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NOVEMBER — DECEMBER 1980

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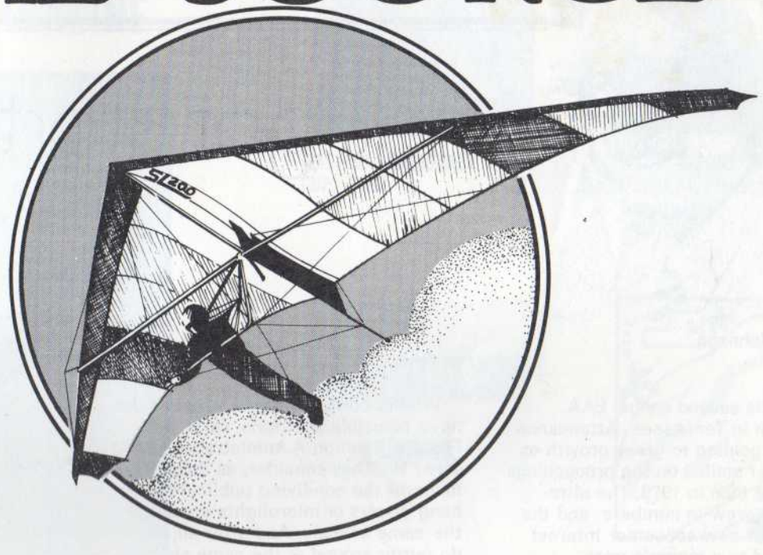

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A source is a place you can count on as a reliable center for products, information and services. At Flight Designs, we've taken some unique strides in the ever-expanding business of hang gliding so we can offer the best of services to the recreational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

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

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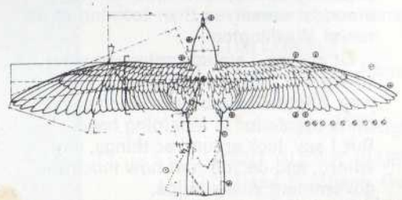
Our policy of maximizing the price to performance ratio in all our products so we can offer the consumer true value for their dollar has always been and will continue to be the bottom line at Flight Designs.

The Proof is in the Performance.

Congratulations to 15-year-old David Pugh who flew 7 miles cross country, launching from 420-foot Morningside Recreation Center in his 175 Lancer.



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TULLAHOMA '80

Dan Johnson

what got started?

It was the second annual EAA Convention in Tennessee. Attendance estimates pointed to great growth as the weather smiled on the proceedings much more than in 1979. The ultralights also grew in numbers, and the heartbeat of new consumer interest accelerated to a jogger's pace.

Representatives of most major ultralight companies promoted their products, and conceived a new organization . . . the P.U.A., or Professional Ultralight Association. Not just aircraft manufacturers, this group includes all firms producing original equipment plus the media, *Glider Rider* and *Whole Air*. With a $250 member fee, not everyone will join, but most will feel pressure to gain a voice.

Does it welcome hang glider producers? No. Should it? Not necessarily, though interaction is likely and in my opinion, vital. But here the waves actually part.

The argument was put forth by Larry Newman of American Aerolights that if regulation comes to ultralights, it will be the fault, not of "motor heads" buzzing into airports without a brain, but of glider pilots, who may soar thousands of feet into controlled air space, unaware of their transgression.

This conviction is just about the opposite of what is believed by most glider pilots. To the "quiet" pilots, the mere intrusion into any level of airspace by an ultralight airplane is the situation most likely to bring Washington bureaucrats into the action.

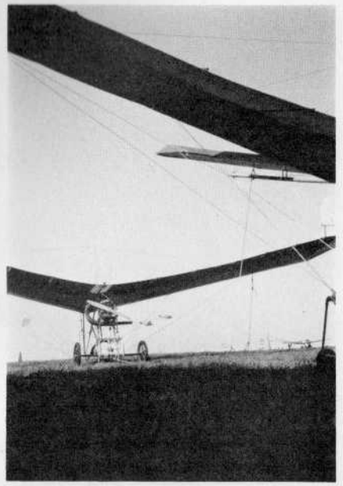
Who is correct? Actually, both sides have plausible positions. Does the Federal Aviation Administration (FAA) care? No. They consider, as does the mass of the non-flying public, that hang gliders or microlights are all the same animals. And after all, we do putter around at the same slow speeds, which I consider to be a primary means of grouping all of us.

Ultralight, ultraslow, powered, or un-powered, the Man is lumping us all together and threatening to issue a NPRM (Notice of Proposed Rule Making). If passed, and the "if" should be capitalized and underlined, the resultant law could crimp our free-flying spirits to an unacceptable degree.

What are we going to do about it? Darn little, I am inclined to guess. Scattered, unorganized efforts may be mounted to oppose regulation (in whatever form it takes . . . a start means future growth). But we may probably spend more time battling amongst ourselves than teaming up to resist Washington.

Of course, I am assuming we *want* to fight it. Not everyone feels that way. Several members of each camp think regulation is a helping hand. But I say, look around at things, anywhere, and decide just how much the government really helps.

The point is this . . . the EAA wants us, they formed a new division, a function they truly did not wish to do at first. The need was too great, however. AOPA (Aircraft Owners and Pilots Association) wishes to take us



in their fold, which is much larger than the EAA. And lots and lots of people feel there may one day be many more ultralights flying.

But right now, glider pilots are the larger group (of ultralight, or ultra-slow enthusiasts) and are the more organized. If we all got together, we just might generate enough "Leave Us Alone" responses to knock down the unnecessary NPRM. We can and do regulate ourselves, darn well in my opinion, and we should keep it that way. The FAA considers us as one body, why not resist their advances in the same way?

On the other hand, we could just keep on slinging mud at each other, waiting apathetically for the Law to come in and supposedly help us help ourselves. It's pretty much up to everyone of you . . . what's getting started?

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ON THE COVER:
In flight formation . . . with John Lasko on the photo Quick, catching Rob Kells and Dan Racanelli, on Harriers as they slide in close.

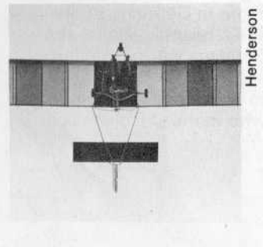
FEATURES

Henderson

MASTERS, NATIONALS CUP, 1980 25-27

Chris Voith

PILOT REPORT 28-32
Ultralight Products Comet



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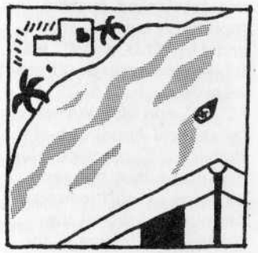
ULTRALIGHT AIRCRAFT REPORT 36-39
Eipper Formance Quicksilver



TOWING 40-41
Lockouts

A PILOT'S PERSPECTIVE

TECH PANEL 18

SNEAK PREVIEW 14
Harrier, Viper, ASG-23

ULTRA LIGHT TOPICS

FORUM
Reader Commentary 6, 7

EURO-MARKET
News from Abroad..... 8

MOTORIZED
Information Outlet 10

USED GLIDER BLUEBOOK
Used Purchase Guide 20

WAM DIRECTORY
Where to Buy Source.....44-46

PRODUCT LINES
Consumer News 50

Henderson

See subscription order form, page 47

FORUM

UNIVERSITY OF LOWELL DEVELOPS NEW GRAPHITE GLIDER

I have been working for the past two years with a graduate student who at this time wishes to remain anonymous, on developing a Sensor graphite glider. This graduate student did all the calculations necessary to design tubing that was at least 1½ times stronger and 40% lighter.

Graftek division of Exxon fabricated approximately 30 lengths of 2" and 1½" O.D. x .050" wall tubing and spun in different weaves such as 5°-25°-30°-45°-60° and 90°. We found by several bending tests that the 25° graphite tube had just about the same modulus or stiffness as Aluminum. I did all the cutting and drilling of the spars with carbide tipped saws and drills. At the keel crosstube and deflexor locations all the sleeves were secured in place with 2 ton ½ hour epoxy, and all bolt locations were bushed with stainless steel.

The glider, with an overall weight reduction of 25% means improved speed, greater penetration, control response and reduced sink rate. The graphite tubing definitely helped me bridge the generation gap by placing 2nd in Region 8 competition, qualifying me for the U.S. Nationals.

It is rather expensive now but this graduate student and his associates may go into production soon. If you have an interest in graphite spars, please forward your questions to the following address:

Bill Blood
University of Lowell
Hang Gliding Club
1 University Ave.
Lowell, MA 01854

Sincerely,
Bill Blood

Dear Editor;

I am enclosing a glider picture which ought to be of interest to your readers. As you'll see from the article enclosed Halvor Garos and I built a very well designed glider in 1931. It weighed only 40 pounds and was equipped with a stick controlling the elevator and ailerons. Garos had done some gliding at the famous Wasserkupfe in Germany in the early twenties when the Germans were prohibited under the Versailles treaty to build airplanes equipped with motors. It's my contention that the Germans might have come up with an entirely different airplane if the rest of the world hadn't continued to build planes with bigger and bigger motors.

Of course I never claimed to be the "inventor" of hang gliding but I'm pretty sure I was the first to build and fly a ski glider.

Sincerely yours,
Carl Messelt
Los Angeles, CA

Article appeared in SKI Magazine, October, 1979, Written by Mort Lund

1931, Carl Messelt with his 14 foot, aluminum and canvas, "ski glider".

Dear Editor,

Buyer Beware!

In the past six months, I've talked with many people who are starting to fly ultralights. Some have a truly amazing number of hours in small aircraft, some in jets, some in hang gliders, others with no experience at all but a true desire to fly. Most of these people have approached ultralight training with respect for the potential dangers. Many of them have, for all their experience, had an uncomfortable (at the least) first flights. Sometimes the aircraft was at fault for many different reasons (bad design, bad assembly instructions, bad materials—BUYER BEWARE!). Often the cause was due to the pilot not spending enough time on the first steps of training.

Please get good, no-rush instruction with your ultralight. Get Jack McCornick's and Dennis Pagen's instruction manuals. Be meticulously perfect at each stage of training. Spend a minimum of one hour taxiing, until you're a pro. Then fly inches (just inches) over the ground. Very difficult until you master the controls! Maximum speed —minimum speed—then at one foot altitute—etc. . . . S turns at five feet? YES.

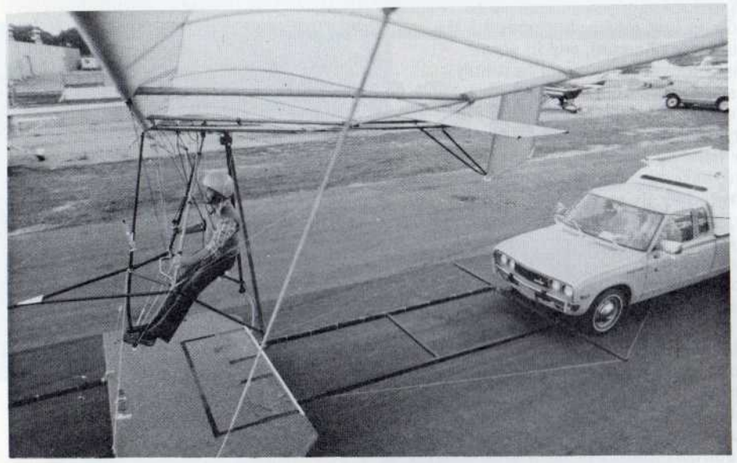
Hours and hours of beautiful sunrises and sunsets await your graduation. You'll be able to relax completely and take it all in. Oh friends, take care, it's so lovely—low, slow, and free. There's no need to hurt yourself. Better to take extra care.

Yours truly,

Judy Hopkins
Downingtown, PA

GLA, Inc., the producers and distributors of the Minibat sailplane kit, have opened a new production facility near their administrative offices in Muskegon, Michigan. The facility, located in nearby Hudsonville, will increase the company's effective productive capacity in order to meet the increased demand for Minibat kits. As before, individuals are welcomed to contact GLA, Inc. for a tour of the facility and, of course, a personal visit with the company Minibat. GLA, Inc., 841 Winslow Court, Muskegon, Michigan 49441 (616) 780-4680.

Also, GLA, Inc. has just completed the development of a unique new "learn-to-fly" system exclusively for the Minibat builders/pilots. Actually a beneficial by-product of the Minibat's compact size, the learn-to-fly system incorporates the use of a land or auto-based tripod upon which the Minibat is mounted. This method, coupled with gradually higher auto tows, allows the student to safely learn the stick forces required to operate his or her Minibat in a proficient manner. More information on this system can be obtained by contacting GLA, Inc.



AN ULTRALIGHT INDUSTRY FIRST!

Ultrasport, Inc. of southern California has developed a flight simulator which allows beginning powered ultralight pilots to fly at low levels with virtually zero risk.

This moving platform permits the aircraft (an Eipper Quicksilver) to fly up to four feet high and five feet horizontally while traveling down the thirty-six hundred foot taxiway at a local airport. Each pilot can experience control response lags, stall characteristics, cross-wind effects, downwind speeds, and overall 'feel' during evenings after work. By the time UltraSport students are ready for supervised solo there are almost no possibilities of pilot-induced-oscillations, reverse control inputs, or sensory overload. For further free information call or write:

UltraSport, Inc.
P.O. Box 3700
Simi Valley, CA 93063
(805) 581-3395

A BUSY SEASON

While Steve Moyes spends his time at the competitions, the rest of the Moyes Boys are busy building the new kite factory in Michigan.

Designed by Henry Braddock for hang glider and micro-light manufacture, the building with 6,000' of floor space and 2000' of loft space is nearing completion. It will be operating before the snow falls.

The pictures taken while Steve was in Japan, show Henry, Jim, and David Braddock and Bill Moyes on roof construction.

MOTORIZEDDDDDD

The ultralight pilots in the northwest now have a new organization known as the "Minnesota Ultralight Association".

The club, soon to be incorporated, is aimed at the preservation of unregulated powered flight thru a system of self regulation as well as close cooperation with the guidelines set by the U.S.H.G.A. and the E.A.A.

The members also plan to organize fly-ins and competitions, cross-country flights and camping/fishing trips are also being discussed.

The members elected a three member board consisting of Kevin Von Kuechenmeister of St. Paul, as president and treasurer, Bill Young also of St. Paul, as flying site procurement and safety officer, and John Kueffner of Minnetonka as secretary and head of publications/communications.

This is a brand new organization and an enthusiastic one. Anyone interested in becoming involved with this group can do so by writing to:

Minnesota Ultralight Association
630 W. Larpenteur Ave.
St. Paul, MN 55113

Kevin Von Kuechenmeister
President, M.U.A.

EURO-MARKET

By
Noel Whittall

POPHAM, AUGUST 23rd - 25th 1980
U.K. POWER COMES OF AGE

Most nations name their public holidays after saints, great leaders or revolutionary events. We British take a more practical line and celebrate the vacations of the financial institutions and call the days "Bank Holidays". On our August Bank Holiday the British Minimum Aircraft Association held a fly-in at Popham in the South of England.

Popham is a rarity in the British aviation scene—a family owned and run private airfield where people fly aeroplanes for fun—and for the three days of the fly-in that's just what everyone did.

This side of the Atlantic, hang gliding has developed almost exclusively around the flexwing; Easy Risers, VJ23's, and until very recently the fledge, are only rarely spotted on our hills. This is reflected in the powered scene where progress has been very tentative and fragmented until this year.

Now in just a few short months the picture has changed, and in some areas the two cycle motor is ruling the skies. Three clear influences have achieved this: Jack McCornac's Pterodactyl, handled very professionally over here by the Baker Brothers: the Eagle, assembled in Scotland and marketed by Brian Harrison's Eurowing operation, and now the Hiway "Skytrike", from the home of the Super Scorpion.

For the first two days the weather gods switched off the wind machines and permitted the ultralights to take to the sky unhindered. I don't know if anyone was counting, but there seemed to be a perpetual line of machines bumping over the rough ground to take up their positions at the start of the grass strip. Circuits were established and uneventfully flown throughout the day even though the same air was being shared by Cessnas, Pipers, Tiger Moths and other assorted recreational aircraft. By the third day the wind increased and conditions became rather challenging—even so by English standards two good days out of three is far above average!

In the air the Pterodactyls appeared to score for sheer performance, certainly showing up an impressive climb rate, although at the expense of a strident exhaust note. The Eagles flew well and have a great appeal as they porpoise gently along looking like something from a past age. Surely one robust engine would be less hassle than the two clutched Chryslers currently fitted though?

The trikes all looked good in the air, leaping off the ground after a short run but then sometimes needing careful handling to get through the occasional turbulence and sink near the trees. Three or four U.K. manufacturers are on the verge of full production with tricycle units, but Hiway has a slight lead. Their little 160cc machine hooks onto a number of different gliders with but slight modification: It's well engineered, easily car toppable, and will probably have most appeal for the flexwing-minded Britisher. I'll be letting you know about my own adventures with one in a later issue.

One thing is quite clear—Foot-launching is out; the only sample present spent the days lying on the grass with a "For Sale" notice on it. Wheels rule. Even Alan Weeks' very effective prone Soarmaster Fledge uses an undercarriage. Weightshift control however, is "in". The trike units pivot from the heartbolt area of the wing, and control is exactly as in a seated hang-glider, the only difference being the foot throttle.

Popham was the showplace for 1980 . . . the next year should be really interesting.

Only three or four years ago, the Turbulent, seen here behind an Eagle being rigged, would have been considered about as minimal as an aircraft could be, having a mere 1600cc's of Volkswagen engine to drag it through the air!

Motorized

This month I'm going to attempt to answer some of the common questions I get about engine operation.

Q.—What is the best way to shut off my engine?

A.—The best way is the same way an aircraft engine, by shutting off the fuel supply. If you shut off your engine by using the kill switch, it won't damage your engine, but it can make the next start more difficult.. Here's why. When running, the engine draws fuel through the carburetor and pumps it up to combustion chamber, where it is ignited by the spark plug. If you use the kill switch, the spark plug no longer fires and ignites the fuel and engine starts to coast to a stop. However, during this time, fuel is still being drawn into the engine, but it is not being burned. Some of this excessive fuel remains in the engine. Gasoline, which has a lower temperature than the oil in your fuel mixture, starts to vaporize away due to residual engine heat, leaving the oil behind. This excessive oil can cause the plug to foul the next time you try to start your engine. By shutting off the fuel supply and letting the engine run at approximately half throttle, the engine will continue to fire until no more fuel remains. You will have proper lubrication and enough oil remaining to protect the engine. Your next start will also be easier because the engine will get a fresh charge of gas and oil mixed to the proper ratio instead of one that has excessive oil.

Q.—Can I put a larger diameter prop on my existing plant and get more thrust.

A.—Probably not. For example, if you have a power plant with a reduction unit that swings a 42" x 12" prop and install a 48" x 12" prop all that will happen is less performance, unless you also change the ratio and/or the pitch of the larger diameter prop. The engine will be lugged down to a lower rpm which means lower hp. Each engine and reduction ratio combination can swing only a matched prop. The larger the prop diameter, the slower you have to turn it. Another point to consider is the aircraft the power plant is on. Many times an engine-prop combination that works well on a high drag airplane won't work as well on a low drag airplane and vice-versa. The propeller is the heart of the entire power plant. Horsepower means nothing if it isn't converted into thrust. Therefore, propeller selection is very crucial to the success of a power plant. So before you arbitrarily change props, consult your power plant supplier for their recommendations or consult a good prop builder.

TIP OF THE MONTH: When preflighting your airplane, always pay close attention to welds, brackets, etc., for fatigue cracks. Wipe oil off and inspect closely. The best location to examine for any cracks is outdoors in bright sunlight. If you discover any cracks, ground yourself and contact your engine supplier. Better be safe than sorry.

P.S. If there are any particular subjects or any questions you may like to see written about in this column, please write to me @ CGS Aviation, Inc., 4252 Pearl Rd., Cleveland, Ohio 44109.

Chuck Slusarczyk
President, CGS Aviation, Inc.

COMING NEXT ISSUE

In the January-February WAM

"Pilot Report" on the Wills Harrier

Harness Testing by Flight Designs and Wills Wing

WAM Interview with National Champion, Tom Haddon

The Cable Simulator, an innovation in training

Hawaii Flying Sites

Another Ultralight Aircraft Report

WAM Interview with Dick Turner of the USHGA Executive Committee

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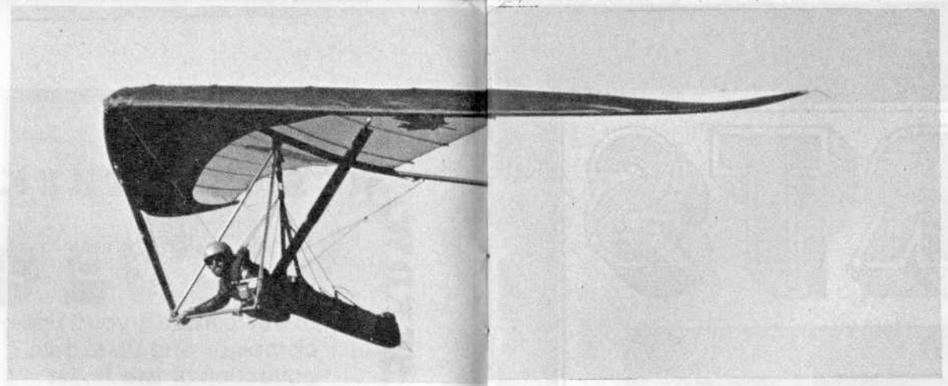
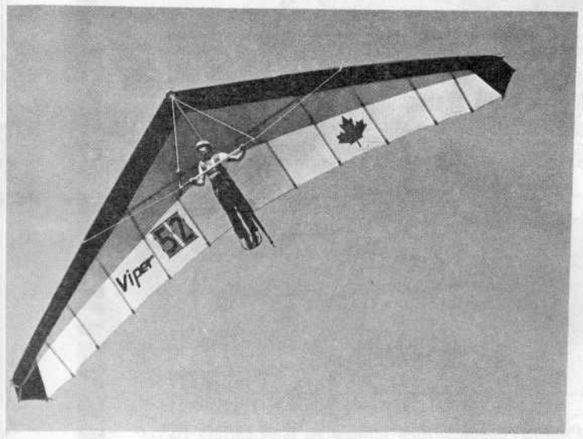
SNEAK PREVIEW

ASG-23, Harrier, Viper



Steve and Mike have done it again, some are saying, as the new Wills Harrier makes first showings around the country. The Wills design team concept, featuring Mike Meier and Steve Pearson, has proven its abilities convincingly to hang glider pilots, beginning where Bob Wills left off. They finalized the Alpha, then proceeded with a super-floater (Omega) and early speedster (Omni), this year entering the Raven, one of the sport's most successful models ever. Now, the Harrier.

In the second contest in which Comets flew, the Harrier made a very effective showing in the tough So Cal Regionals.



Henderson Photography

Bill Bennett's Delta Wing is rarely left behind in the production of state-of-the-art hang gliders or related equipment. Matter of Fact Delta Wing is often the innovator of new concepts. For example, the B.U.S. (Back Up System) was pioneered by Bennett, and today he markets another premier, the Rapid Deployment Parachute (RDP).

With the Viper, Bennett reveals his continuing abilities to "keep up with the Joneses," in this case "Jones" being Ultralight Products, and their widely heralded Comet. Only subtleties differ the Viper and Comet, except price. The $1795 Viper has a slightly different method of restraining the crossbar, and though you will have to look close, the double-surfaced sail cut is marginally altered.

Three members of the 1980 American Cup Canadian Team flew Vipers in the competition. While their team finished in fourth place, and while the meet did not let the new "stiff wings" really exercise their advantages, the Vipers proved to be a competitive design. This is significant as many experts are saying that these late 1980 design entries stand noticeably above the superships of earlier in the year, namely the Atlas, Mega, Sensor, Sierra models.

Really however, Delta Wing is not new to double surface technology, or hidden, floating crossbars. Nor are cambered, reflexed ribs or deflexorless leading edges new to Bennett. It stands to reason that the Viper is a logical design growth from gliding's oldest manufacturer.

Delta Wing can be reached at 13620 Saticoy; Van Nuys, CA.,, 91408 or phoned at 213/787-6600 for more information on their new Viper.

Again at the Nationals, the Comets and Harriers were considered the gliders to beat.

Now, on the market, as of early November, the Harrier starts to come on strong as demonstrated by the aerobatic flying done at the 1980 Cup by Wills president, Rob Kells, and Dan Racanelli (see cover of this issue). This ship features a brute frame, 5.3 ounce, heavily reinforced sail, pre-loaded leading edges, and can boast the finest handling of any of the new "stiff wings."

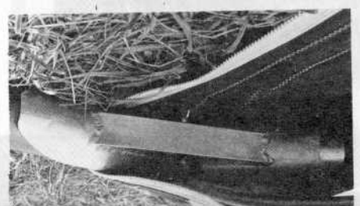
Priced at only $1675, the Harrier can expect to continue the favorable early reaction, with factory/dealer support well established by Wills. A full Pilot Report will be available in the January-February **Whole Air,** but till then you can contact Wills at 1208-H E. Walnut St., Santa Ana, CA 92701.

The ASG-23 was designed as a minimal structure, weight shift control hang glider with as little parasite drag as possible. The number of structural components are approximately one-third those of a conventional all aluminum frame yet the glider is designed to take aerobatic loads (especially negative loads). The weight of the "23" is average at about 63 lbs. even though carbon fiber is used in the structure. The use of exotic materials is necessary for strength and rigidity in the semi-cantilevered leading edge spar and for column strength in the side struts. The glider would weigh about 75 lbs. without the use of carbon fiber yet more carbon fiber would yield a lesser structure weight. At present only enough of this material is used to give a conventional weight and keep costs within reason.

The ASG-23 is as aerodynamically clean as practicability will allow. The leading edge being semi-cantilevered means no cross tube. The keel is pre-shaped and is totally faired into the root airfoil. The fixed tips are also internal. With side struts there is no need for upper rigging which eliminates any interference drag on the upper surface. The side struts are faired and are estimated to have a little less drag than conventional upper rigging.

The sail has a 55% double surface along the full span and can be pulled a little tighter than normal which should offer a little less twist which in turn produces a little less induced drag.

The ASG-23 is currently under development at Canadian Ultralight Aircraft in Lumby, British Columbia and will be available in late December, 1981. CUA is a newly formed company involving the merger of Randy Rouck, Saddle Mountain Soaring School; Larry Croome, Mt. Swansea Soaring School and Tom Price, Albatross Sail Gliders.



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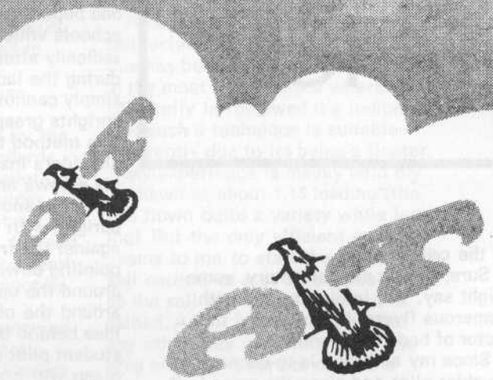

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TECH-PANEL

Dear Tech-Panel:

For a long time my T.O. procedure involved changing hands from the side to the base tube, beginning almost immediately as I started my run—just about exactly as demonstrated in the three photo series of a Raven being launched in the May-June issue of *WAM*. My harness is a prone padded waist belt type with shoulder and thigh straps plus knee hangers. My reason for making this hand change was simply that I couldn't prone out without holding the base tube. Eventually this caused trouble on a cliff launch when I changed hands at a critical moment and I realized then that some changes in procedure were necessary.

In checking out various hand grips and ease of proning out on control bar set up in my basement, I found it very difficult unless I held the base tube. But it suddenly dawned on me that *body CG* was the controlling factor. After adjusting my leg straps more snugly, which then held the main harness support straps lower on my body, proning out required practically zero effort with *any* hand position.

When I next flew the change seemed almost magical. Proning out during T.O. was automatic and I flew some distance with my hands still on the side tubes.

Among a number of flyers who said they always changes hands to the base tube to prone out, I found their main straps attached several inches higher on their body than mine. Their's were placed close to waist level while mine are closer to my hip joint. And since I've become so aware of this point now I see many ads showing pilots flying prone where the support straps seem to be at the butt—even further down than mine. Incidentally, I believe the harnesses of the flyers referred to were designed for use with stirrups, tho these flyers use only knee hangers. This may have some bearing on the matter, but even with stirrups they're only useful after you get into them—not at launch which is the critical time.

Sure, this is all elementary, some might say. But in discussions with numerous flyers, I never heard the factor of body CG mentioned.

Since my ambition is to become an older pilot and since the more I learn the more I find there is to learn, any comments or evidence, contrary or otherwise, would be welcome.

Bill Walter
Asheville, NC

Response from Mike Meier of Wills Wing:

I have always felt that changing one's grasp of the control bar from the uprights to the base tube during the launch run was a dangerous idea. I definitely prefer a launch technique in which the pilot holds the control bar uprights throughout the launch run and into the first few seconds of flight, changing hand position only when the glider is trimmed out, under control and safely away from the hill.

There are a number of aspects of launch technique which affect a pilots ability to maintain his or her grip on the uprights during the launch. One of these has been addressed by Bill Walters; if you need to grab the base tube to get prone, and you need to get prone to fly, you'll have to grab the base tube during your launch run. Bill's solution to the problem seems reasonable to me; adjust your harness so that you can get prone without removing your hands from the uprights. I personally favor another solution. I, and all of the pilots with whom I fly, remain in an upright standing position during the entire launch sequence, without hands on the uprights, and do not go prone until well into the flight. All of my experience is with stirrup and full length harnesses, which are well suited to this type of technique might be used with a knee hanger harness.

One of the critical aspects of the launch technique that will determine whether you can keep your hands on the uprights throughout your launch is how you grasp the uprights during the initiation of your run. There is one popular method taught in many schools which virtually forces you to radically alter your hand position during the launch, because the glider simply cannot be flown with the uprights grasped in this manner. In this method the pilot places his shoulders inside the uprights, with his elbows and forearms behind the uprights, and his wrist inside the upright, with the palm of his hand against the front of the upright, thumb pointing down, and fingers wrapping around the upright from the front, around the outside to the rear. The idea behind this grip is that if the student pilot noses in, the pilots grasp will break free from the upright without injury to the arm or shoulder. The problem is that the glider is difficult at best, and impossible at worst to fly with this grip. As a result, pilots grasping the bar in this way tend to change their grip during the take-off run. I prefer a method of holding the bar in which the arms wrap around the outside of the bar when it is lifted, and the uprights are grasped from behind, in the way in which you would grasp the rails of a ladder you were about to climb. It has been argued that this method increases the risk of arm injury in the event that the pilot blows the launch and noses in. I prefer to concentrate on devising a launch technique which offers the best possible chance for a successful launch. I also feel quite strongly that most intermediate and advanced pilots are extremely efficient in launching skills, and that those pilots who have any significant chance of nosing in on launch should be working on a training hill, with a large set of wheels on the control bar, until their launch technique is perfected.

Dear Tech-Panel:

I would like to find out why most foreign countries (Austria, Switz., France, etc.) don't recognize our HGMA standards? Where do we fall short . . .?? Also—what is preventing us from recognizing the "Atlas," "Wings," "Ranger," "Lancer," etc., gliders that have had extensive testing done in the countries of origin? Where do they fall short??

Peter M. Stolle
Franklin Square, NY

Response from Mike Meier of Wills Wing:

In the past there has been no unified set of European airworthiness standards; each country had a different set of standards. Different European countries didn't necessarily recognize each other's standards, the U.S. didn't recognize theirs, and they didn't recognize ours. There is currently an effort underway to unify testing standards in Europe, and to provide for mutual recognition between European and American standards. This is a complex situation, made more complex by the fact that all airworthiness standards are in a continuous state of evolution as we learn more about hang glider airworthiness and how to test for it. The U.S. made Lancer 4B 170. 190 and Super Lancer 180 and 200 are currently HGMA certified. The Atlas cannot be certified until a documentation package is submitted to and reviewed by the HGMA Board of Directors. This also applies to any other foreign glider. It is understandable that many foreign manufacturers would not choose to incur the cost of HGMA certification since it is not required to sell a glider in the U.S. In some European countries, certification is required to sell a glider, and some American manufacturers have certified American designs to some European standards. Hopefully at some point in the future we will be able to develop a single set of standards. Before that can happen, we will need to feel that we have answered all the important questions airworthiness in a hang glider and exactly what constitutes how best to test for it.

We are currently doing research and testing for a comprehensive article on harnesses and suspension systems. When we have it ready for publication, we'll let you know.

Dear Tech Panel:

Please clarify this idea of a "filled sail technique" for launching. I know this has been mentioned before, and in the most recent issue where the UP Firefly is reviewed it's indicated that such a technique is suitable—apparently due to its being a floater.

My experience is mainly with my Seahawk at about 1.15 loading (tho I've flown quite a variety while learning). But the only efficient method seems to me to start the launch with sail neutral or just barely positive so the sail will inflate as speed is gained. And it seems obvious that any other way will either increase drag or make it hard to carry the glider. Then, in the normal course of the launch, speed-and lift-become sufficient so that you're flying and no longer running. Except possibly in a cliff launch I don't see how launches could be otherwise (of course I do recall *the beginning* when I ran till I figured the time had come, pop the nose up and I'd be flying—or stalling! —then suck in the bar and I'd *really* be flying—hopefully).

Obviously, there's something here I'm missing and your remarks would be appreciated.

Bill Walter
Asheville, NC

Response from J. C. Brown of Electra Flyer:

I think the proper reaction to a loss of airspeed is to pull in. This is especially true when you are close to the ground. Here's why: Rate of sink increases markedly below minimum sink speed. Also, on most gliders controllability deteriorates rapidly as airspeed drops below minimum sink.

The air closest to the ground holds the greatest number of nasty surprises in the form of gradients, eddies, and the like. In order to safely fly through this sometimes bumpy and unpredictable air it is necessary to have sufficient speed for good control.

It would be possible, if you mushed off the ramp into a good thermal cycle, to loose less altitude by continuing to mush than you would by diving. But again, you would be compromising control for altitude, which I think is a bad trade-off.

Dear Tech-Panel:

Has anyone ever tested the breaking point of two or three hang loops looped together in a chain type arrangement?

This often is the case in gliders with a fixed length hang loopsuch as the Wills Wing gliders, in order to give the pilot proper distance from the control bar. I wonder if the loops will test full strength this way?

Cal Tax
Miami, Florida

Dear Tech-Panel:

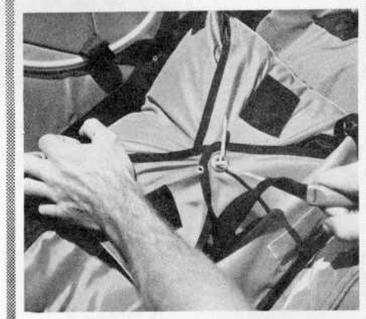
I would like to have more information on hang straps. Especially about the grade and type of thread used to sew hang straps. Also—the preferred weave pattern.

Shane Mehollin
Tampa, Florida

Response from Mike Mier of Wills Wing, Inc.:

SUGGESTIONS

By
Noel Whittall



Notice to all owners of chutes employing cotter pin final closure. A hard pull (as shown) may still not work if the curved "head" of the pin slips through the restraining loops.

Noel found that a small piece of pliable rubber tubing will prevent this problem completely. Of course, this only solves the stuck cotter pin difficulty; there is no substitute for chute preflight.

Here's a simple, effective solution to the stirrup hassle. A length of rubber elastic was looped from the end to the middle. You can forget your stirrup once looped (as shown). Run hard and find entry easier.

USED GLIDER BLUEBOOK

EDITION NO. 16

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

Manufacturer	Year	Model	Size	Clean Price	Avg. Price
BENNETT DELTA WING	76	Phoenix 6B	Jr.	425	350
	76	Phoenix 6B	Reg.	425	400
	76	Phoenix 8	Reg.	450	450
	77	Phoenix 6C	Jr.	550	450
	77	Phoenix 6C	Sr.	425	400
	77	Phoenix 6C	Reg.	500	425
	77	Phoenix 8	Reg.	650	375
	78	Phoenix 8 Super	Reg.	675	450
	78	Phoenix 12	Reg.	650	525
	79	Phoenix 6D	185	875	775
	79	Lazor	190	900	775
CGS AIRCRAFT	76	Falcon V	225	550	450
	76	Falcon V	185	575	400
	77	Falcon V	185	650	500
	77	Falcon V	220	600	475
	78	Falcon 5½	Med.	750	625
	79	Falcon 8	Med	100	800
EIPPER FORMANCE	75	Flexi II	240	400	200
	75	Cumulus V	180	450	300
	76	Cumulus VB	180	450	375
	77	Flexi II	185	525	475
	77	Flexi III	185	575	500
	77	Cumulus 10	Med.	550	525
	78	Flexi III	Lg.	700	600
	78	Cumulus 10	Med.	675	500
	78	Antares	Med.	975	800
	79	Antares	Med.	975	900
	79	Antares	Lg.	1000	900
ELECTRA FLYER	76	Nimbus	20-17	200	125
	76	Cirrus	3	425	350
	76	Cirrus	2	425	350
	77	Cirrus	3	600	400
	77	Cirrus	2	500	300
	77	Olympus	160	575	525
	78	Cirrus 5	C	700	600
	78	Cirrus 5	A	700	575
	78	Olympus	160	700	625
	78	Olympus	180	675	550
	79	Trainer	—	400	400
	79	Cirrus 5	A	750	625
	79	Olympus	160	800	750
	79	Floater	205	900	775
MANTA PRODUCTS	79	Fledge	IIB	1200	1000
MOYES DELTA WING	76	Mini	180	525	400
	76	Midi	220	625	575
	76	Maxi I	200	650	550
	77	Maxi I	200	700	625
	78	Maxi II	200	1000	800
	79	Maxi III	200	1150	875
	80	Stingray	200	1100	1000
	80	Maxi IV	200	1300	1125
SEAGULL AIRCRAFT	75	Seagull III	220	325	250
	76	Seagull III	220	350	275
	76	Seagull VII	174	600	350
	77	Seahawk	170	725	625
	77	Seahawk	190	700	600
	77	10.5 Meter	—	800	500
	78	Seahawk	170	800	675
	78	Seahawk	190	800	600
	78	10 Meter	—	975	875
	78	10.5 Meter	—	900	800
	79	Seahawk	180	1000	875
	79	10 Meter	—	975	850
	79	11 Meter	—	950	875
	80	11 Meter	—	1050	950
SKY SPORTS	76	Kestrel A	185	500	350
	76	Kestrel A	220	525	425
	76	Merlin	160	500	375
	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	800	675
	78	Sirocco II	164	875	825
	79	Eaglet	191	550	425
	79	Osprey 2	175	800	700
	79	Sirocco III	189	1100	925
ULTRALITE PRODUCTS	76	Dragonfly Mk. II	174	575	375
	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	825
	79	Mosquito	166	1200	1075
WILLS WINGS	75	Swallowtail	20-20	350	150
	75	Swallowtail	22-20	225	175
	76	SST	90	600	400
	76	SST	100A	625	450
	76	SST	100B	600	475
	77	SST	100C	750	575
	77	SST	100B	775	550
	77	Universal	100A	650	500
	77	X-C	185	700	650
	78	SST	100C	775	650
	78	Alpha	185	875	775
	78	Alpha	215	950	800
	78	X-C	215	900	775
	79	Alpha	185	950	750
	79	Alpha	215	1000	850
	79	Omega	220	1100	950
	79	Omni	187	975	950
	79	Raven	209	1175	1000
	80	Raven	229	1250	1200

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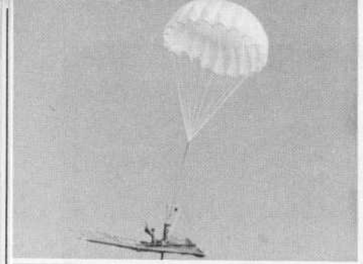
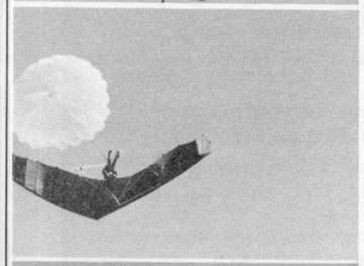
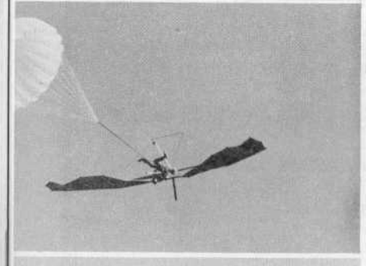






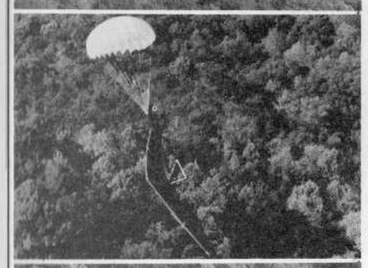
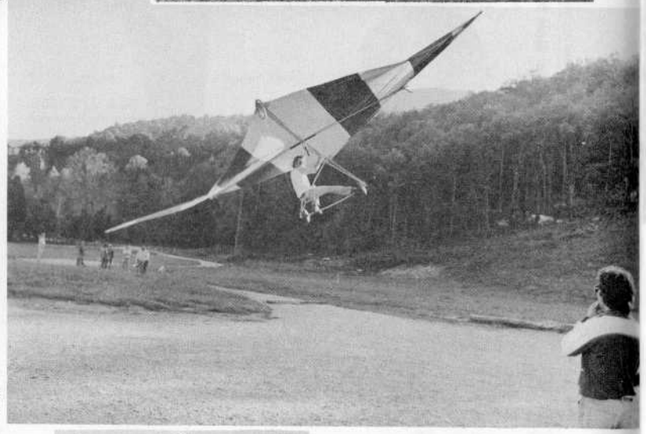


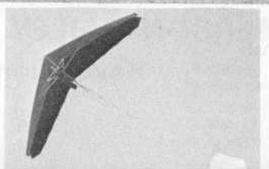
Photo by Vincene Muller

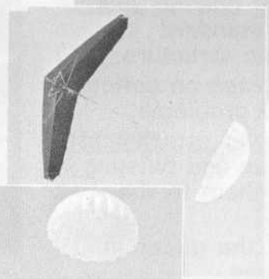
Finding control impossible after tumbling his Moyes Mega, David Ledford deployed to a successful conclusion. Only a single kingpost part broke. Thanks to Vincene Muller for these views.

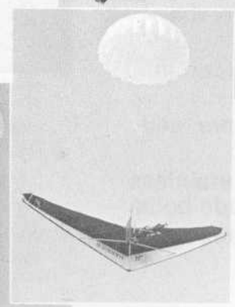
Photo by Chris Voith

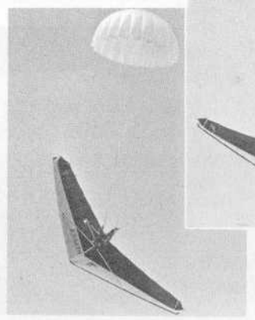


In a demonstration as part of his winning aerobatic act, Wills' Rob Kells deploys one of two chutes he wears. While delayed, due to a stiff quick release, cut-away was successful with a normal landing.









Henderson

Photo by Chris Voith

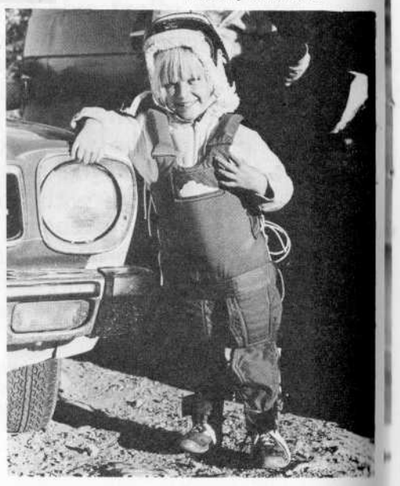


Photo by Doug Barnette

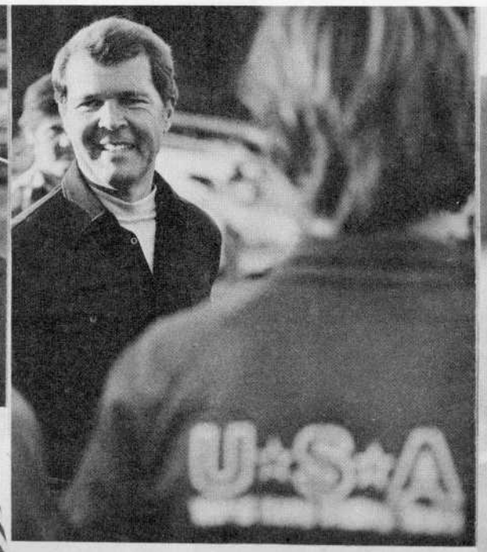
Competition: PAST, PRESENT, and FUTURE

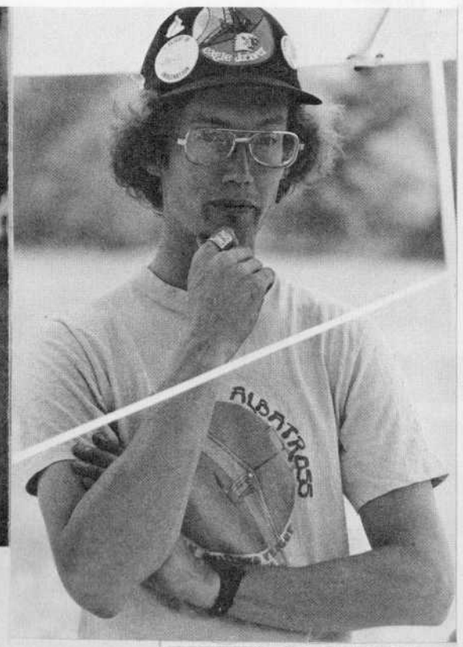
By Starr Tays

To know that we know what we know, and that we do not know what we do not know, that is true knowledge.
—Thoreau, *Walden*
(quoting Confucius)

Hang gliding, as in the rest of life, requires that a certain amount of time and knowledge be accumulated before one could feel able to exert or compete efficiently, thereby, better controlling the results or outcome.

Each new "happening" is a learning experience, with the resultant data being consumed, processed then put back into action to test effectiveness. Finally, it is "filed" under TRUE, FALSE, or INSUFFICIENT DATA.





This process starts at birth. Through test and elimination many things are determined and held, confidently, in our continuous search for better understanding. From atomic science to hang gliding, the process of arriving at state-of-the-art, in most cases, is primarily achieved by the same method, trial and error.

The first hang gliding competitions were our beginning, our first attempts at exerting what we thought we knew. And since, at that time, there were only a couple thousand people who had ever been on a glider the contests were a great proving ground or common ground. They were a chance to accumulate information from someone who perhaps had more soaring hours, or depending on how far back you go, had even soared. Perhaps you could meet someone who was more familiar with the new "high performance" gliders such as a Seagull III, when all you had ever flown was a bamboo standard. The emphasis wasn't so much on the competition, but the social exchange it allowed.

Being able to travel the 1980 "fall" competition circuit was a valuable learning experience on that realm of our sport of hang gliding.

I started my trip off by going to the Canadian Nationals, held this year in Mont St. Pierre, Gaspie, Quebec. In many respects, attending their meet was a little trip back into the past of hang gliding. I mean *nothing* derogatory by this remark as I will explain my comment further.

First, the area where it was held, was a bit like being in paradise. It is a quaint little French-Canadian village, nestled among mountains, on the St. Lawrence River, which could easily be mistaken for the ocean. The village did not seem to be keeping beat with the outside world. Right away you noticed that it was absolutely devoid of commercialism. The people, the food, the land, and the competition lacked this spirit. It's as if "Hollywood" had yet to come to Mont St. Pierre.

Second, this was the first meet to be designed by the Quebec Vol Libre Association which simply means that if it lacked confidence and smoothness, it was *only* because it was their *first* attempt. Besides, you have to have a starting place—a point from which to grow and play with the trial and error method, as with all competitions before. They were completely humble in their attitudes, as they summoned assistance often from pilots such as Barber-Starkey, and Mueller, who have been involved with a various assortment of differently designed meets around the world. This gave them experiences upon which they could draw, only enhancing and completing their own knowledge.

Canada on the whole employs a system from which we could learn, as they retain the same officials, in the same capacity for each meet. These people are paid a nominal fee, of course, and given free training, but what you have is a very effective officiating system. It offers less hassle (complaints) over poor judging, therefore a lessor amount of time lost to this "pothole" in the flight path of competition.

Their competition was designed to display pilot skill, more than what equipment is current on the market (you saw everything from a Phoenix 8 to an ASG-23). This contrasts sharply with the plague in American competition, which is, in my opinion, how many people you can get to pay to see your meet, or what I call American commercialism.

It all worked for them, and curiously, their meet managed to pull more spectator attendance and enthusiasm than either the American Nationals *or* the American Cup. I don't know if this was due to their location or the fact that it was a "freebie" (or, free) and the others were not. Whatever the reason, I noticed the audience participated more. Almost everyone had a pair of binoculars, therefore involving themselves more in the actual flying, viewing both take off and landing. I left on route to the American Nationals with fond memories.

If the American Nationals was the birthplace of the Comet's future, the Cup this year was its showplace. This double surfaced, latest entry from U.P. Inc., consistently stole the show in both cases with its performance. It probably helped produce more sales for UP than any ad, in any magazine could do. It's performance was almost boastingly saying, "I *am* the future!"

A lot of money was needed for the kind of meets that those in Ellenville and Chattanooga produced. They are always hoping to make this money back, through spectator participation.

This didn't or hasn't turned out to be the case, as most promoters have had to consume much of the cost.

In America we have propelled ourselves onward in our never ending search for the better way. Eventually this always seems to include the commercialization thereof. Is it logical to expect to make money presenting our competitions as we have been?

As with everything, you must analyze why something does or doesn't work, what is right or wrong with it, what you keep as valid or throw out as irrelevant.

In most of our sport only a fellow pilot or loyal spouse could care less about watching. Anything but speed runs or aerobatics is comparable to watching *golf*, or worse, for most people. Very few people have the desire or the agility to stand for over 10 minutes watching specks in the sky. Most American spectators demand that two factors be involved, speed and/or danger. Without these being primary, you will atract no one other than those truly interested in more than watching. But most meets attempt to attract the entire market. spectator through participator. I think the "aim of the pitch" will have to be more direct.

To capture the broader markets of both pilot *and* spectator you will have to cater specifically to both. Cater the competition end totally to the pilot and his/her skills. For the spectator, give him/her what he/she wants to see. You might present a symposium for the pilots. Each company might be represented with displays of their current products; perhaps some could have simulators or hands-on experiences like parachute deployment and re-packing clinics. There could be lectures and discussions on cross-country, towing and motorized. These types of "happenings" would attract both the pilot who was competing, and the pilot who just came to watch and learn. In other words, create the "three ring circus" effect, with a broad representation of facts. Turning it back into a social exchange, you can capitalize on more tastefully.

To further protect your interests, only anticipate paying, "outside" spectators for the days you have designed with spectator appeal, such *as* speed runs and aerobatics. Chances are, they would visit other displays, which could only help serve as educators and in some instances, sales boosters.

An improper understanding of facts is the cause of most ignorance, fear is the result. This is why most come back with the retort that flying is *too* dangerous. Until you educate and and promote properly, you can't expect anything but apathy and discord towards your product.

On to the days of indoor flying tracks and laser beam timers . . .

PILOT REPORT:

starting a new generation...

UP COMET

by Dan Johnson

In 1979, the Nationals competition flew Manta Fledglings with rag wings. The resultant sweep by the fixed wing craft inspired news reports of a "massacre" and how it was "unfair" to pit rags against rigids.

Some persons did not feel this was deserved. Pete Brock was one such person. He feels the grind of competition produces superior machines. And he believes that if we do not compete openly with any craft, that we will not be provided with the same incentives to strive for improvement.

After these news reports, Brock returned his Reader Response card to the **Whole Air Magazine,** with the comment, "I believe the 'difference' between flex wing and rigid wing gliders will not be evident in another season."

Ultralight Products released their new design, the Comet, just before the XC Classic, a contest which they had won the year earlier with their Mosquito. The Comet swept. In the demanding So Cal Regionals, again the Comet swept. At the 1980 Nationals, the Comet was 1, 2, 3. And finally, at the American Cup, the American Team, exclusively flying Comets, won a decisive victory over teams from Britain, France, Canada, Brazil, and Australia. The Comet heralds a new wave.

Pete Brock, owner of U.P., reports sales are already approaching the 200 mark. It is their strongest sales entry in their eight year history. The Comet has already spawned several competitors, the Harrier, Viper, Vampire, and Demon. All follow the Comet lead in what is being described as "stiff wings". But they are stiff wings which handle.

When walking up to a Comet, the first impression is clean. The Comet takes advances in this area a step further than those on the Mega, Atlas, and Sierra. Beginning at the nose plate, you will see the nose baten extends all the way forward of the noseplate to rest on the keel. The sail is drawn forward too, to cover the the nose batten extends all the way forstiffened leading edge, you can only tell the crossbar junction by extrapolating from where the upper side wire disappears into the sail. At the tip, you must open a velcro closed inspection port to seat the tip-most rib. The sail encloses all of the leading edge spar. Once under the sail, the defined washout tube pops in by bungie. At this point the batten pockets are conventionally sewn.

distinct changes in design, and performance which is decidedly head and shoulders above other high performance wings, are causing renewed belief in the efforts of designers, such as Comet creator, Roy Haggard.

Looking over a Comet carefully is an education in state-of-the-art, but the proof of design performance is in the flying. I confess I couldn't wait after Serial No. 101, arrived in early September for this evaluation.

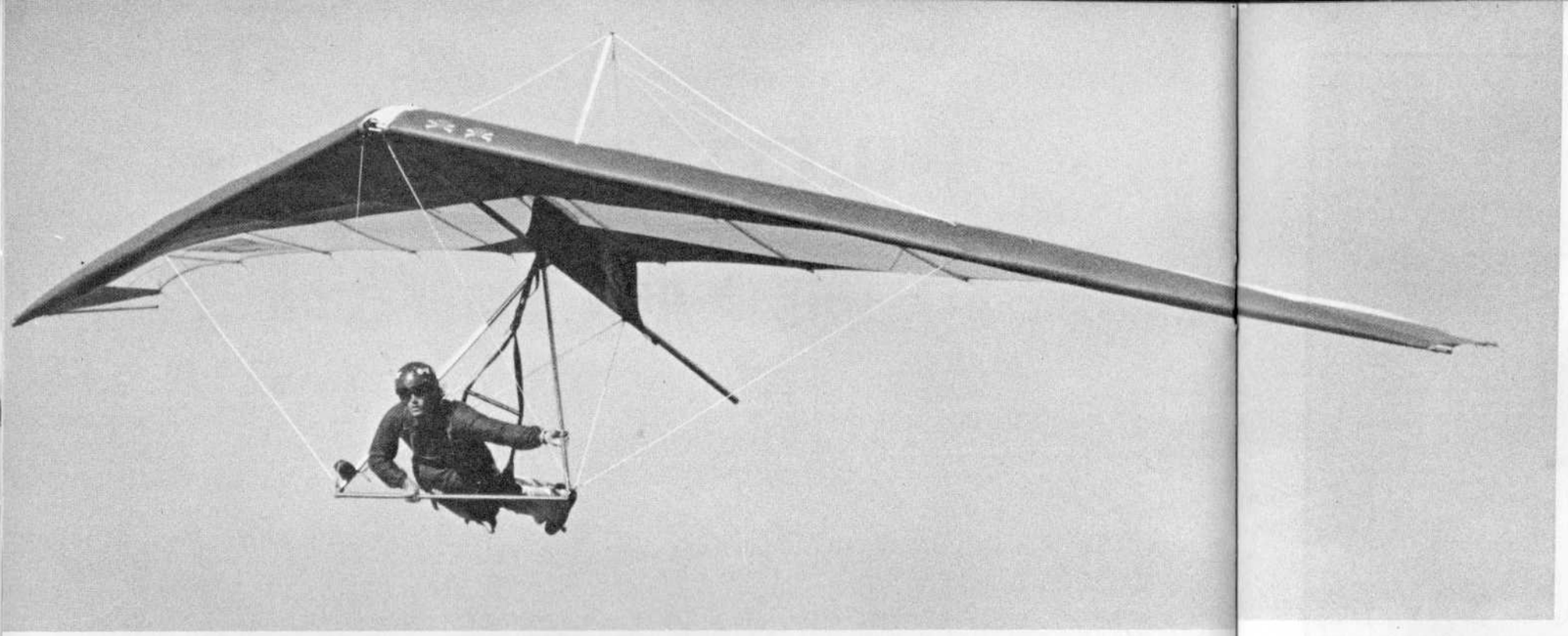
Henderson

But moving inward you will notice the batten pocket is applied, sewn only to the sail's lower surface helping to clean the upper surface. This moves your eye to observe the lower surface, which runs all the way to the tip. The crossbar is fully enclosed by this lower surface. Looking over to the keel pocket will reveal several velcro closures. These open to permit assembly of the crossbar, then seal up to fair the hardware. Even the keel pocket has velcro to enclose it, front and rear. The center section of a rag wing has never been so cleaned up. Now, retreating from the glider, you can be truly impressed with the uncluttered appearance. It works!

The word is traveling at lightning speed about the Comet. Its contest wins, the

CONTROLLABILITY

Factory specs define a roll rate of 2.6 seconds for the classic 45 to 45 roll reversal. This is indicative of a good roll rate but does not tell the whole story of the turn. At speeds above 26 or 27 mph, the bar response is firm and roll is lag-free. As the speed reduces to the low twenties, the loose lower side wires become more evident, and a lag is experienced not unlike the looseness in non-power steering autos. Once the wire draws tight against the frame, roll response is very adequate and the roll rate rapid. Maintaining the turn, as in a thermal, is very straight forward, with the bar response more solid at faster speeds. Roll-out is done with adequate authority.



Henderson Photography

EASE OF TURNING

In roll, with the snug wires brought by high twenties airspeeds, pressures are very light, better than a Mega or Atlas, and only slightly heavier than designs with some billow like the Raven or Lancer. The lightness does not really disappear at lower speeds, as it is the wire looseness that complicates or delays pilot controls. In pitch the Comet is slightly dampened, exhibiting reasonable bar pressures within normal speed ranges. At the very high speeds of which a Comet is capable, bar pressures build significantly, graphically confirming its positiveness.

CONTROL PREDICTABILITY

The Comet shows a great stable tracking ability regardless of speed. The wing wants to fly easily, slipping through the air without oscillations about its axes. While the roll lags somewhat at slow speeds, you feel comfortable at speeds right down to stall. The Comet illustrates a bit of a "stiff pitch" quality which I have felt in the Mega and Sierra, and probably exists on the Atlas as well. This tightness is much less evident than on those older designs but does identify itself in slow thermalling turns.

SINK RATE

This minimum speed performance parameter has surprisingly good results on the 165 square foot Comet. So far as I could determine the Comet will sink competitively with any design I've flown, and a light Comet pilot could expect to spend a good deal of time "on top" in all but very marginal conditions.

GLIDE ANGLE

The glide on a Comet is a good half point above the best other wings flying prior to the summer of 1980. The easiest way to experience this is to pull in and fly at 28-30. Most of you will concur that flight in this speed realm is not really practical. That is unless you fly in a Comet or its design offspring.

SPEED RANGE

The Comet has unequivocally the widest speed range of any glider I've flown. Not so low as the Condor or Omega, not so fast as the Fledge, but still offering more usable speeds than either. Control is not crisp at slow speeds, but those speeds can nevertheless be useful. Decaying glide performance and sail chatter render speeds over the mid-thirties unwise except when pure penetration is the goal.

TOP SPEED

A pilot at the 175 pound hook-in weight should be able to reach 50 mph without stalling to gain inertia. It is simple to travel 30+ mph, and that cannot be said for many rag wings. Most experts agree, however, that while the Comet may truly be superior to the Fledge in all-around performance, it cannot consistently outspeed the popular fixed wing.

PARACHUTEABILITY

The Comet is not capable of parachuting in the floater sense of the word. It does, though, exhibit mellow landing qualities at slow speeds. I found medium slow speed approaches to work best, as the wing is less efficient in this mode so it does not retain energy as much at flare time. Bull's eye shooting is more difficult, to be expected in high glide designs.

STALL CHARACTERISTICS

With slow forward bar travel to fingertip extension, the Comet does not stall but mushes controllability. A stall at cruise speeds, with sudden full bar movement, produces a breaking stall, but a dull break with mild nose-over. This quality encouraged me to utilize the slow speed approach to produce the lightest touchdown.

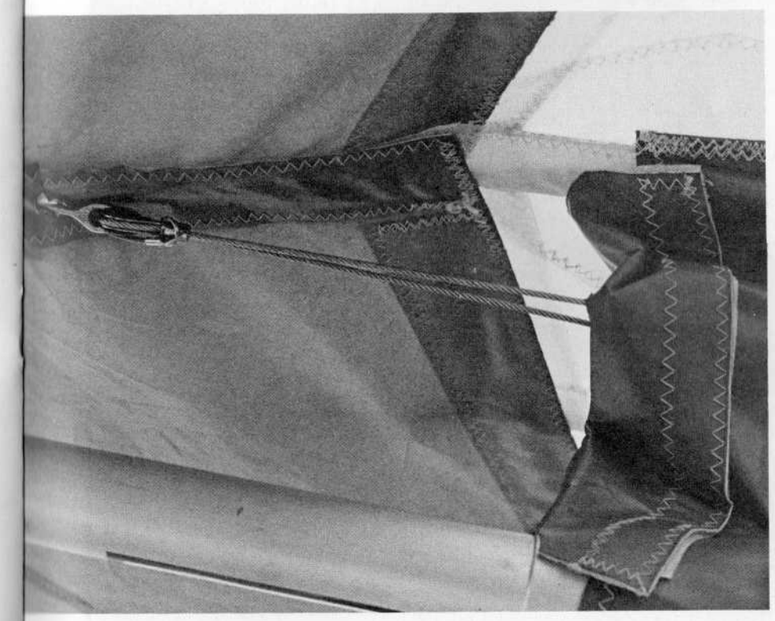
GROUND HANDLING

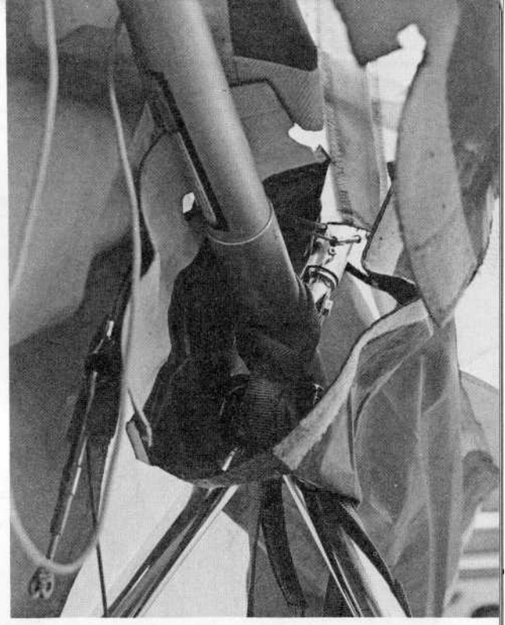
Static balance is excellent, and the weight of 64 pounds, while heavy, can be accomodated more easily thereby. But lower wire looseness is so upsetting that I learned to land close to where I would breakdown to avoid walking the Comet.

On my first launch I stopped after my first launch stride. One wing began to lift slowly and the zero speed bar looseness caused an effective loss of control. You must, repeat, must start smoothly with perfectly level wings to begin your run. Once a few steps have been taken the wing flies and the problem disappears. Another solution is wire launching into stronger, soarable air.

SET-UP

While each step of assembly is well thought out by the factory, the process is lengthy due to the crossbar mechanism, the center junction fairing and velcro closure, and the nineteen batten/ribs. Considering the complexity of the design and sail work, set up is adequate, and you have the choice of ground or control bar style assemblies. You are strongly encouraged to read the owner's manual covering rigging prior to your first attempt. Practice helps a lot.





FRAME FINISH AND SAIL QUALITY

Brock has a reputation for supplying only the finest in hardware. The Comet participates except in one small area—batten tips. This may seem picky but they are noticeably absent on an U.P. glider. Proper ones are on order.

The 3.8 ounce sail represents quite an effort in professional construction, complex as it is especially. But, as with most double surfaced designs, the mating of two sails is not without some rippled areas. The factory continues to discover better methods as with the newer spanwise sail cut, but some small buzzes are still present. Nevertheless U.P.'s quality extends to their sail loft, and their effort is the best double surfaced one I've seen.

AND RESALEABILITY PURCHASE COST, LONGEVITY,

The Comet has a winter price of $1895 till March 1, 1981, when it will rise to $1995. At this price, at this time, and considering the lead of the Comet, the glider is the most reasonably priced U.P. ever offered. As it comes in $100 under the Mega, over $200 less than the Atlas, and only $220 more than the Harrier, it represents an excellent value in my opinion. This view is obviously shared widely as sales mushroom for Ultralight Products. Deliveries were already being quoted well into 1981, as of mid-October.

The Comet is not hard to fly, offers superior performance and 1980 looks. It is not burdensomely priced so resale should be good at a respectable figure. If the Raven was the glider to buy for the first half of the year, the Comet wins honors for the last half of 1980. Congratulations are in order for Haggard and U.P.

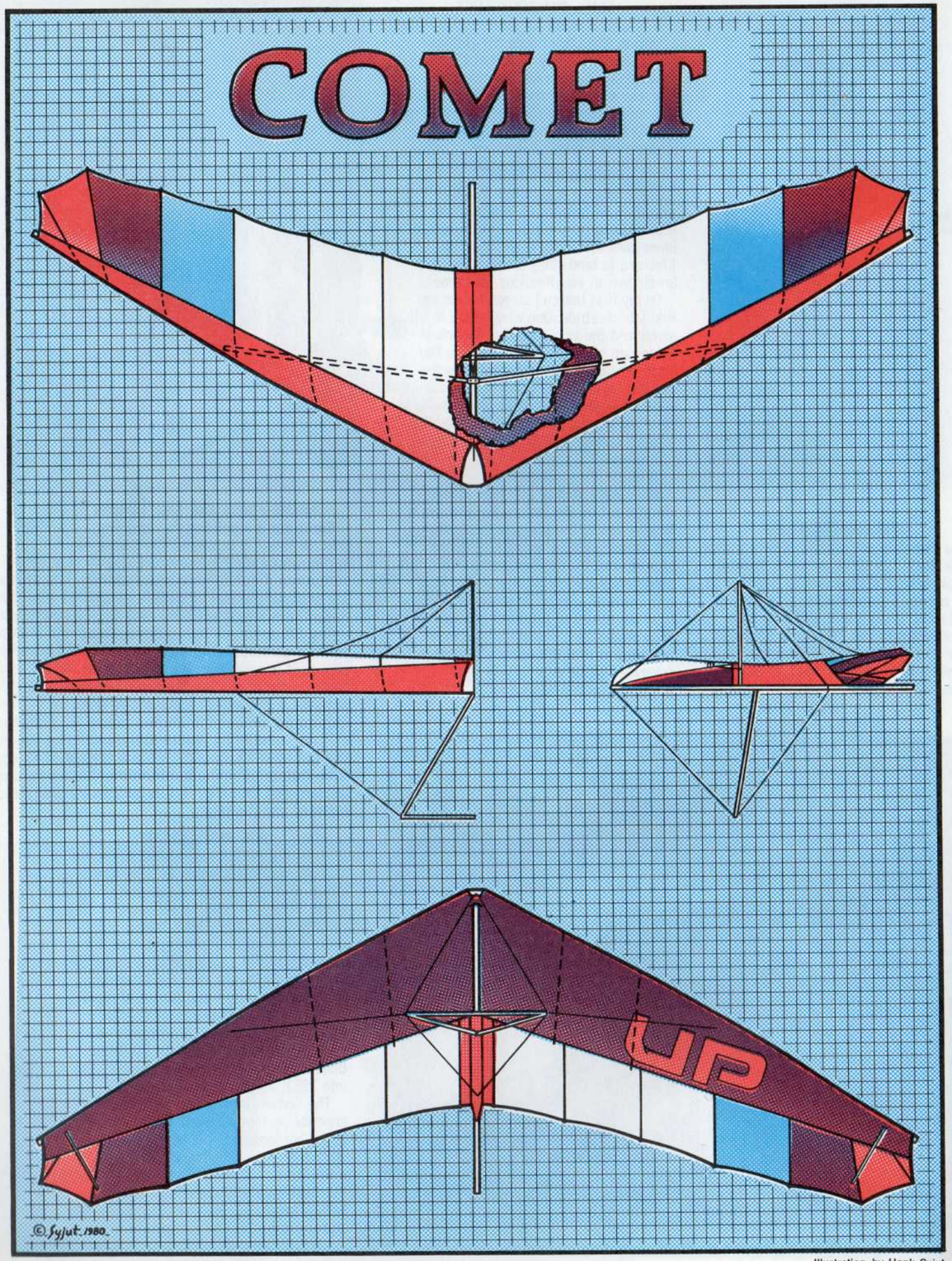


Illustration by Hank Syjut

UP Firefly 2B

SETS NEW WORLD'S ENDURANCE RECORD!

RECORD: 24.5 hrs.
PILOT: Jim Will, Honolulu
GLIDER: UP Firefly 2B- 181
SITE: Makapuu, Hawaii
DATE: 4/30-5/1.1980

	149	181	216
AREA	149 sq. ft. (13.84 m²)	181 sq. ft. (16.815 m²)	216 sq. ft. (20.07 m²)
NOSE ANGLE	107	107	107
WING SPAN	28.5 ft. (8.72 m)	31.6 ft. (9.63 m)	34.5 ft. (10.52 m)
ASPECT RATIO	5.5	5.5	5.5
SPEED RANGE	17-42 mph (27-67 kph)	17-42 mph (27-67 kph)	17-42 mph (27-67 kph)
WEIGHT	46 lbs	51 lbs.	56 lbs.
PILOT WT. RANGE	103-155 lbs. (47-70 kgs)	130-193 lbs. (59-87.5 kgs	160-220 lbs. (72.5-99.8 kgs

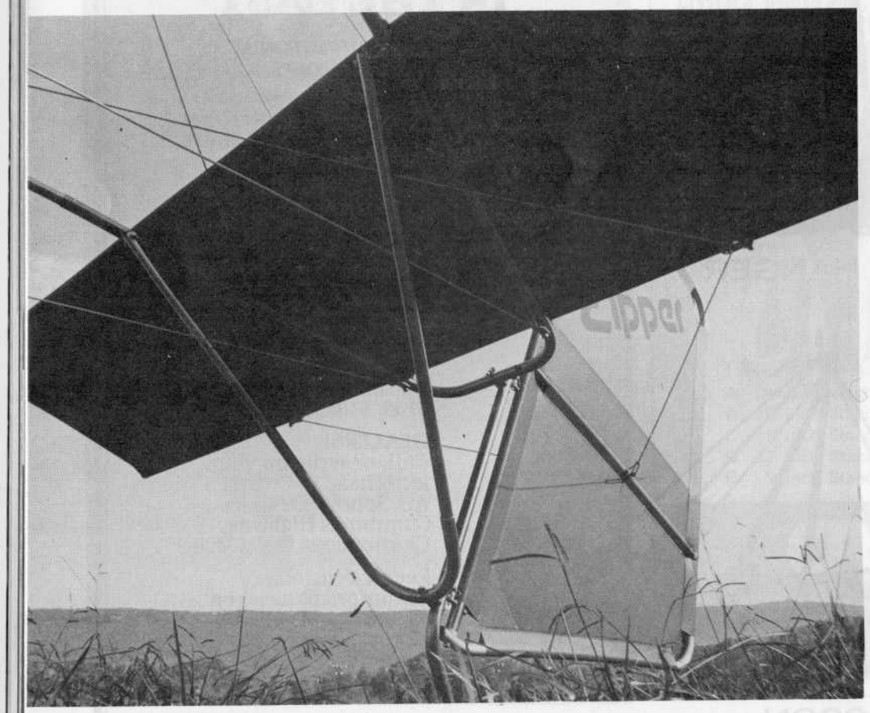
UP, INC. P.O. BOX 582 RANCHO/TEMECULA, CA 92390 USA TEL: (714) 676-5652

Photo by Chris Voith

Ultralight Aircraft

by Dan Johnson

EIPPER FORMANCE QUICKSILVER



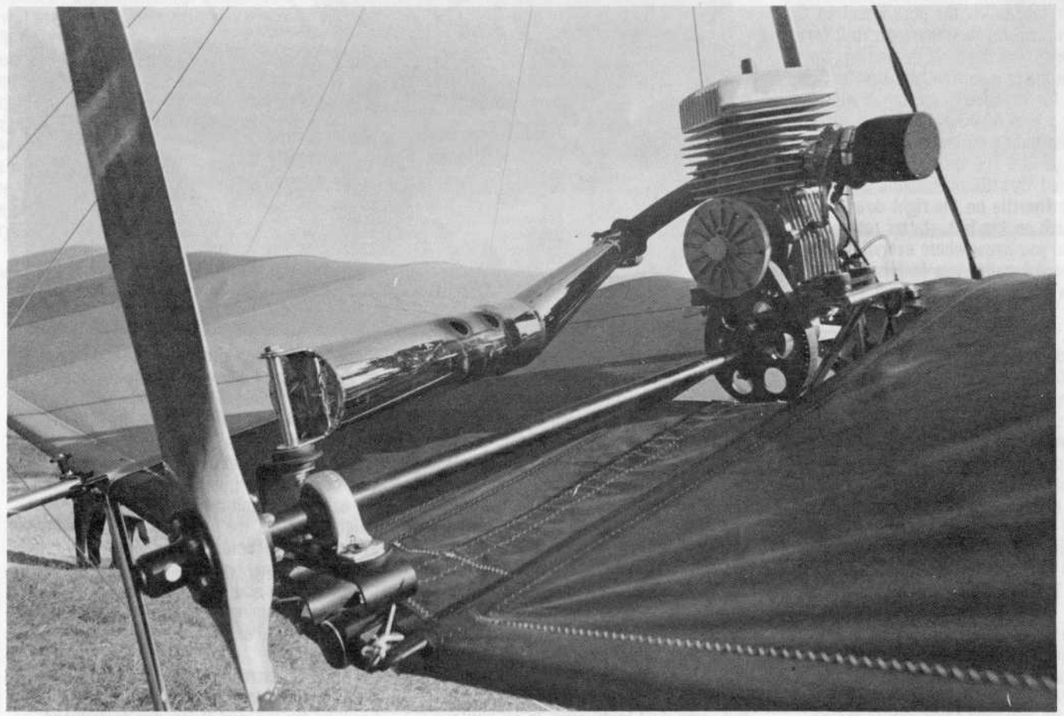
Henderson

Reaction was gratifying to our first installment of reports on ultralight aircrafts. A new interest is spreading for powered experiences by glider pilots, and this group joins a fast-growing number of pilots whose time is logged solely on ultralights.

This time we look over what may be the single most popular design in the industry —the Eipper Quicksilver. That is, it is correct to say that Easy Risers still outnumber all other designs, but the Quicksilver is a plane that ranks second or third on its own trade name, yet has inspired several very similar crafts.

One reason stands paramount to this success, and it is a good place to begin. The Quicksilver may be the easiest ultralight in which to start one's flying. In general, the Quicksilver is not the highest performing, or the finest in handling, or the cheapest, or the most compact when disassembled. But the combination of qualities represented by the Quick make it very likely the best choice in ultralights, certainly so for the novice pilot.

For this report Eipper supplied a custom black Quicksilver, later purchased by American Cup Team Member, Malcom Jones. Prior to delivery to Jones, I was able to log about an hour, then transferring to a completely stock unit, which I helped construct from kit form. The educational benefit was tremendous, and Eipper generously supplied factory representative, John Lasko, to assure we built correctly. He also ascertained that my flight experiences were correct, and generally made the whole process of this report much simpler.



Henderson

The kit took three of us portions of three days to build. I would estimate 54 man hours. But we did a lot of learning from Lasko so every hour was not as productive as if one of us had worked systematically. The owner's manual contains assembly instructions, which though not written in step-by-step form, are easily followed, using many illustrations to explain each detail.

Once we had the airplane constructed, I set about to read the owner's manual. Now, I have seen many owner's manuals, from typewritten, Xeroxed sheets for mid-seventies gliders, to slick one hundred page booklets from Beechcraft or Cessna, and have **never** come across one more properly executed than the Quicksilver manual. I believe if a non-pilot took delivery of a Quick and its accompanying manual, that he could discover almost all the information he needs to go build and fly his Quick safely. Assuming of course, that he exhibited good judgement, and proceeded very cautiously. But this credit to the manual does not at all substitute for professional training and construction.

My advice is strongly to go see an Eipper dealer, picked by Eipper for his ability to build, train, and service. Learn all you can when you purchase. The kit lists for $3295, and you will pay about $250-$500 for construction, plus $150 to $400 for training. Frequently, the lessons will be provided free for the purchase of a completed unit. Built, broken-in, test-flown, weight balanced, and delivered for $3695 still makes the Quick a very reasonable purchase. Freight charges alone are worth over a hundred dollars.

The Quick of late 1980 comes standard with a Yamaha 99.6 c.c. engine. This engine went through five years of design effort with the goal of totally surpassing performance and reliability of both the

McCulloch and West Bend engines. They all compete in the racing go-cart arena, except that Yamaha succeeded so well, that the engine was setup in its own class after the first year. It produces 18 horsepower and operates slightly de-tuned on the Quick at 15 hp for longer service life.

Priming the engine is a hassle, as you must climb up on the control bar to relieve the diaphragm prior to priming. Failure to do so could damage the unit. But after that, a squeeze on the primer bulb, and a few tugs on the recoil starter rope (all easily accessible in flight) and the engine comes smoothly and smartly to life. After only a few seconds of warm-up, restarting requires only a single, easy pull.

Strap yourself in to the supine harness, check rudder control movements and you can taxi out. The Quick has no steerable nose wheel, and now after about eight hours logged, I agree, one is not really needed. Very tight turns will require an air blast plus one foot to lift the nose wheel so you can pivot on the main gear, but for most turns, and take off or landing, the rudder control is perfectly adequate. Still, it calls for practice to master. It will also call for use of 40-60% throttle to turn the craft, depending on the speed at time of turn initiation. The spring-loaded, well-positioned throttle makes this simple enough. Throttle on the right downtube, kill switch on the left, starter rope above you, and you know where everything is. Even the 3.4 gallon gas tank is right where you can check quantity remaining.

After I taxied some, I got ready to "crow hop" it. This consisted of several runs up and back on the runway getting airborne only a few feet. It uses full power best, but can operate in ground effect on three-quarters. But it breaks ground fast, very fast if your push-out is full enough. Without a hard push, the craft continues to accelerate till the main gear gets very light and you fly off at a low angle of attack. Using the full push-out style, lift-off comes at under fifty feet of ground roll. In a ten mile an hour wind lift-off will be even faster. The numbers are similar for landing roll.

Once the craft has broken ground, any hang glider pilot will find the Quicksilver an absolute "piece of cake" to fly. I expected roll to be slow but found otherwise. Especially with the prop blast, roll is reasonably quick and thermalling simple. Roll reversal is delayed but not disconcertingly. My standard procedure after only three or four hours is to use full power take-offs, throttle back to 75% after only fifty feet of climb, and back to 30-40% as soon as I locate the first thermal. As long as you turn the same direction, thermal flying with marginal power is very pleasurable. In still air the Quick climbs at 250 fpm easily, even more so in buoyant air. All turning is weight shift supplemented by rudder control, which occurs automatically.

Henderson

In those turns you will notice how much pitch control is needed—plenty. This should forewarn you about pitch movement on landings. Recall the full arm pushout for take-off and assume similar motions on landing. Or you may supplement pitch movement with power applications, assuming you have power. In my opinion, the landing requires the most practice due to the rather sluggish pitch response. I feel you **must** know how to do a "deadstick" (no power) landing. Good as the Yamaha engine is, like all two-cycles, when it quits, it does so abruptly and totally. Practice landings a lot, and the rest of the Quick flying will follow easily.

For non-pilots, not only is a much more cautious approach heavily recommended, but some dual instruction in an airplane is mandatory if you wish to proceed safely.

Stalls in the Quicksilver are mild. With power, no break develops, as you will mush along. Without power, a distinct break happens, but even with no power to recover, altitude loss is under one hundred feet.

The Quick has a nine year history, during which time it has suffered no structural failure. This record qualifies the Quicksilver as the most time-tested of all ultralights. It remains a single surface wing because it works beautifully for what is intended. Higher performing prototypes already exist at the factory; I viewed a double-surfaced model last January. Further, a spoiler package will be offered before the end of the year, as will be stick control. This latter option will feature a bucket seat with control wheel, and a moveable elevator for enhanced pitch control, all without weight shift. As the basic design is fully evaluated, the factory, with research by Dave Cronk, can spend time on many refinement ideas, in addition to the above, including a training simulator, more performance, skis, and tail-dragger landing gear.

I tried an example of the latter, to find it much easier to taxi plus offering better handling for thermal flying due to reduced weight and drag. The example I experienced was produced by Dale Kjellson of Iowa, but the factory also has plans in progress.

The Quicksilver flies easily and is more nearly idiot-proof than any other desi gn I have seen. It is almost impossible to gain sufficient speed in-flight to cause a structural failure. Full throttle, fully pulled in, recorded only 43 mph on my Hall Meter, though I once pegged the instrument (50 mph) when exiting a strong thermal. I also went weightless in the harness. Cruise is best at 20-25, same as landing approach speed.

The landing gear works beautifully on smooth surfaces. It has no suspension but withstands rough landings very well. The pneumatic tires are brute, failing to perform flawlessly only on quite rough terrain.

The finish of frame and sail is simply not rivaled anywhere in the ultralight industry. Of course, Eipper has had a large head start, but the result is still the same. Eipper always did have a reputation equal to that of Ultralight Products (Comet mfr.) for finish quality.

This polish of finished product makes assembly much easier. Bolts slide into their holes without binding. Pip pins fit likewise and make disassembly rapid. The Quicksilver is normally broken-down to a structure the length and width of one wing, then laying down with fifteen inches of depth. A van carries the craft easily, engine and all, though some special racks will make transport much safer.

In summary, the Quicksilver looks like a Honda of the air, detailed to perfection. It will provide all pilots with very enjoyable flying. Transition is simple for prior pilots and no one ultralight offers a better combination of performance, handling, simplicity, and ruggedness for the beginning ultralight pilot. Factory support (parts, new options) can be expected to parallel their marvelous owners manual. Oh, by the way, it foot launches real well, too. See the photos of such an effort performed in very light winds.

Henderson

TOWING SECTION

tight lines

by Ed Quirk

Not long ago I was asked by some pilots from the mountains why I thought towing was so great. After some discussion about setting up once and not changing flying sites everytime the wind does they started firing at me the typical questions of those who haven't tried towing. Isn't it dangerous? How can you stand to watch the rope pay-out before launch? What about lockouts? Didn't so and so lose it towing? Hmmm . . . it appears today's towing has an identity crisis and information void.

Later I was reading R. V. Wills' article on hang gliding fatalities for 1979. Of the fifty plus fatalities, two occurred on a tow line. I began to ask myself — *is* towing really as dangerous as they said? Reading further into Mr. Wills' article it hit me that if some of the accidents that occurred in the mountains happened at the typical towing site those people may be alive today. A good example is forgetting to hook in. If you did that while towing you'd only fall a few feet—not hundreds.

What it all boils down to is really quite simple. Both towing and foot launch have dangers unique to each and the price paid is equal. I am sure you've been exposed to the more common ones for foot launch, but what about towing?

Perhaps the one I hear the most questions about and the most misunderstood is the dreaded lockout. It's really not as bad as you've come to fear. It occurs when you are not tracking correctly with the tow vehicle, usually, in a turn or a crosswind tow. The lockout starts when the glider is off to one side of the "path," therefore the tow-line is exerting a force sideways to your intended direction. If allowed to continue without corrective action the sideways pull will become sufficient to roll the glider away from the tow vehicle. The situation then becomes progressively worse, to the point that the tow-line pulls the glider at an increasing bank and accelerating rate of speed towards the surface.

I've experienced my share of lockouts over the years and have come to the conclusion there are three factors which promote a lockout. They are in-tow turbulence, glider roll response and tow-line tension. The pilot has control over all of these, so needs to understand how they interact. Let's take a look at each in more detail as it applies to a typical tow flight.

Turbulence encountered under tow, as in free flight, causes the glider to change from the intended direction, sometime abruptly. Keeping this in mind you need to be observant of the conditions you choose to tow in. On a good thermal day you will encounter the strong turbulence associated with the lift while towing up. When you run into this trashy air you must, as they say, "stay on top of it." This means making constant corrections to keep the glider in line with the tow vehicle. The tow forces being placed on the glider will cause somewhat of a delay in the glider's reaction to your corrections, but in turn amplifies the response once it has started.

Next time you get a chance to watch an experienced tow pilot you'll notice that while under tow they make quick corrections constantly, while the glider continues straight ahead. A good comparison is that of riding a bicycle. The same rule applies with towing—make your corrections early and quick. The longer you wait the more pilot input it will take.

Roll response of the glider plays an important part in your ability to tow or track well. Years ago when we towed standards, there was very little roll response as compared to today's gliders. These older gliders would tow up straight, but if they started off track it took a lot more pilot input to correct. Today we teach new pilots with Seagull III's because they are docile and forgiving under tow. Newer gliders get off track easier but present little problem to bring back on track — if done soon enough.

Take a moment to think about the three axis of control, yaw, pitch and roll. The glider's yaw and pitch controls are dampened with the tow-line pulling from the center of the control bar. Roll is the one axis the pilot has the most control over. The glider can rotate around the tow point with little or no restriction from the tow line. Keeping that in mind most tracking corrections are made with roll. Therefore, it is important to not give much roll input or you will be off track before you realize it. This is especially true if you are not familiar with the roll response of the glider. Students taking their first tow flights often make this common mistake.

The pulling force of the tow line I believe is the most critical of the three factors. Let's face it, if you were not being pulled you couldn't lockout. But you are being pulled, so what can the pilot do about controlling this? Perhaps the best choice is letting only experienced tow drivers pull you. That person should have considerable flying experience under tow. It follows to reason they would have a "feel" for what is happening to you on the line. If the driver sees a lockout developing they must react and help you recover. The driver should be constantly watching the direction of the glider in relation to the tow vehicle. If it's in line with the path, no problem. If the glider becomes pointed off track, several decisions must be made by the pilot and driver immediately. The first reaction of the driver should be to back-off the throttle, relieving tension on the tow-line. The pilot is faced with the same decision to either stay on the line and correct, or hit the releases and put the glider in free flight. The major factor influencing this how far off you are. I've found a good rule of thumb to use is, if you are less than 30° off from the track you can correct and continue. If you are off more than 30° it's best to get off the line. It is usually not as clear cut as this if the other two factors of roll response and turbulence are working against you.

Right now I am sure some of you are asking yourselves "what if?"

What if the boat driver doesn't back-off? Well, the pilot still has the alternative to hit the releases, even though they are under tension. The hot tip here is to pull in the bar and then hit both releases at the same time. The glider will continue to roll in the direction of the lockout. Once off the line you'll have sufficient airspeed to coordinate the roll into a turn. Do this by pushing out the bar gradually and attempt to make the turn as flat as possible. At this point you'll most likely be headed downwind, handle this as you normally would according to your altitude.

If the pilot doesn't correct, what can the tow crew do? This is why there is a "pin man" to release the line from the tow vehicle, or in the case of a winch, allow it to payout freely. The tow crew must do this as soon as they realize the pilot is not correcting. The tow crew should have already backed off the throttle prior to this. Today's gliders with higher aspect ratios and defined tips will have a strong tendency to pull out of the roll and into a controlled turn once the line tension has been released. However, there is one flaw in the plan, the glider is now flying downwind with the tow-line dragging behind. If allowed to continue, the weight and drag of this line could tuck your glider, so it's a must to get this burden off.

At this time I'd like to point out something to think about. There are several releases available that will open by themselves when the tow-line is overflown. This is a good advantage if you are busy correcting the glider. The release systems made by Moyes and Bailey are two that come to mind. Many tow systems use a modified Schweitzer sailplane release. This type of release is not designed to open by itself when the line is overflown.

This should give you a brief overview of what a lockout is and how to recover. I believe if you take an objective look at what is involved, you'll agree this situation requires no more input from the pilot and crew than a wire launch. TIGHT LINES!

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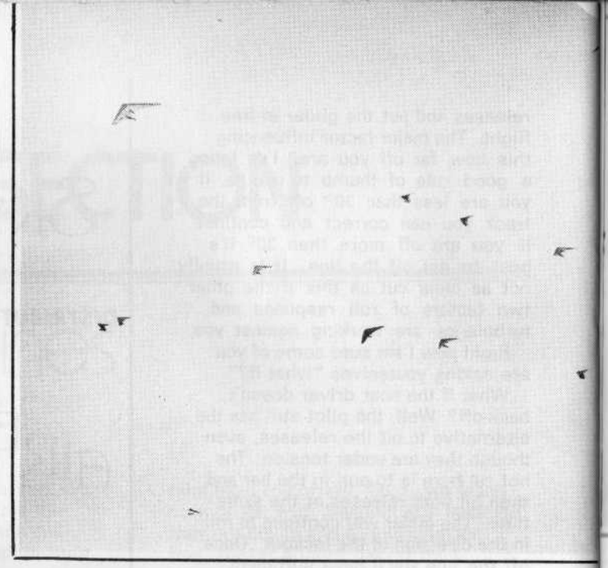

On October sixth, Ray Foley broke the Crystal record by soaring Raccoon Mountain for five hours and twenty minutes, soaring up from a low point only one hundred feet off the ground.

On October 23, the American Cup came to Crystal for an exhiliarating day of soaring. Another record was set as 27 gliders and two ultralights worked the air for nearly three hours each. The previous record was nine at a time.

Yet this site, Raccoon Mountain, has given more pilots their first high elevation launch than any other flying site in the East.

"The keel pocket is said to be the single most significant glider design innovation. This system (cable simulator) is *the* most innovative new development since the keel pocket."
—Rob Kells, President of Wills Wing, Inc.
October 1980

Chris Voith

Training

GROUND SCHOOL: $20. ☐ 2 hrs. ☐ simulator

INTRODUCTION TO FLIGHT: Begin at ground level, learning to grip, pick up, and run with the glider. Then, you'll move to our low, gentle slope for several tries of your own, under close supervision. Small groups for fast learning. All equipment provided. $48. ☐ 4 hrs.

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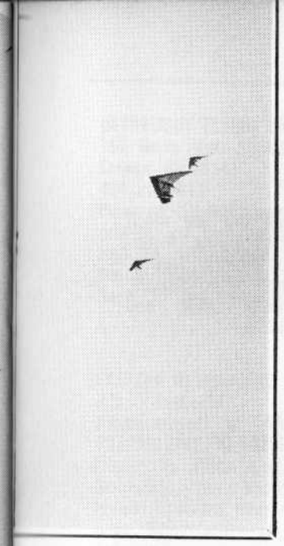

Photo by Chris Voith

Flying

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—Brian Milton, Editor of WINGS! and English team coach.
October 1980

Chris Voith

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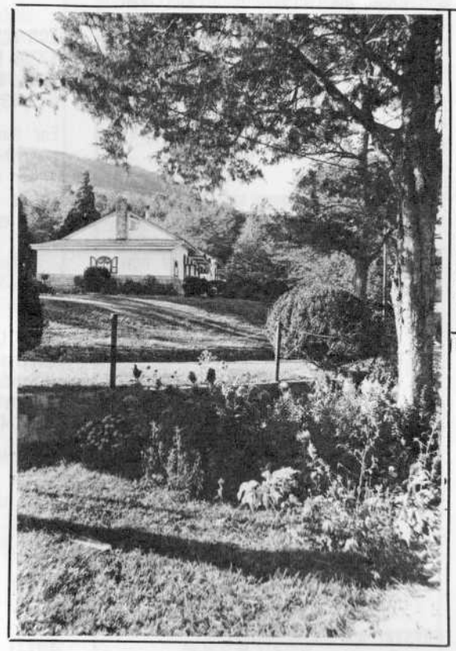
The above cable simulator system is under final developments at Crystal Flight Resort. The device will be operational by early 1981, and will be written up in the Jan./Feb. 1981 issue of the **Whole Air Magazine.**

Lodging



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Phone (615) 821-2546 daily

WAM DIRECTORY

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

The reader will also have a source list for where the **Whole Air Magazine** can be bought, as all our dealers become retailers of the new 1980 magazine. We encourage all readers to patronize these shops. They are serious places of business, interested in serving the needs of the pilot.

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NO. 15
SEP/OCT 80

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

NO. 14
JUL/AUG 80

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

NO. 11
JAN/FEB 80

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

NO. 8
JUL/AUG 79

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

NO. 7
MAY/JUN 79

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

NO. 6
MAR/APR 79

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

NO. 13
MAY/JUN 80

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

NO. 12
MAR/APR 80

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

NO. 10
NOV/DEC 79

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

NO. 9
SEP/OCT 79

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

NO. 5
JAN/FEB 79

Statistics of gliders and models. Premier of Consumer Action Line. Heckman Interview. Parachute advice. All USHGA Directors aldresses.

NO. 4
NOV/DEC 78

Special artwork cover. Statistics on injuries, chute, vario, and glider popularity. "There I was" at the 78 Great Race Tree Topper Records.

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1979 Seagull 11 Meter	(4)	$1095.
1977 Seagull 10 Meter	(3)	$ 750.
1979 Wills Alpha 215	(4)	$ 975.
another one	(3)	$ 895.
1979 Moyes Maxi 3	(4)	$1100.
1980 Moyes Mega	(5)	$1675.
1980 Wills Raven 229	(5)	$1295.
another one	(4)	$1195.
another one	(4)	$1195.
1978 Wills Alpha 245	(4)	$1095.
1977 CGS Falcon 5+	(3)	$ 650.
1977 Seagull Seahawk	(4)	$ 750.
1979 UP Condor 194	(4)	$ 950.
1980 Wills Raven 209	(5)	$1295.

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PRODUCT LINES

CHATTANOOGA TN --- The competition season has ground to a halt, and preparations for winter and the new season that follows are well underway. Not for everyone, tho. This recession year has collected its toll from some. We start here on a sad note of the demise of Seagull. Owner, Ralph Smith, a So Cal attorney, threw the brakes on the still faltering company by foreclosing on a rather large loan. Within a very few days, the apparently well executed plan had shut down Seagull, sold off all remaining assets to Kitty Hawk Kites, and opened the factory to its new lessee, a trucking firm. A bunch of the respected Seagull names are left with salaries still due, and several debtors within the industry will have to close their accounts with the epitaph, "bad debt." In the same vicinity, Santa Barbara, another ending has come, this time to Australian great, Peter Brown. Peter was killed while riding his motorcycle, and will be missed by his friends, family, and the many pilots who admired his flying. Still in Santa Barbara, Tom Peghiny is working with former Seagull sail loft foreman, Gordon Cayce, on a new wing expressly designed for power application. Tom's craft has three axis control, employing a conventional tail on a wing of large double surface (similar to Fledge construction). He plans to show it at Lakeland's Sun N Fun convention in the spring of 1981. The craft is being built at Bob Trampenau's Seedwings factory where new things in gliders are also ocurring. Bob's 510 craft is in developmental stages, and according to Peghiny, looks very promising. No plans have been made to manufacture it at this time however. In other new craft, Dick Boone has left Delta Wing to pursue an independent venture. His Series I glider was seen briefly at Chattanooga's Great Race. Boone's company, called Pro-Air, has plans to market the ship, but Boone will continue to do design work for Bill Bennett. His last effort for the Van Nuys outfit was the Viper (more details available on pages 14 & 15 of this issue). Up north in Montara (near San Francisco), the Stratus folks are going ahead with the manufacture of their new double surfaced, deflexorless Stratus V. Dan Racanelli flew this wing in the Great Race and earlier as part of the Aerobatic contest in the '80 Cup. They plan to sell it for around $1700., a competitive value these days. Sunbird Gliders has taken on the job of certifying and distributing Israel's AC-5 glider from Agur Gliders. This Alpha-like ship has impressive hardware and satisfactory aerodynamics, yet is priced unusually at under a grand retail. Whole Air has also received one of the models to evaluate. More on this later. Another machine requesting Whole Air reporting is the Aolus from Spectra Aircraft. The unconventional looking aircraft uses a tail, double surface airfoil, and bowsprit construction on a wide 150 degree nose. We'll keep you informed on this, too. At Flight Designs, plans are underway to perform a partial manufacture of the Comet-like Vampire. This very contemporary Swiss design (mfd in France by Pacific Kites) uses styrofoam shapes fastened to the leading edge, which help impart a rigid airfoil to a mylar/plastic/Dacron fusion, all ultra-clean. Other new developments are nearly ready from Eipper Formance in the form of modifications to their proven Quicksilver. The new ideas include a spoiler package and stick (no weight shift) control. The latter will be a major alteration aimed at the airplane pilot market. It employs a fiberglass shell seat, with wheel to control the rudder and moveable elevator (new). Solid mechanical linkages replace the string rudder lines. Enhanced pitch control results in an option which will help Eipper convert those who are not familiar with weight shift. The option will be available in 45 days, and will require a student pilot license to order. Eipper's major motorized contest ($10,000 First Place prize; $25,000. purse) is nearing final stages. A Dealer Division has been added to the Stock and Open Divisions. More on this in the Jan/Feb Whole Air. While we are on motor meets, the Blue Stratos World Invitational Powered Hang Gliding Competition was held Oct 24-26 with a custom-built Easy Riser the winner. Second was an Eagle, followed by a gaggle of Quicksilvers, and Rex Miller's Fledge. The meet tasks were designed to incorporate speed, efficiency, and maneuverability, with each task using a landing requirement. The most popular powered design, the Easy Riser, now has a tail option offered by UFM of Kentucky. It's a nice looking arrangement which received good enough response at Oshkosh to cause owner, Mike Loehle to pursue the opportunity full-time. Whole Air saw the configuration at Tullahoma and may report it in a later issue. An Instructor Certification Clinic is scheduled for Jan 10 & 11 in Oklahoma. Qualify for Basic or Advanced; bring your Hang 3 and $20. Contact Gene Bledsoe at 405/787-3125. George Worthington reports sales of his book, "In Search of World Records" have exceeded the 1100 mark. George has been out cross-checking performance of the new "stiff wings". Currently he gives a nod to the Comet, but I wouldn't be surprized to see an article on the subject real soon. Another fellow has been working on a project for three years, which should better the lot of us ultra-light pilots (glider or powered). Glenn Muehlstedt provides the USHGA with their liability insurance, and has now started a physical damage insurance to include theft. You've seen the ads no doubt; we wonder how many are interested -- look for a Whole Air survey later on. Meanwhile, contact Glenn at 612/835-5365. Happy Anniversary to Crystal Air Sports, who just celebrated their fifth year in Tennessee. With reports from the Small Business Administration saying that 90% of all businesses fail in the first five years, it is a great barrier to pass. Crystal is one of at least three major ultralight retailers expanding operations. Stores are planned for opening during the next year in Atlanta (underway now), Birmingham, Nashville, and Knoxville. This "chain" concept is also being followed by the first to try it, Ken DeRussy, of Channel Islands (Santa Barbara) who also opened up in San Bernadino. Kitty Hawk Kites, perhaps the largest U.S. retailer, has opened their second store, all the way cross-country in Marina (CA) near Flight Designs. This marketing idea is not new, but as it emerges in hang gliding, it may spell the beginning of the end for the old sub-dealership system. As we close with expansion in mind, we at Whole Air (Dan Johnson, Starr Tays, Randee Laskewitz, Regena Wehunt and the other invaluable persons) wish to pass on greetings for the 1980 Holidays and hope for a continued widening of all our horizons. Get high, fly safe, and enjoy a Merry Christmas and a Happy New Year in 1981. See you there! Got news or opinions? Send 'em to Product Lines, Box 144, Lookout Mountain TN, 37350.