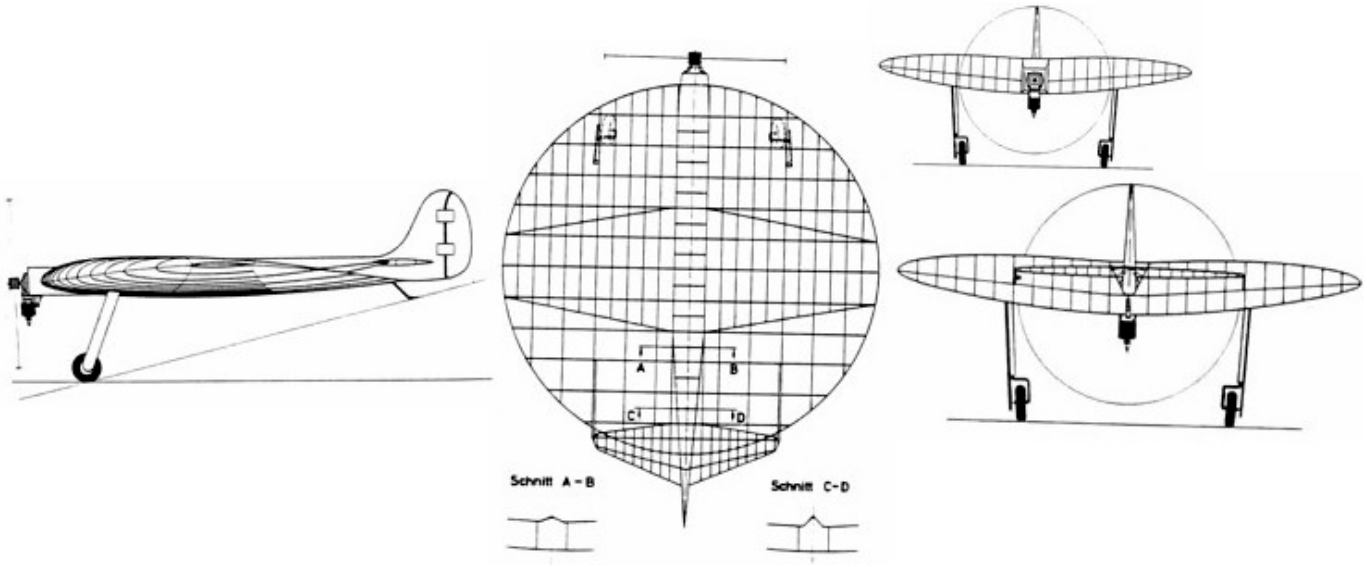
**No. 197** **NOVEMBER 2002**

# T.W.I.T.T. NEWSLETTER

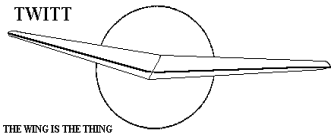



**Here are some model drawings for the AS 6 circular wing. These came from Luftfahrt International dated April 1979, page 156. This was part of the material contributed by Eric du Trieu de Terdonck earlier this year. For those who read German, the caption was:**
"Die AS 6 entstand aus den Erfahrungen von Arthur Sack mit Flugmodellen. Diese Übersichtszeichnung zeigt Sacks – fliegenden Berdeckel – von 1939/40. Am Entwurf dieses Modells glaubt Peter von Schalscha-Ehrenfeld entscheidenden anteil gehabt zu haben."

**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., **0211** means this is your last issue unless renewed.

**Next TWITT meeting: Saturday, November 16, 2002, 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.

## T.W.I.T.T. Officers:

**President: Andy Kecskes (619) 589-1898**
**Vice Pres:**
**Secretary: Phillip Burgers (619) 279-7901**
**Treasurer: Bob Fronius (619) 224-1497**
**Editor: Andy Kecskes**
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The **T.W.I.T.T.** office is located at:
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| 1oz/1 | 1.75 | 1.75 | 1.00 |
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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

About the time you get this I will be updating the website to add a Members Only section. This will allow us to provide our members with exclusive access to unique information before release to the general public or, as is the case at this point, color pictures of newsletter items and past newsletters.

You can access the new section through the home page and then use the following User ID and Password, both of which are case sensitive, to take you to the subject index page. Then just click on the item you want to view. Use your Back function or the link at the bottom of each section to return to the index for another selection. You can bookmark the Members Only page, go directly to it and then check the update date at the bottom to see if anything new has been added.

User ID: **twittmbr**
Password: **member02**

As noted on the first page of the section, we would appreciate our members not sharing this section with non-members since it is a benefit of being a TWITT member. As I noted above, some of the sections will eventually find their way to the public side of the site (other than the past newsletters), so others will have access, just at a later date.

For those of you who have Internet access I would like to apologize for you not getting much new content in the newsletter this month. I simply ran out of material, like letters or new articles, so used Don Mitchell's biography as filler. It sort of went with the question on his stabilator from Karl Nickel and, I was getting desperate to put something of flying wing significance in the newsletter. I guess I will have to get an earlier start on the December issue and dig through our archives for some other unique items of interest.

Andy

## NOVEMBER 16, 2002 PROGRAM

It looks like there won't be any program for November 2002. We haven't been able to find a speaker and, although Gerry Heflin offered to bring over the re-designed, revised version of his "Skler", I hated to ask him not knowing that we would have very many people. It is a lot of work to get it on the trailer and across the airfield, so we will save it for another time.

We will continue looking for a speaker, so you might want to give Bob, June or myself a call (numbers are on the first page) on Friday evening to see if we have anything for those of you with long drives.

With all that said, we will still be at the hanger on meeting day for those of you who just like to get away from the house on a Saturday afternoon. We will have some hot water for the coffee, tea and hot chocolate, and a box of donuts for your sweet tooth. Come on by and sit around for some hanger flying and roam around the hangers along Skid Row, if you haven't taken the time at previous meetings.

I am sorry we couldn't come up with a program, but they are just getting harder and harder to put together from the limited resources in the Southern California area. I will make my usual impassioned plea for help from our members in finding speakers or, offering to put on a program on one of your own projects. They don't have to be fancy, just something to show others what you are doing and getting feedback from the group.

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## LETTERS TO THE EDITOR

October 2, 2002

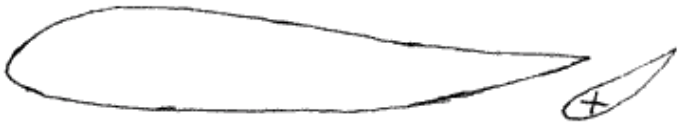
Dear friends of the wing:

If you want to know what's going on flying wing wise even in your exact neighborhood you have to read the TWITT newsletter. How else could I have know that the airport of Aalen-Elchingen is the home of a newly built tailless ultralight aircraft? (Aalen-Elchingen lies not too far from Freiburg; with the motorglider I can make it in one and a half-hours.) Last week my wife and I have been there and we were overwhelmed!

The flying wing in question is a modification of a Mitchell U-2. Its builder is Wolfgang Uhl. He used a (modified) U-2 wing, blended it with the forepart of the fuselage of a Cirrus sailplane, added a retractable landing gear and powered it with a Rotax motor. A highly remarkable construction! And it flies quite well, as my wife and I have seen. Two photos of it have been printed in the TWITT newsletter No. 193 in July 2002. To find the whereabouts of Wolfgang Uhl was not so easy for me. In case anyone of you flying wing enthusiasts wants to contact him, here is his address:

Wolfgang Uhl
Oberriffinger Strasse 9
D – 73441 Bopfingen
GERMANY
Tel. In Germany: 0163 – 380 1390
or 07362 – 4471

By seeing this wonderful bird with it typical Mitchell elevons, a question came up to me. Perhaps somebody in the TWITT community can answer it and help me? This is it: One of the big inventions of Don Mitchell is the fact that he used for elevators a special arrangement of flaps. Here is a sketch of them.



The reason for doing this was presumably that in slow flight, when these flaps are up, there is a jet produced by the slot, which "blows away" the separated flow and, therefore, improves the low-speed handling. According to Wolfgang Uhl this goal has been reached.

Now my question: Has such a wing-flap combination ever been tested in a wind tunnel? Are there measurements available of the polar diagram with various flap angles? If yes, where can one get them?

Many thanks in advance.

Karl Nickel
Schlierbergstrasse 88
D-79100 Freiburg i.Br
GERMANY
Tel. (from US) 0(1149)-761-403159

*(ed. – I sent Karl's question to Richard Avalon to see if he knew of any such data. Here is what he had to say:*

"Andy,

This is a note in response to the question from Karl Nickel about the stabilator control system that Don Mitchell developed for the "Mitchell Wing" flying wing aircraft.
In order to give a flying wing airplane level flight stability you have to have a lot of 'wash-out' at the trailing edge of the wing, like a hangglider, which produces a lot of drag. Or you

can build a ship utilizing several different airfoils, like the Horten ships. This is a great deal of work and requires special engineering knowledge.

Or you can, like Don did, use an inverted airfoil as a separate little flying wing, called a stabilator, because it is full flying by itself and is separate from the main airplane. It's an upside-down airfoil because it is constantly lifting down to hold the airplane steady and stable, as well as, they are movable together or separately to provide pitch and roll control.

This system is the easiest to build and adapt to a flying wing. The gap is there so that when the wing is at a higher angle of attack, like for landing or taking off, there will always be clean air flowing over the control surface. This is the big reason flying wing designs don't work, except Mr. Mitchell's. His little secrets are the distance of the stabilator to the wing and the twist (not twitt) that he designed into this flight control device.

To my knowledge, there has never been any wind-tunnel test work done and the only super computer used was the one installed in Don's head sometime prior to his birth.

Hope this info helps. Don also mentions this and other neat things in his tapes. The taps contain a lot of very valuable data, always keep some sets on hand.

THE WING IS THE THING

Richard Avalon"

*If anyone else knows of any technical evaluations that may have been done on the Mitchell design, please let us know. I imagine it would be a private effort on the part of someone with access to the necessary equipment and the desire to determine why the configuration works as it does.)*

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October 10, 2002

Hello wing nuts:

Yes I am a wing nut myself. My fellow "nut" Terry Baxter of Darwin sends me the newsletter (we share the cost of the subscription). Our Australian pensions do not allow luxuries such as subscription to overseas magazines. Sorry, but that is as it is.

Now I read in No. 191, May 2002, that you are wondering and worrying about the fall in membership/subscriptions. May I, without intentionally wanting to offend anyone, suggest more factual reports, such as write ups on a wing builder, repairs to a wing, projects, concepts, whatever that will keep people's eyes onto the newsletter and waiting for the next installment.

A good friend is interested in a single seater Mitchell wing (unfinished) and when I have it in my workshop I'll write a few reports and photos for you.

Eric du Trieu de Terdonck must have discovered a trunk of goodies. His photos and other bits of information on Horten wings are impressive. Good for you, fellow Belgian.

There has to have been hundred of flying wings built over the years by amateurs, Fauvel 36 sailplanes and, many others. Perhaps some reports on them would be appreciated. What about the Mitchell wings from A-10 to U-2? I for one do not see the need for 4-pages of write-up on birds – we cannot equate to them, only imitate as best we can.

Thank you for your kind attention and I hope this letter will help a little with getting TWITT back on track. It would be a disaster to see this valuable link between wing lovers go out of circulation.

What's going on with Barnaby's 2-seater Facetmobile? A dead project? If so, a shame.

Bye for now friends. Happy flying and good landings.

Andre Maertens
138 Eel Creek Road
GYMPIE QLD 4570
AUSTRALIA
Tel: 61 7 5482 6805

*(ed. – I appreciate Andre's comments and take no offense. I would be very happy to include such articles in the newsletter, but they are very hard to come by. This issue is a primary example in that there were few letters, let alone anything of the nature Andre has mentioned. His articles and photos would be greatly appreciated as a starting point. As we all know, Terry Baxter has been a past contributor and from what I can tell everyone seemed to enjoy the conceptual approaches to a flying wing solution to his transportation problem.*

*If we could get people like Wolfgang Uhl to write about his construction project with the modified U-2, it would be great. I will have to write him and see if this is a possibility. Finding people who are, or have, built a wing is also one of the problems, since we don't reach everyone. We have to depend on our members to be our eyes and ears in the field to give us leads.*

*We will continue to search for the types of articles Andre is talking about, but it will take some time so please bear with us.)*

---

October 23, 2002

Dear Sirs,

Subject: Saint Cyr #52 Airfoil

I am documenting the drawings specifications of an aircraft built around 1928. I need the dimensional data of the subject airfoil. Mr. Peter W. Young, Senior Lecturer at MIT, suggested that I contact your organization.

Your help will be much appreciated.

Jack Steinhorn
9360 Craven Road #1204
Jacksonville, FL 32257
jaxdiana@bellsouth.net

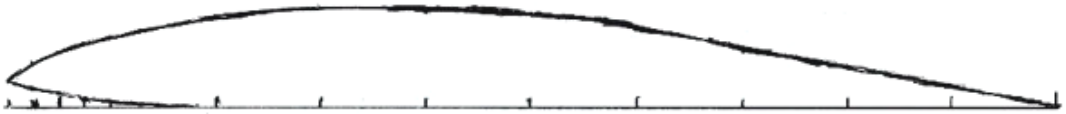
*(ed. – I couldn't find an answer to Jack's question internally so went to the Nurflugel mailing list and within 24-hours had the answer he was looking for. It came from Bruno De*

*Michelis of Australia and included the raw data along with a hand drawn sketch of the airfoil. Here is what Bruno had to say:*

"Yes, I do. I found it in an old book of mine: " Manuale dell'aeromodellista Moderno" by Bruno Ghibaudi, an Italian doctor in aeronautical engineering. The X scale is 100 mm. in length and the Y/s is the top line of the profile, whilst the Y/i is the inferior one. You need to maximize your browser to see the data correctly. Cheers! Here it is:"

**SAINT CYR 52**

| X | 0 | 2.5 | 5 | 7.5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y/s | 2.5 | 4.24 | 5.5 | 6.17 | 6.8 | 9.1 | 10 | 9.8 | 8.8 | 7.5 | 5.5 | 3.9 | 2.1 | 0 |
| Y/i | 2.5 | 1.66 | 1.3 | 0.87 | 0.8 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



*(ed. – Apparently Jack contacted Bruno directly, which resulted in the following when I responded with a thank you to Bruno through the mailing list:*

"Cheers! Jack contacted me already (off the list), because the CAD drawing of the profile was a little "lumpy". I suggested drawing it by hand: when the Saint Cyr 52 was designed CAD was a desire in the eye of daddy! In fact I sent him a hand drawing which is much more workable. I add it as an attachment. The Saint Cyr profiles with high numbers were predecessors to the L.D.C. (NACA series), which was bearing a max. thickness at 50% (+) of the chord, trying to avoid fluid disconnection from the boundary layer, but creating at the same time a considerable amount of drag due to the sharp drop of the Y/s after that point."

*I have asked Jack if he would provide us more information on his project so we can put this airfoil into perspective with the aircraft. We'll see what happens.)*

---

October 28, 2002

Subject: Have You Seen FMS?

**H**as everyone looked at the Flying Model Simulator? It's available as freeware, and is very easy to use.

The best part is that there are flyable models of a Horten IV, Me-163 and an SB-13 in the model files; I also downloaded an available model of a Zagi.

It all looks very realistic--sure beats not having a flying-wing of your own to fly!

I can provide links as necessary if anyone can't find it. You'll have to adjust the controls (elevons, throttle, etc.) to fit your hardware--but it's real easy to set up.

Look at: http://fms.pathbot.com/

Bill and Jan Hinote
hinote@charter.net

*(ed. – I took a look at this site and then went ahead and downloaded the program. I have played with it a little bit, but without having a joy stick hooked up I was having problems with the key functions trying to get the Horten model to slope soar. However, with the investment of a little time and some tweaking, it looks like it could be a fun program.*

*If you have an older model computer, it might not work quite as well, but for those of you with state-of-the-art equipment, especially a fast chip, you might see some good action.*

*If anyone else tries it, I would appreciate some feedback on how easy it was to setup, how the model reacted to the commands and, your overall impression of the "free" program.)*

*(ed. – After a couple of days the following showed up on the mailing list attesting to the addictive nature of these types of programs:*

Hallo everybody,

I downloaded the stuff yesterday. I enjoyed it so much I didn't get to sleep before 01:30 AM (and that is a record for me in years). But, did you know that there is a freeware to make the models too. I found it on the links section of the site. The origin is Japanese. But there is a very good guide in English and French. There is something about a shareware version and the need to get a code to be able to export the file to be used in FMS, but I am not that far yet. I guess that the freeware makes it possible to use the exported file. But if you don't succeed yourself in making one, there are a lot of already made models on the net. A real FMS-gang. Besides ... man, I just love the steering. Reminds me of my very first sim, jetfighter (1st edition). Easy steering and very forgiving. A real must for those that thought sims are not for them. Learn your fist steps in sims here and advance then to the more realistic stuff.

I made a update in Nest of Dragons just to promote this FMS-stuff. I really love it that much.

Koen Van de Kerckhove

*(ed. – Here are the three flying wing images from the program.)*

AND another hint at how to use the program:

I recommend flying the Horten IV in the slope-mode (or alpine-mode). Choose a bit more uplift (or on the flat flying field more thermal-power).

---

*(ed. – The following was added to the website some time ago, but there hasn't been enough room to put it in the newsletter in the past. I thought everyone might like this insight into Don Mitchell who has made very dramatic impact on the amateur flying wing community. I would like to thank Richard Avalon for providing this material.)*

*(NOTE: This was written by Don Mitchell around mid-1990 and provided to TWITT by Richard Avalon of U.S. Pacific, a distributor of Mitchell B-10 and U-2 plans. It is sort of Don's mini-autobiography and parallels what he said during a presentation at the 1991 Sailplane Homebuilders Association Western Workshop at Tehachapi, CA and, a 1992 presentation at TWITT.)*

## PREFACE

### By
### Don S. Mitchell

I have spent my whole life in aviation. I love gliding and soaring and the beautiful gliders and sailplanes, from the primary's to the hot glass jobs of today.

I have two requests that I would like fulfilled before I die. One: that I be nominated for and inducted into the Soaring Society of America's "Hall of Fame", and the other that when the time comes I have a pot of glue in one hand, a piece of plywood in the other ready to go onto my new home built sail-plane.

The Soaring Society of America can fulfill and accomplish the first and I request that they at least consider doing so.

## INTRODUCTION

### By
### Richard Avalon

Don S. Mitchell will be 75 years old on Feb. 1990. He has been actively engaged in gliding and soaring since his high school days, 59 years ago.

Don became interested in aviation when, at the age of 5, he saw the dirigible, R-34 fly over the family country home in Scotland. 'The Mitchell family moved to Alameda, California in 1921. His grammar and high school days were filled with model airplane building, winning contests, reading aviation books and magazines, and spending countless hours at the

Oakland and Alameda Airports, climbing over arid in the "Swallows", "Eaglerocks", "Waco's", "Travelairs" and the beautiful Lockheed "Vega".

As a member of the high school aviation club, he worked on the primary glider, that the club was constructing, under the supervision of Mr. Hall, a French, World War 1 flyer.

He is a prodigious builder, just completed his 34th home built. Skilled in metal, wood, honeycomb and composite structures and is a most talented and imaginative designer.

His aircraft have established and hold many world records and are flying in countries throughout the world. They are on display in a number of exhibition halls and museums. S.S.A. and Oshkosh to name but two.

His ultralight flying wing power gliders and hang gliders have won more contests, set more records, been given more awards, than any other in the history of the movement.

He's a member of S.S.A., first joining when he was with Hawley Bowlus, and has been a member most of the time since. For several years he contributed articles and over 100 pictures to the Vintage Sailplanes Association and was a member of the organization.

Mr. Mitchell has been an active and strong booster of soaring and gliding for well over 50 years. He is a member of Soaring Homebuilders Association (SHA) and has given lectures and demonstrated his ships at every one of the SHA Western Workshops held at Tehachapi, California. He has been Western Vice President of SHA and an active organizer and contributor to all of the workshops and the SHA publication S.H.A.P. He is a member of E.A.A. TWITT (The Wing Is The Thing) and actively en-gages in the publication.

In order to keep this presentation brief, some of Mr. Mitchell's aviation engagements have been eliminated. Such as his work at Hiller Helicopters in the Quality Control department and as a Federal Aviation Inspector. His Q.C. work at one of the leading manufacturers of wood and metal rotor blades for helicopters and the various management positions in "Pico"
manufacturers of emergency escape slides for commercial airlines.

After you have read this presentation throughout to the end, you will believe as I do, that Don S. Mitchell, should by all standards be nominated for and inducted into the Soaring Society of America's "Hall of Fame". Certainly no other person is more deserving.

## DON S. MITCHELL'S SOARING, GLIDING AND AVIATION HISTORY

### By DON S. MITCHELL

The following can be substantiated by one or more of the following:

1. Documentation
2. Pictures
3. Eyewitness

### 1929—1932

Helped construct a primary glider while attending Alameda High School, Alameda, California.

### 1934—1936

Student Boeing School of Aeronautics", Oakland Airport, Oakland, California. Hanger #5.

### 1937

Dec. 1936 — Jan. 1937, employed by United Airlines at Oakland and Fresno, California, as Radio Operator and Station Attendant.

Left UAL and went to San Fernando, California in Feb. to see Hawley Bowlus. Asked him to teach me how to design and build gliders and sailplanes.

Lived with Hawley for the next 6 years and worked as his "right hand man" for 11 years, on every project during that time.

Hawley and I built the original "Baby Albatross" (Just the two of us). It was first flown in Feb. 1938.

We manufactured and sold four (4) "Baby" Kits in 1937.

Hawley and I wrote and made up the original instructions for assembly of the "Baby" Kits.

Once a month, at our own expense we drove up to Arvin, California and the White Wolf Ranch, to obtain permission to hold soaring meets at what became known as the "Arvin Soaring Site" - First meet held in 1938.

### 1938

Original "Baby Albatross" finished, licensed and flown in Feb. Hawley made two flights and I made one. Flying down at "Muroc Dry Lake", now Edwards Air Force Ease. We towed with Hawley's 1936 Ford V-8.

I am the original registered owner of the original "Baby Albatross".

Hawley made two airplane tows and .1 made one at Van Nuys Air-port. Gorden Buck did the towing using his 40 H.P. Cubs. Ship flown without the canopy and we used a ¼" rope, 200 ft. long.

Hawley, his father and I made the wood plug for the molded pods, cast the concrete forms and started production of pods for the "Baby Albatross" and the "Super Albatross".

we started building the original "Super Albatross" for J.K, O'Meara. To take to the National meet at Elmira.

"Super" not finished. J.K. O'Meara and I, as crew chief, took the "Baby" to Elmira for the 1938 National Soaring Meet.

Hawley and I repaired the nose and one wing of the "Big Albatross", that was in the shop, damaged, when I arrived in 1937.

We built one set of "Baby Albatross" wings for Dick Esserie's "Baby Bomber", a two place, side by side sailplane.

We mounted a 4 cyl. 16 H.P., 2 cycle "Radio Plane" engine on the front of the "Baby" and I flew it at the Dry Lake. Five flights made, we had a castering nose wheel on the front of the skid, aft of the tow hook.

During 1938, Hawley and I turned out 6 "Baby" kits, plus 2 we sent to Durban, South Africa.

Hawley, Al Essig, and I organized and formed "Bowlus Sailplane Inc.", late in the year.

I was elected president of "Bowlus Sailplanes".

During 1938 I flew the "Baby almost exclusively for many hours, doing auto, pulley, winch, airplane and horse tows.

## 1939

Finished the original "Super Albatross". Licensed it and flew it at Rosemond Dry Lake. Hawley and I made several flights, auto tow.

Hawley and I made the first of the three, two place "Baby's".

Under Hawley, I had full responsibility for running the production shop manufacturing the "Baby" kits and for hiring and training the ever increasing personnel, on how to mold pods, spars, wings, etc.

## 1940—1941

Designed and started to build on my own, the 50', two place side by side, 3 wheel, retractable, landing gear, flying wing, glider. Using my external stabilators for aileron, elevator and stability control. (See Soaring May—June 1948).

Made one horse tow demonstration in the "Baby" at Grand Central Air Terminal. Al Essig and Don Wilson, Jack Benny's announcer, did the towing with 100 riders from the El Charo riding group charging down the runway in front of us.

Broadcast over a National radio hook up from the "Baby" before, during and after the tow.

Molded pod for the only other "Super Albatross" ever built.

In the shop we built two more two place "Baby Albatross" sailplanes. Ted Nelson purchased these.

Continued building "Baby" kits and started FAA certification of the "Baby". J.K. O'Meara, doing most of the flight test-ing for the Co. and the FAA.

Participated in a major way with the static testing of the "Baby" for certification.

Worked on my flying wing, as time would permit.

Appointed Soaring Editor of Western Flying Magazine.

Left "Bowlus Sailplanes" to teach aircraft welding at Aero I.T.I. located at Grand Central Air Terminal, Glendale. Welders were in short supply in the ever-increasing war effort.

Went to Timm Aircraft to mold the fuselage. Timm was designing and building an all wood trainer for the military.

Contributed my know-how and experience to the FAA static testing of the trainer.

## 1942

Early in 1942 Timm got contract to build the Waco Glider CG-4A.

Sent by Timm to two major furniture manufacturers in Los Angeles to organize and get them started on production of the CG-4A wings. Weber Showcase was one of the Companies, Super Cold the other.

Nov. 1942 hired by Weber to take charge of CG-4A wing production.

Made trips to Grand Rapids, Michigan and Hutchinson, Kansas to set up sub-contracting our CG-4A wing parts.

During my employment at Aero ITI Timm and Weber, I went to Hawley in the evenings and weekends to help on the design and building of the two-place tandem, all wood training glider and the ½ scale 46 prototype of the Cargo Glider XGC-l6.

## 1943—1944—1945

First part of 1943 left Weber and rejoined Hawley Bowlus full time, building the full size XCG-l6 prototype.

Still working as time permitted, on my Flying Wing model 278.

Al Criz and Hawley organized and formed General Airborne Transport Co. to build the XCG-l6.

G.A.T.C. got military contract for three XCG-16 Cargo Gliders. One for flight, one for static test and one for standby.

Al Criz and Hawley made me Director of Projects at G.A.T.C. In this position I worked under Hawley on problems associated with the XCG-l6, (And there were many), and I had two engineers working on an engine, propeller, and rear wheel drive unit for a roadable flying wing airplane I was designing. One other engineer I had working trying to design

a way of swinging a propeller around the boom of a “Baby Albatross” with the engine in the pod.

The other project that I did myself was the conversion of the ½ scale, 46’ prototype of the XCG-16, to a flying wing, using my external stabilators for control and stability.

After completion of the conversion Hawley, Paul Tuntland and I flew it many times at the dry lakes.

Towing was by auto and airplane. All flights were made without any major problems. (See Soaring Aug. 1989).

After the delivery of three XCG-16 gliders to the military and the cancellation of the glider projects, Hawley and I went to work on the mock up of what was to become the “Dragonfly”, a two place side by side, pod and boom power glider with a three wheel retractable landing gear. Originally this design was known as the “Bumble Bee”, but later changed to “Dragonfly’. At this time I had my 50’ flying wing in Hawley’s shop, working as time permitted.

In Nov. 1945, Nelson Aircraft was formed to exploit what was believed to be a market for power gliders.

## 1946—1947

Worked with Hawley designing and building the prototype of the “Bumble Bee”.

After flying the prototype, we started FAA certification.

A new set of wings had to be built using 45° plywood, plus other modifications in the design.

Under Hawley I had charge of getting the wings, pod, tail, etc. built for static test and participated in a major way with the actual testing, as well as working on engineering and shop problems.

Gave Paul Tuntland, shop support in the FAA flight certification tests.

When we went into production, Hawley appointed me supervisor of production, with all shop personnel, and manufacturing under me. Note! “Bumble Bee’ was changed to “Dragonfly” after we were informed by Republic Aircraft that the name was on their copyright list. They had copyright on every kind of “Bee” you could think of. They were building the “Sea-Bee”.

Finished my flying wing model 278 on April 1946. Experimental Airworthiness Number NX18992 issued by the FAA.

Flew the flying wing many times at the dry lakes, as did Paul Tuntland and Hawley. No problems with either control or stability.

Later I mounted a Nelson, 2-cycle engine on the wing and we flew it as a power glider. This was the same kind of engine we used on the “Dragonfly”.

## 1948—1950

Depression hit the aviation industry and “Dragonfly production stopped. Totally built, 7 plus one prototype. This was a sad end to a fully certified power glider, with most personnel laid-off and the San Fernando shop closed.

Ted Nelson and Harry Perl asked me to move 350 miles north to San Leandro, California to build a new power glider. Just the three of us. So I moved.

We took the molded shells of the “Dragonfly” pod and spliced on a new mahogany plywood tail boom. I built the cantilever wing, with some help from Ted and Harry, out of 7075-T6 aluminum. This included making form blocks for each of the L.E. ribs. One every 6 inches, heat treating and artificially aging each, making the spar and skinning the wing. Later I made the trailing edge ribs, etc. Most of the wood structure was done by me. Ted worked on the engine, propeller, engine mount, landing gear and the retraction. Harry did most of the design work. I call this ship “Post Dragonfly, Pre-Hummingbird “ ship.

The above ship was flown but had poor performance so the wings were saved and the rest scrapped.

Harry talked Ted into one more try at a power glider and he gave us the go ahead.

Harry and I designed, laid out, and discussed a two-place tandem seating, with tandem gear. Engine and propeller to be fully retractable. The fuselage and tail to be wood and the wing to be the one saved from the other ship.

Harry did the majority of the detail design, Ted did the engine fittings and retraction. I did the majority of the work on the fuselage, tail, short center section, and controls with help from Ted and Harry, when required.

In April 1949, I designed and started to build, on my own time, a new flying wing to be known as the “Osprey”. This is a single place, 50 ft. span, all wood wing using my external surface control system.

After the original “Hummingbird” was completed, licensed and flown, I left Nelson Aircraft and completed the “Osprey”.

Helped to start the Northern California Soaring Association. One of the Directors the first year.

## 1950—1963

Flew the “Osprey” at Hayward Airport. Four auto tows to 25-30 feet. All controls normal and flights successful.

Paul Tutland came up from Los Angeles to look at it and agreed to test fly it for me. Paul was killed in a glider accident, and a month later the building where The "Osprey" was stored burned to the ground. The end of what might have been a great sailplane.

Designed and built the first of the "Nimbus" sailplane series. "Nimbus I" was 46', single-seater, full cantilever, all wood glider. After many good flights, it was wrecked making an off field landing during a contest in 1954.

Designed and built "Nimbus II". A 50', single-place, all wood, cantilever sailplane. This ship had, for the time, outstanding performance and was entered in three national meets and many California soaring contests and get-togethers.

Designed and built "Nimbus III", a 40', cantilever, single—place, all wood sailplane. (Ed Blalocks "Nimbus" had a 46' wing.)

"Nimbus III", was winner of the High Performance Sailplane Design Award at the 23rd National Soaring Contest, Grand Prairie, Texas.

"Nimbus III" won the Hawley Bowlus Helm's award at the San Diego Soaring meet at Torrey Pines.

Without help I built 4 complete "Nimbus III" sailplanes and sent out 7 "partial kits" (50% of the ship completed)

Designed and built "Nimbus IV". This ship had an all metal fuselage and tail with all wood, 50', cantilever glider. It did not perform as expected and was discarded.

### 1964—1975

Repaired and/or modified the following:

One Flying Plank
One Slingsby Skylark
One Baby Grunau
One Foka SZD-24C
One Dutch "Sagetta"
Three "Baby Albatross"
One Weihe
One Tweed GT-T
Two KA-6
Three Standard Austria
Two BG-12
One Nimbus III
One Wing for Mooney Mite
One Concept 70: Cleaned up the flaps and made ailerons droop with the flaps, etc.
One Australian Arrow: I cut the 43.5' single piece wing in half at the centerline and made it into a two- piece wing. This ship is still flying.

### 1976 - 1977

Designed and built the "Mitchell Wing" hang glider. From start to flight took 23 days. This was the first rigid-wing hang glider with 3 axis controls. This ship has such outstanding performance that immediately after it flew at Los Angeles regional meet, I obtained 12 orders. Sold one complete to B. White who flew it to the regional championship in Los Angeles and then to a National championship at the National Hang Glider meet in the East.

I built 7 complete "Mitchell Wings" and turned out 5 more kits.

George Worthington bought completed ship #4, and flew it to three world records. (See Soaring Sept. 1977).

Organized "Mitchell Wing, Inc." located at Porterville, California, to manufacture the wings. Orders were coming in from all over the world.

### 1978—1985

I installed a 10 HP pusher power pack to turn the wings into a foot-launched power glider. Five ships like this were made.

Made new cage for the "Wing" with three-wheel landing gear, 10 HP pusher engine installation. Thus you took off and landed on wheels. Later I went to 18 Hp and called the ship the "Mitchell B-10"

Experimented with fixed and adjustable flaps, slats and slots for the wing.

"Mitchell Wing, Inc." sponsored and paid for Ultralight Fly-In get-togethers at Porterfield, 6 years in a row. The first had 5 ships - 3 of them ours, but the last one had over 400 from all over the United States and Canada.

Took ships to Oshkosh 6 years in a row. Awarded top honors, many times. More than any other ultralight ever did or has since.

Designed and built in my own shop in Mariposa, California. The original "Mitchell U-2 Ultralight Flying Wing".

The Mitchell U-2 holds the world's maximum altitude record for aircraft weighing less than 600 pounds, of over 26,000 ft. It also holds the sustained altitude record of a little less than 26,000 ft.

"Mitchell Wing" sold hundreds of drawings and kits for the B-10 and U-2 and the hang glider version of the B-10.

They are flying in countries all over the world.

Designed arid built the original A-10. This is a foam and aluminum skin, B-10. A very successful ship and holds 3 worlds records. A-l0's were sold as a complete ship. No kits or drawings were sent out.

### 1986 to June 1989

Designed and built the foam and glass "Victory Wing" , power glider. This ship meets all the requirements for

Ultralight and Microlight categories. It has either a 3-wheel or tandem landing gear. Tandem gear is fully retractable as is the nose wheel on the 3-wheel gear. Flown same and all who have, flown it admit it is a super, easy flying ship.

Built and sold 2 modified B-l0 hang gliders, boosting the span to 39 and 40 ft. Made enclosed pods and cleaned up the ships for additional performance.

I have the plans for the "Victory Wing" but have not decided to sell them at this time,

Have the basic design for a two-place, 50 ft - flying wing power glider and may start construction the first of 1990.

## AVAILABLE PLANS & REFERENCE MATERIAL

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