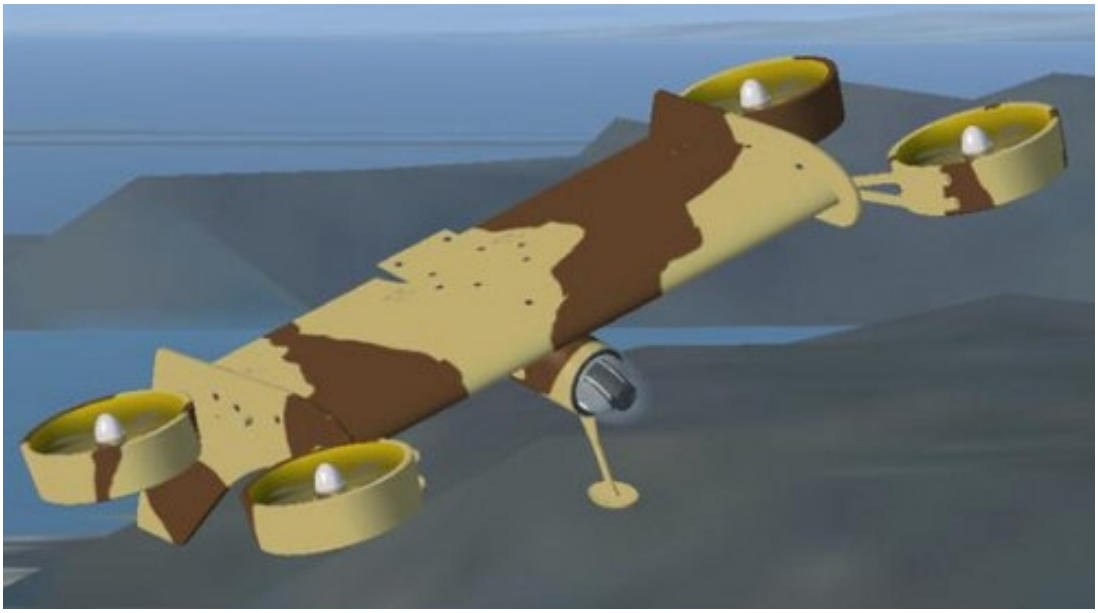
No. 285 MARCH 2010

T.W.I.T.T. NEWSLETTER

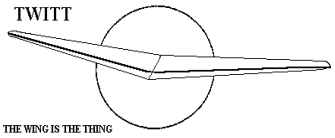


Found this at http://www.gizmag.com/flying-wing-vtol-uav/13962/picture/109376/ that was posted in January 2010 so it is a recent VTOL UAV concept. The web site has several variations.

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

The number after your name indicates the ending year and month of your current subscription, i.e., **1003** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, March 20, 2010, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast side of Gillespie).



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. T.W.I.T.T. is affiliated with The Hunsaker Foundation, which is dedicated to furthering education and research in a variety of disciplines.

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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

When I finally got access to the May-June 2000 issue of Sailplane Builder I found that I wasn't missing any of Al Backstrom's text, but just three of the figures. I have included these towards the end of this issue so you can use them in reference to the article from last month. Again, I apologize for the inconvenience.

It is that time again for changing the user ID and password for the members only section of the web site. I will do it with the publication of the April issue in order to allow those subscriptions that came due last month and this to renew so they will have uninterrupted access. I will post it in the masthead to the left and make the change after the April issue should have been received by most of you.

THERE IS NO OFFICIAL PROGRAM FOR MARCH

As usual, you are more than welcome to drop by the hanger and see what is going on in the aviation world that resides there. As some of you know, there are a lot of interesting things going on at the hanger and those around us, so take a couple of hours on Saturday, March 20th and come see us.

There weren't a lot of e-mails to cover this month so I went back and found some Nurflugel threads that I had missed late last year. I have been surprised that the level of activity within that group has dwindled significantly over the past several weeks. I hope this is not a sign of a waning interest in flying wings here in the US and especially in Europe.

Andy

LETTERS TO THE EDITOR

February 5, 2010

Dear Mr. Hoey:

Hello my name is Alex from Israel. I want to know if sell your model?

Thanks

Alex Kapmar
<alex@nanocom.co.il>

Hello Alex,

I have not produced any kits for the bird models that I have built. The Raven II glider model plans were published in the Jan 1994 issue of "Radio Control Modeler" magazine. Although the magazine is no longer in publication, I believe the plans are still available from RCM,PO Box 487, Sierra Madre, CA. 91025. Plans number 1160 and 1160A. The price was $12.00 and $6.00 last time I checked.

The Turkey Vulture plans were published in the June 2002 issue of "Model Airplane News". Plans are available from Air Age Mail Order, P.O. Box 407, Mt. Morris, IL 61054-5827. Plan number FSP0602. Price is $19.95.

I have received feedback from several builders in Europe and all report that the models fly well. I hope you will join in with us in experimenting with bird-like flight. Please let me know of your experiences.

Good luck!!

Bob Hoey
bobh@antelecom.net

February 8, 2010

Dear Sir,

Can you offer the RC Gull for sale please?

Kind Regards

Steve John
<medewi.bali@gmail.com>

(ed. – I sent Steve the earlier reply from Bob Hoey to Alex but haven't heard anymore back for either. However, the following concerning the Gull models came in from Bob. It is great that there continues to be such an interest in radio controlled bird flight around the world.)

February 25, 2010

Thought you all would appreciate this short video clip.

(http://www.twitt.org/Attacked1_E.wmv)

Evert Klienhans, from South Africa, emailed me last Sept. asking for plans to the Seagull model. My gull plans were never published, so they are pretty sketchy, but I sent him a copy. After several email questions and exchanges he just finished the gull and sent me this video of the model flying with some real gulls (who don't seem to be too happy about it!). Little clips like this make it all worthwhile!!!

Bob Hoey

Great video Bob!

I have a fiberglass gull from a fellow in Israel who was offering them on RCGroups. Photo attached of my wife holding it.

Here is a link to the RCGroups forum:
http://www.rcgroups.com/forums/showthread.php?t=897603

I've had problems getting mine flying but am waiting for the right conditions which may not happen till optimum slope weather blows in westerly during summer.

Here's a video of my not so great test flight where I stripped a wing servo:
http://vimeo.com/5423738

Thanks so much for the update and keep up the good work.

Sincerely,

Paul McKenzie
paul@gregdelory.com

Hi All,

Just thought I would give a quick update. Not sure when anyone has talked to Alex in Israel last, but I do not believe he is producing Gulls any more. (he has not returned my e-mail or PM)

Long story short, Alex and I were both bidding on the original Birdworks Gull tooling directly from Steve Hinderks, he won. After a short time Alex decided he could do better and CNC machined his own tooling, upon which time he decided he no longer needed the original tooling and sold it to me.

I now own the original Birdworks Gull tooling and will be selling Gulls as 'short kits' in limited quantities.

Without more details on the conditions from each of the two videos, it is hard to compare the two, but it appears Bob's Gull flies better. I may have to consider a hybrid Gull, somewhere between Bob's Gull and the Birdworks Gull.

Best regards to all,

Matt Richards
<richards10@gmail.com>

February 6, 2010

Hello.

Great site and very informative. I make flying wings for sale and I am always interested in seeing different designs. Here is my site.
www.wowings.com

Thanks.

Pete Loftus
<info@wowings.com>

(ed. – Here are a couple of the models from Pete's web site.)

March 3, 2010

I want to build a real low aspect ratio airplane like the Arup or Jim Lloyds or a lifting body like the Facetmobile except with curves instead of flat panels. Can anyone offer help. What kind of airfoil is Jim using on his plane? The wing plan form is almost a delta if you draw lines from the outer aileron back to the leading edge.

Hadley McIntyre
<joh-mci@msn.com>

(ed. – This came in through the web site Guest Book. I am not sure what to pass along to him so if someone has an answer to his questions, please pass them along to him an copy us so it can be included in the newsletter for everyone's benefit. Thanks,)

NURFLUGEL BULLETIN BOARD THREADS

G'day. This is one of my test models, video was taken on its maiden flight and we were still tweaking it.
http://www.youtube.com/watch?v=_Cd0lFPyP4I

Cheers. Tom C

It is a model of the Facetmobile, not quite a lifting body, but it flies very well.

Bruno DeMichelis

That is a truly remarkable design, I have seen quite a few now, even indoor versions.

Rob Wallis

G'day, The Mk2 model on Youtube is no Facetmobile, it is my improvement on the Facetmobile. Mk1 was a faithful reproduction of the Facetmobile, it didn't fly well at all - it was stable enough but it had a very poor L/D, and settled alarmingly when power was reduced.
Mk2 and a later Mk3 fly very well, in fact they won several model aircraft competitions flying against conventional aircraft of the same weight and power. We plan to build a Mk4, 1/3 scale of a full sized single seat prototype. Depending on the results we will go ahead and construct the prototype, all of the design work is complete and I have gathered much of the airframe material.

We have learned much from the models including CG limits and all conditions and attitudes of flight.

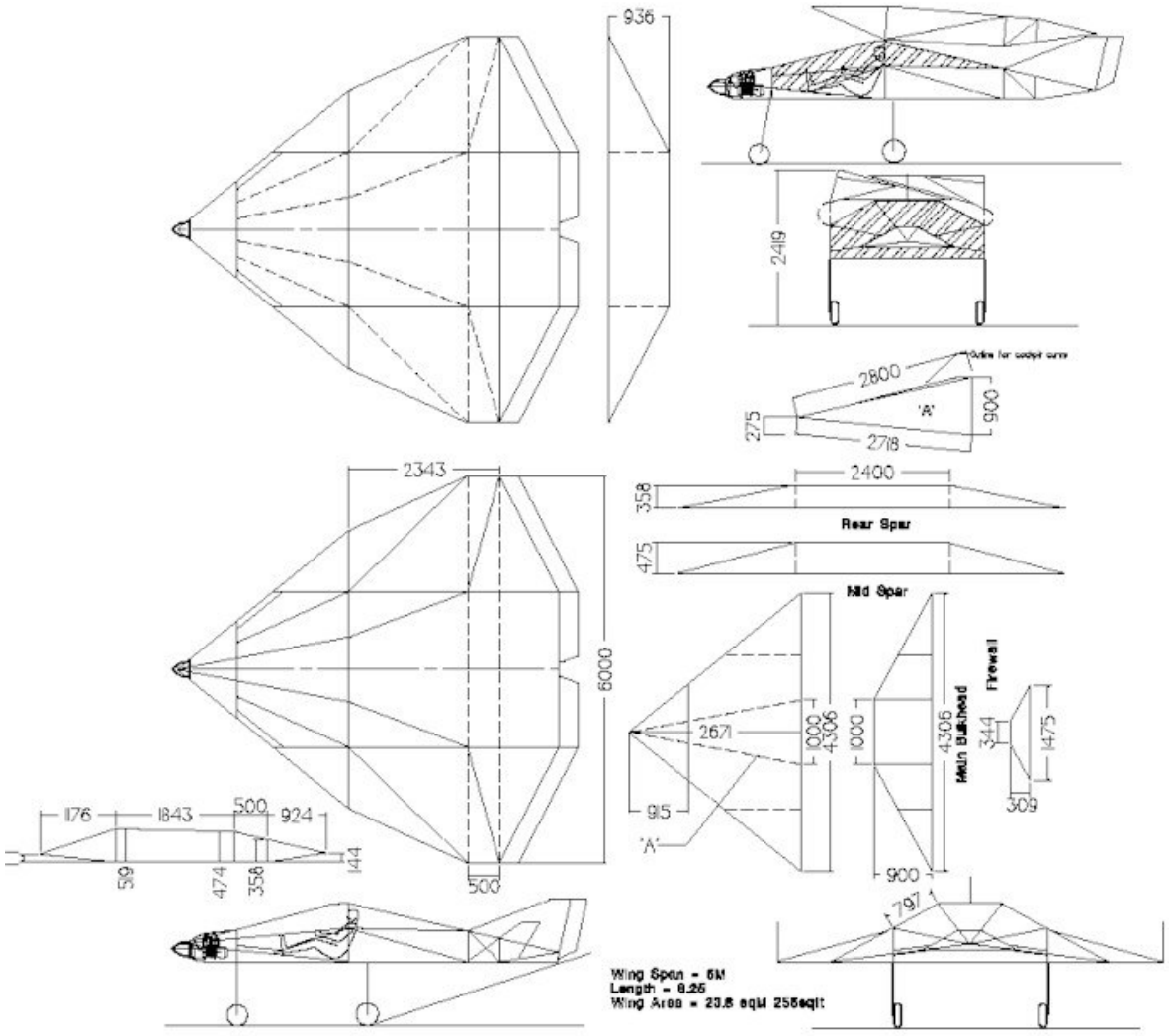
Cheers Tom C

My comment, Tom, was based on close similarity. I did not and I do not mean to be overcritical. My compliments: you seem to have fixed most of Barnaby's problems. Could you post a video of the MK3 flying, please? Thank you in advance.

Cheers from Bruno

(ed. – Here is a line drawing of the proposed full scale aircraft mentioned above. You can see the similarity to the Facetmobile with some unique features like a folding wing to enable it to fit in a garage.)

(ed. - The following items were the result of Norm Masters posting I put in the October 2009 issue on all the videos he had been looking at, some of which were related to wind tunnel tests.)



That's great Norman, Wind tunnel test pilot looks like the best job in the world. The funny thing is that it seems they used the same push button all-or-nothing control system to test the YF-16 in '75 that they did back in the 40s. Maybe it is operator skill, but the model seems a lot less touchy than some of the other tests.

http://www.youtube.com/watch?v=nrc5M0SCwy8&feature=channel

That was the first time I've seen a XB-53. so that's cool too.
keep'em comin'

Nick Strum

Curious about the workings of this tunnel. Is there some form of 'thrust' created in the model?

I've had an interest in building a small wind tunnel to test stuff for a while now. My research lead to water tunnels which might work better for my low speed aerodynamics'. I'm mainly interested in looking at flow interference areas on some designs I've been working on. The option would be to build 25% scale models and outfit w/ cameras and go flying. Not sure how conclusive that type of testing would be [less controlled for sure]. I've looked at CFD and have 7+yrs experience doing 3d modeling but don't have resources to just buy a CFD program for my testing..

I've access to most of the parts that would be needed for a wind tunnel [industrial level fan's and motors etc] but I'm not sure if I could build it such that I'd get reliable results. Realistic, yet affordable CFD would be my first choice, but I think those two don't go together when it comes to this type of software :).

Anyone have recommendations or suggestions as to what my most economical direction would be?

Thanks for the great vid's!

Jerry Johnson

Hello Jerry

I followed the R/C "big" scale model approach you mention at a certain point as an option.

I evaluated that a wind tunnel (air tunnel) with a good air quality (low noise/turbulence) is not so easy to build, add on this that if you have a small test section life is even harder, then you must have a good speed profile on the section, lot of hassles.... eventually, my way of seeing and carrying on things is to use interactions among aspects as a start rather than isolating each aspect and then trying to pack up, I mean, keeping an eye on practical solution for an idea is a good thing to carry side by side with the development, and if you go fly stuff you sure are closer to that rather than banging your head in a wind tunnel or even worse doing CFD. An equilibrium among all these things has to be found of course, cannot rule out the latters, just keep a balance.... which usually has a tendency to drift on the latters.... but if you are just an experimental guy with no background, you won't make it either.

Don't know your experience with actual R/C building, it's amazing in my opinion how you can "program" reality as you would do it on a computer, I mean, after a while you learn to pack up reality as you would code in a computer, it's an amazing sensation. This is helped if you focus on no-frills fast prototyping process (if you work on your R/C stuff as you would on a lengthy 1:1 scale aircraft project, forget about it). You use reality as a simulator actually :-)

As for on board hardware to use on the R/C stuff, it depends on what you're looking for to investigate. You can do a pretty good job investigating with basic parameters (speed, efficiency, controllability) by video recording the flight from the ground and with an onboard small camera (you see the video later on the ground, you time both videos and on the ground video you speak to make appropriate commentaries on the actions you are performing). By using basic watt meters onboard (sold for nothing on R/C shops) you can work out a number of things if you do well the math and know what to look for. As for maintaining exact alphas (just an example), well, either you use a gyro from heli in a clever way or make a flying wind tunnel (a big steady model) on which you lock the stuff you want to test... just food for thought, never tried actually this. Never tried with
smokes onboard either but you could have a go.

Evaluating water stuff, think that those models come out really tiny due to Re, very precise machining is needed to achieve trusted results. The bigger the better... go into the air :-)

As for R/C parts at a very low price and amazing quality, I'm not endorsing by any means but have a look at Hobbyking, then come back tell me :-)
http://www.hobbyking.com/

All this, it depends of course on your target as said. If your research is more on an academic-style, the one I suggest is not the proper approach. But again, go flying!

Hope this helps a little. Write to go in depth on some specific topics

mrk

(ed. – I have included pictures of a couple of models from Hobby King. From what I could see they are reasonably priced and are electric so there is some extra expense if you don't have a radio, electric motors and controllers.)

Mrk, thanks for taking the time to reply. I'm like the idea of a large scale R/C as it's fun as well as educational. I think regardless of which route I take there will be a large-scale model flown of it prior to ever building a full-scale unit. I've flown R/C a fair bit. [Haven't in the last few years due to other time constraints, but that is slowly changing]. My platform [while not a flying wing] is complex enough that detailed testing on various models is the only way I'm going to get a better understanding on the flow in certain areas of interference [engine nacelle's to the fuselage] and be able to optimize the design.

I do plan to build the aircraft in full scale at some point in the future so I may as well do what I can to prove the design [aerodynamically] to the best of my abilities [in an economical fashion].

Some of the negatives of an R/C model as I see it

1-Repeatability of the tests, could be difficult due to uncontrollable environmental conditions [turb, wind, temp etc]

2-Time to put together a flying model [accurately] test, change and repeat could be very time consuming. I estimate that each iteration [simple solid foam w/ electric motors could be more than 50+hrs/iteration to get them flying]. I'm thinking there could be a fair number of changes and test over time, which adds up to a lot of time [yrs] doing this type of testing.

3-Cost, wrecked models and equipment will start to cost more and more as time goes on [and more and more tests are done]

4-Equipment needed to do proper testing [onboard computer stuff [cameras etc] would be expensive, and heaven forbid they get wrecked in a crash, etc

5-My current location limit's the amount of time [through-out the year] that is available for flying. I'm limited to ~4-5mo of the year and generally only during the very early morning or late evening due to wind during the day.

Some of my reasoning for doing a wind tunnel

1- No end of things a guy can test and rain/sun/wind/ calm.. you can test..

2- It should be more finite at getting realistic data [comparable but possibly not absolute i.e. #1 is better than #2 etc] between model renditions.

3-I've got most of the components [i.e. 48" axial Fan which is able to run up to ~4000rpm, actually got access to several of them if I wanted them. This coupled w/ a PTO from a tractor on the farm would give me everything I need to get enough airflow they are actually set up for belt driving right now so.. it's almost like falling off a log]
Negatives include

1-absolute accuracy of the tunnel [as mentioned low turb etc]

2-Cost and I'd have to set it up ~1.25hrs drive way from here [due to size constraints where I currently live, however it could be re-located in the future]

3-Time, it'd be a lot of time towards something that is not the actual design.. worth it in the end, but a time eater none the less.

Some of my reasons for a water tunnel.

1- Small and simple.. could be set up in the basement.

2- I own a CNC mill so machining all the models I want is not an issue.[but possibly time consuming]

3- very good at modeling flow realistically [as I understand it]

4-less expensive/time consuming than a wind tunnel.[??]

Negatives--

1-who wants several hundred [or thousand] gallons of water in a temporary tank in their basement?

2-Not sure on the absolute accuracy of parameters [can one realistically measure lift or drag in a water tunnel??]

3-Just the 'unknowns' of a water tunnel.. I understand how they work.. but don't know of any of the "got-ya's" of a water tunnel vs a wind tunnel [not that I'm a wind tunnel expert]

CFD would be great if it was simple and reasonable to obtain but I know of no such program at this point. Possibly collaboration w/ a undergrad student who was looking for a project or something is my only possible solution at this point [as I see it.. but open to suggestions here]

I'm sure there are lots more reasons [both pro and con] for each of these routes, these are the ones that come to mind as I type this.. [haven't put a lot of time to compose so please forgive any major oversights that may have occurred there-in] Thanks for bouncing idea's!

Jerry Johnson

Jerry, last year I built my own wind tunnel and it worked very well, giving results which are fully comparable to the ones obtained using pertinent and expensive software. If you are interested, let me know and I will e-mail to you several photos and data. I also have videos of it in operation.

Bruno DeMichelis

Bruno! That would be incredible! Please feel free to send whatever you have.. I really appreciate the offer.

Can you offer any basic details, size test section size, fan size etc..

Thanks!!

Jerry

Not to hijack the thread as I'm interested in the wind tunnel bit as well.

Does anyone know how the models are controlled in the tunnel? From watching the videos I would have assumed using servos driven and powered through the tether?

Curious as the X46? would have been in the late 40's and I can't see them having servo's small enough to be used unless they were rather good sized models.

Rather interested as well as every R/C I have ever touched ends up in more parts than the original box contained. Usually referred to as "re-kitting" by some of my "friends" who weren't sharp enough to accidently break something before I got hold of it.

Dave

(ed. – This was a follow-on message from a discussion on split flaps, but I included it since there was a reference that would provide additional information that some of you will find interesting.)

Just to expand the discussion, I recall the flaps employed on the Marske Pioneer 1a for glide path control. To avoid any pitching moment, the flap hinge line was at roughly 50% MAC. IIRC, these flaps were each about 8 feet in span and 10 inches in chord. These were on a 46-foot span glider.

Here's an article on the P1A I wrote in 1969:

http://www.continuo.com/videowebpage/lloydupdate2/photo.htm

They worked well as landing flaps by increasing Cl Max but they were marginal for glide path control.

Bill Daniels

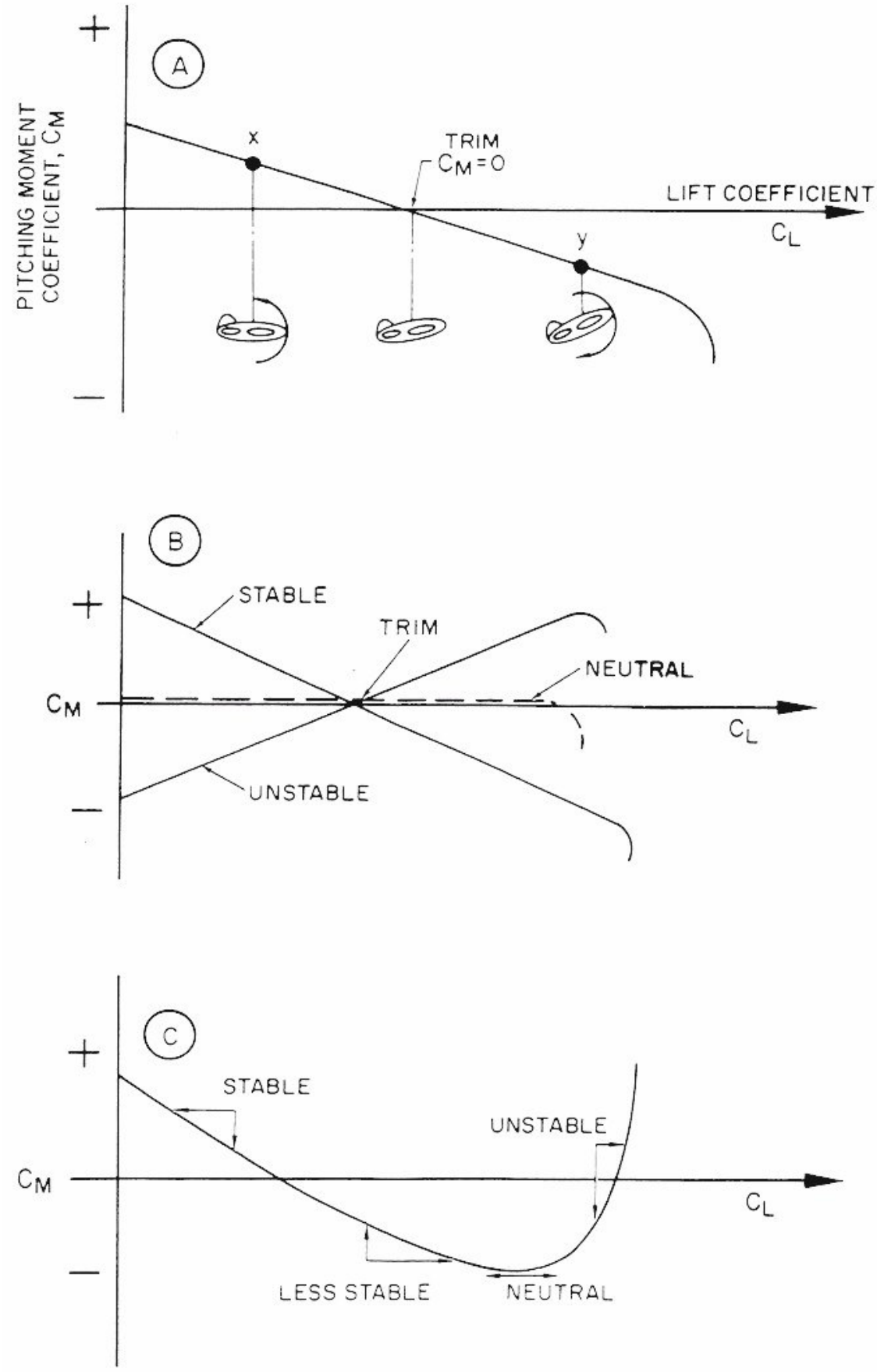


Figure 2 Airplane Static Longitudinal Stability

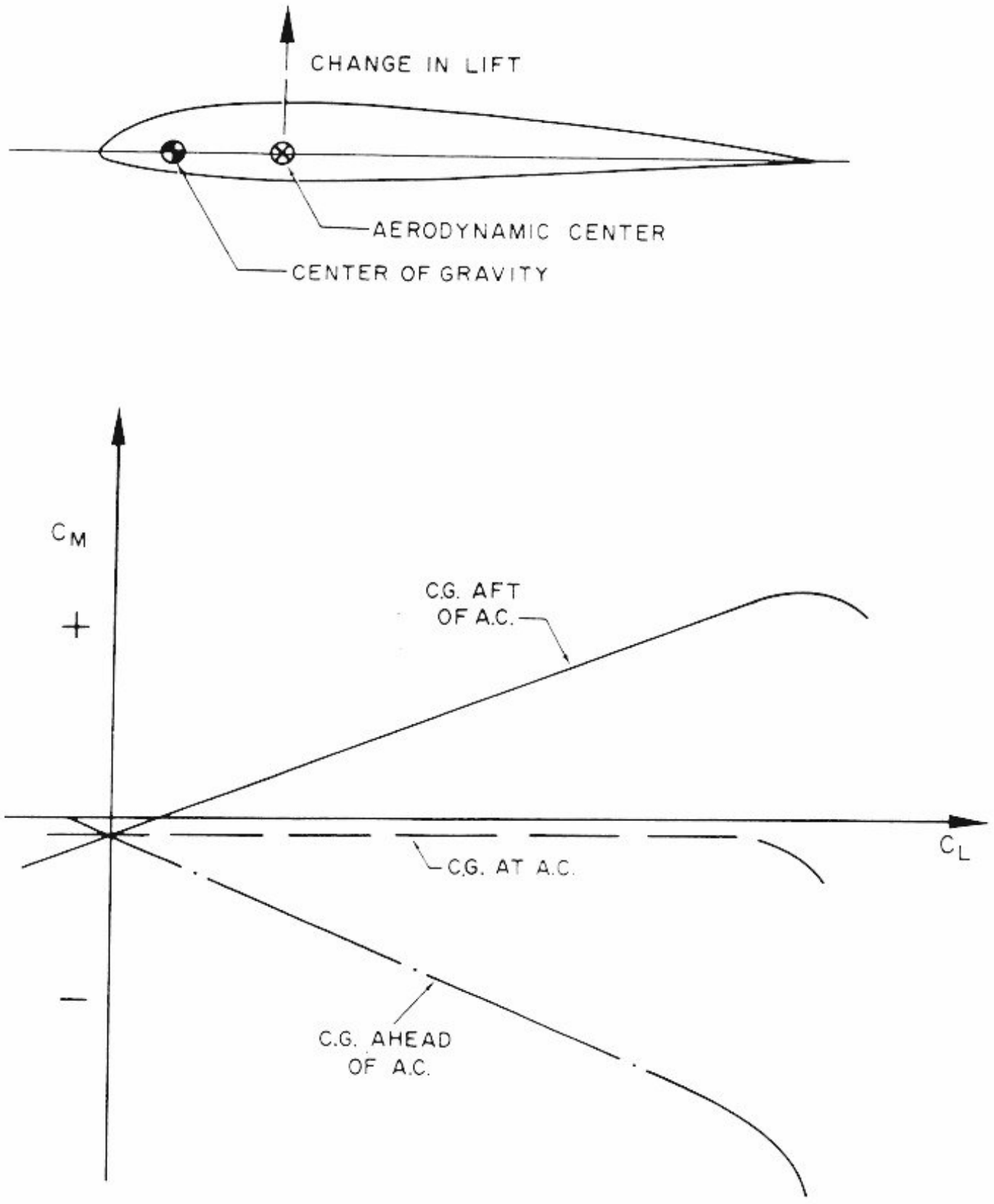
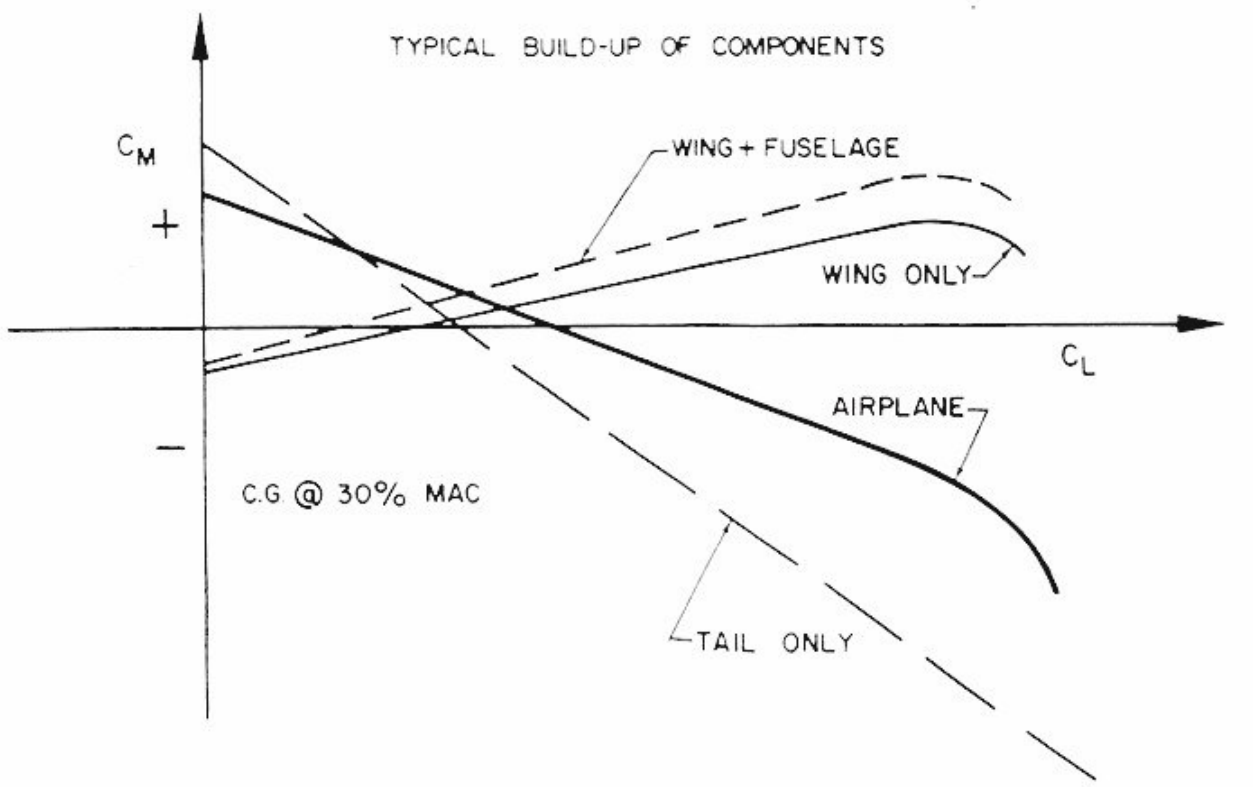


Figure 4. Wing Contribution



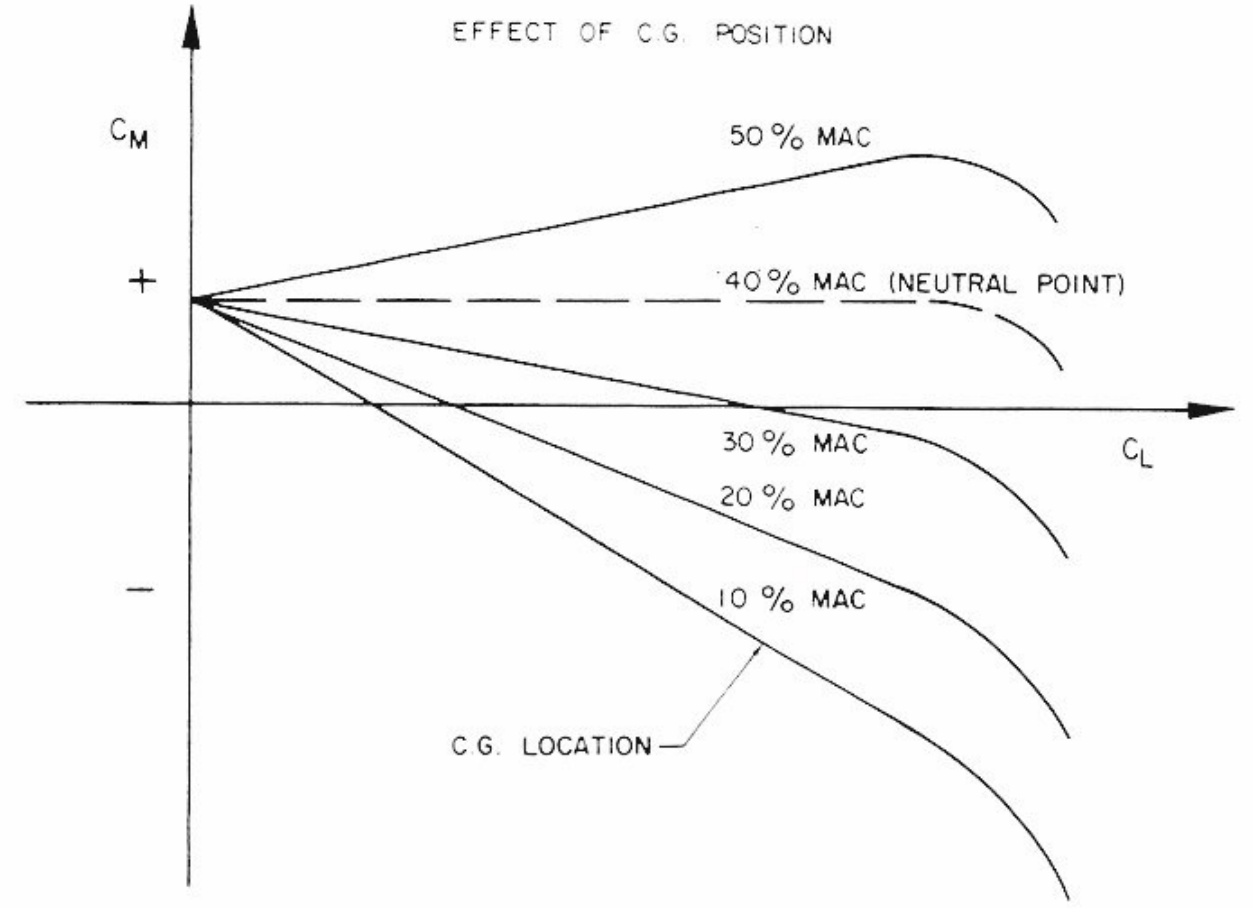


Figure 5 . Stability Build-up and Effect of C.G. Position

AVAILABLE PLANS & REFERENCE MATERIAL

Coming Soon: Tailless Aircraft Bibliography Edition 1-g

Edition 1-f, which is sold out, contained over 5600 annotated tailless aircraft and related listings: reports, papers, books, articles, patents, etc. of 1867 - present, listed chronologically and supported by introductory material, 3 Appendices, and other helpful information. Historical overview. Information on
sources, location and acquisition of material. Alphabetical listing of 370 creators of tailless and related aircraft, including dates and configurations. More. Only a limited number printed. Not cross referenced: 342 pages. It was spiral bound in plain black vinyl. By far the largest ever of its kind - a unique source of hardcore information.

But don't despair, Edition 1-g is in the works and will be bigger and better than ever. It will also include a very extensive listing of the relevant U.S. patents, which may be the most comprehensive one ever put together. A publication date has not been set yet, so check back here once in a while.

Prices: To Be Announced

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

Bruce Carmichael brucehcarmichael@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 $140, postage paid. Add $15 for foreign shipping.

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