THE AUSTRALIAN HOMEBUILT SAILPLANE

Editor: James Garay

Volume 6 Issue 22 **September 2001**

G'day folks ...

In this part of the world we are in the middle of the winter season. At the moment it's cold, windy an wet and I'm sitting in front of my computer producing this newsletter for you to read and I hope you enjoy the content of this editions different sections.

Last week I had the opportunity to meet Alan Bradley from Adelaide who rang me from Queensland telling me that he was coming back home after spending 3 months touring Australia in his caravan. He said he was interested in building a Woodstock and expressed the wish to try and sit in the Woodstock's cockpit to see if he could fit in it.

I booked him into a caravan park nearby and I picked him up on Saturday and we headed to Malcolm Bennett's work shop. I'd asked beforehand for permission to take Alan Bradley to see my finished glider and Mal's Woostock under construction. Malcolm obliged and Alan was more than happy to see and sit down in my glider and Peter Raphael's Woodstock (*see Alan's report somewhere in this issue*).

Our cousins from Vintage Gliders of Australia are well underway for their Summer Rally to be held at Stonefield, South Australia, home of the Barossa Valley Gliding Club from 5th to the 12th January 2002. There will not be AN aerotow available, making it impossible for us to take part in their Summer Rally. We haven't decide yet where we are going for our summer camp, a possibility exists to go to Raywood or Locksley.

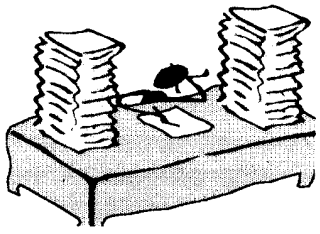
At last my 'Woody-Roo' made his first flight on Sunday the 9th September 2001 at Tocumwal. Peter Raphael (The Erudite) was at the controls for the first flight. We took it to Tocumwal on Friday the 7th September and we spent the whole day on Saturday checking the final details under the strict supervision of Mike Burns who finally gave the OK for the test flight. On Sunday the weather was cold and windy and the flight went ahead without any problem at all.

After being in the air for about 30 minutes, Peter landed the 'Woody-Roo' putting it on the ground gently. He reported that the 'Woody-Roo' had no vicious behaviors and flew like a dream!

The second flight was carried out by Malcolm Bennett who confirmed the report given by Peter Raphael, making a remark that it was very quiet even when the wind was blowing very strong.

I didn't get a chance to fly the 'Woody-Roo', the weather wasn't good and the wind was very strong.

James Garay
Editor



Address all correspondence to:
James Garay
3 Magnolia Avenue
Kings Park Victoria 3021
Australia

Inside This Issue

MAIL BOX

Eds Note:

One member of our group bought an "American Eaglet" home built sailplane 90% built and he wants to finish it. He needs any information that you may have about it. So, give him a call or write to him at: Phillip Alaban, 33 Gordon St, Port Macquarie, NSW 2444 or e-mail: famousphil@hotmail.com or Ph.02-6584-2805

Dear Ed,
I have followed the Windrose discussion, also in the last issue. What struck me is that the tail boom section glued together in the corners. It means to me that the peeling effect will be there, when twisting the tail boom. I have not seen the US NTSB report, but it seems from the last issue that the tail boom stiffness and twist had something to do, with the US accident.

A tail boom made from aluminium tube will take the forces much better. The glue lines are in the same region as the twist power. The twist causes a demolition, starting the peeling. An all wooden tail boom is an advanced thing to do with a square or rectangular section. We have a Windrose on our building list in Sweeden, so it is interesting.

In Sweeden the Windex power plant so far has logged 10 hours and it seems to work. New more silent people do de job.
In the experimental class register there are 10 self launching gliders to date. Three have flown and the building list contains 8 under construction.

Shaw Europa motor glider

The fly in was visited by Shaw Europa with Motor glider, a powered XS and a turbo XS version of aircraft. There are 11 of them in the building list, of which 5 seem to be motor gliders. The Europa branch is in England and the prototype motor glider version was airborne in the 2001 Spring season. I have no details as I did not attend the Fly in this year.

The Swdish Summer is very well developed and I have done some cross country with the SF 25 C, about 180 Km in total.. In May when the polar front put in cold air and gave 4-5 m/s, it was no big deal to do some cross country with a low performance glider at all.
Many happy landing to you all.
Neil Ake Sandberg.Sweden.

Dear Ed,
I am a friend of Terry Baxter from Darwin and have spent some time making calculations and working out leverages and controls for his ornithopter. Terry is a top man with a fantastic brain and alas a very badly damaged body, but he plods on with his pet project and is already drawing sketches for a 2 seater ultralight flying wing. It is beautiful to look at and having made a model I can assure you that it flies like a dream. The full size machine should fly at 100 knots cruise, 32 knots landing speed on 85 hp. Not bad is it? I'll now write a little more about 2 requests for myself.

1. Some years ago I inquired about A.H.S and never did anything about it. Terry sends me the newsletter as soon as he gets it, then I return it for him to read, so instead of copying the interesting parts and making A.H.S. miss out on income, I'd like to join you people. Please send me an application form and fees schedule, you will get my contribution by return mail

2. I too am involved in aircraft building or better re-building but having just about finished this project I am looking to the next one already and for that I need some help. I am looking for a glider fuse, tandem 2 seater, reclined. To use as a mold plug. If it is damaged it is OK too. If the tail is missing it is OK all I really need is the whole cockpit area to say 2 feet behind No. 2 seat. I'd like to borrow this item for say 6 months unless it is given to me. So I am prepared to pick up and return it from anywhere in the eastern states. As you see I am not specific with my request because the brand name and model is not important. I need a very low profile cockpit for this project and the sailplanes I have seen at Gympie (home base) Kingaroy and at Jondaryan seem to fit the bill very nicely- now for a pranged one!

Thank you James, for very interesting articles and 5 years of top service- here is to another 10 please.
Most sincerely yours, Andre Martens.

PS. Any Gympie people in A.H.S? Perhaps if I had a few back issues to lose at the soaring club?

Dear Ed,
Here included $20 for subscription to A.H.S. by return mail as promised.
I would be available to help people with machinery problems when I am in Australia. I do still travel for 2 companies who have machinery overseas. Those machines were of my design and so I do get called to sort out problems once in a while. However, there is no fixed times for such calls, so ring and see where I am, if at or near home base all is OK.
My present interest in flying is mostly ultralights. Having done 4 years military flying way back from '58 to '62, as well as gliding on weekends, the bug was/ still is in the system, no antibiotics or shock treatment can get it out. As you well know.
I have been for the past years dreaming of building a 2 seater tandem, high speed ultralight. (We are the only country in the world without speed restrictions), and to save hundreds of work hours, I'd like to obtain borrow, get a loan of or remove for free a 2 seater sailplane fuselage. It may come from a badly damaged machine or a worn out one or even... whatever, as long as it is a very low profile cockpit semi reclining seating position. I am willing to pick up and return it (if required) anywhere in the eastern states. This fuselage would be used to make templates etc. for my dream machine. Could you please put this in the next newsletter?

Also is there such paraphernalia as A.H.S. badges, car stickers etc. to advertise this group? Our soaring club here at Gympie's Kingaroy Aerodrome is very active and with some literature from you we may attract a few more members. Some of our ultralighters may be keen on joining too. I'll be waiting for further instructions.

Is there a fax number available to A.H.S Members?
Any members in my neck of the woods, if so I'd love to get to know them.
Happy Building and many good smooth landings too, not to forget gentle thermals
Yours most sincerely,
Andre Maertens

PS. anyone interested in a B10 Mitchell wing? New, needs a little work and covering (no engine etc.) alas no paper work. Let me know.

Dear Ed,
Thanks for the reminder about the subscription dues. Enclosed is the amount required which I think is the best value in soaring stuff I know. I still look at the plans for my Woodstock and wonder when I will get around to starting on it. I am sending you something for the newsletter via E-mail. Sincerely. Dete Hasse.

Dear Ed,
To all members of the Australian Gliding Museum, Vintage Gliders Australia, Australian Homebuilt Sailplane and others who may be interested in the establishment of the Australian Aviation Heritage Centre.

I am enclosing for your information copy of an article I have prepared for publication in Australian Gliding Skysailor. This article covers recent developments in the long battle to have Point Cook RAAF Base proclaimed as the Australian National Aviation Heritage Centre. I hope you find it of interest.

Members of the Australian Gliding Museum Committee have been greatly encouraged by the positive support we are receiving for the establishment of the Australian Gliding Museum and in particular from people who are not curent active members of gliding clubs. Accordingly, in addition to current members of the Australian Gliding Museum and Vintage Gliders Australia, this article is being circulate to others who my have an interest in the establishment of an Australian National Aviation Heritage Centre and , in particular, the Australian Gliding Museum, which it is hoped will form part of the National Aviation Heritage Centre.

There is a list mainly based on personal contacts of the Museum Committee. Undoubtedly there are many others who have derived great enjoyment from their involvement in gliding in the past and who could be interested in the Gliding Museum project. It would be greatly appreciated if you could let any of your own personal contacts know of this project and hopefully enlist their support.

If any member of The Australian Homebuilt Sailplane wish to discuss this subject with me personally, I can be contacted by mail at 2 Bicton Street, Mount Waverley, Vic, 3949. By phone on 03 9802 1098 or by e-mail G.F Barton @bigpond.com I look forward to hearing from you.

STOP PRESS...!

Jim's Woody-Rooo takes its first leap on 9th September 2001. At Tocumwal under the supervision of Mike Burns.

TECHNICALITIES

Adapting A Headset To Handheld Radios. By Peter Raphael (The Erudite)

Having completed the construction of a glider ones attention usually turns to the less important of those accouterments required to extract the maximum enjoyment from our creation. The radio would probably qualify as one of those necessary evils, though while not mandatory in this country, do serve a valuable purpose in letting people know where we are while also announcing the proximity of Flying Foreign Objects.

My choice in answer to this dilemma was to use the Delcom Air 960 Handheld radio as the primary inflight communications source. A reasonably priced unit, it provides all the necessary frequencies and a reasonable output power. The configuration sees all the important controls contained in the top of the radio, this is a useful feature should you wish to insert it into a panel. Another popular unit is the ICOM, this radio has added advantages of frequency scanning and a digital display, but mounting is a little more difficult should you wish to use the display.

One shortcoming usually found with handheld radios in gliders is the inconvenient access to the transmit switch and the location of the microphone and speakers. My answer to this has been to adapt a commercial operator style headset to the radio and incorporate a PTT switch in a convenient location to suit. While this type of unit is usually available as an accessory for most handheld radios they are generally given an "aviation" price, meaning "more than they are really worth".
Lightweight headsets with microphone are now readily available in electronics stores and it is relatively easy to adapt one of these to suit a radio.

The earphone component is quite straightforward and should plug easily into the radio speaker socket using the 3.5-mm phone plug, the only pitfall here may be the presence of a stereo plug in the case of stereo headphones with dual earpieces. There are a number of solutions to this. One is to ignore it and enjoy reception through one ear, the other is to use a mono/stereo adapter and listen to the chatter in pseudo stereo. My preference is to use an operator style headset leaving one ear free to monitor the chirp of the vario and the tortured groans of the wingspar. Failing this the stereo plug can be cut away and a mono plug substituted, both earpieces can then be commoned in the plug.

Some headsets will be found to have a single stereo-type phono plug and this may have to be cut off and individual plugs attached. This will of course require you to identify the common, earphone and microphone legs, relatively simple process using a single pencell and listening for the click from the earpiece.

Next is the microphone. This appears as a smaller 2.5-mm mono socket usually adjacent to the speaker socket. In the case of the" Delcom" and "Icom" the correct microphone type is the electret or capacitor microphone and this is generally typical of the type in most readily available headsets. Both these radios

rely on the continuity of the microphone circuit to activate the transmit mode and it is simply a matter of placing a PTT switch in series with the microphone. Physically, this means re-routing one leg of the microphone lead out through a normally open momentary switch, then back to the plug. Closing the circuit will then activate the transmit mode.

Using a clever arrangement of changeover type momentary switches it is also possible to arrange for dual headsets and transmit buttons in both control columns in the case of a 2 seater. I have used this arrangement with an" Icom" A20 and 2 Yaesu headsets very successfully in a" Bocian" glider.

I find the headset combination far superior to a boom or hand held microphone due to the fact that it is always ready for use and is not a distraction in the cockpit.
Quite obviously and really a topic in its own right, the "rubber ducky "antenna usually supplied with handhelds is not a very effective or convenient form of antenna. However, this is easily substituted for with a BNC connector some RG-58 coaxial cable and a suitable straight wire antenna SWR'ed to the desired spectrum.

AIRCRAFT MATERIALS

Some basic principles

In contrast to a popular misunderstanding, aircraft specification materials are not necessarily stronger than commercial materials. The real difference between the two is the much greater reliance you can place on the aircraft specification materials being consistently of the specified strength as well as specified ductility, chemical composition, purity, brittleness etc.

Thus, when the designer calculate the strengths of a part made of aircraft Spec. Material he knows he can relay exactly upon the first and all subsequent parts being of the appropriate strength, quality and suitability.

This does not mean that commercial metals and metal parts are not made to Specifications. Practically all are, even such things as carpenters nails, corrugate iron or hairpins. Standard Associations in every industrial country are pursuing this aim which results in greater efficiency and economy for both manufacturers of metals and the users.

Nevertheless, the Commercial Specs. Are not nearly as rigid as Aircraft Specs. They aim only to reduce to an acceptable commercial minimum, the likelihood of a bad or defective batch of material being used.

Aircraft Specs. On the other hand are aimed at precluding beyond doubt that every bit of every batch shall be made to specification.

This mean that Aircraft Specifications, especially for metals and hence metal parts, specify and control the manufacturing processes stage by stage right through the cycle almost from rough cast billet to finished sheet, bar or tube. This cost a lot, hence the expense of aircraft specification materials.

To add to the control and make sure Aircraft Specification materials are used in the final aircraft parts, whenever such materials are passed from one organisation to another, e.g. manufacturer-wholesaler-aircraft firm-subcontractor and back, they are accompanied by a certificate guaranteeing that the material is what it suppose to be. This certificate is called a Release Note and must be signed by an approved person who is a member of the approved Inspection Department of the dispatching Company.

There are hundred of Aircraft Specifications for metals. English, American, some Australians, French, German-doubtless Russian etc. They are not so very different one from another. Everybody has much the same aim. They are slowly being standardised internationally. Out of these many hundred, I propose later to only name a few British and American Specifications of metals that are commonly found in gliders in Australia. Before dealing with these I must mention some of the difficulties in expressing the strengths of metals even for a simple type of load like tension. I want to show you that the stress at which a metal breaks is not the only important criteria.

If a rod of metal has a tension load applied to it, and this load is steadily increased, the metal first of all stretches like a spring, extending a little more for each addition of load. It is stretching elastically like rubber and will return to its normal strength if the load is released.

As the tension load applied to the rod increases still further there comes a time when it stretches more for a given increase in load than it would if it were still behaving like rubber. If released now it does not quite come back to size. There is some permanent stretch. The stress in the rod, usually expressed in tons per square inch, at which it just ceases to deform elastically is known as the Elastic Limit. *To be continued.*

WHAT'S NEW?

Dan Armstrong's Win Dancer

(An excerpt from Sailplane Builder - December 2000)

Here is an up date from Dan on the Win Dancer project, which has slowed a bit because of the amount of time Dan has had devote to his work as an aero engineering consultant.

Also Dan is a member of the OSTIV Sailplane Development Panel and shares the panel's concern for safety in the design and flying of sailplanes.

When the prototype is completed and test-flown, he hopes to offer plans and some difficult parts, not a complete kit.
Dan reviewed the factors driving his design (and others now appearing) and set forth the characteristics he is striving for in Win Dancer.

The cost of the machine and its operation must be kept down, operational constraints like aerotowing must be removed, and the number of gliders readily available must be increased in order to attract new people to the sport of soaring.

To help achieve these general aims, Win Dancer is designed to be very light (220 kg. Class DU in International terms) with excellent turning performance, mild handling characteristics,

and the ability to be launched in a variety of ways (from bungee to hang glider pay out winch to aerotow by ultralight or conventional tug).

The fun characteristic he is looking for are shared by other light sailplane designers: in this ship, one should be able to achieve flight more or less on demand and stay up; cross country should be possible, and the aircraft itself must be safe and affordable. He notes "there is only a weak relationship between fun and performance" so high speed and high L/D are not the items called for here.

There are four design requirements for Win Dancer: it must be capable of all forms of tow and simple and easy to build, and it must have an enclosed cockpit and fixed gear. As to aerodynamics requirements, it must meet JAR 22 standards, have a maximum wing loading of 20 kg?m2 (about 4lb/ft2) and a maximum LD 30"1, full camber-changing flaps, and Schempp-Hirth type spoilers for path control.

For assembly, it will feature automatic hookup of all controls and require no tools.

MORE ON THE CARBON DRAGON

Here Bruce Carmichael's report on the Terry and Santee presentation given at one of the Workshop.

Jim Terry, a retired personal aircraft project engineer from the Wichita, Kansas area, gave a fine discussion complete with many drawings on his investigation of combining a small engine with the basic Carbon Dragon design to meet the ultralight power empty weight.

He tried several different vertical wing locations to obtain better pilot visibility compared to the original CD.

He attempted to obtain a large prop diameter and showed a chart of propeller efficiency as a function of prop diameter not often shown in past studies.

Don Santee SHA Historian and long time sailplane builder and flyer, spoke about the problems of getting into and out of the cockpit of a sailplane when one reached the age of wisdom.

His solution was to build a forward fuselage shell back to the pilot's shoulders as a unit and slide the entire shell forward for entry and exit. (Gary Sunderland's MOBA-2 design). He showed the design of rails and rollers to accomplish this.

STOP PRESS!

Jim, the proud father with a new child! The Erudite test fly's the Woody-Roo at Tocumwal on 9th September 2001 under the supervision of Mike Burns...the flight was a complete success. *Read this story in more detail on page 11 of this issue.*

SHOP TALK

TO BE OR NOT TO BE? THAT IS THE QUESTION!

By Alan Bradley

I thought I would take this opportunity to thank you and your group of Woodstock owners/ builders in Melbourne for going out of your way to help me with my decision making process.

My visit to Melbourne was the last port of call on the 3 months winter pilgrimage, which my wife and I try to make each year. I find 3 months a little bit long, as workshop fever seems to set in after about 8 weeks. However 4 weeks of silent suffering is a small price to pay for the acceptance of my few vices by the household "chief executive".

Some 12 months ago, after several years of dithering between various types of ultralights which I thought the "chief executive" needed, I was shocked to find that she really didn't have any interest in any of them – more importantly I realised that there didn't appear to be any strong resistance to me building some sort of aircraft just for me. (I'm not sure whether this means that after 40 years I am getting a few things right, or if I am no longer indispensable). Which ever it is it appears that I have a "green light" to proceed with building an aircraft of some type.

I settled on the Woodstock sailplane with the intention of fitting a motor. I came to this conclusion after discussion with Keith Jarvis and Ted Pascoe (both very experienced home builders and designers of sailplanes in South Australia), and your staunch band of "Australian Homebuilt Sailplanes" enthusiasts in Melbourne Being Malcolm Bennett, Peter Raphael and of course you, our Editor, being the proud owner of a brand new homebuilt ready to fly Woodstock. You gentlemen, together with Mike Burns in Tocumwal, helped me no end in my decision making process.

After many phone calls to each of you I had come to feel that I had known you all for some time but in reality I only had met Keith and Ted during 45 years of association with gliding.

I visited Mike and spent a very pleasant evening discussing mainly a span increase of a meter, winglets and an increased load carrying capacity to cater for an engine and heavier pilot. My Chief Executive Officer and Mike's discovered that they were both keen players of "Phase 10" and this gave us considerably more time for our more important interest.
On to Melbourne where our Editor had booked us into a very well located Caravan Park. If this were not enough he insisted on picking me up at the Van Park and taking me to Malcolms so I could sit in the cockpit of a Woodstock. I had formed the opinion after inspecting construction drawings, that there would be insufficient room for my size 14 shoes in the nose. I was wrong, the cockpit is very roomy. I had the opportunity to sit in the cockpit of not only the finished aircraft of our Editor and the unfinished fuselage of Malcolm but to my surprise, the much flown Woodstock of Peter's who arrived with his in its trailer. All of this took place on an icy cold (10c) Saturday morning with gusting westerly and showers.

Thank you very much to everyone – I trust that my endeavors over the next 3 years or so will reward you for your effort this morning.

There was a payback required – Jimmy asked me for an article for our newsletter to be completed that afternoon

DETE'S RAMBLINGS

By Dete Hasse

Well Jim, here is the promised something for the newsletter. If you don't like any of it just edit it out.

A phone call from our Editor James Garay prompted me to ponder why I won't let go of the hope that one day I will build my own glider.

It forced me to ask if I still want to build the Woodstock.!

I bought plan #713 over a year ago now after being inspired by Peter, Malcolm and James. They kindly let me hang around in Malcolm's workshop, where there was a hive of activity with 2 Woodys and a Duster under construction.

This was a fantastic opportunity to view the innards of the gliders and to ask lots of questions. I felt that I might have slowed progress on the constructions while I was there that day, so I was very grateful for their helpful advice. It was at Mal's that I knew that I was capable of putting the woody together and so bought the plans.

At this point I should explain why I chose the woody!

I did some soaring during my thirties and started as a foundation member of the Bendigo Gliding Club and was their second solo pilot flying the Schneider Kookaburra GZA. After flying a syndicate LS1f for several years I left gliding when the syndicate dissolved amongst other things.

Flying being what it is, I found the opportunity, at age 47, to do a Hang Gliding course ***(was this part of my mid life crisis?).*** I am now well set up with an intermediate glider, Moyes Sonic 165 square feet. I felt at the time that due to my age, that I may not be able to hang glide for very long but I enjoyed it so much that I am still as keen as ever.

What I have learned is that a Hang Glider operates in a very different way to a (comparatively heavy) glass sailplane. It is so responsive to the air in spite of the lesser glide angle, it will climb tighter and faster in thermals. I am also able to comfortably fly in close proximity to a sloping hill of say 400' and stay aloft on the breeze. The ability to use the weaker lift and the nippy handling are unique. The down side is that it is less comfortable particularly in strong thermal conditions. The Woody shares some of the flying attributes of a lightweight machine but with more comfort (for endurance).

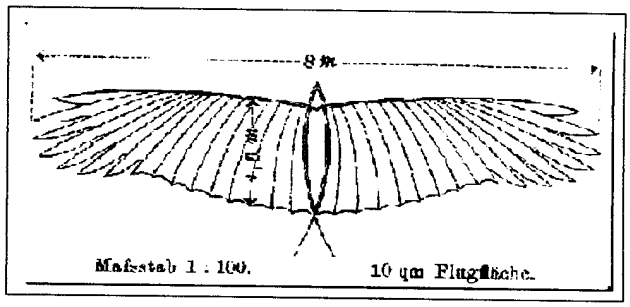
There is no glider other than the Woody I know that fits into this flight envelope except the very lightweights like the carbon dragon, but these don't fit well into Hang Gliding operations being three axis control, nor do they fit into Gliding operations because the tugs are to fast.

So there it is. I will just have to build my Woody so that I can get into the air when I am to old to run down hills and handle 165 square feet of sail and aluminium tube in a 15 knot breeze on an exposed hilltop. It doesn't matter what I fly for now as long as its soaring and is heaps of fun.

LILIENTHAL GLIDERS

By Peter Champness

In a previous newsletter I had wrote book review of "Bird Flight as the basis of Aviation" written by Otto Lilienthal and published in 1889. The book has been republished in 2000 by Markowski Press. My article had included several drawings of the Lilenthal gliders, which could not be published because of shortage of space. The following pictures of the lillienthal gliders were published in the book or were obtained from internet sources listed below.

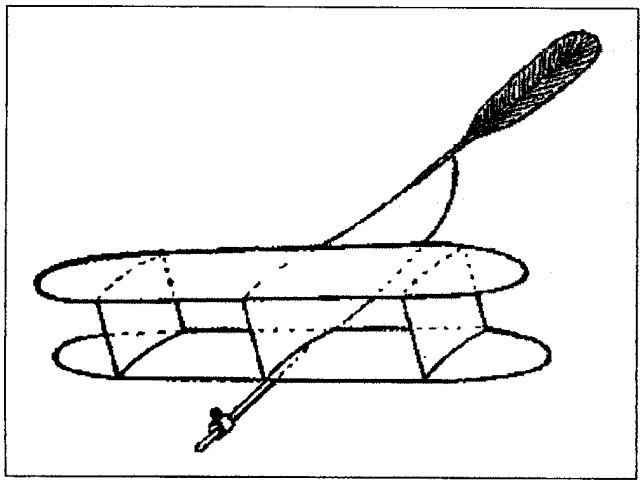


This is one of the earliest Lilienthal gliders. I originally thought that it represented a kite or possibly just a paper design exercise. The span of 8 metres and the area of 10 sq m indicates that it was intended as a man carrying glider. The pinion feathers look very complicated to construct suggesting that this glider may not have been built. However other comments by Otto indicate that he did construct a similar machine. The curved central longerons forming the fuselage are a typical feature of later Lilienthal designs. The glider was tested by running into the wind and by leaps from small platforms. These experiments were conducted at night times or in secluded places as because Otto did not want to be ridiculed by his friends and neighbours. Otto found that the glider was easily upset by wind gusts from the side. As a result his subsequent designs incorporated a tail so that the glider would weathercock toward the wind.

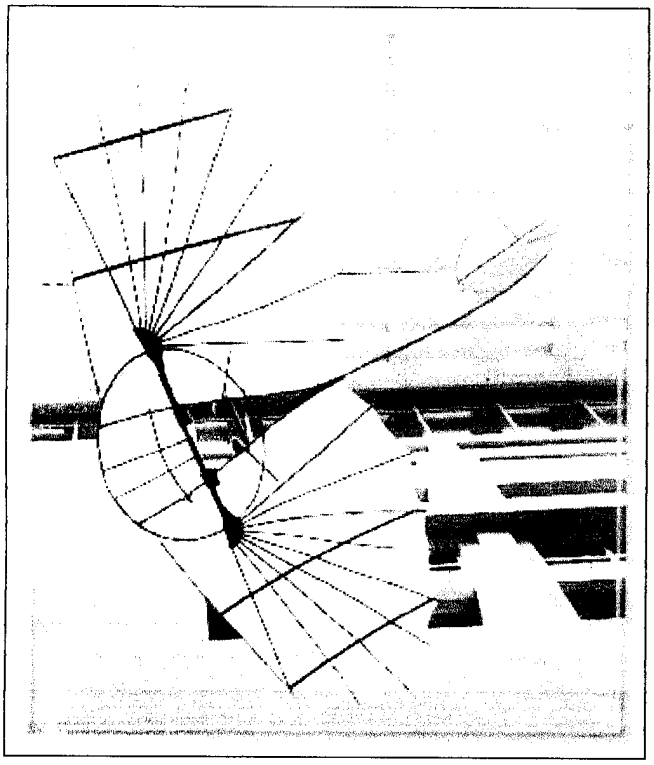
The resemblance to a Stork is quite striking. The Stork was undoubtedly Otto's favourite bird and the inspiration for his flying adventures. Lilienthal raised Storks by taking eggs from Stork nests and hatching the eggs. He did this in order to study the birds early attempts to fly and hence to learn the secrets of bird flight.

STOP PRESS!

Malcolm Bennett did the second flight in the Woody-Roo at Tocumwal 9th September 2001.



A drawing by Lilienthal of a model glider, probably made from cardboard. The idea of curved wing surfaces was clearly established, indicated by the profile of the vertical struts. The feather tail seems to be vertically rather than horizontally orientated. The adjustable balance weight at the nose is quite interesting.

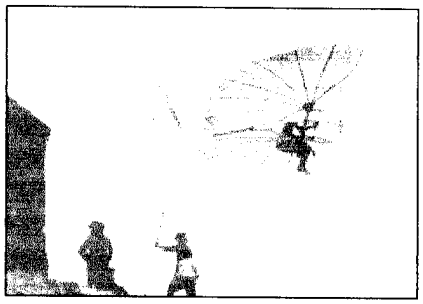


The "Sturm....." or storm wing model was a reduced span version of the "standard glider" designed for strong wind conditions. This is a reconstruction of the original. The central hoop and curved longerons extendind rearward to the tail are recurrent features of the Lilienthal designs as are the spread of thin willow wands supporting the fabric. The system of bracing wires is not obvious in this picture.

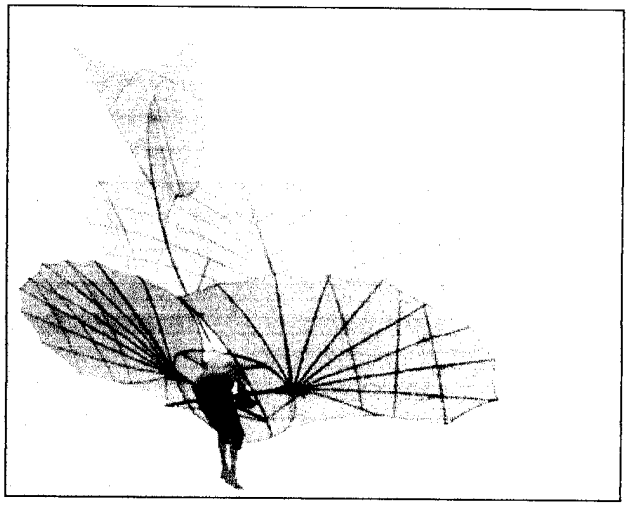
STOP PRESS !

Too windy for Jim to fly his Woody-Roo at Tocumwal on 9th September 2001. He will fly his Woody-Roo at Bacchus Marsh, Victoria.

The so called "normal glider was the world's first production aircraft. At least eight were produced and some were sold, others given away. In this photograph Lilienthal is demonstrating his aircraft to a large crowd. The hill is quite a high one, possibly the ..... at ..... The design is similar to the storm model but the span and wing area are greater and the tail boom appears a to be shorter.



Another view of the "normal glider" near a building. Lilienthal built his own testing hill in the grounds of an old brickworks at. He had a hanger on top in which he kept his glider. It is likely that he has just launched from the roof of the hanger. One of the observers is holding a flag to indicate the wind srength and direction.



The large biplane glider appears very similar to the storm model glider with an extra wing mounted above.

W.W.1 AERO Magazines Review

By Peter Champness

Our illustrious editor and glider manufacturer James Garay lent me a few copies of a magazine, which was new to me, called **W.W.1 AERO**. I have been sitting up for a few nights reading

some of the articles. As I had suspected WW1 stands for World War One so the articles are all about very early aircraft, starting from the beginning up to the about 1918. I did not find any articles about gliders and so I wondered at first if they would be of any interest to homebuilders of gliders. However I then realised that every glider builder was and still is a model aircraft builder and hence is very likely to be interested in such arcane material.

The magazine appears to be published 4 times per year. Each episode is a substantial size with 144 pages not counting the front and back covers. The subject matter is very well researched and authoritative. There are a large number of photographs. Photography was well established by 1914 and I imagine that there must have been many hundreds of thousands of photographs taken during the war. Every new design was undoubtedly extensively photographed. The wonder of it is however that the publishers have been able to accumulate so many of these originals as a very great many of them must have been lost or destroyed by now.

I had thought that I had a reasonable knowledge of early aircraft development. It turns out however that my knowledge is extremely limited. Each episode contained many examples of aircraft I had never heard of before. There seems to have been a very great number of designs. Everyone with an interest in flying seems to have attempted his own design. In many cases the material is supported by quite detailed 3 view drawings and detailed sketches, so there is plenty here for the modeler.

Of course not every reader of **W.W.1 Aero** is an aeromodeller. Some are busy restoring original aircraft from surviving fragments or constructing exact scale replicas (using original engines where possible). The degree to which some people will go to produce an authentic replica is quite amazing.

One article dealt with the development of reproduction lozenge fabric. This was a type of printed fabric used on German aircraft during the first war. A variety of large geometric patterns such as triangles and pentagons were printed on a base colour such as purple. The author intended to build a replica of a Halberstadt CL-IV for which he was able to obtain authentic drawings. He was disappointed however to find that lozenge print fabric is no longer available (although it was made up to 1991!). Consequently he had to produce his own.

The first problem was to find a manufacturer of aircraft linen (made from flax). These days aircraft fabric is nearly all synthetic (ceconite etc). Having found a manufacturer a number of problems then arose. Firstly the fabric was rather finer (72x77 threads per inch) compared with his original sample of 50-60 threads per inch. Secondly the original material was a lighter colour than the new material. The reason for this seemed to be the process of retting (soaking the flax in water for some days separate the fibrous husk used for spinning from the woody core). The modern fabric had a dark grey- tan colour but the original was lighter. This seems to be because the original flax was retted in the river Lys (lys retting), which imparts a paler colour than the modern practice of allowing the flax to lie in the fields for a few weeks exposed to the rain and dew. Retting in the river Lys was banned after the war because it poisoned all the fish. After this there were problems of slubs (variations in yarn thickness), finding accurate print patterns, matching the colors accurately and matching the ink penetration (bleed through to the back side of the fabric). There was also a printing fault called traps (overlapping of two adjacent colours). Naturally, the wartime fabric suffered from all these faults much more than the modern article. The problem was to persuade the manufacturer to make a material with much worse faults than their normal product! Having achieved a very authentic reproduction the author now offers the same material to other enthusiasts.

There were many other articles ranging from pilots reports of flying original machines to biographies of famous, not so famous and infamous people to cockpit layouts and instruments. One author speculated about why the fabric sometimes ripped of the wings of the Nieuport 28 and the Fokker Triplane in flight. Apparently both aircraft were notorious for this but it only ever involved the top wing! If you find this sort of detail about old aircraft fascinating than **W.W.1 Aero** is definitely for you.

A LITTLE BIT OF AUSTRALIAN GLIDING HISTORY

By Allan Ash

Launching by wire (Part 1)

In recent years there has been a return to an interest in wire launching. Two factors have sparked this interest. One is the increasing cost of aero-tow launching. The other is the improvement in winch design and reliability.
For the benefit of pilots who have known little except aero-tow launching I will give a brief survey of the technique of wire launching, both by winch and car-tow. I plan to cover the subject in three segments:

1. The pilot's technique
2. The winch driver's technique
3. Car towing

The main benefits offered by aero towing in the past have been that it could give higher launches than the average wire launch to between 800 and 1000 feet and the de sailplane could be towed around the sky until lift was encountered, often at some distance from the take off point. These benefits were available at a cost about four times that of a wire launch.

Modern developments have made available winches that will consistently give launches to 1500 t0 2000 feet. This provide much more time to search for thermals, especially when combined with the improved performance of modern sailplanes.

In the "good old days" when we flew sailplanes with a glide ratio of 18, a good launch to 1000 feet provided about two minutes of search time which necessarily was confined mostly to within or just outside the airfield.
My recent winch launches have provided start heights of 1400 to 1700 feet and in a sailplane with a glide ratio of 30 or better have allowed searches of five or six minutes over a kilometre or

so radius around the airfield before we were down to circuit height.

Almost invariably, the result was successful soaring flight.

The take off technique for winch launch is different from and more spectacular than an aero tow, which involves little more than following the tug in level flight.

As part of the preflight cockpit check, the pilot should be careful to note the placarded maximum speed for a winch launch. It is vital that this speed should not be exceeded during the launch.

Also the trim lever should be set for nose-down. The degree of the setting will depend on the pilot's weight and the position of the launching hook and will be learned basically for trial an error. This setting is required to provide a rapid nose-down moment in the event of an emergency release or cable-break. It is better to have the lever too far forward than not forward enough.

A good winch launch gets the sailplane off the ground after a run of two to four lengths. In most sailplanes, as flying speed is reached, the sailplane will take off without the need for back stick and will begin gaining height as the nose begins to rise as a result of the leverage from the centre of gravity hook below the fuselage.

This comparatively modest climb rate should be maintained until the aircraft is about 100 feet off the ground, at which time the pilot can ease the sailplane into a steep climb. It has been proved that pulling the sailplane into a steep climb off the ground adds very little to the maximum height of the launch and is not worth the considerable risk of crashery and injury that could easily result.

The climb should not be started by the pilot until he is about 100 feet. This is a safety measure in case the cable breaks or the winch motor stalls or some other emergency arises. It is embarrassing to say the least, to be caught just off the ground with the nose high just as something goes wrong.

With the aircraft safely off the ground it can be eased fairly rapidly into a steep climb. The pilot will feel the strong pull of the wire which should be resisted firmly by the steady back pressure on the stick. The sailplane at this point will be climbing at about 2000 feet a minute at the correct climbing speed and the pilot will be looking almost straight up at the sky.

There are signals (commonly used all over Australia) by which the pilot can, if necessary, signal to the winch driver that the speed is too high or too low, assuming the pilot is not in radio contact with the winch driver.

If the air speed is too high, the pilot should apply full left and right rudder alternately to cause the aircraft's tail to wag, If the speed is too low, the pilot should apply full left and right aileron alternately to cause the wing to rock.

If the speed falls too close to the minimum flying speed, the pilot should not attempt to rock the wings as this could led to a stall. In this instance the pilot should immediately put the nose well down to regain a safe airspeed and then release from the wire. If this happens at too low an altitude, an early landing is inevitable, but that is better than spinning in.

During the launch the pilot should be aware that increasing the back pressure on the stick, that is, raising the nose of the aircraft, will reduce the airspeed by resisting the pull of the wire, while lowering the nose will (for a short time) lower the speed by reducing the pull of the wire.

As height is gained, the pull of the wire gradually changes from straight ahead to almost straight down and the sailplane gradually takes a curved path from a steep climb to level flight at the top of the launch.

When the sailplane stops climbing, often encouraged by the winch driver reducing power, the nose of the sailplane must be momentarily lowered to cause some slack in the wire and the release pulled, at least twice. The immediate result of releasing the cable will be that the aircraft jumps briefly. This is because during the final part of the launch the sailplane has been carrying the extra height momentarily.

The pilot should quickly settle to the aircraft's normal flying speed and attitude and adjust the trim. The sailplane should then be turned away from the runway to clear it for other sailplanes to take off.

It is not a good idea to land on or near the part of the runway where launches are being made, or even beyond that point. For one thing, you will be landing over or close to other aircraft, but more importantly, you run the risk of landing on a wire that has been laid out ready for another launch. This could lead to the wire, or the drogue chute or a shackle, becoming entangled with your aircraft. Better to land at some distance to one side of the launching area.

To be continued.

NEXT ISSUE: Driving the winch

HINTS & TIPS

HINGES FOR THE WOODSTOCK
By Brian Berwick

Have you tried to source the MS35822-4D Cadmium plated mild steel piano hinge specified for the Woody control surfaces? I have checked all reference material available to me to no avail. As a rule, the suffix "D" after the dash number indicates aluminium! The prime number does not appear.

Substitution is the way to go. Aircraft quality piano hinge is generally made from either aluminium with a cad plated steel pin, or, from corrosion resistant steel with a passivated steel pin. Heavier duty hinges can be extruded but these are generally too heavy for glider use.

As I don't like the idea of primary flight controls attached by aluminium hinge, I selected corrosion resistant steel for my Woody. There was a length of MS20257-C4

hanging around my workshop, although it had an open width of 1.5" as against 2.0" on the drawings, it seemed quite adequate for the job and, the price was right.

I put a fine hacksaw blade into the trusty, bench mounted jigsaw and set at the slowest speed, proceeded to cut all the segments. After these were de-burred, I cut the hinge wires OK, we measure twice and cut once. What if you measure the wrong piece of hinge that's laying on your bench?

Now I was in need of a length of passivated wire 0.1195 dia. Although I had a part number, none of the local spares sources could help. In desperation, I typed piano hinge in an Internet search and, bingo! BARRON & RAWSON Pty. Ltd. (www.barronrawson.com.au) of Revesby NSW are manufacturers. They, in turn put me on to their agent in Melbourne. HINGE-FIT Pty. Ltd. 177-179 Grange Rd Fairfield Vic 3078.

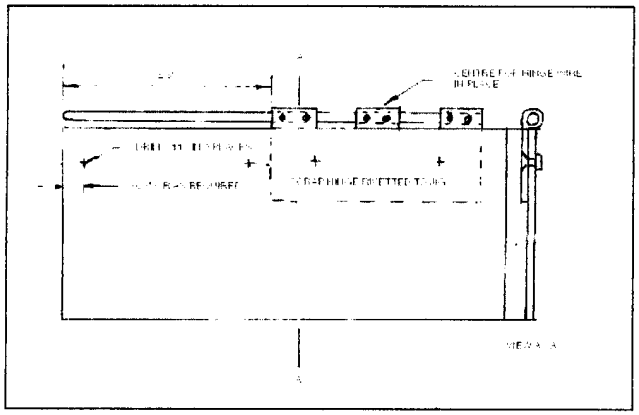
The lady in the store was very helpful and found a length of 2.0" open width stainless hinge with the same characteristics as MS hinge except the pin dia is 0.125' stainless wire .She mentioned that they had supplied the Government Aircraft Factory piano hinge for the Nomad production line.

Back in the workshop all the pieces were cut and de-burred, the hinge wire measured too many times and cut, and the hinges assembled prior to bending the pins.

This step is worthwhile because I was able to clean up a couple of small burrs on the rolled knuckles resulting in a smooth operation.

A drill jig was made that enabled repetition of the attach hole locations, see drawing attached. I have adjusted the pitch centres to allow fitment with channel anchor nuts. Simply slide the half to be drilled onto the extended hinge pin till it abuts the riveted plate and drill on a pedestal press at low speed using a Cobalt drill bit for best results

You may ask, why use anchor nutplates? During a form 2 check on the clubs K7 I needed to remove both aileron horns for repairs, they are only held on by 4 bolts each yeah !..well at least the ply scarfing and fabric work practice was useful.



MALCOLM BENNET'S HINT & TIPS

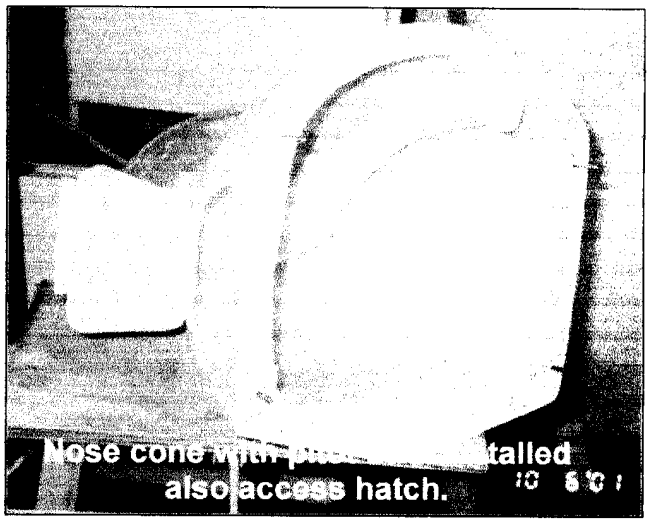
Malcolm shares with us some thoughts on making adjustments and maintenance of your future homebuilt easier with less individual loose pieces when disassembled.

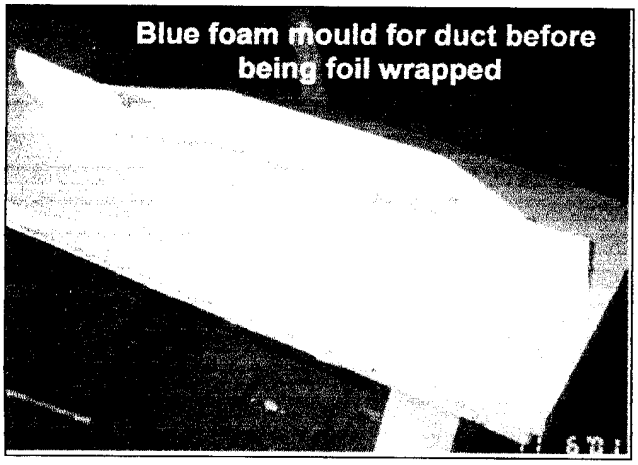
1. *Nosecone Access Panel*
   Access to the pedals of your Woodstock or to the battery if nose mounted can be through an access hatch in the side of the nose cone held shut with 2 Dzus buttons and hinged to the fibreglass of the nose.

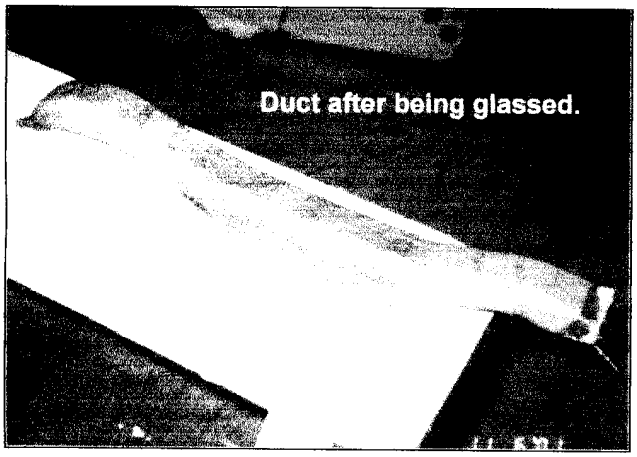
2. Mark out the door on the nose cone fibreglass. Saw with a fine saw along the edges, leaving only a couple of short sections to hold the door panel in place. Apply release agent around the edge of the door panel on the inside and when dry run a fibreglass strip overlapping the cut line such that when you cut the retaining sections the door can be removed leaving a rebated edge. Trim the inside edge of the glass and hinge the door. When you close the door it seals and is flush on the outside. Fit retaining buttons. Easy and quick access, no loose pieces.

Auto hookup of air vent when the nosecone is installed. No pipework to connect. Form pot pilot and duct in one go using foam, cut and sanded to shape. If styrene foam, wrap in aluminium foil bound over with masking tape to keep tight to the shape. Coat in PVA release agent and when dry encase in light glass and polyester resin. When cured, dig the foam, foil and tape out of the molding and bandage in place in the nose cone with a flange on the edge of the panel bulkhead.

Make a duct to go from the front bulkhead to the panel over the dashboard and repeat the process. This means that when you fit the nose cone the duct runs from the pitot to the dashboard with no fiddle loose pipes to connect. You fit a pencil box slide vent on the panel to control the incoming air supply, that is directed up onto the canopy by the shape of the outlet on the end of the duct. Simple and effective- no cables, no butterfly vents, and foolproof when assembling the nose to the aircraft. See the accompanying photographs of my aircraft for additional details.







STOP PRESS!

WOODY-ROO TAKES IT'S FIRST LEAP
By Peter Champness.

James Garay gave me a ring during the week to say that his recently completed Woodstock should be having its first flight on the weekend of September 8-9. The previous weekend had been unsuitable because of bad weather but it was hoped that the forthcoming weekend would be better. So it was that I drove up to Tocumwal on Saturday to see the action. The construction team of James Garay, Peter Raphael (The Erudite) and Malcolm Bennett had driven up the previous afternoon towing the glider in its new trailer. By the time I arrived the glider had been rigged in Mike Burn's hanger at Tocumwal and the initial form two inspection had been carried out. Brian Berwick was performing some sort of minor adjustment in the inner end of the wing with a large file and Tim Berkes was providing moral support and assistance as required. Mike Burns was on hand to oversee the work and give advice and Gloria Burns gave us cups of coffee and chatted about the projects in the Burns' hangar.

The next step was to check the weight and balance. Mike keeps a set of accurate scales which were originally marketed for the weighing of cattle but are just as well suited to weighing aircraft. The Woodstock was set up on the scales, carefully leveled and weighed both with the battery in place and without. The pilots were then weighed wearing the Bennett parachute and the weights were checked with each pilot in the cockpit. The Woody had originally been a bit tail heavy, partly because James had built it with the removable tailplane modification and this delayed the first flight for about six months until the problem was rectified. The tail heavy condition was resolved in a number of ways: such removing some excess of material in the rear bulkheads were not strength was critical the battery was located in the front cone nose, and pilots seat was moved forward a few inches. This time the weight checked out OK to the relief of all.

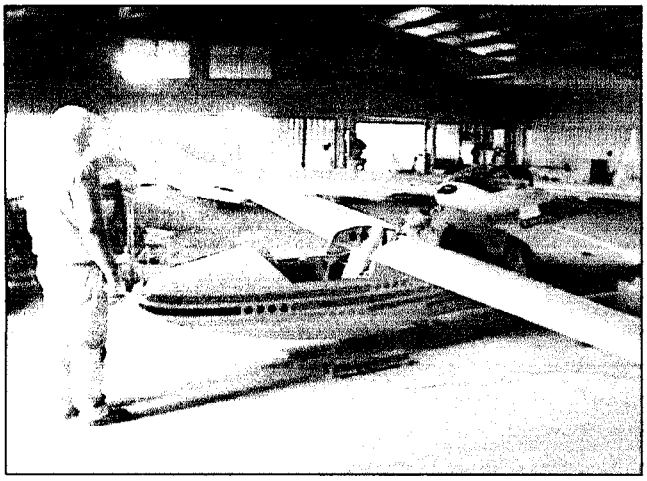
The Woody carries up to 3 ballast blocks on the front bulkhead as well as the battery. Peter Raphael who is fairly light can fly it with one block but chose to fly with two to bring the C of G into the front half of its range for the test flight. Mal Bennett can fly without any ballast but decided to use one block for the same reason. I don't need any ballast but decided not to fly it at all because James has built the glider to suit people with short legs and I am too tall! By this time it was getting on to late afternoon and the weather had deteriorated with very strong winds and heavy showers of rain. It was a pretty cold weekend with snow falls in all the resorts. Hence we retired to the pub for dinner and hoped for better weather the next day. Mike and Gloria Burns came to dinner. Mike recalled that he was the CTOA of the GFA when James had started his project in 1990. His first question to James was "How old are you?" and James replied "I am 60". At this Mike had rolled his eyes and wished James the best of luck! Despite the early pessimism the glider has been completed in about average time for a home built project. 10 Years.

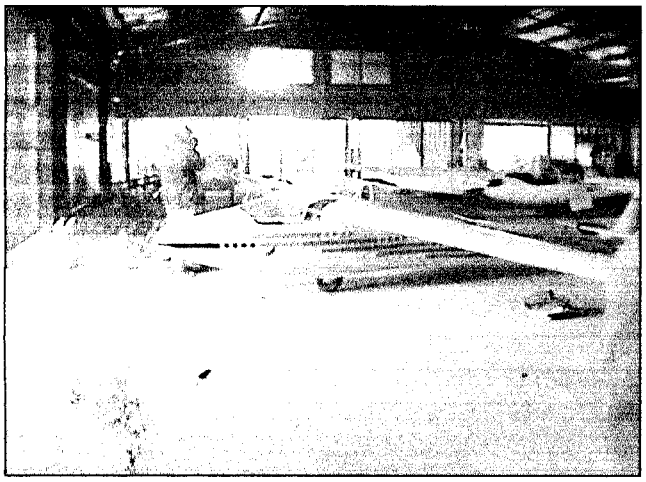
The next day the conditions were a little better but it was still very windy. The glider was towed hopefully to the end of the long runway and a tug aircraft showed up on queue. Peter Raphael (The Erudite) jumped into the cockpit with such little ceremony that I missed the big moment on my movie camera. He was helped to adjust all the straps and then all was ready! I imagine that he might have been a little bit nervous but there was no outward sign of it ("just like any other flight" quipped Mal Bennett). Cool...!

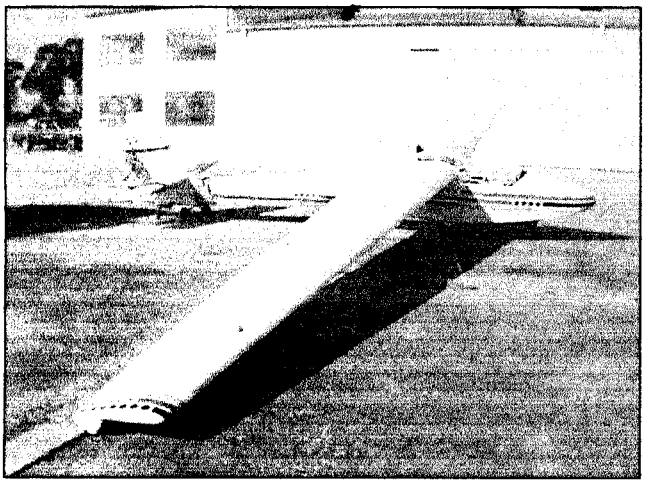
The tug hooked on and drew the rope tight, followed by a few moments pause then the tug engine was opened up and the Woody rose up after a short run and sat steadily at about 10 ft altitude until the tug reached flying speed then both aircraft climbed steadily away to 4000 ft. We were treated to about 25 minutes of distant views as Peter disappeared and reappeared between the clouds. At one stage he found lift on the windward side of a large cloud and was seen soaring back and forth across the face of the cloud. Gradually the Woody came closer and lower and finally swept into the landing circuit keeping a conservative degree of altitude and staying close in because of the strong wind. The Woody descended steeply with spoilers fully opened and touched down smoothly only a few feet beyond the launch point. Peter reported then the glider is very nice to fly and that there was no discernible difference in handling from his own Woodstock. Stall speed is 30 knots which is the same is his aircraft. Mal Bennett then flew the glider putting in 30 minutes and said much the same thing. James...! by this time had a tear in his eye, such was the emotion of the moment as 10 years effort were rewarded with a perfect outcome.

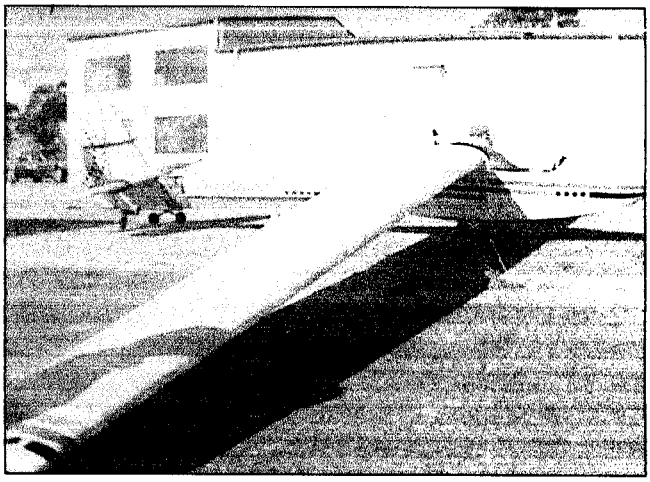
James has decided to christen his aircraft "Woody-Roo" to emphasise its Australian origin. The colour scheme is derived from Aboriginal art with stripes and dots reminiscent of a

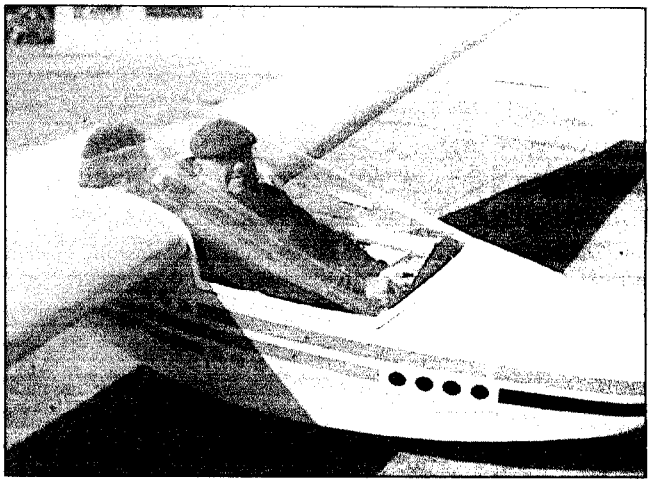
corroboree body painting. The base colour is similar to yellow ochre and the stripes and dots are in orange ,red and black. The effect is very striking and original. The team then returned to the hangar to toast the first flights with champagne and finally to put Woody-Roo back in its trailer. James intends to fly Woody-Roo at Bacchus Marsh. I understand he had hoped to fly it himself this weekend 15-16 September 2001 but has been frustrated again by strong winds. ***"Congratulations James Garay".***

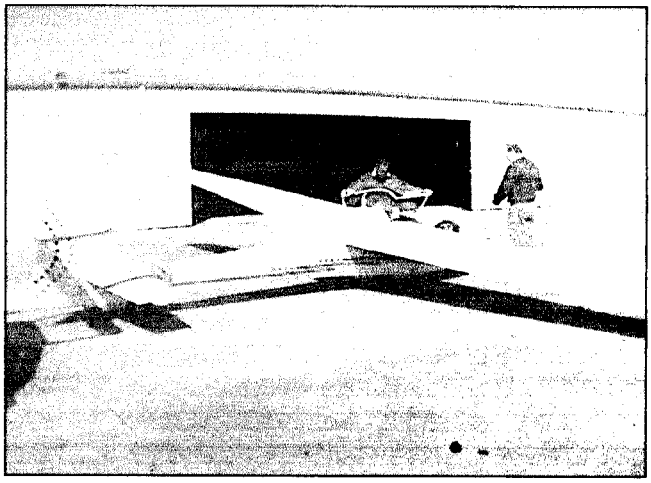


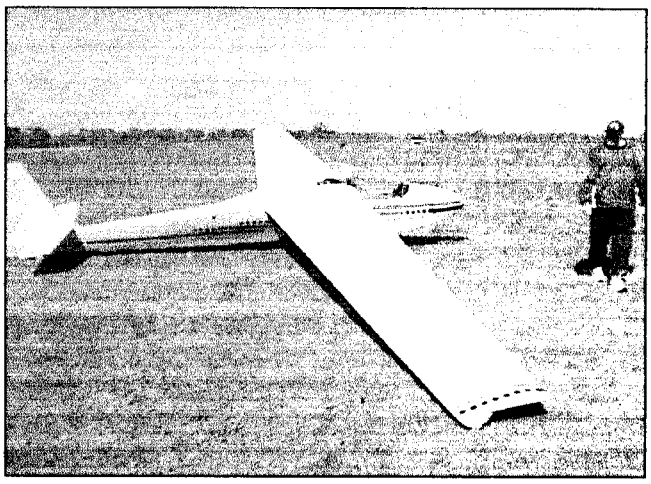












CLASSIFIEDS

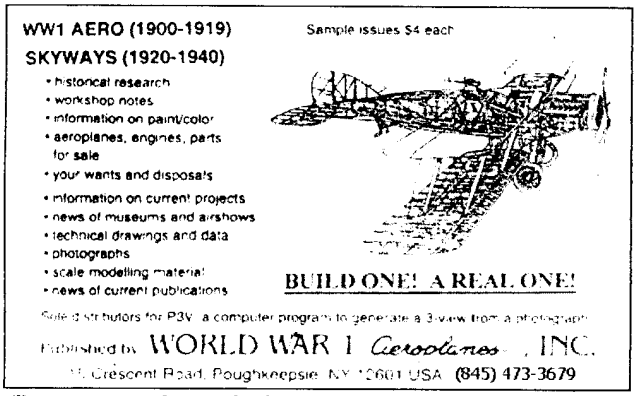
We have a new subscriber to welcome to the group:

- **Peter F. Selinger. Landschreiberstr. 21. D-70619 STUTTGART-Sillenbuch, GERMANY.**
- **Rafael Bieber, 165 George St, Fitzroy. Vic, 3065**
- **Andre Maertens, 1682 South Bruce Hwy. Kybong, Qld, 4570**

WANTED - Study books and/or plans for gliders. Design Building etc. Contact: John Thirwall, P.O.Box 69, Northbridge 2063 Ph. 02 9958 7311 Fax 02 9958 0350

VINTAGE TIMES
Newsletter of the Vintage Glider of Australia. Editor Tighe Patching. 11 Sunnyside Crescent. Wattle Glen. Victoria 3096. Australia. Annual Subscription: AU $ 15

"SAILPLANE BUILDERS "
Official publication of The Sailplane Builders Association U.S.A. Regular Membership (First Class Mail) US$33. All other countries (surface mail) US$ 32. South America & Central Canada (Air Mail) US$40. Europe (Air Mail) US$45. Pacific Rim & Others (Air Mail) US$50. Make cheque payable to Sailplane Homebuilders Association.
Mail To: Dan Armstrong, Sec/Treas.
21100 Angel Street Tehachapi, CA 93561 USA.



(Payment may be made directly in Australian Dollars to: Colin R. Owers. Pudman St .Boorowa. NSW 2586, saving Bank charges)

WANTED - Information on "American Eaglet " home built sailplane. I have purchased one that is 90% complete and I would like to finish it. P.J. Alaban. 33 Gordon St. Port Macquarie 2444 email: famousphil@hotmail.com

WANTED - **"WOODSTOCK"** Set of drawings with an unused construction approval number. ***Contact: Alan Bradley. 14 Darcy Court. Paradise 5075 South Australia. Or Kaven Denham on 08 8395 4001.***

FOR SALE - BG-12 Sailplane Contact E.J. Zoanetti. PO Box 929.Toowong.Qld. 4066.

Dear AHS Subscriber,

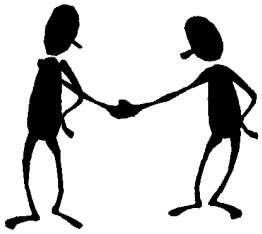
Forgotten something??

Just a friendly reminder that your AHS subscription is now over due and I am just sending you this last letter.

We gratefully appreciate your support in the past and we still need you as a subscriber!

As Editor, on behalf of the AHS, it is very hard for me to ask for your support but the group depends on its subscribers. If you decide not to continue as an AHS subscriber, could you please let me know so that we can adjust our records. The subscription fee for a year is : Australia $20 and $25 Overseas (payable in Australian dollars by International Money Order).

Looking forward to hearing from you soon!



James Garay
Editor

THE AUSTRALIAN HOMEBUILT SAILPLANE

3 Magnolia Avenue, Kings Park, Victoria 3021 AUSTRALIA

SUBSCRIPTION FORM

Are you a member of a Gliding Club *Yes* *No* *If Yes, which Club* _____

I, _____ Signed _____ Date _____

(Address) _____

Wish to subscribe / not subscribe to the A.H.S. for one year. (If you do not wish to re-subscribe, could you still please forward this form to the above address so we can adjust our records).

If subscribing, please forward this form plus subscription fee to the above address.

The SUBSCRIPTION FEE FOR THIS YEAR IS $20 (Australian) and $25 (Overseas). Please note: Only Australian currency can be accepted.

Thank you for your assistance in keeping our records up to date.

Please Note: This is your final newsletter unless you subscribe.
