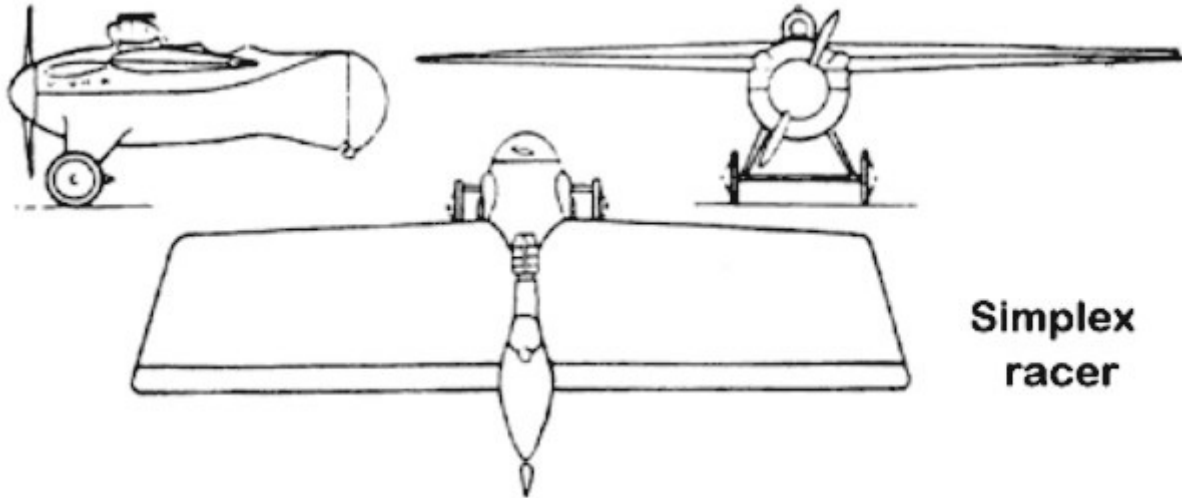


T.W.I.T.T. NEWSLETTER



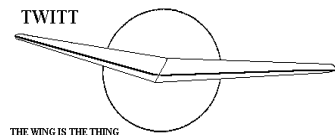
"Created by René Arnoux undoubtedly presents the greatest simplicity, it is aerodynamically satisfactory and structurally superior to any other known tailless system." (ed. – *Might make a great R/C model.*) Source: http://www.nurflugel.com/Nurflugel/Fauvel/e_arnoux.htm

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.)**

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis.

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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

Most of you will enjoy this issue since there are a number of pictures originally sent to Bob Hoey concerning one of his bird models. This gentleman had made a mini version of Bob's Turkey Vulture and was showing him how the wing tip feathers were being controlled. He didn't offer any descriptions so it will be up to you to determine how the mechanisms are working.

This issue also contains some of the Nurflugel and U-2 threads that have come in over the past couple of weeks. Up to this time the Nurflugel people have been very quiet so I guess no one is actively pursuing development of a new flying wing model or playing with a new design.

With the winter months now upon us, if you have started on any new construction or modifications to something you are already flying, please drop me a line with some pictures and explanation of the project. I am basically out of material going into the January issue so anything you could contribute, be it long or short, would be greatly appreciated.

MERRY CHRISTMAS

HAPPY HOLIDAYS

HAPPY NEW YEARS



LETTERS TO THE EDITOR

Hello Andy,

I recently came across the (apparently old) Peck-Polymers "Genesis" flying wing R/C sailplane kit (see: https://www.google.com/images?hl=en&q=Peck+Polymers+Genesis+glider+plans&gbv=2&sa=X&oi=image_result_group&ei=bdhiVIXU18qxogT91ILIBA&ved=0CBQQsAQ). I am interested in building a small (no more than 20" or so wing span), Free-Flight down-scaled version of the Genesis, made of either sheet balsa or cardstock. Does anyone in T.W.I.T.T. have 3-view drawings of a Genesis from its plans? I will gladly reimburse him or her for a photocopy of them (plus postage). Also:

The Genesis' slightly-swept, constant-chord wing planform is simultaneously simple and aesthetically pleasing. A small F/F (Free-Flight) version of the Genesis could even be flown as a model rocket boost-glider, by using a jettisonable "pop-pod" (as with the Estes Nighthawk:

<http://www.spacemodeling.org/jimz/k-34.htm>)

containing the rocket motor and the pop-pod's recovery system. Such a model could also be powered by Jetex www.jetex.org or Rapier www.rapier.cz model jet motors.

Many thanks in advance to anyone who can help!

Jason Wentworth

(ed. – As I wrote back to Jason I will look through our archives and see if I can find anything more on the Genesis. The Pecks were TWITT members, attended meeting for a period of time since their shop was in El Cajon and had contributed some things to the group. I will let everyone know if I find anything of interest.)

Dear Mr. Hoey

I am a wood RC soaring modeler since 1970 . I was looking for plans of a seagull. So Internet brought me to you.

How would it be possible to get a copy of such plans. I would really appreciate to have some news.

I'm Swiss but actually in LA for machinery Installation.

Thank you so much. Best Regards

Fernand R. Oppliger

(ed. – Bob has a set of working drawings for the seagull and has forwarded a copy to Fernand. He also says that construction is similar to the Raven model that has published plans.)

Hi Bob,

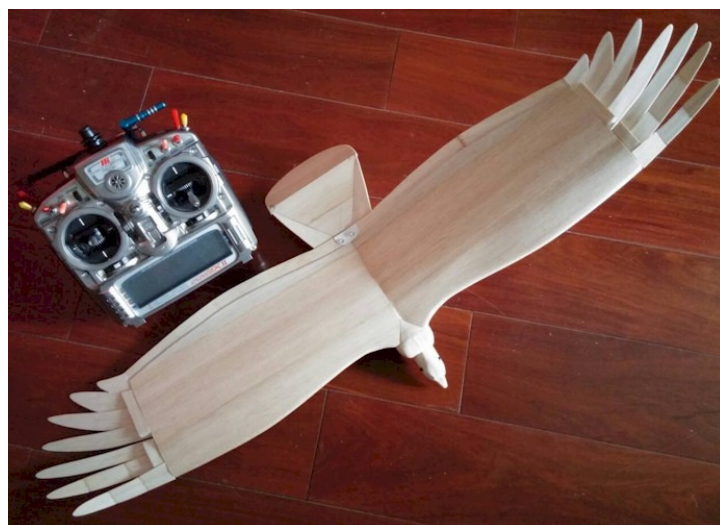
Here is my Turkey Vulture 820mm wingspan, wing tip aileron use 0.3mm piano wire L sharp spring and servo pull system.

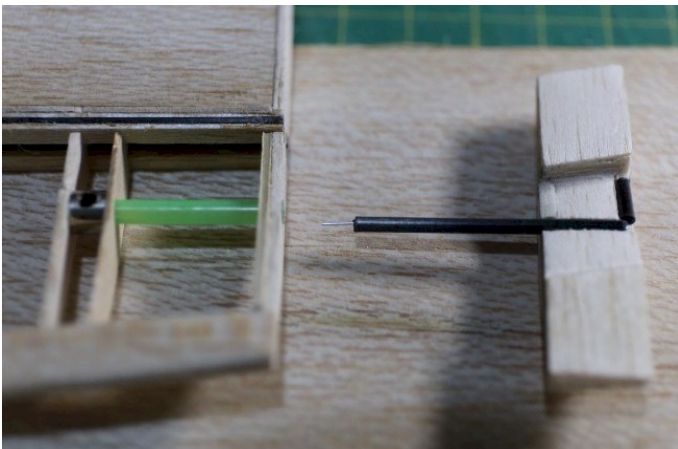
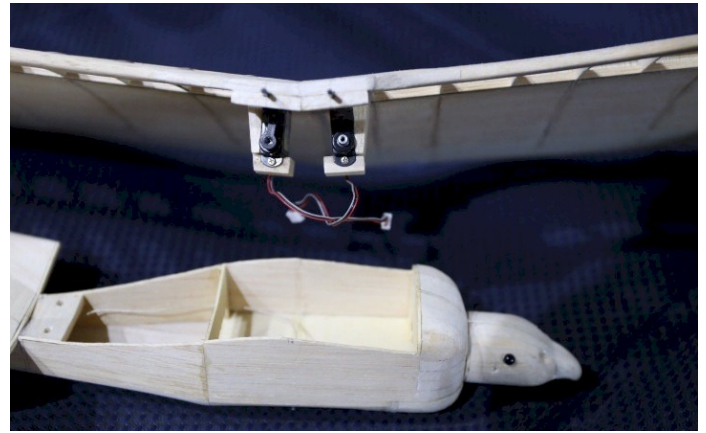
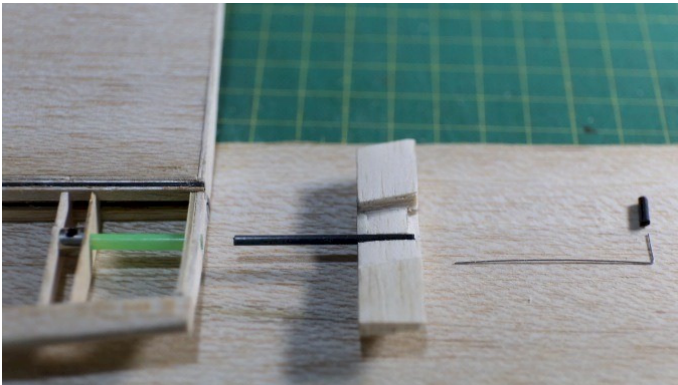


The tail elevator will use 0.3mm piano wire U sharp spring and servo pull system. Same as PCM Mini-Q DLG design.

Lawrence
lawrence4shan@gmail.com

(ed. – Below are the photos he included with his e-mail. There were no explanations about any of them but I think you should be able to figure out what they are showing about the flight control system. It looks like an interesting adaptation of Bob's design.)



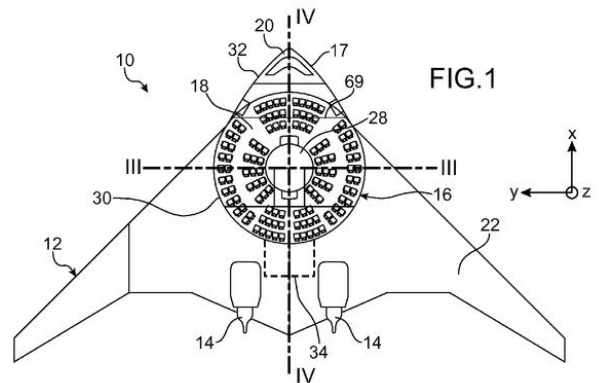


Nurflugel Bulletin Board Threads

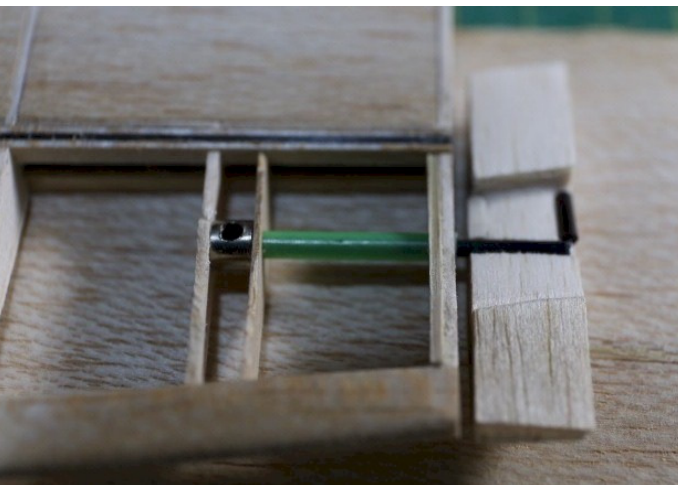
Apparently a response to the Boeing BWB.

<http://www.npr.org/blogs/thetwo-way/2014/11/17/364708388/flying-donuts-airbus-files-patent-for-a-new-kind-of-plane>

Doug Holverson



(ed. – The text accompanying this image indicated that Airbus submits over 600 patents a year and that this is just on concept that more than likely would not enter production. It also says that this seating arrangement



actually offers more seating than a typical tube and wing design like used today. From a passenger standpoint there are probably a lot of people who wouldn't want to fly backwards or sideways although they do it in subways.)

Sorry Airbus. No WAY that's a more efficient use of space!

And if there's only four rows with possible window access, I can imagine the premium charged for those seats.

Finally, again Airbus seems incapable of coming up with new aero ideas ... at least this patent sketch seems to be a copy of the Boeing BWB ,, as do all their design plan forms being copies of current configurations. They need to hire some new thinkers, like Burt Rutan.

Cheers,

Bob Storck

As I understand it, the circular (or lentil) shape of an internal pressurized cabin is an approach to handle cabin pressure in a BWB configuration, which seems to be a major obstacle. The outer planform seems to be not that important (and yes, it looks like Boeing).

Joachim Bergmeyer

Windows are probably going to disappear from all airliners since they're structurally inefficient. They'll be replaced with high-resolution video displays which can show anything including an external view.

To me the bigger concern is emergency exits which, apparently, would have to be in the roof.

N141

That's been often proposed, since the 1950s, but no airline has been brave enough to challenge passenger expectations and commit to actually ordering hardware. Recall that American Air was among those which installed a camera in their wide bodies, and gave the passengers a cockpit view of takeoffs and landings.

Unfortunately, after the Chicago DC-10 engine loss disaster where the cabin got a view of the roll and dive into the ground, that feature was quickly discontinued.

Airlines had hoped that this would wean passengers from needing windows. Note that many private biz jets offer 360 degree views on demand.

To me the bigger concern is emergency exits which, apparently, would have to be in the roof.

I agree completely. Sad to say, I can't think of any jumbo/widebody that has been involved in an accident where the escape systems were used. Lots of smaller jets land without gear or slide off runways and wind up intact, but the bigger passenger liners usually seem to break up and survivors escape through the wreckage cracks ... Cedar Rapids, Toronto, Dallas, Tenerife, San Fran come to mind.

Am I missing some?

Are you aware that Northrop tried to get interest in their flying wings as passenger craft post WWII? I have a brochure that seems to presage the Boeing BWB sales package, with panoramic windows in the leading edge of the wing for the front row seats.

And yes, I realize that the lenticular shape largely deals with pressurization issues, but IMHO, after 50 years of passenger craft and even longer submarine design, I'm told that there is a very small advantage in structures ... very low single digit weight penalty, and all offset by aero/hydrodynamic issues. The Navy has lots of patents on saucer style submersibles, but so far, only a few ROVs in that configuration.

Note that the patent claims also claimed efficiency in space utilization which I still question.

Sorry Airbus. No WAY that's a more efficient use of space!

And if there's only four rows with possible window access, I can imagine the premium charged for those seats.

Finally, again Airbus seems incapable of coming up with new aero ideas ... at least this patent sketch seems to be a copy of the Boeing BWB ,, as do all their design plan forms being copies of current configurations. They need to hire some new thinkers, like Burt Rutan.

Bob Storck

Ok, seriously, I just actually have looked into the patent document. The pressurized cabin has the shape of a doughnut, so there is a hole in the middle of the airplane (where you guys thought the stage with the pole would be). This ring shape can withstand internal pressure very well.

The passenger seats are oriented to the front, not more than about 30° off. You can see this when you look at the patent document in original size.

So indeed there seem to be some original ideas at Airbus. This is even a benefit for Boeing, keeping them on their toes! ;)

Oh, and by the way, emergency exits go to the center hole.

Jochen

I am glad to see that I'm not the only one who bothered to read the patent. I thought of a toroidal passenger compartment years ago when I saw that array of boxes in the early BWB concept art.

I don't think the leading and trailing edges are going to have much influence on the shape of the pressure vessel because however the cabin is arranged the distance from floor to ceiling has to be about two meters to accommodate people walking around.

Norm Masters

Form follows function, guys. When the patent application concerns the cabin, it's important to show that it is adaptable to a functional BWB.

Serge Krauss

Mitchell U-2 Threads

Control Stop

Ok so I have been looking more at control stops and understanding the need for them more.

My question for you is this, can I take my control mix box as seen in the photo, mark the spot that each stabilator is at zero degrees, then install a control stop (a bolt) and then do the same when the control stop is at 30 degrees for each stabilator. Thereby preventing

the control going beyond the limit recommended by the designer. Will this work? Please share with me your feedback.



Control Movement/Feel

So I have installed my stabilator weights to balance them, when operating the controls there is some resistance and they feel a little heavy - is this to be expected due to the system having to go through 3 push pull rods and a torque tube? Is there anything that can be done to make it glide a lot easier with minimal resistance besides lubricating each area the torque tube goes through in the plastic holders that the tube runs through? Or just accept the resistance and understand that is how it is designed? Your feedback is valued.

Ryan Derot

(ed. – The following message provides answers to both these issues.)

ELEVATORS AND OTHER STUFF.... The next comments are only from my own experience with my own plane...There is no guarantee that it will fit yours and you will apply them at your own risks....Clear enough ??????

Ryan, you should read first in my album called U-2 stuff part 2....Test flying 1 de 6 to Test Flying 6 de 6 (6 pages total) from Tasso Proppe who wrote this ,I believe it was published in the old Mitchell wings news centuries ago. It gives a very easy and comprehensive explanation of the basics of a flying wing.....Print it, you might relate to this later on.

Then, from him and John Connors (ex-owner of the M. Company at one point), I adjusted the elevator from -5 degrees (T.E.down) to +35 degrees (T.E.up)... That is in reference with the chord of the main wing compare to the first rib (inboard) of the elevator, the one that is not twisted. Be careful, the chord of the

main is not a line from the L.E. to the T.E. cause of the reflex. I think the plans shows the chord which passes under the reflex. Make a template like Tasso says. I think, to get to that amount (40 degrees), I had to move the idler brackets from the front of the spar to the back of it.....to get more amplitude...I was told that I should at cruise, run 3 to 5 degrees UP. So, I decided that this is where my elevators should be when cruising at 50 mph...I set the elevators at + 4 degrees, clamp them and measure from the end of my stick to the dash, which more or less was 4 inches. I took one of those nylon straps that bundles cable together, which is more or less like a spring and attached it to the dash, so I know when I fly that I am at 4 degrees when the stick meets the end of the spring which can be bent, compressed or what ever without disturbing the stick movement. By the way, the stick has to be bent to fit your needs. Hard to see but look at IMG_2436 and IMG_2417 in the same album. My stick is bent like an S, first, from bottom to top, the stick goes forward then round off backward (to accommodate the bottom edge of the seat) and then point to my belly. I usually fly with the arm resting on my leg.

Control stops....I am kind of cautious about that but I felt it is not needed. In front, the stick will touch the dash, in back, will try to get trough your belly, and sideways, your legs are in the way.... Bushings...This is something I can not talk about, I did installed them, did not liked it at all and finally replaced them with some aluminum bushings which are greased every year through inspection holes under the wings. I still did changed the torque tubes after 200 hrs cause they were wearing out at the bushings, I replaced them with a heavier tube (.060 instead of .040,I believe) and also inserted and glued internal sleeves where the bushings are as back-ups. Those wings flex so you do not really know what that flexing does to the torque tubes. The inward brackets of the torque tubes are removable so I can slip the tubes out of the wing to do a good check. The stick should be so easy to move that you think it is not connected to nothing...

MISCELLANEOUS

I saw your photos, congratulations, it takes a lot of work to get to this point, Your gas tank are in the D-Cell ????? Make sure that they are tight, gas and foam ribs do not mix together... Counterweights is a must for the elevators Trustline...important issue, You could also read and print a letter I wrote few days ago (1991...LOLLLL) to an FAA guy, that can give you more insights about my own 'saga' with the bird....

I forgot to say that the letter I wrote is in the same album, it starts by 'my let+1 de 10' up to my 'let+10 de 10', (10 pages)..

Guy

I will take a look at your other letters, I did print the other ones you mentioned. I have a binder with everything U2 related that I can find online and print them. Your 6 page letter on the U2 was actually my reading material on the plane when I was on vacation 2 weeks ago :-)

My stabilators / elevons are balanced with just under 2 lbs of lead weight - made a big difference but my controls still feel like there is resistance so I may go back to my points where the torque tubes are and ensure it is lubricated plentiful. Can you recommend a lubricant that is best to do this job? Do you recommend graphite? I bought a can from aircraft spruce and it seems like it does not lubricate enough. With the correct lubrication it should make the controls very easy to move and operate?

My thrust line is 7 degrees and so is the pitot tube at the nose.

So question, are you saying you set your elevators / stabilators to -5 degrees and up to positive 35 degrees instead of the zero degrees to thirty degrees as per plans? Also did you measure from the trailing edge closest to the cockpit for the angles?

My fuel tank is in the d cell and secured very tight, the only areas that could leak would be the top where I fill the tank and the bottom where the fittings are and there is no foam around there but a door. I also have an overflow pipe for added precaution as I did not want to rely on just the vented cap.

On the other note, I am unable to locate the folder "U2 Stuff Part 2" and only see "U2 Stuff" - where is this folder located or could you email me some of these documents ryanderot@hotmail.com

Sorry if this email is all over the place, my brain is running in 300 directions as we speak.

Ryan

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.

Serge Krauss, Jr. skrauss@ameritech.net
 3114 Edgehill Road
 Cleveland Hts., OH 44118 (216) 321-5743

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.

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Bruce Carmichael bruceharmichael@aol.com
 34795 Camino Capistrano
 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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