COMPLIMENTARY

THE AUSTRALIAN HOMEBUILT SAILPLANE

Editors: James Garay / Peter Champness

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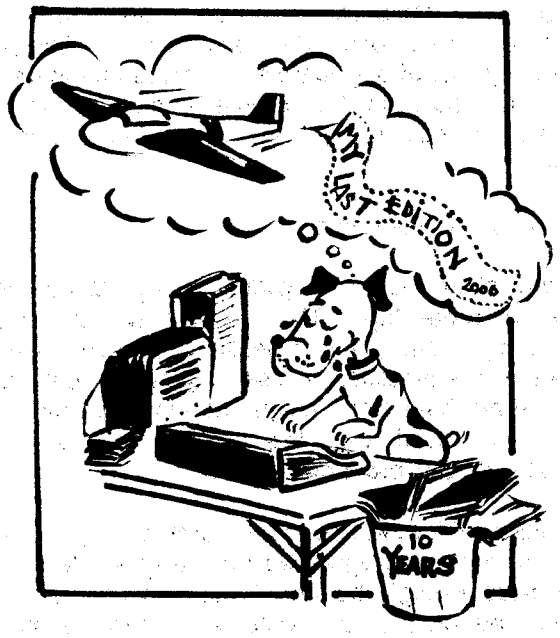
Editorial.



And with sadness!. After ten years as Editor.
I have to tell you!
This is my last issue.

G'DAY MATE!

Well !, here I am again trying to tell you that this month, March 2006, marks my tenth year as Editor of the "Australian Homebuilt Sailplane" newsletter.

To remark this event I have asked Peter Raphael (our own Erudite) to write about this particular moment which has bad news. Read inside what is all about.

With sadness I am telling you that due to family problems I am not longer able to continue as Editor and I am closing down the publication. It is your last issue for the year 2005-2006 of the AHS Newsletter.

To all the problems that I have it has been very notable the lack of interest from the members to contribute with articles for the Newsletter and for a long time I have been struggling and begging for contributions to complete each issue.

I take this opportunity to thanks every body that has been helping me to complete the task. I can not mention their names. They all know who they are!

Also I extend my sincere thanks to the publications with which we have been associated for a long time; such "World War 1 Aero", "Pacific Flyer", "Free Flight Quarterly", "Aviation and General Engineering", "Australian Gliding Museum", "Vintage Gliders of Australia" and our cousins "Sailplane Builder" Official Publication of the Experimental Soaring Association of America.

A very special and sincere thanks have to go to Peter Champness who has been helping me with the last issues

And as the famous Erudite said!... While all this may sound ominous and final, I sincerely hope that the spirit of the movement will continue in the absence of a formal publication. A lot of good work has been done so far. There must always be hope that we can pick up where we have left off, some time in the future.

James Garay. Editor.

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Inside This Issue

TEN YEARS AS "AHS" N EWSLETTER EDITOR.

As we have now reached a significant milestone for our humble organisation James has asked that I write a little about the last 10 years of the homebuilder movement..

It was back in October 1994 that Mark Stanley published the first edition of the newsletter of the Homebuilt Sailplane Association and with little more than a second hand typewriter and the kind considerations of the Waikerie Gliding Clubs photocopier a modest circulation to ten members was established.

Mark had long harbored a desire to build a Woodstock and had acquired an established project. I can recall many long phone conversations that we had dealing with all aspects of building and flying the Woodstock and it was Marks vision that the Glider Homebuilding Community could share information exchanges such as this.

Mark continued to produce the quarterly newsletter and in June 1995 he announced that we would be conducting our first regatta. This was held at Ararat over the Christmas period in conjunction with the Vintage Gliding Associations annual event and this has established a symbiotic relationship that continues to this day. In fact, it would appear that most of our participants might now qualify in both categories! I find it particularly gratifying as I have attended the various venues each year, to meet those members of our group who make an effort to visit the regattas and make themselves known.

Mark managed to develop and improve the newsletter and membership until the February 1995 edition when events conspired to distract him.

In a letter Mark wrote to me he said, " ...something I have been waiting for has finally come to the party- and yes-she's female...", this being a dilemma that most of us can relate to and I guess he could be forgiven for shifting his allegiance at this time. It was at this time that Mark appealed to the Homebuilding community for a replacement editor and as luck would have it, James Garay stepped up to bat.

James had entered the movement as the owner of a partially completed Woodstock and was able to avail himself of the pool of knowledge that now existed within the group. He moved the now newly named "Australian Homebuilt Sailplane Association" to a new level and with the introduction of the use of a computer he enhanced greatly the production of the newsletter, aided in no small part by his immediate family. Over the ensuing years Jim has been responsible for the introduction of the Homebuilder Website and a number of events designed to bring homebuilders together and strengthen our profile within the gliding movement. Expansion of the membership was a main aim of James and by reciprocal arrangements with aviation magazines both in Australia and overseas he succeeded in broadening membership internationally. His efforts also saw a number of our own articles published in commercial magazines. A final name change to "The Australian Homebuilt Sailplane" was effected in September 2000 due to legalities involved with being called an association.

Aside from the ongoing involvement in the Annual Vintage Regattas Jim has been instrumental in enlisting the support of some of Australia's notable gliding identities in sharing their skills and knowledge by way of a number of symposiums and workshops we have run over ensuing years. These have been well received by the membership and have assisted in raising the knowledge and skill levels of our members. I think it would be fair to say that the level of support and communication would not exist as it is today were it not for the contributions and support that the membership have provided for the magazine and its editor.

Other notable achievements over this time would have to include the completion of a number of homebuilts. These include Graham Betts's "Carbon Dragon", Paul Johnsons' Windrose, Peter Raphael & M.Bennett's "The Duster" and James Garay's "Woodstock" along with the current progression of several other Woodstocks and a Monerai in the pipeline. By way of our humble magazine members have been able to share in the progress and triumph and tribulations of the builders and learn that these dreams can be realised.

And what does the future hold?

We, as are other facets of gliding today, faced with a **declining membership**. The availability of suitable homebuilt designs and plans is declining and very few new projects are in the pipeline. Those projects currently being worked upon are based on designs no longer commercially available. So faced with this gloomy prospect **what direction should our movement take?**

Looking back on the evolution of our humble magazine I see a publication that has progressed from a typewriter written, cut and pasted lovingly handmade document into a slick information filled tome, all the while catering to the interests of its members. Much care and time has been spent gathering information, printing, proofing, publishing and mailing the final product, not to mention the administration of subscriptions. However, after ten (I0) successful years in this role I understand our long suffering Editor is having a very difficult time with family problems.

A small publication such as ours is very dependent upon its readership for contributions and you may reflect that when you are not reading content that interests you then may be a good time to think about this situation. Our Editor James Garay has been deeply thinking to solve the problem (lack of interest) and with sadness after ten years he has decided to close down the publication of the AHS Newsletter.

While this may sound ominous and final, I sincerely hope that the spirit of the movement will continue in the absence of a formal publication. A lot of good work has been done so far. There must always be hope that we can pick up where we have left off, some time in the future.

Peter Raphael.

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MAIL BOX

Dear James.
I read with great interest your September 05 issue, and was especially struck with your fine review of our Journals and your printing of our ad towards the end. I am sure there are things which will be of interest to your people and our people!

Minor point: in the review, Dr. P. Champness said our subscription rate was $47 overseas, which it is, but the $30 extra is for optional airmail postage, not surface postage. That would make it a very expensive journal!
Congratulations, and thanks again. Very best wishes.
Leonard E. Opdycke. Publisher
WORLD WAR 1 Aeroplanes.INC.

Dear James.

Enclosed is a copy of the article that I wrote for Australian Gliding. I am not sure if you published it also in the AHS Newsletter.

I have edited out the incorrect statement that Geoff Richardson made his own glue for the Golden Eagle.

He did that for his previous glider and by the time he started the Eagle Casein was being produced commercially!

Keep the good work on the newsletter which along with Vintage Times are now being sought after by pilots in preference to Soaring Australia and also by overseas readers.
Regards! Claude Alan Patching.

Dear James.

Please note my change of address as detailed below.
Also, I'd like to thank you for an excellent publication and also to all those who contribute and make it such a interesting reading.
Regards! Martin Hibbert. 2 Wattlebird Drive. Higbury. S.A.2005.

Dear James.
Congratulations for your last edition of our Newsletter, it is full of very interesting articles.
Thanks for the notice of offer for sale the plans of the Woodstock, maybe Francis Humblet will be interested.
I have been in contact with the owner of the unfinished glider, the one you have given me the phone number, he said he will contact me but I have not be in touch since.
I take the opportunity to wish you a prosperous New Year 2006.

I have been in contact with Al Gerber when you gave me the information about the SKYLARK available for free to a good home.

I went to see the glider, and I saw it in a good trailer. It has the front and tail damaged been the result of a ground loop. It can be repaired.

But as I have not knowledge to make repairs, I contacted Andre Maertens at Gympie to see if he would be interested. He said yes! Now the glider is in his possession ready to be repaired.

Regards. R Jollin. QLD.

SHOP TALK

VALE LES SQUIRES.

Taken from Aus.Soaring Newsgroup.

Got a call from Brad Edwards last night (Mon) reporting that Les Squires died on Sunday, evidently had a heart Attack during a swim near Coff Harbour.

Les was written up in Allan Ash's book "Gliding in Australia". In the early days he worked for De Havilland at Bankstown as a toolmaker, his boss being Mev Wahorn. Les was almost permanently on Mev Waghorn "Foreign orders" building several gliders and many repairs as gliders were damaged-all wooden. He also built his own Grunau Baby which he sold to the Hinkler Club in 1949.

At early retirement Les moved to Coff Harbour where he built a WOODSTOCK homebuilt. Later followed a J-3 ultralight then a Jodel Sky Princess VH-ACK complete with mylar seals and negative flap. He flew this at Bruce Taylor's property and would let anyone young or old fly it.

Well into his seventies he got his Private License and then flew the Jodel around Australia several times. Through this period he refabriced Keepoits Pawnee as well as a Bergfalke and SF 26 glider (building a Bergfalke skid was a 48 hour job for Les) and was made a life member of Keepit Club. He sold the Jodel about 6 years ago and then went on to built a working model steam train.

About 2 years ago he got macular degeneration of the eyes which meant he could no longer use his milling machine and lathe. A treatment for same was introduced in USA last year and is soon release in Australia and only a month ago I was talking to an eye specialist friend with the view of help for Les.

He helped many homebuilders like Geoff Sim and Bob Charlton with their Lancairs and would think nothing of building a new fin for an glider so long as I got the plans from Germany and the wood. Another specialty was making main pins etc., for many gliders. When Les did the job they were difficult to rig the first times but never ever did play or slop develop- the job was done once and was done right and I think all present remember his method.

Les was brilliant with using his hands and tools as well as wood working, and could probably claim to have done more ply splices in aircraft than anybody else in Australia with the exception of probably Harry Schneider. Only yesterday I was working with Todd Clark in King Island Airlines workshop in Melbourne and the name of Les Squire came up about his wonderful skills.

It now reminds me that when Todd was in his early 20's and airline job hunting he gave him the Jodel to fly to Melbourne in- Todd could fly that's all that counts for Les,

Other exploits were sailing a boat he built to USA and then working there for years without a green card till he got sent back to Australia by US immigration.

I gather Les has not been to a doctor for years so the funeral is delayed till Thursday week 9March 2). I think Les was 83.

I do know Brad and I shared a birthday with "Old Les". Les only had a sister as family and was never married. A few people suggested I write this and you are welcome to add to it if you know more of things I have forgotten.

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THE FIRST 60 YEAR INSPECTION OF THE GOLDEN EAGLE.

By Claude Alan Patching.

Owning the oldest glider in Australia makes life interesting at times, and can keep a person out of mischief for a long time.

In September 1937 a young Geoff Richardson took his own designed and built GOLDEN EAGLE for the test flight at Laverton, Victoria. As he expected it was OK and so started real soaring flight in this country, The subsequent flying history has already been reported in this newsletter.

In 1995 it was obvious that the 25 year old fabric would not pass the finger test at the next annual so the decision was made to do the 60 yearly inspection.

Fortunately Geoff is still very interested as to how his workmanship is standing up to the rigours of time. All I can say is that it is great help to have the designer and builder available when doing such an inspection. His detailed knowledge saved the cutting of a number of holes and various tricks of the trade saved a lot of time with the repairs and the recovering. I also had the help of Jim Fullarton, the well known modeller and the person who started me in gliding with the building of the HERON Primary Glider in 1943. The HERON is now on display in Morabbin Aircraft museum.

The following is a summary of what we found and did during the inspection and refurbishment, culminating in the GOLDEN EAGLE being awarded the trophy for the best restoration at the 1998 Vintage Rally at Gawler.

STRENGTH OF THE CASEIN GLUE.

The standard finger nail test on rib gussets indicated that all was fine, but for this important question I wanted to see if the glue was still stronger than the wood. To my surprise, I found that the block for one aileron hinge was not there, and for 60 years the bolt had been squeezing the shear webs of the boxed aileron spar together!!! The block was two inches away and someone had placed larger washers under the nuts during a recover to alleviate the problem. This gave us the very opportunity to carve open the structure.

THE GLUE STILL STRONGER THAN THE WOOD.

Some of the plywood used on the wing leading edge would not pass the chisel test in 1967, but on contacting the CSIRO Division of Forest Products I learn that a Casein spreader had been used with the synthetic glue resulting in not enough glue, and even when new the plywood was stronger. This plywood was used to cover the original wooden struts and I still have one to periodically check the state of the plywood. So far I cannot detect any change
WATER DAMAGE.

Unlike most fabric covered structures there are no drain holes in either the wings or empennage, since Geoff does not believe they are required! Also the construction of the trailing edges makes their insertion a very hard task, and their effectiviness doubtful. The plywood covered fuselage does have drain holes at strategic locations. Some water damage was found after removal of the fabric at the following locations.

Leading edge of the Port Elevator on the lower surface near tip, and junction of inboard rib and spar.
-Port wing-trailing edge gussets buckled and were replaced at 7 places.
-Lower skin to root rib forward of main spar.
-Lower skin to rear spar at tip in two places.
Starboard wing-Plywood strip attachment to rear (aileron spar) one lower surface and three upper surface.
Note. These were as a result of insufficient pressure during manufacture as only one brad had been used instead of at least two.
Ailerons. A total of six small glue separations were found some due to water and some initial low pressure.

MINOR REPAIRS.

Wing. There was a fracture in the top chord of a rib at the forward end of a repair.
A gusset was missing (never fitted) from a rib and the diagonal was loose.
Rudder. Leading edge skin unglued from spar at a repair.
Lower trailing edge warped and was rebuilt by Geoff.
Ailerons trailing edges. Over the years these had became warped probably from the trailer fittings, and these were straightened by clamping steel straight edges to them for some weeks.

Wing trailing edges displayed some bowing from the fabric tension, and this was reduced by judicious planing.
Fuselage. Apart from replacement of the main skin there were no repair actions required.
All repairs were done using System Three POX-E-GLUE.

CORROSION.

This was almost a non-event since Geoff had painted all the fittings and bolts with black enamel, which he then baked in his mother's oven. The main spar strut fittings had not been removed for 60 years, and both the fitting and the bolts could have gone back again for another 60 years. They were cleaned and painted with Epoxy primer along with al other fittings and bolts. All bolts had been purchased from Mc Ewans hardware where Geoff worked.

The only bolts replaced were the cad plated bolts fitted during the spoiler modification. The life of such bolts in wood appears to be about 20 years. A coating of spar varnish certainly helps prevent corrosion. Current cad plating has been passivated and should last for many years.

The wing root end fittings had been removed along with the fuselage fittings during the 50 year inspection, and so were left untouched for this inspection.

COVERING AND INSPECTION.

The wings, rudder and empennage were completely stripped of the cotton fabric and well sanded before covering with poly-fiber fabric and paint scheme.

Although I obtained plenty of advice from others who had done a recover, and considerable assistance from Dave Darbyshire, all I can say is that it is not easy as cotton and doping.

I spent some time at OSHKOSH in 1997 talking with the Poly-Fiber people and Jack Randolph, and have formed some firm opinions about the synthetic finished. I am no expert but offer the following suggestions as result of my experiences.

Firstly, it is essential to paint all old woodwork that has seen any paint or dope with an epoxy primer to seal the surface, since the dope reacts with the new adhesive and prevents proper gluing of the fabric.

There have been a lot of articles about this since the Steve Wittman accident. The fact is that the synthetic fabric bond is not as strong as the dope cotton. In the USA all ribs are stitched including top surface and rudder. In gliding we seem to manage with only stitching cambered lower surfaces, but even then the fabric jumps off between the stitches quite often.

Before applying any fabric spend some time filling any hollows or depressions, since the fabric is very stiff and does not follow an irregular surface easily. I used Polyfilla wood filler, which was easy to apply and sand.

Despite washing over the floor each day before painting there are signs of dust on the finish, at least I can see them.

All the safety instructions must be followed since all the materials are toxic and can be absorbed through the skin. It is too late to find out that you are allergic to something after being exposed. Talk to someone who had reaction and look at their hands. I used barrier cream, overalls, hood, mask and gloves, with plenty of ventilation- with success I hope.

Working in a garage meant that there were many days we could not glue or spray because the temperature was not high enough, which made the job take more time.

The fuselage was given a light rub down and brush painted with enamel. The old trick of having the paint in a can of hot water has meant the brush marks are hard to see, many people think it has been sprayed:.

Thew colour scheme of white wings and empennage with trainer yellow fuselage has been retained. It was interesting to find traces of the previous colour schemes. There had been two shades of white, some Dayglo on the wing tips and rudder, grey, two shades of blue, and a bright striping used at various times.

After finishing the glider components were weighed and compared with Geoff's original figures which he had managed to find. All figures are given in Pounds-you can do your own conversions.

WEIGHTS. /Pounds.	As built	Actually
Starboard Wing	86	95.7
Port Wing	86	89.7
Tailplane	20	18
Rudder	5	4.8
Wing Struts	24.8	24.4
Fuselage	160	201
Total Empty	378.8	429.4

Since the original construction there have been a number of modifications some adding weight and one reduction. This from removing the tailplane struts. The fuselage was modified forward of the main bulkhead and the canopy fitted, while the wings had spoilers and diagonal spars added, and one wing has some repairs which involved a weight increase. Comparing a weighing in 1988 the recover and repaint resulted in a decrease of 12 pounds.

The job took two years to complete but the finished product was worth all the effort. Since the test flight last September the GOLDEN EAGLE has made 17 flights and of these 7 pilots flew it for the first time. All commented as to how pleasant it was to fly, especially the aileron and elevator effectiveness.
The glider has now made a total of 4427 flights for 954 hours, and looks all set to fly another 69 years.

SMILE.

By members demand. If you do not like it, please skip it!.

Friendship Between Women:
A woman didn't come home one night. The next day she told her husband that she had slept over at a friend's house. The man called his wife's 10 best friends. None of them knew about it.

Friendship Between Men:
A man didn't come home one night. The next day he told his wife that he had slept over at a friend's house. The woman called her husband's 10 best friends. Eight of them confirmed that he had slept over, and two claimed that he was still there.

MAN'S BEST FRIEND.

Steve took his dog for a walk down the local pub on Saturday night. He was having a quiet drink when the footy result came up on the television set. Steve's team had won and the dog started running in circles and yelping with delight.
"What does he do when your team loses?", asked the barman.
"Somersaults", said Steve.
"How many?" asked the barman.
"Depend on how far I kick him."

A VERY INTELLIGENT DOG.

All the regulars were sitting around the fire in the country pub when Roy walked in with his mangy dog Ralph. Roy bragged to all and sundry that Ralph was a very intelligent dog.
"Never gets it wrong", he said. "Reacts instantly".
All the farmers and drovers in the bar were sceptical.
"I 'm not just talking about simple commands like 'sit', 'stay' and 'heel'' said Roy I am talking about six word sentences and instant obedience".
So a bet was laid- $100 to prove that Ralph wasn't capable of passing such a test. Roy matched it, picked up Ralph and threw him on the blazing fire and yelled, "Ralph! Get off that bloody fire!"

I WILL FOLLOW MY DREAM.

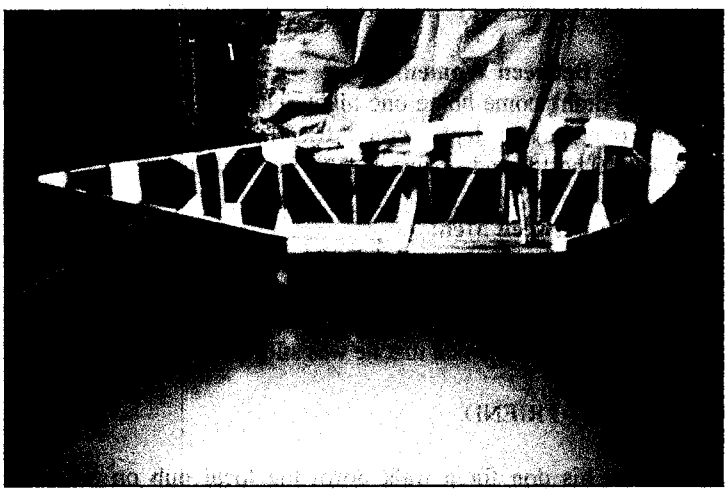
By John Biggs

To Jimmy Garay and Peter Champness and all the AHS gang,

Happy New Year!
You are both doing a great job with our Newsletter - greatly appreciated by this old geriatric.

This is the fourth e mail that I have ever sent, so here goes nothing. I hope you had a ' soaring ' time at the Bordertown Vintage Glider Rally with Woody Roo and all the other folks. I could not make it - we had a family reunion in Canberra at Little Johnnies' week-ender.

First off, can I say that I really enjoyed reading, several times, the Micro Lift article in the Sept.2005 newsletter by Gary Osoba in his Carbon Dragon. It has really encouraged me to press on with the design and hopefully one day, the building and flying of my little Blowfly. It will never be a Carbon Dragon though! I have made a test wing rib of RAF 48 aerofoil - 36 inch chord, made from 4.5 mm thick marine ply sticks 3/8 inch wide and 1.0 mm Birch a/c ply gussets, which Jimmy supplied, stuck with Araldite epoxy and no nails or staples. The gussets are held in place with masking tape and pressure is applied with a piece of 1 inch thick chipboard with plastic sheet over the rib and 3 bricks on top - very technical !



Rib clamped to Garage floor.

I then proof loaded the rib by clamping it upside down to the garage floor (see photos) and then I stood on it. I recorded the weight I was able to exert on it with one foot, 161 lbs on a 18 x 6 inch board, the other foot being in mid air with me holding onto a little stepladder. This equates to 214 lbs/ sq. ft - Blowfly wing loading is 5.25 lbs/sq.ft and it DID NOT BREAK

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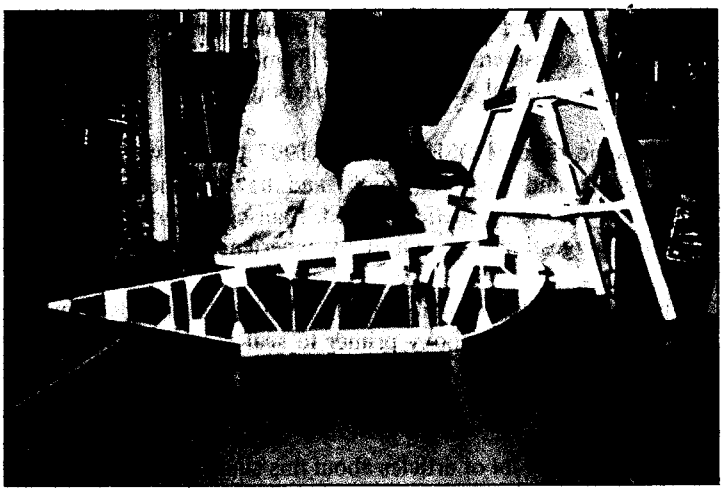
Yes! With sadness I have to tell you, This is my last issue as Editor.



Applying the load.

So I intend to press on with Blowfly and make all the ribs anyway. My sums show me that all the wing rib and tail feathers rib sticks will come out of one 2400x 1200 of hoop pine marine ply and all the finished ribs will weigh 18 lbs total. For the past 12 months, I have had 3 pieces hoop pine marine ply hanging on the back fence in the consistent Melbourne weather- stinking hot one day , freezing the next! One was untreated, one was painted with clear polyurethane and the other with Araldite. None of them now look very waterproof- even the Araldite started peeling off. I like the idea of painting a ply covered fuselage with colored epoxy and no fabric - it would save a fair bit of weight. 'Bote-Cote' marine epoxy and polyurethane finishes look promising. It should be ok, as my Blowfly will not be left outside for 12 months - it and me will be in the doghouse a fair bit of the time anyway!

One flat foot applying the load.

Second kite off, I would love to see a Monnett" Moni", the little U.S. all metal powered sailplane. Anyone know of any here in OZ ? Please give me a call on 03- 9398=3537 or ozziebloggs1@ bigpond.com.au if you can help me - thanks a million.

Third and tail end Charlie, I liked the photos and write-up by Peter Champness on his visit to Brisbane Airport. As a highly paid volunteer at the RAAF Museum down at Pt.Cook, I thought I would find out just how many Aussie airmen were lost during WW2, as Peter queried the number lost by 460 Sqn. on the bronze plaque. 460 Sqn. was formed in Nov. 1941 and operated Wellington, Halifax and Lancaster bombers as part of RAF Bomber Command lost 188 aircraft and 986 men. The Aussies in Europe lost a total of 5504 killed and the total RAAF airmen lost was 10754 all over the globe. Let's hope we do not have another

big one - I would be too old for Dads Army anyway! (The numbers quoted came from RAAF Printing and Publications 1946.) I hope these little bits and pieces help with our Newsletter. Not too bad for a touch typist- one finger!

A LITTLE BIT OF GLIDING IN AUSTRALIA.

By Allan Ash.

The West Australian Flying Club.

The various clubs which sprang into existence in and around Perth during 1930-32 had just about fizzled out by early 1933 but the keen members among them sought to revive the interest by an amalgamation of interests and equipment. By early winter 1933 a new club came into existence under the name of the West Australian Flying Club. It acquired two extremely heavy primary gliders which were known as PG-1 and PG-2.

They had been built from plans published in an American book called *How to build 40 gliders*

The new club took a lease on 84 acres of sand hills at City Beach, cleared it of undergrowth and built a hangar. Among the leaders of the club was Arthur Farmer. Under his guidance the club carried out regular flying in the two primaries by bungy launch. Other members included Jack Dalton, Alf Cole, Eric Lane and Cleve Gandy.

One afternoon, the group flying on the sand hills was joined by a young man named Cyril Flood, who worked for an aircraft firm at Maylands aerodrome. As he was employed by an aircraft company, the club members assumed that Flood was an experienced pilot, so they offered him a flight in one of the gliders. Flood accepted and was catapulted from the top of the hill. The glider zoomed up, dropped a wing and crashed back onto the sand. Flood the revealed that this had been his first flight as a pilot. Later, Flood joined the club and became a good pilot.
The two gliders gave good service until PG-1 was crashed about 1935. To replace it the club chose a nacelled primary design called SG-1 from their book of plans and began building it.

Though the original design may have been reasonable, the effort of the unskilled club members turned it into an overweight brick. Whenever anyone had doubts about the strength of a part under construction, the part was made heavier. The result was something almost too heavy to fly. Almost, but not quite. Somehow the proud members towed it into the air to perform short straight flights of several seconds duration.

In addition to City Beach, the club flew occasionally from Subiaco aerodrome, above five or six miles from Perth. On this rough and gravel covered aerodrome the members flew their gliders from bungy launches.

BORDERTOWN REGATTA,

By Peter Raphael.

Once again the homebuilders made their annual pilgrimage to the gathering of Vintage Gliders held in Bordertown during the Christmas break. This year the group assembled there again to, once again, enjoy the same hospitality we had received the previous year. For a small club, the members do enjoy excellent facilities and surroundings.
This year, due to other commitments, Malcolm Bennett and I chose to travel later in the week and arrived on the Wednesday having first traveled to Bendigo the day before to disassemble and box the Duster. As we would only be there for a few days we felt that one glider would satisfy our needs and so decided to travel together. Knowing beforehand the facilities available meant we needed to bring a minimum of resources to ensure our comfort and as the catering was of an excellent standard we decided only to look after our breakfasts and lunches. With 300km to cover we arrived at lunchtime on Wednesday and spent most of the afternoon catching up with all the old familiar faces that regularly appear at these regattas.

As we had traveled light we were able to set up our small tents on the sheltered grassy area at the rear of the clubhouse in the company of Leigh Bunting. Leigh was there once again campaigning his magnificent Grunau Baby. And now teetering on the edge of the homebuilder movement was Caleb White, proud owner of VH-IZZ the EP2 Super Goose, an Australian designed, homebuilt vintage sailplane.

Peter Champness had attended with his Foka 5 for the first weekend of the regatta so unfortunately our paths did not cross this time. Apparently, Peter's visit was not without some trials and tribulations that resulted in a lesson in canopy repair administered by Emilis Prelgauskas.

The conditions over the few days we flew were relatively consistent, being blue and topping out around 4-5000ft and over the period of the camp some 280 launches were undertaken and . The Duster achieved several flights of over 2 hours but the fickleness of the conditions at times discouraged us from extending too far from the field. A distinct advantage of this was the ability to share thermals with the many colourful gliders at the meet.
One highlight of the week was the achievement of Mike Williams Silver distance flight to Nhill in the Boomerang he had recently acquired from Beaufort Gliding Club. As a homebuilder Mike is currently in the process of completing a Monerai and was given assistance by a number of the AHS members in closing the wings last year.

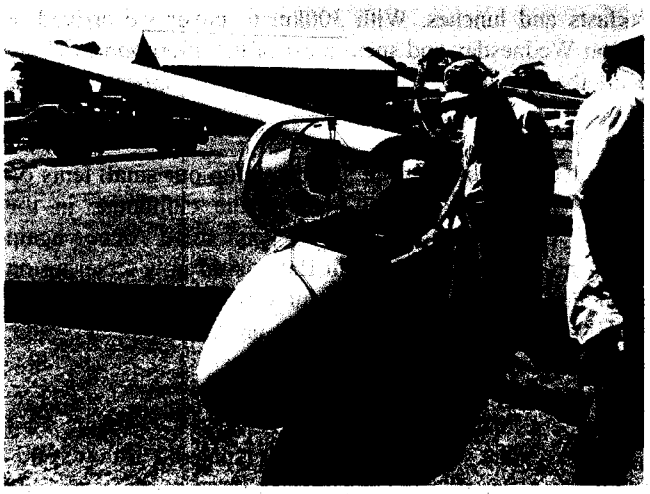
These vintage regattas are becoming an event not to be missed, a field of diverse colour and design. There appears to be a growing interest in owning and maintaining older gliders, fuelled in some part by the supportive and friendly atmosphere in which these people gather. Evidence of this was demonstrated during the course of a wood repair course that Keith Nolan had prepared for the occasion. While participants had undertaken construction of a standard part prior, inadvertent damage to the trailing edge of the "Oly" wing also became a practical demonstration in the art of repair.

Some evening aeromodelling usually rounded off the days events, providing entertainment for the assembly as the sun went down. A highlight of this was the culmination of Geoff Hearns desire to engage in some night flying with his 2X4 Glider off the bungee. Though this was achieved successfully with the aid of cymalume sticks and a keychain torch , Geoff's nerves and heart rate may take some time to recover!

Presentation night was conducted in the usual Patching fashion with lots of mirth and light hearted sledging, trophies awarded and missing friends remembered, and once again a superb spit roast meant no one left hungry. These country guys really know how to

knock up a meal!

Sunday morning saw the progressive dispersal of the gathering to their home fields with a promise to meet again next year. Leeton has been proposed as the next venue in order to share the burden of travel with our northernmost members, so God willing, we look forward to seeing some of you there then.



John Ashford and Hans Prem prepare the K2

Jenne and David Goldsmith with the Ka6

WHAT'S NEW

"WOODSTOCK" .Progress report on my project.

By Alan Bradley.

Details of my Woody.

I did cut some ribs at the end of March 2001 but the job not really started until 28th of August 2001.after my holyday. I have had about 18 months of holyday in that time.

-Wing span. 13 metres including winglets.

-Fuselage has been extended 100 m/m to move the pilot far forward.

-Wing spar has been constructed from laminated beech with plywood both sides for full length.

-Spars upgraded to carry: 110 Kg pilot (original 85 KG)Extra span (original 12 M

-Konning 3 cylinder radial engine on stalk with folding propeller.

-15 Litres fuel and 6Kg battery (total about 45 Kg)

-Retractable wingtips wheels.

-Steerable tail wheel.

-Blown canopy.

-Removable horizontal tailplane

-Pushrod on ailerons.

-Main wing fittings upgraded

HINTS & TIPS

Don't Buy a New Radio

Peter Champness

Does a glider need a radio? The question is still open legally. (CASA regulations require a radio in class G airspace but do not seem to require one within a CTAF area.) The new airspace requirements however certainly assume that aircraft will take off with a functioning radio.

I have been flying for a long time now with an ICOM hand held radio which I tuck down on the left side near my hip in the tight glider cockpit. It satisfies the legal requirements and I can hear quite well but there is a delay if I want to transmit. To talk I have to retrieve the radio from where ever it has slipped down to, and hold it in one or the other hand near to my mouth and press the talk button. All this is subordinate to flying the glider so I don't talk much, particularly during the launch and aerotow and also during the final stages of the landing circuit.

I was thinking of buying a new *microcom* radio because it fits nicely into a standard opening in the instrument panel and my glider has a spare spot. I was dwelling over this decision for a few months because a new *microcom* costs about $1200 plus accessories. Why pay that when the current radio works quite well?

Well one reason is that you can give the ICOM to your ground crew so that you can talk to them but I haven't had a ground crew so far so that was not quite good enough. Another is that a microcom radio can be mounted on the instrument panel. If one were also to purchase a suitable microphone and speaker and install them along with a switch on the control stick (push to talk) to activate the microphone them one could have great convenience when operating the radio.

My plan was revised recently when I visited a computer show at the local town hall and noticed that one could buy a desk top microphone, complete with a flexible stalk and ear plug speakers, for $15. The microphone and speaker looked a lot like the ones that you buy with a *Microcom* radio for a lot more money! The ICOM and similar hand held radios have a connection port for an

external microphone, and also speaker if that is required as well as external battery power and aerial. I wasn't sure if the microphone would work but I was prepared to take a chance for $15.

I was encouraged in this thought by the fact that my glider had previously had an ICOM radio installed in front of the instrument panel along with a fixed aerial and a switch on the control stick. The radio had been removed before I bought the glider but the aerial and the switch were still there!

Initial experiments were not encouraging but I still thought I might be on the right track so I called in the help of Peter Raphael (the Erudite) to help solve the case. Peter was able to inform me that microphones come in two types, dynamic and electret.

A dynamic microphone means a moving coil microphone, just like a speaker used in reverse. If you talk into a speaker and connect a multi-meter to the two terminals (switched to milli-volts) you will record an electronic signal. Dynamic microphones were the first type invented and you will see them in old movies and newsreels. The output signal from a dynamic microphone is very small and they usually require a preamplifier to work properly. Dynamic microphones are considered much better than electret for HiFi applications and are usually much more expensive. Therefore it seemed almost certain that the microphone I had purchased was the electret type.

It also seemed very likely that the ICOM radio was designed for an electret microphone. Some German radios use a dynamic microphone but the ICOM is American manufacture. There was no mention in the radio instructions about the need for a pre-amplifier for external microphones. Also radio-transceivers do not usually boast about their high fidelity performance. It is not required in this application.

Peter agreed with this analysis. It was possible however that the microphone connections were the wrong way round. I don't really know how electret microphones work but I think they are a type of variable resistor or diode. The resistance varies with the sound pressure. Any way they may work when connected one way round but not the other. A dynamic microphone by comparison should work in either direction.

At this particular time we were in the trailer park at the Raywood airfield, north of Bendigo. There seemed little prospect of rewiring the microphone. The Erudite however does not come unprepared. He had his *gas powered portable soldering iron* with him! He calls it his Diners Card because according to their advertising you don't leave home without it. With this device we were able to rewire the microphone in a few minutes. Lo and behold! It worked. I was able to transmit very good voice messages to Peter's radio only a few metres away.

Now I knew that the ICOM radio could be installed as a fixed radio in the glider. But there were still a few problems to be solved before a good installation was achieved. Firstly the radio needed to be attached to the base of the instrument panel (with Velcro glued to the back of the radio). Then the various wires had to be attached with suitable plugs to suit the radio. Plugs of all sorts can be obtained from a chain of electronics shops called JAYCAR. Dick Smith's and Tandy used to be possible sources for these things but they have both gone off recently especially Tandy.

One of the plugs required is a DC power plug. These come in 3 sizes; 2.1mm, 2.5mm and 3.5mm. The 2.1mm and the 2.5mm look almost the same. The ICOM radio requires a 2.5mm plug which comes in both long and short versions (short required).

Anyway, having obtained a variety of plugs in different sizes I took them all home and set to with the soldering iron to wire them up. Having burnt my fingers a few times I thought I had everything wired up correctly but I was not able to check the transmit function at home since I had no other radio to receive. I was able to check the receive function by listening to airline broadcasts.

The next outing for the glider was the Vintage Regatta at Bordertown. The result there was that no one could hear me so the microphone was not working as expected. So once back home again I got out the multi-meter and started to check the wiring carefully.

As it turned out I had two problems:
Firstly the push switch on the control stick was unreliable and had to be replaced. Secondly the wires to the microphone were very short, once I had cut away the plastic base and had to be extended. I chose a piece of the thin wire which came with the earphones of the desk microphones. This wire, the same as used on the microphone, has central insulated wire strands, surrounded by concentric outer strands. The central wire may be thought of as the positive and should be soldered to the central (end) terminal of the phono plug. This is the wire which is interrupted by the push switch in the control stick. The outer strands are the negative or earth wire and are soldered to the base or outer part of the phono plug. The problem here is that the outer strands are insulated by a varnish on each stand which is difficult to remove from such thin wire and it is very difficult to obtain a good electrical connection even when the solder appears well joined.

After several attempts I replaced the extension wire with 2 core flex and obtained better results. If this works well the next job is to extend the flexible stalk of the microphone because it is a bit too short and then find the best spot on the cockpit to mount it. After that I might add a remote speaker on the bulkhead near my ear.

All being well I hope to report on the results in the next newsletter.

Canopy Maintenance Care and Repair

By Ian L inke,
(Aviation Acrylic Mouldings Pty Ltd)

Washing a canopy
Preparation
Hand washing a fitted canopy is the best and safest way to remove the built up dust. It is not unusual to have to remove a visible layer of dust from a canopy after the night tie -down, or the off seasons trailer storage, or hangarage. Don't forget to remove your rings and possibly watches. They are potential canopy gougers.

Do not touch the canopy with anything when the canopy is dry.
Blowing dust off with compressed air is OK providing the compressor does not spit oily water out of the line.
Close any vents after making sure the canopy is latched. This will stop water from entering the cockpit.

Cleaning the outside
Rinse out a clean Chamois under the tap. If it has been used on oily greasy things, get another one.
Fill a clean bucket with clean water. Do not ever use the bucket of water that has a layer of silt on the bottom from yesterdays wash.

Douse the canopy with liberal amounts of water allowing the first water to run off, thus taking the largest part of the dust layer with it. Using A hose is another option, but do not pressure squirt the canopy or frontal are of the glider as you can get water into the cockpit and also force water into the statics. Allow the water to dribble over by holding the hose above aircraft. This will remove the major layer of dust.

While the canopy is drenched, use a saturated chamois to drip extra water on to the canopy while you wipe your clean wet hand longitudinally along the top and side, a little like a squeegee.
Remove any stuck bits, (bird droppings) with lots of water and a fingernail if necessary, then rinse off the residue.

When you are confident the canopy is dirt free, roll up the chamois into a log. Hold both ends of the log drag it from the front of the canopy to the rear. This will effectively squeegee off any remaining water.

Wring out the chamois on to the ground, dunk it in the clean water bucket, wring it out again and wipe the canopy lengthwise to remove any water stains. Do not ever wring the chamois is back into the clean water bucket. Remember to wipe the dirty water and stains off the fuselage with a rag once finished.

Optional

Finish with a good Anti static Perspex polish that leaves a hard wax finish and uses propane as the propellant.
(I highly recommended Plexus Available at Tenex Aviation Supplies Parafield.)
Mr Sheen is a cheaper option. But has silicone which is not so good if intending a refinish of the airframe with Polyurethane or dope.

Cleaning the Inside
If the inside is as bad as the outside then remove the canopy it and do as for the outside. Generally the inside only needs a longitudinal wipe with a clean wrung out chamois. If you do the outside first it is easier to see any smears on the inside. It is generally harder to clean the inside due to awkward access, so make life easy for yourself.
Removing Sticky Residue
Using the solvent that carries your canopy polish is a way of removing tape glue residue from the canopy. Saturate a small patch of clean rag with your polish and apply it to the glue immediately, rubbing locally.

Removing tape residue has always been a problem. The only safe petroleum product to use is shellite (dry cleaning fluid). It leaves no residue and evaporates extremely quickly. Again do not use on a hot canopy. The severe localised cooling will instigate crazing.

Notes:

Only buff the polish with a clean soft cloth using horizontal, lengthwise strokes. Do not use vertical strokes as any scratching will cause sun flare when landing. Rotary strokes are the worst of all.

When applying the spray, do not let the can get any closer than about 300mm from the canopy.

This allows the propellant time to evaporate fully before getting to the canopy and causing solvent damage. It is best practice to spray onto the rag and apply it from the rag.

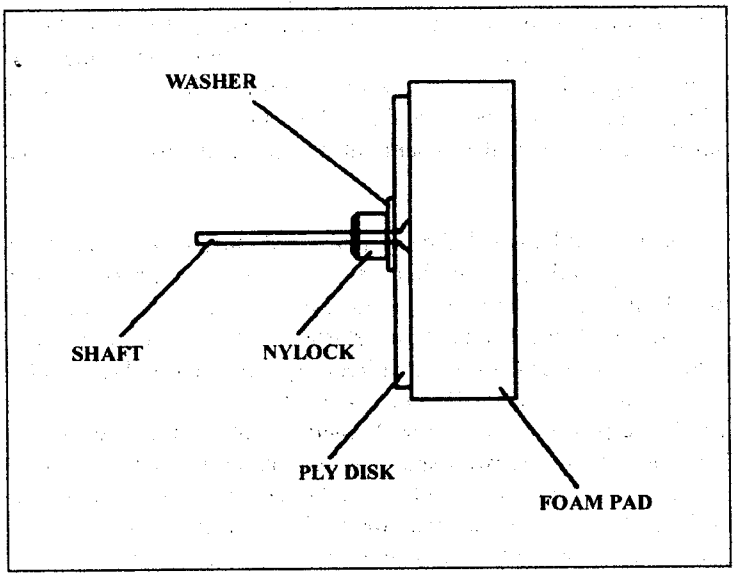
Never be tempted to use any form of paper towel on any acrylic unless it is a certified lens cleaning product. I am sure there is a high content of diamond dust in ordinary tissues.
Don't wash your canopy in the midday sun. The quick evaporation of the water leaves watermarks which are not only hard to remove but are deposits of minerals harder than the acrylic.
Do not sp ray polish or apply Shellite on a warm canopy. The solvent evaporation can cause localised cooling resulting in crazing.
If you have tar or similar that needs a solvent to remove, only use Shellite on a cold canopy. Do not saturate the canopy with any hydrocarbon. Use sparingly.

Beware around entry holes when applying the spray polishes. The edges are rarely highly polished as they should be, so scratches on the canopy edge due to the cutting of the hole are especially susceptible to solvent crazing. This applies especially to the screw holes where capillary action will draw liquid polish and its solvent in between the screw and acrylic to sit there and evaporate very slowly. This results in crazing and then cracking out from the screw holes.

If the Clearview window is not sliding nicely do not flood the rail with Perspex polish and try to work it in. The only remedy is to remove the rail and wash it in clean soapy water then dry, polish and replace. The rail screws should only be done up barely tight enough to hold the rail in place.
Never use anything with alcohol or ammonia in it. Eg methylated spirits or window cleaner. These will initiate the demise of your canopy.

Removing Canopy Scratches
You will need:
· 1 flexible rubbing block. Approx. ¼ sheet size.
· 1500 wet and dry rub sandpaper.
· 1 x 130 mm dia. x 10mm thick ply disk
· 1 x 50 mm thick sponge x 150 mm dia. foam pad. (Dark grey) Firm
· 1 x 50mm x M6 to M10 countersunk screw and appropriate washer and nyloc.
· **3M Finesse It** water based burnishing compound.
Make the polishing buff as per the drawing, using 5 minute epoxy to glue the head of the shaft to the wooden disk and to attach the pad. Wash it in clean water and spin it dry. Place In a resealable plastic bag. It must be kept clean.

Define the depth and surface of the scratch. It is really easy to be caught polishing the outside when the scratch is on the inside.
Wash the canopy with clean water, and chamois dry. Remove the canopy and take it to a clean wind free area/workshop.
If the scratch can be detected easily by scraping your fingernail over it then it needs to be sanded out. If it is fine it will simply polish out. Use 1500 wet and dry on a rubber block across the direction



of the scratch. Do not concentrate on the scratch, as they are a needs to be gently and imperceptibly feathered into and out of the scratch region. NEVER be tempted to sand the canopy using your hand. You WILL leave finger grooves in the canopy. The closer to the forward viewing area the damage is, the larger the sanded area needs to be to avoid distortions. Make sure the scratch is gone by allowing the residue to dry and wiping it off with a clean cloth. Like dye-check it will leave a tiny amount in the scratch if it still exists.

Once the area is clean, put the polishing buff into an electric drill. Even a battery drill will do. First
wash the buff and spin out the excess water. Apply a small amount of polish to the centre of the buff and place it on the canopy. Start the drill, and slowly move the buff randomly over the area to be polished. Keep applying the polish as is needed until all scratching is gone. Finally, and don't leave this out. Hand polish the area using a soft clean cloth and compound, keeping all strokes in the fore aft direction. This stops flaring (blinding of the pilot when flying/landing into the sun) of the canopy. It is very important on the frontal areas. Finger polish the Clearview window hole. This action will help to stop it cracking by removing any small machine notches that can precipitate a fracture. Rub along the edge, not across it.
Wash the canopy again and chamois dry. Apply a good antistatic polish such as Mr Sheen or Plexus.

Notes:

It is not recommended to use wool buffing pads. They are beautifully soft and do a magnificent job for final polishing, but have the ability to harbour abrasive dust deep in the pile. Before you can react, you will get ring scratch marks from nowhere. They do not present a uniform pressure surface when wet buffing. The foam pads are self cleaning and can not harbour nasty grit within them. Even if the foam pad is not entirely flat, it will compress easily to apply quite uniform pressure over the polishing surface. This lessens the possibility of polishing in ruts that result in optical distortions. The foam pad also is sacrificial if high heat is accidentally generated. Being made of a softer material the pad will melt before the acrylic. Wool pads will bind to the acrylic, leaving hairs fused into the canopy.

Repairs

Cutting

Cutting a canopy can be a very stressful procedure if done with the wrong tools. The only way I recommend cutting a canopy is with a thin metal cutting disk in a 100 mm grinder. It may sound like doing brain surgery using an axe but it does not stress the acrylic like saws do. Any form of reciprocating saw is a recipe for disaster. Bandsaws are not as scary but any form of sideways loading on the saw cut will result in a fracture, so I suggest not using one.
The 100 mm grinder will remove a thin cut of material that will be deposited all over your body so please wear Safety glasses and ear muffs for the noise. It is best to remove large amounts of excess by running a shallow groove the full length of the cut. Like cutting glass, this gives it a fault line for a fracture to follow in the event of you catch the blade. By cutting the full thickness in a couple of passes, little heat is built up in the acrylic edge, thus minimal stress is introduced into the canopy. Start by practicing on the waste areas, then cut the canopy large and sneak up on the fit, removing smaller waste sections, until the fit is achieved. Using the face of the cutting disk as a grinder, waviness can be removed from the cut edge.

Notes:

Acrylic becomes very brittle as its temperature drops. It is a very wise idea to warm the workshop before cutting or drilling any canopy. Remember that acrylic does expand with temperature although the amount of expansion from 20 to 30 degrees is small. An easy way to warm a canopy is to leave it in the car in the sun, however, be very aware that if the sun catches it at the correct angle it can set your car alight by concentrating the light as if it were a magnifying glass.

Edge Preparation

Acrylic is very notch sensitive. This means that any scores or scratches in the material form a weak point from where it will crack. Once a canopy has been cut, it is very important to remove these marks from the edge. This can be done by sanding the edge along its length using 180 grit wet and dry paper, then 320 grit, used wet. The edge can then be scraped using a sharp knife blade to remove any sharp edges. This will generally be enough however if you wish to go to the nth degree then the edge can be polished also. The area that will really benefit by this treatment is the clear view window vent hole. This should be rubbed smooth using 800 wet rub, and polished until the edge is transparent. Many canopies would have lasted much longer if this had been done.

Drilling

Drilling Acrylic can be fatal. Before any drill bit comes even close, it MUST be backed off. This is done by touching the cutting edge of the drill flute on a grinding stone to remove the angle of attack of the cutting edge. This action will replace the sharp cutting edge with a very small vertical scraping edge. It is always a good idea to test drill some of the scrap before attacking the real thing.
Do not forget to remove the sharp edges of the hole with a larger diameter drill bit used in the fingers or a countersinking bit. This will help to prevent stress cracking from the screw holes.

Crack repairs

Repairing canopy cracks invisibly is most definitely a black art. Most repairs leave visible damage far worse than the original crack.
When a crack has been identified it must be stop drilled. This is best achieved by drilling a very fine 0.5mm hole just beyond the visible end of the crack. Stretch strips of elastic tape such as electrical insulation tape across the back of the crack to help pull the edges together. Make sure the hole is covered

Place a drop of very thin cyanoacrylate (super glue) into the hole and watch as it wicks down the crack, turning it transparent. Apply a small amount on the outer surface to wick in if the crack is

very long. Allow to dry for 24 hours. Remove excess glue residue with very fine 1500 wet rub and polish as above, however if you are careful this should not be necessary. If it has been done well then the crack will only be visible on the surface of the canopy and will look similar to a bad scratch.

If there is high humidity at the time of repair, the glue fumes can produce a white flush around the crack on the surface. This should be able to be polished off with burnishing compound or a light abrade with a fine wet rub followed by the polishing procedure.

Note:
Model shops sell super glue in various viscosities. Super wick in is the best to use as it is
Extremely thin.

TECHNICALITIES

Canopies can ..... be fixed!

Peter Champness

The canopy of my glider has suffered great misfortune over the past few months. The first damage occurred in December when I was flying from Benalla. The week of cross country flying that I had planned had got off to a poor start. The first two days were not suitable for soaring and I had only twenty minutes logged to show for my efforts. The next day seemed better. A group of pilots, who were attending a cross country course, launched before me and headed off east toward Murchison. I thought I would tag along and see if I could pick up any thermals by watching the flock. I was climbing slowly in my first thermal after launch when I saw the gaggle heading off from nearby, at about 4000 ft. They looked like migrating geese.

I was just over 2000 ft at the time. I thought I would leave my thermal none the less and try my luck for a better thermal over the Benalla town ship. I did not find anything there so I pressed on to a square of scrubby forest near the Hume Highway interchange which can be a good thermal source. This produced some encouraging signs of lift but I was rather low and was unable to core anything sufficient to sustain my height. I thought I had identified a nearby farmer's airstrip which was my escape route. When I got there however it turned out to be a long but rather narrow track between small paddocks most of which were occupied by Horses! The track was too narrow to accommodate the glider, it was only about 8 feet wide! I found a little bit of lift. Not enough to get away but I managed about two turns while I assessed the options: SIZE, SLOPE, SURFACE, STOCK, SWER, SURROUNDINGS.
Size, none of the paddocks were big but several were landable on the diagonal which was more or less into the wind.
Slope, the whole area was pretty flat.
Surface, Most paddocks had long grass which could obscure obstructions. There were scattered trees.
Stock, Horses in all paddocks but one of the larger ones had only one horse. That could mean it's a Stallion. They say not to land in a paddock with only one cow because it is probably a Bull. Does the same apply to horses? I wasn't sure but it was standing in the corner near the gate and looked rather bored so I wasn't too worried.
SWER, Single wire earth return. A type of power line, common in country Victoria, which supplies electricity to homesteads and consists of a single, thin and high tensile wire, strung on poles often more than a quarter of a kilometer apart. The lines are almost impossible to see so look for the poles! There were several of these and I hoped that I had them all spotted.
Surroundings, No real problems there. Just don't hit the upwind fence.

I chose the paddock with the one Horse. Moments later I skimmed over the upwind fence and landed in four foot high grass. Flying time 13 minutes! Not very good for a cross country day but on the other hand I had made mistakes, starting with leaving the airfield before I had gained sufficient altitude so maybe I was lucky to be down without damage, OR SO I THOUGHT!
The horse paid no attention so I wandered off to find the owner. She wasn't there but two painters were painting the house and one of them was about to return to Benalla. He gave me a ride to the airfield. When I got back with the trailer the owner was back so I explained about the landing and asked about retrieving the glider. She asked where it was. I pointed. She said "OH YES, IS THAT IT SURROUNDED BY ALL THE HORSES." I said, "No, there is only one horse in that paddock. She Said, "No, all of the paddocks have a lot of horses in them. Damn! They must have been hiding under the trees. I rushed out to the paddock and tried to shoo the horses away. They didn't take much notice of me. THEY WERE BUSY TRYING TO EAT THE GLIDER! That's the trouble with a wooden glider. It tastes like food to live stock.
Fortunately the damage wasn't too bad. They hadn't trodden on the glider, which was a major danger. There were a few gouges in the paintwork and some fairly deep gouges in the canopy, but it was still usable. It looked a bit like a club trainer canopy now compared with its former pristine state.

The next damage occurred at the Vintage Glider Regatta at Bordertown in January. I only had the weekend off and it was a six hour drive each way from home but I thought I would show the flag. Mark White was going to attend with his recently acquired Foka 5 and hence we would have two Foka's there, for the first time in ten years.

I was rigging the glider on Sunday morning with the help of Mark White. It was all together when I thought I would open the canopy again to test the control connections. When I did it fell off its rail onto the front of the fuselage. The canopy was cracked transversely from side to side! HOW DID THIS HAPPEN! The Foka canopy is unusual because it slides forward to open on a rail at the front of the fuselage. It can't fall of the rail if the clip at the back of the track is locked. So I checked the clip and it was locked. The only way the canopy could have fallen off was if the rail hadn't been properly installed on the little wheel at the front. Therefore I supposed that I hadn't properly installed the canopy on the little wheel.

As it happens, at a Vintage Glider Regatta there are quite a lot of experts on glider repairs. The merits of Perspex cement were discussed but unfortunately no one had any. The model aircraft enthusiasts thought super glue might work but it might turn the canopy milky! Emilis Prelgauskas declared that super glue would work. Therefore the broken canopy was brought into the club room and many hands set to work.

Firstly the ends of the crack had to be stop drilled. This means drilling small holes at the ends of the crack to relieve the stress which tends to extend the crack further on. An electric drill and a 1/16th drill bit were obtained and the holes were carefully drilled. More than two holes were needed because the crack diverged at

one end into several branches.

Since it was my canopy it became my job to get underneath and try to hold the edges of the crack together as accurately as possible. Others on the outside applied counter pressure in appropriate spots. Emilis was the chief applicator of glue! The modelers supplied us with some cyano-acrylate glue known as ZAP thin. Superglue apparently sets when it comes in contact with moisture. There wasn't much moisture in Bordertown in early January although the temperature was only about 35 degrees! The inside of the canopy was wiped with a damp sponge to set the glue when it reached the inside. Emilis then began to apply the glue to the outside of the crack working steadily from the outside of the canopy from one side to the other. The thin glue could be seen spreading along the crack several centimeters ahead of the spot where Emilis was applying the glue due to capillary action.

The end result was by no means perfect. I wasn't quite successful in aligning the edges of the crack precisely. There is a band of opacity about 2cm wide transversely across the front of the canopy. However optically it is no worse than a canopy bow, at about the same location as say on a Hornet canopy, so it is usable. Emilis assures me that considerable improvement can be obtained by careful use of abrasives and canopy polish. This may be a project for the winter months, in front of the TV.

After an hour of setting Emilis declared that he was satisfied with the strength of the bond so I put it back on the glider and set off for the launch point at the far end of the runway. If not for the repair I would have been unable to fly at all for the weekend which would have been a sad disappointment after such a lot of driving.

In the end I had some compensation. I had not previously had a successful winch launch in the Foka. My initial attempts at Raywood had resulted in launches which were far to fast resulting in cable breaks. However my practice run in the Bordertown Twin Astir was successful and I was cleared to try a launch in the Foka.

By now it was almost 3pm and the temperature had reached thermal ignition point. The last dozen winch launches had resulted in circuits and landings. Mark White suggested that I should attempt the double: my first successful winch launch and then demonstrate the sweet handling characteristics of the Foka by getting away. This was the way it turned out! The Bordertown winch is not as powerful as the Raywood winch and I had a good launch. As I was reaching the top of the launch my airspeed began increasing at the moment that I was expecting the power to be cut off, a sure sign of a thermal. I turned back along my launch track and picked up a thermal which took me to 8000 ft and a flight which was limited only by the requirement to return to Melbourne in time for work on Monday morning.

FACTORS AFFECTING STRENGTH.

Eds Note. This is an excerpt from Australian National Gliding School Notes.

STRESS CONCENTRATIONS.

The presence of a hole or a sudden change in cross sectional area will cause a concentration of stress at the edge of the hole or cut out. Depending upon the amount that the material can elongate between the yield point (or proportional limit) and the ultimate strength, there will be an "internal adjustment" of the stress. The lack of ability to redistribute the stress will result in the failure of a member when the nominal stress in it is well below the ultimate strength.

A further and more serious effect of stress concentrations is to increase the likelihood of a fatigue crack appearing in these local areas of high stress leading to collapse of a member.

The matter of stress concentrations should be carefully considered when using such materials as improved wood and aluminium alloys.

CONNECTION OF DISSIMILAR MATERIALS.

When materials of differing stiffness, such as normal wood, improved wood or metals are fastened together for a considerable distance and are under a high stress, consideration should be given to the fact that the fastening causes the total deformation of all materials to be the same. A typical example is a long metal strap bolted to a wood spar flange for the purpose of taking the load out of the wood at a wing joint

In order that the load be uniformly distributed among the bolts, the ratio of the stress to the modulus of elasticity should be the same for both materials at every point.

This may be the approximated in practical structures by tapering the straps and the wood in such a manner that the average stress in each (over the length of the fastening) divided by its modulus of elasticity gives the same ratio.

When splicing high-density materials to wood, or in dropping of bearing plates, the slope allowed for normal wood.

SHRINKAGE IN TIMBER.

When the moisture content of a piece of wood is lowered its dimensions decrease,
Checking or splitting of wood members frequently occurs when shrinkage takes place in members that are sometimes given by metals fittings and quite often by plywood reinforcements, since plywood shrinkage is roughly only 1/20 of cross grain shrinkage in plain wood.

The minimum distance between bolts and the minimum end margin to prevent splitting effects in spruce are given on reference ANC 18 Design of Wood A/C structures (US Dept of Commerce)
(Tech Book & Magazine Co. or Technical Bookshops)

TEMPERATURE.

The strength of most materials decreases as the temperature rises. The temperatures encountered in gliding do not affect any metallic materials. However, temperature must be considered when dealing with timber structures and fibre glass reinforced plastic. Extensive investigations conducted on an international basis revealed that temperatures exceeding 80 degrees C, and with corresponding moisture contents of 20% were possible in wooden aircraft operating in Northern Australia. Tests conducted in a typical wooden structure indicated an overall reduction in strength of about 45%

The reduction of timber strength with increase in temperature is available from standard handbooks.

The drop in strength and stiffness of fibre glass reinforced plastic is dependent upon the properties of the resin and German airworthiness authorities require static strength test to be conducted at54C. If this temperature is reached in practice then the glider must not be launched.

MOISTURE CONTENT.

All timber strengths are quoted for a standard moisture content of 15%. The strength decreases for moisture contents greater than this value and there is a corresponding increase in strength for lower values.

WELDING.

There are two sources of weakness when two pieces of material are welded together. Firstly in the material adjacent to the weld by a reduction in tensile strength resulting from heating. This can be partially corrected by heat treatment. Secondly, in the weld itself resulting from incorrect welding practice. For glider construction it is essential that all welding be carried out by a qualified aircraft welder.

The supplies of Chrome Molybdenum steel in this country are a mixture of American and Australian, both made the same Specifications S.A.E. 4130. However, Australian steel manufactured prior to 1946 is virtually non weldable, and should not be used for welded fittings. Steel manufactured after this date is designated X 4130.

FATIGUE IN WOODEN STRUCTURES.

The safe fatigue life of wooden gliders designed to the British Civil Airworthiness requirements Section E- Cloud Flying Category- has estimated by Obee (The Fatigue Life Of Wooden Gliders-9th Ostiv Congress Argentina 1963. OSTIV Publication VII) To be 100.000 hours, which for all practical purposes can be regarded as infinite.

NOSTALGIA.

I remember the milk from the billy,
With yummy rich cream on the top.
Our dinner came hot from the oven,
And not from the fridge in the shop.

The kids were a lot more contented,
They didn't need money for 'kicks'.
Just a game with their mates in the
Paddock,
And some times the Saturday 'flicks'.

I remember the shop on the corner,
When a pen'orth of lollies was sold.
Do you think I'm a bit too nostalgic?
Or is it....I'm just getting old.

I remember when the loo was a dunny,
And the pan man came in the night.
It wasn't the least bit funny,
Going out the back with no light.

The interesting items we perused,
From the newspapers cut into squares,
And hung from a peg in the outhouse
It took little then to keep us amused.

The clothes were boiled in the copper,
With plenty of rich foamy suds,
But the ironing seemed never ending,
As Mum pressed everyone's 'duds'

I remember the slap on the backside
And the taste of soap if I swore.
Anorexia and diets weren't heard of,
And we hadn't much choice what we wore.

Do you think that bruised our ego?
Or our initiative was quite destroyed?
We ate what was put on the table,
And I think our life was better enjoyed.

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