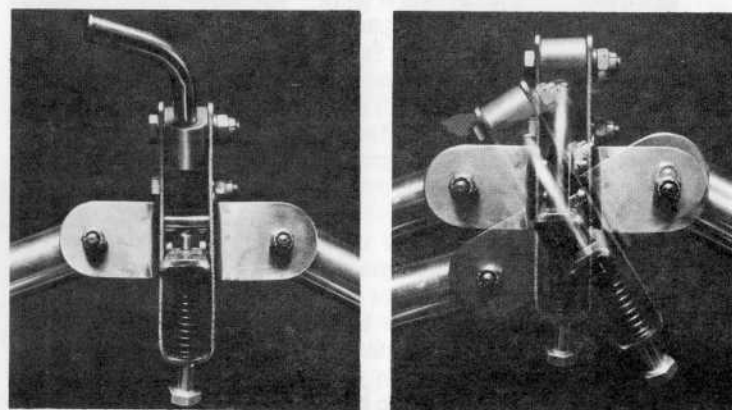
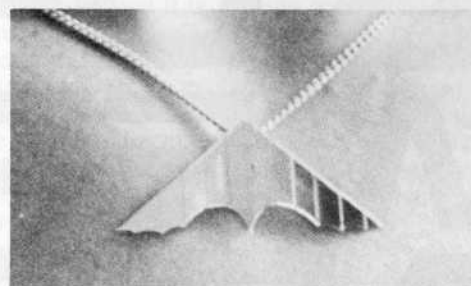


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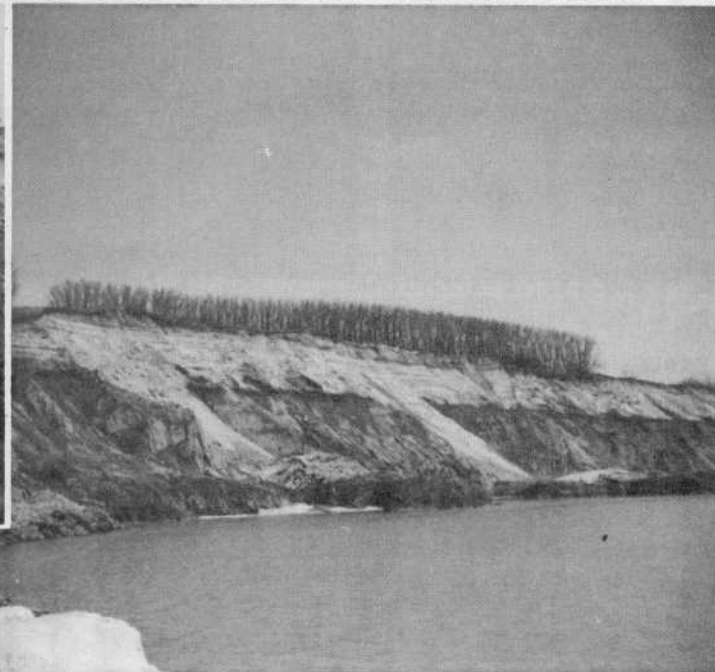
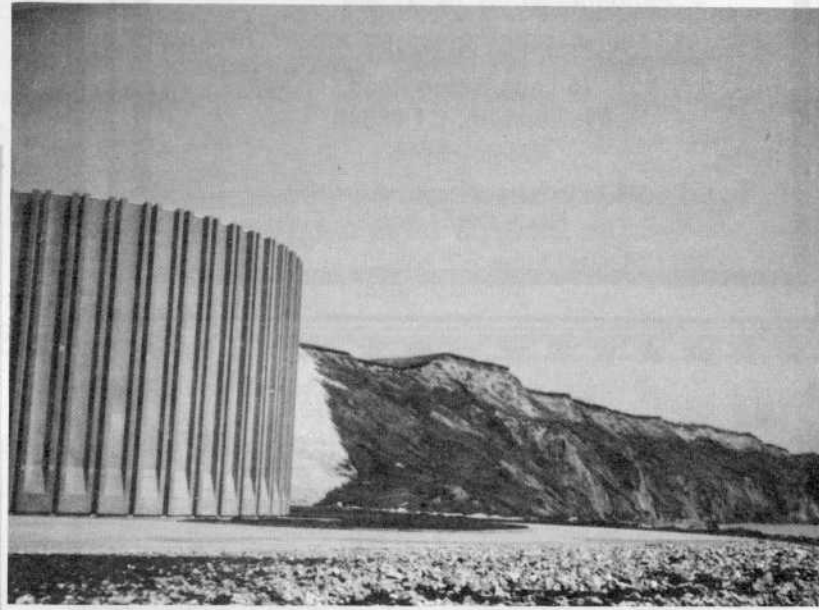
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FLYING SITES OF LOWER ONTARIO



by Glen Russell

Off of Lake Erie it is mainly south facing cliffs beginning at Wheatley. A ridge running 110°-160° goes to Erie each 80-100 feet. It starts again just after Bleinheim and is about 150-175 feet vertical. As you soar this section you pass small towns and it is strange looking down and seeing traffic lights. It is mainly bowl after bowl with predominant southeast, however, the contour changes every couple of miles and on top landing "only" is available for most of this section. At Port Stanley the prime ridge begins 200 feet vertical with occasionally perfect vertical surfaces scattered throughout the 12.5 miles of south facing ridges. Several beach landing areas are available, one at Port Bruce Beach and another at a pumping station knoll.

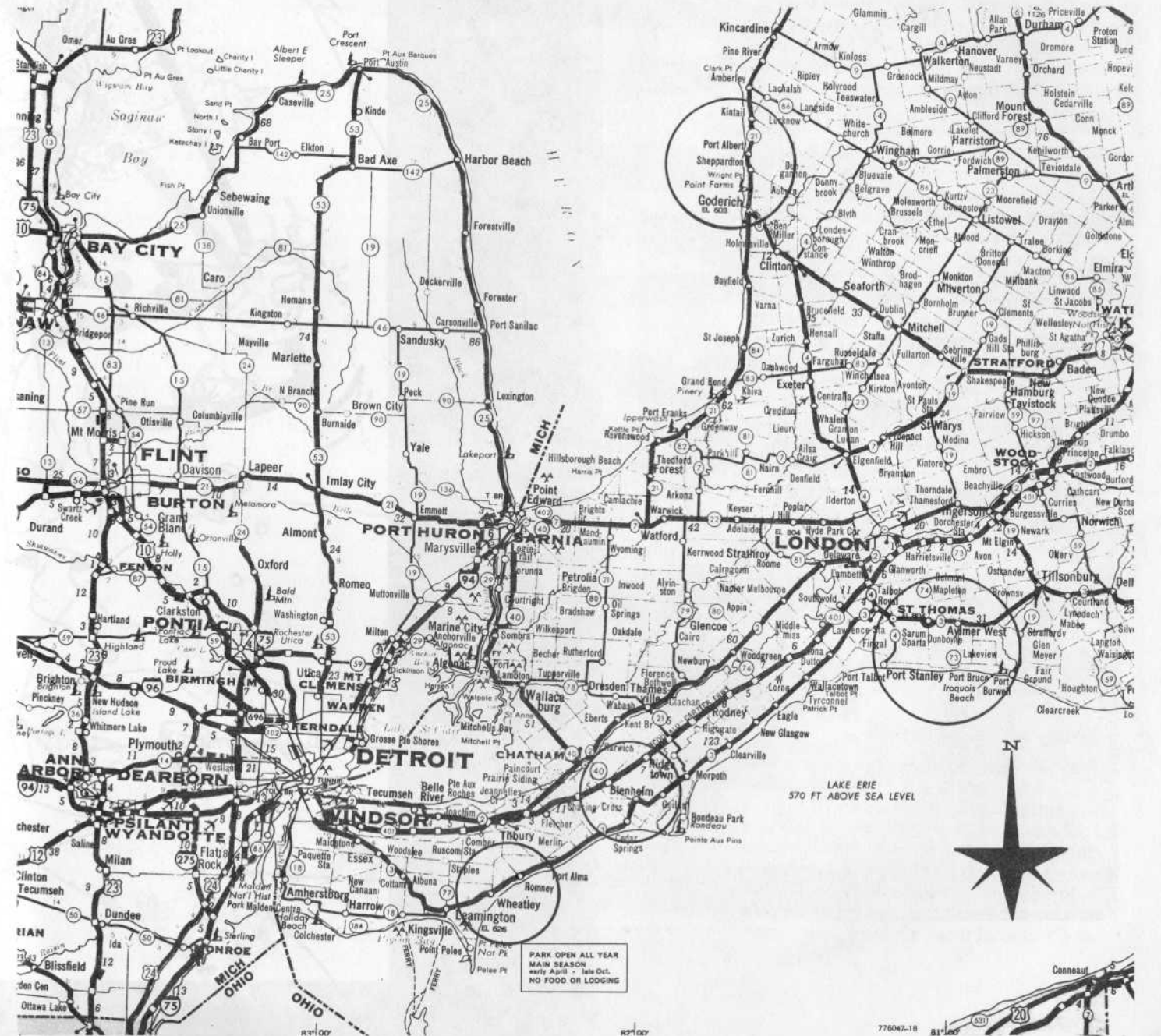
A nice Canadian who lives on the ridge, Rick Bently, has sheltered and fed us while we waited for it to improve. Anyone wishing to visit the site should contact me for directions and the phone number of Rick.

The next site on Lake Erie is Port Bruce, facing southwest at 150-175 feet with a popular launch at Sand Hill Park Dunes. A nice feature of these southerly sites is the sun contact is decent, and on any warm day thermals are present. Driving time from Detroit to Port Stanley is 2 hours 20 minutes. St. Thomas has a nice 100-foot northwest training hill.

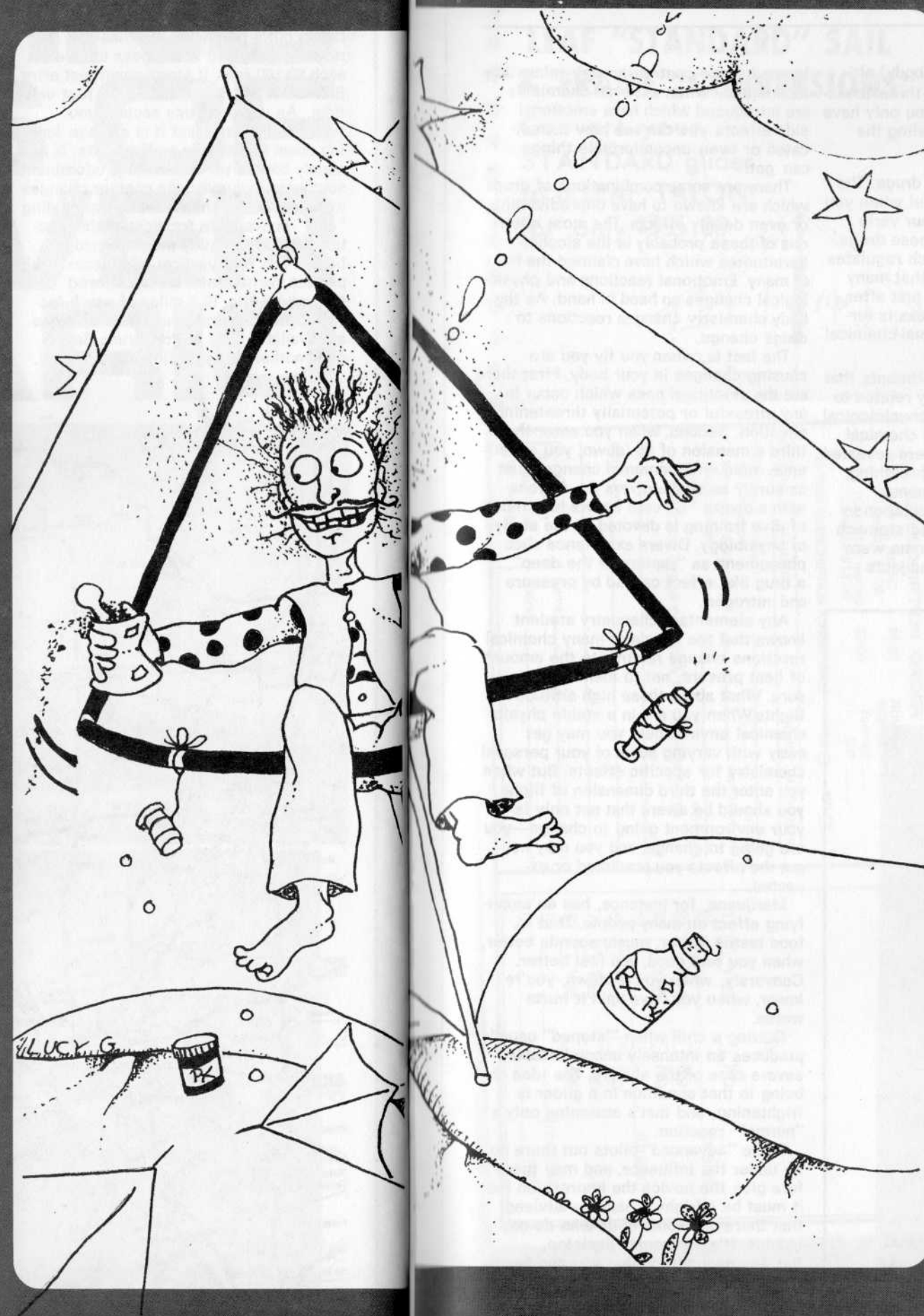
The Lake Huron northwest to west facing sites are even more numerous, but not quite as high. Just 10 minutes out of Sarnia the ridge begins at 60-80 feet starting and stopping numerous

times, changing direction and altitude all the way to Port Albert with 150-175 feet of vertical.

We've found a dozen launch sites from 215° to 340°. From Detroit, driving time is 1 hour 30 minutes to the first north by northwest site. A simple sticker made in the USA will satisfy customs and many beach landings can be had here. At one northwest site you can land on top with no rotor due to nice contour of the top. A lot of Canadian pilots frequent the Goderich cliff. All in all a lot of flying can be had and with less driving time for Detroit area pilots due to the numerous sites. The Canadian weather number is 1-519-451-3390 and they are pretty accurate and friendly. Anyone wanting specific information on launch locations can call me at (313) 372-3652 or 891-4922.



POCKET THERMALS



One can hardly visit a flying site today without being witness to the ritual of "pocket thermals". For the uninitiated, this is the practice of using herbs or chemicals to gain mental altitude when one is physically earthbound. This is not surprising when you look at who we are. Statistically we are the same generation that began the "Drug Culture". The *Whole Air* surveys put our median age at about 33 now.

How much overlap of pocket thermaling and the real thing goes on though? The idea of flying under-the-influence is universally frowned upon in the literature and texts of all other flying disciplines. Balloonists traditionally carry a bottle of champagne but this is for irrate farmers or to pour over the heads of novice pilots upon landing. The social nature of hang gliding however has seemingly allowed our other social habits to make the landing field a party site. There is an unspoken tolerance for the use of drugs, which is even occasionally referred to in our own sport publications. This is not to say that anyone would knowingly help wire launch a clearly obvious intoxicated pilot. But the effects of some drugs may not be apparent at launch time. These conclusions are based on observations and conversations with pilots across the country.

"Statistically, we are the same generation that began the "Drug Culture."

The purpose of this discussion is neither to condemn nor condone this practice but to present some ideas for consideration. A review of conventional aviation training texts shows that there are documented effects of the use of alcohol and drugs, even over-the-counter drugs, which can be hazardous to pilots.

POCKET THERMALS

The FAA does statistical studies and investigations of every accident and makes rules for pilots under their authority. We have no such regulations and thus, no records of how we are doing. For instance it is estimated that 35% of general aviation fatal accidents may be related to alcohol use and that one-fourth the amount of alcohol is necessary to produce measurable decrease in performance-flying as opposed to driving.

The word "drug" is used here to mean any chemical which alters the ongoing processes of the body or mind. Very much of what we are, is an incredibly complex chemical process. Every bit of energy expended is the result of combinations and reactions of combinations and reactions of substances which are only superficially understood by the experts. Some of them, for instance, believe that pilots should abstain from aspirin because it may lessen their resistance to hypoxia. Also, they say that the carbon monoxide in smoke, which can displace oxygen in your blood can

raise your physiological (or body) altitude to 8000 feet after only three tobacco cigarettes. That means you only have to gain 2000 feet to start feeling the effects of hypoxia.

Your body makes its own drugs. The "adrenalin rush" that you feel when you finally hook one and hear your vario peg is the result of one of these drugs. Adrenalin is a hormone which regulates body function. And the fact that many pilots feel the call of nature just after they have donned their harness is further evidence of the emotional-chemical link.

NASA found in their experiments that motion sickness was directly related to stress. Using sophisticated physiological monitors they could see the chemical changes occurring as they were revealed in increased heart rate and breathing, change in galvanic skin response (sweaty palms), reduced circulation in the extremities, and reported stomach distress. All of these symptoms were reversed as experimented subjects

learned mood control through relaxation techniques. When external chemicals are introduced which have emotional side effects you can see how complicated or even uncomfortable things can get.

There are some combinations of drugs which are known to have unpredictable or even deadly effects. The most notorious of these probably is the alcohol-Barbituates which have claimed the lives of many. Emotional reactions and physiological changes go hand in hand. As the body chemistry changes reactions to drugs change.

The fact is, when you fly you are causing changes in your body. First there are the emotional ones which occur in any stressful or potentially threatening situation. Second, when you enter the third dimension of up/down, you experience rapid environmental changes just as surely as scuba divers do. Anyone with a divers "C" card knows how much of dive training is devoted to the study of physiology. Divers experience such phenomena as "rapture of the deep", a drug like effect caused by pressure and nitrogen.

Any elementary chemistry student knows that the nature of many chemical reactions change relative to the amount of heat present, not to mention pressure. What about those high altitude flights. When you are in a stable physio/chemical environment you may get away with varying some of your personal chemistry for specific effects. But when you enter the third dimension of flight you should be aware that not only is your environment going to change—you are going to change, and you may not get the effects you predicted or expected.

Marijuana, for instance, has an amplifying effect on many people. That is, food tastes better, music sounds better, when you feel good, you feel better. Conversely, when you're down, you're lower, when you have pain it hurts worse.

Getting a chill when "'stoned" usually produces an intensely uncomfortable, severe case of the shivers. The idea of being in that condition in a glider is frightening, and that's assuming only a "normal" reaction.

Some "advanced" pilots out there do fly under the influence, and may therefore give the novice the impression that it must be alright. Please be advised that there are some of us who do not indulge. It's a personal decision. But, the assumption that you can handle it in the air bears further thought and discussion.

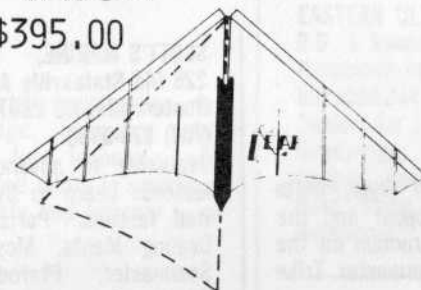
DRUG

POSSIBLE EFFECTS

Antihistamines	Drowsiness, dizziness, nausea, headache; especially hazardous because pilot may be unaware of drowsiness after initial alertness. Vision, coordination, and equilibrium can also be affected.
Stimulants	Dilation of pupils and blurred vision, nervousness, impaired judgment.
Muscle Relaxants	Sleepiness, weakness, vertigo.
Barbiturates	Initial excitement, then sleepiness, and impaired mental and physical activity not appreciated by pilot.
Tranquilizers	Blurred vision, mental depression, sleepiness.
Weight-control agents	Nervousness, errors in judgment, euphoria (feeling of well-being, regardless of condition).
Antismoking agents	Nausea, discomfort, and distraction can result from the use of antismoking drugs.

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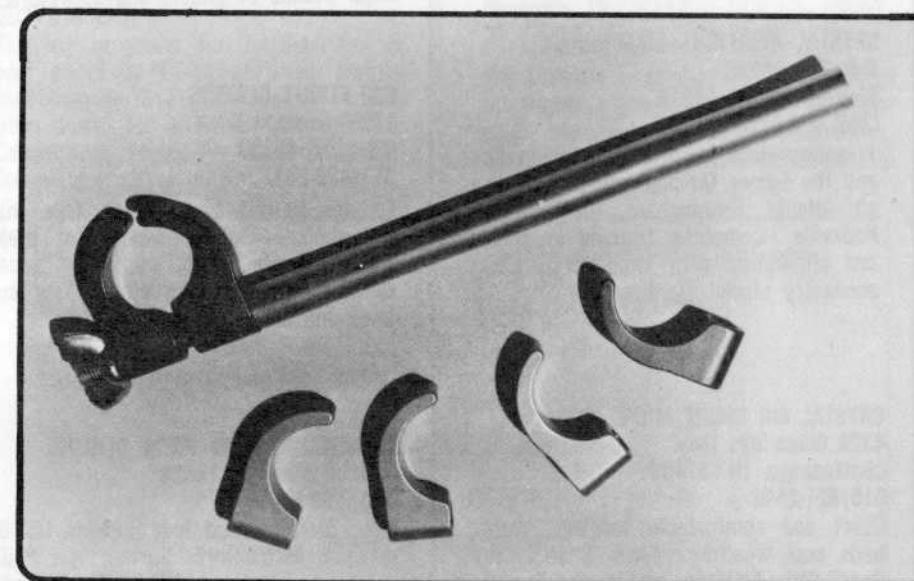
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PRODUCT LINES

CHATTANOOGA, TN --- Lots of news this time after our second annual western tour, which this year also lead to western Florida for Sun N Fun '81. First, a word of welcome to our newest four color advertiser, Odyssey. Just turn yer head to the right and read about the Vampire. Odyssey joins Wills, Eipper, Delta Wing, Ultralight Products, Flight Designs, and the USHGA in helping Whole Air look colorfully glossy. Congratulations to all these companies for success in the face of heavy competition and tough economic times. Incidentally, Odyssey has moved way south to Amherst, Mass. They've a new address, of course: P.O. Box 299, Amherst, MA 01002; phone 413/253-9761. Next is more new developments for successful businesses, only this time it's retail dealerships. You've heard of the HGMA, now hear of the HGDA. The Hang Glider Dealer's Association was formed at the occasion of the second annual Wills Wing Dealer Seminar in Santa Ana, California. Meeting in the evenings following the Seminar, using the same room (donated by Wills), Ken de Russy took the lead, later finding himself elected Prez'. This same effort was tried last year, but failed. However, this year professionalism was a key word and thought, resulting in 31 dealerships signing up. The list reads as a Who's Who of retail establishments and all seemed to feel a genuine need to begin such an association. Ken de Russy was elected President, with Dan Johnson (VP), Erik Fair (Sec'y), and Bonnie Nelson (Treas) filling the officer's positions for Year No. One. Whole Air has followed efforts to start such an association for several years and applauds the event finally occurring. Speaking of successes, or rather the lack of it, most readers will now be aware that Electra Flyer has closed its doors, to the hang gliding consumer. After 14 months of surveying for the largest manufacturers, Whole Air always found Electra Flyer on top. That last such report appeared in the Sept /Oct '79 issue, and now, only fifteen months later, Electra is no more. Cited as the reason was "decreased demand" for hang gliders. Tom Peghiny observes that they could utilize the floorspace more profitably for ultralight construction than for hang gliders, and that sounds reasonable. What goes around comes around, it's said, and Larry Newman pushing to become the biggest builder of ultralights, undoubtedly is part of the reason his hang glider company fell by the wayside. But, we wonder how many ultralight businessmen consider American Aerolights to be the largest (or second or third or whatever). An interesting rumor is that Newman sold Electra to his Atlantic Crossing balloon-mate, Ben Abruzzo, who in turn sold it to his son, Louis Abruzzo, who used it (I find this humorous) for a tax write-off. That's some ending for ole No. One, ain't it? On to going concerns, we visited Flight Designs, where activity is fast-paced, having several new things in the works. They have three new gliders: a small Super Lancer (155), a new training ship called the Sabre, and a new supership from England, the Demon. This will give Flight Designs a well-rounded line. Hiway is the manufacturer of the Demon in Great Britain, and they've made a deal to license Flight Designs to build them in the USA. This Bob England design is going thru minor modifications to perfectly suit it to the American market. It does not use mylar for a leading edge stiffener, but instead, the increasingly popular soft foam. The FD Demon uses a spanwise sail cut like the Comet, and employs a unique method of batten pocket construction. Only a single seam is used to sew it on, making the batten pockets droop below the wing like a series of tiny keel pockets. Company Prez', Marty Alameda, says this helps control spanwise flow, and happens to be a dandy, easy way to sew the batten pocket to just the lower surface of the wing. The crossbar is restrained by cable to the rear of the keel, a convenient place to pull back and attach the crossbar. It looks very nice and we're anxious to fly it. Look for a Pilot Report in a summer issue of Whole Air. Attracting a lot of interest without advertising or promotion is FD's new trainer, the Sabre. Built to replace an old favorite with schools, the Seahawk, the Sabre is a lightweight glider with no deflexors, a small control bar, modern sail cut, and a swell price tag of only \$1095. Flight Designs has the mini-Super Lancer ready, too. It's a 155 square foot version of this popular design, and fits pilots weighing 95-145 pounds. Sized in all ways to tinier pilots, it boasts excellent static balance. The Salinas folks have been busy with more than gliders, also developing a motorized parachute. It has more reinforcement throughout, with heavier bands on the circumference. The bridle is more resistant to prop damage by virtue of lightweight stainless steel cable running inside the tubular nylon bridle. Marty's brother, Dan Alameda, is Flight Designs' motorman, and he's busy with the FD Trike. Yep, another one, this one has some desirable changes getting attention, like possible control bar mounted throttle, suspended main gear, lighter total weight, easier steering nosewheel, and no yaw swivel primary attachment. It's to be marketed for around \$1845., and should be ready soon. Flight Designs planned to debut their new gliders at Chandelle San Francisco's very well known New Glider Showcase, where another new design was to debut. Ultralight Products will be marketing a new intermediate, the Gemini. U.P. says it is an inexpensive Comet, using almost identical planforms. You can get it in three sizes, 134, 164, and 184. The Gemini has an exposed crossbar with mechanical center pivot, and taut cables. Less double surfacing and loads of undercamber should produce a slower flying ship which works well at high angles of attack, plus having a reasonable stall. Lighter and less expensive (about \$1400-1500.), about a dozen Gemini's are in field testing as of late March. The Gemini replaces both the Condr (floater) and Firefly (beginner/intermediate). Many pilots know of the big Comet, but there is also a mini-Comet. Pretty

mini at only 135 squares, U.P. claims over 100 orders. Pete Brock writes of flying the 135 in Hawaii in light winds of only 8-10, at his book-in weight of 200. Impressive, hard-working sailing, I'd say. Well, Comet prices are up at U.P. Uh oh, you say? Oh no, prices are up a whopping buck. Huh? Yep, only a single dollar increase on the hottest selling high performance glider in the world. All-time record U.P. sales are helping them keep the lid on escalating prices. Congratulations Pete and entire crew, for working hard to save us all some hard-earned dollars. They've got a couple other things in progress as well. A new full envelope harness is available. It features an integral chute container, and optional, progressive ballast container (which can carry glider bags as well). They'll have it in stock, retailing for \$228. with chute smoothed in, \$295. for full competition model with three (count 'em) progressive ballast holders. Further, Brock has been employing some old expertise from his successful racing car days, to design an ultralight engine. I'm hardly an engine expert, but the basic features sure sound intriguing to me. It is a 350 cc, opposed twin cylinder, air cooled engine producing approximately 35 horsepower. A sophisticated, integral planetary reduction drive reduces the 8000 rpm output with a 3.6:1 or 4:1 reduction (changeable depending on the application). Usable in sailplanes too, the U.P. engine will have CDI ignition, hand or electric start, automatic compression release and a weight of under 50 pounds. The U.P. UL aircraft engine is scheduled for viewing at Oshkosh '81. While we're on engines, Marty Alameda reports that Xenos is developing an engine specifically aimed at the ultralight market, redesigning a snowmobile engine for this use. Also, while we're in power chatter, a new calendar item is the Elsinore Powered Ultralight Meet and Air Show, scheduled for June 12-14, 1981. A fun flying contest, the event will also have a manufacturer's display and an area specifically designated for foot-launched flying. For more information, call Mike Miller at 714/678-2050 (days), and/or Steve Grant at 714/968-6129 (evenings). I found out about this when I met Steve at Wills Wing, where much news is also happening. Development work is now completed for the Harrier 147. Wills specifies a weight range of 110 to 210 pounds. Test pilots scattered throughout this range have all been extremely enthusiastic about the performance and handling characteristics. The planform is the same as the Harrier 177, except there is no center panel. It is also priced at \$1675. Certification was proved for the 147 even after Wills tried to break it by going 90 mph in the positive load test. Only 64 mph was required yet this high speed failed to produce a yield in any part of the structure or sail. Similar safety margins were found in the critical negative 150 test. Orders are being accepted. Wills Wing reports their West Coast Dealer Seminar was a big success. A number of excellent presentations were made by various dealers on a wide range of topics. The East Coast Seminar occurs April 8-9-10, at Kitty Hawk Kites. The popular Wills Demo Days are also scheduled: Kitty Hawk Kites on April 11-12; Crystal Air Sports on April 18-19; and Golden Sky Sails on April 25-26. While we are thinking of scheduled events, plans are set for an Instructor Certification Clinic in Tennessee. Foot-launched instructors should note May 22-25, 1981 in Chattanooga on their calendars, and powered instructors can become certified on May 29-31. Contact Region 10 Director, Dick Heckman at 205/539-5624 or Tom Phillips at Crystal, phone 615/825-1995. USHGA is set to enact "regulations" on helmets using the Z-90, 66 code. These will be mandatory for USHGA sanctioned competition events. The popular GPA "soft helmet" is not on the approved list. The HGMA has new officers. Highster's Mike Giles is the new president; Dick Boone, now of Progressive Aircraft, is secretary-treasurer. Giles has just received publicity from an article appearing in Hang Gliding and Glider Rider on his test rig, but plans to build a limited production (100 units) of his new Highster as well. He says his rig measured 11.22:1 glide from his new wing and that he has 18 orders without ads or really even trying. It'll all depend on time available to Mike as he has requests to use his rig from several glider/ultralight builders plus windmill manufacturers and trucking firms looking to further streamline their road vehicles. A couple of Rons in the news, also. Ron Hurst, who is marketing the Switzerland Delta Safaris, reports a sharp drop in the cost of his adventure trips, as the US Dollar moves upward against the Swiss Franc. As of March 3rd, the price dropped from \$2330. to \$1865., enough savings to pay the plane fare to Switzerland. If you can now is a good time to buy. Another fellow, Ron Hess (17625 Blanchard Dr., Los Gatos CA 95030; phone 408/395-8067) is making the best looking fairing set I've seen. Also sold via Flight Designs, the set retails for \$67. It is constructed of mylar-backed Dacron, its shape held by the mylar and an inner sleeve of nylon, thereby eliminating the foam fill of earlier sets (see photos on page 12). They fold up on the crossbars better, and rotate very freely on the spars due to the slippery nylon sleeve. Dealer pricing is available. Last word is a free Eipper Quicksilver. Eipper has joined efforts with the Coca Cola company for promotion of each of their products. Eipper is putting up two Quicksilvers, and Coke, through a Mello Yello Sky Show promotional tour, will offer the units for a Sweepstakes Give-Away. Coke/Mello Yello will show and advertise the Quicks all across the US at various big city shows. The International Balloon Association is the organizing promoter, and Crystal Air Sports will help supply pilots and ships to race in a pylon contest in the various metro areas. Keep your eyes on Coke trucks and in supermarket displays; you might win a free \$5,000. specially made Quicksilver ultralight. Got news or opinions? Send 'em to Product Lines, Box 144, Lookout Mtn TN 37350.



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