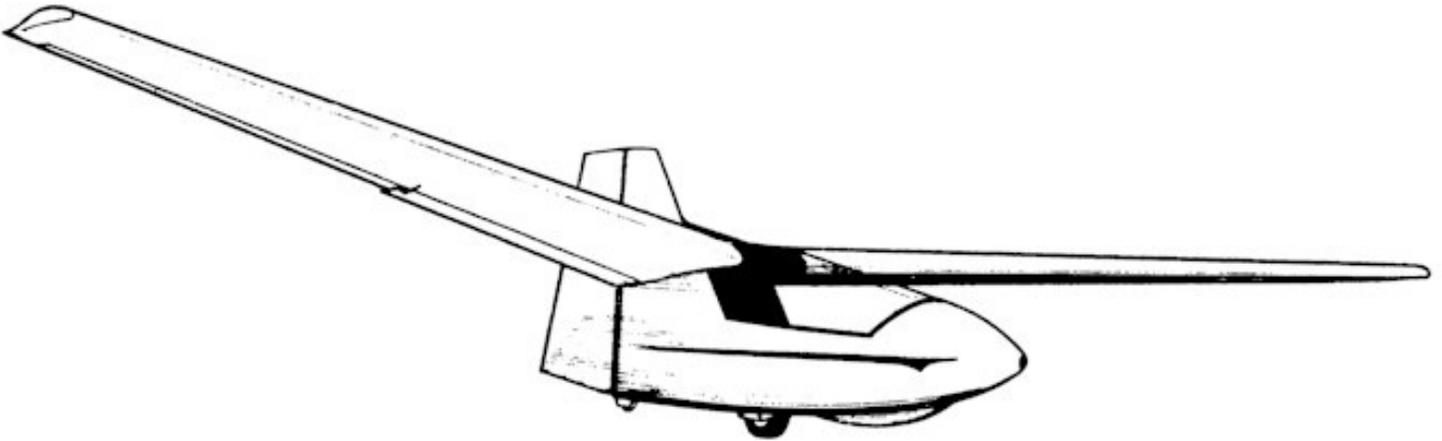


No. 340

OCTOBER 2014

T.W.I.T.T. NEWSLETTER



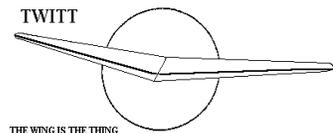
Haig Mini Bat flying wing design. See page 4 for a brief discussion on this sailplane between Syd Hall and Bruce Carmichael.

T.W.I.T.T.

The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021



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**THE WING IS
THE THING
(T.W.I.T.T.)**

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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive (#1720), east side of Gillespie or Skid Row for those flying in).

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PRESIDENT'S CORNER

I have what I think is a good issue for you this month. It gets started with an article by Mike Hostage on his flight experience with the Marske Pioneer 3 flying wing sailplane. This was his second flight at Jim's invitation after Jim had made a number of improvements in the finish and other areas affecting the performance. Mike is close to finishing his own Pioneer 3 kit and hopefully we will be able to get another article out of him after he has flown it for a while. He is retiring from the Air Force in November, so will have more time for finishing and flying this unique sailplane.

Also included in this issue is a series of letters between Syd Hall and Bruce Carmichael discussing among other things the Haig Mini Bat. Mike Hostage had commented that he looked into this design at one point and found enough deficiencies in it that he decided not to pursue building one. Syd and Bruce also discuss Syd's design he was going to submit to SHA's contest although it was not a flying wing. I found the discussion interesting especially Syd's description on how he would construct his design. The techniques seem plausible and could be used in the construction of any type aircraft in the same general category.

I hope you enjoy the issue. Don't forget to send me your stories, pictures, etc., so I can share them with the rest of the group.



LETTERS TO THE EDITOR

(ed. – This came in through my ESA contact with Jim Marske and Mike Hostage.)

A ndy, here is my input on the Pioneer III. I've included two shots of my own P-III project. The first is a shot of my garage with the fuselage in progress, the second is a photo of the ship assembled in the driveway, to do a rigging check. I have since covered the flight surfaces and am in the process of surface-finishing the fiberglass fuselage.

Mike Hostage

B y way of introduction, I started flying hang gliders back in the '70s with Les King, when he was on the East coast. I entered the USAF after graduation and they sent me to pilot training but made me give up hang gliders. So, after learning to fly fast jets, I got my glider rating and began learning to soar in 1980. I got into home building when I helped an Air Force friend build a Rutan Quickie. From there, I put in a few hundred hours building a flying wing glider called a Mini Bat. Fortunately, I came to my senses and junked that project before attempting to fly! In 1988 I met Jim Marske and decided to build one of his Pioneer IIDs. Five years later I achieved first flight and flew it for the next 12 years. I sold the P-II and built Alisport's Silent II Targa. I've been flying that for about 5 years. Right



after returning from two years duty in the Middle East, I joined Jim Marske in Ohio for the first flight of his new Pioneer III. I was hooked! I arranged with Mat Kollman to have the basic glass and metal parts made. Mat delivered the parts in March of 2012 and I began to build. At present, my wings and all control surfaces are finished and covered and I'm about to do the final surface

finishing of the fiberglass fuselage. My progress is currently slowed by the need to finish a trailer and get the wings/fuselage safely mounted, so I can move out of my home. I will retire in Nov and all energy since Aug has been focused on completing my 37-year AF tour and relocating.



Earlier this spring, Jim offered me the opportunity to fly his prototype again. The first test hops had been short 30 sec glides behind a 200' auto-tow, so I was anxious to try the ship out on a real soaring flight. Luckily, the day we had planned on turned out to be a good soaring day. I flew up to Marion, OH in a friend's Cirrus SR-22 and joined Jim and his son Sean. We pushed the P-III out of the hangar and readied it for flight. First, we checked the CG as I weigh a bit more than Jim. With the proper ballast in place, it was time to fly.

For the first takeoff, we pushed the glider to the hard-surfaced runway. Jim's glider club normally uses the grass to the side of the runway, but Jim wanted me to have a smoother surface for my first takeoff. The tow plane, a C-152, accelerated briskly with the 365 of P-III and 200 lbs of pilot behind it. I found the takeoff quite normal and easy to control. I was off the ground well before the tow plane and had no difficulty holding position until we commenced the climb.

I'll confess to my first sign of nervousness as I ended up releasing from tow much earlier than I'd intended. As I mentioned, the sky looked very promising, with CUs dotting the sky, and I had planned to tow to 3000'. However, the lift felt so good that I adjusted my plan, now intending to release at 2500 agl. However, I am used to flying in the Tidewater area of Virginia, where the field elevation is 15' or so. So, when I saw 2500' on the altimeter, I pulled the release...only to then realize that the 1000' elevation of Marion meant I was off a bit

early! Fortunately, I hooked into a strong thermal within 180 degrees of my first turn and climbed up to 6000msl. I spent the next 50 minutes climbing from 4000 to 6000 and experimenting with different aspects of the P-III's handling.

I found that thermaling at an indicated of 38-40 kts gave me a tight circle and decent climb. Later, I tried circling at 45 knots and found the crisper control feel allowed me much better precision in my turns and I felt it gave me better overall climb performance. When flying the P-III only a few knots above stall, the controls are just a little bit mushy and weren't allowing me the precision I needed.

Speaking of stall, I tried some straight ahead stalls, from level attitude and could not get any kind of break. The ship would just slow down until the elevator was buried at full aft stick and I continued to mush ahead with full directional control, using the rudder. I could not get a clean break. I then did some 10-15 degree nose high stalls and got a more normal straight ahead break. Recovery was instantaneous, upon releasing backpressure. I could not read any significant altitude loss on the altimeter. I tried some stalls in thermal turns and found the same mushing characteristic, with no tendency to drop the nose or enter anything resembling a spin. Again, releasing backpressure ended the mush, though this is where I determined that flying a few knots above stall to thermal (the 38-40 I noted earlier) was not as effective a thermal technique as flying at 45 knots.

After several climbs I tried pushing the speed up. From exiting the thermal up to around 70 kts, the flight path seemed very flat. However, as I tried to go faster, the dive angle seemed to increase notably and by 90 knots I felt like I was on a 10-degree dive bomb pass! Jim thinks there may be some separation occurring on the bottom side of the wing at the higher speeds and that has become his latest area of exploration in wringing out maximum performance.

At the end of one hour I was having a great time, climbing easily and experimenting with the ship, but I was feeling guilty at taking up the heart of the soaring day to myself. So, I opened the speed brakes and headed back to the Marion pattern. I landed in front of the soaring group and congratulated Jim on a superb flying machine. Much to my surprise, Jim was adamant that I continue flying, so I took another tow, this time climbing to an actual 2500' agl!

On this flight, I had arranged with my friend to have him join up in his Cirrus, and have another friend take some aerial photos of the P-III. Needless to say flying formation with a glider and a speedster like the Cirrus was a bit tricky, but we got two decent passes with the P-III holding 70 kts and the Cirrus flashing past at 135 kts. The video of those passes shows the obvious nose

down pitch of the P-III, holding the AOA to allow that speed.



After the photo passes we called off any further formation as it was not that productive and my two 70 speed runs had gotten me down to 2500'agl. I scratched around for about another 30 minutes, but the day had cycled and all the CUs had dissipated. I landed after another 1-hour flight, even more excited about the prospects of finishing and flying my own Pioneer III. Jim's glider has a fixed wheel and external nose skid, but I have incorporated a retractable main wheel and a retractable nose skid on my glider. Given the slickness of the ship overall, I'm anticipating that this drag reduction will pay off well.

Both landings in the glider were uneventful. The speed brakes are very powerful and there is no noticeable pitching with their use. I had remembered, with my P-II, that if you landed with any extra speed, the short-coupled ship tended to pitch forward on the nose skid, and come to a quick and bumpy stop. On my second landing, I managed to land on-speed and was able to roll along on the main wheel until I was ready to put the nose down.

Jim is continuing to explore the performance envelope, seeing great improvement with sealing air leaks around the canopy frame and potential points for air inside the fuselage to leak out over the wings, disturbing the flow.

I greatly appreciate Jim Marske allowing me to fly his new glider and I am eager to finish and fly mine!

(ed. – The following are letters between Bruce Carmichael and Syd Hall from late 1989 concerning the Haig Mini Bat. It seemed applicable based on Mike Hostage's comment about giving up his Mini Bat project.)

November 2, 1989

Dear Syd,

Sure is good to be corresponding with you again. Your last letter is most interesting. A contest will soon be announced in SHAp Talk for paper studies of homebuilt sailplanes both with and without self-launch. They don't have to be built or even practical but it is intended to shake out new ideas. One copy to be sent to me and one to SHAp Talk editor for publication. Membership will vote on a 0, 1, 2, 3 rating on each at the time of whichever SHA workshop comes up first. Requested is a 3-view, table of characteristics, comments on materials and building practices and any special features. Be sure to send in what you sent to TWITT as an excellent entry. This was Jim Maupin's idea and he already has a dandy entry. (*ed. – Bruce had enclosed the Carbon Dragon entry, I believe.*)

I also do not know the full story on the Mini Bat. I liked Larry Haige and lectured together with him one year at Oshkosh EAA. He was an innovative designer and really tried to develop sailplanes that would be easier to build. My college roommate built the McCulluck powered Eagle. It had spar material problems and many builders had to rebuild their wings. The power was inadequate for a normal size person for self-launch. Still it was an appealing ship. My friend Dick Clark said the spoiler lateral control system worked o.k. The Mini Bat was built like this type of model airplanes called ARF (Almost Ready to Fly). Lots of large molded parts to just glue together. I saw one completed at San Diego at an air show but it did not fly at that time. I believe there were some fatal accidents in the first ones completed but I am hazy on this so shouldn't really say it. I read on article on it one time and did not understand the longitudinal control system. Seemed backwards the way it was described. Larry entered the Mini Bat in our 1980 SHA contest. It was violently opposed by Irv Culver, one of the judges who is anti tailless configuration. I have a fuselage drawing and segments cut from the wing drawing. Also comments on rigging and weight and balance and a small 3-view. I am sending these to you for your study. I would enjoy seeing your material on it if not too much trouble to send. I think Larry is still alive but my old college friend and my college professor Ed Leshner do not know where he is. I expect he ran into the same problem so many do when trying to market a plane before it is full developed. You run out of money before you run out of problems.

I just got back from my 45th University of Michigan reunion. Five of my aero classmates and

wives were there as well as Ed Leshner. One brought a picture of the 5 of us aero nuts and model builders 20 years of age line up in front of our rooming house. We found the old house, lined up again and reshot the picture. We sure will call on you if we ever get to Nevada City. Hope you can pay us a visit here in Capistrano Beach. Keep in touch.

Bruce

November 10, 1989

Dear Bruce,

I have always suspected that you had a bit of Blarney, but your latest prove my suspicions were right. Never the less, I do think that I'll follow your suggestion and send it in, revised as per TWITT, etc. Please advise when and how. Who is SHAp Talk? Address? Date?

Now, on to more important things: Thank you for the stuff on the Mini Bat. Do you want it back? I am sending you my bit on the project, having photocopied all that I need, with the provision that you send it on to TWITT, but also that you, or they, find out what the heck went wrong, and bring us all up to date.

I am convinced that that we should know why a thing fails, in or that we may anticipate future failures and avoid them. There are other such items (George Worthington in a Mitchell wing at once comes to mind) and in the past I have faulted Soaring for not giving a post-mortem, as it were.

I have quit Soaring (SSA) since it came to cover only glass birds and I am almost poverty stricken, so soaring is only something I think of now and then. A matter of facing the facts and acting accordingly.

This bird that I'm working on is a possible for me. There are only for ribs to plot, spaced at slightly less than 8 feet on centers (where the ply has to join anyway span wise). In between are foam ribs – hot wire cut at 6" c.c. The sharp leading edge radius (23012) is Kevlar-Epoxy, and the 1/16th ply is bonded to the leading edge and that joint cured. Then, next day, the ribs are wetted with epoxy and the piece wrapped to the spar (which is a box with wide webs – quite oversized – see later). Later, a second piece of ply is added to get to the drag spar. All this takes place both top and bottom. The entire trailing edge is hot wire cut, solid foam, covered. Sections are hinged but behind the spoiler in a fixed part. But the important part is that the thing car tops in three 14'2" pieces. These are stacked behind the car, bolted for

transport, and the cranked up a track to the top, where they are further bolted for transport. The thing flies with a ballistic chute at a modest red line and if I find that I like it (and this is the later) it gets two coats of Kevlar-Epoxy and the red line then changes to take advantage of the over-sized spar. When I get home the total car-top load sucks up to the rafters of the garage and I have not hangar fee.

Next on my list is getting my ski boots ready, so I must quit. (Skiing gives free lifts to many of us over 65. Wish soaring did that too.)

Syd

November 20, 1989

Dear Syd.

Sure was delighted to get your good letter and Mini Bat info. You may keep the plans I sent as long as they are useful to you. I had planned to carry the Mini Bat info to TWITT meeting this Saturday but came down with the flue and cold. I have talked to Fronius on the phone and he is about as vague as you and I on the full story of the Mini Bat. We will try to locate Mike Turchen who was the San Diego dealer and who had a completed Mini Bat at an air show I attended some years ago. I got to sit in it. I will mail the data you sent to TWITT with the provision that if you should ever want it back they will return it to you. That is a very interesting document but it still seems to me that his explanation on longitudinal trim is backwards. (*Syd – Yes, it is backwards probably editing or a slip.*) I will also try to locate Larry Haig and see if he is willing to tell the story now that some years have gone by. Some of the features in this ship deserve to be carried over into the poor man's sailplane.

George Worthington set many records in a Mitchell Wing but he was killed in a conventional ship designed by an expert model builder who made a major structural error in the wing carry through the fuselage. Most of us old timers are tempted to or have already quit Soaring which has turned into the Ladies Home Journal after getting locked into expensive glass. I sent them an excellent article by Irv Culver on Designing for Safety and they informed us that they had no means to convert this from simple typed form into ready to publish. (*Syd – Can TWITT publish it serially? Seems TWITT & SHA have to fill the void left where Soaring was.*)

The description of your building techniques are just the sort of comments desired to supplement the 3-

view and table of characteristics in our SHA contest. SHAp Talk is the monthly newsletter of the Sailplane Homebuilders Association (*ed. – Now Experimental Sailplane Association (ESA)*). Membership is \$15 per year payable to the Treasurer. It is about the size and quality of TWITT but should grow under this present contest. You should be able to enter the contest without joining if money is tight. Send one copy of your entry to the Editor. I was pleased to hear that Alex Strojnik and Don Santee are both fascinated with the popular light soaring machine. If light enough perhaps we can launch with the rig the hang glider guys are using. They take off from a flat bed truck and kite on a Kevlar line with a controlled tension until they tow into a thermal. Needs a dry lake, abandoned airport runway or unencumbered country road. What you think?

Wish you happy skiing. I have some wood Norwegian cross-country skis that I try out about once year. P.S. Please send me a copy of your entry also as I want to be sure all entries get into publication. Keep in touch.

Bruce

(ed. – Even though this is not a fly wing I am including the 3-view and characteristics to close out any questions lingering from reading the above series of letters. The philosophy and construction techniques could be applicable to any type of aircraft so read it with learning a new methodology for design or construction.)

Stealth Primary

Basic Design Philosophy:

1. The first goal was to design something fairly quick and easy to build.
2. The primary launch technique is by bungee off a hill. At the same time it can be launched by auto tow. With ballast added, at 3.4 lbs/sq' it can be aero towed at your local glider port.
3. With the 100 lbs allowable for ballast those interested can experiment with adding an engine. The cockpit layout allows the pilot to be moved forward 8 inches.
4. Builder Creativity: in the cockpit area the structure is there. The box is about 20" wide in the hip area. At shoulder height the glider is open. Using stringers and Dacron, or foam/glass, the builder can enclose the pilot to suit. Flat wrap or blown

canopy, etc. He has ballast weight allowance to play with.

Construction: Spar caps are carbon. Fuselage longerons spruce reinforced with carbon in high stress areas. Plywood panels use added carbon and Kevlar.

Performance:

	L/D Max	Min Sink	V Stall
@ 350#	23 @ 37 mph	124 fpm @ 28 mph	26.5
@ 450#	23 @ 42 mph	140 fpm @ 32 mph	30.0

AVAILABLE PLANS & REFERENCE MATERIAL

Tailless Aircraft Bibliography

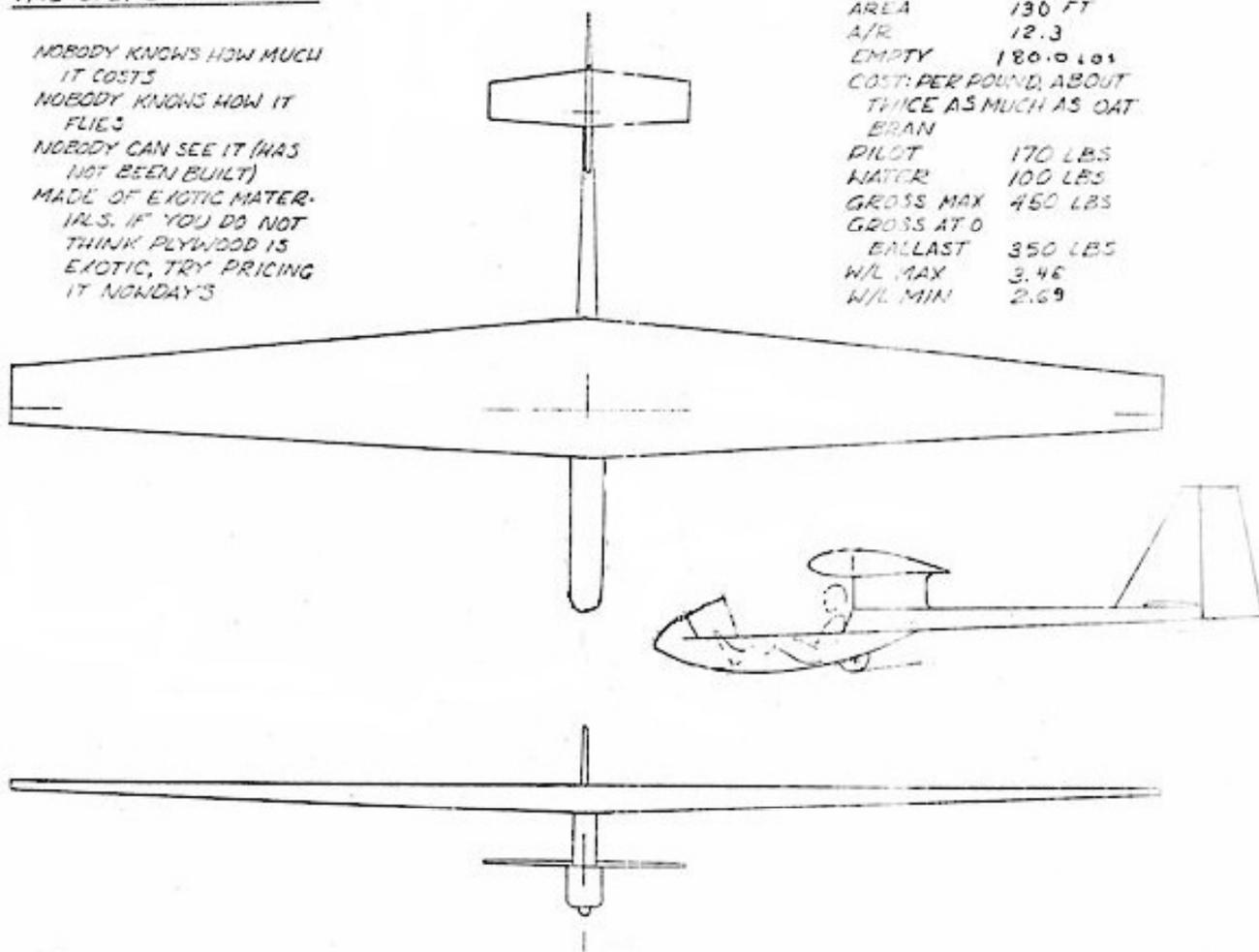
My book containing several thousand annotated entries and appendices listing well over three hundred tailless designers/creators and their aircraft is no longer in print. I expect eventually to make available on disc a fairly comprehensive annotated and perhaps illustrated listing of pre-21st century tailless and related-interest aircraft documents in PDF format. Meanwhile, I will continue to provide information from my files to serious researchers. I'm sorry for the continuing delay, but life happens.

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(216) 321-5743

THE STEALTH PRIMARY

NOBODY KNOWS HOW MUCH
IT COSTS
NOBODY KNOWS HOW IT
FLIES
NOBODY CAN SEE IT (HAS
NOT BEEN BUILT)
MADE OF EXOTIC MATERIALS.
IF YOU DO NOT THINK PLYWOOD IS
EXOTIC, TRY PRICING
IT NOWADAYS



SPAN 40 FT
LENGTH 20 FT
AREA 130 FT²
A/R 12.3
EMPTY 180.0 lbs
COST: PER POUND, ABOUT
THICE AS MUCH AS OAT
BRAN
PILOT 170 LBS
WATER 100 LBS
GROSS MAX 450 LBS
GROSS AT 0
BALLAST 350 LBS
W/L MAX 3.46
W/L MIN 2.69

(ed. – We had a Mini Bat and owner at a TWITT meeting many years ago, but I can't find the issue where this was covered. I do recall looking at the fuselage/wing attachment method and noted it did not appear anywhere adequate enough to carry the weight of the pod or the pilot. I imagine this was one of the reasons Mike Hostage abandoned his.)

Books by Bruce Carmichael:

Personal Aircraft Drag Reduction: \$30 pp + \$17 postage outside USA: Low drag R&D history, laminar aircraft design, 300 mph on 100 hp.
Ultralight & Light Self Launching Sailplanes: \$20 pp: 23 ultralights, 16 lights, 18 sustainer engines, 56 self launch engines, history, safety, prop drag reduction, performance.
Collected Sailplane Articles & Soaring Mishaps: \$30 pp: 72 articles incl. 6 misadventures, future predictions, ULSP, dynamic soaring, 20 years SHA workshop.

Collected Aircraft Performance Improvements: \$30 pp: 14 articles, 7 lectures, Oshkosh Appraisal, AR-5 and VMAX Probe Drag Analysis, fuselage drag & propeller location studies.

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 Capistrano Beach, CA 92624 (949) 496-5191



VIDEOS AND AUDIO TAPES



(ed. – These videos are also now available on DVD, at the buyer's choice.)

VHS tape containing First Flights "Flying Wings," Discovery Channel's The Wing Will Fly, and ME-163, SWIFT flight footage, Paragliding, and other miscellaneous items (approximately 3½+ hours of material).

Cost: \$8.00 postage paid
 Add: \$2.00 for foreign postage

VHS tape of Al Bowers' September 19, 1998 presentation on "The Horten H X Series: Ultra Light Flying Wing Sailplanes." The package includes Al's 20 pages of slides so you won't have to squint at the TV screen trying to read what he is explaining. This was an excellent presentation covering Horten history and an analysis of bell and elliptical lift distributions.

Cost: \$10.00 postage paid
 Add: \$ 2.00 for foreign postage

VHS tape of July 15, 2000 presentation by Stefanie Brochocki on the design history of the BKB-1 (Brochocki,Kasper,Bodek) as related by her father Stefan. The second part of this program was conducted by Henry Jex on the design and flights of the radio controlled Quetzalcoatlus northropi (pterodactyl) used in the Smithsonian IMAX film. This was an Aerovironment project led by Dr. Paul MacCready.

Cost: \$8.00 postage paid
 Add: \$2.00 for foreign postage

An Overview of Composite Design Properties, by Alex Kozloff, as presented at the TWITT Meeting 3/19/94. Includes pamphlet of charts and graphs on composite characteristics, and audio cassette tape of Alex's presentation explaining the material.

Cost: \$5.00 postage paid
 Add: \$1.50 for foreign postage

VHS of Paul MacCready's presentation on March 21,1998, covering his experiences with flying wings and how flying wings occur in nature. Tape includes Aerovironment's "Doing More With Much Less", and the presentations by Rudy Opitz, Dez George-Falvy and Jim Marske at the 1997 Flying Wing Symposiums at Harris Hill, plus some other miscellaneous "stuff".

Cost: \$8.00 postage paid in US
 Add: \$2.00 for foreign postage

VHS of Robert Hoey's presentation on November 20, 1999, covering his group's experimentation with radio controlled bird models being used to explore the control and performance parameters of birds. Tape comes with a complete set of the overhead slides used in the presentation.

Cost : \$10.00 postage paid in US
 \$15.00 foreign orders

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BLUEPRINTS – Available for the Mitchell Wing Model U-2 Superwing Experimental motor glider and the B-10 Ultralight motor glider. These two aircraft were designed by Don Mitchell and are considered by many to be the finest flying wing airplanes available. The complete drawings, which include instructions, constructions photos and a flight manual cost \$250 US delivery, \$280 foreign delivery, postage paid.

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All other Countries	\$35 /yr	Pacific Rim	\$35 /yr
Electronic Delivery \$10 /yr		U.S. Students	Free
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