November/December 1981

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WHOLE AIR

The International Magazine for Sport Pilots

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The performance begins once you take your seat.

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For starters, take the seat itself. Sturdy and rigid, it's contoured for proper body support and richly padded for hours of flying comfort.

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Experienced microlight and conventional aircraft pilots know that performance is what makes an airplane great and that's who we designed the MX for–experienced pilots.

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(714) 744-1514

WILLS WING HARRIER

THE WAIT IS OVER!

GOOD NEWS: THE NEW 187 HARRIER IS FINALLY HERE!

BETTER NEWS: ALL 3 SIZES ARE FINALLY AVAILABLE IN STOCK, WITH FAST DELIVERY ON ORDERS WITH CUSTOM SAIL COLORS.

THE BEST NEWS: MORE THAN 150 PROFESSIONAL HANG GLIDING SERVICE CENTERS ARE STANDING BY TO TAKE SPECIAL CARE OF YOU AS A MEMBER OF THE WORLD WIDE FAMILY OF WILLS WING PILOTS.

BELOW IS A LIST OF DEALERS WHO ATTENDED WILLS WING SERVICE SEMINARS IN 1981.

AERIAL TECHNIQUES
ELLENVILLE, NY
AIRTIME HANG GLIDERS
FORT SMITH, AR
AVIA SPORT
CANADA
BUFFALO SKYRIDERS, INC.
ALBUQUERQUE, NM
PATRICK BREDEL
RIO DE JANEIRO, BRAZIL
CAPITAL CITY GLIDERS
LACEY, WA
CHANDELLE SAN FRANCISCO
DALY CITY, CA
CONNECTICUT COSMIC PRODUCTIONS
EAST HAMPTON, CT
CROWN CITY KITES
TRUXTON, NY
CRYSTAL AIR SPORTS
CHATTANOOGA, TN
EASTERN ULTRALIGHTS
HAMMONDSPORT, NY
ELMIRA AIR SPORTS
ELMIRA, NY
FLIGHT REALITIES
SAN DIEGO
GOLDEN SKY SAILS
GOLDEN, CO
HANG FLIGHT SYSTEMS
SANTA ANA, CA
HANG GLIDERS OF CALIFORNIA
SANTA MONICA, CA
HANG GLIDERS WEST
IGNACIO, CA
HANG GLIDER CENTRAL
EUGENE, OR
HANG GLIDING CO.
PISMO BEACH, CA
HANG GLIDER EMPORIUM
SANTA BARBARA, CA
HANG GLIDER EMPORIUM
SAN BERNADINO, CA
HANG GLIDER SPECIALTIES
RANCHO CUCAMONGA, CA
HIGH SIERRA HANG GLIDERS
CARSON CITY, NV
KITTY HAWK KITES
NAGS HEAD, NC
MISSION SOARING
FREMONT, CA
MONARCH FLYING MACHINES
WINCHESTER, MO
NOLAND HANG GLIDERS
SANTA CRUZ, CA
NORTHERN SUN HANG GLIDERS, INC.
ST. PAUL, MN
ONTARIO HANG GLIDERS
ONTARIO, CANADA
THE OTHER BROTHERS
EMMITSBURG, MD
PACIFIC GULL
SHERWOOD, OR
PEGASUS FLIGHT
WEST VIRGINIA
RISING STAR HANG GLIDERS
LACEY, WA
SCOTTS MARINE
HUNTERSVILLE, NC
SILVER WING
CHICO, CA
SKY HIGH
ANCHORAGE, AK
SUNRISE FLYING TEAM
DALY CITY, CA
SOUTHERN AIR TIME, INC.
ATLANTA, GA
SOUTHERN CALIFORNIA SCHOOL OF HANG GLIDING
VAN NUYS, CA
SPORT FLIGHT
GAITHERSBURG, MD
SUNFLIGHT HANG GLIDERS OF FLORIDA
ORLANDO, FL
SUPERFLY HANG GLIDERS
GRANTS PASS, OR
ULTRAFLIGHT SYSTEMS
MODESTO, CA
ULTRALIGHT POWER GLIDERS
HOUSTON TX
UPWARD BOUND HANG GLIDERS
PALM DESERT, CA
ULTRALIGHT FLIGHT SYSTEMS
ENDICOTT, NY
WASATCH WINGS
DRAPER, UT

HARRIER SPECIFICATIONS

	187	177	147
AREA			
SPAN	34' 8"	33' 4"	30'
GLIDER WEIGHT (without bag)	69 lbs.	63 lbs.	51 lbs.
PILOT WEIGHT RANGE	165-265	150-250	110-210
PILOT SKILL RATING	III	III	III
PRICE	$1750	$1675	$1675

WILLS WING, INC.
QUALITY-SERVICE-INTEGRITY
DEALER INQUIRIES INVITED

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WHOLE AIR

ISSUE NO. 22, VOLUME 4, NO. 6, 1981

PILOT'S PERSPECTIVE

FEATURES

ULTRA LIGHT TOPICS

Photo by Hugh Morton

Volume 4, No. 6, 1981
ISSUE NO. 22

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On The Cover:
"Sky Ballet" © by David Dees
Acrylic on Masonite.

Publisher's Column

NOTICE: The Washington FAA offices confirmed they WILL accept and review letters somewhat after the deadline of Nov. 24th. But you MUST write TODAY! *Whole Air* supports this position and replaces our usual column here to provide an "eleventh hour" reminder to WRITE TODAY!
— Dan Johnson

Attention Pilots!

THIS IS THE MOST IMPORTANT ISSUE THAT WE AS HANG GLIDER PILOTS HAVE EVER FACED. YOU MUST RESPOND TO INSURE YOUR CONTINUED RIGHT TO FLY.

READ THIS NOW. . .

The Federal Aviation Aviation (FAA) has issued a Notice of proposed Rule Making (NPRM) concerning Hang Gliding and Powered Ultralights. The final outcome of can be influenced by our input. HOW? By writing letters. Each and every pilot, friend, spouse, and spectator must write to the FAA and to our elected government representatives.

Th FAA specifically invites comment on the overall regulatory, economic, environmental and energy aspects of the proposal.

SEPARATION: A strong statement for separation from powered ultralights should be made to eliminate the need for the regulation of hang gliding whatsoever. Ideally, this is the result we seek. You can support this idea with the following points:

- Hang gliders are different than powered ultralights.
- We have been successfully self regulated for the past ten years, complying voluntarily with FAA Advisory Circular 60-10. Our experience and safety record is good.
- There is no reason to believe that any substantial increase in safety margin would be accomplished by the FAA regulating hang gliding activity, yet the cost of administrating any government program would be very high, as the activity by nature is de-centralized. We do not need airports, so there is no central place for the FAA to make contact with hang glider pilots and their gliders.
- The most important idea we must get across is that to regulate hang gliding will cost taxpayers' money, with no appreciable increase in benefits to the public or pilot safety.

The USHGA Board of Directors has sent input to the FAA commenting on the specific content of the NPRM. The real goal of this letter writing campaign is to KEEP HANG GLIDING SELF REGULATED.

DO THIS NOW: Go directly to your desk. Grab pen, paper, envelopes, stamps. Sit down. Re-read this information. Make an outline of the points you feel are important. Write your letters. Mail them TODAY. Take the attitude that you are writing to people who want and need the information to make the best possible policies. Your ideas will be listened to. Be neat, polite, avoid emotionalism, and provide facts. The FAA has requested that you respond in duplicate, and that you list Docket No. 21631 on your correspondence.

The deadline for comment is November 24, 1981.

Address your letters to:
Federal Aviation Administration
Office of the Chief Counsel
Att'n: Rules Docket (AGC-204)
800 Independence Avenue
Washington, D.C. 20591

(Congressman)†
House of Representatives
Washington, D.C. 20515

(Senator)†
U. S. Senate
Washinton, D.C. 20510

†Names of your local representatives can be found in the front of a current phone book.

REMEMBER, in 1975 a successful letter writing campaign changed a proposed rule to eliminate hang gliding in the National Parks. We can and do influence our elected law makers. WRITE TODAY!

Stay High.

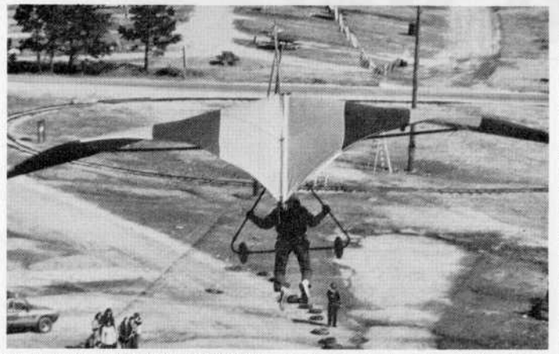
Jan Case and Dennis Pagen
Safety and Training Committee
Board of Directors
United States Hang Gliding Association

P.S. Please pass this (article) on to at least two other people.

STOLL FLIES 24 MILES TO ALABAMA FROM 835 FOOT RACCOON MOUNTAIN

THE CRYSTAL CHRONICLE

1981 International Edition — Vol. 1, No. 1 CHATTANOOGA, TENNESSEE — November/December



CRYSTAL FLIGHT RESORT, Inc. is entering its second year of Simulator training with very encouraging results. More people are experiencing the thrills of hang gliding, because now there is "a safe way to do it." A real glider tethered from above brings you to a four foot deep sawdust landing zone. So simple, yet innovative. People dreamed of a way to do it better, and Crystal created it.

The serious student finds the learning experience enhanced when the danger and work are removed from his flight-intensive, but totally controlled, first encounter with a true flying machine. The glider is swiftly transported back up the hill for another flight. More total actual air time is acquired in that first lesson than in most beginner packages available today. The convenience of training available under almost any wind conditions is un-matched anywhere.

Crystal Flight Resort is operated by Crystal Air Sports, one of the sport's oldest surviving businesses. Contacts with all major manufacturers allow the Pro Shop to carry a full inventory of all the finest equipment and accessories available. Wills Wing, U.P., Flight Designs, and Pro Air keep Crystal's stock First Class.

The Flight Resort concept continues with a program to take students progressively up the training slope to the only **ramp** training launch available. This leads the student smoothly to the cliff launches so common in the East. When qualified, students are graduated with their first mountain flights, which are under close supervision, and in radio contact with two Certified Instructors.

Advanced students may avail themselves of the unique chance to deploy their back-up parachutes in a real environment. The Simulator again opens new doors to safe learning experiences.

Weather

The weather outlook is for much flying and soaring from early March till the end of February.

Motorized

ALSO AVAILABLE AT Crystal are ultralights for every type of pilot or would-be pilot. They have Bennett and Flight Designs Trikes, and the Eipper Quicksilver line in stock and available on an immediate basis.

Naturally the pilot who prefers the hang glider as his/her only flying will be pleased with the addition of a Trike to their wing. Flatland soaring capability is nice on downwind or "sled run" days.

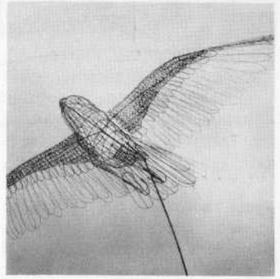
One of the leaders in ultralight aviation, the Quicksilver comes in three styles to suit the pilot's flying needs. Whether it is weight shift control, or three axis, Quicksilver fills the bill, and Crystal has it.

"Crystal Award"

CHATTANOOGA, TENN — Finally a Reality! After twenty months of searching and waiting for overseas delivery of non-existent artwork, "Crystal Award" founders, Chuck and Shari Toth have unveiled an original piece of sculpture they commissioned artist Charlie Yowell to create especially for the two year old award. Created to reward pilots for outstanding flying achievement from Tennessee Tree Topper sites. The 1980 Crystal Award was presented to Ted Liston who flew to Crystal Flight Resort after launching into soarable conditions at Whitwell, Tennessee. Not the longest flight in 1980, but flown over some of the most inhospitable terrain imaginable, Ted's flight covered 14 miles.

Charlie Yowell's wire sculpture with just under a three foot wing span, is a unique expression of living flight as only a Red Tail Hawk can achieve.

The "Crystal Award" will be on perpetual display at the Sky Gear Gift Shop.



CHUCK AND SHARI Toth, Chicagoans turned Chattanoogans, are now operating the Crystal Air Sport Motel for hang glider pilots and have no intentions of pulling up stakes and heading back north.

It was seven years ago when they came down for a hang gliding vacation. They saw the Motel and liked how close it was to the great mountains and soarable bluffs that surround it, and realizing the potential with a large landing zone and tram cable car in their back yard, they decided to buy it and open what remains to this day the first and only "Hang Glider Resort Motel" in the world.

The Motel is known to glider pilots the world over as a place where flyers can find a place to get totally involved with hang gliding.

Not only a very good place to rest and relax, but a great place to get tuned into the day's weather reports and site recommendations. Pilots from all over the world enjoy sharing hang glider lore at its best. What more could a pilot want?

Along with restoring the pool and grounds, and redecorating the already rustic knotty pine rooms, Chuck and Shari added "Sky Gear," a specialty hang glider gift shop located in the office. I do not believe you can find a better selection of hang glider apparel and accessories, anywhere.

Chuck is a leader in the local hang gliding community, having hosted and acted as Master of Ceremonies in many hang glider competitions over the years. He is also an experienced hang glider pilot with ten years under his belt. See Chuck for Tennessee Tree Topper clearances and USHGA responsibilities.

Meantime, Shari keeps her 17 flower and vegetable gardens and works at her hobby of stained glass to supply her gift shop, when she is not performing household and motel tasks, and keeping up with two children.

The Motel is an ideal location for traveling hang glider pilots, but, of course, it is not limited to those. Landlubbers are welcome, too.

HOTLINE

Seven days a week 8:30 am till evening, call 615/825-1995(Pro Shop), or 615/821-2546 (Motel)

FORUM

IN MEMORY

Chotia Dies

CRASH OF PROTOTYPE AIRCRAFT KILLS DESIGNER

Riverside, California — John Chotia, President of Weedhopper of Utah, was killed when the prototype JC-35 Rocket ultralight aircraft he was flying crashed near Riverside Fla-Bob Airport. Chotia, 34, was demonstrating the JC-35 Rocket for the press when the plane nosed over from 75 feet and dove straight in. He died instantly.

Chotia, who designed and built the Rocket, had flown the aircraft for about 30 hours. A preliminary examination of the plane after the accident indicated that the control system was intact after impact and there had been no structural failure. Pending further investigation, pilot error has not been ruled out.

Chotia designed, built and test flew 35 different prototype airplanes. He became a major figure in the ultralight industry, having built up a company with 115 employees, a flight training center and a world-wide dealer network.

The Weedhopper C, Chotia's most popular design, will continue to be produced and marketed by the company.

Last Flight

Tom Sadler was a student hang glider pilot who lived in Chattanooga, Tennessee and worked as a Riverboat Pilot on the Tennessee River. Tom died just weeks before his 34th birthday, the result of a massive brain hemorrhage. He had expressed his love of hang gliding in what may be a classic wish; that upon his death he be cremated, and his ashes scattered from a glider. Tom's girlfriend, and only family, approached the staff of Crystal Flight Resort in hope that we would help carry out that wish.

On October 3rd, 1981, pilot Tom Phillips was able to gain 1000 feet in a late evening thermal over Raccoon Mountain, where the Tennessee River is visible as it winds through the Grand Canyon of Tennessee. The ashes were released from a ballast container to stream out and up in the thermal.

Tom Sadler has returned to the River, Sky, and Mountains that he loved.

Myers to attempt 20 World Records

Abilities Demonstrated By The Disabled (ADD) announces that in accordance with its goals of encouraging the public and employers to look at the disabled and see skills rather than disabilities, it will endorse an attempt by a disabled pilot, Zane Eldo Myers, to establish 20 Official World and American Records in the new Ultralight Airplane Class.

Sanctions have been obtained from the Federation Aviation International (FAI) in Paris and from the National Aeronautic Association (NAA) in the USA for official record attempts including altitude, rate of climb, speed, and distance. Sites for the various record attempts have not yet been selected, nor have the type or types of aircraft to be used. Both will largely depend on the amount of financial support received.

We are soliciting aid from any and all sources, including individuals, business, industry, and Foundations who may wish to help ADD and bring these ultralight aviation records to America.

ADD is a non-profit, public charity, tax exempt corporation. All gifts, grants, and donations are tax deductible.

For additional information please contact:

Abilities Demonstrated by the Disabled
Rural Box 499
Bella Vista, CA 96008
(916) 549-4007

Wingover Deployment

Dear Editor;

Last Friday after thermalling for an hour over La Cumbre Peak in Santa Barbara, I headed for the landing area in the new 510 Sensor I was test flying.

Approaching the landing area, I decided to do just one little wing-over. I was flying in a new "Raymond Type" of harness (with faired-in flush parachute container). I had packed my three year old 24 foot Advanced Air Sports parachute into the new harness. Carefully! After diving to gain speed, I pushed out and entered the wing-over. Suddenly, my parachute popped out. The extra force pushing me downward into the harness had caused the velcro to release.

Could the chute have been too large? The container too small? Perhaps not enough velcro? At any rate, the chute instantly deployed, and I was thrown through the control bar as the glider pitched nose down.

At this point, I was approximately 300 feet above ground level. I realized that I was really "smoking in," in spite of the chute. The glider was not slowing my descent at all. Although it seemed to take a super effort, I managed to free myself from the bridle, which was pinning my feet and crawl upwards through the control bar, placing my feet on the base tube, and my hands on the down tubes (just like then tell you to do).

I managed to get the glider flying again, or at least it seemed to be slowing my descent. No . . . I am sure it was actually flying. Some four or five seconds passed, during which I watched the ground coming up toward me, fast! Then the incredible impact and I was sitting, stunned, wondering why nothing in my body was broken. The glider hit nose and base tube simultaneously. One batten was broken, the base tube and king post were bent.

I suffered a stiff neck, sore heels, sore knees, and a STRONG desire not to repeat the experience.

What could I have done differently? During the descent, while in the control bar, I had been leaning back as far as I could. This was barely enough to get the glider in a flying angle of attack, leaving me no further extension to flare. Had I reached back and grabbed the the keel, possibly the glider would have absorbed more of the impact. I landed downwind and that did not help much either. I could possibly have turned the glider into the wind, from my position behind the control bar while continuing to control the pitch, but there was too much going on and I did not. Anyway, I am back flying again, sadder, but hopefully wiser.

Please publish. Maybe this will save one person from making the same mistake.

Robert Keeler (the other)
Santa Barbara, Ca

Aerobatic Championship Results

Because *Whole Air* has always followed and supported aerobatic flying developments, we are pleased to report the results of The First World Aerobatic Hang Gliding Championships. The event took place in Telluride Colorado from September 28th through October 4th, 1981. Launch site was Gold Hill at the Telluride Ski Area, with an MSL elevation on 12,253 feet. Five Thousand dollars was distributed to the winners, with sponsorship coming from The Telluride Ski Area, The Testors Company, and The Telluride Air Force.

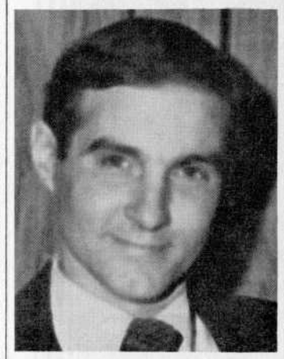
First place was taken by established aerobatic pilot, Dan Racanelli, 25 years old from Pacifica, California. Dan won $2,500 flying a Seedwings Sensor. In second place was Larry Tudor, a 27 year old from Draper, Utah, piloting a U.P. Comet. He won $1,000. Third was taken by Brad Harris, another 27 year old from Draper, winning $600 for his effort. Brad flew a Stratus V. Rob Kells, the 26 year old President of Wills Wing from Tustin, California took fourth and $500, of course on his company's Harrier. Finishing out the finals was Dave Gibson, 24, from Lake Elsinore, who won $400 flying his U.P. Comet. *Whole Air* wishes to congratulate the "upside down crowd."

At the same time, other contests were also run, including two Testors Challenge Series, the Tellurider I and II courses, respectively 21 miles and 28 miles of triangular X-C courses. First place in the 21 miler was Larry Tudor, again on the Comet. A familiar soaring name, Charlie Baughman, came up the winner of the longer triangular X-C course. Charlie, 35, hails from South Jordan, Utah, and flew a Comet.

CGS Aviation

C.G.S. Aviation is proud to announce the election of Mr. Gary W. Titzel to the position of President and C.E.O. of CGS Aviation Inc. Mr Titzel replaces Mr. Chuck Slusarczyk, founder of CGS, who has been appointed Chairman of the Board.

Mr. Titzel comes to CGS with a wealth of financial and mangerial expertise, with a background including a lengthy association in finance with Melon Bank N.A. of Pittsburg, PA., General Plant Manager for American Evans, Inc., and owner and General Manager of Rose Chevrolet of Aurora, Ohio. Mr. Titzel is the former Executive V.P. and General Manager of CGS Aviation, Inc.



Wills Wing

187 HARRIER RELEASED

Wills Wing has announced the release of the 187 Harrier. The 187 exhibits the same handling qualities as the smaller sizes. Its purpose is to give the larger pilots optimum sink rate performance in marginal conditions. Weight: 69 pounds (without bag). Span: 34' 8". Retail Price: $1750. Fully certified to 1981 standards.

NEW ADVANCED AIR SPORTS HARNESS

Designer Jim Handberry has incorporated his parachute industry experience into a full length harness with strength and comfort as the primary goals.

Its features include 1— Enclosed chute container, 2— Adjustable security back strap, 3— Accent stripes, 4— SMC locking carabiner, 5— One inch main supports with ¾ inch inner web.

Also available are single or triple enclosed ballast containers. Various color combinations are in stock, and the harness is available through Wills Wing dealers world wide.

CONSUMER ADVISORY

A San Diego pilot recently failed a side flying wire of an early model Harrier under a normal G-load. Fortunately the rest of the structure did not fail catastrophically and the pilot was able to steer his glider to a safe landing without deploying his chute.

We sent both the failed side wire and its mate to an independent lab for examination and testing. The unfailed side wire appeared to be in good condition except for slight surface corrosion. It was load tested and predictably failed at approximately 95% of its rated strength. The other cable which had failed on the cable side of the control bar nico had a deformed thimble and appeared to have been kinked. The lab confirmed our opinion that the kink was responsible for a premature fatigue failure of the cable.

New cable assemblies are particularly susceptible to being kinked because the thimbles fit snugly on the plastic "Never Kinks." Always include an inspection of all cable terminals in your set-up procedure before you tension your rigging. Never fly a glider with any rigging that has been kinked.

Some for... Some against... Some like it all...

Dear Editor;

Forget power, except when it directly relates to soaring.

A man cannot serve two masters; if he tries, he turns into a whore.

Pete Biesel

Dear Editor;

I will not subscribe anymore because your magazine is geared mainly to soaring (non-powered aircraft).

Edward A. Kralich
Gilbert, MN

Dear Editor;

I enjoy reading your magazine as it covers *all* areas of sport flying and does not dwell on one area of the sport as other magazines do. Keep up the great work!

John E. Basa, Jr.
Virginia Beach, VA

FORUM

Bennett Delta Wing
PUBLIC NOTICE

I have great pleasure to say I have been released from the hospital with a repaired aneurysm of the pancreatic artery and grateful release from the Dialysis machine which kept me alive until my kidneys decided to return to duty enabling me to do the same.

I am completely overwhelmed by the hundreds of get well cards and best wishes I received from all over the world. Particularly gratifying were the special messages from my competitors — U.P., Wills Wing, C.G.S., and visits from Bill Moyes and many other kind folks.

To one and all, please accept this as a personal and truly heartfelt "THANK YOU."

Gratefully,
Bill Bennett

STOLEN PARACHUTES AND VARIOS

Recently stolen from Delta Wing, the following numbered Rapid Deployment Back Up Systems and Litek Model "C" Varios:

RDP's: 3003, 3078, 3042, 3073, 3035, 3037, and 3023. Varios: 390, 417, 420, 434, 401, 423, 433, 383, 404, 403, 397, 256, 287, 213, 230, 243, 247, 233, 249, 251.

If you are offered one of these units, please contact Detective Bob Hanson of the Van Nuys Police Department, phone (213) 989-8371, or Delta Wing, phone (213) 787-6600. A substantial reward will be paid for information regarding the whereabouts of the person with these units in his possession.

DELTA WING RELEASES NEW "X" SERIES GLIDER LINE

The "X" Series is now available in 200 and 180 ft² models with the 160 and 140 ft² models ready very soon. The certification package is almost completed and will be presented at the first available HGMA meeting.

The "X" Series were designed by Delta Wing's new designer, Mr. Mark West.

Specifications are as follows:

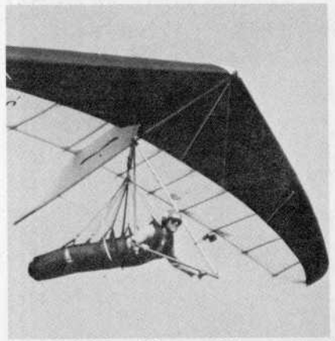
Area	200
Span	35 feet
Aspect Ratio	6.3
Nose Angle	130°
Double Surface	63%
Battens	8 upper
	3 lower
Weight Range	170-270

Other features include enclosed washout struts, shock-absorbing webbing crossbar restraint (stronger than cable restraints), a spanwise sail cut, faired closures on keel and kingpost, and a retail price of $1895.

For more information, write Delta Wing at P.O. Box 483, Van Nuys, CA. 91408-0483.

Watch for a Pilot Report in an upcoming issue of Whole Air. — *Editor*

FORUM



COMING NEXT ISSUE . . .

The Sensor 510 has earned the status position of de-throning the Comet, the world-wide king of competition for over a year.

Finishing First and Second at the Nationals, First at the Telluride Aerobatic Championships, and attracting a following of some the country's hottest competition pilots, Bob Trampenau's newest design exudes "clean" and "fast." In the January/February WHOLE AIR, we report on the latest from Seedwings and much more. Subscribe Today!

Swiss Alp Hang Gliding Safari

During the Summer of 1982 we again take to the road in our Safari Bus so that you may encounter the rapture of soaring the Swiss Alps; each day bringing new challenges and peak-experiences.
From the summit of carefully selected mountains, a view of 1000 snow covered peaks, sun drenched granite walls, glimmering mountain lakes, spectacular water falls, and peaceful alpine meadows.
I invite qualified pilots to join us in 1982, on one of our exceptional Swiss Alp Safaris.

Ron Hurst

Ron Hurst, Zürich

For complete documentation of our high adventure Swiss Alp Hang Gliding Safaris send S 5.00 to cover airmail postage to:
Ron Hurst, Kurfirstenstr. 61, 8002 Zürich, Switzerland, AIRMAIL

Eipper Formance

LASKO NAMED SALES V.P.

SAN MARCOS, Calif. — John L. Lasko, 23, has been named Vice President of Sales for Eipper-Formance, Inc., makers of the Quicksilver line of ultralight aircraft, manufactured here.

Lasko, who joined the company 18 months ago, replaces Larry Cook, who left to pursue other business interests.

Lasko is responsible for overall sales programs and other activities involved in keeping the company's network of 100 dealers in the U.S. and abroad supplied with Eipper ultralights.

Lasko is a veteran ultralight pilot. He began hang gliding in 1973 and placed fourth in the USHGA National Championships and third in the World Hang Gliding Competition.

He has flown powered ultralights since 1979 and has many awards to his credit, including Grand Champion at the Great Western Ultralight Rally in Porterville, Calif., Second Place in the Greater Arizona Ultralight Race, and Third Place in the Blue Stratos World Invitational ultralight contest.

Lasko is a native of San Diego. He studied aviation at Grossmont College and at San Diego State University. A bachelor, he resides in Carlsbad, Calif., near San Marcos.

SANDERSON BECOMES EIPPER FIELD REP

SAN MARCOS, Calif., — Jerry Sanderson, 42, has been appointed Field Representative for Eipper Formance, Inc.

Sanderson has been an Eipper dealer since 1974, initially representing the company's line of hang gliders. In recent years he has traveled throughout the northwest states for the company to assist dealers.

In his new post, he will broaden his travels to include the entire U.S. network of Eipper-Formance dealerships.

"Some of the work will be troubleshooting, helping dealers implement new and more effective ways of running their businesses," Sanderson said. "I'll also bring them the latest assistance in the areas of aircraft maintainence procedures, flight techniques, and training of customers."

Sanderson's appointment is an outgrowth of Eipper's new program of increased dealer assistance, according to President, Lyle Byrum.

DUNBAR NAMED PRODUCTION MANAGER

SAN MARCOS, Calif., — Dave A. Dunbar, 25, has been named Production Manager for Eipper.

A native of Anaheim, Calif., Dunbar was founder and president of Custom Metal Products of San Marcos. He owned the company for four years prior to joining EipperFormance, Inc. Custom Metal Products specializes in custom and short-run manufacturing of specialty structural metalwork such as hang glider airframes, racing car bodies and assemblies for industrial applications.

In his new post, Dunbar is responsible for overall production processes and scheduling and for personnel training. He oversees eight department heads and a staff of 60 production workers.

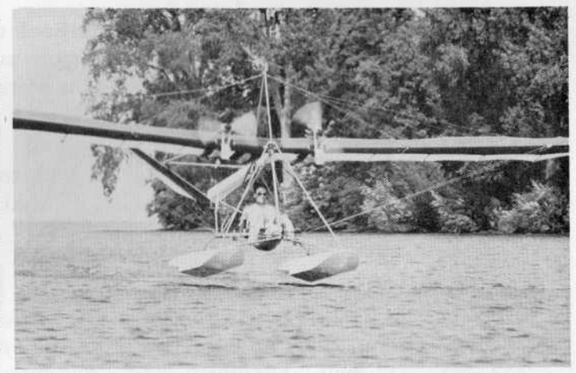
Sealord
Ultralight Seaplane Floats

The Flight Systems Division of Composite Industries, Inc., in Grand Rapids, Michigan has announced it has completed flight testing of their new Sealord ultralight seaplane floats. The Sealord floats differ from floats already on the market in both construction and design. Composite Industries, a company with a decade of background in molding fiberglass and composites, elected to utilize a ¼ inch thick fiberglass — P.V.C. foam — fiberglass sandwich as a monocoque outer shell for its high strength to weight ratio. The interior of the Sealord float is hollow and is divided into separate floatation compartments by bulkheads which also serve as stiffeners at the load bearing points. Three four inch diameter deck hatches allow access to the inside for inspection and storage of small items. Mooring cleats are also standard equipment as is a comprehensive operators manual.

The ten foot long Sealord floats utilize a shallow vee hull design with a 15° deadrise. At the bow, the vee increases to a 45° deadrise angle to cut through waves during take-off and landing in heavy seas. The twenty four inch beams provide the required surface for rapid planing and the 15° shallow vee prevents the Sealord from catching the chines in the water during a skidding touchdown.

Composite Industries Flight Systems Division already has mounting systems for a number of popular ultralights and is continuing with development on many others. The Sealords weigh in at around 46 pounds per pair, but the removal of the aircrafts wheels when mounting brings the actual weight increase to 40 pounds or less.

For further information on the Sealord floats, write Composite Industries, Inc., P.O. Box 8452, Kentwood, MI, 49508



A.R.V. Design Competition

Tacoma, Washington — In order to stimulate new homebuilt designs that are easy to assemble, economical, efficient and which incorporate modern material and construction techniques. *Western Flyer* and *Ultralight Flyer* publications are hosting an Aircraft Recreational Vehicle Design Competition. The object of the contest is to create the ultimate, new homebuilt aircraft in two weight categories: first, a light aircraft weighing less than 350 pounds which can be trailered or towed and set up by one person. The plane should qualify in the amateur built experimental category and, as such, must comply with applicable FAR's.

The second category would be an ultralight aircraft that complies with the FAA's definition of an "ultralight vehicle." It must be a towable, trailerable, or cartopper unit that can be assembled by one person.

Peter Lert, well known avaition writer and test pilot, has agreed to serve as the judge for the flight test portion of the competition. Lert is Senior Editor of *Air Progress*. Jack Cox, Editor of *Sport Aviation*, the EAA magazine, will judge the appearance phase of the contest. The airplanes with the highest total in the two categories win.

Cash prizes totalling $10,000 will be awarded. Anyone interested in entry forms and judging criteria should write: ARV Design Competition, P.O. 44400, Tacoma, WA., 98444.

Advanced Aviation acquires Hi-Nuski

As of October 1, 1981, Advanced Aviation, Inc., has taken over manufacturing the Hi-Nuski from LayFayette Aviation. Although ownership has changed, the same employees are producing the ultralight aircraft. Wayne Richter is the President and Kerry Richter is the Production Manager.

Advanced Aviation will work through the dealership arrangement that was instituted by LaFayette Aviation. With improved production facilities, Advanced Aviation will be better able to fulfill its commitments.

The Hi-Nuski Huski will remain the same through the present model year. The succeeding models will incorporate new design ideas to further enhance performance.

Yours Truly,
Wayne S. Richter
President

Ultralite Products (UP Sports, Inc)

UP Sports, Inc. today announced it was in full production with its new 1982 design, the UP Gemini — a single surface sailwing glider based on its internationally successful UP Comet. UP's new Gemini is essentially a less expensive twin to the Comet. Many of the components of the Gemini are interchangeable with the Comet, and the sail is made directly over the Comet patterns. The Gemini is the first intermediate since the phased out Condor/Firefly line made way for the production of 1500 Comets. UP Sports, Inc. expects the Gemini to exceed demand even for the Comet. "We know that for every Comet sold to an advanced pilot, there are two beginner or intermediate pilots that need a new "state of the art" glider;" said UP Sports, Inc. president Peter Brock, "our new Gemini is the perfect answer!"

The Gemini features a lever controlled floating keel and precurved composite battens giving the glider an "advanced wing" appearance not seen on any previous intermediate type glider.

FLIGHT DESIGNS TRIKE

The new "Jet Wing ATAV" from Salinas . . . the newest trike entry; powerful frame, powerful engine, and powerful appeal/Report and photos by Dan Johnson

The folks at Flight Designs do not spell "trike" in the conventional way. They spell it A-T-A-V, and that translates to All Terrain Air Vehicle.

The company brought two of their trike systems, or ATAV's to Zephyrhills, Florida. The purpose was to permit an evaluation in *Whole Air*, and to present the hang glider form of ultralight aircraft to representatives from twenty-one foreign nations. The occasion was the Sky Diving World Meet, and a crowd observed the flights with wide open eyes, enthusiasm, and applause.

Unfortunately, the winds blew steadily at 20-25 mph the entire day on which the evaluation was to take place. A busy schedule for Flight Designs and its new parent company, Pioneer Parachutes, dictated that the machines must move on and other arrangements were made for a more complete opportunity to put the ATAV through its paces.

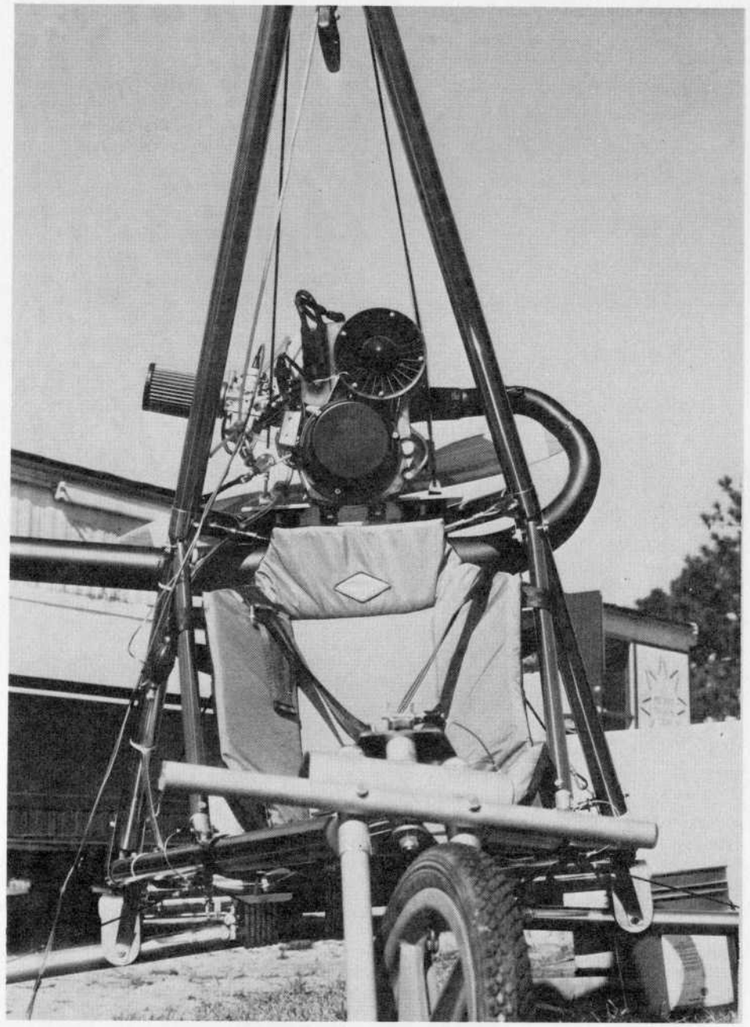
We were able to photograph the new piece of equipment, and interview President, Marty Alameda, for details. With strong interest revealed through a *Whole Air* Reader Survey, it is important to keep the information coming in trikes, and the introduction of the ATAV now brings the total of major American manufacturers to three — Soarmaster/Bennett, Manta, and Flight Designs.

ATAV ANYONE?

The first question most of the sky divers asked was, "How much does it cost?" Indeed, most pilots will ask that question, too. Yet as of October 15th, the final cost analysis had not been completed, and thus a price not established. This should be finished by the end of the month, and shipments of several already completed units will then begin. In its association with the parachute giant, Pioneer, a more calculated approach to business has resulted, which has Flight Designs performing this cost investigation rather than the more common *stab* at a marketable price. This marketable price must not only have appeal to the consumer, but provide adequate profit margins and dealer discounts to keep the sales growing.

Perhaps the next most common question was, "What kind and size engine is that?" Flight Designs will use the Kawasaki 440 engine, and they have secured a distribution agreement with Kawasaki which confirms a steady supply of the engines for all Flight Designs needs.

Research on this project began in December of 1980 and the engine was one of the major concerns. The Salinas folks experimented with the Yamaha, and Fuji Robin, among others. Their design goal centered on three qualities: engine availability, engine operation and reliability, and parts supply. The Kawasaki answers these problems with major corporate solidity. Alameda became familiar with the Japanese engine via a homebuilt Pterodactyl.



At first, Flight Designs considered their trike project just an accessory. But in the time during which they researched the prototypes, they have discovered potential customer market. Many would-be hang glider pilots exist within the larger picture of aviation enthusiasts. But, as most reader are fully aware, the sport can be difficult to enter should you reside in a place remote from mountains, training sites, and established shops. If trikes could access that market, a very broad customer base might be uncovered.

The ATAV is *not* an ultralights, and was/is not intended to compete with the ultralight market. Flight Designs will eventually aim at that market as well (the Kawasaki can straddle both kinds of aircraft), however, the ATAV/trike is its own craft. Alameda is convinced a large market exists for this system, and *Whole Air* Reader Surveys seem to confirm that. Alameda also feels training can be accomplished with trikes and that a trike "tug" may ease the too-fast speed problems of the Pterodactyl Ptug. Our first reaction to training was distinctly negative. But realizing that a new student pilot can even be taught safely to fly a helicopter (perhaps tougher than balancing a unicycle), the trike training concept cannot be unreasonable. Great care, thoroughness, an established syllabus, and a receptive student should combine to make hang glider flight possible in the flat lands.

FEATURES

The carriage itself is very stout appearing with stainless steel fittings designed to maximize triangulation strength. What is surprizing is the weight, right at 100 pounds. No scale was present to verify this figure. It boasts independent rear suspension relying on a hinged axle/bungie system. The half inch bungie is an aircraft cord with 1700 pounds of break strength. Jumping up and down on the gear bearing full weight, illustrated the absorption capability and it was easy to conceptualize how that could smoothen even very rough fields. Twenty inch Zytel wheels are on the rear with a sixteen inch copy up front. At comes with two 1¼ gallon fuel tanks, a hand throttle, on the control bar, with kill switch mounted right on the throttle. In-flight start is simply a matter of reaching overhead to a wide plastic handle originally designed to accomodate a heavily gloved hand. A large tuned pipe delivers a throaty sound and reduces noise fairly well, at least at something less than full open. Frankly, we asked Alameda if a reduction is in plans as the take off noise is rather high, though a bit milder than the popular Cuyuna 430D. A reduction sustem is under design and will retrofit present models. As stated, most fittings are stainless. The aluminum framework is blue anodized. Alameda claims they investigated black, but psychologically, it appeared to be heavier.

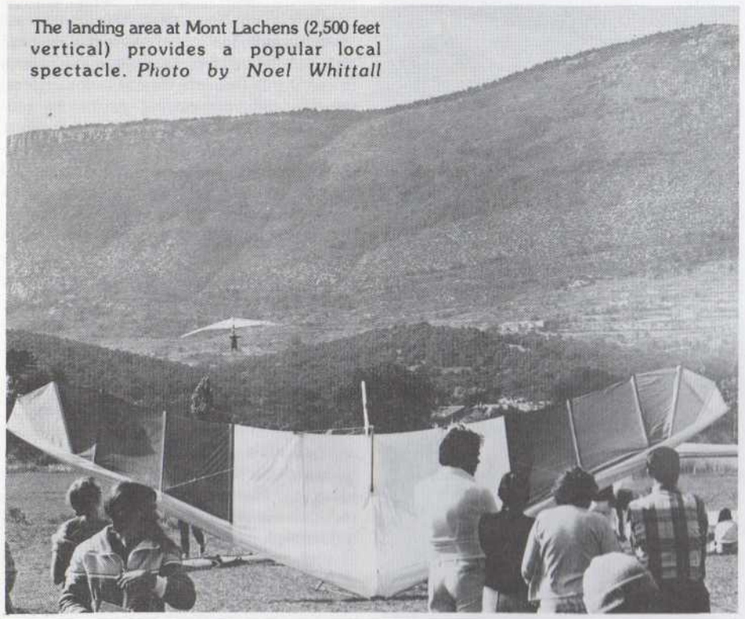
One major difference between the ATAV and the Soarmaster/Bennett is the yaw action between trike and wing. The Soarmaster/Bennett permits up to 40° of yaw each way, and they argue that this allows controlled crosswind landings. The ATAV only yaws a few degrees, providing a more solid feel, which we are inclined to think is preferable with the powerful, and heavier (than Bennett/Yamaha) Kawasaki engine.

The Kawasaki, while actually larger by 10 cubic centimeters than the Cuyuna just mentioned, looks a bit smaller, and indeed wieghs less, claims Alameda. It, too, uses fan assisted cooling and has CDI ignition, and alternator (for electric power supply) and can accomodate electric start. The engine usually puts out about 40 horsepower, but is de-tuned to 30 horses to prolong engine life. A 36 inch diameter, 20 inch pitch prop swings on the direct drive shaft.

In the January/February *Whole Air*, we will report on flight characteristics and their introduction of the system via a series of dealer seminars, the first eastern one occurring in Chattanooga on November 21 and 22.

EUROPEAN SCRAPBOOK SUMMER, 1981

by Noel Whittall



The landing area at Mont Lachens (2,500 feet vertical) provides a popular local spectacle. *Photo by Noel Whittall*

The hills we fly in the British Isles are rarely much more than a couple of thousand feet above sea level, and the price we pay for all that green grass is to endure a lot of grey rain. Thus it is hardly surprizing that in summer we English pilots like to migrate south to the French Alps for a week or two of soaring and sunbathing. With a few of my Dales colleagues I ended up at Mont Lachens, a few miles inland from Nice. No flying trip to Europe should omit Lachens. The flying was brilliant, including some radical thermalling, smooth sea-breezefront soaring and glassy evening sled rides. Add to this the traditional French attractions of superb food, wine at a fraction of English prices, and beaches where most of the girls have apparently lost major portions of the bathing suits, and you have the recipe for a great vacation.

The local fliers were most hospitable, even though out-numbered by British, German and Belgian parties, plus individual pilots from half a dozen other countries. Mike de Glanville, who headed the French team at the American Cup in 1980, runs a soaring school on the site, but is also very generous with free advice to overwhelmed visitors from relatively flat lands.

On these big European sites the most common glider is still the Atlas, although the Comet offspring are coming up fast. Of these the UP original has a good following, as has the English HiWay Demon and Solar Typhoon, and the French X-Ray and Vampyr. In the air no one model has supremacy, which makes choosing a 1981 glider still very difficult!

After two weeks when usually during a flight one only has to do a 180 with the head to change the view from one of the Mediterranean Sea glittering on the horizon to that of the snow-capped peaks of the Haut Alps many miles further inland, I took the opportunity of re-visiting St. Hilaire, just outside Grenoble, the site of the 1979 World Championships. Flying conditions were poor, although a trip off the near-vertical launch ramp there is always an experience even if the mountain is unsoarable! The landing field is a botanical paradise in which I counted twenty two different wildflowers while walking my glider across to the side. For a color-blind nonbotanist that isn't bad going.

Back in England conditions at last improved, and my flying log for August is full of different experiences. One weekend I flew Comet, Demon, Typhoon and Atlas, as well as my old faithful Storm. Of that selection the Demon came out tops for me because of its very pleasant low speed characteristics. The Atlas was the biggest of the range, and as I am only 160 pounds I found it pretty hard work even though getting to the top of the stack was almost automatic provided I was prepared to hang on to the side tubes occasionally. I am told that the new French-type articulated hang-points are the answer for gliders which are heavy in roll, and look forward to trying one soon. Dubbed the 'French Connection' the model shown in the illustration is fitted to a Gryphon crossboomless glider which was originally notoriously hard to turn. As your weight shifts, the whole hang point displaces sideways, and the resulting command effort has been described as being equivalent to swinging from a thirty foot line! If you are thinking of making one up for your glider, do please use a back up rope as well — there are an awful lot of wear points compared with a normal simple hang point.

A few days later I made a tandem flight with a blind co-pilot. The story behind this is a long one — suffice it to say we picked a very safe, very open site, and waited for perfect weather conditions. Wan Yeo is a 52 year old Chinese/Scottish lawyer who has been blind for fourteen years and has more courage and skill than anyone I have met.

I do not know of any other hang glider flights by blind flyers — if anyone in the States has done it we would like to hear about it.

Next on the list was a test of a Nimrod glider with a Hornet trike unit. The Nimrod is our old friend the Comet, built under licence here, and beefed up to give a 6G stress factor with a trike fitted. Certainly the fastest trike outfit I have handled, and reassuring to know it is so strong. Is the trike condemned by its dependence on weight-shift control to remain an aerial curiosity or is it capable of being developed into a practical aircraft? I guess we will not know for a year or two.

Later that day, in the evening stillness, I sampled the earliest mode of manned flight —the hot air balloon. Hang glider releases from balloons are infrequent over here, and it had been an ambition of mine to perform one. Problems with insufficient buoyancy resulted in cutting free with only about 750 feet of ground clearance, but all the best stories have happy endings, and the flight after release was uneventful. The initial drop was somewhat dramatic, but my glider (old faithful Storm again) sorted itself out without any marked assistance from me. Adventures like this add a bit of spice to life, and a pint or two of beer with the crew afterwards go down rather better than usual.

The evenings are already shortening, and soon it will be time for thermal underwear again. At least looking back in summer it will not have been totally lacking in variety.

STATISTICS

Data from the first Chattanooga Chute Deployment Seminar, plus our survey of magazine readership.

CHUTE SEMINAR DATA

In the September/October *Whole Air*, Chuck Toth presented a report on the real environment parachute deployment seminar held at Crystal Flight Resort in early August.

Tabulations were accumulated by recording "fumble time" (pilot locating handle and taking action), "deployment time," and total time, summing the two figures. Notice how the average times dropped on Sunday after this *real* practice took effect.

Space did not permit the table of data to accompany the article, so we show it this time, appropriately under our "Statistics" column.

CHATTANOOGA PARACHUTE DEPLOYMENT SEMINAR
Saturday True Air Deployment Tabulations

NAME	FUMBLE TIME		TOTAL TIME		DEPLOYMENT TIME		TYPE
	1st	2nd	1st	2nd	1st	2nd	
Mike McCain	2.05	3.14	9.0	8.2	6.95	4.06	*Windhaven*
Kim Meriweather	1.35	2.06	4.9	7.8	3.55	5.74	*Windhaven (early)*
Dave Holder	1.54	1.59	6.4	5.7	4.86	4.11	*?*
Earl Chambers	1.70		7.6	8.14	5.90		*Odyssey*
Al McCullough	2.10	1.60	6.5	8.4	4.40	6.80	*?*
Mike Potvin	3.30	3.25	10.8	9.3	7.50	6.05	*Advanced Air*
Chris Kendall	1.57	1.24	9.8	6.6	8.23	5.36	*Sky Sports*
Bill Hulett	1.90	1.80	6.0	6.0	4.10	4.20	*Advanced Air*
Denny Haldeman	1.72	1.56	5.83	6.2	4.11	4.64	*?*
Patty Bentz		2.19		6.6		4.41	*?*
Kim Girardin	1.46	1.92	7.85	5.5	6.39	3.58	*Odyssey*
John Mote	1.65	1.85	5.6	6.7	3.95	4.85	*Windhaven*
Bruce Robertson	1.72	1.99	8.3	6.5	6.58	4.54	*?*
Jerry Depew	1.57	1.49	6.25	6.02	4.68	4.53	*Bennett*
Diane Depew	4.10	2.00	10.9	9.38	6.80	7.38	*Bennett*
Bob Surber	2.05	1.71	5.8	5.54	3.75	3.83	*Windhaven (early)*
Bob Bautz	3.77	2.40	8.4	6.66	4.63	4.26	*Odyssey*
Joel Berg	2.24	2.08	8.04	7.16	5.8	5.08	*D.A.R.*
BJ Schulte		1.19		5.97		4.78	*D.A.R.*
Larry Guetthoff		2.76		9.62		6.86	*?*
Chuck Toth	1.52	1.53	6.70	6.74	5.18	5.21	*D.A.R./Bennett 26*
John Saari		1.39		7.62		6.23	*?*
Average Time (Sat):	2.12	1.97			5.75	4.94	
Average Time (Sun):	1.57				4.86		

PILOT SURVEY

In the July/August issue, our pilot survey endeavored to quantify the readership of four other magazines besides *Whole Air*. We asked, not did you subscribe to each, as they cannot be lumped together for purchase comparison, but rather, "Do you *subscribe* to *Glider Rider* . . . , Do you *receive Hang Gliding* . . . , Have you *seen Windsport* . . . , Do you *read Ultralight Flyer*? We felt the question had to be different as the magazines/newspapers are all in different stages of development. For example, it hardly seemed fair to contrast voluntary subscribing to *Glider Rider* with membership benefit receipt of *Hang Gliding* to purchase of brand new *Windsport* or *Ultralight Flyer*. Based on 2.8% of our paid circulation, here are the results:

	Yes	No
Glider Rider	80%	20%
Hang Gliding	87%	13%
Windsport	21%	79%
Ultralight Flyer	12%	88%

We also asked what was, in your opinion, the best feature of each. The "less power" vote was predominant from our readers as a whole. Many of you had little opinion about the two newer publications, which comes as no surprize. Both are western magazines, and the largest percentage of pilots familiar with them predictably live on the west coast. This reduces total readership of the newest entries.

In *Glider Rider*, far and away the most named "best feature" was Pagen's "Wingtips" column, garnering nearly 8% of the total. Next was a surprize, a category we loosely titled "personal stories (from pilots)." Other popular items were fast-breaking news reports, coverage of any hang gliding events, Jim Lawrence's Star of Rangomere fiction, and evaluations of equipment.

For *Hang Gliding*, the top feature was the color reproduction, followed by an amazing three way tie for technical, how-to articles, glider reviews, and *any* hang gliding (*not* power) coverage. Also doing very well were Eric Fair's "Right Stuff," Harry Martin's cartoon series, new product releases, and the photo reproduction and overall quality.

Windsport won many votes for having no motors and, in general, variety of material. *Ultralight Flyer* did well with reviews of equipment, and rapid news reporting. In all magazines/newspapers, many "favorites" were mentioned but these represent the "mainstream" opinions.

As to *Whole Air*, 40% of you "Love it," 38% think it is "Good," 12% feel it is "Just OK," and 10% of you believe that our hang gliding/ultralight/towing concept "Needs re-working," which almost unanimously was further defined to mean *"Less Power!" The issue in which the survey appeared had a disproportionate amount of power compared to those before. We took that report very much to heart, readers, as explained in our editorial in the September/October Whole Air.*

Next issue, we will review the results of our Sep/Oct survey dealing with your primary type of flying activities, your interest in ultralight towing of hang gliders, homebuilders or modifying interests, aerobatic flying desires, and what you liked best in our Fall issue. We appreciate you input, hope you enjoy seeing the results, and ask you to keep checkin' those tiny boxes on our Reader Response Cards.

BLUEBOOK

EDITION NO. 22

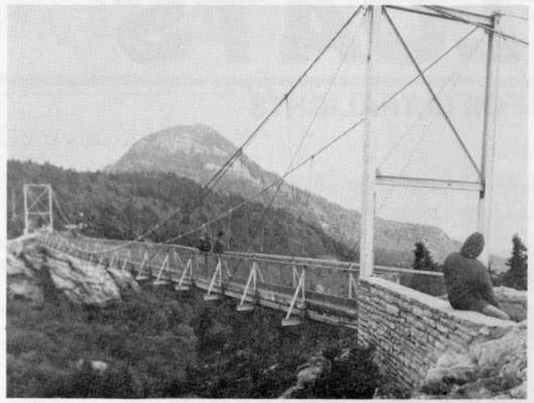
These prices are designed to be guidelines for evaluating your glider or one you wish to buy. We do not intend for these figures to be considered the final authority. Consult your local qualified dealer.

MANUFACTURER	YEARMODEL	SIZE	CLEAN PRICE	AVG. PRICE
BENNETT DELTA WING	77 Phoenix 6C	Jr.	550	450
	77 Phoenix	Sr.	425	400
	77 Phoenix 6C	Reg.	500	425
	77 Phoenix 8	Reg.	650	375
	78 Phoenix 8 Super	Reg.	675	450
	78 Phoenix 12	Reg.	650	525
	79 Phoenix 6D	185	725	650
	79 Lazor	190	775	625
	80 Phoenix 6D	215	875	700
	80 Lazor II	175	875	725
CGS AIRCRAFT	77 Falcon V	185	650	500
	77 Falcon V	220	600	475
	78 Falcon 5½	Med.	750	625
	79 Falcon 8	Med.	900	800
EIPPER FORMANCE	77 Flexi II	185	525	475
	77 Flexi III	185	575	500
	77 Cumulus 10	Med.	550	525
	78 Flexi III	Lg.	800	600
	78 Flexi III	Med.	750	600
	78 Cumulus 10	Med.	675	500
	78 Antares	Med.	875	600
	79 Antares	Med.	875	600
	79 Antares	Lg.	925	675
ELECTRA FLYER	77 Cirrus	3	600	400
	77 Cirrus	2	500	300
	77 Olympus	160	575	525
	78 Cirrus 5	C	600	475
	78 Cirrus 5	A	600	500
	78 Olympus	160	625	550
	78 Olympus	180	625	550
	79 Dove	A	700	575
	79 Trainer	---	400	300
	79 Cirrus 5	A	650	625
	79 Olympus	160	725	650
	79 Floater	205	775	675
	80 Spirit	200	1050	875
FLIGHT DESIGNS	79 Lancer	190	900	675
	80 Lancer	175	975	900
	80 Super Lancer	200	1025	925
MANTA PRODUCTS	79 Fledge	IIB	1200	1000
MOYES DELTA WING (U.S. MOYES)	77 Maxi I	200	700	625
	78 Maxi II	200	800	775
	79 Maxi III	200	850	775
	80 Stingray	200	850	775
	80 Maxi IV	200	950	825
	80 Mega II	172	1275	975
AMERICAN AEROLIGHTS	*80 Twin Eagle*	---	*3400*	*3100*

MANUFACTURER	YEARMODEL	SIZE	CLEAN PRICE	AVG. PRICE
SEAGULL AIRCRAFT	77 Seahawk	170	600	450
	77 Seahawk	190	550	450
	77 10.5 Meter	---	625	525
	78 Seahawk	140	675	625
	78 Seahawk	170	675	525
	78 Seahawk	190	675	525
	78 10 Meter	---	800	750
	78 10.5 Meter	---	800	750
	79 Seahawk	180	850	625
	79 10 Meter	---	825	700
	79 11 Meter	---	825	700
	80 11 Meter	---	925	850
SKY SPORTS	77 Bobcat III	Lg.	675	600
	77 Merlin	160	600	500
	77 Sirocco I	156	600	475
	77 Sirocco I	175	575	400
	78 Osprey	175	700	525
	78 Sirocco II	164	725	600
	79 Eaglet	191	550	425
	79 Osprey 2	175	625	550
	79 Sirocco III	189	850	725
ULTRALIGHT PRODUCTS	77 Firefly	174	650	500
	77 Dragonfly Mk. II	196	700	550
	78 Firefly	154	800	700
	78 Spyder	176	850	675
	78 Condor	178	900	775
	79 Mosquito	166	1000	850
	80 Firefly 2B	181	775	700
	80 Comet	165	1500	1375
WILLS WING	77 SST	100C	625	575
	77 SST	100B	625	550
	77 Universal	100A	525	500
	77 X-C	185	600	550
	78 SST	100C	700	650
	78 Alpha	185	825	775
	78 Alpha	215	825	775
	78 X-C	215	800	775
	79 Alpha	185	800	750
	79 Alpha	215	800	700
	79 Omega	220	950	875
	79 Omni	187	975	750
	79 Raven	209	1075	800
	80 Raven	209	1100	925
	80 Raven	229	1075	925
	80 Harrier	177	1450	1400
EIPPER MICROLIGHT	*80 Quicksilver*	*CM*	*3450*	*3125*

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

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



Photos (2) by BJ Schulte

Cool, calm, consistent, confident. The champion sits on top of the stack. Every challenger knows the champion is the best. His record proves it. But every competent hopeful successor knows the champion can be beaten, and the hopefuls have nothing to loose. But to be the champion, one must put together the string of victories that earn him that distinction. In these days of one-on-one competition, its not good enough just to beat the champion — one must become the champion by his total performance.

Steve Moyes sits alone at the top —hang gliding's Superstar. Coming into the Master's, this year, Steve had won the Cypress Gardens World Tow Championships, he had won the Cerro Gordo Cup, and he had won the wealthiest contest in hang gliding — the first Texas Cup. He placed Third in the X-C Classic, Second at Grouse Mountain, and being two time defending Master's Champion, everyone knew Steve Moyes was the one to beat.

MORE *MOYES* MAGIC AT THE MASTERS

Steve Moyes wins his third consecutive Masters title/by Aer Stephen

Grandfather Mountain stands tall atop the Blue Ridge Mountains in North Carolina. Being among the oldest rock formations in the world, the mountain has been around for over a billion years. Even amongst the craggy cliffs and jagged gaps, a certain mellowness is sensed. More varieties of vegetation bless its slopes than populate the whole of Europe. Six days of soarable weather, some front and some backside, preceded the contest, giving the pilots who arrived to prepare a good taste of the mountain air. When the Master's began, the autumn colors were coming on and the moon was full.

At the pilot's meeting the eve of the Master's, Meet Director, Tom Haddon, laid out the course for the pilots. The "one *on* one" launch format from the NW facing front side of the mountain began the race. The first altitude gain pylon was to be ½ mile to the NE — past the gap and about 300 feet higher than launch. There was no advantage from achieving this pylon before one's opponent. However, if just one pilot of the two made this pylon, he was the winner. If no pylon's were achieved, the race became a duration task. If both pilots were to make pylon one, the contest was still a duration task until one of the pilots made pylon two — about 1 mile from launch and 650 feet higher. If no additional pylons were made, the first pilot to pylon two was the winner of the race. If both pilots were successful, they would have to fly all the way back past launch and circle a non-racing turn point pylon. The turn point would be located anywhere from the SW point of the mountain to the designated landing area, McRae Meadows, some 950 feet lower than launch and about 1 mile to the SW. The race would then continue into the second lap, past launch to pylons 1 and 2 again — the first pilot to each additional pylon the leader and winner if no further pylon was made. All pylons being garnered, the race to the finish line was on. Located on the launch cliff just to the left of launch, the finish was directly in front of the hundreds of spectators. Watching Jeff Burnett's wingtip pass directly over their heads at 40+ mph had to be exciting. The race course took the pilots past the spectators three times at least, plus they witnessed all launches. Finally a hang gliding competition held excitement for the spectators as well as the flyers.

On the scratchy SE facing backside, a "one *and* one" launch format from the single ramp was to be used. The pilots would be timed at launch in case a duration situation developed. Again, pylon one was not a racing pylon, and provided a winner only if one pilot was to make it. The duration task continued after making pylon one, and the race was to pylon two, about ½ mile away across the gap to McRae Peak. This pylon was another 700 feet higher, and the first pilot to achieve pylon two was the winner.

To break ties, landing points would be given to landings in the mysterious, rotorridden McRae Meadows. Two small 25 foot circles were laid out inside the ¼ mile oval running track. A landing outside the infield of the track received 0 points, as did a landing anywhere inside that bent the glider or hurt the pilot. One-half point was awarded if the pilot dropped the glider but landed inside the track and outside of the small circles. One point was earned of the glider was dropped inside the 25 foot circles, 1½ points to a controlled landing inside the track but out of the circles, and 2 points to a controlled landing in either of the two small circles. The emphasis was on a graceful, controlled landing.

Hugh Morton, owner of Grandfather and Master's Meet Chairman, then announced, much to the pilot's delight, that Peidmont Airlines had put up $5000 to co-sponsor the Championships; putting the prize money at $10,000, the single richest prize in hang gliding would be $5000 to the winner; $1500 would go to Second; $1000 to Third; $700 to Fourth; $500 to Fifth; and $300 to Sixth. And, following up on a system set up at the recent Texas Cup meet, $10 a heat victory would be paid each day following competition.

To finish the initial meeting, the pilots seeded themselves. Expected to give top seed, Moyes, a run for the money were (2) Jeff Burnett, (3) Sterling Stoll, (4) Jeff Scott, (5) Mike Arrambide, and (6) Dave Ledford. Local competitor Stew Smith would also be tough to beat. [Burnett and Smith are both former members of the Grandfather Mountain Flying Team.] But then, the whole field of 24 top pilots would be tough. One does not receive an invitation to the Master's without proving that. The international flavor of the meet was somewhat hurt by the close scheduling of the Bi-annual World Championships in Japan. Many foreign representatives could not afford to make the trip to the Master's as a single pilot when they were already committed as a team member to the World Championships. Steve Moyes would represent Australia, Bob England and Jerome Fack would represent Great Britain, and Grouse Mountain Winner, Robin Pederson would represent Canada. Americans filled the remaining 20 spots.

Anticipation was up, the preliminaries were over, and the rain came down. The streak of six soarable days ended with the opening of the contest, and Tuesday brought a blown out condition and rain. Stew Smith's weather report — "The best thing that could happen is the front will blow through and it will be soarable the rest of the competition, and the worst is it will stall and be rained out for the duration," — haki and the Rubik's Cube provided the main entertainment of the day. Always the generous host — Hugh Morton treated the pilots and officials to a dinner on the mountain in the evening.

As Wednesday's cloud cover lifted and the cold front blew through, the pilots were anxious to get started. One full round was flown Wednesday and of the 12 pilots at

MOYES

10, only Moyes had made a 2 point landing. The Champion was meeting the test head on.

By Friday, four rounds were completed. Conditions had been super soarable and full course races were the main contest. The turn point had been moved about ¾ mile from the mountain, almost to the landing area. The flying had been superb. It was not always a sure bet the race could continue after being pulled off the mountain to make the turn point. This provided the other crowds of spectators along the mountain overlooks and at the landing area with a great show. Some of the heats could not make it back to the mountain, and the pilots worked small thermals in the quest for precious altitude. Bob England had defeated Steve Moyes after 30 minutes of scratching on the 500 foot, mild sloping ridge, and had joined Moyes at 3-1. Smith found himself alone in the lead at 4-0, and Bruce Case, Arrambide, Ledford, Pederson, and Mark Bennett were also at 3-1.

The field had been narrowed to 21 as Keith Nichols was out with a re-injured arm from a landing in the "Meadows Monster." Tom Peghiny, the 1977 Champion, was out with a bruised knee-cap from a hurried launch with a short flight ending between the two launch ramps. T.J. Young had also had a nervy experience when a hurried launch ended at the front of the ramp, with the nose of the glider pointing straight down and the base tube a foot short of the end of the ramp. The one on one launches were testing a pilot's maturity as he sometimes had to wait during the launch window instead of rushing to catch his racing opponent. Safety must be considered first and foremost. Champion from 1978, Dave Rodriguez, found himself at 0-4 and withdrew. Even though Dave led all contestants with 6 landing points, the "Meadows Monster" had flirted with him enough to send a responsible father home.

When Saturday's high winds never dropped, Sunday's rounds were desperately needed. The mood of the contest was changing with the winds and round five brought scratchey, cyclic conditions and very tight and crowded flying as the heats tended to get stalled on the course during a down cycle. The cut to finalists would be made at the end of the day, and all knew they had to flying their best to make the cut.

Round six almost died with the wind. With the main flow of SW air splitting the ridge at about 3 mph among the short calm cycles, the competitors excercised the rarely seen "Refusal to Launch Option." Three heats in a row refused to launch and wind dummies were once again sent out. When the launch window re-opened, the wind had started to come more straight in and the rock faces of the cliffs were generating their own thermals. Tom Haddon had changed the duration task landing area to the helicopter pad at the lake, and if the pilots got on the course, the DLA would be the Meadows. Now the pilots saw the task as "fair for conditions," and the round was completed with about a third of the heats getting on the course. At the end of the round, the finals were set.

Moyes, Ledford, and Bennett shared the lead at 5-1. Arrambide, Doug Lawton, Case, Smith, Pederson, and E-Z Vorhees were at 4-2. Burnett squeaked in at 3-3 by virtue of his seed as he was tied with England and Scott in record and landing points. The competition would continue for 9-11 rounds — and end at the end of a round with a clear leader.

Monday brought still another variable to the contest as the wind was now from the SE and the Backside course would be run for the first time. The two newly certified 190 Meteors (passing certification the day before the Master's began) of Moyes and Ledford would square off in the first heat. The other leader, Bennett, would fly his 185 Comet against Case's 177 Harrier, the sink rate of which had led pilots to believe something was unstock about the glider. Moyes defeated Ledford when he out-thermalled Dave and finished the race at pylon two. The day held in store some of the lowest scratching and tighest flying ever seen at Grandfather Mountain. The last heat of the round involved the Bennett/Case pair and was the most remarkable flight of the entire competition. After working for some thirty minutes at pylon one, Bennett finally headed across the gap and Case followed. Neither pilot could achieve the pylon and Bennett made it back to pylon one while Case flirted with the impossible. Getting dangerously low, Case would not give up. Although leaving himself no landing area except the forest, Case finally hooked a small thermal about 100 feet off the deck, produced by a pile of cement bridge supports for the completion of the Blue Ridge Parkway. After working the thermal up and back some 1500 feet in about 15 minutes, Case was almost to the second pylon when the lift dispersed. He still could not make the second pylon, and in the following down cycle, he out-lasted Bennett, who had scratched around pylon one and launch. Only Moyes was left with one loss at the end of round seven, with Ledford, Arrambide, Bennett, Pederson, and Case all tied at 5-2.

Round eight got underway and the weather was relatively the same. Moyes would fly Bennett, Arrambide would fly Ledford, and Pederson would fly Case. Arrambide and Case were winners, and during the Moyes/Bennett match, the wind had pretty much stabilized to ridge lift and it became a duration contest. The flight lasted for about 1½ hours. At times the pilots got so close, it was truly scarey. On one pass, Bennett chose to fly under Moyes and above the tree line on top of the Mountain, giving himself mere inches between Moyes and the Mountain. It sounded as if Bennett had gone in, or that they had hit each other, but Bennett's sail had just brushed the tree tops. Moyes got behind Bennett as the lift was diminishing and the pilots were forced to leave the mountain. Moyes had launched 12 seconds after Bennett, so would need to land at least that much later. Staying behind Bennett all the way, Moyes seemed to float on nothing. Then Moyes used the tree line on the edge of the landing field for the final seconds. When it was all over, both pilots had earned 2 point landings (Moyes second of the finals), and Moyes had won the heat by 7 seconds. Two heartbreaks had put Bennett at 5-3. Case and Arrambide were at 6-2 and Moyes stood alone at 7-1.

Round nine on Tuesday took us back to the front side and cyclic conditions. The course was attainable, but one would have to work. The last match of the round would feature Moyes and 1976 Master's Champion, Mike Arrambide, as Moyes had already defeated Case. Arrambide had also been runner-up to Moyes in 1979. The quality was coming out. By Moyes' launch time, Ledford had already beaten Case. If Moyes won, the Sixth Master's of Hang Gliding would be over. If Arrambide won, there would be a final flight between the same two pilots for the championship.

Moyes led for the first two pylons and after rounding the turn pylon on the SW point of the Mountain, Arrambide had to use strategy to counter sink rate. The pilots were working marginal thermals whose soft lift seemed to disappear 300 feet over launch. Moyes crossed the gap and got pylon three and then came back to take-off as the lift diminished. Arrambide stayed at pylon three and hooked one and it looked like this could be it. But, no! Arrambide could not get the altitude necessary to make pylon four, and he also returned to the launch area. Time and time again Moyes would out-sink Arrambide in a thermal only to have to leave the thermal early as Arrambide would start heading toward the final pylon. After about an hour, both pilots hooked one at pylon three with Moyes on top. Moyes got pylon four first and headed home, with Arrambide close on his trail. But the lead was too much to overcome, and Steve Moyes became a three time winner of the Master's of Hang Gliding. Dave Ledford's victory over Case had given the 190 Meteor a sweep of First and Second place. How much more "Moyes Magic" can there be?

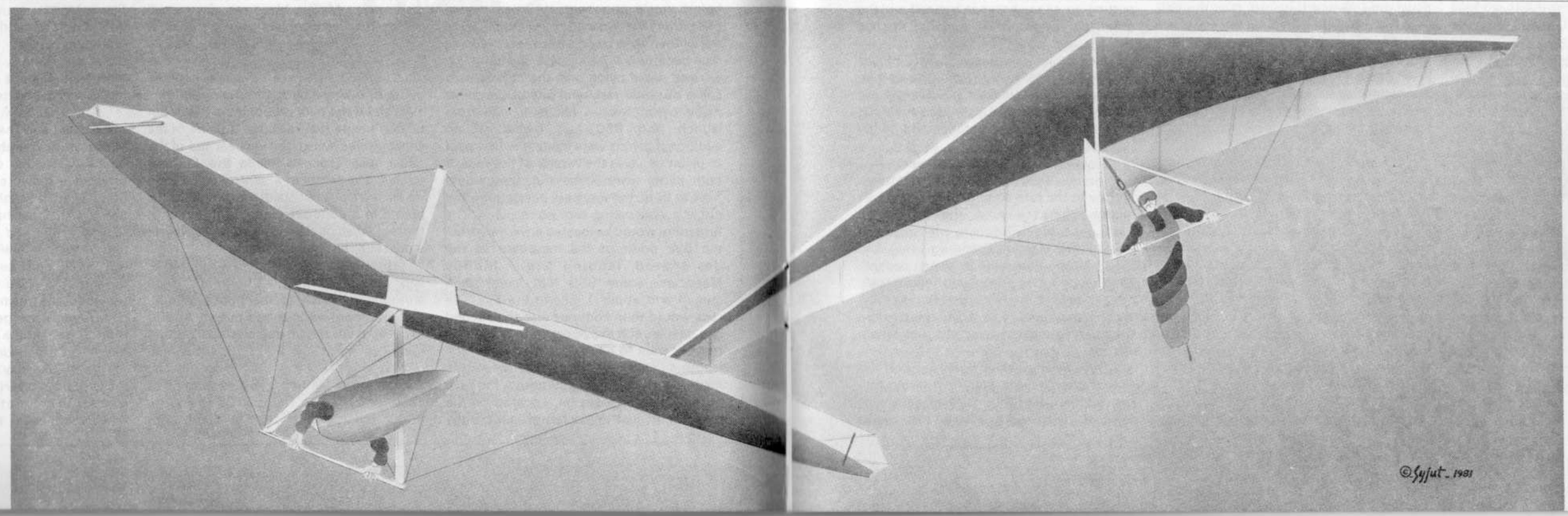
REFLECTIONS

Technical difficulties were basically eliminated from this years Master's as the team of officials and the Grandfather Mountain Flyers had prepared well. The addition of Tom Haddon as Meet Director brought a first hand competition expertise to the tasks. When in a tough spot, Tom came up with the right adjustments, and was supported fully by the pilots. When asked if he would be returning, Tom said, "It is a job every serious competition pilot should have a chance to do once, and now I have done." Hopefully, he will try it at least twice!

"Cometosis" seems to be diminishing as less than half of the field flew Comets. The tally was: 11 Comets (7 185s, 4 165s), 6 Demons (one being a HiWay Demon), 3 Meteors (2 190s, 1 175), 3 510 Sensor 180s, and one Harrier 177.

The Master's remains a pilot's meet, and no manufacturers were present to represent their product. [Bill Moyes was present, but his role was as a father and coach.] Hugh Morton successfully attracted a co-sponsor to the event with Piedmont Airlines, and can offer the pilots large sums of prize money with no entry fee. This, along with various treats from a gracious host, makes the Master's special to the pilots from an angle other than flying.

The flying was the best ever and the money was the most ever. Grandfather Mountain can accomodate large crowds of people to watch the flying and now the course is designed to make it exciting for the spectator on the ground. The Master's of Hang Gliding is a showcase for the sport.



ROUND 5

Moyes vs. Case — some Masterful competition/by Dan Johnson

Photo by BJ Schulte

The nickname "Grandfogger" is not some strange hillbilly dialect, but a meteorological statement of common condition on North Carolina's highest peak. Frequently, as in years past, the 1981 Masters of Hang Gliding Competition had to hang wait quietly in the stone building gift shop atop Grandfather while morning mist disapated. Sometimes it was too much wind. Fifty knots is hard to stand in, let alone contemplate flight, even in today's faster superwings.

But the promise of prize money loitered in the minds of most competitors, and the often weathered-out contest persevered. The prestigious Masters always decided a champion and 1981 could be no exception.

Begun in 1976, the Masters represents an invited list of names culling the most successful competition pilots from the years meet activity. It also includes some pilots who have fared well in those earlier Masters events. Tom Peghiny, Mike Arrambide, Dave Rodriguez, and Steve Moyes are former champions. And perhaps because hang gliding competition has become more consistent through the years, many other invitees are names participating in the previous Grandfather meets.

A few newer names are present, pilots with respectable contest records in the more recent past of hang gliding. In one particularly interesting battle of the one-on-one competition, the "new" challenged the "old" Champion — Case vs. Moyes.

Sunday, September 20th started like many of the others, but cleared up much earlier. Unusually, it remained light and took on the image of an ideal spectator day as the sun shone warmly, carrying only gentle breezes up to the twin launch ramps perched on the edge of the 700 foot shear.

Two pilots launch with almost perfect timing. Two more prepare on deck. A check is made to see if both are flight ready. Yes. The countdown from five starts to announce the opening of the launch window. It opens. Two pilots remained poised and alert, carefully assessing the light conditions, and the launch timing of their opponent. The crowd is large and very silent as they wait for the next pair to leave the ramp in their aerial duel. The countdown has begun from fifteen signifying the open launch window, and the last moment to launch gets ever closer. Six...five...four...three... The two watch their opponent with peripheral vision, waiting, analyzing. Finally one begins his run; the other starts almost immediately. The footsteps on the raised plywood launch decks emit a stacatto of heavy steps as each pilot begins his acceleration, with gear, instrumentation, and today's weighty gliders. The noise lessens as the end of the ramps arrive for each airman. Suddenly, silence. They are off and scratching. The crowd cheers the perfectness of their departure.

Two more move on the grey, sandpapery decks. One is relative newcomer, Bruce Case. He flies the only exposed cross-tube glider in the contest, a Harrier. The other is Champion, Steve Moyes, winner of the '79 and '80 Masters. Formidable. Thoughts race through the minds of each. Case knows many regard Moyes as the finest pilot in the world. His competition track record is unparalleled. Moyes is aware of Case's recent success at the Nationals and knows that any of these quality pilots can be the spoiler who dethrones him.

The lift is very marginal. The two other pairs are battling as much to stay aloft as to beat their opponent. Much strategy is present in this one-on-one contest. They launch. The Meet Director, Tom Haddon, calls for a halt to more launches as the sky above Grandfather is full of six contestants. Launch Director, Aer Stephens, puts the next pair on hold. All eyes are glued to the six aerialists, especially the tight war between Case and Moyes.

Case has been somewhat penalized in the first rounds of the contest. It has been blowing hard till today, and his Harrier cannot achieve the same blurring speeds as the awesome new Sensor 510s, nor the prolific Comets and Demons. But in this light air, the precise handling and good sink rate places the Harrier on par with the others.

Moyes, it is alledged, could win while flying a styrofoam cup. Today he uses the Meteor, however. The model had a slow start, but has gone through subtle changes by master-designer, Bill Moyes. Steve has told us that he feels it is a very good glider now; he feels it is very competitive.

In what seems the only thermal, the two work so tightly that several times a mid-air appears imminent. Neither wishes to give up a centimeter. The other four are equally close in the same bubble.

At times, one gains a few feet on the others and daringly tries to reach the first pylon. But the lift is extremely light and localized. They cannot quite make it.

Case is flying very well. He is slowly putting air space between himself and the other five wings. Moyes is next. Case has the thermal cored perfectly and finally strikes out for the elusive pylon. Moyes follows in the nature of one-on-one competition. They make it, out of sight, but we hear it confirmed over Haddon's FM radio. The other four cannot and do not try just yet.

Coming back they are very low, scratching. They must now pass launch and fly to the turn point near the backside launch ramp, beyond the mile high swinging bridge. The route will take them toward the Meadows landing area. And their altitude continues to decay causing all of us on top to speculate that they may have to land. Case leads and looks to win should they land. It is a set back to the Champion's chances for a third repeat victory.

But in the tiny bowl where the Grandfather Ravens play in howling fifty knot winds, Case hit a small lift area. Moyes as well; both work it with the expert deftness becoming a Master. The lift allows them to reach the turn point and head back toward launch, now bound for the more distant pylon Two. Case travels to where the lift had been earlier. It is still present, as are two first competitors. He works up slowly. Moyes does not follow. He has hooked solidly into the small but steady thermal in the Raven's bowl. He, too, works up slowly.

The air space has cleared enough, Haddon decides, and two more are launched. Now seven crowd together in the small lift areas. Attempts have been made for the first pylon by the others but have met with no success. Canadian Robin Pederson flies so low to the trees at times, that the crowd wonders if he will not inadvertently top land. Moyes and Case work up still.

With conditions remaining the same for another half hour, two others make it and after rounding launch to the turn point, two more take off. Moyes is now 800 above; he strikes out for the second pylon. Case follows, rather low.

We hear again they made it, but we do not see them. Moyes has gotten there first and now takes the advantage. We were looking too high; someone hollers to look very low. It seems they will have great difficulty even getting to the closer and lower alternate landing area, the tight and tiny helicopter pad, by the lake. From on top they seem to be brushing the tree tops.

Slowly, carefully, they move to landings. Case lands first, Moyes after an amazing bit of low scratching. Moyes has won the battle. The contest is still young, though.

Earlier in the meet, the conditions were very rowdy. Second Masters Champion, Tom Peghiny, crashed on launch. He banged his knee and did considerable damage to the Demon he flew, but escaped serious injury. It was likely the fault of insufficient communications between wire crew and pilot as his left wing was loaded at lift-off. The right wing caught the ground and whirled Peghiny and Demon into the rocks between launch ramps. The winds were 25 gusting to 30 and beyond. Tom is out of the running.

Dave Rodriguez, the '78 Champion, has also left the running. He had no accident but was tossed about so violently on approach to landing in the Meadows, that he went weightless in his harness a mere hundred feet off the ground. This and the close intensity of the aerial battles, plus the speed and ruthless theme of modern competitions have caused him to assess his situation. He chooses to exit the contest, not in contention. He has never left a meet before, and had objected to others who did. But he considers the contest so demanding of risk-taking that the conditions and his position all suggest he withdraw. He prefers the joy of soaring to the hot, and speed oriented combat of modern competition. He feels the new breed of gliders are evolving in a way which detract from total pilot enjoyment.

George Worthington has also written on this subject, saying that the next generation of gliders may not be landable. As we watched Chuck Toth's video record of the day's flying, we saw far more near crash landings than gentle arrivals. Of course, Grandfather's McRae Meadows has a powerful reputation for rotored landings. The Meadows is big enough for today's long gliding crafts, but is a tough master, even for Masters. Several landings were thoroughly bone-jarring, down tubetweaking affairs. Blue Stratos representative, Keith Nichols smacked into the ground in his blue Demon, and was taken to the hospital for examination. His arm suffered no serious injury, but removed him from the competition. Landings which did not throw pilot and glider on the ground warranted applause from spectators and fellow pilots. The landing site can be blamed, but is also represents a statement about the gliders, that these superior pilots have such a rough time making good landins with consistency. Even regular Grandfather Mountain pilot, Mike Degtoff, banged in on his control bar, afterwards attesting, "It's NASTY down here!"

Moyes ended up taking all the marbles home, winning his third for three Masters of Hang Gliding. Hugh Morton successfully upped the prize money to over $10,000 with first place earning $5,000 plus heat rewards. This is the largest first place prize ever offered in the sport. The biggest total purse ($13,000+) had just been distributed at the Jack Grimm Buffalo Gap Meet earlier in the month. First place in Texas was $4,000 plus heat/round winnings. Moyes again picked up $4260 and another First to his growing string of victories. He had taken the Cypress Gardens meet in August and as such becomes the cash winningest pilot in the history of the sport. While hardly stakes like those in tennis or golf, the sum is highly respectable in the sport of hang gliding.

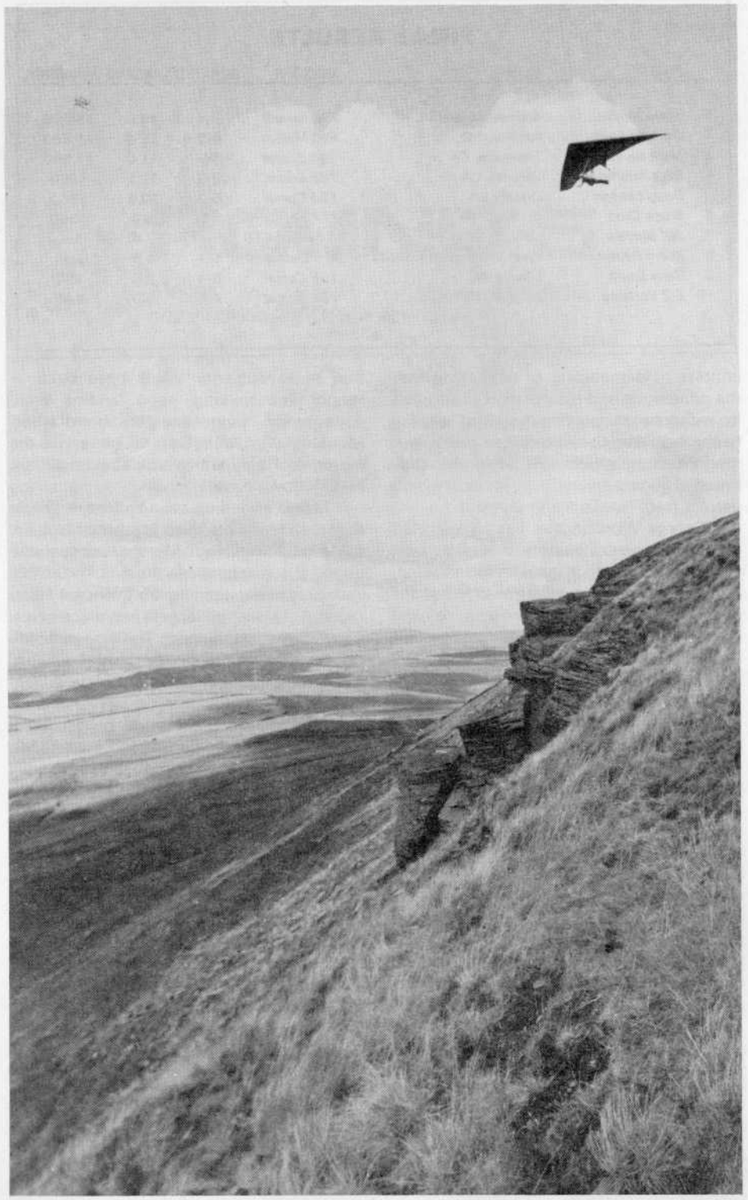
It is an upward trend in the fine sport of soaring and it was a pleasure to observe the Masters fly at Hugh Morton's stunningly beautiful and awesome Grandfather Mountain.

FINAL RESULTS

	PILOT	HOME	GLIDER	RECORD	LANDING	WINNINGS
1	*Steve Moyes*	Sydney, Australia	*190 Meteor*	8-1	10.5	$5,080
2	*Dave Ledford*	Ashville, NC	*190 Meteor*	6-3	12.0	$1,560
3	*Mark Bennett*	Temecula, CA	*185 Comet*	6-3	11.0	$1,060
4	*Mike Arrambide*	Ventura, CA	*185 Comet*	6-3	10.5	$660
	Doug Lawton	Duluth, GA	*185 Comet*	6-3	10.5	$660
6	*Bruce Case*	St. Paul, MN	*177 Harrier*	6-3	8.0	$360
7	*Jeff Burnett*	Milford, NH	*180 Sensor 510*	5-4	7.0	$50
8	*Robin Pederson*	West Vancouver, Canada	*175 Demon*	5-4	6.5	$50
9	*Stew Smith*	Linville, NC	*165 Comet*	5-4	6.0	$50
10	*E-Z Vorhees*	Orlando, FL	*165 Comet*	4-5	5.0	$40

Mark Bennett and Steve Moyes in a close call.

Photo by Jim Morton



TALES from WALES

British speed and technology was demonstrated at Myrthyr, and they understand the full use of the "French Connection" and speed bars/Photos and text by Doug Barnette

BRITISH NATIONAL CHAMPIONSHIPS

The League

The new British National Champion, Johnny Carr snatched the honors in the BHGA League Finals from Bob Calvert. Calvert held off 48 British League pilots for two years to just miss by a slim margin to ace competitor Carr.

The sixth and final 1981 British meet was held September 11-13 at Myrthyr Tydfil (1,000 AGL) in Wales, England. The site offered the typical top landing capabilities and smooth, rounded ridges which abound all over England.

The overall quality of team flying and task selection demonstrated by organizer Derek Evans of the BHGA, was far superior to that witnessed or written about in the States. It will only be a mild surprise if a Britain wins at the "World Championships" held in Japan. (Cumulative points should show Team Britain did their homework!!)

British speed and technology was demonstrated at Myrthyr, and they understand the full use of the "French Connection" and speed bars. The top League pilots had either one or both. One of the French Connections had as much as 12 inches of movement (Michael Carnet Comet) — much improved from the original connection of only 8 inches of movement. Speed bars are an extended horizontal control tube (much the same shape as an old type belly-bar), with a nico swaged wire replacing the original horizontal control member. French Connections are CG-altering devices which the pilot's harness hooks into allowing less bar pressure at higher speeds. They also allow weight shifts to flow farther forward or backward for better minimum sink as well as extending the L/D.

The English "Magic" Comet (by Airwave, Inc., in license with U.P. Inc.) had some extremely clean airfoils and tip improvements. With the combination of the Comet, the connection, and speed bar —there were times that gliders resembled fighters making anti-radar runs at amazing speeds. (With a 175 square foot English Demon, a Winter Air Speed Indicator, and an 8 inch movement "Welsh" Connection, this author obtained a 55 mph apparent air speed.)

Selected to represent Britain at Beppu, Japan were National Champion, Johnny Carr, along with veterans Bob Calvert, Graham Hobson, and Robert Bailey (Captain). Several new additions from the League are Andrew Wilson, Tony Hughes, and Ronnie Freeman. Derek Evans is team manager and Noel Whittall is steward. (Noel was invited officially by Japan to assist the team.)

Andrew Wilson piloting a Comet received the "Best Newcomer" Trophy, and placed 4th in the League finals. He had come in 6th at the recent Cross-Country Classis in Owen's Valley, USA. Ronnie Freeman (Typhoon) was 8th in the League and was awarded the "Most Improved Pilot" Trophy. Graham Slater received 3rd on a Comet. The rest of the top ten in the 1981 League finals are Hughes (Comet) 5th, Hobson (Demon) 6th, Michael Carnet (Comet) 7th —the only Frenchman in the British League — Robert Bailey (Comet) 9th, and Dick Brown (Typhoon) 10th. The Ladies' portion of the League was captured by Jenny Gunderton, 2nd was Natalie Wilson, and 3rd, Judi Leden.

On the previous weekend (Friday through Sunday) at Mere, Wiltshire in the Southwest of England, the BHGA held a club meet with Carr flying 56 miles off a 300 foot bowl while coring a burning farmer's field to achieve his altitude. Needless to say, he won the cross-country event, with Tony Hughes placing 2nd and 3rd (22 mile flight). The L/D Distance event was won by an English Frenchman (or vica versa), Michael Carnet (165 Magic Comet) with Jenny Gunderton (Typhoon) coming in Second. Jenny later became the British National Champion in the women's portion of the League finals at Myrthyr.

TRIKES (STONEHENGE)

Mere was the location for a rather extensive Trike display and demonstration. The BHGA, unlike the USHGA, has adopted the powered movement and with competence, run both side by side. Dan O'Neil (Frigate Aircraft in Miami) and I went to England to see for ourselves if the British had really developed something in the Trike.

John Ivers of HiWay Gliders Ltd., graciously offered himself as a guide, as well as designers/pilots Joe Binns, Bill Payne, and Jim Bowygr for a week-long escort from Trikes at Stonehenge, through Tredegar (HiWay factory) to the League finals.

On our way from Heathrow Airport in London to Mere (SW England) we came upon Stonehenge, the ancient and *mysterious* clock, calendar, and/or sacrificial monument. Pre-dated 3,000 years, it offered quite a spectacular greeting for the beginning of our ten-day trip. With little thought or knowledge of what lay ahead, we set off to find the "major Trike display" about which John Hudson (Mainair Sports, Ltd.) had telegrammed us. An hour later, we found Mere in Wiltshire and a Comet/Trike sitting at least a grand over the Cathedral. Winding our way though small streets following "BHGA Meet" signs, we came upon a cluster of hang gliders on top of a 300 foot bowl with tents, flags, and Trikes from three or four major companies scattered around. The Trikes ranged from 125cc singles to 343cc twins.

After a few introductions and some old friendships rekindled, we flew the HiWay 343cc unit supplied by Chris Johnson. It flew *great*, stable, accurate, powerful, and with complete ease of handling.

We had a night's rest, then set out to discover the real potential. A quick word in John Iver's ear, and my motor-drive infrared triggered shutter release, 35mm Contax was clamped on the 343 cc twin Demon. Off we went to Stonehenge. Twenty-five miles later — five Trikes in all (two American pilots, one German, and three British) — we landed at the "Henge" after a spectacular crosscountry and in-flight photo session. The crowd and police were very cooperative, so after a change of film and trade of a pilot or two, we flew back to Mere. Later in the pub, we realized that the flight had waited almost 3,000 years for technology to make it possible!

Now we were convinced that after two years of research on Trikes, the English had the quality, engineering and performance we desired. John Hudson saw to it that we exported two Tri-Flier Kits for our use in Miami. Those Tikes have *monopole* constructed frames with quick-cam breakdown and *anti-yaw brackets* for ease of handling.

The anti-yaw brackets are probably the simplest yet most important difference between American Trikes and the British ones. The British bracket restricts the yawing tendency and allows the glider and Trike to maintain the same heading, while the American ball joint can and does allow the glider to rotate left or right in the opposite direction with respect to the Trike. This latter fact can by overcome with experience, but a flyer's hands may become tired in gusty air and the extreme differences in heading make for some hard work in thermals.

Monday morning found us at Tredegar in Wales where the HiWay factory is located. Dan and I purchased a Demon, but it turned out that our real interest centered with the new Italian engine (HiWay) 22 horsepower and 125 cc prototype. Its major advantages include *internal reduction drive, oil bath, radiator, electric start,* and new monopole frame. Its advantages are obvious, and production should begin in early January of 1982. (Manufacturer of the engine is Airdelta-Hiro, Milan, Italy.)

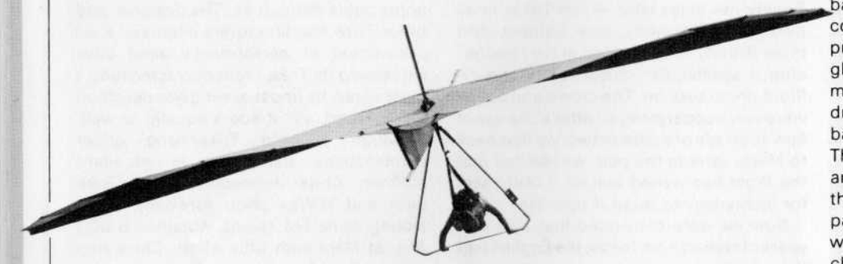
Another notable mention is the Sealander (parallel developed Aolus) Trike 160cc. It flew powered in *ridge lift*, with velocities exceeding 25+ with no appreciable difficulties. The designer and other Trike manufacturers *endorsed it as uncommon in performance* aand after witnessing its Trike flight characteristics, I must *agree*. Its unusual wing was designed to be Triked, yet it soars equally as well. Although all the Trike/hang glider combinations performed in excellent manner. Chris Johnson (Demon/Trike pilot and HiWay shop foreman), while testing some FM radios, obtained 8,000 AGL at Mere with little effort. Chris also officiated and competed in the League, flying the same glider without power during a cross-country task for some 28 miles.

Pilots flew in competition, but between rounds Triked all over the countryside. John Ivers, while at the local pub, stated, "Yes, we really psyched them out by Trikeing our gliders to takeoff." Ivers actually attached a folded Demon hang glider in its bag to his keel on a Demon Trike and carried it to launch, leaving it and returning to fetch another. I observed Trikes on many competition pilots' vehicles. It became apparent that many use their Trikes to travel from *home* to *footlaunched sites, land on top, unpin the power system, soar* as in free flight (harness), *land, hook up* after a day's flying and *trike home again*. Granted, you have to be able to topland.

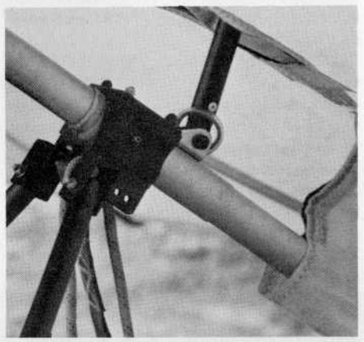
Not too surpisingly, it appeared a new age was becoming evident as future hang glider pilots will have the best of both worlds with two wings in one. As inventive as the British are, I'm sure that is not the last tale in Wales!

Calvert, Carr, and Slater

PILOT REPORT



Photos (2) by Chris Voith



AOLUS

"The most different glider any of us has ever flown."

This issue welcomes a new contributor, Aer Stephens, of Grandfather Mountain, North Carolina.

In providing the following report on the Spectra Aolus, Aer offers information in an area of paramount importance to Whole Air *reader/pilots — glider equipment reviews.*

Several persons took flights on the test Aolus, a prototype. All agreed it was the most different machine they had flown. Spectra is a small company. While they might be criticized for not providing a standard production model, it must be remembered that this is an expensive proposition. The prototype did *deliver the flight characteristics, set-up, and general inspection. Considering the glider is so unique, this evaluation was satisfactorily accomplished by the prototype unit, and permits* Whole Air *to tell the hang glider world about the Aolus. Those with an eye for "something different," have certainly found a prospect in the ship from Spectra Aircraft.*

Our cover painting is a piece of genuine fine art by an Atlanta pilot, David Dees. Many hours were spent rendering this beautiful creation, and we are proud to have it adorn our cover, coordinating as it does with this particular Pilot Report. The artwork offers a special flavor, appearing on our "holiday issue."

AOLUS 170 EVALUATION

In today's glider market totally dominated by the Comet and its "clones," the Aolus sticks out rather noticeably; not just from its noselike bowsprit relatives, but also from its rear with a fan-like tail unlike any glider on the market. This beast also has a 150° nose angle and the sail appears to have the lowest twist on the market. The uniqueness of the Aolus had aroused my curiosity, and I was eager to fly a glider with these new innovations.

SET-UP/CONSTRUCTION

The glider is covered with a heavy weight material bag that uses twist snaps for the front third of the glider and a zipper that closes from the rear for the remainder of the length. This allows one to leave the control frame assembled and the glider easily covered. The bowsprit is also covered with a full length bag, as are the battens, the kingpost top, and the whole control bar and downtube ends. These protection bags effectively protect the glider from wear, but the heavy weight material rolls up bulkily, and can be a real drag with which to fly. With the glider on its back, the control frame is the first to set up. The straight, one inch diameter downtubes are attached to small channel brackets through which the CG adjustment bolt passes into the main channel bracket, which has five CG adjustment holes. These channels appear to be anodized aluminum, and when the glider is set up, the small channels on the downtubes pull away from the main channel slightly. The system is clean and light, but causes me to wonder about its strength. The whole unit is connected to a slider box which moves down the keel and is secured in place with a pip pin. That, however, is the last step of the set-up. Due to this system, the glider must be set-up lying on the ground. The pre-bent control bar is connected to the downtubes with elbow joints and bolts, and after connecting the one assembly bolt, the control frame is together and the glider is set up on its belly. The nose batten is put in place on the noseplate, the king post is raised and the bowsprit is laid out by the nose, in readiness to be assembled. After first eyeing all the wires to assure no snagging, each wing is pulled out to almost full spread and the plug in lockups are deployed. After installing the ½ X .049 battens, one stands inside the bowsprit wires and levers it into place and slides the oversleeve down to the nose securing the beak with a pip pin. (This sometimes takes a couple tries to line the beak up straight.) The wing almost magically pops to life as the rigging tightens and the tail raises. The final step of raising the glider's nose and sliding the control box down to position, completing the set-up.

The Aolus has no luff lines. The prototype tail is firmly secured on the back ground wire. A one inch diameter tube runs from the tip of the tail to the keel where it is attached with an eye bolt. The two small fiberglass battens that stiffen the tail can be easily deformed down while not in flight, but the pressure on the sail in front of the reflex during flight provides correct batten curving to allow the tail to perform its task.

The battens are secured with velcro straps, and in a period of time, the sharp ends of the battens will work through these. Where as bungies are easily replaced, the sewing repairs will cost time and money.

For flyers approaching a glider with so many unique features, it would make more sense for Spectra Aircraft to equip it with a straight base tube. Then, the new flyer, because of a poor landing due to inexperience, would not be grounded while waiting for parts to arrive from California.

The front and back flying wires are each one piece. The single swage at the nose and tail was not flared. This improper swage can easily shear a wire in landing, especially since, in a nose-in, the wire takes the main lead.

The most ingenious trick on the glider is at the tips. The sturdy sail attachment is nicely concealed from the airflow. This clever sleeve tensioner set-up allows quick and precise adjustments in sail tension at 3/16 inch intervals. The whole tip unit slips into the leading edge and have five radial wash-out adjustments on the inner sleeve.

The glider I was flying was a prototype (number 3) and had many patches on the sail to prove it. Aside from that, the sail work looked respectable. The production models come with an additional two battens that parallel the nose rib on either side. The leading edge pocket is sewn to accomodate a mylar insert, but that is left up to the pilot to install. The sail is approximately 40% double surface, with no undersurface battens. I did not have the heart to even try to figure out where to put the storage bag. It was just too big to attach to this sleek bird.

GROUND HANDLING/LAUNCHING

The glider weighs under 60 pounds and is statically balanced, easy to hold. The bowsprit weight does pick up some leverage as it noses down though. It launches clean and easy from slopes and cliffs and offers no surprises. The control frame is not oversize, but it is not small.

HANDLING

I was able to get nearly ten hours flying time on the glider in 22 flights. The glider was tuned at the loosest sail tension for handling and I never did experiment with its range. The sail was old and broken in, but fluttered only slightly at the tip at extreme high speeds. The manual tells you the glider will turn with adverse yaw and it does. If the sail were new and working in, the manual says the handling will get better. This glider was surprisingly easy to fly after what I was prepared for from reading the manual.

To initiate a turn, the weight was shifted and when I returned to center with a slight push-out, the glider responded nicely. Sometimes I was fooled at how much energy I had to give it, and the glider would not turn after this procedure, but with time, I became more acquainted to its feel. Bar pressure was light but positive, even at full dive. At slower speeds, the glider became quite squirrely and yaw oscillations tended to occur. The handling was quite predictable at maximum glide speeds, even if it was different than the internal crossbar, double surface models. It compares closest to the new Sensor in handling.

The strangest handling feature is the pitch oscillation. When I would enter a nice sized thermal head on, the nose came up as expected, but when the tail also entered the lift, the bar would swing back about three to four inches as the tail would "plane out" in the lift. Not only is the glider lifting, but it is also taking speed. This was the most difficult aspect to integrate in thermalling. I could not get it to lock in to the thermal, and was constantly having to give it input to keep it turning in the thermal.

If the thermal was big enough, the glider would flat turn real sweetly, and maximize the lift well. However, to turn sharply in tight thermals, I constantly found myself loosing too much altitude to use them. If you can get it turning flat, it was great, but if you got at a certain bank angle, it would slip, unless you were aware enough to have taken more speed before you got there.

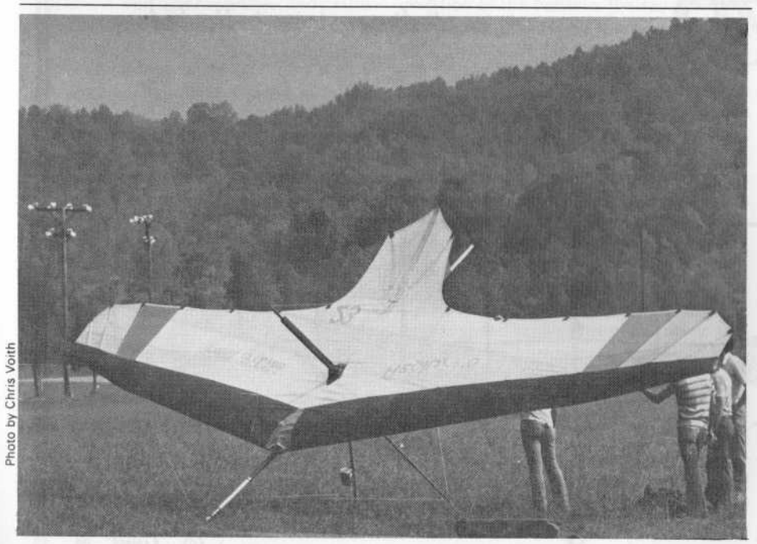


Photo by Chris Voith

PERFORMANCE

The glider is a cruiser. It covers a lot of ground and performs best at a good clip. In light ridge conditions, I would sink out before any of the double surface designs. In stronger conditions, it flew faster with an equal glide to a Demon, but it could not keep up with the Comet or Sensor without losing its glide. I was loaded on the light end of the weight range though. I could thermal as well as the rest, but had to work at it longer. The glider can fly very fast and still feel solid. I will leave the aerobatic discussion to someone who cares to give it a try.

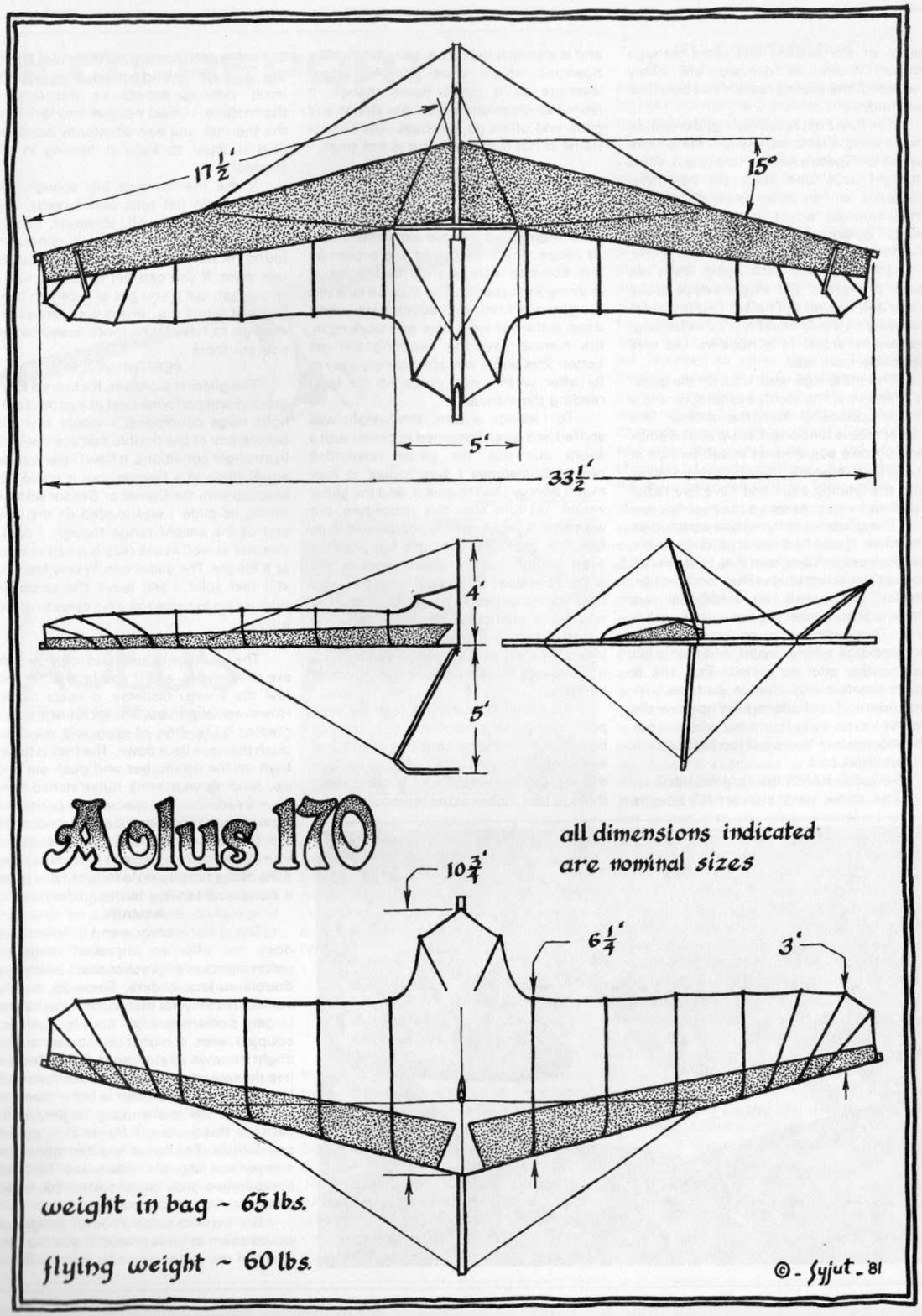
LANDINGS

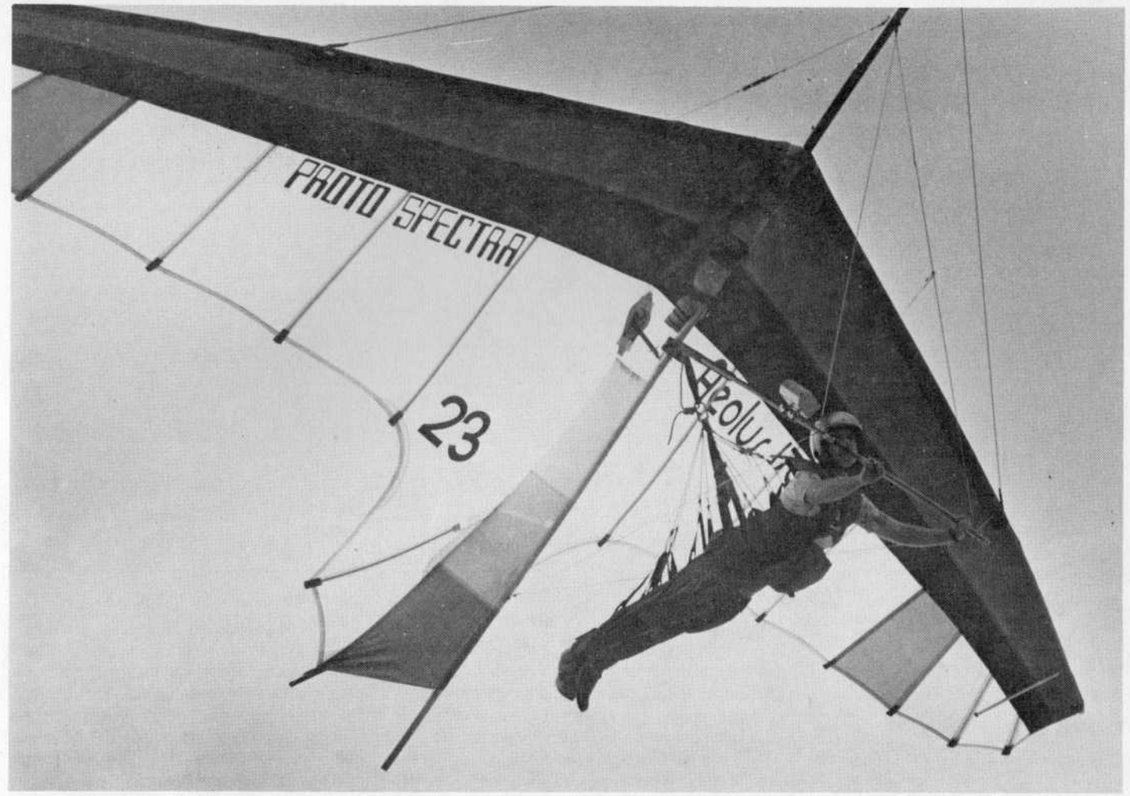
The landings in light and strong winds are predictable, and if you land it hot and feel the energy disperse, it lands nicely. However, when you finally flare, the tail creates quite a bit of drag and wants to push the nose back down. The trick is to get high on the downtubes and push out and *up*, holding your arms outstretched over your head. This is especially important in no wind landings — and be prepared to run fast for the first several steps. After about four landings, I was able to land controlled 90% of the time. I would hate to have to do a downwind landing in this glider.

SUMMARY

The glider is unique and different, but does not offer an improved range of performance over present state-of-the-art double surface gliders. The 40% double surface is really not that much — perhaps a larger percentage of double surface, coupled with a higher cambered airfoil might improve its slow speed. The Demon has the largest airfoil I have seen, followed by the Comet. The Sensor is faster than the Aolus, but still has a much larger airfoil. Perhaps this accounts for its slow speed capabilities. The Aolus is a fast glider. In comparison though, flown too fast, its comparative glide deteriorates; too slow and it has squirrely handling.

The main decision in purchasing one would seem to be aesthetic. If you like the looks of the glider, you can learn to fly it.





At trim speed, bar pressures are light and nice. As the bar is pushed out, pressure increases.

but it falls short of the possibilities of the Comet and its "clones," particularly the Sensor, and especially in light winds. At $1600, it is a bit less expensive, and it sure is a whole lot different.

The glider Spectra Aircraft supplied for the evaluation was a prototype with a new airframe matching today's certified production models. I personally do not feel it is fair at this point to say the production models will match the characteristics described in this report. If a manufacturer is willing to have an evaluation such as this done to its glider — it is in the best interest of the public to supply a glider that is a replica of the production glider Mr. Public will purchase.

SECOND OPINION

by Brian Burnside

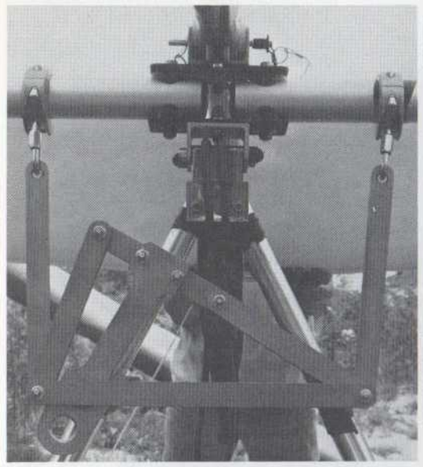
Set up of the glider is simple and quick with no unusual or difficult procedures. The flat on the ground set up affords easy access and good windy set-up. But, with the bowsprit not tensioned, to give easier insertion of the battens, the sail is almost completely touching the ground. The batten pockets leave much to be desired as it is easy to miss the pocket or the stop. The velcro batten fasteners are not reinforced causing the battens to break through with only the necessary tension and minimal wear.

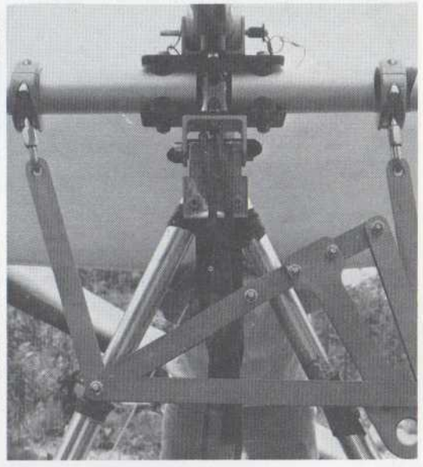
On the ground the glider looks impressive. Except for a little bunched area at the nose, the sail is tight. Static balance is good and ground handling is excellent. Launching the Aolus is easy and positive.

The flying characteristics of the Aolus are good but a little unusual. Within the usable speed range, this glider achieves a very good performance. At trim speed, bar pressures are light and nice. As the bar is pushed out pressure increases, and at full extension, bar pressure is great without stall occurring. As the bar is pulled in, the sail begins to flutter and at full-in, bar pressure is light and positive with the sail breaking up badly, and performance lacking. In stable air, I found handling exceptional, roll being immediate and turns exhibiting perfect coupling. Unstable air is quite a different matter. The tips respond to gradients or gusts increasing the reaction of the glider to thermals. This makes it difficult to turn into lift. Once you have gotten into the thermal, the great handling returns, until one tip exits the thermal. That tip falls rapidly, trying to turn the glider out. This trait can be rather annoying, but can be overcome. This increased sensitivity to the air can be exploited, in that it can better define the boundaries of lift.

The Aolus has continually demonstrated disastrous landing tendencies. This is due to the difficulty in stalling the wing with normal weight shift limits. I believe this is caused by the heavily reflexed "tail," making the root section overly stable.

The poor landing qualities, lack of effective high speed, and "unique" handling make this glider less than desirable for the average pilot. But for someone with a desire to be different, or for someone with a flair for the unusual, you may feel right at home in an Aolus.





ANCRAGE FLOTTANT

The Answer to Good Handling Stiff Wings?/*photos by BJ Schulte*

Ironically, the subtitle of this look at a new piece of hardware is an American adaptation to a European innovation. What makes it ironic is that the French or English, who use them widely, do not use them as Americans do.

In England, as in France we understand, the current primary use of the CG displacement device (sometimes called the "French Connection") is to reduce pitch pressures, facilitating far pull-in for cross-country or speed flying. In America, the first usage was to reduce roll pressures. Hence our subtitle.

Indeed both applications have merit. Doug Barnette of Frigate Aircraft in Miami, was in England during September, 1981, and reports that he saw *no* crossbar attachments, which serves roll control. The English, using French, or Wales, or *where ever* connections, always employed them for pitch. In fact, they attach the rearwardmost part of the devices at the CG point, thereby adding greatly to forward speed. Of course, this was during the British League Finals, and speed competition was underway. Still, no roll enhancement was sought with the link. In fact, they not only used the Flottant, but "speed bars" as well. Further billow control levers are also affixed. Read Barnette's piece, but consider the European push for speedier flight.

Whether for pitch or roll, the invention has similar results. Flying Chuck Toth's Atlas with a flottant offered some insight. Toth, who bought the first connection in Chattanooga, was terribly excited over the effect.

I noticed a reduction in pressure which was dramatic. The roll *rate* did not seem significantly faster, nor was the *response delay* shortened noticeably. But it made what is frequently considered a "stiff" glider a great deal less work to fly. That is a fine achievement and would seem to find a place in today's market of superwings.

Bill Moyes told Toth at Grandfather Mountain that his next design would incorporate some version of the connection (Down Under Connection?).

Invented by Monsieur J. L. Darlet, we understand it was first intended to permit easier handling on the big (196 ft²) Atlas. Darlet is an associate of Gerard Thevenot, designer of the La Mouette Atlas.

The Flottant, brought to America by Bruno De Robert, is simply put, a power amplifier. Toth, an engineer, says it is very similar to something called a Watt's Link, a popularly used device in our servo-assisted world. It transposes motion in a vertical plane, is based on a parallelogram geometric shape, and maintains an even, smooth pressure throughout its range of movement. Barnette adds that the connections are valued by their displacement capability, for example, eight-in throw, twelve-inch throw, and so on.

We view this device as a harbinger of things to come. Airframe structures have lagged behind sail design changes, but may now be given more impact as creators attempt to solve handling deficiencies, widen speed ranges, improve landing problems, and increase the set-up and transport abilities of the crafts of tomorrow.

TOW LOG

"Notes from the Towing Logbook"/by Ray Foley and the Florida Flyers

Whole Air is rather proud of our unique stance on towing. We are the only publication in America devoting regular space to this valued method of launch.

However, it is something of a struggle to maintain a regular flow of information. Few manufacturers supply equipment, and frequently, these are low-profile garage operations. The Cypress Gardens World Meet is about the only tow news event receiving publicity. Without question, this explains why most magazines are light in towing information.

Since many areas do not tow, much of what is needed must be how-to oriented. *Whole Air* has reviewed most of the available equipment, both flight and support. This coverage has been accomplished by our Towing Editor, Ed Quirk, who has also approached training considerations.

So, this issue we give you "Notes from the Towing Logbook," tales by some of the Florida Flyers. We asked Ray Foley to generate these notes, as we judge Ray to be one of the most successful pilots in the state. His group of contributing pilots are all very talented and know towing from the ground up. We are pleased to present his efforts, written by six pilots and left largely un-edited. We believe you will enjoy these exploits and respect the flying done using towing for launch. (Of course, they footlanded.)

Sunday I visited Orlando friends and the following are individual logged flights of the day's flying. I am sorry that I could not remain on the ground and try to describe what was happening. Instead I told my friends to log their flights — that *Whole Air* had mentioned writing about our activities and that perhaps the readers would be able to draw some information from our logs. John Gruener also promised to send me a description of a recent cross-country venture.

[Ray Foley—Comet 165] Wind dummy; first tow: With cumulus building and surface winds NE 5-10, I launched behind the winch climbing steadily to 1200 AGL. When the boat turned at the end of the tow I released and flew over a community on the southeast side of the lake where small lift was encountered. The lift gradually got stronger and I gained to cloudbase at 3,000 AGL. With the city of Orlando spread out under me, with WhisperJets landing five miles away, my concentration wandered, and so did I. Putting my Comet in the "zoom mode," I flew around like some crazy bird with no destination other than to occasionally work another thermal to altitude (40 minutes).

Second flight: Generally the same conditions existed. The same resident thermal carried me to 3,800 while drifting back about 2 miles at which time I headed back against the wind, catching the lift at times 700 feet and back to cloudbase. Later I watched Jim Walsh after release about 1 mile ahead and climbing out fast. I searched the east side and was rewarded with another trip to cloudbase.

2nd flight time: 1 hour, 30 minutes

Total time: 2

Total time: 2 hours, 10 minutes

P.S. The preceding weekend (Labor Day), I spent in the mountains (Chattanooga) to get a total of 1 hour and 10 minutes in 3 flights on 3 days.

[John Gruener—Pro Air] 1st flight: Tow was fairly smooth. Released at 1200 feet. Lots of sink (600 down). Found some bumps at 700 feet, over the north cove, held altitude for about six minutes, then lost it. Landed 14 minutes after release.

2nd flight: Wind picks up to about 12 mph on the surface, 18 mph at 1000 feet. Erratic tow downwind, difficult turn around south cove, then good steady tow into the wind. Released at 1400 feet, turned downwind, flew back to the south cove, found 200 to 400 up, worked it to 2,100, but drifted about a mile from the shoreline. Decided there was not enough lift to go for it, so returned to the lake. With the headwind I just barely made it back. Time: 21 minutes.

3rd flight: Shorter tow (did not fo into south cove). Released at 1,000 feet, found a little lift over the north shore, but not enough to hold on to, so landed after 7 minutes.

4th flight: Very exciting tow downwind and around the south cove. Went through lift on the straight run into the wind. Released at 1700, in zero sink. Circled and drifted with it, looking for the core, but then suddenly got dumped into 700 down. Pulled in and flew downwind (to the west), found lift about a half mile west of the shoreline, and at about 1500 feet. Climbed to 1900, then lost it. Needed most of the altitude to penetrate and make it back to the lake. Soared the tree line for about 5 minutes (20 to 30 feet above the tree tops), then lost it when the wind died momentarily. Landed 23 minutes after release.

[Jack Krips] My first flight I was towed to about 1200 feet. I knew there were areas of good lift; Jim Walsh was just climbing to cloudbase, and Ray Foley had been shooting from cloud to cloud for the past hour. Flying with plastic bags on my vario proved to do me in on this flight. The sun had been shining on the vario and upon zeroing I actually read 200 down. For Florida flying, scratching and working light lift at times, you must believe what you see on the vario. I scratched around for 10 minutes and could not climb up to Walsh and Foley.

2nd flight: My turn has come! The cycle was perfect. As I released at 1200 feet, there was patch lift. I searched momentarily and found a 200 to 300 up core that I rode up to a little over 2000 feet. Watching downwind, Walsh and Foley were climbing to cloudbase. We had drifted a mile or so downwind of the lake and Foley made a search upwind of where we were circling. He had been doing this routine for the past hour so who was going to argue with success. I followed him, into some great sink. We scratched downwind of the lake and I barely made it back over the tall Cypress trees to the lake. Not too bad for a 900 foot gain and 20 minutes of flying.

[Jim Walsh] 1st flight: 20 minutes.

2nd flight: Towed to 1200, released into approximately 300 fpm lift, worked to 3500 in 10 minutes with numerous cores drifting back 2 or 3 miles crossing paths with Ray (Foley) at 2500—with 7 persons flying (30 minutes) 4 of us were soaring.

At the same time Ray and I turned upwind with me flying a 160 Mega, and Ray in a 165 Comet (Supine). Ray came from a half mile behind, passed me and flew another half mile farther upwind. I held on to my altitude a little better, but Ray took advantage of the Comet's greater L/D at speed.

tow log

[Bruce Pemberton] Sunday, 9-12-81. Typical Sunday afternoon, except I got drilled twice. First flight was OK, but I lost half my altitude until I got lift. Worked it for about 15-20 minutes, gained 500 feet.

2nd flight: Sunk out.

3rd flight: Ditto.

4th flight: Bingo! Again, lost half my altitude, but got good lift. Thermalled with Roland Alexander who was already up. Flight lasted 30 minutes, gained about 1400 feet.

Packed up. Went home.

[Campbell Bowen] Today just was not my day. Same day as Ray's hour and a half flight, I found strong sink on my first two flights, and got dunked twice in the process.

Yesterday was better for me. My last flight of the day, we circle towed back over Bruce Pemberton's apartment complex. I released at about a thousand feet into light lift. I thermalled around for about 8 minutes. Then Jack Krips towed up in his Pro Air. He cored a small one 300 yards to the west of me. It looked better than what I was in, so I flew toward him. When I arrived, he climbed right past me. I got in under him and found the same core. Jack climbed to about 1600 feet with me climbing 500 feet below.

Jack flew upwind to catch the next bubble. About this time Bruce Pemberton towed up and he and Jack worked the same thermal, wingtip to wingtip, at about 600 feet over the complex. We all hung on trying to out-sink each other for about 10 minutes more. Finally, we lost down to 300 feet. Bruce peeled off first and landed by the pool. Then, I came in and Jack followed about half a minute later.

My flight time was 30 minutes. This was at 4:30 p.m., right before the sea breeze came through.

Ray	2 hr, 10 min.
Campbell	20 min.
Jack	40 min.
Jim	1 hr.
John	25 min.
Roland	45 min.
TOTAL TIME	5 hrs., 20 min.

by John Gruener

July 19, 1:35 p.m. Wind is SW, 5-8 mph. Ray Foley, flying a 165 Comet, has been in the air 65 minutes, and Jim Walsh, on a Mega, has been airborne 45 minutes in thermals. I have tried 3 times, unsuccessfully, to tow into some lift. I am flying Roland Alexander's new Pro Air, and these are my first flights on it. I ask Roland if he wants to fly, but he says to go ahead one more time.

The tow is short, but directly into the wind. Release is at 1100 feet, but no lift. I fly downwind to about ¼ mile north of the north shore, trying to get under Jim. By this time, I have only 400 feet, so I start to turn back, but then, WHAM, 800 fpm up! I find the core and it carries me right up past Jim, who is at 2,700 feet, to cloudbase at 3100 feet. I fly away from the cloud to keep VFR (Visual Flight Rules) separation, but am still climbing, finally topping out at about 3,400 feet. Ray has flown south and lost the lift, and is landing. Jim has now flown a mile to the west and is climbing up to my altitude, so I decide to follow him. I get there at about 2500 feet, and immediately hit 700 up, which again takes me to cloudbase. Then, strangely, Jim leaves the lift and starts descending, finally landing after a 1½ hour flight. I found out later that he thought I was Roland, and was landing so that I could fly the Mega, a glider we were sharing at the time.

I have now been up 45 minutes, and a nice cloud street is forming, so I decide to go for it. I fly north under the street, keeping well clear of the control zone to the east.

After about 5 miles of straight ahead flight, I have not lost my altitude, and am having to pull the bar in further and further to avoid going about 2600 feet. Then I reach a wide area between the clouds, and have about 100 fpm up. The cloud to the north is beginning to get a bit darker, and it is evident that it is fast becoming a thunderstorm. I circle in the clear area for about five minutes, and the lift is getting stronger. It is now 300 fpm up, and I am at 3600 feet, well above cloudbase. I begin a straight line course to the northeast, skirting the rapidly building cloud, which is now beginning to shoot roll clouds under me. The air is beginning to get a little more rowdy and cold as the rolling edge of the storm starts to curl up. It is as if it were a giant surf, with the wave coming up from underneath and breaking high above me. The sight is awesome. I am now at 4000 feet, and in the curl, which is not solid but has more of a dark, wispy appearance. I expect some violent air, but only receive some very strong twists, which twice turned me up to a 90° bank, from which recovery is fairly easy. It is clear, however, that it is time to leave this thing, as quickly as possible.

Now at 4200 feet, I turn due east (being well clear of the northern edge of the control zone). I begin cautiously bringing the bar back, as I am unfamiliar with this glider. I smoothly accelerates with no adverse yaw or roll. Some very solid scud clouds are now forming under me, and are moving in front faster than I am going. I bring the bar back to an arms locked position, and am now gaining on the clouds, but losing no altitude. I hold this position for about 7 minutes. My head is swivelling in all directions, for I am passing through the straight-in approach path to Orlando International, about 15 miles to the south, and I am somewhere near the glidepath. One 727 passes by to the south, in a left turn, about ¾ of a mile away, right at my altitude.

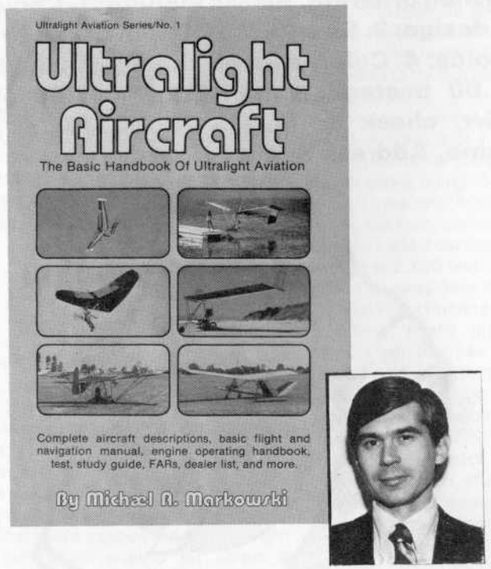
By now I am in the clear, 3800 feet and have 200 fpm down. It is time to find some more lift. I head slightly south, toward a cloud. I arrive under it at 2200 feet, and be cloud. I arrive under it at 2200 feet, and begin circling in 300 fpm up air. I am now drifting across the St. Johns river, and a very large swampland, with no roads for 5 to 10 miles in any direction. I work the thermal to 2800 feet, but the cloud is breaking up and the thermal disappearing.

I fly due east now, scratching in every hint of a thermal. I can now see Titusville, on the east coast of Florida, and cannot contain myself thinking about making it that far. I find 100 fpm up in clear air, and begin looking for the core. I am now passing over a deserted north-south dirt road at 1500 feet, and there are 5 more miles of swampland between me and Titusville. Although there is a possibility of my hanging on to this thermal and drifting with it, I decide the chance of landing in the swamp, miles from civilization is not worth it, so I fly back to the road and touchdown at 3:45 p.m.

After about 20 minutes a couple came by in a jeep. They ask where I came from (I am dressed in bathing suit and T-shirt). When I tell them, there is a pause, then great laughter. Then, "...now where did you *really* come from?" After I take them to the glider, they offer me a ride to the nearest town, which I graciously accept.

The flight duration was 2 hours and 5 minutes and the straight line distance is 28½ miles. (The path which I followed was 35 miles long.) At 28½ miles, this is the third longest flight to my knowledge in the state of Florida.

BOOK REVIEW



"ULTRALIGHT AIRCRAFT"
written by Michael Markowski

"Ultralight Aircraft" is the newest book in a series from Ultralight Publications. Two predecessors include "The Hang Glider's Bible," and "The Encyclopedia of Homebuilt Aircraft." Markowski also once manufactured hang gliders and put out a hang glider periodical, so his background in our sport is solid. He was associated with Tom Peghiny and the then Sky Sports gang, including author Dan Poynter. And Markowski designed a three axis control Princeton sailwing configuration which was written up in *Scientific American*. Further, as his advertising informs you, he is conventionally trained as an aeronautical engineer. All this gives Markowski a platform from which he can disseminate ultralight aircraft information with credibility.

"Ultralight Aircraft" is divided into four sections. The first is the heart of the book, categorizing 42 of the current ultralight aircrafts available today. It will share a common problem with all attempts of this kind in that, with the passage of time, many manufactuers will fail, others will change models, and hopefully only a few will prove to be un-airworthy crafts. But since reprintings can and will correct these alterations, it is fair to say this is the most comprehensive listing anywhere of what you can buy. Markowski begins with a very well deserved word of caution regarding performance figures. His information comes largely from the manufacturers. Markowski gives his own basic description of design and flight criteria and it makes helpful reading. Drawings are frequently provided and are most useful. Also, plenty of photographs break up the fact-intensive commentary. As stated, this is surely the most concise and easily grouped rundown of all the crafts to be had in 1981. This section fills the first half of the book.

Section Two is a basic ultralight flight manual. While several of the major manufacturers provide rather complete flying information with their machines, the reader looking to buy and inexperienced with ultralight flight could very well justify the price of the book by this section alone. It seems competently written and is not so terribly dry as many attempts of this type tend to be. It consumes the next 50 pages of the 288 page book.

The relatively short third section on ultralight propulsion, including engines, propellers, and troubleshooting will undoubtedly make some of the most important reading for a hang glider pilot adding ultralights to his or her logbook. In the case of these aviators, the flying may come easily, but engines and propellers are new entities which can cause considerable consternation. Again, Markowski writes with awareness and clarity.

The last section holds all the appendices and lists. While readers frequently skim over these area, they offer valuable reference sources. And for the most part, this section will not deteriorate with time, having been established in conventional aviation. However, the ultralight dealer list is very incomplete, and has several spelling errors which helped alert us to the fact that a number of dealers listed represent long-since-departed businesses. The manufacturers list is better, but has a few of the same problems. These are very challenging lists to present, though, and not at all worth faulting the book as a whole. One little thing that peeved us is that the magazine in which you are reading this review, did not make it in the periodicals list.

In summary, *Whole Air* can genuinely recommend Markowski's "Ultralight Aircraft" for anyone with a burning or a passing interest in flying or owning an ultralight aircraft. At $12.95 for the paperbound, or $19.95 for deluxe hardbound, you will part with more change than usual to obtain this book, but you will not find another book which offers everything in one place.

For more information, or your own copy, write to Ultralight Publications—P.O. Box 234W—Hummelstown, PA 17036. Add $2 for postage and handling.

—Dan Johnson

DIRECTORY

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Easy Riser, Wing Ext. "O" porosity sail. Red with yellow rudders, Zero time. $500. 901/285-9490.
22

SAN FRANCISCO SCHOOL OF HANG GLIDING

Private and Group Instruction by Certified Instructors. Call 415/731-7766 or 992-6020.
22B,MXB

HANG GLIDER EQUIPMENT COMPANY

For All Your Hang Gliding Needs. 3627 Taraval, San Francisco, CA 94116. 415/992-6020.
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THUNDER BALLOON

Balloon, Thunder, AX8-105. Less than 40 Total Time, Dual Burners, Will consider trades. $11,500. Call 904/651-0881, or write: 24 Marlborough Rd. Shalimar, FL 32579
22,23

EIPPER DOUBLEQUICK

$4,000.00 Eipper Double Quick, Five hours TT — Yellow with Green and Orange stripes over engine — plenty of space for Logo work. Gary Weyman 404/452-0007, or 404/223-0132 after 6:00 p.m.
22

QUICKSILVER "B"

Quicksilver "B", like new sail, bag, seat, $400. Will ship anywhere 213/374-7552.
22

SUPINE HARNESS

Supine harness by Sunbird, perfect condition, $70 or trade for prone. 213/374-7552.
22

PHOENIX 8

Phoenix 8, excellent condition. $250, will ship anywhere. 213/374-7552.
22

ENGINE AND PROP

MAC 101 engine, 1 hour since rebuild, 28" Fritzen Prop, mount for Quicksilver. $250, will ship anywhere. 213/374-7552.
22

FRIGATE AIRCRAFT

FRIGATE AIRCRAFT, INC. 6321 NW 37th Avenue, Miami, FL 33147. (days) 305/696-4449; (eve) 305/888-5675. Trikes, Eagle, Hummingbird, Pterodactyl, Moyes, Ultralite Products, Wills Wing and Flight Design. Export to South America and Europe. Sensor 210E (large) $895; Fledge IIB $895; Lazor II (175) $749; (NEW) Viper 175 $1299; Osprey 220 $699.
22B

USED GLIDER SERVICE

Looking for a used glider? Selling yours? In 213 and 714 Area codes, call Doug Hertzog's Hang Glider Referral Service, at 213/436-4891.
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SAIL REPAIR AND CONSTRUCTION
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CUSTOM SEWING

AERIAL DYNAMICS is owner-operated and seeks to provide service and products to pilots on a small shop basis. Less bother than going thru dealer networks, it is also more personal than too-distant manufacturers. By direct contact of craftsman to customer, AERIAL DYNAMICS can provide reasonable prices, quality work, and prompt service. Expansion of these services is anticipated in the future. For further information, call Dennis van Dam at 404/820-1962. Or write AERIAL DYNAMICS, P.O. Box 151, Wildwood, GA 30757.
†See cover of May/June *Whole Air*
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ELSINORE SKY SAILS PRESENTS

FOR MOTORIZED ONLY: The 28 foot Rapid Deployment Parachute! Easy chest mount container, fly away diaper. Demand the best for yourself, eight pounds of life insurance! . . . Elsinore Sky Sails, 15524 Grand Avenue, Lake Elsinore, CA 92330. 714/678-4980, 674-3288. Dealer inquiries welcome. Also the 22 foot R.D.P. in stock, all colors . . . $425, 5 pounds.
22-23B

EIPPER QUICKSILVER

1981 Underwing Yamaha engine Team Eipper colors. Brand New, never flown except test flown by Crystal. Must sacrifice due to hospital expenses incurred on motorcycle. $3,200. Gary Taylor, Blue Ridge, GA 30513, or call 404/632-3657.
22

EXCITING NEWS

Glenn Muehlstedt, the pioneer in Glider and Ultralight insurance is now able to offer to you a comprehensive liability policy for dealers and schools that provides:

1) A combined single limit of liability in the amount of $500,000.

2) Premises Liability for your training sites (and we will include land owners etc. as additional insureds.)

3)Premises Liability for your shop or store.

4) Liability protection for the student while he or she is training at your sites.

5) We will include as the named insureds:
A) Your business.
B) Your employees (including instructors).
C) Students while training.

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

1) Flat annual charge of $150.00 per store or shop.

2) Flat annual charge of $100.00 per training site.

3) One time $20.00 charge for *powered* training student, or $8.00 for *foot-launched* training student, for the entire training program.

4) Flat annual charge of $50.00 per instructor. Also we are able to offer an accident policy for students which will provide $25,000 coverage for loss of life, medical expenses, and other extensions caused by a hang gliding injury for a flat charge of $25.00 during the entire training program. (This is a *super* program.)

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

HOLMBECK & ASSOCIATED, INC.
Glenn G. Muehlstedt, Vice President
612/835-5365

PRODUCT LINES

CHATTANOOGA, TENN. — It is the end of 1981, and reflecting on changes in the year shows a continued divergence in the success of various firms. The year began with **UP's Comet** beginning to really take hold, as the number of their contest victories began to mount. This was followed by scurrying by most, but not quite all, other manufacturers to "clone" the Comet for their own hot model. Till the end of the season, no one really took any strides to replace "Comet-osis." Finally, however, **Bob Trampenau's Sensor 510** began to edge out the ultra-popular UP design. (Watch for an upcoming Pilot Report on the Sensor 510.) Wills has recoiled with a prototype **"Duck"** which did well with former UP Team pilot, Rich Pfieffer, at the Japan World Meet. This brought Flight Designs to announce work on their **"Skunk."** Plus other interesting designs showed in Japan, namely Graeme Bird's **"Shark"** (a 100% double surface design), LaMouette's (Atlas mfr) **"Azur,"** Guggenmos' **"Wings,"** and Schonauer's **"Firebird."** On the home front, **Manta** has released their **Fledge III** at last. And **Bill Bennett** has a new line, the **X-Series,"** (see pg. 10). But not everybody thrived throughout 1981... as we record more manufacturer losses. Summing up '81, **Sunbird** was eased out, troubled with aerodynamic problems on their Challengers; **Highster**, who according to Bennett, will end business, a contributing factor supposedly being a failing grape crop for the family wine business which had helped finance Highster at times; **Sky Sports** was sold by long-time owner, **Ed Vickery**, and the new **Sunny Sky Sports** has yet to indicate if they will really fill Ed's shoes, production-wise; and earlier this year we told you **CGS Aircraft** joined the the crowd of companies who lost out to an internal power shift. As the Moyes team has finally worked out problems on the **Meteor**, US Moyes will revive and take their place among the Big Five of true production-oriented hang glider firms, a list that included U.P., Wills, Flight Designs, Bennett, and Moyes. Some smaller outfits are prospering, though, and help round out the marketplace. **Pro Air** is coming on slowly, but steadily and cautiously, as owner Dick Boone has seen what can happen if you try to grow to fast. **Seedwings** and **Stratus** hang on to their loyal customers by continued refinement and development, and **Spectra** and **Sport Aviation Mfrs** finish the list, tho these outfits are really to new to be judged with the others yet. Incidentally, we were just informed by Spectra's John Reisig that they will be introducing a new glider called the **Sonic**. The 150° nose craft has a 90% double surface, and internal cross-bar, with foam leading edges. Sounds like a good step in their design evolution. But the total now comes to only ten American glider builders, and that may be a stable number for U.S. hang gliding. One name is noticeably absent — **Odyssey** and its American **Vampyr**. Dave Aguilar reports they, too, fell prey to the over-growth temptation, and things got a bit out of hand for the Massachusetts firm. But, far from out of business, as they have government (and other) contracts for nan-hang gliding products, they have had to retreat and re-trench with a temporarily smaller enterprise. Aguilar sounds confident that his certification and production of the Vampyr WILL resume. So now, let's keep looking at details of the strong concerns. **Pete Brock's U.P.** (which, according to a Nov 1 News Release, seems to be changing names to UP Sports, Inc) has had the best year in their history, claiming a sales count of 1500 Comets, 1000 of which were 165's. This has really fueled their drive, and they have expansion planned into the board-sailing market, plus more gifts and accessories, but mainly, their concentration is now on their intermediate ship, the Gemini (see pg. 14). They are an understandably very thrilled flight company, and congratulations are in order for a job well done. **Wills Wing** enjoyed a profitable year as well, doing very respectably with their Harrier, re-known for its superior handling on a very tight wing. They have quietly been building a large number of Ravens as well. Now their "Duck" is arousing some attention. While they emphasize it is NOT yet aimed at production (hence that "catchy" name ?), the fact that Pfieffer chose it over the Sensor 510, has put them in a pinch to make a Go-No Go decision. The "Duck" is a Harrier-like planform, with 60% double surface, enclosed cross-bar, 130° nose, a foot and a half more span (and more area thereby; about 188 squares), faster than the Sensor, with Wills handling and very easy landing, info from Prez' Rob Kells. Kells has also been busy with three other interesting projects, first, a **ballistically deployed chute.** Not just a spring-loaded affair, but a .22 (calibur) charge which fires a projectile, which literally yanks out the canopy tor the shortest deployment time, by half or so, of any other system flying. He has done two in-air (balloon-towed up) deployments with perfect results. This follows over a year of development by designer, **Boris Popov**, owner of Northern Sun. Second is the Wills **Aerobat**, a specially built Harrier for aerobatic flying. Definitely NOT for production (yet anyway) this idea is a super-extra-stout ship capable of tumbling without failure. Of course, it requires a negative-G harness system. Third is **air-towing**. Yep, this near-reality involves successful air tows between **Eipper VP, John Lasko** pulling Kells on a Harrier with a Quicksilver MXR. The slower flying tug (slower than the Ptug) performed flawlessly with no lock-out problems, even as Lasko towed Kells in relatively small circles around the Eipper factory in San Marcos. Kells used a running launch with a wheel-equipped control bar. While this is still most emphatically an "experts only" proposition, Kells expressed that to tow-knowledgeable pilots, no problems are present that time and experimenting cannot solve. The bridle lines were attached to two spots on the trailing edge of the main wing, and two spots on the axle, running 200 feet back to a three point bridle on the Harrier. "Three ring circus" fail-safe releases were used on each end. Kells agreed with our forecast (May/June *Whole Air*) that, "... in one year, air towing will be commonplace." In the interim discovery period, he views the flight testing of production crafts to be the ideal way to learn more, while accomplishing a worthwhile activity. Up the coast at Flight Designs, a whole new world is opening up due to their affiliation with the technological giant, **Pioneer International**. Prez Marty Alameda has been traveling widely (frequently to the Connecticut headquarters of Pioneer) and increasing communication with the new parent company. **Flight Designs'** position is quite enhanced with the planning, financial, technological aid of Pioneer. The newest product from Flight Designs is their **"Jet Wing ATAV"** (see pages 16 & 17). This deluxe trike entry will be shown in November to most Flight Designs dealers at introductory seminars. The seminars will be held at several locations, to reduce travel cost, probably being the west coast, Denver, Texas, the Southeast, and Connecticut. The Chattanooga event is scheduled for Nov 21 and 22, about the time this issue is being delivered. By the way, Alameda figures the Kawasaki powered ATAV could perform air tows, at hang glider speeds. Time will tell. Speaking of trikes, Bill Bennett informed us of a major trike fairing project funded by, of all people, the **Yamaha Corp.** They alledgedly spent $25,000 on an extra-fine Kevlar fairing which even includes the nose wheel. Very interesting that Yamaha should spend this energy and money, we think. Alameda was fully aware of the fairing, and we might see the ATAV carrying a fairing option, down-the-road. At **Eipper**, a number of management changes have happened, see pg. 12. The new staff has cleared up some tough problems for the largest ultralight manufacturer. Delivery is way down now, to 2½ weeks, and a "spot build" program of full assembly of randomly chosen kits coming off the line, proved that the changes implemented by Lasko and crew were successful. In some last item round-ups, we have heard of a British "Brain Drain," as some top English names are coming to America. Most notably, **Brian Milton** is in the U.S.A. looking over a change to Yankee broadcasting. Also, the **Fack Brothers** are thinking of re-locating in America, and HiWay (Demon) designer, **Bob England**, has already made the move. Another move brought regular *Whole Air* artist, **Hank Syjut**, to the mountain-top in Georgia, where he is building a new studio to further his work. His "Eagle Rock" settlement is unique in that it is land held by several hang glider pilots. They are all building their own homes (including saw milling all their own lumber) on several bluff acres, with their own private flying site. To all our readers and friends (about 15,000 of you now), the *Whole Air* staff wishes to convey the warmest Holiday '81-'82 greetings, as we close another year in our exciting sport. Got news or opinions? Send 'em to: Product Lines, Box 144, Lookout Mtn., TN 37350-0144.