THE AUSTRALIAN HOMEBUILT SAILPLANE ASSOCIATION

Volume 3 Issue 9 **JUNE 1998**

G'day people!

I am starting my third year as Editor of AHSA Newsletter and it is a very demanding job, so far so good, with no complaints from the members and every body is telling me that we are on the right side of the road.

This issue you are reading has a new format and I am taking this opportunity to introduce, on the left of this page, all the persons that make it a reality. A.H.S.A. is a non profit association and the persons involved with the production of the journal are *ad-honorem*. Without their help, this could not be possible.

Very many thanks to all those who were kind enough to send me letters of encouragement and best wishes.

Your help and advice were very much appreciated and from the bottom of my heart I am extremely grateful to all.

On the 31st of May we had our A.G.M. at Smithfield. Nagambie and in that day we elected the association's office bearers. Gary Sunderland is our President, Peter Raphael Secretary. James Garay Treasurer and Editor. Terry Whittford Assistant Treasurer.

Now that we are growing, our association will be noticed and we are sure that our members will be the winners.

John Ashford continues his article on Perspex and Mike Burns on Flutter.

Paul Johnson is ready to fly his Windrose. VH-UII.

Via Editor Bill Baker I have received a complimentary copy of "AVIATION HERITAGE". The Journal of the Aviation Historical Society of Australia. (A.H.S.A) (Sounds like a very familiar abbreviation ?).

This Journal is very well produced and highly recommended to those interested in our Aviation History. Our sincere congratulations to the Editor Bill Baker. Read inside more about subscription rates.

On the first and second of November 1998 (Melbourne Cup day) we will be holding our annual symposium. Last year's symposium was a complete success , so try to make it this year and you will not miss any excitement . Drop me a letter to let me know if you will be attending. Following the symposium, our president Gary Sunderland will be running a short course on major and minor repairs of gliders. The schedule will be a technical lecture in the morning and flying in the afternoon - more details in the next issue.

This year's summer time activities will be in conjunction with the Vintage Glider Association - from the 2nd January to the 10th January 1999 at Locksley (Victoria) .

James Garay

Inside This Issue

MAIL BOX

Dear Ed,
You are doing a great job with the Newsletter. Thanks. Wayne Rhodes.

Dear Ed,
This is a short note just to remind you I sent this year membership fees to you some time in December 97 when I asked for information on the Windrose.

Once again thank you for your help, and the AHSA Journal. At present I am making inquiries about the S-2A which is also a self launching sailplane. I shall keep you informed of any development. Yours sincerely. Rod Dash.
Ed's Note: Yes Rod, you are financial until next year. Thanks for your support.

Dear Ed,
I'm having a visit by our CTOA and John Ashford on Friday as my Windrose is finished (as a glider) and engine installation is almost finished.

The weight and balance revealed I'm over weight by 39 lb.
i.e. Plans max AUW = 740 lb.
My WR AUW = 779 lb.

A fellow WR builder (Mitja) who knows about our association suggested I ask you about how Oz Woodstocks faired in regard to their actual weight versus planed weight? What flight envelope limitations were imposed If they were over weight? James, each phone call seems to bring news of changes I need to make! All very frustrating. You must be all but finished yourself Jim?
Regards Paul Johnson.

Dear Ed,
Please find enclosed cheque for my subs- cription . I will try to get to the AGM but because of my hearing problems, I do not always follow the proceedings very well.
Paul Johnson did his weight and balance on his WINDROSE last Sunday, with Gerry Downs, Richard, Doug Cameron and myself. He now has to battle the system to get it into the air.

Not long ago, I had the honor of spreading half of the late Ken Davies ashes over Benalla airfield from the Yellow Witch during the Old Timer Week. The other half was spread by his long time friend Rudy Field from his Ximango. Keep up the good work, it is a lot of work for you, but it is a really worthwhile. Happy soaring. Keith Nolan.

Dear Ed,
About rejected parts, "bogus" parts and those that look like the real thing as mentioned in the December issue.

I just want to tell you about our Swedish solution just as an example of how we manage to help the builders.

Spruce or other wood materials can be sent to our EAA for testing. Metal parts, aluminium for example can be tested by using a ball (from a bearing) with a specified dimension then applying pressure to it and measuring the diameter of the mark on the tested part. This is called the Brinell Test. Bolts and any other parts can be tested to meet specifications. Anything can be sample tested.

As the possibility of materials being tested is known to all sources and because of our own sales of good material for aircraft use, our market has been rejected by the crooks. Most builders turn to our own suppliers and the rest can easily be tested for a small fee. The bogus or rejected parts are not always sold at good prices.

Our EAA Chapter has put the specifications into a Builders Handbook or "Bible" for builders,so that every builder is well informed. This Handbook mostly contains available specifications from around the world,translated into Swedish.I have done a short piece myself. The documentation is 5cm thick in A4 format pages. When I started my Monerai project in 1980 (it is now sold) there was no Handbook at all. In late 1997 the metal section was added, information well known to all Monerai builders over the past 15 years.

In 1998 the EAA Chapter 222 , Sweden , is being asked by the Authorities to take over issuing building permits as well as inspections of any Homebuilt aircraft. This is I hope, the result of the Chapters ambition, and mine too, to maintain high quality. The sailplane builders ,which are mostly self-launchers, area relatively small part of the Chapter's membership of around 1600 people.

The aversion to rulemaking for its own sake is well anchored at company level in Sweden.SAAB will withdraw it's civil production SAAB 340 and the new SAAB 2000 commuter liner at the change of millennium. The US light aircraft industry was wiped out in the 80's and this had nothing to do with quality of production or flight safety either. The administrative system needs a foolproof way to function. I think home-building points to every malfunction and smiles at it in a manner that kills the problem. But there are still more fools than proof.

KSAK, the equivalent to your GFA, is not at all interested in our building activity. And in the early 80's it seemed, negatively interested. Today the interest can be seen in telling members about our activity, the building list, test flying list and registered experimental craft. Since 1989 there has been a downturn in gliding activity in Sweden. Most of the problem is the fact that the gliding society is partly separated from the KSAK in a similar manner to the distance there is nowadays between power and glider pilots. KSAK has reduced to a fraction of what it was. Hard times could be one of the elements responsible, and an unemployment never before seen in this country another factor.

The summer of 1997 was the best in 100 years but still there was not much extra activity around. The membership dropped from 6000 down to a little more than 3000 persons. People who had an interest in power and glider flying had to make a decision, that was a real killer too. Gliding was my choice as I had no interest in paying two membership fees. The EAA is the only membership retainer, with a little expansion over this period.

In the Ange Flying Club we use powered gliders, Grob109B and Scheibe SF25. Our internal competition , just for fun, you can see on the web ➪
(http//hem2.passagen.se/angefk/statistik.htm)

I just can't deny that I love to cut the engine below 500 metres and fight to gain height for a distance flight and return. A discussion about arranging a 5 hour flight for a Silver-C diploma this summer seems to fire up interest. A distance flight of 50 km or more could be made in 4 directions to different glider fields. The first Motorglider Silver -C diploma may make history this year. Two new individuals are about to become glider pilots this year so we will be expanding our flights and activity. Best regards to all of you.
N.A. Sandberg, Sweden.

Dear Ed,
The GFA no longer have plans available for study purpose but I think this would be a valuable service to members of AHSA.

If nothing has been instigated yet I am prepared to volunteer to run such a scheme.

I already have copies of drawings for some gliders and aircraft but would need to collect more to get things started so could you please place the following in the Newsletter.

Glider Study Plans wanted to start AHSA Library. Buy/Swap/Copies. Contact Wayne Rhodes PH/FAX 08-9341 3034.

Is it possible to publish a membership and project/interest list at some stage to make it easier for members to contact each other.

Keep up the good work James. Wayne Rhodes.

From the Editor & Co-Editor

Dear Wayne,
We were pleased to receive your correspondence and your kind offer to volunteer to run a plans loan scheme on behalf of the AHSA. It is great to see this kind of support being offered as it demanding enough to provide the newsletter on regular basis.

As you have indicated, GFA no longer provides this service although I have been informed that such an archive exists in the Ferries Mc Donald Gliding Reference Library under the administration of Emilis Prelgauskas (i.e. Resource Addresses AG Mag). Obviously, this is not widely known in the home-building community and we ourselves have not explored the accessibility of this service to our membership. However it makes sense to adopt such a scheme within our association as we steadily grow, being first point of contact for prospective homebuilders.

We heartily support your offer to instigate such a service but would like to point out that due the minimal fund we generate, (only the annual subscription) we are unable to offer any financial assistance. However, in terms of publishing such a resource would be more than happy to do this along with directing any telephone enquiries for such information your way. I am sure that such a service could be self funding in terms of despatch and recovery. Perhaps the service could extend to information pack/builders notes on particular designs. This matter was raised on a previous occasion during discussions between GFA officials and some of our membership, with GFA being unprepared to address enquiries I know myself that we have some information available for the Woodstock, Duster, Monerai and Windrose that could go towards developing this resource.

Your suggestion to publish a project/interest list for the benefit of members is a good one and something we hope to address in the near future. Happy Soaring!

Dear Ed,
Please find a brief update on my Windrose project.Also enclosed is a photo and my renewal subscription. Paul Johnson.

TECHNICALITIES

PERSPEX
I.C.I. Technical Information
Courtesy J. Ashford.

Perspex is the registered trade name for Polymethyl Methacrylate sheets and rods manufactures by I.C.I. (Imperial Chemical Industries Limited).

JIG SAWS, FRET SAWS, HACK SAWS, ETC...

Jig saws and similar saws can be used to cut small pieces of Perspex but they are not generally advised as the process is slow, and the saw overheats very easily, causing it to bend and stick, these, in turn, leading to frequent breakage.

Thin sheet, 3/16 in.(2.4 mm.) or less can, with care, be scribed and snapped along the scribe cut. Even pressure continuous support on the under side, and adequate clamping, are essential for this process.

BLANKING AND SHEARING

Perspex can be blanked with clicking dies or steel rule dies as used for cutting paper, but to avoid cracking it must be heated to a temperature of 120 to 130 degree C.
Clicking dies are made from steel bands bent to the desired shape sharpened and hardened. Support is provided by a plywood or other rigid material centre and rubber ejector ads prevent the blanked piece sticking in the die (see Fig 2) This method is suitable for sheet up to about 3/16 in (5mm) thick.

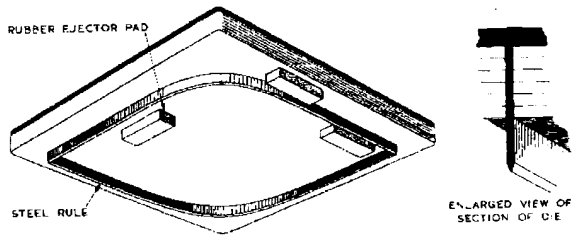

Fig 2. Typical clicking die or steel rule.

For thicker sheet a more robust tool is necessary, made from tool steel to the general design illustrated in Fig.3. A taper is

provided on the inside of the tool so that the blanked piece is lifted clear and ejected through the centre.
The temperature of the sheet should be raised to about 160 degree C before blanking, and after blanking the pieces should be re-heated to 160 degree C to square up edges.
In general it is necessary to polish the edges of the blanked pieces to get the desired finish, and with thick material linishing or machining may be required before polishing.

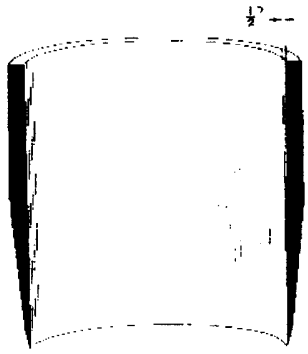

Fig. 3. Section of blanking tool.

Fig.3. Section of blanking tool.

DRILLING

Drilling of Perspex can be carried out on standard equipment using ordinary twist drills, but those with slow spiral and wide polished flutes will make good work easier to achieve. It is important to avoid overheating and it is therefore advisable to use a hand feed so that the swarf can be cleared frequently, and binding, an gumming do no occur. The drill should be running true, and full support must be provided on the underside of the sheet. Clamping the work to the table or holding in suitable jigs is recommended.

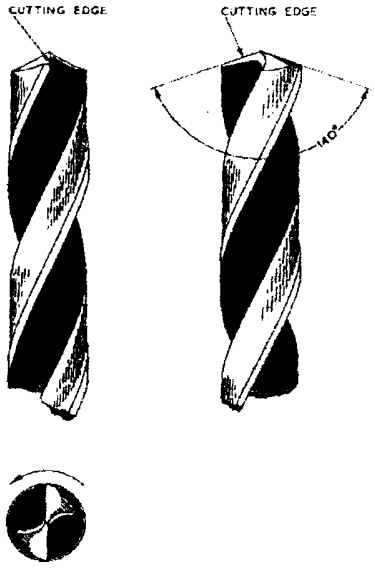

Fig.4. Method of sharpening twist drill for Perspex.

The speed of the drill is not critical and the following figures give guidance on this point:

1/16 in (1.6 mm) diameter	7000 r.p.m.
¼ in (6.4 mm) diameter	1800 r.p.m.
½ in (12.7 mm) diameter	900 r.p.m.

Drills should be ground as illustrated in *Fig 4*, the important points being:

(1) No rake
(2) A clearance angle of about 15 to 20 degrees
(3) The margin between the two cutting faces as small as possible. The included angle should be obtuse.
(4) Coolant such as soluble oil or water will help to produce accurate, strain free holes. It is important that the coolant reach the cutting faces. Larger holes can be cut with fly cutters and trepanning tools, with no rake and adequate back clearance.

TURNING

Perspex can be turned on wood-working or metal-working lathes, but the latter are more generally used. The cutting speeds are not very important and can vary widely from say, 300 ft.(100m) per minute up to1.000 ft (300m) per minute.Tools should be ground to have a slight negative rake and clearance angles of about 20 degrees. The tools must be kept very sharp, and after grinding should be finished off on a fine stone, such as India Stone to produce a polished cutting edge. High speed tool steel is recommended as this will take a higher polish than a tipped tool and produce a smooth finish on the Perspex.For roughing work, cuts up to 0.050 in. (1mm) or more are possible depending on the condition of the lathe available, but for finishing, fine cuts at high speed will give the best results.

Removing the swarf and keeping the tool cool are most important and are best achieved by a jet of compressed air directed at the point of cutting. Soluble oil or water can be used as a coolant, but for fine work are not so effective as compressed air.

MILLING

Normal methods used for light metal can be used for Perspex, but for first class results, adequate means of holding the work firmly in position are essential.
Vacuum chucks are particularly useful for this. Tools with wide pitch, no front rake, and adequate back clearance are desirable.
It is most important to clear the swarf away from the work and the tool with copious quantities of soluble oil.

ROUTING

Standard high speed wood-working routers are used for machining Perspex using the same speed as for wood. It is usual to use single or double edged cutters which should be ground and honed with a back clearance angle of about 12 degrees or over. With double-edged cutters it is useful to grind away the centre as this prevents the swarf from lodging under the tool. Routing is usually done dry, but it is an advantage to remove the swarf and cool the cutter with a compressed air jet. Where possible, the corners of the router cutters should be

ground to a small radious, so as to produce a small fillet at the bottom of the cut for additional strength.

SPINDLING

A most useful tool for rapid machining of Perspex is a spindle moulder with cutters as used for wood working. High speed is necessary and peripheral cutter speed of 4.500 ft. (135m) per minute or over are advised. As with other machining operations, sharp tools are essential for good work. Spindling is usually done dry, and the question of removal of swarf dopes not arise as the cutter takes it away from the point of contact with the work. Two-bladed cutters are normally used and are preferable to multi-bladed ones, on account of their greater ease of setting.

To be continued...

FLUTTER

By M.Burns

CONTROL SYSTEM STIFFNESS

All "DESIGN REQUIREMENTS" have standards to be met on the degree of allowable STRETCH in any flight control system. Fig. (8) reproduces the requirements from B.C.A.R section S "Small Light Aeroplanes" in which Parts 4.11 says: "The amount of control surface or tab movement available to the pilot shall not in any condition be dangerously reduced by static stretch of control circuits" so excessive control system stretch can be both a flutter " trigger" and/or reduce the pilot's control authority making it very important subject. All sailplane Design Requirements, BCAR Sect E, JAR 22 etc, make similar statement and specify stiffness testing procedures.

FLUTTER PREVENTION

Figure (1) tabulates the 3 stages of responsibility for flutter prevention:

- The designer must employ correct design principles and set adequate operational criteria.
- The pilot must fly the aircraft inside the designer's limitations.
- The construction and maintenance of the sailplane must continually address all structural and mechanical items that can become flutter "triggers".

Obviously the designer is the corner stone, since the pilot, builder and maintenance engineer must depend on that work being correct. So, let's look at the various roles in flutter protection.

THE DESIGNER'S ROLE

Fig. (1) spells out key points that are under the designer's control, lets have a closer look:

- Wings, tailplanes, fuselages, control surfaces must all be stiff.Just being strong enough will no necessarily produce a safe airframe. Long thin control surfaces are difficult to keep stiff.
- Fig. (5) A wing design that has its centre of gravity well forward, as close to the wing's ELASTIC AXIS as possible will be more resistant to flutter than a wing with a centre of gravity well back towards the trailing edge. This can be a final factor in choice of wing section, type of control surfaces, mass balance etc.
- All control surfaces should be as light as possible, the lighter they are the less need there will be for mass balance. But if mass balance is needed then it will in turn be as light as possible.
- 100% control surface mass balance is ideal, however in many cases 100% would require very large amounts of weight to be added. Most designers settle for 60% to 100% to avoid large control weights.
- The control system between the pilot and each control surfaces must be "stiff" to both prevent control surface flutter and lost motion due to system components stretching or deforming. A common cause of lack of stiffness can be control system rods which are to small in diameter and have insufficient support to stop distortion under compressions loads.
- NOTE!! Do not confuse control system "stiffness" with "friction" they are 2 totally different things.
- Where pilot controlled trim tabs are used, mainly on elevators, they must be sized and balanced to have a high natural frequency of vibration. If their control circuit fails, which is not uncommon, they will not, then, cause flutter of the control surface to which they are attached.
- All control surface mechanical systems must be detail designed such that there is an absolute minimum of system freeplay. The detail design of control surface hinges to prevent freeplay is very important. Attachment of system parts to the structure must be stiff.
- It is not uncommon for the designer to HAVE TO RESORT TO A PNEUMATIC OR HYDRAULIC DAMPER UNIT IN A CONTROL SYSTEM TO FIX A FLUTTER PROBLEM. This is usually the result of the original system not having enough basic stiffness. That would suggest that if the design work was better at the start then a damper should not be needed.

CONCLUSION

The designers role is critical and the limits set by the designer must be followed.

THE PILOT'S ROLE

Accident and incident investigation has consistently shown that many flutter occurrences have happened because the pilot has exceeded the speed limitations of the sailplane set by the designer. As pilots we must respect the TRUE AIRSPED limitations of our aircraft which can be very different to the INDICATE AIR SPEED we see in the cockpit. Altitude, temperature, density, instruments error all have influence. Flutter is directly related to TRUE AIRSPEED in sailplanes.

- Fig (7) shows this aspect of the ASW20 limitations.
- Most homebuilts are not tested as extensively as the ASW20 was, for instance we would not know the

conditions under which the "WOODSTOCK" was flight tested and deemed ''flutter free' was it 2000 ASL? 4000 ASL?

- The pilot also has part to play in the way the daily and pre flight inspections are carried out. That is the point at which any damage to structure and systems from the previous flight is likely to be found.

FLUTTER *(Fig 7)*

ASW 20 C -Flight Manual-

DATE: Dec.2, 1983
AUTHOR: Waibel

11.5. SPEED LIMITS AND LIMIT LOADS

Maximum permissible indicated airspeeds (IAS)

At altitudes below 3000m (9843 ft) NN*:

At flap setting 1	265 km/h	(143 kts)
At flap setting 2	200 km/h	(108 kts)
At flap setting 3	200 km/h	(108 kts)
At flap setting 4	160 km/h	(86 kts)
At landing setting L	120 km/h	(65 kts)
With full control surface movements (maneuvering speed)	175 km/h	(94 kts)
In severe turbulence**	180 km/h	(97 kts)
On winch tow	120 km/h	(65 kts)
On aero tow	175 km/h	(94 kts)
Landing gear extended	175 km/h	(94 kts)

*Note: Flutter testing was carried out at an altitude of approx. 2000 m NN (6562 ft). With increasing altitude the ASI indicates too low, as it is the true airspeed which determines the flutter limit for light aircraft, the following table of limits applies for high-altitude flights:

Flight Altitude	V max (km/h) Indicated
0-3000 m NN (0-9843 ft)	265 (143 kts)
5000 m (16404 ft)	240 (130 kts)
7000 m (22966 ft)	215 (116 kts)
9000 m (29528 ft)	195 (105 kts)
11000 m (36089 ft)	170 (92 kts)
13000 m (42651 ft)	145 (78 kts)

If you observe these indicated speeds above 3000 m NN (9843 ft), the true flying speed will remain a constant 315 km/h (170 kts), and this covers the possibility of facing strong headwinds in wave flying.

***BUT ONLY IF WE LOOK**

Slack control cables. Water inside control surfaces. Too much control surface freeplay. Structural damage. Serviceability of the ASI system. Change of " feel" in the control circuits.

These are just a few items that have a flutter relationship.

WHAT TO DO ??

So, despite all that has been said we go out and fly our (say) Astir CS, pushing along under a cloud street, speed sneaks up to just over our Vne limit, height is over 8000 ft, temperature high since its mid January and Wow!! the back end starts to shake. We have bad rudder tramp.

The pilot must not react violently. In all cases the sailplane should have its speed SLOWLY changed, with our Astir CS, slow down with a gentle pull up incorporating a slow turn in either direction. The flutter will stop. The question remains, has it caused any damage??

- Broken hinges. Bent push rods. Loosened mass balances. Fractured airframe to control attachments.

These are all likely, plus anything else you can think of.

In many flutter instances the pilot's reaction have caused more damage than the flutter itself. One Astir CS in an incident similar the one above, suffered a very heavy application of back stick which broke the horizontal tailplane in half. That damage was found on an inspection following the landing.

To be continued...

WHAT'S NEW??

Aviation Historical Society of Australia.

The Aviation Historical Society of Australia is a non profit Incorporated Society dedicated to the preservation and recording of Australian Aviation history. The Society fosters contact between members for mutual edification and co-operation.

The Aviation Historical Society of Australia consist of a Federal Committee which is based in Melbourne, and several state branches. Membership is Australia wide and overseas.

One of the aims of the Society is to publish the result of members research in one of the two publications, the Journal "Aviation Heritage " for longer illustrated articles, and the Newsletter for shorter articles, air shows reports, aircraft list, etc. Membership is predicated on the publication of four Journals, and entitles members to all Newsletter published over the same period-nominally one calendar year.

Subscriptions are due on the completion of each volume and membership is for the duration of the next volume, nominally a period of one year. Those joining during the publication period will receive all those journals relating to the current period, i.e. the complete volume.

The Melbourne branch of the Society meet the fourth Wednesday in every month 7.30 at the Air Force Association, Cromwell St. South Yarra. For further information- Keith Meggs Ph. 9580 0140.

REPORT TO MEMBERS

AHSA meeting at Smithfield
31st May 1998

Jim Garay tells me that we have sixty members and still growing! A very fortunate state of affairs, but it looks as though our association now needs to take the next step, and elect office bearers to represent the association at certain formal meetings.

A president and secretary has been suggested and I am willing to occupy either position, if required. I do not think we need to be formally incorporated or to establish a committee at this stage.

A number of matters are at issue which need to be tackled by Association representatives, for the benefits of the members.

GFA Initial C of A Fee of $465
(Refer to GFA Minutes of Executive Meeting 21/22 Feb - Item 6.3)

The initial or first of type air worthiness fee is relevant to the first "factory built" glider in Australia, where the CTO/A has to spend considerable time collecting and checking specifications, flight manuals and Maintenance Documents. Presumably the $465 fee is based on this exercise.

In the case of a homebuilt project of an identical nature, that is a type certified design from Europe, then an equivalent fee might be justified. (i.e. a second glider of the type might well be fully imported).
However, most homebuilts are either U.S.A "experimental", accepted on the basis of "demonstrated history of safe operation"' or a local design for which justification is by analysis and tests.

In both of these cases it is not necessary for the CTO/A to allocate any time, as the GFA Design and Development Committee is available to undertake these tests at no cost to the applicant or the GFA. Most of the inspection work is carried out (90%+) by the state RTO/A's

It should be noted that no amateur designer could afford the cost of paying the CTO/A time as a paid officer, for checking out a local design. For this reason the D&D Committee exists to provide volunteer assistance, at no cost, to the CTO/A and the Membership.

GFA Form 2 Yearly Inspection Fee of $125
This fee also seems to be excessive, given what is provided in return, and that typically small amount of flying most homebuilts achieve in a year. On the same basis the VGA obtained a lower fee of $30, for vintage gliders. The $125 fee represents the major cost in operating my own glider and at approx 30 hours flying a "year" [Actually two weeks of typical operations] is difficult to justify. Consequently I often do not carry out a form 2 every year, which means the MOBA gets even less flying. If the weather turns good I miss out and regret the decision, but it is too late by then. The lack of service, to homebuilders, is also of concern. The CTO/A gives priority to the factory built glider problems, which is understandable. But a response time of over 10 years, in the case of the MOBA and also Monerai correspondence, is surely unacceptable for any organisation.
One resolution of these airworthiness problems may be to seek the delegation and authority for the AHSA to ultimately run its own affairs, under general supervision by the GFA. We already have experienced people in the membership (e.g. Mike Burns and myself), who can cope with any technical matters, at least as well as the GFA office.

Recognition of AHSA within GFA.
The AHSA as a "special interest group" within the GFA. Contest pilots, including sports class pilots, are recognized as a group. The VGA are partly recognized and are seeking more recognition. State Associations are representing local interests, not specialist groupings, and are unlikely to understand all of our concerns.
We need to work with VGA and the GFA to establish our positions. For example, we need to work with VGA to avoid duplication, assist each other and our memberships, and promote our combined flying events.

Extended Promotion and Liaison
We seem to have excellent contacts with our opposite members in the USA - the SHA. We need to promote more contacts with the Australian HGF, the ULA and the SAAA. At least, they need to know that we exist. The same could be said of the various Universities around the country. Both German and U.S.A Universities have long experience in promoting practical gliding research and construction. There has been some important work done here under the leadership of Dr. Henry Millicer and Alan Patching. We are the experts in practical glider construction, and we should assist and future engineers to turn theoretical designs into practical hardware.

Technical Symposium and or Repair School
As mentioned in the last newsletter, I suggest that we could run a practical training school to suit existing AHSA members and other GFA members.

The school could be at Smithfield and have 3 main objectives:

a) To extend existing homebuilder's experience, sufficient to achieve GFA "minor" and "major" repair authorities.
b) To train new homebuilder's in basic construction, theory and practice. (GFA membership not necessary.)
c) To train GFA inspectors in "minor" repairs, wood and metal.

The more experienced homebuilders to act as team leaders and demonstrators to the latter 2 groups. Time is usually a problem and we need to decide how and when such a school could be organized. A full one week's course would suit me best but weekends only might be an alternative, over to you.

Publicity within GFA.
The March/April 1998 issue of AG featured a yellow homebuilt on the cover, thanks to George Buzuleac. George is always keen to attend gliding events, and AG is always looking for news and photos. Unfortunately they screwed up our information on page 42 and used Mark Stanleys old address. The previous edition had an excellent coverage of our last AHSA meeting, so we are doing very well in the publicity within AG, our newsletter and WWW page spreads our message far and wide. Keep up the good work.
Gary Sunderland

Smithfield NAGAMBIE
31 May 1998

Attended:
James Garay
Gary Sunderland
Kevin Parkinson
Dominic Lowe

Malcolm Bennett — John and Sophie Biggs
Terry Whitford — Alex Adam
Peter Champness

James Garay opened the meeting with a brief review of the progress of the AHSA since he took over the presidency from Mark Stanley two years ago. At that time there were 20 members and $201 in the bank account. Now there are 66 members (including several overseas members) and enough money just to keep the Association running.

James has found the duties of combined President, Treasurer and Editor too demanding for one person. Of course there have been no complaints about his performance which has been magnificent but he feels that the job has grown and needs more involvement from others if the group is to grow and succeed. As a result and following a brief discussion the following office holders nominated and were elected:

Gary Sunderland - *President*
Peter Raphael - *Secretary*
James Garay - *Editor and Treasurer*
Terry Whitford - *Assistant Treasurer*

Gary Sunderland then spoke about the potential of the AHSA group and proposed a number of projects which could be undertaken by the AHSA. The first is to raise our banner within the gliding community since we are almost invisible at present. With a membership of 66 and growing we have approximately a similar level of interest within the GFA membership as open competition pilots and sports class each of which gets considerable assistance from the GFA.

Other projects include:

1. Seeking a reduction of GFA fees for; initial C of A (currently $465). Form 2 yearly inspection ($125) as current fees seem out of proportion to GFA contribution. The Vintage Glider Association already negotiated at reduction of Form 2 fees to $30 for their machines.

2. Extend our current liaisons and associations with like minded groups which include; the USA Sailplane Homebuilders Association, TWITT (the Wing is the thing- a USA group interested in developing and exploring the potential of flying wing designs), the Wusserkruppe museum in Germany, the Vintage Gliding Association. New glider design is a particular interest of Gary's and probably also for many of our members. There are four members currently working on unique designs of their own and we hope to learn more about their projects soon! Association with Australian aeronautical schools and their students is also on the agenda and perhaps we could offer some practical building experience and assistance to students who propose interesting designs.

3. Development of practical inspection and repair skills amongst our members. Practical training schools for Form 2 inspection and minor repairs are on the agenda probably starting toward the end of this year. Keep a watch out in the newsletter for announcements. Gary is also running a week long course for form 2 inspectors at Bacchus Marsh in October this year.

The proposals are very ambitious but Gary has made a very big commitment to the AHSA which has included canceling his Private Pilots License and resigning from committees and rosters in his club at Bacchus Marsh to make time for AHSA priorities.
Members may also not be aware of the GFA Design and Development committee (consisting of Gary Sunderland and any other members he may co-opt to assist) which is ready to assist members with their design or construction problems. If you have a design or a problem get in touch. There are people who would like to help you!

Further discussion included the possibility of a social program at the next AHSA get together . Sophie Biggs said she would enjoy some company so why not bring your partner next time. Hopefully there will also be glider flying as well with the Smithfield club so we can remember what it is all about!

Finally I should mention the building projects underway. There are at least 2 Woodstocks and a Duster under construction and a Windrose is at test flight stage. That compares very favorably with the number of new factory built aircraft coming into the country at present. If you would like to learn something about constructing your own glider lend a hand to some one who is building one. How many kits are currently in storage around the country? Maybe all of these projects could be brought to flying stage. That would really be something to be proud of!

Peter Champness

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We have new members to welcome to the association.
Boz Ilic - Coral Rd.Woolooware. NSW 2230.
Richard Street - 247 King St. Hamilton. Vic. 3300.
Welcome Aboard! We look forward to a long and mutually satisfactory association.

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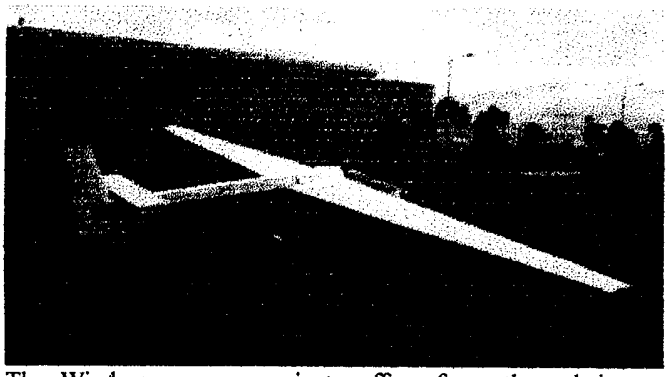
Address all Correspondence to

James Garay
3 Magnolia Ave.
Kings Park
Victoria 3021
Australia

VH-UIL SO NEAR YET SO FAR!
By Paul Johnson.



The Windrose as a project suffers from there being no drawings covering either the engine installation and cowling or the harness attachments. Both of these have consumed many hours of thought and procrastination.

After wasting what seemed like a large portion of my life trying to solve the "exhaust " arrangement, I decided to concentrate on completing the project as a glider first (engine and prop fitted and with a "dummy " exhaust). A couple of weeks before Easter I was ready, or so I thought.

Weight & Balance
Carried out the week end after Easter.
(Awaiting results but assured all was OK)

First of type inspection
Carried out on the 7th of May.

Form 2
Carried out 21st of May (subject to harness proof load and fitting of appropriate placards).

So far so good eh!.. Well...not quite.....
During the First of type inspection Jonathan Shand expressed concerns about the harness arrangement that I had come up with and we agreed that I would have to change the top support bracket to a new design and that I would need to test the harness to 9 G prior to a permit to fly being issued. Several other changes in regard to the engine installation were also suggested (stage 2).

An Engineering Order (EO 98-2) was raised detailing the loads for plus 15 G and the accompanying letter suggested that I had 2 options:

1. Apply the plus 15 G loads as an actual test.
2. Carry out an engineering design study on the mount to comply with a plus 15 G load.

Today I received from Jonathan an Approved Modification (MOD 98-1 which details the redesigned lower harness attachment points the main feature of which is a solid ¾" 4130 steel rod which passes trough the bottom beam of the fuselage and to which both harness fittings attach. Unfortunately this will see me cutting the fabric without the wheel ever having left the ground.

Speaking of leaving the ground. I was "quietly" ringing around to see if I could find a strip" out of the public gaze " to carry out a couple of "ground handling" tows when much to my SURPRISE the voice at the other end of the phone said:

"I don't know much about gliding, I'll put you on to Mike Valentine, he knows about gliding".... He sure does...!
Mike was sympathetic to what I was wanting to achieve. Jonathan however was much less so. No ground handling auto tows nor any other auto-tows would be agreed to until the harness fittings were reworked and the other administrative matters were finalised. ie. only on the day when a permit to fly could be issued.

The good news is that I survived the suggestion to the "trouble and strife" that we eat only bread and butter for a week so that I could buy that 4130 rod.

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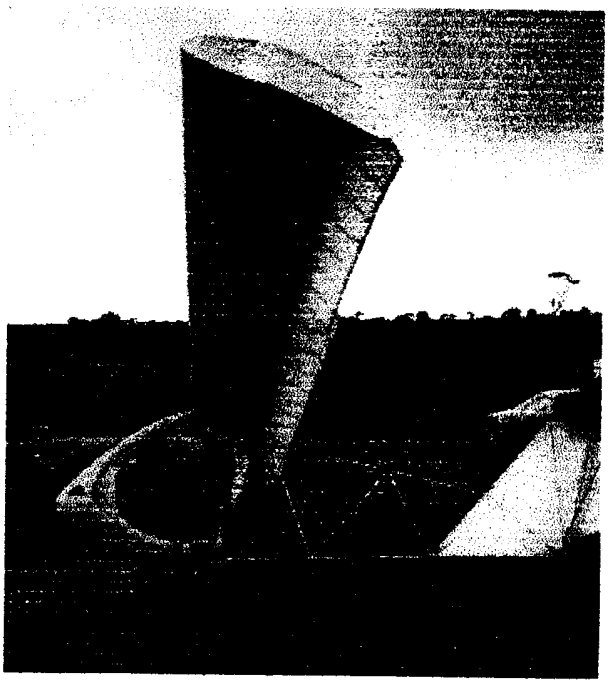
H-111 Hippie
By Emilis Prelgauskas



Design: Ursula Haenle. Germany
Construction: Mixed wood, FRP,and steel tube.
Category: Not VH registered ultralight single seat glider.
Design Philosophy: Ursula Haenle (wife of the founder of Glasflugel sailplane manufacture) operated her own sailplane manufacture company "Star & Flug". The company turned out small production runs of particularly sailplane types, best know for producing the fully aerobatic H-101 Salto. The company intended to produce a 2 seater H-121 Globetrotter but went insolvent before the prototype flew. The company also did a lot of repair and maintenance work, including a one off 15.6 m version of the Salto.

In among all this the company became interested (like others before and since) in a glider which could act as transition between hang glider and sailplane. Start & Flug went back to the SG-38 primary and laid out a modern replica including laminar FX wing section and lighter construction using modern
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materials. The intention was for a slope sorer capable of foot launching.

The inherent drag of an open cockpit/wire braced airframe however meant the original prototype (8m and 9m in span) grew to 10 m span before going into production. About 3 dozen H-111 were built and went all over the world, with few remaining in Germany. They were built in 2 variants, about halfway through the production run the "gate " type fuselage was simplified.

The glider shown above is owned by Geoff Lloyd, 61 Reids Rd, Highbury S.A. Original flown at Blanchetown with the Scouts Gliding Club off autotow alongside Cleve Gandy's Zoegling replica. Was stored for many years, receiving a lot of damage. Rebuilt in 1996 and now based at Monarto with the Adelaide Hills Soaring Group. **Basic layout:** Empty weight 48 Kg.

Parallel chord wing with timber main spar, with 200mm wide FRP with carbon fibre bracing wing box section glued end to end to form the D box, marine ply ribs aft of spar with fabric covering. Control surfaces with FRP circular spar and marine ply ribs, fabric covered. Aluminium boat mast struts. Wire braces from fuselage nose, mid section and tail top and bottom to wing at struts.

Fuselage in 2 sections. Front formed FRP pilot pod with integral Tost nose hook, rudder pedal Yoke and top hung control column. Aft fuselage and tail steel tube covered for "fin" section below a T-tail with struts.

Construction focus - with the lightweight structure, it was easy to distort the airframe with fabric tensioning. The ailerons have in built wash out which can be altered by fabric tensioning. The marine ply ribs proved in service to be subject to vertical splitting, resulting in loose trailing edges. Gussets are FRP cloth glued on.

The FRP factory skid proved impractical and was upgraded to a steel sheet skid, despite the increase in empty weight. The D-box sections are a very neat way to develop a parallel chord wing with only a small mould required. The moulding forms the skin surface and "rib" downturns at both ends in one operation.

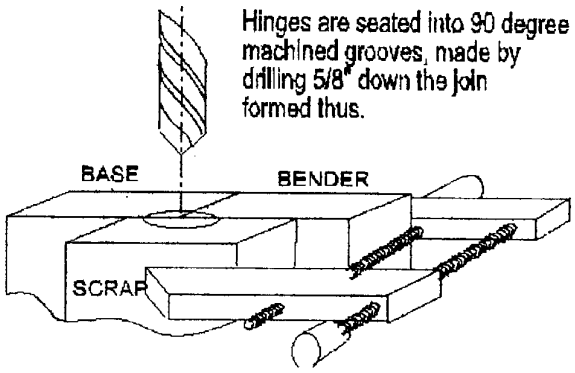
The overall structure is more "flimsy" than we are used to in sailplanes, and the cockpit side placard says (in German) - "This device is not aviation approved".

The Adelaide Hills Soaring Group Inc. through its workshop activities, has over many years accumulated a great deal of stuff, much of which can have use in homebuilt projects. Some of this came to us as a result of the closure of Edmund Schneider manufacturing works, and includes timber and steel tube components for the ES sailplane types. This includes main spat footings, control rods, rudder pedals and control columns, and laminated tail skids. Much of this still in boxes which haven't sorted. We also have our own projects underway (Trevor Smart's " Tern" and the remains of Ka6 VH-GHA), and the prompting to get this stuff sorted would help us get our workshop in order.
For more details contact. Emilis Prelgauskas (08) 85344011.
Gliding field- Monarto South Australia.

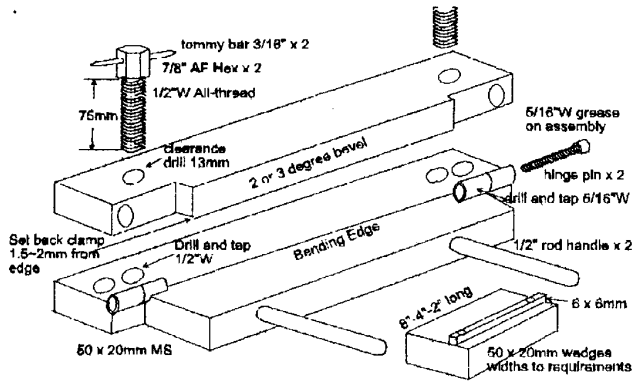
HINTS & TIPS

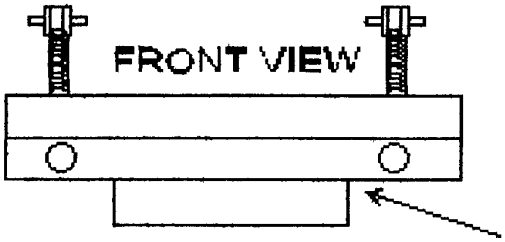
A SIMPLE SHEET METAL BENDER
by Drew Diamond
(Article courtesy of Melbourne Society of Model and Experimental Engineers).

Here is an idea for a simple bender, which (I hope) should suit many of the which light routine bending jobs around amateurs workshop. Because of the nature of things, off the shelf and scrap box materials for instance both metric and imperial are used. I apologise if this irritates you. A bending width of about12 inches (305mm) was chosen because, upon placing a rule to my recent projects showed that a bender of that capacity would have done the job.

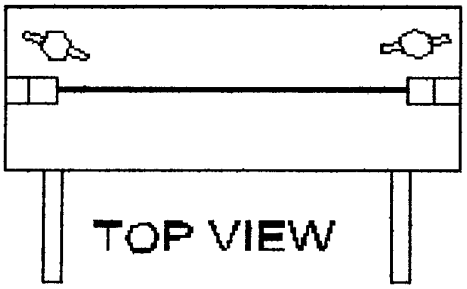


Plain right angle bends are obtained using the top clamp as shown in the drawing and flange style bends, typical in box construction, are obtained by rotating the top clamp through 90 degrees and using an appropriate wedge or wedges. My wedges are (arbitrarily) 2" 4" and 8". By using wedges singly, or in combination, various widths can be accommodated. For bends that are slightly longer than a wedge, or combination, it is not necessary that the full length of the bend be supported, gaps of less than about 20mm are not usually a problem. Of course, additional wedges can be easily made for those special jobs as the need arises. Rectangular section MS bar was used for the 3 main components, which are; base, top clamp and bender. The working distance may be slightly larger than my 12 inches. To produce nice sharp corners, the bending edge must bear directly upon the material with minimal gap, so the hinge axis must therefore pass along the bending point. The hinges are made from 5/8 diameter MS rod, The segments are each 1" long. In the lathe; drill two segments to match the shank diameter of your two high tensile Allen bolts 5/16W is suggested. The other two segments are drilled and tapped to suit the bolts. Drill and tap each of the threaded segments as shown for a 4 BA recessed grub set screw, which lock and prevent the hinge bolts from loosening during use. Fabricate the top clamp, base and bender components as shown.





Weld lug under base for fixing in bench vice



To counter the spring effect when bending sheet, the top clamp and wedges should be filed or milled to a slight bevel of 2 or 3 degrees. Drill the four top clamp bolt holes to tapping drill size first, then, to preserve alignment accuracy, align the top clamp onto the base and "spot" through for the two configurations. The relative position of the holes are shown pictorially. The actual placement depends upon individual choice - but remember to offset them by an appropriate distance so that they don't clash; 5 or 10mm is suggested. If using 1/2" W all-thread for the clamp bolts, clearance drill the top clamp holes to 13mm. Drill and tap the corresponding holes for the clamp bolts in the base.

I don't have a mill, so how to machine the seats for the Hinge segments? Use the drill press. The top-clamp, base and a scrap of the 20 x 50 is firmly fixed with engineers clamp (shown in the drawing) and an additional G clamp (not shown) at right angles to the engineer's, and the assembly clamped to a right angle bracket fixed to the drill table, with the bottom of the assembly resting on the lower table. Carefully check that the axis of the assembly is at 90 degrees. In stages, drill to 5/8 diameter, 2" depth to accommodate the hinge(s). The additional depth of the seat cut-out (which perforce results in the bender component) may be used to advantage later as an extra place to weld, and thus improve the strength of the hinge. Drill the holes for the two handles, which may be welded, or preferably, interference fitted into the bender.

When ready to weld the hinge segments, align and clamp the hinge assemblies, complete with hinge bolts inserted (dry) onto the base and clamp as shown. Tack weld the segments first, then test that the bender operates smoothly through 92 degrees. If satisfactory, weld the segments in position. Keep in mind at all times which parts need to be able to rotate and come together in operation.

The heads for the clamp-down bolts are made from 7/8"AF MS hex. A length of about 2" is suggested. In the lathe, drill to about 1 3/4" depth (that is , not right through) . Tap to suit you all-thread. Clamp the job in a machine-vice , then cross-drill through the head and all-thread, to accommodate the Tommy bar as shown. Hint: drill small pilot hole first, then follow with a drill which is just 1 or 2 this. under the diameter of you Tommy-bar diameter; drill to depth about 1/8" short of half way (use the depth-stop on the machine to prevent the drill going too far(. Reverse , and do the same. Drive the Tommy-bar through the hole. The small undersize segment in the middle will keep the Tommy-bar firmly in place, and prevent it falling out, and also keep the from turning in the head. In actual operation, a 7/8" AF spanner should be used to pinch up the clamp bolts after hand tightening.

The 1" diameter spacers are optional. Without them, in plain bending there would be rather a lot of bolt thread projecting below the base, so a pair of spacers saves in adjustment times etc. In the lathe drill through to clearance (13mm) for each .

Weld a suitable lug onto the underside of the base for fixing the bender in you bench vice. Upon assembly, apply a blob of grease to the shanks of the hinge-bolt ,pinch up the hinge bolt just sufficient to obtain smooth operation consistent with minimum lash.

Finally tighten the set-screws. Place 1 Or 2 centre-punch marks immediately adjacent to the set screw to cause some hinge metal to spread across the top of the grub, thus locking them in place. The wedges shown , again were arbitrarily chosen to suit my past and projected work, however they may be made to any reasonable preferred height and width depending upon your particular . The stops are necessary to retain the wedges from being forced backwards during bending, the clamp alone is incapable of preventing this undesired effect.

A couple of things I wish I had thought of during construction: most of the aluminium and brass I bend is in the range of perhaps 1 to 2 mm. There is no adjustment for material thickness in the wedge configuration. Two ranges of thicknesses may be accommodated simply by offsetting the top clamp bolt-holes by an appropriate amount and turning the top clamp around in actual use, and secondly the base lug under the base could be extended the full length of the base thus providing extra strength and additional resistance to bowing of the base during heavy bends.

Finally, a safety hint. Once when lifting the machine out of the vice the bender accidentally flopped down and closed on my fingers, which naturally were underneath, no damage was done but it hurt a bit. When inserting or removing the device therefore, make sure the bender is in the down position and keep fingers away from the bending edge.

SHOP TALK

HOMEBUILT GOLDEN EAGLE.
THE FIRST 60 YEARS INSPECTION.

By Alan Patching.

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

In September 1937 a young Geoff Richardson took his own designed and Homebuilt GOLDEN EAGLE for the test flight at Laverton, Vic.
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 rigors of time. All I can say is that is a 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 know 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 the 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. South Australia.

STRENGTH OF THE CASEIN GLUE.

The test data available from England only covers about 40 years of testing, and furthermore as everyone knows Geoff had made his own glue since it was not commercially available in 1934 when he started building.
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, and Geoff's 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 IS 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 contracting the CSIRO Division of Forest Products I learnt that Casein spreader had been used with the synthetic glue resulting in not enough glue, and even when new the plywood was no stronger. This p[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 structure there are no drain holes in either the wing or empenage, since Geoff does not believe they are required! Also the construction of the trailing edge makes their insertion a very hard task, and their effectiveness doubtful. The plywood covered fuselage does have drain holes at strategic locations. Some water damage was found after removal of the fabric at three 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 seven places. Lower skin 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

Wings. 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.
Aileron Trailing Edges. Over the years these had become 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 skid 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 a 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 fittings and bolts could have gone back again for another 60 years. They were cleaned and painted with a Epoxy primer along with all 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 fitting had been removed along with the fuselage fittings during the 50 years inspection, and so were left untouched for this inspection.

COVERING AND PAINTING

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 as 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 finishes. I am no expert but offer the following suggestions as a result of my experiences.
Firstly, it is essential to paint all 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 doped cotton. In the USA all ribs are stitched including top surface and rudder. In gliding we seems 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 a reaction and look at their hands. I used barrier cream, overall,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.
The 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 wingtips and rudder, gray, two shades of blue, and a bright green 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.

DATA

	As built	*1997*
Starboard wing	86	91.5
Port wing	86	89.7
Tailplane	20	18
Rudder	5	4.8
Wing Struts	24.8	24.8
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 a 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 60 years.

FOOT LAUNCHED GLIDERS

Part 1: Otto Lillienthal

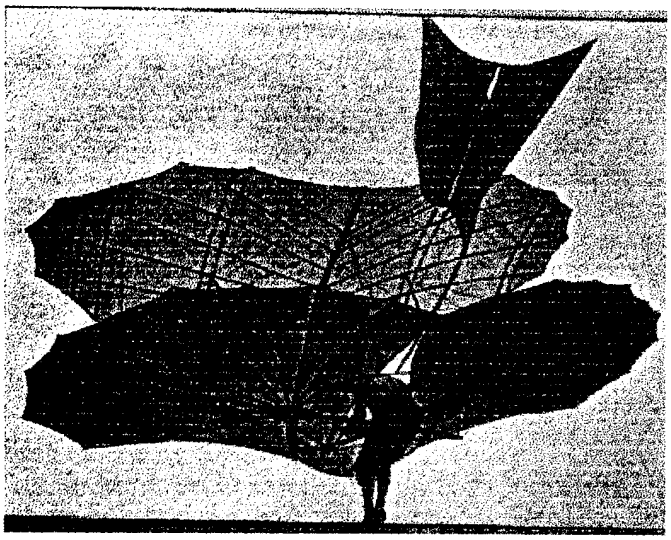
By Dr.Peter Champness

The first successful aviator was Otto Lillienthal (1848-1896) who designed, built and flew a number of foot launched gliders between 1891 and 1896. Prior to this a single gliding flight had been achieved by Sir George Cayley in 1853. Cayley designed a boat shaped glider with wheels supported by a kite shaped parasol wing. He declined to fly it himself but ordered his coachman on board and sent him skimming over a valley. The coachman is said to have been terrified by the experience and should be regarded as a passenger rather than a pilot as there is no evidence that he had any control over the machine.

Otto is said to have made over 2000 flights (although other references put the number at over 200). His gliders (both biplane and monoplane designs) were remarkable because they actually look as though they should fly and incorporated all the modern features. Construction was light weight, consisting of a single layer of fabric stretched over a frame of radiating ribs (similar to a bat's wing) and with a slightly cambered aerofoil. The wings, of relatively short span, were wire braced above and below. The wings were rigged at a shallow dihedral angle for lateral stability and an elegant tail was placed at the back. The tail boom however is a very thin and flimsy affair with no apparent bracing. Flexing of the tail may have contributed to Otto's crash

~~~ PAT KEDGE TO RETIRE ~~~

The GFA Secretary Mrs P. Kedge is retiring on the 3rd of July '98. She has been very helpful to our Association and we will certainly miss her! We wish her all the best in her retirement in the company of her family and friends and we hope one day you will be soaring with the eagles... All the best for the future Pat!! On behalf of all the members of the Australian Homebuilt Sailplane Association.



Otto's gliders were controlled by weight shift. This method of control is quite effective, particularly at slow speeds. Otto appears to hang from a transverse strap under his armpits and swing his body by gripping two handles attached to the glider framework. The sitting posture shown in the illustration suggests that Otto may have devised some sort of swing seat. A swing seat or harness increases the power of the weight shift method because the body's centre of gravity is located at about the level of the hips. With a swing seat the leverage for moving the centre of gravity is greatly improved compared to swinging from the armpits.

The weight shift method of control is fine so long as the aircraft attitude is near to horizontal with a positive G loading. If the G loading is negative (or near zero) such as may occur with a severe down draft, vertical dive or inverted flight the control effect is completely lost. In 1896 Otto Lillienthal was fatally injured when his glider was hit by a gust of wind and crashed. His last words were reputed to be "sacrifices must be made"!

If the weight shift method is ineffective in certain flight conditions then weight shift gliders must include aerodynamic design features which ensure stability such that the glider will right itself from unusual attitudes. Otto's gliders had the necessary elements such as dihedral, a vertical fin and horizontal stabilizer. The tail however was carried on a very slender boom with rather tenuous connection to the mainplane. It may be that the tailplane twisted in flight or even broke off before he crashed into the ground.

Otto Lillienthal was the first successful aviator. He wrote a book about his gliding endevours and his flights were widely publicized. His work was the inspiration for other aviators including Percy Pilcher, Octave Chanute and the Wright brothers.

A little bit of Gliding in Australia.

By Allan Ash.

The first Australian glider and aeroplane pilots did not get into the air until several years after the first successful flights in the USA, Britain and France, but there were Australians who were dabbling in fly as early as 1850, when the population of the entire continent was less than half a million.

Lawrence Hargrave

One of the pioneers of aviation in Australia was Lawrence Hargrave. Though he never piloted a glider or aeroplane, he laid much of the foundation for flight by man and, as such, is worthy of mention here.

Hargrave was born in Greenwich, near London, England, in 1850. He was educated in England and came to Australia with his parents at the age of fifteen. He completed an apprenticeship with an engineering firm and employed his skills as a ship's engineer on several scientific expeditions to New Guinea.By these means he was able to develop his interest in the natural sciences.

While employed as an assistant astronomer at the Sydney Observatory (1878-83), his principal task was to measure doublr stars, but his spare time was spent in contemplation of developing a method of harnessing wave power to propel ships. His studies in this area took him into the realms of animal locomotion, especially the movement of fish and snakes. He was aware that his " Trochoidal" propulsion method, as he called it, could be used to propel.. ships.. or balloons or flying machines. Flying machines rapidly became the focus of his research.

Private means now allowed Hargrave to further his experiments full time. He built several successful model ornithopters powered by rubber bands, one of which flew 120 feet. In 1885 he built a wheeled test rig to determine the weight, area of supporting surface and power necessary for the flight of a full-sized machine.

The propulsion was provided by hand cranked flappers. Needless to say it did not fly.

Next, he turned his attention to engines for his model aircraft, and this led to his invention of the rotary engine, which proved successful in model form. In 1908, the Seguin brothers in France developed a similar engine, though they claimed they have never heard of Hargrave's work. The Frenchmen's engine was developed as the Gnome rotary and became the most widely-used aero engine in World War 1.

In 1893 Hargrave flew his first " soaring machine" as a kite, and discovered the benefit of dihedral in producing lateral stability. This and other soaring machines employed the curved aerofoil which , he later found, greatly increased their lift.

Following the success of his soaring machines as kites he flew a "kite of three dimensions ' which was to be the forerunner of his cellular or box-kite, which evolved in 1894.

Hargraves found the box-kite design to have considerable lift combined with excellent stability and low drag. Linking four of them together Hargrave climbed aboard a seat slung beneath them and was raised to a height of 16 feet in a tethered kite experiment at Stanwell Park beach about 25 miles south of Sydney.

His work with kites confirmed the basic soundness of the cellular boxkite configuration for lifting surfaces, but remained uncertain of the effects of the curved aerofoil section.

To be continued...

1999 summer activities in conjunction with the Vintage Glider Association at Locksley (Victoria)
2nd January to 10th January 1999

Keith Nolan reports that planning for the 1999 rally at Locksley is progressing well.
Locksley is located on the edge of the Great Dividing Range in central Victoria offering great soaring conditions and a wide variety of tourist activities for the family and friends.
Accommodation is available on site in caravans which are booking fast. Contact the editor for details. A small clubhouse and kitchen is also on site. Hangarage is extremely limited. If the weather turns, it may be possible to squeeze in a few but the nightly needs of gliders will be restricted to tie downs outside.
For those with no accommodation , there are two excellent hotels approx. 10 km from the field. Owner of the operation - Peter Johnston has kindly reduced the cost of a winch launch to $10.00 to vintage gliders. Aerotow is also available. We hope to see you there.

Communications at the Symposium!

SECOND ANNUAL SYMPOSIUM. 1st and 2nd NOVEMBER 1998.

Please be advised and do not forget to keep the date, that on the 1st and 2nd of November (Melbourne Cup Day) we will beholding our annual Symposium.
Last year Symposium was a complete success, so try to make it this year and you will not miss any excitement.
As usual the venue will be at the Smithfield Soaring Group in Nagambie, camping facilities and catering will be available for every one wishing to attend. Guest speakers on different topics will be invited and we guarantee a friendly atmosphere.
Bring your wife, friend or girlfriend and join us. There is lots to see around Nagambie and plenty of Hotels, Motels to stay and have a good weekend.

Following the Symposium, for the rest of the week our President Gary Sunderland will be running a short course on Mayor & Minor Repairs on Gliders. More details in a separate circular to the members.

CLASSIFIEDS

For Sale: Woodstock project at boat stage with tail feathers attached. Main spars completed. Some instruments and most timber/metal to complete the project.
Comes with log book with appropriate pieces signed out.
Selling for personal reasons, but would like to see it flying, not stagnating!
Asking price AU $ 2000 the lot. Phone/Fax Mark Stanley on (08) 85413227

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For Sale: Plans for Light weight gliders.

"Monarch" Flying wing . $ 200
"Super Floater" $ 75
VJ-23 & VJ=24 $ 35 & 80
Plank EPB -1-C $ 200 (central rudder)
Note: Postage extra and more to overseas. Ring for more information. James Jensz. R.M.B. 5100. Wangaratta. Vic 3678. Ph. (03) 5725 1519 (evenings).

VINTAGE Times

Newsletter of the Vintage Glider Association of Australia
Editor/Secretary Ian Patching
11 Sunnyside Crescent , Wattle Glen Victoria 3096 Australia
Annual Subscription: AU $ 15.00

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TWITT is a non profit organization whose membership seeks to promote the research and development of flying and other tailless aircraft. Yearly subscription rates: US$ 18 inside US , outside is US $ 22 . 12 issues per year .
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"Acrifix 192" **Acrylic cement,** Peter Raphael had acquired the dealership for this well known stuff, if you want some for canopy repairs, give Peter a call he is selling it at AU.$ 15.00 a tube plus postage.
Peter Raphael.34 Ivan Ave. Edithvale.Vic. 3196 Ph. 97723929

Attention "Woodstock" Builders...here is the good stuff! "Woodstock" sailplane sketchbook illustrated construction manual US $25.Also available are drawings for simple jig used to construct various components . Package deal of sketchbook and jig drawings US$85. Overseas customers add US$ 15 for airmail delivery. Send SASE for more information to:
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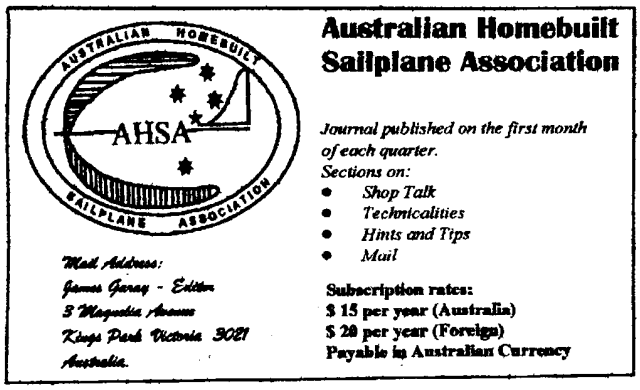

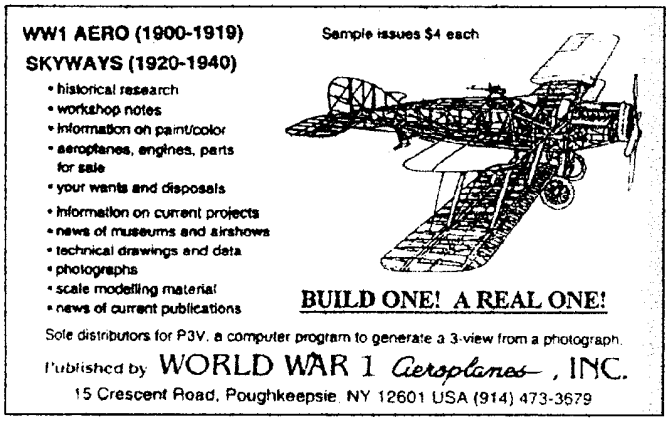

Payments may be made directly in Australian dollars to Colin A. Owers, Box 73, Boorowa NSW 2586, Australia, for Down Under members-thus saving bank charges.

BOOK REVIEW

"Personal Aircraft Drag Reduction" By Bruce Carmichael. 207 pages and illustrations contain information on aircraft drag reduction beyond streamlining. The cost US $35. Publisher:- Bruce Carmichael, 34795 Camino Capistrano, Capistrano Beach, California 92624 USA

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ULTRALIGHT SOARING NEWS

The United State Ultralight Soaring Association's newsletter is now available. Their purpose is to foster a heightened consciousness about ultralight soaring to encourage an exchange of knowledge and information making possible the growth of this sector of soaring, and to serve members in their common ultralight soaring needs.

Donations are being accepted to cover the cost of sending the newsletter: suggested amount is $ 15 for one year(may be later credited towards first year's membership dues) or you can send $ 25 for your " Founding Membership"
Please make cheque payable to:
Chuck Rhodes.
130 Los Padres Drive.
Camp Pendleton, CA. 92054. U.S.A.

The Australian Homebuilt Sailplane Association is now on the Internet!

By Eddy Garay (Web Master)

Our new home Page can be found at:
http://www.geocities.com/CapeCanaveral/hangar/3510

This new medium will be used to periodically include new information regarding our association as it comes to hand.
Thus far, it includes :

- A builder's profile - Peter Raphael and Terry Whitford's "Woodstock" VH-HNW and will shortly have one on Malcolm Bennet's "MONERAI" VH-HDF. (Please feel free to send your "profile" for inclusion)
- A list of approved (in Australia) types for home construction.
- Graphic images
- Subscription information
- Links to the Gliding Federation of Australia and other Gliding related Web sites.
- E-mail

If you have any suggestions on what else we may include on our Web Page please E-mail me (fasteddie@majestic.net.au) or write a letter to James Garay.

All correspondence to: James Garay
3 Magnolia Avenue.
Kings Park. Vic. 3021
AUSTRALIA.