

whole air catalog

ONE DOLLAR

May/June 1979



F I R S T A N N I V E R S A R Y I S S U E

INSIDE
George Worthington, "Hang Glider Performance." Fiction by Paul Burns. Point-Counterpoint on Federal Regulations. and our new column, FORUM.

Idea•Graphics, publisher
WHOLE AIR CATALOG
P.O. Box 144
Lookout Mtn., TN 37350

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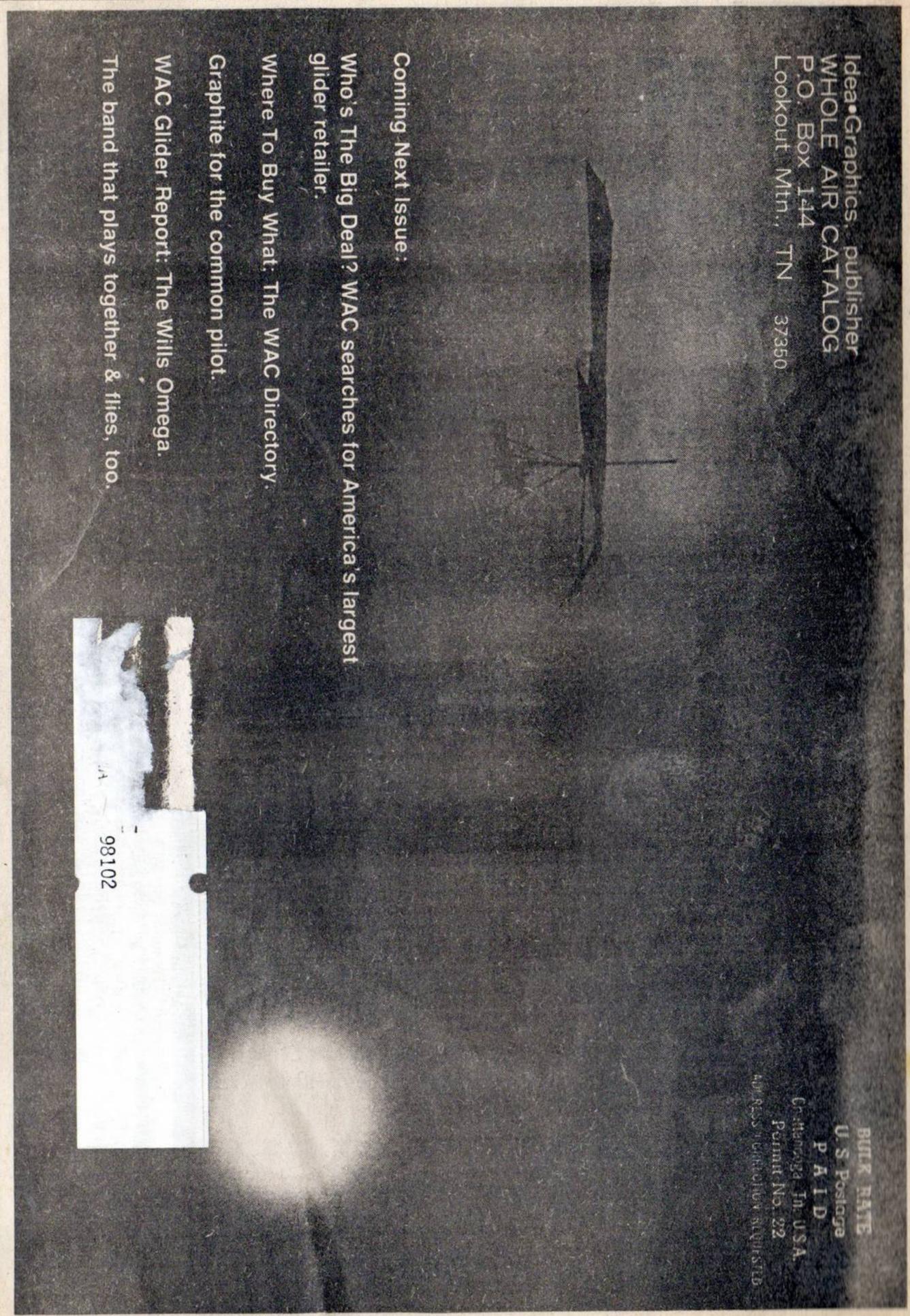
Who's The Big Deal? WAC searches for America's largest glider retailer.

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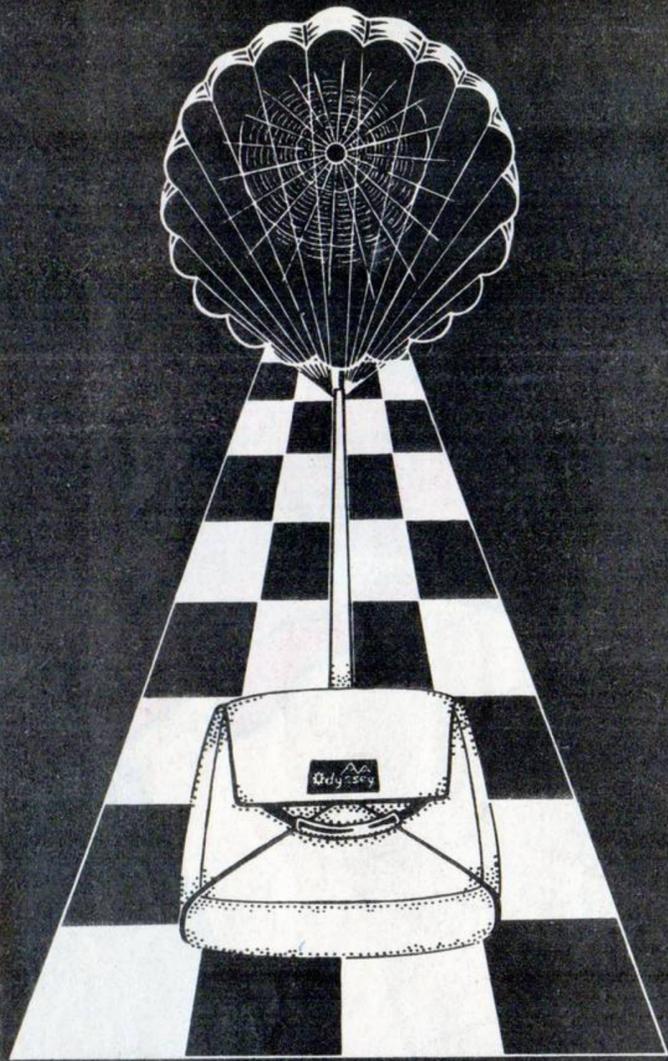
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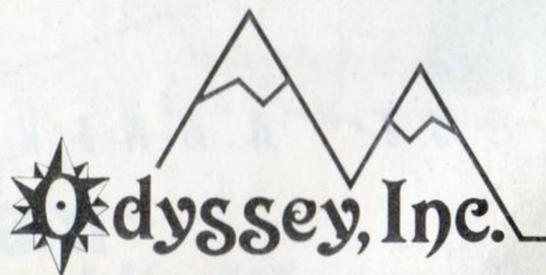
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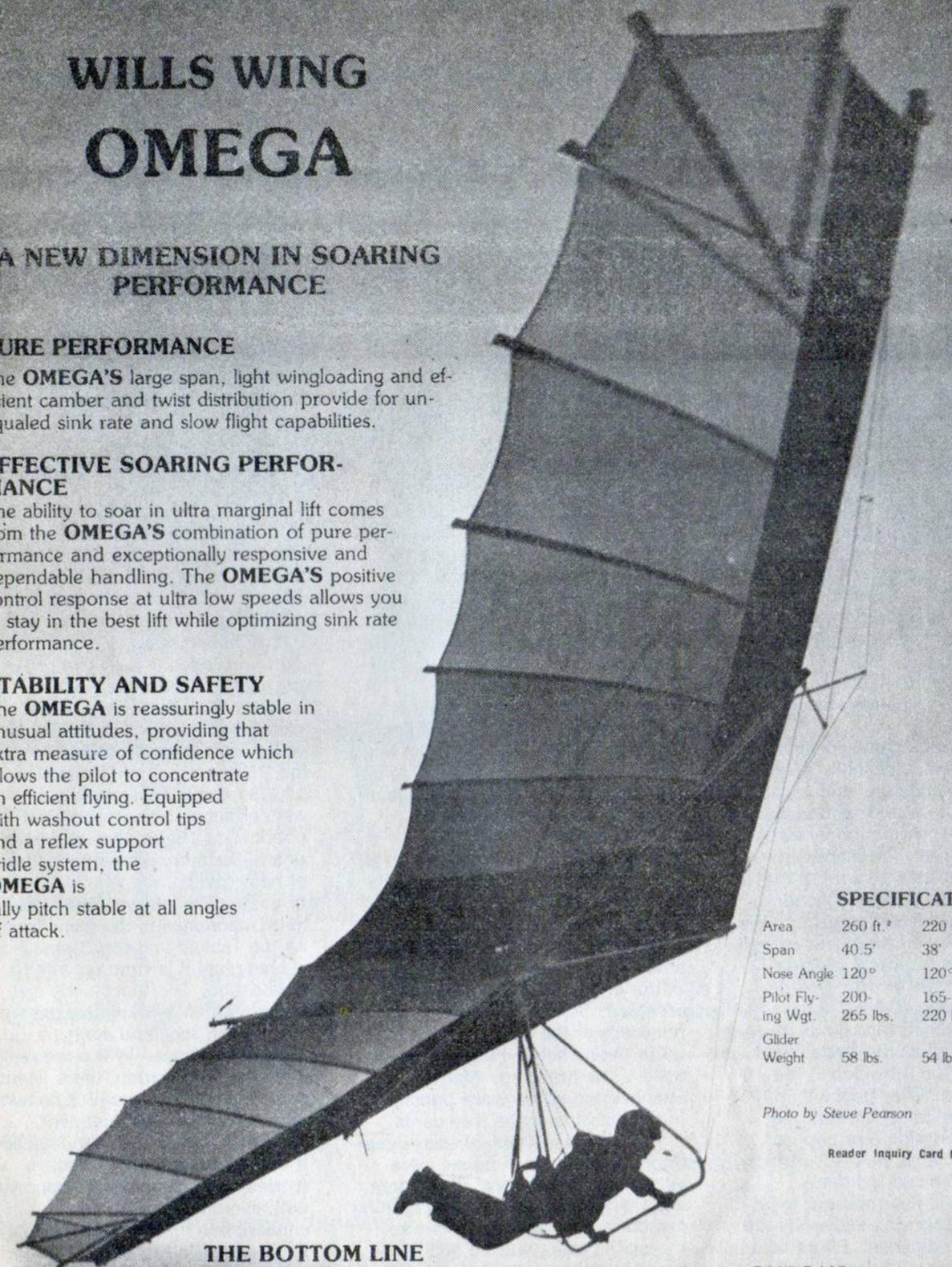
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Photo by Steve Pearson

Reader Inquiry Card No. 2

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The proof is in the flying. We could go on forever about the **OMEGA'S** extraordinary capabilities, but nothing we could say will impress you as much as your first flight on the **OMEGA**. You owe it to yourself to check out this extraordinary new soaring machine. See your dealer today for a test flight on the new **WILLS WING OMEGA**.

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WAC CREATION STORY

In the beginning there was no WAC. Only a Tabloid and a Glossy ruled the roost. They offered insight as well as pretty pictures to pilots here and abroad. This was good. But it was not all.

A little newsprint rag in magazine format was born. It knew not what its destiny was to be. But it cared not, as it merely wished to tell pilots all around the globe what sort of equipment was available. It had no stories or pictures for mere entertainment. It, too, was good. Well, not as good as it was to become, perhaps, but the four hands which assembled it worked very hard. It had dedication, thoughtful consideration, and lots of TLC to get it thru those early formative stages. Much of the then hang glider world was also growing, and the little rag began to find its place.

Another issue came forth where only a first was originally planned. Those four hands became very full indeed, as life was breathed warmly into the new publication by awesome response. Thousands of pairs of eyes saw a value to the WAC, and this was very good.

Yet another issue emerged. The colorful bands on the cover earned an entry into a contest judging related creative efforts. Inside, the color sparked the look of pages, and those thousands of eyes fairly twinkled at the fledgling attempts of the little book. They wanted more. They gobbled up the shreds of editorial content that appeared. An article or two had been added. One was full of numbers (some called them statistics) and it turned out to be very good. This was known by the remarkable response. Pilots could really be involved because little post cards requesting reader input were provided, right from the start. These cards were named Reader Inquiry Cards, and miraculously, they could be sent back to the four hands without charge. Many flyers

used them. All this was good.

As the season approached the birthday of a better-known creator's son (some know it as Christmas), the little rag added extra leaves. Not for the cold, but because more equipment was featured, and, because the entertaining material continued an evolution. A beautiful cover was painted by an inspired man from afar (Brazil). Pilots so loved this issue that they sent more than ever of the free white cards.

Then came winter. The ground grew cold. Those who make the delicate wings drew within, during these blustery months, and looked very hard for ways to make their wings better. The four hands of WAC also wanted to make changes. Other hands became involved, too. A free buyer's service was to begin a slow, cautious move toward an entertainment/informative magazine. The lessons learned from serving the buyer would not be forgotten, tho. Instead, the four hands and their friends were to be busier than ever, as this change of columns, and feature articles took its toehold. Interviews, stories, regular columns, and feature articles became part of the fare. Still, this service cost the thousands of eyes nothing.

Another new cover, with bright colors gave a new look. The editorial material was very well received. So well that many hundreds of the white cards piled up in the mailbox. Pilots seemed to love the little rag. Many encouraging notes were penciled in the margins of the free cards.

The next issue was already deep into planning. More pages were added, along with new advertisers, and many new pages of entertaining or informative writing. This was the sixth issue, with no end to the creation in sight. By now, the WAC was ready to celebrate its first birthday. This event would occur with the next (and seventh) publication. The reply cards in the very popular issue had a space to write in impressions or comments.

So many nice words were written that smiles appeared on the faces which nurtured the little rag. The four hands and friends were very happy. Still, no charge was made. Some readers found this amazing; many said they would gladly pay to keep the magazine coming. Little did they know this was being contemplated already.

The four hands need extra hands. A better publication could result from greater revenues than advertisers alone can provide. It was time to ask the thousands of eyes for their support. Oh no, not just now, however. The plan was to provide free distribution of the WAC all the way through 1979. This kept all promises to advertisers and others. This, also, was good. All felt so.

But, nonetheless, support would still be needed if the little rag was not just to survive, but to grow. It was hoped that many readers would send their contribution (see order form, page 4), to help during the '79 season. Then, by January of 1980, the WAC would be a regular subscription supported publication. Being the third such one in the natural aviation sport of hang gliding, the WAC is proud of past achievements, and is glad to be mentioned in the same breath as the Tabloid and the Glossy.

Many feel it is time for a third publication. The four hands and helpers agree, and will try to earn that title in each and every successive issue. While not really a "news" publication, there seem to be many areas in which honest communications are needed . . . the WAC will address these needs. It will be reasonably priced, as it tries to be humble. We hope you will, everyone of you, send a subscription in. And after you have sent your own in, take a friend aside, fill his eyes with WAC, his hand with the order form, and his heart with the inspiration. With your encouragement and your help, we with the hands, will do our very best to delight you with the eyes. Help us help you!

'Continue The Experience Of Flight'



Photo by PAUL WILLENBORG; Pilot RON FC

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Volume 2, Number 3, 1979

CATALOG NO. 7

WAC Creation Story	4
Publisher's Column	6
Hang Gliding Statistics	8
By Dan Johnson	
Used Glider Bluebook	12
Hang Glider Performance	14
By George Worthington	
Past Thru Tomorrow	18
By Don Baker	
Point/Counterpoint	22
By Dick Stern and	
Dick Heckman	
Bird Flight	26
Fiction By Paul Burns	
Forum	24
Safety Tips	36
(formerly Crystal Corner)	
Product Lines	38

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PUBLISHER'S COLUMN:



Dan Johnson

Here it is, our Anniversary Issue, complete with a little **WAC** history on page 4. We begin with our two leaders, "Statistics" and "Used Gliders." At one year old each, they can boast great popularity.

Then on page 14, we start the George Worthington feature "Hang Glider Performance." This is George's first time to grace the pages of the **Whole Air Catalog**, and we are glad to have his expertise. Enjoy his look at the merit of speed for gliders. The Worthington style is universally well liked. Next is Don Baker's series, "Past Thru Tomorrow." We received a lot of good comment on Don's first contribution, which highlighted some pioneer hang gliding crafts. In this issue he will delight your eyes with some futuristic renditions that are decidedly unique.

As federal regulation shadows ever more around us, we wanted to present another way of looking at the controversy. So, resembling the popular TV show, **60 Minutes**, we approached two respectable, fellow pilots for their distinctly opposed views. In a positive manner, they each present their informed opinion. We hope you pause thoughtfully with the two Richards, Stern and Heckman.

In last issue's very successful story, "The Comeback," Paul Burns proved his style is enthusiastically appreciated. This issue Paul contributes some hang glider fiction. While this is not the first such trial, we think you'll chuckle and grin through this interesting piece of writing. For more opinion, read your own, as we launch a brand new column, "Forum," on page 24. Distilling just a few comments was the difficulty. Selecting was tough for which cards were best representative of many similar ones, or cleverest, or merely what we thought you would like to read.

Last we close with two very popular columns, "Crystal Corner" (now renamed "Safety Tips"), and "Product Lines," with Coming Next Issue, on our pretty rear cover.

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Pennsylvania Pilot Discovers The Secret of How to Fly Further, Higher, Longer and Safer

EXPLOSIVE POPULARITY AND TREMENDOUS TECHNOLOGICAL PROGRESS DEMANDED THAT THIS BOOK BE WRITTEN!

At last, someone has *finally* put it all together! After more than six years of dedication to hang gliding, the author has written the most comprehensive, up-to-date and accurate encyclopedia possible. Hang gliders have developed rapidly over the past few years and have literally "come-of-age". This great new book tells you what it's all about.

GET YOUR ACT TOGETHER.

When you're flying a hang glider, there's no time for guessing games — you act and react with the instinctiveness of a hawk! You are lightning fast in the harness as you make aggressive and positive moves. You've got to know what's happening before you even think of hooking-in. **THE HANG GLIDER'S BIBLE** tells the whole story. No question about it. This book doesn't leave you "hanging" . . .

IT'S FUN TO READ AND EASY TO UNDERSTAND!

THE HANG GLIDER'S BIBLE is actually a 2-in-1 volume with easily understood "flyers theory" and down-to-earth, practical information you can really use to improve your flying skills. The author has cleverly unraveled the "mysteries" of flight and revealed the "secrets" of the soaring birds. This book is written in plain-English without any engineering "double-talk". Yet, it is extremely accurate, well detailed and lavishly illustrated.

Whether you're a beginner, expert, builder, buyer, flyer, instructor, designer, manufacturer or retailer, this book is for you.

YES! YOU REALLY DO NEED THIS BOOK.

Chances are, you already know quite a bit about hang gliders and feel you're a pretty competent flyer. Since you are a "near-addict" when it comes to flying, you are obviously *adventurous* and have an *inquisitive mind*. You fly as much as you possibly can in order to be the best flyer you can be.

You know enough about hang gliders to know they offer you super sport, great friendships and, that no matter how much you know, you learn more every time you fly. Each flight is different and exciting.

But, how much do you *really* know about hang gliders and flying? **THE HANG GLIDER'S BIBLE** will tell you what you know . . . and, more importantly, *what you don't know*.

"A classic book on the classic aviation sport. Destined to become a collector's item and bestseller."

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A WHO, WHAT, WHY, WHERE-TO, WHEN-TO and HOW-TO MASTER-PIECE OF HANG GLIDER WRITING. This great new book has *something for everybody*, whether you're into hang gliding or just like reading about a fantastic sport. It's tops!

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•Dealer Inquiries Invited•

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Tom Peghiny, First Place Champion of 30 hang gliding competitions, Independent Designer and Professional Pilot says this about **The Hang Glider's Bible**: "It's the kind of book I wish I had when I started hang gliding. It covers all the way from beginner's instructions to expert, as well as all the facets and ramifications of design. The language is clear and easy to understand. Definitely a benefit to all who read it!"
Betina Gray Photo

LEARN THE FLYING SECRETS OF HAWKS

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Some other outstanding features of this giant volume include: graphs, charts, tables and drawings making it easier than ever before for you to fully understand your glider and the air it flies in.

TO RECEIVE YOUR OWN PERSONAL COPY, FILL-IN, THEN CLIP OUT AND MAIL THIS COUPON NOW. DON'T DELAY. DO IT TODAY.

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Please make payable in US funds to: **THE HANG GLIDER'S BIBLE**, P.O. Box 4371-WA, Harrisburg, PA 17111.

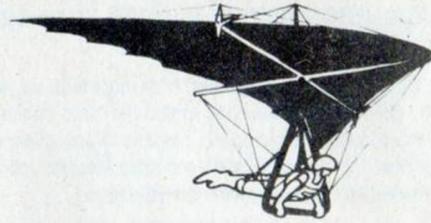
Name _____

Address _____

City _____ State _____ Zip _____ Country _____

HANG GLIDING STATISTICS

By Dan Johnson



This is the sixth edition of Hang Gliding Statistics. The *Whole Air Catalog* has reached a milestone in opinion or statistical surveying. For one year WAC has gathered a wealth of information from the hang gliding community via our popular Reader Inquiry Cards. This proven system (outside of Hang Gliding) has always been a way for consumers to receive more information from advertising suppliers. And though that part of our card program works rather slowly, we are helping to generate greater consumer awareness of products, while providing our advertisers with the names of you readers who have shown a marked interest in their brand.

What we failed to perceive when we started, was the great amount of information we were to attain from questions placed on the cards. Nor did we realize that the card system could give us input on a regular schedule, rapidly enough that we could report findings or print comments in the very next issue. Printing WAC every other month also aids in this latter advantage over monthly publications.

The results of this endeavor bring about a new era in hang gliding. Only a little over a year ago, writers within the sport had to say that extremely little was known, quantitatively. No one knew who flew what; when they might have bought their crafts, whether they had had accidents or injuries, what kind of safety equipment or accessories they possessed, or much else related to the flying market place. Because of Reader

Inquiry Cards we now know some of the above. We hope you will keep up your very steady use of them, letting us know whenever your situation changes.

Another benefit realized that was not anticipated was the fact that your circling of advertisers product numbers constituted a "vote." This vote said that you had seen their ad, and were interested by the product or service displayed. By compiling these votes, after surveying thousands of cards, we are able to communicate knowingly with our advertisers. We can tell them what percentage of readers wanted to have information on their product. This figure can be compared to all the other ads, to previous response, and to cumulative response. In addition, a narrative provides opinion trends so that advertisers know better when to change their ad, and how their products are doing in the area of generating interest.

All of this requires a "Thanks" to you involved readers, and keep up your participation with WAC and our cards. They will remain as a regular part of the *Catalog*; they really help our sport, we believe.

Now let's look at the survey from our March-April WAC.

While the Brand Market Survey continually becomes more steady in its movements, a close look at the current issue poll will show some shake-up. Electra has fallen from the Number One spot, to the second; this has happened recently. Seagull and Wills remain strong, with Electra, as the Big Three. Two companies moving up steadily of late are Sky Sports and Ultralite

Products. Their successes with the Sirocco and Condor, respectively, are no doubt responsible for their upward propulsion. Toward the lower end, Sunbird has broken into the listing, probably by virtue of their Nova. Also Manta continues a quiet upward trend with good sales of their double surfaced Fledge.

BRAND MARKET SURVEY Mar/Apr WAC				
Rank	MFR	% Share	Last Rank	
1	Seagull Aircraft	15.5	2	
2	Electra Flyer	14.0	1	
3	Wills Wing	13.0	3	
4	Sky Sports	9.0	5	
5	Ultralight Products	6.0	7	
	Bennett Delta Wing	6.0	4	
7	Manta Products	5.5	10	
8	Eipper Formance	4.5	6	
9	Sunbird Gliders	3.0	—	
	Ultralight Flying Machines	3.0	7	
All Other Brands had less than 2% Market Share				

BRAND MARKET SURVEY Cumulative Results				
Rank	MFR	Last % Share	Now % Share	Change
1	Electra	15.9	15.5	—
2	Seagull	12.4	13.0	+
3	Wills	10.8	11.2	+
4	Bennett	8.8	8.2	—
5	Sky Sports	7.8	8.0	+
6	Eipper	7.8	7.1	—
7	UP	3.9	4.3	+
8	UFM	3.6	3.5	—
9	Manta	2.8	3.3	+
10	CGS	3.0	2.4	—
11	Moyes	2.1	2.0	—
	All Other Brands	21.3	23.5	+

(Continued on Page 10)

GRAPHITE SPARS FOR GLIDERS THE HARD FACTS

The pure and simple truth is that nearly every glider manufactured in the last two years can benefit from Grafspan's Retrofit Program in these ways:

- 1) Stiffness** Guaranteed 100% increases to the certified strength of your leading edges, crossbar, downtubes, and/or king post are now being offered.
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- 5) Accuracy** Every design currently listed has been made available directly from the blueprints provided by the participating manufacturers. For you, we will even provide a set of detailed, concise instructions!
- 6) Simplicity** Grafspars are designed to incorporate today's fittings and hardware. Likewise special tooling isn't necessary to complete your retrofit conversion. The assistance of a qualified Hang Glider Dealer for miscellaneous parts and service is a good idea.
- 7) Price** The next legitimate generation of gliders will make extensive highly efficient use of graphite for the best price possible. *Right Now* a set of leading edge Grafspars for a popular example will cost: Oly 160=\$199.75; Seagull 10 meter=\$182.50; Highster 170=\$206.00 (Price subject to increases in the cost of aluminum)

Included for your money will be a spec sheet on your glider listing the over/inner sleeves in aluminum for those of you who need to balance the strength of the crossbar or downtubes an appropriate amount.

Graphite design has come a *long way* in two years, and now—You Can Have It Safely, Cheaply and Immediately! Grafspan invites your order and your inquiry. We have more facts available in our brochure, "Designing and Building with Graphite Tubing". So for \$2 you can get more of the complete story while applying it to the purchase of your first graphite glider.

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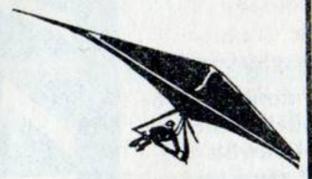
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STATISTICS

continued from page 8

On the more reliable cumulative results poll, changes are less evident, so we added the "change" column to assist your comparison. The effects of the issue poll are seen in this table but to a subtler degree. An additional cross-check is the most popular model poll. Here, you can see the trend movements of the largest margin. This is due to the proliferation of models. The telling factor is which models, especially those more successful, came from which manufacturer.

MOST POPULAR MODEL		
Rank	From WAC No. 6	Cumulative
1	Seagull Ten Meter	Seahawk
2	Wills Alpha	Ten Meter
3	Seagull Seahawk	Olympus
	Electra Cirrus 5	Alpha
5	UP Condor	SST
6	Electra Olympus	Cirrus 5
	Electra Cirrus 2/3	Cirrus 2/3
8	UFM Easy Riser	Phoenix 8
	Manta Fledge 2	Easy Riser
10	Wills X-C	Condor

Last issue we began a survey of back-up parachutes. Thus, as we now poll for the second time we are gaining cumulative results. You will readily notice a significant change in the various positions of the four primary manufacturers. Please still keep in mind that this topic is new, with less background than glider brands. After two more issues of surveying, we will have fairly dependable data in this equipment area.

CHUTE BRAND SURVEY			
Rank	MFR	From No. 6	Cumulative
1	Advanced Air Sports	31.7	29.2
2	Windhaven	23.8	24.2
3	Bennett	22.7	29.4
4	Odyssey	16.8	13.7
	All Other Brands	4.6	3.4

Based on Number of Pilots
Now Owning Chutes51%

You should also know that the number of pilots purchasing this safety accessory is continuously rising. From 35.5% in our first survey, to 47% last time, the group of pilots has risen to 51% that currently own chutes. Remember, this is over half of all persons receiving the *Whole Air Catalog*. Not all are at the intermediate skill level or above, so it is reasonable to assume that most pilots who are soaring and getting high are indeed wearing parachutes. WAC applauds this fact.

Advanced Air Sports, originally Free Flight Systems, and Odyssey seem to be enlarging their share of the Market. Though B.U.S. innovator, Bennett, still holds a slim lead, others are advancing. This may be due to the sales program. Advanced Air is not a glider manufacturer, but has builders like Ultralite Products, Wills Wing, Flight Designs, among others, representing their product. Odyssey has been making good inroads in the East by the well proven system of manufacturer visits to dealers and sites.

Our last topic is a listing of which articles you enjoyed most. We seek this information so that you readers can be involved with our attempts to present desirable material. But it is also interesting to you, we found, to know how your fellow pilots voted on our editorial content. In the March/April WAC, it was no contest for Paul Burns' article, "The Comeback." Following this story, you once again gave our Statistics column very high points. Actually, you seemed to really delight in all the articles or columns, as voting remained heavy. Here's the top five:

- 1 — The Comeback by Paul Burns
- 2 — Hang Gliding Statistics (column)
- 3 — Solar Powered Ultralights by Hank Syjut
- 4 — Product Lines (column)
- 5 — Crystal Corner (column)



AERIAL TECHNIQUES

WINTER HOURS: Closed Tuesday & Wednesday — Open Thursday - Monday, 9:00-5:00

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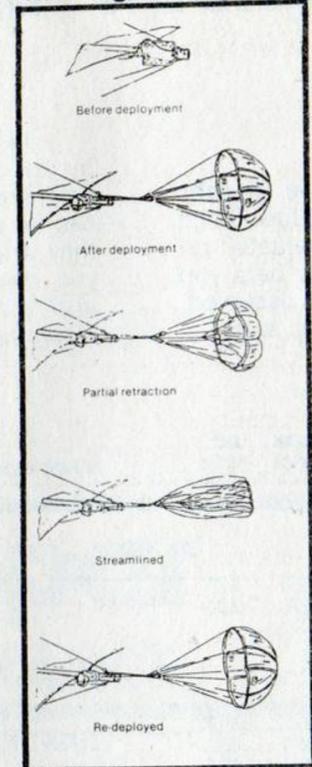
Moyes Redtail	1,000 (D)
ASG-21 180 & 160	500.00 (U)
Easy Riser Comp	900.00 (U)
SST 110G	1,195.00 (N)
Phoenix 12	900.00 (N)
Condor 178	1,200.00 (N)
Firefly 174	1,100.00 (N)
Phoenix 6C 162	1000.00 (D)
Seagull 4	500.00 (U)
Phoenix 8jr	600.00 (U)
Phoenix 8	700.00 (U)
Phoenix 6C 180	750.00 (U)
Seagull 3Z	500.00 (U)
Electra Flyer Floater (205)	1,350.00 (N)
Flexi III 185	600.00 (U)
Scirocco I	900.00 (U)
Phoenix 6D 185	1,140.00 (N)
Firefly	700.00 (U)
Merlin 160	550.00 (U)
Merlin 180	550.00 (U)
Alpha (3) 185's	1,295.00 (N)

GLIDERS ON ORDER:

Seagull 11M (4)	1,445.00 (N)
Seagull 10M (2)	1,445.00 (N)
Seahawk (2) 180	1,135.00 (N)
Seahawk (2) 200	1,135.00 (N)
Moyes Maxi III (3)	1,395.00 (N)

(N) — New (U) — Used (D) — Demonstrators

Hummingbird Drag Chute



ACCESSORIES:

- Hummingbird Drag Chutes \$ 45.00
- Bennett Drag Chute 19.95
- Windhaven Drag Chute 17.95
- Bennett Mark II Chute 359.50
- Odyssey Chute 325.00
- Up Chute 349.00
- Windhaven Chute 346.00
- Up Cloud Harness 93.00
- Price Prone Harness 94.50
- Skysports Prone Harness ... 84.00
- Manta Prone Harness 95.00
- Bennett Comfort Harness ... 85.00
- Bennett Enduro Mesh 65.00
- Sunbird Supine Harness ... 109.50
- Sunbird Prone 94.50
- Bell Helmets 54.95
- Car Top Carrier Brackets ... 20.50
- Control Bar Wheels (High) .. 12.95
- Control Bar Wheels (Frank) . 20.00
- Astraltune Stereo Pack 195.00
- Up Flight Bags 27.95
- Hang Loops (12" & 18") ... 3-4.00
- Log Books 4.00
- Velcro Tie Straps (18", 24", 30") 2.50-3.00
- Sterling Silver Necklaces (H.G.) 16.50
- Hang Gliding Sweatshirts ... 10.00
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- Soarmaster Unit 750.00
- Dennis Pagen's H.G. Books .. 5.95
- UP Cocoon Harness \$150.00
- UP Pro Bags 29.95
- Bennett Fairings . 29.00

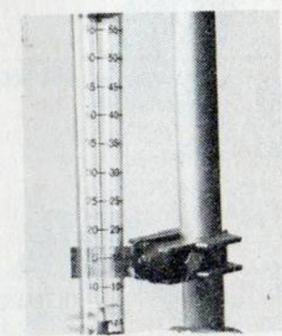
(Prices Subject to Change Without Notice — New York residents add 7 percent sales tax.)

Reader Inquiry Card No. 6



INSTRUMENTS:

Aircraft Altimeters	\$130.00
Thommen Altimeters	119.00
Chad Avt Units	495.00
Colver Varios	209.00
Litek Varios	145.00
Paragon Varios	155.00
Theotek Varios	170.00
Ball Varios	275.00
Dwyer Windmeters	8.95
Hall Airspeed Ind	18.50
Hall Brackets	5.50



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USED GLIDER BLUEBOOK

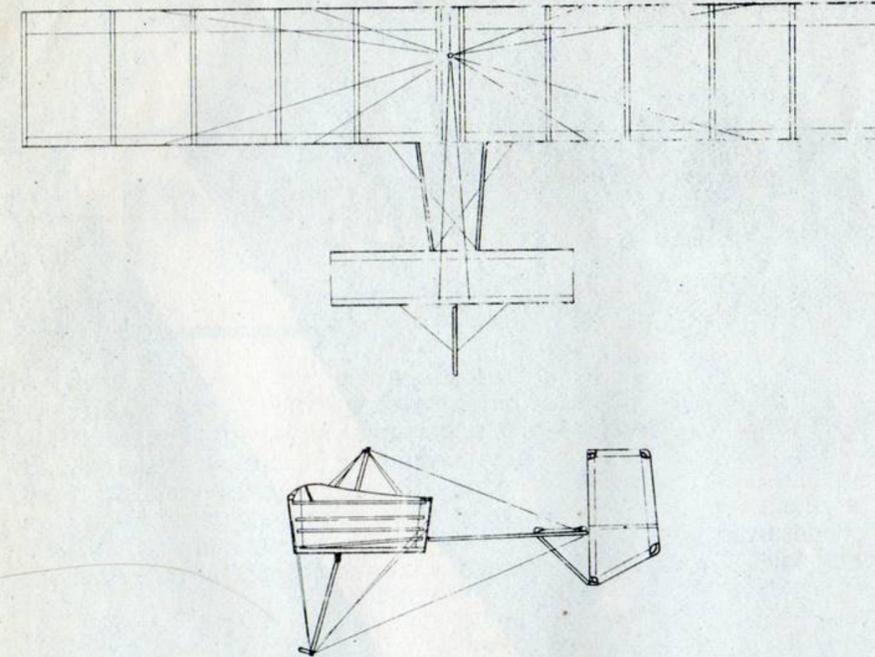
EDITION NO. 7

CONSUMER NOTE: The prices we present are not the last word in used glider value. Each craft must be closely inspected, and evaluated on its own merits. A dealer can very likely help you a lot, but, of course, some fee is then deserved, or a commission in the case of a dealer sale.

In these days of prices continually increased by the pressure of inflation, used gliders may hold great opportunity for savings. Used gliders can be examined in the air and on the ground. If they are good, it's relatively easy to see. If not, you can save your money. Student pilots may also find good use from a used glider. But care is recommended. The market is still buyer beware.

MANUFACTURER	YEAR	MODEL	SIZE	CLEAN PRICE	AVG. PRICE
ALBATROSS SAIL GLIDERS	76	ASG 20	C	550	300
	76	ASG-21	C	575	400
BENNETT DELTA WING	76	Phoenix 6B	Jr.	425	350
	76	Phoenix 6B	Reg.	425	400
	76	Phoenix 8	Reg.	450	450
	77	Phoenix 6C	Sr.	400	425
	77	Phoenix 6C	Reg.	500	425
	77	Phoenix 8	Reg.	650	375
	78	Phoenix 8 Super	Reg.	675	450
CGS AIRCRAFT	76	Falcon V	225	550	450
	76	Falcon V	185	575	400
	77	Falcon V	185	650	500
EIPPER FORMANCE	75	Flexi II	240	400	200
	75	Cumulus V	180	400	300
	76	Cumulus VB	180	450	375
	77	Flexi III	185	675	500
	77	Cumulus 10	Med.	595	525
	78	Flexi III	Lg.	700	550
	78	Cumulus 10	Med.	775	675
ELECTRA FLYER	76	Nimbus	20-17	200	125
	76	Cirrus	3	425	350
	76	Cirrus	2	425	350
	77	Cirrus	3	450	350
	77	Cirrus	2	450	300
	77	Olympus	160	575	525
	78	Cirrus 5	C	675	600
	78	Cirrus 5	A	675	600
	78	Olympus	160	775	700

MANUFACTURER	YEAR	MODEL	SIZE	CLEAN PRICE	AVG. PRICE
MANTA PRODUCTS		77 Mirage	175	700	550
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	825	750
SEAGULL AIRCRAFT	75	Seagull III	220	325	250
	76	Seagull III	220	350	275
	76	Seagull VII	174	600	350
	77	Seahawk	170	650	550
	77	Seahawk	190	675	600
	77	10.5 Meter	—	950	750
	78	Seahawk	190	800	600
	78	10 Meter	—	1100	900
SKY SPORTS	76	Kestrel A	185	450	350
	76	Kestrel A	220	525	425
	76	Merlin	160	500	375
	77	Bobcat III	Lg.	775	600
	77	Sirocco I	156	775	500
	77	Sirocco I	175	700	525
	78	Osprey	175	825	775
	78	Sirocco II	164	1000	925
ULTRALIGHT FLYING MACHINES		76 Easy Riser	Compl.	1125	850
ULTRALITE PRODUCTS	76	Dragonfly Mk. II	174	575	375
	77	Firefly	174	650	500
	77	Dragonfly Mk. II	196	700	550
	78	Spyder	176	850	675
WILLS WINGS	75	Swallowtail	22-20	225	175
	76	SST	90	600	400
	76	SST	100A	625	450
	76	SST	100B	600	475
	77	SST	100B	750	550
	77	X-C	185	800	650
	78	Alpha	185	975	775
	78	Alpha	215	1000	800
	78	X-C	215	950	775



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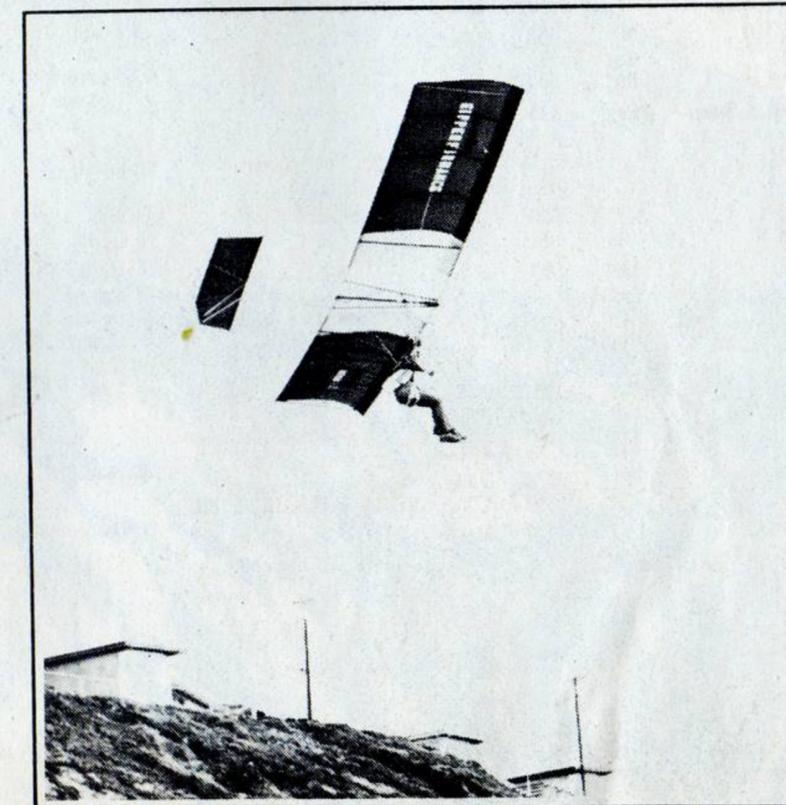
Easiest to learn to fly motorized because of slow take-off speeds. Plus, simplicity of repair.

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Reader Inquiry Card No. 7

HANG GLIDER PERFORMANCE

BY GEORGE WORTHINGTON

Is there a hang glider with a clearly superior performance? Well, yes, the Mitchell Wing. That's indisputable, but what if a pilot doesn't want to mess around with the transport problems and the reduction of "Operational Freedom"? Let me explain what is meant by operational freedom. It's a matter of comparison. For example, the rogallo can be landed most anywhere, even on hillsides or in the sagebrush. No problem. But the Mitchell Wing requires some sort of reasonably large flat area where the pilot can run a few steps without stumbling, during the touchdown. Accordingly the operational freedom of the rogallo is much greater. Now back to the basic question: Is there any particular hang glider other than the Mitchell Wing which clearly has performance superiority?

The question is important. Every pilot contemplating buying a new hang glider is going to ask that question. I would guess that very, very few pilots (including the Hang 5's and the professional hang glider pilots) know and can prove that any particular rogallo has a clear cut superiority in performance over the rest of the new rogallios. I have flown virtually every model advertised in the current hang glider publication. Some have a better sink rate. Some have slightly better penetration. This can be shown and demonstrated. However, of the group being advertised as having the best all-around performance, the difference between models, I believe, are very small. And it is possible that whatever differences do exist can be reversed or overcome by increasing the wing loading (to get better penetration) or by decreasing

ing the wing loading (to get a better sink rate).

So now let's go back to the basic question. Is there a hang glider that has a definite, easily recognized performance advantage? I believe there is, and that's the purpose of this article.

It's not a rogallo. It's the new double surface Fledgling. And in particular it is one Fledgling owned by Eric Raymond. I say one particular Fledgling because there seem to be differences between Fledglings of the same model. Some seem to have very tight sails and others don't. Eric's has a very tight sail. And this seems to make a big difference. One day, while I was flying a small, very fast rogallo, in which I had raced about 6 other assorted new rogallios and in which I had badly beaten 5 out of the 6 and tied the sixth, I asked Eric to race. I was amazed. Over a 2½ mile course, the Fledgling beat me by about 1000 feet. The conditions were such that we both were flying in the 35 MPH range (or about 13 to 15 MPH above minimum sink speed). So this was a real test of penetration. It was very obvious. We were both flying through the same air at the same altitude, in the same strong ridge-lift conditions, and the Fledgling was gaining steadily during the entire race. Ah ha, I thought, he may have a big advantage in penetration, but what about sink rate. The rogallo I was flying had a sink rate roughly equivalent to the best of its size in the group with 160 square feet. In other words it had a very good sink rate for its size and wing loading. So I challenged Eric to a sink rate contest. (Incidentally his Fledgling has about 166 sq. ft. of sail to compare with the 160 of my rogallo.) So this was close to the

same. Also it should be noted that Eric weighs about 145 to my 165. Twenty pounds is a significant difference.) Well, again I was amazed. The Fledgling quickly climbed up to a point about 60 or 70 feet above my average which was about 300 feet above the cliff top at Torrey Pines, and stayed there. It was obvious, he had a better sink rate.

So what does this mean? Well, in my opinion, if a person was interested in maximum cross-country potential, the Fledgling would have to receive serious consideration. I haven't flown one, so I don't know how well it thermals, or turns, or how easy it is to land. I don't think these areas should be a problem. Eric lands in all the most difficult wind conditions at Torrey Pines, and also in the small difficult cross wind runway which we sometimes use. I believe that the Fledgling could safely land anywhere that a rogallo could land.

Eric won't make a no-wind take off in his Fledgling. He said he's tried. He has no qualms about making no wind take offs in rogallios. So there may be a difference in the area of "Operational Freedom," where take offs are concerned. But it shouldn't be a serious problem. In cross country flying I am seldom faced with a problem of zero wind at any take off area that I've used.

Eric does point out a problem with the Fledgling. In a landing situation in a high wind, there is a considerable difficulty in holding the nose down immediately after landing while trying to unhook the harness. Eric feels he must solve that problem before flying at Cerro Gordo this Summer. He's thinking of the type of quick disconnect which parachutes use. He'll need a solution, because one of the



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HANG GLIDER PERFORMANCE

real serious problems at Cerro Gordo in July is that the winds, where we land in the valley, are frequently strong and gusty. And the problem of controlling the hang glider, after the landing has been made, can be considerable. The pilot is usually all alone, unable to get immediate help. In a rogallo, the problem has never been serious for me, even in the cases of very strong surface winds. In the Mitchell Wing it is greater, but still not a critical problem. But I would think that in many rigid wings such as the Easy Riser, it could be quite serious, at least to the safety of the glider, if not the pilot.

The Fledgling seems to have two other disadvantages that should be considered. From watching Eric and other Fledge pilots I've observed that in any wind over about 8 MPH the Fledge is difficult to "ground handle." In stronger winds (20 or so) Eric needs 2 people to help him carry the Fledge to the Torrey Pines cliff edge. And the take off looks scary because the Fledge strains to dip a wing etc. while Eric tries to hold it level just before take off. In the same wind I can launch rogallos unassisted, although I frequently use a wire launch. The second possible disadvantage is that the Fledge takes comparatively much longer to assemble and disassemble than most of the rogallos. I had a Sundance which was similar in this respect. I sort of hated to fly it at Torrey Pines because it always took me twice as long to set up and disassemble at it did for my rogallo.

Now that I've discovered that the Fledgling seems to have a considerable performance advantage over the best rogallos, am I going to rush out and buy one? No. I have a Mitchell Wing, which, while it can't be landed everywhere, does have at least an equally greater performance advantage over the Fledgling, in my opinion, as the Fledgling has over the rogallo. However, I would hate to compete with a Fledgling (if I was in a rogallo) in a 40 mile speed race or a maximum distance task from Cerro Gordo.

These are my thoughts about the Fledgling. What are yours? I hope that I've stirred up a hornet's nest, because we need to think more

about performance, talk more about performance, and we need to gather more hard data about performance of hang gliders.

April 17, 1979. It's been 5 weeks since I wrote the article above. At that time I had penetration and sink rate data, upon which to base my assessment that Eric Raymond's Fledge II is a giant step ahead of all the rogallos in X-C performance. Since that time I've flown in the Mountains with Eric and his Fledge. He has made some no-wind take offs. He has time and again shown that if anyone could stay up (using the best rogallos with very experienced pilots) in marginal conditions he could also stay up. The place was the "E," at Elsinore, California. By waiting until the wind is about to change from East to West, which usually happens every morning between 10:00 and 12:00, a pilot can catch thermals. This usually means a no-wind to a slight down-wind take off. The thermals are starting between 10 and 12 and they are getting stronger from the time they start until late afternoon. It's a tough choice. If you go too early, the chances of finding a thermal and staying up are less. If you go too late, the chances of having down-wind conditions which are too severe are greater. Only the very foolish accept a down-wind strength of greater than 4 or 5 MPH at this particular site.

Eric has made some no-wind take offs at E. Other pilots, flying rogallos, have made many down-wind take offs at the "E" with strengths up to 5 MPH. So, maybe the Fledge is not as suitable for downwind take offs as the rogallo.

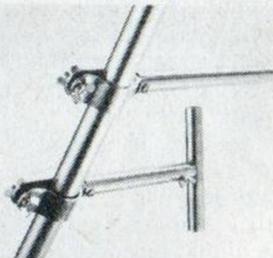
After take off, the successful pilot must turn left and hug the ridge. He'll usually get at least minimum sink conditions if he turns efficiently and stays very, very close to the ridge. He usually has to scratch for 10 minutes or so, sometimes getting lower and lower and moving out further on the ridge where it descends into the valley. But persistence usually pays off and by hanging out close to the spine of the ridge he will find a little bubble of lift to get the precious couple of hundred feet higher where thermals become stronger and easier to use.

Eric and his Fledge have shown a remarkable performance. Not only does he work the marginal conditions as well as the very best rogallo pilot, he usually ends up

higher than anyone. And his power to fly fast and far with a minimum loss of altitude is awesome compared with the rogallos.

I have to believe that Eric and his Fledge are a team. Eric flies every day. He is talented and apparently fearless. He knows his machine. He is a good innovator. He has discarded his droop tips. (Basically I am against having pilots modifying their hang gliders — but there are exceptions.) He has installed short thin battens on the trailing edge of the sail between all the regular battens. This has halted the flutter he used to get at speeds above 40. He usually stays up over 3 hours. When it's time to land he normally reaches the landing site with a thousand feet of altitude, and then does some dramatic spins and dives. His speed must easily reach 60 MPH in some of his screaming dives. He uses his rudders as spoilers for glide path control and lands right where he wants to. Eric is good — real good — but he takes what I consider are high risks. If he survives, I'll be surprised if he doesn't get a World Record or two this Summer.

INSTRUMENT BRACKET

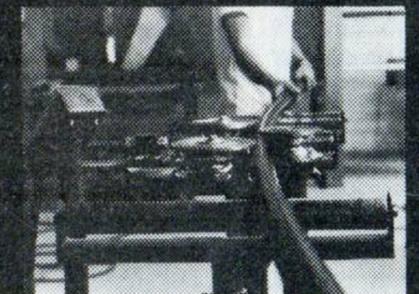
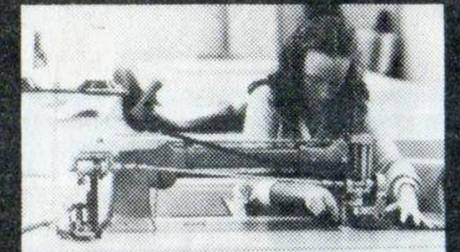
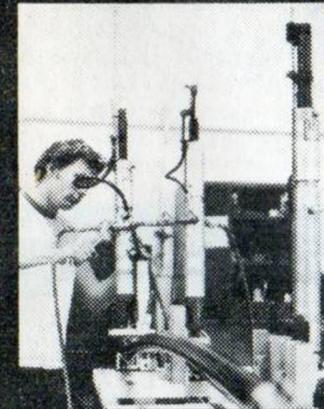
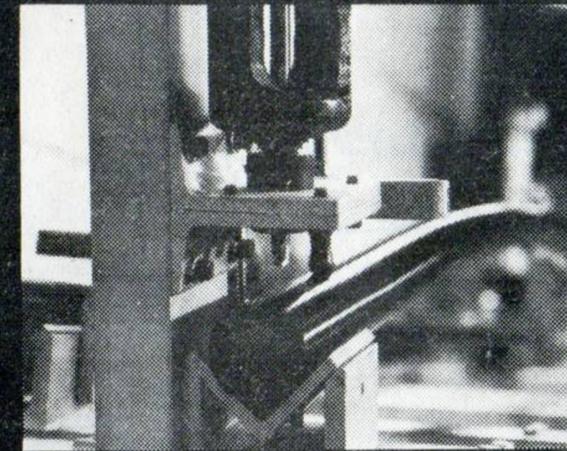
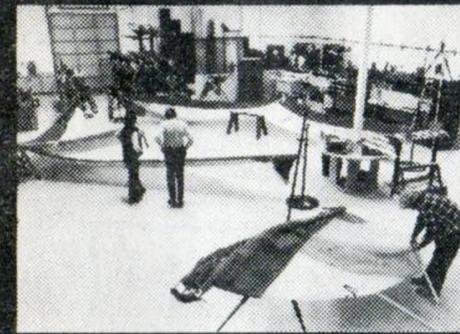


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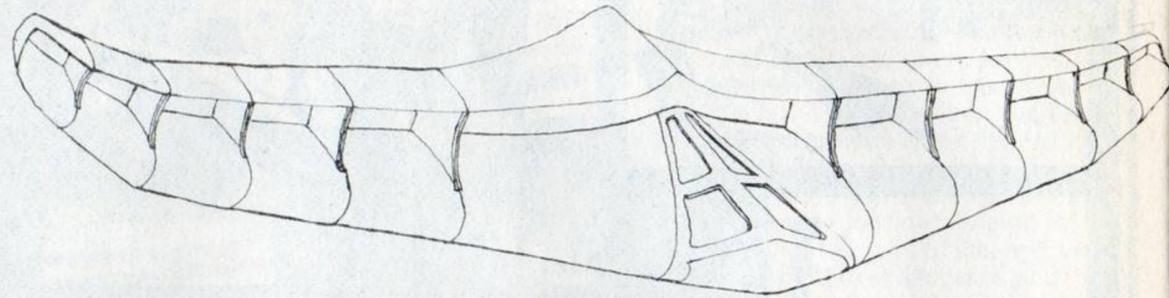
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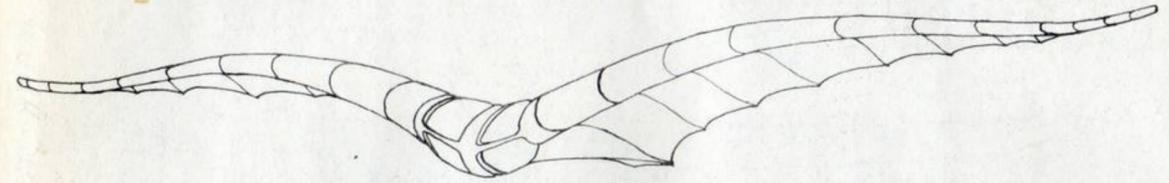
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PAST THRU TOMORROW



a



c

When I first decided to design a collection of futuristic ultralights I felt they should meet at least two standards. One, they should be foot launchable, and two, they should be able to fly somewhat — well at least in theory.

What I found was they seem to fall into categories. First, those available to us with materials and technologies currently at our disposal, and those that will become

feasible as we gain data and as industry develops materials and hardware to fit our individual needs as a specialized area of aviation.

This issue I tried to use a less conventional approach and explore other possible techniques for flight control.

I came up with nine designs, but, for detail sake I'm only publishing four. If you'd like to see more, let me know.

Each design is flown prone or supine inside an integrated pod, with the pilot

entering and exiting the pod via hinged underside flaps (not for the purist, but very low in drag).

The glider in frame "A" is a bi-wing divided into cells. Three-axis control is initiated with rotation of the three outward cells at a set ratio to each other, beginning at the outward cell.

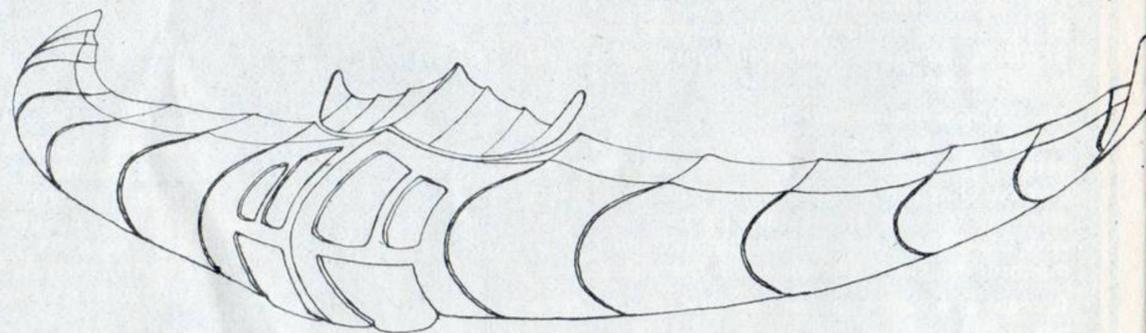
Glider "B" is a bow-wing with roll and yaw control from the inward and upward warping of the wing, via twist grips. Pitch is achieved by the movement of the

horizontal stabilizer connected to the swing seat.

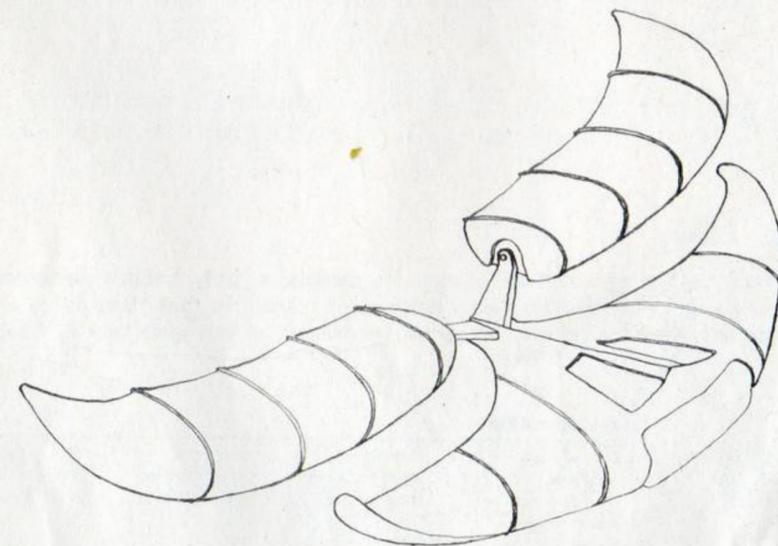
Glider "C" I haven't figured out, yet. It just looked nice.

The Porkwing is a canard that achieves three axis control by independent rotation of the aft wings. It was designed for my friend, Pork, to help satisfy his uncontrollable addiction to canard wings.

TWB 79

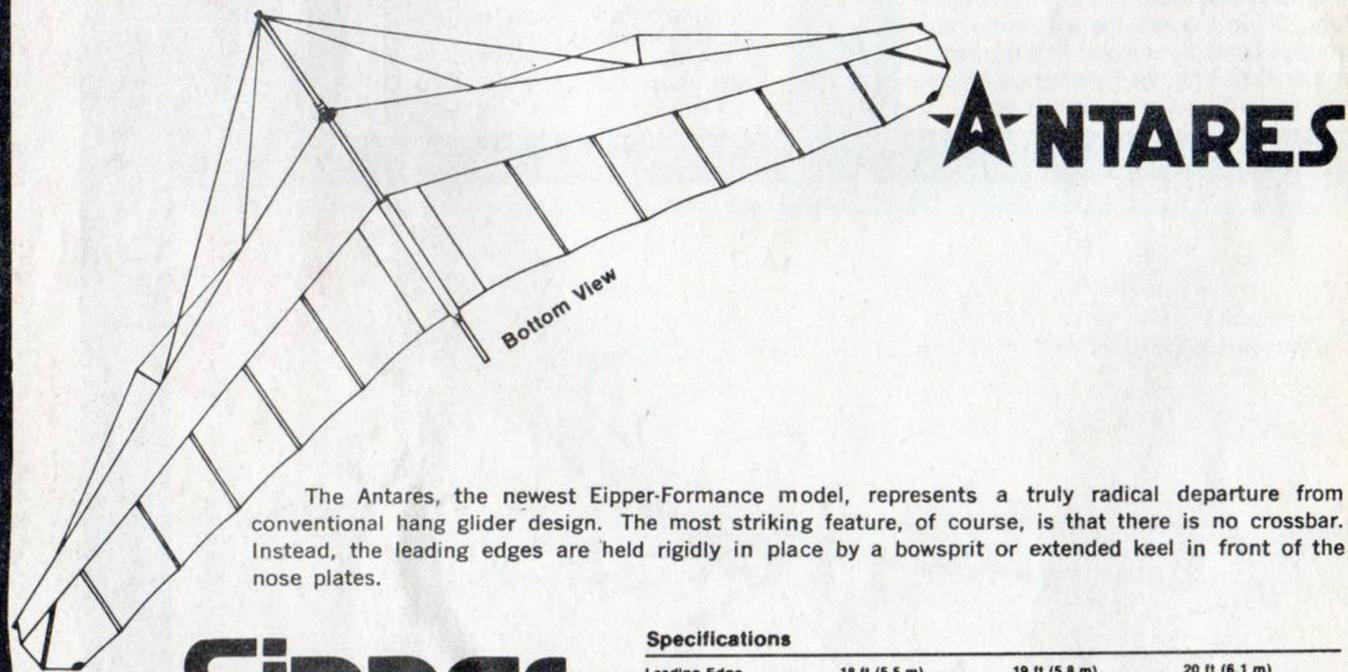
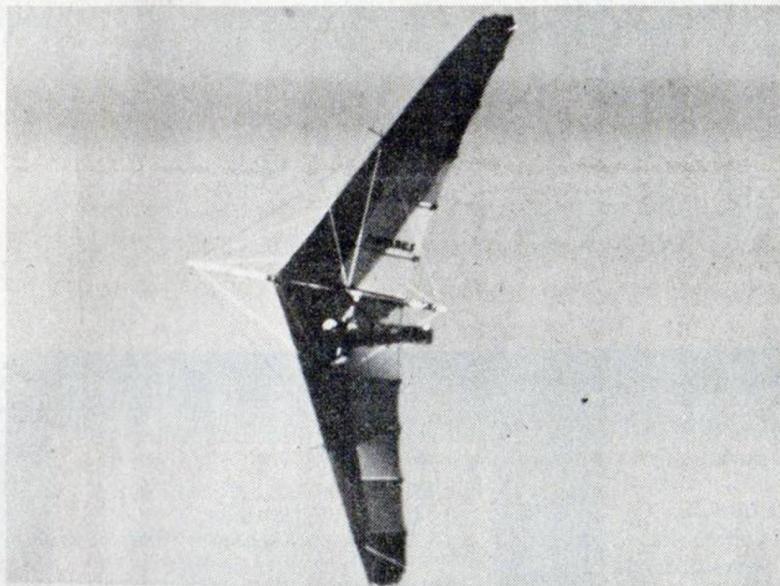


b



porkwing

One Day... You'll Discover Eipper-Formance



The Antares, the newest Eipper-Formance model, represents a truly radical departure from conventional hang glider design. The most striking feature, of course, is that there is no crossbar. Instead, the leading edges are held rigidly in place by a bowsprit or extended keel in front of the nose plates.

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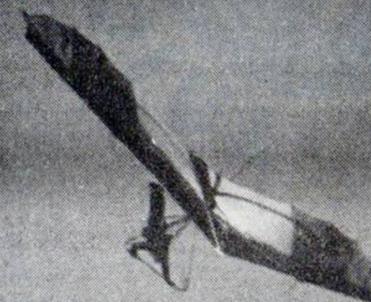
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Specifications

Leading Edge	18 ft (5.5 m)	19 ft (5.8 m)	20 ft (6.1 m)
Wing Area	155 sq ft (14.4 m ²)	172 sq ft (16 m ²)	190 sq ft (20.5 m ²)
Wing Span	33.5 ft (10.2 m)	35.35 ft (10.8 m)	37.2 ft (11.3 m)
Aspect Ratio	7.25	7.25	7.25
Nose Angle	130°	130°	130°
Root Chord	7 ft (2.1 m)	7.5 ft (2.3 m)	8 ft (2.4 m)
Empty Weight	53 lbs (24 kg)	55 lbs (24.9 kg)	57 lbs (25.8 kg)
Pilot Wt Range (Est)	130-165 lbs (59-75 kg)	150-185 lbs (68-84 kg)	170-210 lbs (77-95 kg)
Billow	.25°	.25°	.25°

Reader Inquiry Card No. 10

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- Chris Price

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- Dick Stern "Old Man of the Mountain"

"The **ALPHA** is a true **supership**...it feels utterly stable regardless of the bank or pitch angles...this may make the **ALPHA** the best thermalling glider I've written about in this series."

- Dan Johnson, Glider Rider

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SPECIFICATIONS

AREA	245 ft ²	215 ft ²	185 ft ²	155 ft ²
SPAN	37'	34.5'	31.9'	29.3'
PILOT (FLYING) WGT	190-250 lbs	165-205 lbs	140-175 lbs	110-145 lbs
GLIDER WEIGHT	56 lbs	49 lbs	46 lbs	43 lbs

AFTER ONE FULL YEAR OF PRODUCTION, NOT A SINGLE ALPHA HAS EXPERIENCED A STRUCTURAL FAILURE OR PITCHOVER.

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Reader Inquiry Card No. 11

A serious matter is at hand. The chance of Federal Regulation is closer to us than it has ever been. As reported in *Glider Rider* (April 1979), the FAA has personnel drafting a document which could be a Notice of Proposed Rule Making (NPRM). This means a law could be proposed, which may then be enacted. The conclusion: hang gliding would become a regulated aviation activity.



Like a boil. But as members of the hang glider community, you should think through your own stand on the subject. This task might be easier, we felt, if you already knew of two opposing views. Especially so if those perspectives came from

persons who had awareness of the problems, if you will, the inside track.

As on the popular TV show, *60 Minutes*, we have our two proponents. Each man has strong feelings on the issue, and each man is a member of the Chattanooga sub-committee of the USHGA, which is presently studying the matter. See *Glider Rider* for details of that effort. Here, we wished to present the more or less philosophical angle. And we asked each man to write very briefly on the positive side of his argument.

With pleasure, we present Dick Stern, writer of *Old Man of the Mountain*, and USHGA Region 10 Director, Dick Heckman.

I DON'T LIKE GOVERNMENT REGULATIONS!

Yet here I am, a member of a committee that is working on proposed government regulations of a beautiful free sport. A sport that has not been burdened so far, in the U.S. at least, by big brother. Why?

I would never have been inclined to serve on such a committee except for a sense of urgency; an urgency for defense.

The clock is running out on our freedom. Just as surely as you'll drop your only wing nut in tall grass on a sorable day.

I feel, because of its inevitability, that the best thing we as hang glider pilots can do is get involved with the rule making to make it as light as possible. It's sort of like taking a flu shot. It's going to hurt a little and it may make us a little bit sick to the stomach, but it's a whole lot better than the consequences.

Actually the rules that we are proposing are just plain good sense safety rules that everyone should observe anyway. They are really *our* rules of the road to keep us separated from other aircraft.

Let me ask you: Don't you feel a little bit safer when driving a strange mountain highway if there are yellow and double yellow lines

which help prevent oncoming drivers from passing on a curve or hill and wiping you out? Or when you go blasting through a green light, aren't you glad the cross traffic has a red light?

All other aircraft, including sky divers, have certain rules to observe while sharing the airspace. However, we can go happily gliding through clouds or into air traffic control zones at airports without a care, or a brain.

So when we know that the F.A.A. is going to step in sooner or later and tell us what we can and can't do, the best thing we can do is to help make rules that we can live with.

My hope is that, by getting F.A.R.'s that deal with safety of shared airspace passed, we can circumvent the factions that might be more interested in pilot certification or glider certification.

Once an F.A.R. is established it is extremely hard to get it changed.

As I see it, we have a choice; a light regulation from now on, or a tougher more stringent regulation sometime in the near future.

— DICK STERN

I DON'T EITHER!

I'm personally not sure there is a black or white solution to our present predicament, but let me be a devil's advocate for a moment.

Self regulation is difficult. It requires each of us to accept

certain responsibilities. We must be responsible for our own flying actions. We must work to ensure that all pilots understand the airspace rules of the road. And finally, we must be willing to discipline those of the hang gliding community who show an unwillingness to accept the safe flying principles outlined in the USHGA Basic Safety Regulations.

It is much easier to accept the blanket of Federal Regulation. Someone else will do our work for us. And there are many peripheral advantages of Regulation, such as official recognition of a right to exist in the airspace. But, like a blanket, regulation can smother. And like Fritos, one regulation leads to another. Nobody stops at one.

Under self regulation, our growing, rapidly changing sport has the capability to adjust our rules easily to accommodate changes in the sport. Our capability for responding to changes in our sport is infinitely greater than that of the Federal Government.

Whatever we do, we must not be stampeded into asking for regulation because the F.A.A. may propose regulation, but because we truly feel that it will be in our long range self interest.

Federal Regulation will not make our flying safer. Safety comes not by decree but from knowledge and a sense of personal responsibility.

— DICK HECKMAN

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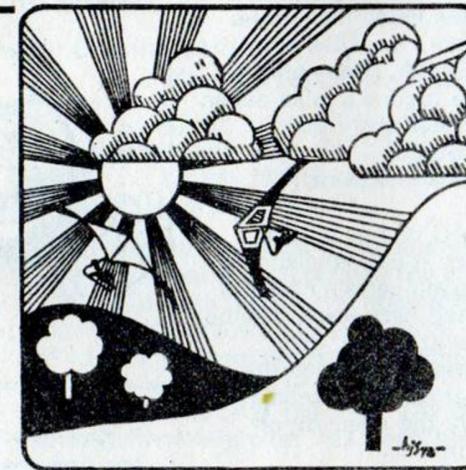
Any order that exceeds ten lengths may be combined for quantity discounts: No boxing charge for orders shipped via truck; however, Air-Freight shipments add \$10.00 for each 12' shipping container.

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Reader Inquiry Card No. 12

"CRYSTAL FLIGHT"

— a graphic print by Hank Syjut



Each of these charming prints is an original work of art executed solely by the artist! Each is hand printed from a hand-carved matrix on 100% cotton paper. Then each is hand signed, numbered and titled. The edition is limited to 250 and no more will be printed! They are priced so low anyone now can own a Hank Syjut original. Sent with matching envelope and documentation sheet — \$14.50 (plus 50c postage):

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They're hand-crafted in 100% nylon (durable, washable, water-resistant) with velcro closures. And, they're so trim and lightweight that they contour to your body!

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Dealer inquiries welcome.

Reader Inquiry Card No. 13

Reader Inquiry Card No. 14

Page 23

BIRD FLIGHT

BY PAUL BURNS

On a pretty summer day last July Bill "Speck" Outsky was soaring a popular Chattanooga flying site. The temperature was mild and the thermals were good. Bill's nickname was appropriate on this day, as Outsky remained "specked" the majority of the afternoon. A bird man for sure, with human senses working at full capacity: feeling at one with his machine, the "Speck" was free as a bird.

Cruising down the ridge in search of the next thermal, Bill approached a rocky bluff line which was known to be a popular roost for resident buzzards.

Some sink, a few turbulent bumps, lift on the vario, and "Speck" began to do exactly that. Banking his craft into a smooth 360° turn, his vario read constant 500' per minute up. Entering the 2nd of a series of turns that would find him eventually at 3000' A.G.L., "Speck" made visual contact with a buzzard in flight. The bird was 500' below, sharing the same smooth, vertical column, courteously carving 360's in the same direction.

Upon completing another turn, Bill again sighted the bird to find it less than 100' below and closing rapidly. As this soaring master passed through his line of vision Bill studied its form, observing every movement. Speck could do nothing more than gaze enviously as the bird tightened its bank attitude into the increasing lift. Obviously, the drag laden hang glider which Outsky was operating was no match for the buzzard.

Seconds before the bird became obscured by his glider, Bill watched intently as the buzzard glanced over its shoulder to get a better look at the strange machine, and pilot, it was overtaking. As a jockey will scornfully shout "get a horse" at a faltering opponent, Bill sensed the bird laughingly called out "get some wings" as it ascended silently from his view.

It wasn't until a couple of hours passed, that Bill terminated his flight. On the landing field, I was already disassembling my equipment, when we overheard a fellow pilot telling his own little "war story." Seems during the course of his flight our friend found himself in a bad spot — low in sink, midway through a gap in the ridge. Excitedly he claimed the exceptional L/D of his machine was responsible for returning him into an area of lift, and praised the design over and over.

Upon hearing this oratory "Speck" recalled his earlier encounter with Brother Buzzard. In doing so he was once again overwhelmed with the performance shown by the bird. Walking over to my location Bill interrupted my breakdown activity to relate his experience. "You should have seen the way that guy went past me, man! It was like I was standing still. And I mean I had it man! I was coring!" I suggested we discuss the matter later over supper and "Speck" agreed.

Over a good ol' fashioned Tennessee-style Italian pizza (topped with blackeyed peas and

pinto beans) and a couple of cool ones we compared Bill's hang glider and the buzzard. Our conclusion — no comparison except that maybe we could say they both fly through air.

As we compared further we concluded that no man-made aircraft could compete with that ol' buzzard. After all, consider the hundreds of years of refinements the buzzard has undergone, the sophisticated configuration alteration capability, plus sensory advantages. The "Speck" and I decided the bird is in an all together different ball park!

After purchasing a refill of his favorite beverage Bill returned to the table, obviously heavily engaged in thought. He stroked his beard and stared into space. "It has to be hang gliders, or something like one. Sailplanes, — naw, not sail planes," Outsky was rambling — thinking out loud. His mind raced and vocal cords attempted to keep up. Meanwhile I didn't interrupt much, as I scarfed up the last couple pieces of pizza.

Once again he returned with a refill beverage, and this time a pen which he had borrowed. Bill sat down and immediately began sketching on napkins — drawings of airfoils and tip sections, and numbers for coefficient of lift, aspect ratio, etc. — with computer like speed. A designer with exceptional creativity and initiative, the Speck was acting like a little kid with a new toy! "What the heck ya doing Bill?" I asked, and

received no response.

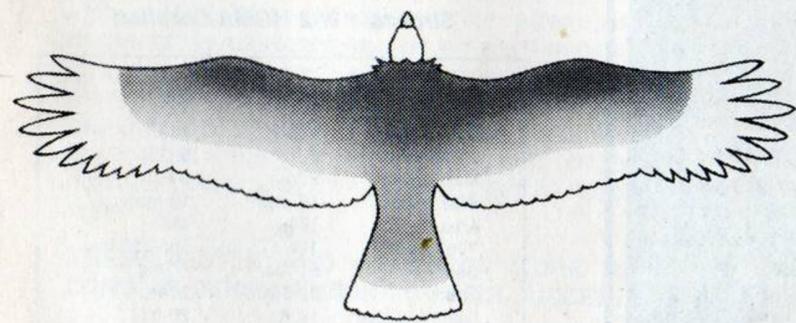
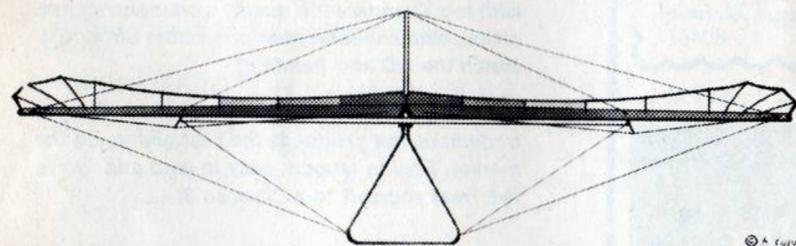
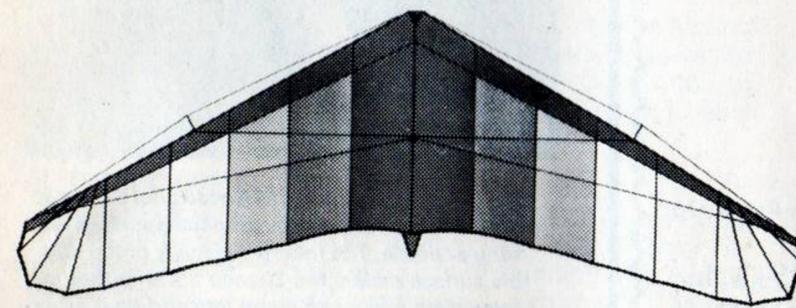
Taking a break, Outsky stood up and headed for the boys room. It was then the bill for our pizza caught my eye, covered with drawings and numbers. I picked it up to study with greater detail. First I recognized a re-creation of an ad for Bill's present high performance hang glider.

Introducing the new "MEGOHI" from Bills' Wings

SPAN	38'
AREA	220 Ft ²
NOSE ANGLE	6.6
BILLOW	120°
ASPECT RATIO	1°

- fully cantilevered construction for lowest possible drag
- adjustable in-flight wing section for varying conditions
- adjustable in-flight dihedral-anhedral
- adjustable in-flight tip configuration

Talk about strong! In high "G" situations the "Buzzard" merely folds its wings, thereby eliminating stress!! So there you have it. The design is called the "Buzzard," it's the most advanced bird in the sky.



On the other half of the page, written in very small yet surprisingly legible print, was an ad similar in format which read: Introducing the "BUZZARD" from the Creator

SPAN	Variable in Flight
AREA	" " "
ASPECT RATIO	" " "
SWEEP	" " "

In addition to the above features, it has the "flap" capability to counteract the effect of sink and to eliminate the need for a launch from an elevated area — launch anywhere. *Special note: If you've had a problem with tree landings the "Buzzard" is the bird for you. The "Buzzard" is as much at home

in the trees as in the air; and relaunches as easily from the trees as it goes in.

Upon his return I questioned Outsky about the curious Buzzard ad I had just read. "Yea man, hot stuff, ah?" I must have appeared dumbfounded in expression as I felt disbelief about the situation. The "Speck" bailed me out however, as he excitedly went on: "Can't you see it man? If I can copy a buzzard and scale it up some, I'll have the hottest thing in the world! Nothin' could out sell me 'cause nothin' could compare to my product."

I studied his facial expression closely, halfway expecting Bill to burst into uncontrolled laughter any second; but found myself observing only seriousness. "You aren't kidding, are you "Speck"?"

"Kidding! Hell no, I'm not kidding," came the reply. "But "Speck," copying a buzzard?" I questioned in a low tone. "Do you think you can do it — copy a buzzard I mean?"

"We put people on the moon haven't we?" "Yea, but . . ." I began to interrupt when "Speck" continued, "We have split the atom, and done hundreds of other things which were thought impossible."

"But Speck," I pleaded, "copy a buzzard?" At this remark the expression on his face changed.

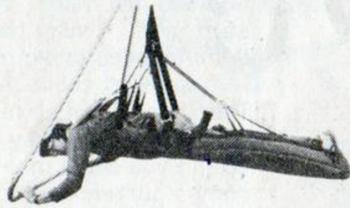
I noticed him disgustingly curl his lower lip, while reaching into the front left pocket of his blue jeans, withdrawing his fist around a wad of crumpled bills. Quickly Outsky separated enough money to cover his half of the pizza, and put it into my hand. "See ya man, Its been real." As Bill turned to walk to the door I asked, "Where are ya going?" "I have things to do man — see ya later," came his excited response as out the door he went.

That was the last time I saw Bill "Speck" Outsky. Lately, however, I've heard of someone who matches "Speck's" description living in a cave on the side of Grandfather Mtn., N.C. Seems the only time this person is seen is on days when the wind is blowing over 40 MPH. During these special times the mysterious cave dweller watches the Ravens perform outrageous aerobatic exhibitions. Its been reported by reliable sources this cave man breaks his hermit-like existence periodically to visit a local machine shop, to form parts of a highly specialized nature, from lightweight material, for very unique applications.

Um, Good luck "Speck"; watch out Paul McCready.

Golden Sky Sails, Inc.

Introduces
The Golden Cocoon



- * Adjustable for length & shoulder pressure.
- * Spreader Bars to eliminate hip & foot pressure.
- * Positive retention back & thigh straps.

The Golden Cocoon \$135⁰⁰

The Golden Prone



- * Tested to 6,000 lbs.
- * Super simple.
- * Comfortable.

The Golden Prone \$75⁰⁰

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DEALER
INFORMATION
UPON
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Reader Inquiry Card No. 17

Scott's Marine, Inc.

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Ultralight Flying Equipment

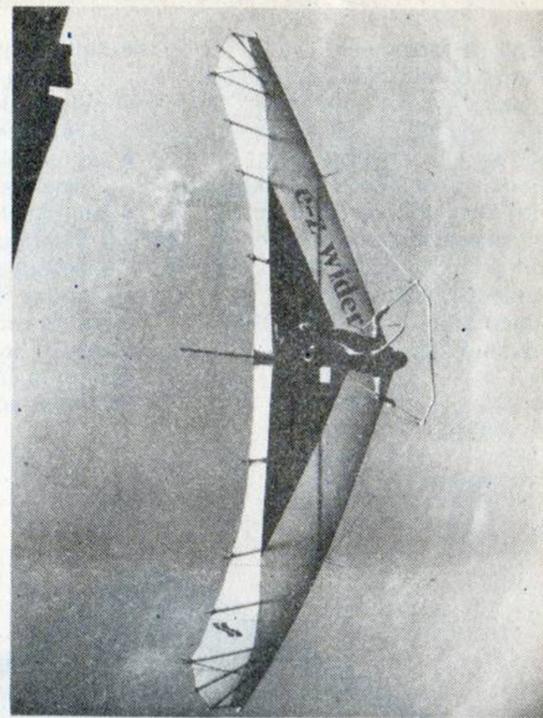


Photo by Albia Miller

Sky Sports offers the experienced pilot the most efficient, computer optimized double surface sail wing available. The inherent stability of the double surface makes the Sirocco 2 a ship that intermediate pilots can climb into and float away with too. Compare the quality workmanship and clean, wind cheating planform of the Sirocco 2. Match the L/D and handling.

Quality and experience: A Sky Sports trademark that produces the best gliders on the market. Easy to launch, easy to land and fun to fly! Treat yourself to a Sirocco 2!

Sirocco 1 & 2 HGMA Certified

SPECIFICATIONS	165	185
Nose Angle	120°	120°
Sail Billow	0°	0°
Max. L/D	9 to 1	9 to 1
Stall Speed	18 mph	18 mph
Area	164.7	185
Pilot Weight	125-175 lbs.	155-220 lbs.
Glider Weight	51 lbs.	54 lbs.
Span	33.5 ft.	35 ft.
Leading Edge	19 ft.	20 ft.
Root Chord	8'6"	9 ft.
Breakdown	10'6"	11'6"
Price	\$1170.00	\$1190.00

Sky Sports
Inc.
P.O. Box 507
Ellington, Conn. 06029

In Europe Contact:
Para-Fun International
Norbrogade 148, 2200
Copenhagen N Denmark 01 83 8586

Reader Inquiry Card No. 19

AT CGS AVIATION, WE'D RATHER OUR CUSTOMERS DID THE TALKING.

TERRY FINGER, MICHIGAN

"Needless to say, but I'll say it anyway, your reduction unit is great! It's nice to know you have the power to take off clean and climb, even with the poor airfoil on my wing..." "I'm looking forward to many enjoyable flights, thanks to my CGS Power System."

TOM CANFIELD

"After a slow start, only one word can describe your West-Bend engine package's performance: EXCELLENT!" "I have a couple of buddies who have a -----, and a ----- (belt driven) engine systems. My engine out performs them like crazy! I can outclimb both of them like anything! No comparison!"

NORTHERN SUN HANG GLIDERS, ST. PAUL, MINN.

"After selling more than sixteen CGS Power Paks, it has come to our customers and my conclusion that the CGS unit is the best all around power package available on the market today..."

JAY SAMPLE, FT. PIERCE, FLA.

"Your MAC 101 reduction drive power unit is an engineering masterpiece. I became airborne very quickly in my "Easy Riser" even though I weigh nearly 200 lbs. I have just ordered a new CGS power unit for my new Mitchell Wing..." "After seeing another beautifully crafted "Easy Riser" barely get airborne with another power unit, it is truly a relief to have power to spare."

THESE PEOPLE AND HUNDREDS MORE HAVE ONE
COMMON DENOMINATOR TO THEIR SUCCESS...

CGS POWERHAWK

★ ★ ★ LATE NEWS FLASH ★ ★ ★

Dick Clauson set an official altitude gain record for powered hang gliders of 11,700 ft. He did it at the Mitchell Wing Meet in Porterville, California and he did it with a CGS Powerhawk unit, of course.



CGSAVIATION

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

Reader Inquiry Card No. 20

WE MAKE PILOTS...

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DAY ONE

Basic Introduction. All equipment provided. Four hours with a certified instructor, including one hour of ground familiarization. No other fees; site fee paid. Get your first taste of the real thing. *Scheduling in advance is mandatory!*

\$48

ALL OTHER DAYS

This plan for all days after Day One till you're ready for the mountains. Maximum group of six, late model equipment. You work up the hill to the 73 foot launch ramp. Three hours per day. Enter any time or level of skill progress. *Schedule early!*

\$36

MOUNTAIN LESSONS

When you're ready, not before, you fly in small groups (2-3) with instructor supervision from 835 foot high Raccoon Mountain. Raccoon is the most flown intermediate mountain east of the Rockies.

\$15

WE SELL THE GLIDERS, TOO.

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185 — \$1295
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SEAGULL

SuperSeahawk
155 — \$1135
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175 — \$1100
207 — \$1120
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SUNBIRD
Nova
170/190 — \$1225
210/230 — \$1325

All prices without delivery expenses.

USED

We maintain a fast moving stock of used gliders at all times, in the brands above and other airworthy designs. Open every day till 4 pm.

CRYSTAL FLIGHT RESORT

(Crystal Flight Resort, Tenn.) Contractual negotiations are now completed for Chattanooga's only Hang 2 mountain. The Flight Resort will continue to offer the famed tramcar transportation system. But Crystal will cease being the operating firm.

The function of maintaining-operator will now be handled by a new corporation not affiliated with Crystal Flight Resort, Inc.

No service to pilots will be sacrificed by this change and all pilots must still register at Crystal's

flight office in the landing field. In fact, a clearance card will be required to purchase tram tickets from the new corporation, which will be housed in the Raccoon Mountain Caverns Gift Shop.

No price increase for tram tickets is anticipated at this time. All tickets purchased by pilots prior to the changeover date of June 1, 1979 will be honored. A change will be noticed in clearance fees and some basic safety rules.

Clearance permits will now be issued for 3 days (\$2.00), 10 days

(\$5.00), or 3 months (\$12.00). The same requirements as before will be used to clear for mountain top privileges. New policy calls for a minimum of two pilots to ride the tram, for tree rescue purposes. Last, no pilots below Hang 4 will be permitted to ride the tram up if Crystal personnel are not present to regulate flying activities.

Training, Sales, and Repair operations will go on as usual. In fact, an increase in efficiency should result as manpower and money are freed from the costly burden of the tram system.

FLIGHT '79

SUMMER CHANGES FOR CRYSTAL

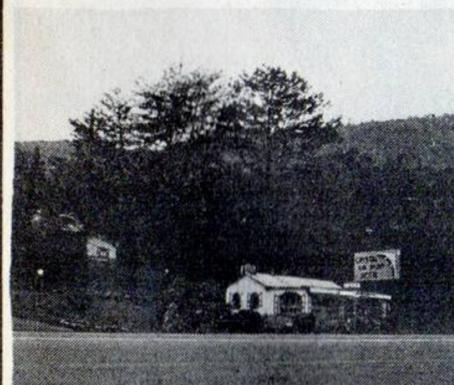


Photo by Paul Willenborg

(Crystal Air Sport Motel, Tenn.) At the Motel, the pool will open in June, for the Summer/Fall season. Please register for pool privileges in advance unless staying as a Motel guest. For 1979, the Motel has expanded facilities, as Units No. 11 and 12 become available to visitors. Chuck and Shari, with Derek and 'Crystal,' are now

permanently established in their new house, totally renovated from the once hang glider shop of Crystal Air Sports.

Pilots are encouraged to register for motel rooms well in advance during this busy '79 season. Also, don't miss the stock of hang glider gifts and T-shirts at the Motel Gift Shop.



Photo by Randee Laskewitz

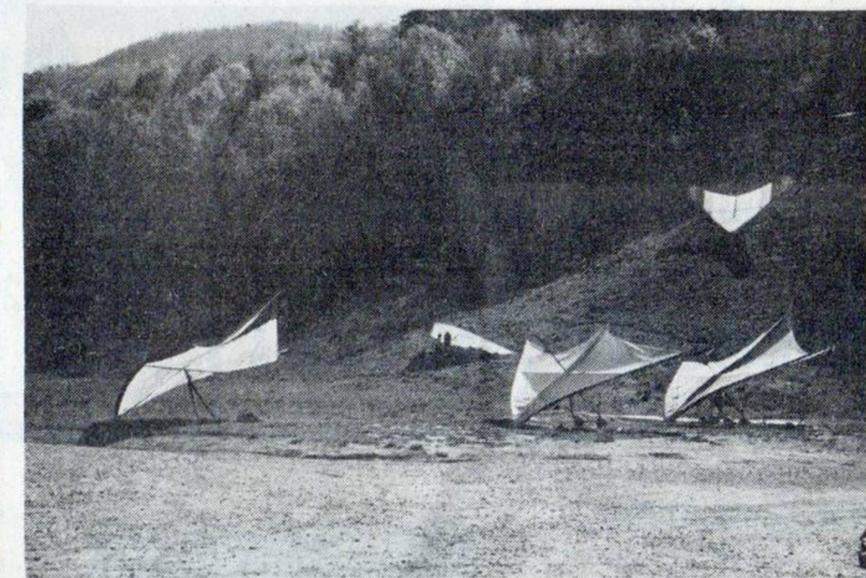
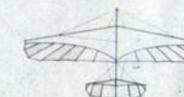
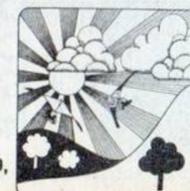


Photo by Randee Laskewitz

CRYSTAL FLIGHT RESORT

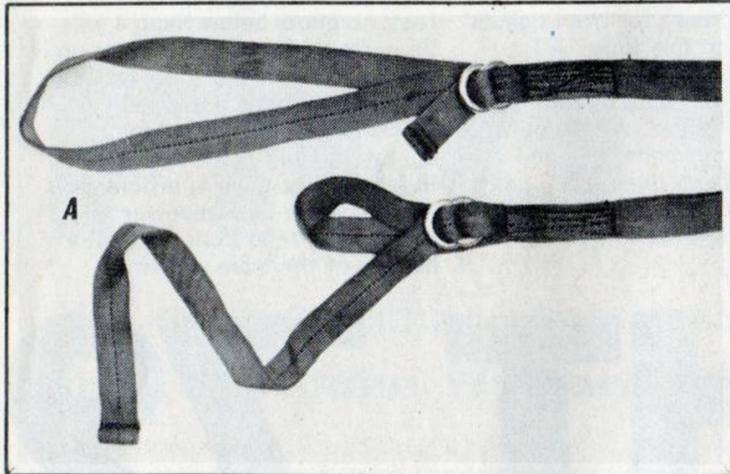
Resort — Rt. 4, Cummings Hwy., Chattanooga, TN 37409, Phone 615/825-1995 9-2 daily



CRYSTAL AIR SPORT MOTEL

Motel — 4328 Cummings Hwy., Chattanooga, TN 37409, Phone 615/821-2546 daily

CRYSTAL accessories '79



ADJUSTALOOP®

A Deluxe adjustable loop with wide length range, positive locking.

\$7.00

SPRING '79 SPECIAL
15% off any 2 loops

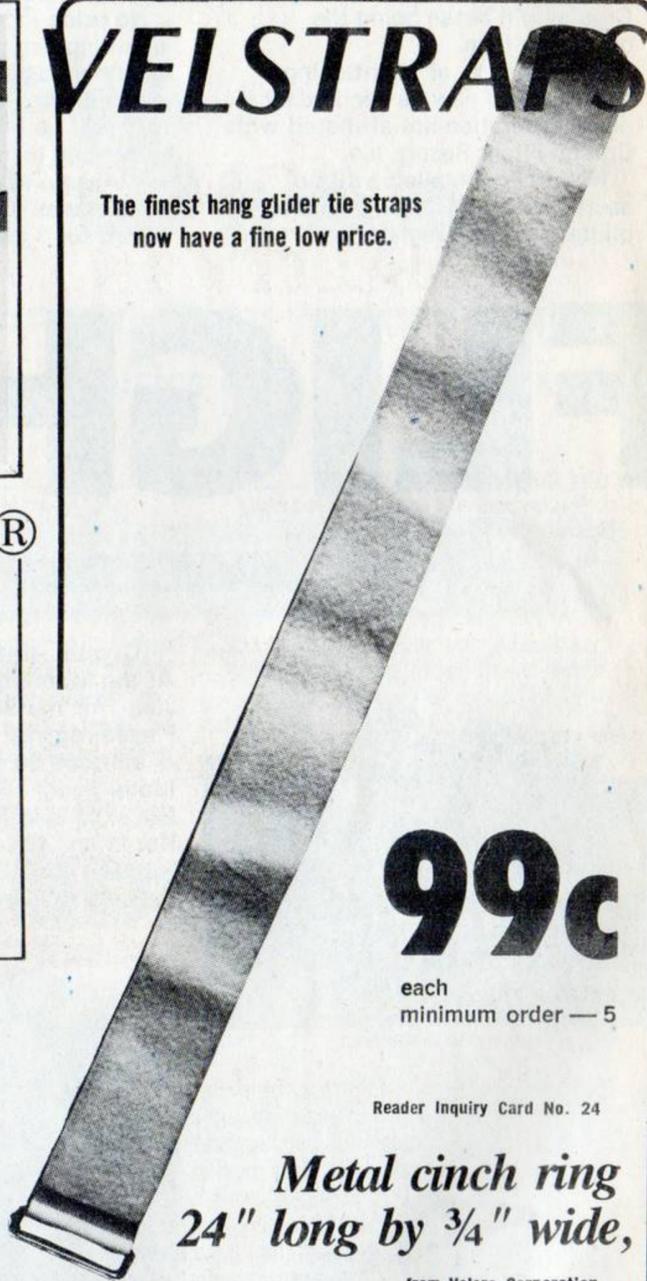
- B** 18 inch standard loop **\$4.00**
- C** 15 inch standard loop **\$3.75**
- D** 12 inch standard loop **\$3.50**
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Tested to 20 G's!

Reader Inquiry Card No. 23

VELSTRAPS!

The finest hang glider tie straps now have a fine, low price.



99c

each
minimum order — 5

Reader Inquiry Card No. 24

Metal cinch ring
24" long by 3/4" wide,

from Velcro Corporation

STROBALITE Using alkaline "C" household batteries, it emits a brilliant blinking signal, visible for several miles in all directions. And Strobalite's powerful beacon lasts up to 7 hours per fresh set of batteries! Don't worry — Strobalite floats!



Reader Inquiry Card No. 25

Decreases Your Chances of a Mid-Air!
Can you afford not to have one for only \$20?

CRYSTAL accessories '79

AT CRYSTAL WE SEE A PRAISEWORTHY QUALITY IN ORGANIZATION.

Padded carrying handle.

Aircraft quality hardware and Delrin® Zippers are used exclusively in construction.

Over 3 yards of 3 inch webbing is used for added support.



Inside velcro pocket.

Adjustable shoulder strap.

Padded bottom.

Taking this into consideration, we decided to design and construct an equipment bag, especially with the needs of a pilot in mind.

Our styling allows you to use either the adjustable shoulder strap or the specially designed handle, which is padded, for extra comfort when hand carrying is necessary. We even padded the bottom to better protect those valuable contents from any kind of shock.

The hardware we use in construction, is the same aircraft quality you're used to.

We have two sizes to choose from. One size for supine or prone harnesses, the other for cocoon harnesses. They will both accommodate a parachute, vario, helmet, clothing and anything else you want to take with you.

Reader Inquiry Card No. 26

SPECIAL PRICES ON BACK-UP 'CHUTES--SEE ORDER FORM

CRYSTAL accessories '79

CRYSTAL accessories '79

To Protect Your Sail

LOWER CABLE

B or C

Put your lower wire coils in bags and you will not only protect your sail, but you won't lose safety pins or other small parts. Bags available in a dual pouch, or single pouches for coils that stay on the control bar. **\$3.00, \$4.00**



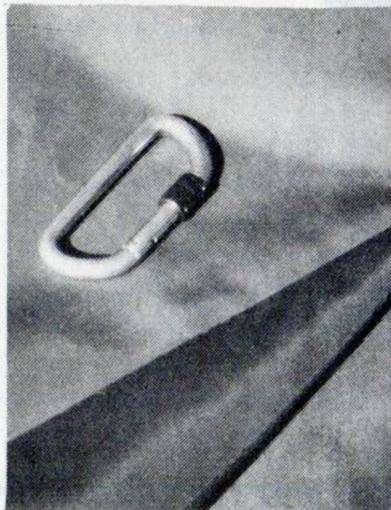
KINGPOST or TENSIONER

Holds tensioners, or any other sharp fittings from tearing your sail. Also can fit over the kingpost top wires, covering the stop terminal nicos. **\$2.00**

Reader Inquiry Card No. 27

MAIL ORDER SPECIAL...

CARABINER

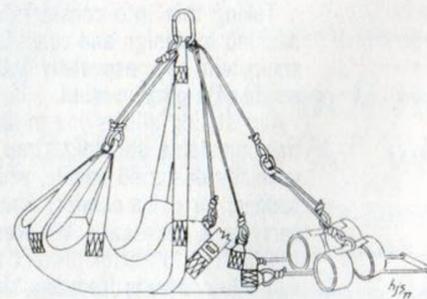


\$4.97

Aluminum, 2500 kg, with locking gate

Reader Inquiry Card No. 28

- Proven reliable body harness
- Adjustable leg straps
- double knee hangers
- with foot stirrup
- one size fits up to 6 ft. pilot



DELUXE PRONE SOARING HARNESS

with Carabiner **\$89.**

Reader Inquiry Card No. 29

SUSPENSION LOOPS

- ___ A Deluxe Adjustable Loop \$ 7.00
 - ___ B 18 inch Standard Loop \$ 4.00
 - ___ C 15 inch Standard Loop \$ 3.75
 - ___ D 12 inch Standard Loop \$ 3.50
 - ___ E 9 inch Standard Loop \$ 3.00
- Two loop orders, take 15% off this Spring '79

BAGS

- ___ A Kingpost/Tensioner \$ 2.00
- ___ B Lower Cable (Single Pouch) \$ 3.00
- ___ C Lower Cable (Dual Pouch) \$ 4.00
- ___ New Crystal Flight Bag, Std. \$35.00
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(FORMERLY CRYSTAL CORNER)

BY MICHAEL SMITH

Pilots new to Chattanooga and other mountainous areas should be aware of one of the more demanding methods of foot launching an ultra-light glider which you will soon encounter, that being the cliff launch. While cliff launching does pose its own set of problems to the fledgling pilot, it can be done safely with forethought, proper instruction, and lots of practice.

Since less margin of error is apparent when launching from a cliff as opposed to sand dunes or grassy slopes, the pilot should do everything within his or her ability to insure maximum positive effort on each attempt.

We are referring here to cliff launching in either no-wind or light wind (under 6 MPH) conditions. When cliff launching in winds stronger than 6 MPH you should be using a wire assist person or crew to insure a safe launch (we will discuss wire launching in a later article.)

In zero wind conditions it is most important that you generate as much airspeed as possible by getting yourself and your glider moving as quickly as possible. Do not try to run as fast as you can with your first step. One of the Newtonian laws of physics states that a body at rest tends to stay at rest. Your first step is critical to establish your momentum while maintaining your balance, then quickly accelerate in as few steps as possible to your maximum running speed.

In light wind (up to 6 MPH) conditions be especially careful about starting your take-off run too far back from the cliff edge as the glider tends to inflate and get airborne before you expect same.

We suggest using as few steps as necessary in your take-off run, as additional steps add to the possibility of tripping over your own two feet or stumbling over rocks, roots, etc. Your timing should be such that the glider is flying and supporting your weight just as you reach the edge so you do not have to dive to attain proper airspeed. My mother used to tell me I could trip over the flowers in a bath mat, so I make a point of taking as short a take-off run as necessary to reach proper airspeed. The late Bruce Lee referred to "Economy of Movement" when describing his extraordinary martial arts style and I believe you can apply the same theory when foot launching an ultra-light to eliminate a little more chance of error.

Positive control of the glider is an absolute necessity. We highly recommend that you keep both hands on the down tubes of the control bar when cliff launching. You will have plenty of time to place your hands on the lower control bar after you insure you have launched the glider straight and level, and the best way to do that is on the down tubes.

Maintain your wings level and remain so until well clear of the cliff. You are not just worried about having to correct a launch induced turn. The possibility of dragging a tip can become very real once you let those wings start to tilt. Remember, if you do not control the glider, the glider will control you.

Strong pitch control of the glider is another important factor, lack of which has resulted in the majority of bad launches we have witnessed. By pitch control I am referring to the pilots control (or lack of it) of the glider's angle of attack, or the angle of the nose relative to the wind into which you are launching.

More so than on sand dunes or grassy slopes the vertical component to the wind is much stronger in a cliff launch. We have seen this vertical force pick pilot and glider up and deposit them gently and otherwise to the rear of launch for lack of proper pitch control. Keep the nose down in a neutral position to the wind and boogie off with as much force as you can.

Run straight and hard squarely off the precipice. If the wind is quartering and you adjust to run straight into the wind, one wing invariably becomes loaded before the other, which again results in possibly dragging a tip. If the wind is crossing so severely (beyond 45°) that you cannot run straight off, please fly another day. While a blown launch at Raccoon Mountain usually results in a harmless tree landing, other sites have a much more vertical drop below the cliff. Another simple fact of flight is the further you fall not flying, the harder shall thee impact. A cliff launch is no place to experiment! Be sure of yourself, the conditions, and your equipment.

If you fly prone and use a foot stirrup, as I do, trying to step into it too early is another way of risking a blown launch. Wait a beat or two after you leave the cliff to insure the glider is under your control and stable and you might be surprised how easy it is to hit the first try. If you should miss the first attempt, why waste time cussing it? Relax and step into it.

The supine cliff launch is a little more tricky, because of the extra foot or so of loose straps, but practical experience has shown control of the glider to be the critical factor. The straps will tighten as the glider inflates and starts to rise after you have properly attained flight speed through a controlled launch. Be aggressive! If you have any doubt about your equipment, the conditions or your readiness to safely cliff launch you can always fly another day. Trust your instincts. Ask questions. More practice from a lower elevation with proper instruction will only insure your success and safety.

Cliff launching can be dangerous, even deadly if done carelessly on your first try or your thousandth try. Done with skill and vigor a cliff launch is surely a magnificent expression of your ability to leave the bonds of earth far below.

hank syjut
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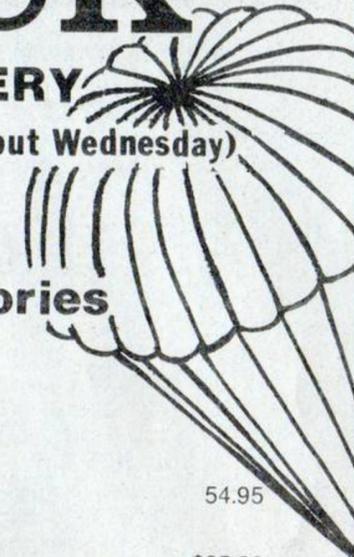
Chattanooga, TN — Much good response to our "FlyingBull" look-a-like column. Heard from some friends of preceding author, Bill Allen, as we grabbed his style. No word from Bill himself. We're glad you liked it so well, and it is a sure **WAC** regular. Its position inside the rear cover is likely to remain as the stable spot. **SOLAR POWER** — It's a reality, thanks to **Larry Mauro** and his crew. Plus an investor, we bet, as the tab ran to about \$50,000, it's alleged. A blockbuster achievement, we wonder what the full effects of this success will be. A \$5,000 solar powered Easy in every garage? Photos and legends of **UFM's** craft, logically named the "Solar Riser," appeared in newspapers all across the country. The **L. A. Times** ran a small piece as well, on May 1st, recording the 65 second flight at Flabob airport in Riverside County, California. They also reported the Riser's upper wing was fitted with 300 solar power cells energizing a 30 pound battery propelling a 5 horse-power electric motor. The photo illustrated a pilot fairing pod, and interestingly, only half the upper wing area covered with cells. It all makes our March/April **WAC** feature author, Hank Syjut, seem prophetic, eh? **Novas grounded by Sunbird** — By a Mailgram on May 2, Sunbird's Gary Valle has grounded all Novas, pending full investigation of an accident on a Nova 230. Seems a light weight test pilot was doing HGMA speed runs on the largest Nova, while Gary watched, and the film ran. A wingover too near the ground, not the test maneuver, was the probable cause. Sunbird will examine the film in detail. While no obvious reasons exist to bring suspicion on the Nova, Sunbird considers this proper manufacturer action, just in case. **WAC** believes this is commendable. Our condolences to all affected by this loss of life. (Note: As of May 11, clearance was again being given to the Novas.) **Sensors from Odyssey** — Dave Aguilar has begun what he's calling a limited manufacturing of the Seedwing Sensor. Perhaps he will be able to spur certification of this three year design. We hope so. As it is, the glider is a possible sore spot at the '79 Nationals. Pilots who like it may be unhappy, sitting it out. Also up in the Northeast, Terry Sweeney has changed his status with Sky Sports from designer to design consultant. Info from BFG #2 owner, Burr Smith, says Terry is now just running his own shop. Among other projects, he's working on a flex-wing designed for aerobatics utilizing a rigid harness suspension. **Wills Wing**, out doing "demo days" like there was no tomorrow, also reports an interest in an aerobatic glider with rigid harness. Rob Kells, Wills' prez, and designer, **Mike Meier** will coordinate on this if time ever allows. Seems Alphas are off to another great year. But deliveries are down to four weeks. **Aerial Techniques** — The First Annual Ellenville Balloon Festival is coming in late September. More details will appear here next issue. Good initial reports are coming on the **Sky Sport Sirocco 3**, as this sophisticated design enters a third season. Control has been made more precise in an improvement said to be as wide as between the Sirocco 1 and 2. The glider has also added some squares as designers found better ways to make double surface wings more controllable. This will make small sizes less necessary. **Seagull** is underway with '79 models, and six weeks backlogged on their very popular designs. But, six weeks is right in there as a new season commences. Others are now at four to six weeks as well. Ultra-dressed-up is the way we hear the entire Seagull line will look. **Dealer Self-Help** is a phrase with new definition following Wills Wings' shipment of dealer

manuals. The free item to regular dealers is so thorough, that it contains answers to 90% of common questions. Plus the Wills manual has full details on prices, parts, tuning, accessories, ordering info, dealer bulletins, factory stock, and on. We hope the rest of the industry will follow this enthusiastic (and very helpful) lead. **Crystal Air Sport Motel** has brought in a few new waterbeds for soaring-weary pilots. Warm, soft sleeping devices will soothe those tired push-out muscles. Look for 'em in Chattanooga. **LEAF of Colorado Springs** has a '79 Super-mod' job available. This is recycling for hang gliding at its best. Here's an out for that not-too-worn standard. They have a new poop sheet to send you, with all the details. Write to 331 S. 14th St., Colorado Springs, CO 80904. **Golden Sky Sails** will soon be writing to you, as they "rent" **WAC's** list. Among many other services, Golden is marketing two new harnesses. See their ad in this issue. **We almost blew it** — In the March/April Product Lines, we reported non-certified gliders were ok for Regionals, and a sure no-no for the Nationals. This is wrong! Only a late arriving rules change, so stating this fact, gave Region 10 organizers a loop hole. Seems **WAC** had already released the no certification announcement prior to Dave Murchison's receipt of the rules update. But all pilots be advised, you must have certification papers for your glider from now on. That is, if you want to gain points for the Nat's. **Crystal Flight Resort** has the third annual instructor seminar coming up on the 15-18 of June. Headed by Region 10 Director, Dick Heckman, the event will judge hopefuls for both basic and advanced. Advance applicants must have had a Basic for a year and be available to help with Basic Certification. Yep, that's part of the Advanced program. Cost for either will be \$40. Bring an Intermediate Rating or better, plus a first-aid card. On July 4-8, Crystal will host the 5th Annual July 4th Fly-In. Come for some good Chattanooga flying. **Kitty Hawk Kites** also has a certification clinic, altho Basic only. This will be June 6-8. Their requirements will be similar to Crystal's, but for cost and your own place on their list, write 'em soon at Box 386, Nags Head, NC 27959. **Kitty Hawk** has a full '79 schedule. On June 9 & 10 they present Mr. Prolific, **Dennis Pagen**. Dennis will chair an Intermediate/Advanced Pilot Seminar. By the way, Dennis also reports a new time-consuming project. Another book, we wonder? On June 23 & 24 Kitty Hawk brings in Marty Alameda of Flight Designs Vario. Marty also distributes Advanced Air Chutes and will host a seminar on they and instruments. Wonder if he'll bring a Lancer too, as he is just into manufacturing them here in the US of A. **Dan Poynter**, on the sky-diving bandwagon this time, sent us a news release for the USPA saying they have a new info kit. Interest is strong and they wish to get the good word out. Send \$2 to USPA Info-Kit, P.O. Box 1036-7, Elsinore, CA, 92330. You'll even get a copy of their rag, **Parachutist**. Last word is the newest Tennessee Tree Toppers site. Chattanooga has always been unflyable in a Southwest wind. No more! The road is now cut to the TTT's 1500 foot SW launch. It's right by the club's own excellent NW site, Hensen Gap. Parking on top, mostly hard surface turn-around taking 15 minutes, and a half mile ridge. Check with a clearing official first! Got news? Send it to Product Lines, Box 144, Lookout Mtn., TN 37350.

LAST MINUTE CHANGE — The Crystal Instructor clinic has been delayed till July 6, 7, 8, and 9. Other details remain the same. Write for reservations!

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