THE AUSTRALIAN HOMEBUILT SAILPLANE ASSOCIATION

Volume 2 Issue 7 *Christmas Issue* **DECEMBER 1997**

G'day People !

Once again we are at the end of another year, and this is our Christmas 97 issue. Steady and slowly we are growing in members and this reflects in the acceptance of our journal, As I said before; I can not take all the credits in my favor, because this is your journal and it is you who feed it's content with letters and comments . My thanks go to all of you, and again to the servants of A.H.S.A. and specials thanks to the staff of the Australian Gliding Federation for their deference and help.

Peter Raphael your Erudite Co-Editor has been a great help and he continues his article about how to build a trailer for the Woodstock.

On the 1st and 2nd of November we had the first technical Symposium at Smithfield. Nagambie. For those who did not attend, they missed a good time with a friendly atmosphere. Try to make it for the next year . Read a complete report in this issue.

Every one is telling me that the journal is pleasant to read, with a diversity of topics, and they suggested if it could be printed every month. My response to this is a rotund. NO !..(But if they **feel** they could manage this, then OK) Editing this journal is very demanding and do not forget it is voluntary work for every one involved.

As a member of A.H.S.A. we have a very good writer with a peculiar style, he has been writing for several journals in Australia and around the world, his name is William Wood, Look at page 12 for his new theorem.

" The Christmas season is a very special time of year. The perfect time for wishing joy to those we hold most dear "

Merry Christmas and a Happy new year to all the A.H.S.A. members from James, Peter, Vicky, Eddy, Sergio, And Miss Pebbles.

James Garay

Inside This Issue ☞

MAIL BOX

Dear Ed,

Thanks, I have received the information on WINDROSE etc,etc. I wonder if you could help with information on the BLUE WREN (NZ) also I think you might be cheating yourself $25 less $15 less $2 is $8 credit not $13..! Looking forward to your next Newsletter.

Yours faithfully. J.G. Fleming.

Ed's Note.. Yes! John you are quite right $25 less $17 is $8. Being the humble Editor for the Associations Newsletter, I think I am going senile in the early stage of my life due to the arteriosclerosis taking possession of my body and not allowing me to think properly in my earlier youthful age of 95!?!

Dear Ed,

Sorry I've not been doing much on Woodstock issues the past five or six months. Our newsletter wasn't getting published very consistently this past year and I quit writing articles as they weren't being used.

I appreciate all the information you passed along regarding the tailplane modifications. I noticed they looked like your original copies and feel badly I didn't return them sooner. I forwarded everything to Janice Maupin, she was to make copies of the stress analysis and other items and return them to you. Jim Maupin Ltd. will offer copies of the modifications to U.S. builders, or anyone who wants them. I don't know how you control this document in your system, you probably want to keep one source of approved documents I presume, so Australian builders should probably obtain copies from your organization.

I plan to continue on a bi-monthly effort with the Woodstock Builders Forum and look forward to hearing from the Australian builders. Also, if something appears in the articles that is contrary to practices in Australia, please feel free to editorialize any information you or Gary feel needs clarification or correction. It is not my intent to lead anybody down the wrong path, I've simply been recounting my tribulations in building a Woodstock, and that includes all dumb or questionable decisions I've made.
Regards and good soaring, Clint Brooks.

Ed's Note.. It is a pity you have quit your Woodstock Builders Forum. May I say our doors are wide open to your contributions. Maybe some of our cousins from "up above" can also contribute. All are very welcome.

We have a very good relationship with the G.F.A. (Gliding Federation of Australia) and through them and us, every bit of information is passed on to anyone who wants it.

I have not received any correspondence from Janice Maupin. We would like mutual correspondence with her and interchange modifications for the Woodstock. Could you please pass our feelings on to her.

OPEN LETTER TO CLINT BROOKS - WOODSTOCK BUILDERS FORUM.

Dear Clint,

With reference to your note on Finnish Birch plywood, as printed in The Australian Homebuilt Sailplane Association Newsletter Volume 2 Issue 6 September 1997 - page 7, unmarked and not graded plywood **should not** be used in aircraft construction.

Such material will almost contain defects, most likely in the core veneers where they are hidden from external inspection, this is the reason the manufacturer has not graded the plywood as suitable for aircraft use.

The Finnish factories manufacture two grades of aircraft plywood marked "GL 1" and "GL 2 ". They also make a thin ply for model airplane builders marked "Class III" which, presumably, is some what less in quality.

Any reject plywood is unmarked and consequently sold on the open market for use in commercial products but **NOT** aircraft.

Regards, Gary Sunderland.

TECHNICALITIES

REJECT PARTS.
By Gary Sunderland.

In this, and in most other countries, the person who is building, repairing or maintaining an aircraft is responsible for ensuring that all parts and materials used are suitable.

This is quite simple when you can obtain spares directly from the local agent or a manufacturer. It gets more complicated when you decide to "shop around for "cheaper" parts.

The manufacturer and the local agent can provide a guaranteed product, with an actual warranty, assuring continuity of insurance.

How do you tell if an "el-cheapo" part is good enough? Most readers will have heard of "bogus" parts which are a big problem in the airline industry. These are items which sometimes look like the real thing, but are not.

A "release note" or identification tag can also be forged as well as the bogus part and such forgeries are difficult to detect.

Fortunately bogus parts have never been a problem in the gliding world.

No crook is likely to make a fortune out of selling bogus sailplane bits!

However, we may have a problem as part of general aviation with the availability of manufacturers rejects. Most gliding people seem to be a trusting lot and tend to judge hardware on its appearance and not ask for the relevant documentation.

All manufacturers are in the business of making money. This means that any reject materials and parts from their production

process is sold as scrap. Such rejects may include bulks of timber, sheets of metal and plywood, nuts and bolts and other sundry hardware.

The manufacturers inspection department will ensure that all paper work is clearly marked as "reject" and all identification tags and marks are removed, erased, or not installed in the first place.

Where do these reject items go to? The answer is anywhere, including onto your glider if you do not take precautions.

Some years ago a two seat sailplane broke up in mid air and the two pilots were killed. This was not in Australia, but it could have been here. Examination of the wreckage disclosed that the main spar had been repaired with spruce timber from an unknown source. The Spruce in the repair looked airworthy but an "IZO D" strain-energy test, on the remainder was below limits. This short grained or "brash" timber most likely was due to the wood being over heated in the drying kiln. Presumably it was rejected at the time and tossed out or sold.

In Australia, it is up to the individual builder or repairer to use the correct specified material. The best way is also the easy way. Obtain the materials from a reputable aircraft supply house with appropriate documents. You may alternatively select appropriate materials from another source, but for this you need to have the relevant specifications and keep records of any test for the air worthiness inspector and the RTO/A.

Plywood is another case in point. All aircraft plywood has the specification stamped in one corner of the sheet, as part of or in addition to the manufacturers stamp. If the aircraft specification stamp is absent then the sheet is most likely reject and not suitable for any aircraft structure.

In many causes the external appearance of the plywood is excellent so the defects are most likely internal.

Many parts used in gliders are commercial in origin, for example, mild steel, BSF bolts in old wooden gliders and DIN cap head screws and bolts in fibreglass sailplanes. Even in such cases there is need for a deal of care, for example, Roger Druce has found that certain imported cap head bolts are way under strength as compared with the German and Australian equivalents

So! stick with your local agents and the reputable aircraft supply organizations wherever possible.

If they cannot help then you should go to your RTO/A, or the CTO/A, for more specific advice.

PERSPEX.

I.C.I. Technical information. Courtesy J. Ashford.

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

MACHINING

Machining of "Perspex" acrylic materials is of two-fold importance. Firstly, many complete articles and components can be made from perspex simply by machining –e.g. engraved signs. Secondly, cutting out, trimming and polishing are essential steps in the manufacture of all articles made by cementing or shaping perspex. Machining is therefore an important factor in all fabrication of perspex.

STORAGE

Perspex sheets are best stored on edge, with the protective paper left in position - in storage racks having a slightly sloping backboard. The compartment in the racks should generally not be spaced wider than 12 inches. Such storage allows adequate support and permits sheets to be withdrawn without danger of damage. Horizontal storage is not recommended as sheets are difficult to withdraw and any dirt, swarf or grit trapped between the sheets may damage the perspex surfaces.

To prevent deterioration of the adhesive between the protective paper and the perspex sheet, store rooms should be well ventilated, cool and dry.

PREPARATION

The paper covering which is used to prevent damage to the surface during normal handling and transit should be left in place as long as possible to protect the high surface finish of the sheet.

In flat sheet work, where the paper can be conveniently used for marking out, it can usually be left in position until fabrication is complete. Where shaping is to be carried out, however, the paper must be removed and the sheet cleaned prior to heating for shaping.

For most markets a gelatine adhesive is used to stick the paper to the perspex surface and the paper can generally be striped away by easing one corner from the perspex surface and pulling to remove any trace of gelatine remaining on the surface and this must be done thoroughly before any shaping work the sheet should be washed in warm soapy water (or preferably warm water containing perspex polish No. 3) and gently wiped with a soft cloth or pad of cotton wool.

After rinsing in clean water, excess water should be removed with a soft cloth or chamois leather and the sheet finally polished with a soft dry cloth. To preserve the high surface finish of perspex, harsh fabric should no be used and the supports of tanks and draining racks should be padded. Care should be taken to avoid picking up grit in the cleaning cloths and water should be changed frequently.

In special circumstances, sheet is supplied with paper attached by means of a pressure sensitive adhesive. Under good storage conditions such papering is best removed by rolling off on a wooden mandrel. Isolated areas of adhesive may remain on the sheet and should be removed by dabbing with the adhesive surface of the paper. The sheet can then be cleaned by wiping over with a damp chamois leather.

Under bad or prolonged storage the amount of the adhesive left on the perspex surfaces may be considerable and washing in paraffin or hexane may be necessary, followed by a wash in warm soapy

water. The complete removal of the pressure sensitive adhesive is not necessary at this stage, even though the sheet is to be shaped.

THE MACHINING SHOP

The following list of machines for a workshop to do general perspex work is arranged in the likely order of importance of the machines:

Cutting.	Band saw
	Circular saw
Drilling	Power pillar drill
Finishing	Polishing mop
	Sanding disc and linishing belt

OPTIONAL

Trimming	Router
	Lathe
	Spindle moulder
	Pantograph
	Milling machine

MACHINING

Flat perspex is an easy and pleasant material to machine because of its uniform and consistent properties and the complete absence of grain orientation. In moulded sheet some slight orientation may occur which may call for special care in some machining operations. These instances, however, are relatively rare. Machining may be done on wood or metal working equipment or even with hand tools. The conditions are similar to those required for light metal such as brass or aluminium.

Good result will be obtained with standard good workshop practice and the following generalizations apply to all types of machining.

1. All equipment should be kept in a good, clean condition and adequately guarded to ensure maximum safety for the operatives.

2. Wherever possible extraction apparatus should be provided to remove swarf and saw dust from the work and its vicinity immediately it is produced.

3. All tools should be kept well sharpened, paying special attention to the clearance angles and rakes. When grinding tools, holding them in a jig is preferable to judging by eye. In general, all cutting and machining tools should have zero or slightly forward rake as this produces a smoother and more uniform surface than do the more conventional type of tools used for light metal. Adequate back clearances are essential.

4. When machining perspex overheating of the tool should be avoided, to prevent the swarf binding on the tool surfaces. Compressed air blown on the work is a very convenient way of cooling and also it help to remove swarf.
5. The perspex should be held firmly in position and solidly supported so as to avoid chattering .

Cutting

Sawing in high speed band saws or circular saws is in general the best method of cutting perspex. Large band saws have the advantage that, owing to the length of the blade, frictional heart is dissipate before any part of the saw comes into contact with the work a second time and thus faster cutting is possible. In addition, with band saws cutting is not restricted to straight lines. Circular saws, on the other hand, are preferable for the cutting of strips and straight edges.

Band Saws

Band saws blades as used for light metals, and having 10 to 20 teeth per inch and running at speed of 5,000 ft (1,500 m.) or more per minute are suitable.

The saw guides should be kept as close together as possible in order to reduce the tendency for the blade to twist. This ensures straight cutting and longer life for the blade. Compressed air directed at the point of contact will produce a smoother cut and help to remove swarf from the work, and in addition it scavenges the saw, and by preventing swarf gumming on it, tend to lessen wear.

To be continued.....

WHAT'S NEW!

SAILPLANE HOMEBUILDERS ASSOCIATION (USA)
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PRESS RELEASE

The Sailplane Homebuilders Association (SHA) is proud to announce the publication of The Collected Works of Stan Hall. It was offered for initial sale at the SHA Western Workshop in Tehachapi, California recently, and is now for sale to the general public.

The Collected Work of Stan Hall is a compilation of all the writing of Stan Hall, a prolific author about sailplane design, construction, testing and flying. Writing in the collection encompass the 1950s into the 1990s. Stan can be regarded as the most widely read author on the subject of sailplane home-building. His very popular column, Homebuilders Hall, was published in Soaring Magazine for many years. All Homebuilders Hall columns are included in the Collected Works.

Stan Hall's writings were published also in the widely read Experimental Aircraft Association (EAA) magazine, Sport Aviation. All these articles are included in the Collected Work also, along with all articles published in Sailplane Builders and SHOP TALK, publications of the Sailplane Home Builders Association.
Also included are articles from other newsletters and presentations, including but not limited to speeches given at the SSA Convention and the Barnaby Lecture.

The Collected Works of Stan Hall is a marvelous addition to any airplane and sailplane enthusiast's library. It is over 300 pages and all profits go to the SHA to support sailplane building activities.

Copies can be obtained from the address above. Initial offering prices are $28 US Dollars prepaid to Australia. Price includes tax, postage and handling.

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We have a new member to welcome to the group. He is:

Peter J. Pilbeam. 32 Helen St. St Albans. Vic. 3021
Welcome aboard! We look forward to a long and mutually satisfactory association.

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A.H.S.A. SYMPOSIUM 1997.

By Peter Raphael.

20:00 hours on a Thursday evening and Malcolm Bennett and I are loading our syndicated Duster into the trailer for the trip to Nagambie on the approaching weekend. Nothing unusual in this you may say; but as the Duster is still incomplete, requiring top wingskins and control circuit connection before final finishing and detailing, I guess she was wondering what was going on. She was in fact destined to be the centre-piece at the Inaugural Homebuilt Sailplane Symposium being held at the home of the Smithfield Soaring Group. It had been a dream of James Garay's to initiate the first of what is hoped will be many symposiums designed to unite and assist members of the gliding movement to start and complete projects. In his own inimitable way James had enlisted the support of four knowledgeable guest speakers to lecture and discuss topics within their field of expertise, these being divided over the days. Saturday morning saw a steady stream of guests arriving and familiarising themselves with the surroundings. The morning period was dedicated to" Tips and Hints"-try saying that with a mouth full of peanuts; and the first presentation was the Vacuum Moulding Device used to manufacture acrylic top hats for Woodstock canopies. Simply put, this comprised of a hot box ,the heat source, a female fibreglass mould and a source of stored vacuum. A brief talk was given by Peter Raphael on the steps taken to reproduce the top hats and much interest was shown by those present. This was followed by a discussion around the assembled Duster along with a display of photos and defects which had to be overcome in the resurrection of this third hand project. With a little luck this airing may provide the impetus to see this project completed in the near future. After a tasty lunch of Spaghetti Bolognaise skillfully prepared by Peter Arnold, James opened the formal proceedings and introduced our first Speaker, Alan Ash. Alan is a noted historian on gliding in Australia and a former editor of the Australian Gliding magazine. He spoke on the growth of the gliding movement with particular emphasis on early home-building efforts so essential to establishing the sport of gliding in this country. We were amused by his anecdotes and his tales of what now seem to be horrific efforts to keep gliders in the air. After a brief intermission Alan Patching took the floor for a sobering lecture on the effects of fatigue in aircraft materials. Alan's first hand experience in such projects as diverse as the Comet crashes and the RMIT Janus project, instilled in all present the insidious nature of this often invisible problem. Alan provided some excellent samples of failure and his slides and videotape held the attention of his audience and drew out many questions. It was interesting to note the input that Australian research has had in determining the fatigue life of composite materials and the benefits that this will confer on the gliding community as a whole . To conclude the proceedings for the day we all adjourned to a barbecue tea with the invited guests and relaxed into the evening with more aviation related video viewing. Day 2 commenced via the "Hints and Tips" session with a demonstration of the hand planing of scarf joints by Malcolm Bennett. Malcolm made this look deceptively easy but revealed his techniques for handling the plane and explained the importance of correct sharpening of this handtool. Moving outside to where a Monerai had been rigged, Malcolm again gave a brief presentation about the origins and unique features of this homebuilt, one of which he has much experience. Another superb lunch of lasagna and salad and we were ready for our afternoon sessions. Mike Burns, proprietor of Aviation and General Engineering and former GFA Chief Technical Officer commenced his dissertation on High and Low Speed Flutter and along with some archive footage provided by GFA we were enlightened as to the potential scenarios and types of flutter one is 'likely' to experience in this game. It became obvious to all that seemingly simple alterations to aircraft structures and control surfaces could have potentially disastrous effects in the air. At the conclusion of this talk Gary Sunderland RTOA and designer/builder of his own sailplane, MOBA, took the floor to speak on Quality Control in our maintenance system with particular emphasis on the safety chain within that system. Gary elaborated on the Form 2 inspection and the Daily Inspection processes,all designed to ensure safer flying for all. Drawing the day to a close with another barbecue meal strengthened the camaraderie amongst those attending. and the general consensus was that this event had been a great success and should be repeated in the future. To the Guest Speakers, who gave freely of their time in support of our fledgling organisation, must go a resounding thanks. To Mike Smith and the members of the Smithfield Soaring Group, a vote of gratitude for the use of the facilities and the hospitality they provided. And to those members who attended this event "Thank you" for your support as it can only serve to encourage further development of these events. As James would probably say "Today Smithfield- Tomorrow Oshkosh"
PS Two Monerais, one Woodstock and a Duster together at one time must be some sort of record for Australian Homebuilt Sailplanes!

A DATE TO REMEMBER. "A.H.S.A" at Gawler 1998.

The Australian Homebuilt Sailplane Association will be attending the next rally to be organized by the Vintage Glider Association to be held at Gawler, SA, from 3 to 10 January 1998. The event will be hosted by the Adelaide Soaring Club and will celebrate twenty one year of the VGA and 50 years of operations at Gawler by the Adelaide Soaring Club.
All AHSA members and visitors are welcome. Catering will be provided on site with camping facilities and limited hangarage available.

If you are interested to join us in a no fuss friendly atmosphere drop me a few lines. Last year we had a good get together at Raywood near Bendigo.

HINTS & TIPS

TOOLS THAT WE MADE...

By Terry Whitford.

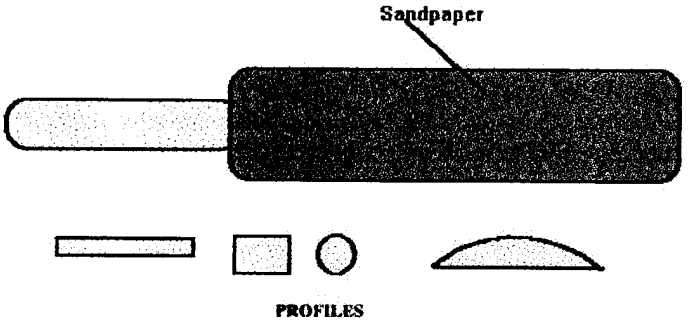
Probably the most used tools that we made and used were the simplest. We called them the wooden files or rasps and we made quite a few of them.

Whenever the task called for a sanding job that didn't fit the files or rasps we had, we simply made one that would do the job. Using the large disc sander that Pete made, we fashioned many a sanding tool that made our job a lot easier .

Shaping a piece of wood that would fit the task, we glued a piece of sand paper to it using disc cement so that it could be replaced with another grade and went for it,

Using this method, we made square, half round, round and flat files and any shape that we required and almost all the files were used throughout the construction.

In my opinion, it was worth it to spend a little bit of time and ingenuity to make our lives a little bit easier and speaking of ingenuity, it certainly helps if you have a partner or someone to talk over your building problems. Problems that may seem insurmountable take on a whole new aspect when viewed with different eyes and to that end, I recommend to anybody contemplating building a home built sailplane to join the *A..H.S.A.*, if only to get the benefit of all that experience in building.



SHOP TALK

AN APROACH TO GLASSFIBRE CONSTRUCTION.

By Dominic Lowe

'So', I thought, driving up to Nagambie in May for the AHSA meeting at the home of Mike and Sue Smith. I don't even hold a trainee's permit, let alone a full license, and I've never built anything as complex as an aircraft. But then, the truth is a good defense. It is still the truth as I write, at the urging of our editor Jim Garay, of my small experience with glassfibre. And still I hope my nonchalance will not offend you. After having two or three brief conversations up there with people who had actually build flying machines I realized that nothing I made or designed had been up to the standards of those gentlemen. There have been no badly-seated fasteners, no test coupons to betray anything less than 'clean room' contamination, no mixture logs with embarrassing temperatures, no telltale ripple confessing a badly-lapped seam. But then, I am not proposing working in wood or metal.

My experience in glassfibre started with the construction of a functional, if most unaerodynamic darkroom sink. At something less than 3 metres long by 650mm wide, powerfully secured to masonry on three sides, able to safely hold over 400 litres in the event of a blocked outlet. (I certified this myself) it will perhaps never fly. My sink is, however, a true composite, a hand lay-up of 2 layers of 6oz chopped glass mat in a polyester resin, over a ¾" plywood base and it has never leaked or rotted.

I then started to use glassfibre in several small design and sculptural projects. A couple of these, using professionally crafted wooden patterns on my plan, had highly finished outside surfaces. They owed, in terms of design inspiration, if not in reality, a debt to aircraft.

The goddess Composite had beckoned and I was her most ardent suitor. Composite construction promised a great elegance and flexibility design with dazzling lightness for strength. But not only was she light and beautiful; I thought I knew that glassfibre and other composites would enable an integration of structure and form more sophisticated than wood or metal. Embedding such things as bosses and catches in structural form seemed elementary. I read about one particular method of making highly integrated tools from complex master shapes that really caught my eye. But the washers I placed as bosses in various layers of some of my rather heavy project (ones that continued to be laid up by hand) were hard to accurately locate. They became unalienable, fugitive bits of metal buried beneath a milky film. I found that internal radii of less than about 12mm were too frustrating to build with constant thickness. I discovered that if you made a female tool from a carefully (and expensively) crafted wooden pattern and had made no allowance for springback at the pattern stage, you were doomed to have mouldings ever too narrow.

My knowledge had by this time gone as far observing that absolute precision and the repeatability acceptable quality standards in glassfibre were very greatly reliant on "operator skill" even more important than my friends and associates working in timber.
They at least have their raw material fabricated for them. But I risk boring you by recounting elementary bitter experience born of headstrong foolishness. In addition to attempting to teach you how to suck eggs, I add that my childish ambition extends to making flying wing sailplanes entirely from matched mold composites!

The design of the Horten brothers, Jack Northrop and finally Burt Rutan appealed to my sense of the beautiful and unconventional and Rutan even designed airframes of glassfibre. Immediately

attracted to the Californian's design for a motorized sailplane. I naively asked James Garay (your Editor) if anyone in Victoria had built one, or even seen one. Being the friendly and helpful person he is, James sent me a review of the Solitaire to read for myself. Sadly, I have to agree with his muttered, disbelieving astonishment that anyone would want to build one. I read later that even the third edition of **The Complete Guide to Rutan Aircraft** is lukewarm about its performance. To add to my growing tone of sour grapes, I found that you have to buy the fuselage as a kit. What sort of challenge could that possibly be ?

MORE ON COMPACT 110

By Tim Berkes

Earlier this year one of our members was seeking information about the Compact 110 superlight sailplane.

I managed to find the address of the designer from an old Kitplane magazine and wrote a few lines just to find out if the address was still correct....well it was.

Bill Spencer, the designer of this aircraft sent me a comprehensive data package, which is available for $ 10. 00 US. (Allow 3 to 4 weeks for cheques to clear). Plans are selling for $99.00 US.

Bill advised me that the first plans C-110 has been built, and flown by Tom Lowdermilk in Bradford Florida, here is what he said. "To say I am very pleased with it would be an understatement in every way. I found it a total delight in every aspect. Especially in pitch stability and aileron control. It took about the worst I could dish out and is still in one piece" (apparently Tom had few hard landings),

Bill is a software engineer and writes programs for CAD applications. He flies gliders and owned and built two Avid Flyers.

The Compact 110 has two versions. The all tube wing design and D section wing design. Both are included in the plans package. It is of aluminium construction, simple pop riveted and bolt together job.

According to Spencer it takes about 300 hours and less than $1,200.00 US to build one. It can be foot launched or towed up by an ultralight plane or by a car.

Type certification in England is in process. For further information send a S.A.S.E to: **Bill Spencer,** 20 Stones Drive, Ripponden, Sowerby Bridge, West Yorkshire HX6 4 NY England.

An Ode to Home Building

(Or will I still be married at the end of it)

So you want to build a glider
Well you've probably got the skill
And you've probably got the tools and things
But have you got the ***will?***

You've looked at all the types there are
and reckoned you can do it
So will you build from a set of plans
Or will you buy a kit?

I recommend that you talk to the guys
That have already built a plane.
They might point out the pitfalls
That can send a guy insane.

Forget about the builder's claim
That it can be built in a one car shed
You can double the size of the construction area
If only to fit in your bed.

Cause you'll be burning a lot of the midnight oil
As you crest each little hill
And as those hills turn into mountains
Well, we talked about your will.

But if you still decide to go ahead
And some problems rise out of the mist
Remember that there are people out there
Who are only too willing to assist.

Or you could look at a part built project
That may save you some time on the curve
But remember that the guy that sold it
Started out with your passion and verve.

And if you're starting now to wonder
If you'll ever own the sky
The best way I can recommend
Is to buy my Monerai.

Both Pete and myself have been asked many times
Was our project all worthwhile
When I sit and reflect on that very first flight.
It brings forth a wondrous smile.

We can recommend the Woody
As a wonderful craft to fly
And the hassles we had in building it
Seem to dim as time goes by.

So my thoughts on aircraft building
Are mixed, and so I'm loathe
to say just go ahead and build one
But was ours worth it. ***Bloody Oath.***

Terry Whitford

SMILE ☺

(We are getting too serious)

Mr Woo often went to Phil's Greek restaurant and always ordered fried rice. Phil and his friends thought it is a great joke to hear Mr Woo order "flied lice"
Mr Woo was sick of the taunts and asked his friend an Oxford graduate to teach him to speak English properly.
When he next went back to the Greek restaurant Phil and his friend were waiting with their taunts.

"I'll have a large serve of fried rice, old chap" said Mr Woo.
"What did you said ?", asked a surprised Phil.
"I said fried rice, you flucking Gleeck plick.

WOODSTOCK BUILDERS FORUM

By Clint Brooks.

Welcome back Woodstock fans! I've been on a bit of a hiatus from writing this column, and it's time to resume. Things have been very busy this year, and I've kind of ignored the Woodstock in favor of other things. A few people seem to be near start up on their projects, as I had a small flurry of sketchbook orders come through early in the summer.

Many thanks to James Garay and Gary Sutherland from A.H.S.A. for sending information on various modifications made to the Woodstock for certification in Australia, most notably the removable tailplane modification KD-1. I believe Jim Maupin Ltd. will offer these drawings to all interested builders soon; check with them for the details. There are a couple of articles that ran in the A.H.S.A. newsletter by Peter Raphael (Woodstock flyer) on constructing a trailer for the Woodstock. He chose a configuration that transports the fuselage on the side, horizontal stabilizer projecting up. The articles are very detailed and you should be able to follow along and build your own from them. If you are interested, I can supply copies of the articles, if you include a S.A.S.E. and a buck for repro cost.

As for the Woodstock project, the refrain "..when is it going to be done?" is getting more persistent. The truth is, I enjoy taking my time and figuring out all the detail it takes to make something into a piece of art, and have a hard time making people believe that such a project is actually fun to come home to. As for now, no completion date has been set, and you should be able to enjoy a few more articles about building a Woodstock.

At this point, the basic empennage is framed, with the fin substructure yet to be skinned. Fitting up the control stick, pulleys, release hook, wheel and brake, instrument panel, et al, can now commence. I started by bonding the control stick mounting pad to the keel ahead of sta. 30.5. I used a thickened mixture of T-88 to form a liquid shim under the 1/8 ply pad, allowing the plywood to stay flat relative to the slight curvature in the keel. When cured, a flat area is available on which to mount the nylon bearing blocks without having them tilt slightly to match the keel curvature when secured with screws. I back drilled through my bearing blocks and keel with them mounted onto the lower control stick bracket tube in the position specified on the drawing. Countersink the exterior side of the holes for Tinnerman washers, and temporarily installed the screws using regular hex nuts. Install the stick temporarily at this time too. I found sintered bronze bearings to fit the pivot tube I.D. (.381) at a local bearing supply house for 80 cents apiece. "Oillite" is a trade name for this type of plain bearing, and many bearing manufacturers supply the same standard bearings.

Next, locate and install the spacer blocks for the aileron pulleys. The two forward left and right hand blocks seemed to put the pulley at a good position to clear the frame cutout at station 30.5, and these were bonded against the lower longerons and canted floor skin with 5-minute epoxy after bonding in the floor skin doublers with T-88.

Using the drawing thickness shown for the aft aileron pulley blocks seemed to put the pulley too far inboard to match the previously drilled holes through the frame at sta 59. In fact, it wouldn't match the holes in the frame unless I left out the block altogether, but this would leave the skin and doubler bearing against the pulley. I elected to make the block slightly thicker such that with the pulley mounted against it the cable will pass through the existing cutout in the frame.

I made a dummy aileron bell crank mounted to a wood block and clamped this to the back of sta 59 at center line of the fuselage. Run heavy string from the control stick, through the pulleys and onto the bell crank on either side. This will allow you to tailor the cable runs, which will need to be dealt with when you establish your seat bottom intercostals.

Locate and install the forward and aft elevator cable turnaround pulleys to the back of sta 15.5 and forward side of the fin post. Clamp the elevator at neutral, and observe where the end of the elevator horn is. The top edge of the pulley diameter should be about even with the hole in the horn end for the cable. Slide up slightly if necessary to ensure clearance on the lowest rudder hinge as it projects through the fin post nearby. I positioned the pulley brackets with the pulley assembled on the aft side of the fin spar and transferred the 1/8" dia. pilot holes from the brackets into the fin spar. The pulley assembly is then relocated to the forward side of the spar, and pinned using 1/8" dia. wire pins. I then clamped the bracket flanges against the spar using scrap wood projected down over them and clamped against the spar in an area accessible to clamps. The two upper holes were then drilled out for full size screws, and one was temporarily installed on either side. The remaining two lower holes were then opened up to full size in the spar and brackets, and temporary fasteners installed.

The forward pulley is easier to locate in the vertical position by running string from the control stick lug, around the pulley and aft a few frames in the approximate path the cable will follow to the rear pulley, and tied off or taped to the fuselage. Move the pulley up or down the aft surface of the 15.5 frame to equalize the swing on the stick lug, and inboard or outboard to put the string on the aircraft center line for the inboard side of the pulley. Mark the location of the lower bracket on the frame, and then clamp the bracket against the frame at the location marked. I had provided 1/8" dia. pilot holes at all fastener locations in the fittings, and these were used to pilot drill through the frame, then opened up full size and temporary fasteners installed. The pulley and upper bracket were then assembled onto the previously installed lower bracket, and the upper bracket clamped to the frame. Pilot, then full size holes were drilled in the frame and bracket, and fasteners installed.

Run a string from the stick forward around the elevator pulley, through the frame cutouts aft to the rear elevator pulley, and then forward to the stick again. String two assembled pulleys onto the string in the bay between 30.5 and 47. Pull the string slightly tight, making the string stretch when the transition pulleys are test

located. The tension will pull the pulley brackets into position, which is necessary to gauge the correct orientation of the mounting block surface. This prefitting of the mounting blocks takes a lot of time to get right, so don't rush it. Study the drawing layout of the pulley installation and you will see that the tension in the cable should be taken up by the pulley with the axis of the pivot tube normal to the force vector applied by the cable as it turns the corner at the pulley. Note that the axis of the pivot tubes of both pulley assemblies are parallel, and this appeared to work out O.K. on the installation. This clue gives you an obvious starting point for positioning the pulleys. The center block is easy to position on the keel, just check the height by observing the string elevation above the keel through the range of stick motion. I ended up with a 3/8" thick block, onto which I bonded 3/32 thick plywood bosses under the ends of the pulley pivot tube.

The offset pulley is a bit more work; determine the location for the offset pulley by positioning against the forward side of sta 47 frame and up enough to allow the string to pass through the cutout in sta 47 and 59. I ended up with a filler block 5/8" thick that was bonded to the canted floor skin/doubler and against the forward side of sta 47 frame. Pilot holes were then drilled using the pulley bracket as a guide, while held in what appeared to be a best fit based on the string tension. Drill one hole, pin, drill the second hole, and pin. Do the same for the center pulley. With the pulley locations established, closely observe the action of the string while moving the stick, watching for how well the string tracks in the pulley groove. I fine tuned the attitude of the offset pulley by packing different numbers of thin washers under either end of the pivot tube. These washer packs were measured for height, and I made a single tapered wood shim which matched the thickness of the washer packs as the slope of the shim passed through the hole center lines. This was located over the holes in the 5/8 thick block, and locations marked for both ends of the tapered block. I cut the center of the shim out, leaving a tapered boss for each hole, which were bonded to the 5/8 block at locations marked previously, and back drilled when cured.

At this point, you are ready to develop and locate the keel intercostals. I decided to let the elevator cable somewhat determine the lowest point of the seat. Both the elevator and aileron cables need to be pulled down to clear the bottom of the seat.

I made templates from 1/8" thick press board to start, fitting them between frames 30.5 and 47, which is where your derriere is positioned. I scaled the drawing side view to get an approximate starting configuration, and gradually fine tuned it as I proceeded. After establishing the 'vee' for the seat crease, I ended up with the final location projected onto the side skins just at the top of the lower longerons. Don't project anything at this point until you are happy with the fit for your body size.

Bond all the 1/4" square blocking for the intercostals on the frames and keel, resulting in slots into which you can slip the press board templates. This done, I used scrap plywood for a temporary seat bottom, and tested the fit. I did end up altering the position of the 'vee' to a more forward position. At this point, things felt reasonably comfortable, with a scrap board clamped across the upper longerons at approximately where I felt my back should be.

I went ahead and fabricated the 1/8" ply intercostals, making the cutouts in the web, and also the cutout for the aileron and elevator pulleys. The remaining blocking was bonded to the intercostal webs and upper edge, which allowed everything to seat into the slots and butt against the blocking on the frames and keel. Dry fit all the intercostals into the slots formed by the blocking, and project the seat profile onto the side skins using a straightedge laid across the intercostals at right angles. I developed a series of points on the side skins, to which the upper edge of the blocking was positioned. Use small staples with scrap ply blocks on the exterior side to clamp the 1/4" square blocking to the side skin while bonding. Don't forget the small diagonal brace under the rear blocking for the seat. Don't glue in the intercostals until you are totally satisfied with the arrangement of the cockpit with the everything at least temporarily mounted, and ergonomically sound.

With the intercostals established, you will need to pull the aileron and outboard elevator cables down slightly to clear the seat bottom. 1/4" "Nylaflow" tubing surrounds the aileron cable from sta. 30.5 to 57. I made 1/8" ply brackets which I ran the tube through. and positioned these against sta. 30.5 and 57 frames to guide the cable into the pulleys, and also on sta. 47 next to the seat belt doubler to pull the tube down and through the frame cutout at that location. These brackets were used everywhere I needed to control the cable location and couldn't simply drill through the frame. I also pulled the outboard elevator cable down on the right hand side of sta. 47, and two of the ply brackets were used on the forward and aft side of the frame to form a clevis, into which a piece of nylon tube about 3" long was installed to form a fairlead.

Check the runs for the rudder cables at this time as well. I had to make fair leads for the rudder and elevator cables aft of sta. 79 (about 12") to prevent the cables from rubbing against the inside of the skin. This may be due to the slightly wider fuselage frames creating a more pronounced transition in this area. These fair leads were constructed in the same manner used for the aileron cables in the wing, and bonded in place with tension in the dummy cables (string) to help with alignment. I also added the double 1/8" ply brackets on the forward and aft side of sta. 133 frame with a 3" nylon tube as a fairlead for the rudder cables, which were going to rub against the cutout in the frame. At the forward side of the fin L.E. cap, I added a 1/8" ply bracket to guide the rudder cables past the side of the cap and anchor the front end of the rudder cable exit tubes.

Rudder pedals were installed at this point, and I was then able to manipulate all controls with the strings. When satisfied with the control runs, bond all doublers on the fuselage frame where the cables and housings penetrate.

That's a wrap for this month. Please feel free to submit your experiences in building and flying your Woodstock.

I received a letter from Gary Sunderland advising against the practice of using non-certified materials in construction of your sailplane, where certified material is specified on the drawing. I had made mention of a source of Finnish birch ply in earlier articles, of which didn't carry a stamp indicating it to be 'aircraft grade'.
According to Gary, if it is not stamped "GL-1" or GL-2" which is aircraft grade, it is probably because defects exist in the core veneer, which isn't visible to you. The other product sold is "Class

III", which is sold for model aircraft use. All other material is sold unmarked, and shouldn't be used in aircraft construction.

Point well taken by Gary, and should be heeded by all of us. I looked at a sheet of 1mm I purchased from my supplier, and it is marked as "II", which I'm not sure fits any scenario described by Gary. In any case, if certified materials are available to you, utilize them in your glider, if that is what the designer specifies. Sources of certified aircraft plywood are found in the back of EAA magazines, as well as Aircraft Spruce, and other distributors. Overseas, I have no idea where you might obtain your materials locally. You could probably obtain them through mail order from the U.S.A., although shipping would probably be kind of expensive. I would be glad to make a note of resources in your country in this column, and also the sketchbook if anyone cares to send along the information. Just out of curiosity, would you consider buying a kit of all the wood components pre-cut and shipped to you in a box? Write and let me know if this has appeal, and maybe some form of limited kitting could be undertaken by die-hard sailplane entrepreneurs!

Lastly, a letter forwarded by Janice Maupin from Al Pickup, who flew his Woodstock for the first time last July.

"First impressions were all favorable. The ground tow did give me a "I can't believe this" moment when it refused to leave the ground. I was too busy over controlling the yaw from my wild ground track to realize I just didn't have the airspeed needed to break from the ground. I was reaching for the tow release handle to abort the attempt when the Woodstock finally leaped into the air. Everything felt normal at that point and my faith was quickly restored. Another pass down the field at the end of the 1500' rope (this time a little more into the wind) and I was ready to get some more altitude between me and that rough grass. The designer suggested a first tow at 60 to 65 mph to 4000'. I was indicating 75 mph on tow and had a little trouble with pitch. The rope kept going slack. Not a lot but enough to keep me busy. At 4000' I released and everything felt fine. I did some turns and stalls and generally felt the ship out. The conditions were such that even a brick would fly, the thermals were everywhere. So I settled down and enjoyed the strong lift for two hours and forty minutes. Not bad for the first flight. Sunday the thermals were not there so I only had my usual "drop like a rock" ride between 5:30 and 6:00 PM.

Saturday, I had been circling right in about a 60 degree bank at 4000' plus and decided to reverse the turn, rolling into a left bank. I guess I was too busy enjoying the view when the Woodstock dropped out from under me, nose down and entered into what would be a nice left spin attitude. That was an unexpected thrill and a lesson that could only be appreciated at altitude. The recovery was swift with only about a 65 mph speed build up. It did teach me to watch my speed closer. I have a bad habit of always flying too slow that I will be working to correct.

The Woodstock is very comfortable in flight sitting on the Temperform cushion. With three air inlets the cockpit is nice and cool. The view is great over the low nose with the exception that the flat wrap Lexan reflects the instrument panel. My piano wire trim device needed one more notch of up trim to fly hands off. But as it was, the flight was a "two finger" affair. I have now modified the trim to correct for this. And I also reduced the tire pressure from 40 psi to 30 psi to improve my rough ground ride. So other than being a little squirrelly on tow, it flies as expected. Again, thanks to all."

Build carefully, and I'll see you next time...

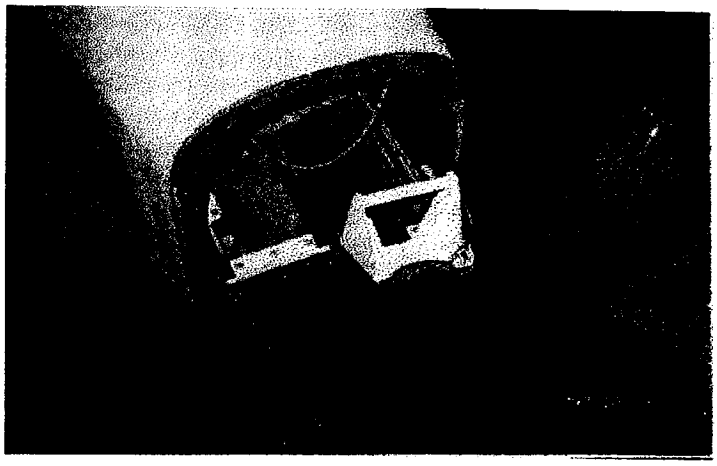


Photo 1 Rudder pedal installation with short guy provision

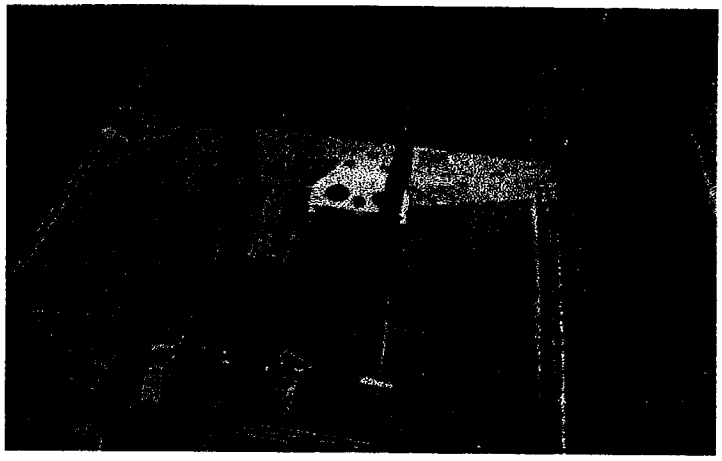


Photo 2 forward turnaround pulley for elevator cable

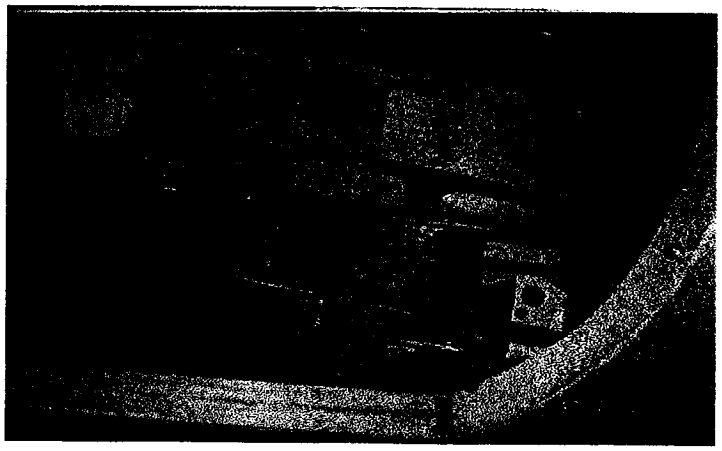


Photo 3 View into cockpit and aileron/elevator pulleys

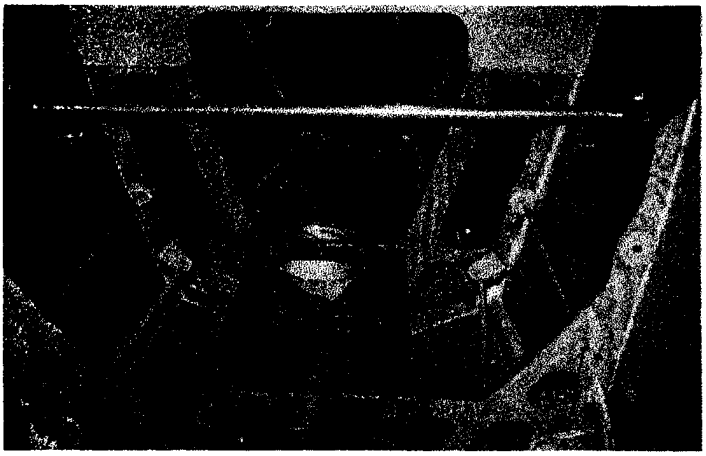


Photo 4 View looking aft in cockpit - sta 47 and 59 frames. Note plywood brackets bonded to frame for cable tubes

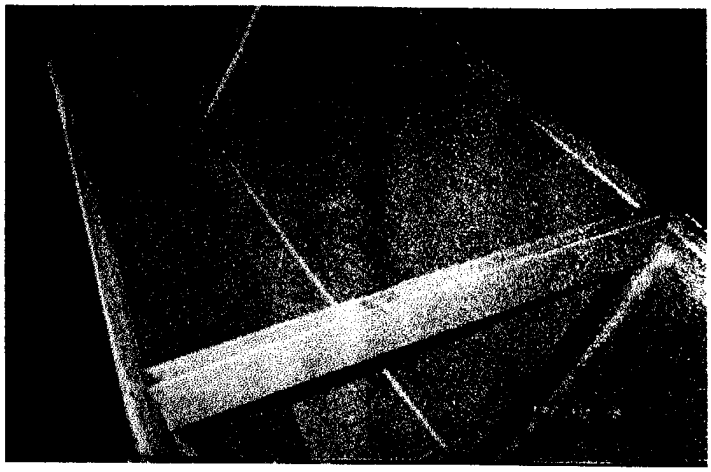


Photo 7 Rudder and elevator cable fairleads against skin. Same concept used in wing for aileron cables

Photo 5 View of aft side sta 59 frame - aileron pulleys and dummy bellcrank clamped to frame

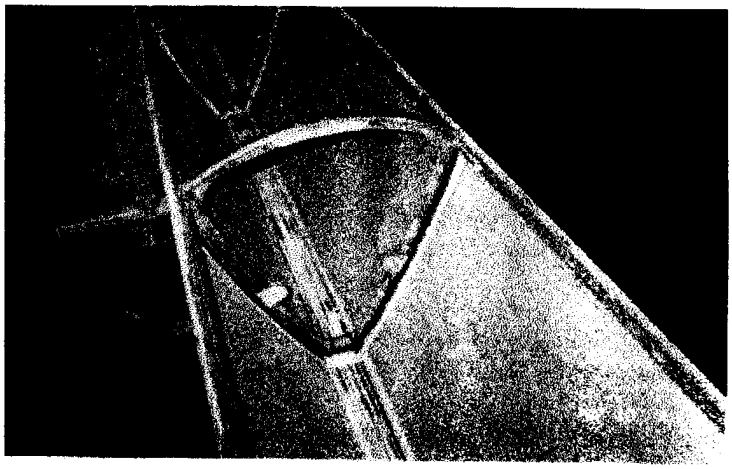


Photo 8 Same plywood brackets at sta 133 for rudder cable fairleads

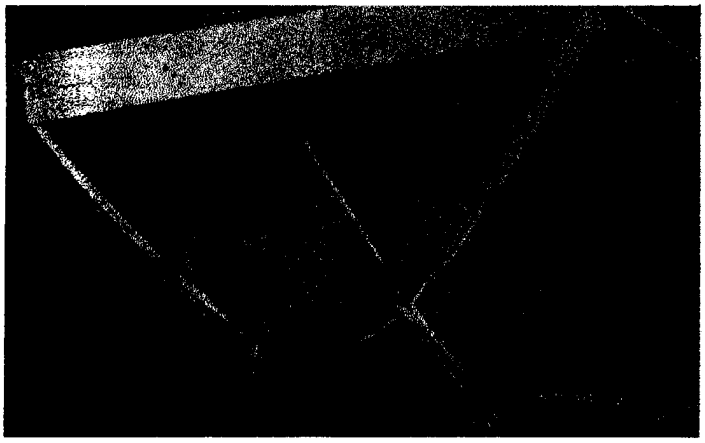


Photo 6 View looking aft sta 79 - same plywood brackets bonded to forward/aft side of frame for cable fairlead

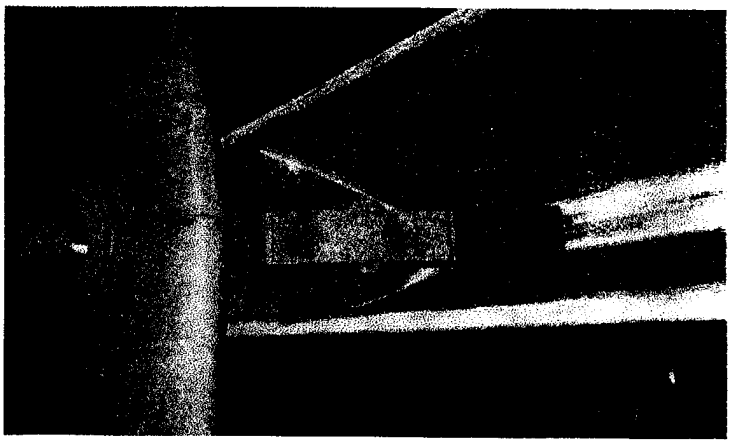


Photo 9 1/8 ply doubler bonded to fin L.E. cap acting as anchor for rudder cable exit tubes

KLAPPERBEIN'S THEOREM

By William Wood

Last month I was privileged to interview the celebrated scientist and glider pilot, Professor Ludwig Klapperbein during one of his rare visits to Melbourne, Australia.

He had recently returned from one of his many sojourns in South America, having carried out a lifetime of research into the effects of high altitude and the part oxygen plays in the human physiology.

His conclusion is that oxygen can shorten your life and too many deep breaths can be lethal. The first clue to the oxygen story came many years ago when it was realized that peasants in the Andes lived longer than their counterparts on the plains below.

Prof. Klapperbein concluded that the life expectancy of those who live at sea level, where the air is 20 percent oxygen, is 70 years. At the top of a high rise apartment block the amount of oxygen in the air falls to 19 per cent. The professor considered that the life expectancy of people who spent most of their life in a high-rise apartment was 75 years - a gain of five years!

Andean peasants, living at such a high altitude, had the advantage of breathing air containing only 10 per cent oxygen and many reached the age of 120, according to Prof. Klapperbein.

This clearly showed that living in a high-rise apartment would add five years to one's life, simply because one is exposed to less oxygen.

Indeed if it was not for a tendency among people living in high-rise apartments to fall out of windows, particularly those building Woodstock sailplanes, the longevity of this group would be even higher!
Immediately upon publication of Klapperbein's findings, the explanation for a whole range of modern ailments became apparent. It is well known that deep breathing can cause dizziness, palpitations, diarrhea and even convulsions - nothing more than an excessive build-up of oxygen at work.
Doctors have long been puzzled at the number who depart this life while jogging, but we now know that huge quantities of oxygen may be gulped in during the average jog. If this does not lead to death, Klapperbein went on, it certainly contributes to the cadaverous appearance of the average jogger. the solution to this health problem - breathe less often or breathe less deeply. With training one can cut one's breathing in half, thus doubling life expectation.
I was most intrigued to learn that Prof. Klapperbein had once collaborated with our illustrious editor James Garay, on a search in the high Andes for the legendary Umiguli bird. This fabled bird, until recently believed extinct, was so named after the agonizing cry it gives each time it lands. The reason for this is due to the enormously high wing loading and complete absence of legs.

Which reminds me of my first venture into foot-launched gliding using a design by the late Mr Heath Robinson. Failing to lower my undercarriage at the required moment resulted in severe trauma to my nether regions. Thereafter I always carried an emergency scrotum repair kit consisting of a small bottle of brandy and a staple gun. One side effect of this emergency repair was a profuse watering of the eyes!

Incidentally Robinson's glider was quite revolutionary for its time. Construction was completed over a period of three weekends using materials obtainable from any hardware store. However, I was dismayed to discover my completed craft had exceeded the designed A.U.W., coupled with a baffling C.G. problem. Unfortunately I was unable to secure advice from the designer as I discovered he had perished on a post-war ascent of Mt. Everest using a mechanized pogo-stick. It appears that as he was nearing the summit he reached into his back pack for a corned-beef sandwich, lost his balance and vanished down a crevasse. A sad loss indeed to the word of aviation in general and gliding in particular.

As luck would have it, Heath Robinson's counterpart in the USA, the noted inventor Rube Goldberg, came up with a solution to my predicament. After studying the problem for a couple of years he suggested I remove the portable shower and reposition the marble bird bath exactly two metres aft thus allowing the glider to fall within the design parameters as envisaged by Mr Robinson.
Thanks to Mr Goldberg, a great American if ever there was, I subsequently made many foot-launched flights, on one memorable occasion achieving a duration of 3-1/2 minutes, mainly facilitated by the discovery of a standing wave over the local sewerage farm.

It is interesting to note that Heath Robinson's only essay into the realm of jet propulsion was during the latter part of World War II. The Air Ministry had at that time an urgent requirement for a long-range bomber to successfully attack the Sauerkraut Silos at Peenumunde, the German rocket research establishment, using the newly developed bomb, code - named "Chubby Chappy". This fearsome weapon consisted of a 40 gallon drum loaded with high viscosity black molasses, the idea being to bog down enemy personnel attempting to utilize the rocket fuel contained in the silos.
Robinson's design was based on a quite conventional airframe of recycled match-wood, the fabric covering being of striped mattress ticking obtained and fitted by his wife Hortense. The propulsion system (subsequently adopted by Rolls Royce and Pratt and Whitney) utilized four flatulent sheep slung from pylons under the main planes and was the first practical RAMJET powered aircraft. Ever inventive, the brilliant Hortense had knitted a pair of underpants for each sheep using their own fleece.

Each set of undies included a spring-loaded flap valve which, operated by a Bowden cable from the cockpit, enabled the pilot to control the thrust.

Once of the advantages of the flatulent sheep system was that the undercarriage was already built in. A special fuel formula using stale cabbage and time-expired baked beans was found to be most

efficacious - in fact a refined mixture of these ingredients was carried by the pilot in order toward off fatigue when the occasion arose during a lengthy sortie.

Robinson kindly invited me to test the aircraft, the prototype looking rather sinister in the dawn light as it was herded out of the hanger. I found the aircraft pleasant to fly with no severe pitching at the stall, as this took place before take-off. Some sheep effluvium entered the cabin with a following wind, but this only served to sharpen the mind on a long haul. I did suggest a requirement for the provision of emergency boost and once again Hortense came to the fore. When the pilot shoved the throttle through the gate, a replica wolf's head suddenly protruded from the lower fuselage - the response was instantaneous with no spool-up lag as in modern day jet engines!

However, the project was short-lived due to problems with asymmetrical thrust and complaints from the local council concerning intermittent short, sharp showers of sheep effluent falling from a great height. As so often happens with many brilliant ideas it was left to engineers in the USA to develop Heath Robinson's design, resulting in the appearance of the very successful Boeing 707. Incidentally still used by our own RAAF to fly Prime Ministers around the globe and apparently still fueled by Robinson's original formula, judging by the smoky jet efflux!

But I digress. Readers will no doubt be interested to learn that the good professor first encountered our editor, Jim, years ago when trekking through the high Andes. The day had dawned fine with scattered light cumulus and against the stunning backdrop of towering mountain peaks the young scientist was astonished to see a small boy suspended in a harness, borne aloft by six magnificent Andean Condors. The boy, sighting the visitor, brought the vultures into a smooth landing and introduced himself, and thus was the start of a life long friendship and mutual interest in non-polluting silent flight.
The young James then explained to Klapperbein how, as a toddler he had been abducted by a Condor vulture, whose idea was to vary the diet of its sole offspring. This boded ill for the boy but fortunately the semi-fledged chick took a shine to Jim, resulting in him being raised as one of the family. He soon began to enjoy having strips of raw mountain goat rammed down his gullet, whilst the very perceptive mother Condor had rigged him out in a fine set of plumage, bound quite securely with thin, strong vines. She offered a wise injunction that he not emulate that silly young Icarus but rather use the father Daedalus as a role model!

Daily in company with his young nest-mate he stood on the edge, exercising his wings until he awakened one morning to see his Condor family soaring overhead, exhorting him to fly. Uttering the vulture equivalent of "Geronimo!" he launched himself into a steep glide, the wind whistling through his pinions as he tore down the face of the precipice. Exultant with the joy of flight (which has never left him) he reached the plains below, stalled a little too high above the surface and thumped down in a cloud of dust, breathless but triumphant.

Alighting expertly alongside, the Condor family offered their congratulations, although the father fixed him with a stern eye, admonishing him to next time flap his bloody wings! Mother interjected, saying not to be too hard on the lad - after all he's only human!

And so Jim took leave of his avian family to rejoin his own kind, eventually revealing his engineering talents and, of course, the rest is history. By the way, Prof. Klapperbein was gratified to see, during a brief visit to Jims' workshop, large bales of recycled Condor vulture feathers which were to be utilized as a covering for the fine Woodstock sailplane currently under construction. Far superior to Stits Poly-Fibre, averred the professor, and any surplus could be used for re-stuffing that old doona, duvet or quilt. Before he departed, Klapperbein confided to me that the high altitude and reduced oxygen environment James had experienced was the main reason for his present day youthful good looks, though in actual fact James has just turned ninety five, living proof of the accuracy of Klaperbein's Theorem!

Meanwhile happy landings and Hasta la vista, amigos! Vaya con Dios mi amor!

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"A.H.S.A " SYMPOSIUM
1-2 November 1997
SMITHFIELD NAGAMBIE VICTORIA

By Peter Champness

Guest Speakers: Allan Ash, Alan Patching, Mike Burns, Gary Sunderland.

Smithfield, the private property of Mike Smith (an aviation enthusiast and friend of the Australian Homebuilt Sailplane Association) is located on the banks of the Goulburn River about 10 km north of Nagambie on the Shepparton Rd. This beautiful property of 150 acres was formerly owned by Colin Hayes, the horse owner and trainer.

On entering the property I was immediately struck by the perfection of the two grass runways mown through the middle of a large field of tall spring grass. Both 2000 ft runways are billiard table smooth and covered with thick even closely mown grass that most of us would be pleased to call lawn. Later on when I asked Mike about his interest in vintage tractors he pointed a large yellow tractor of about 1930s vintage and said that he had acquired it from the late Lord Casey, who had used it to maintain his private strip at Berwick. A large grader blade between the tractor wheels is perfect for knocking the tussocks off apparently. The other tractor tows the mower followed by a roller that keeps the runways in top condition.

A large bungalow style farmhouse is sited on a small rise on the bank of the Goulburn surrounded by a acre of lawns and shrubs and next to this lies a large double gabled hangar that looks fairly new. Within are the treasures including a Lake Amphibian, a Citabria Decathlon, several Blaniks, a Bocian, a DG 200 and the homebuilt gliders.

Four homebuilt gliders were present at the symposium and these were all wonderful examples of the homebuilders art and proof if such is needed that a homebuilt glider can be every bit as good as a factory produced item and perhaps better in some respects as the homebuilder is likely to make each piece as well as he/she can, which may not always be the case with a factory item. The key is
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that the homebuilder must know what he is about and this is what we were here to find out, at least in part.
The Monerai belonging to Mal Bennett and the Woodstock of Peter Raphael are normally hangared at Smithfield. In addition there was the partially constructed Duster BJ 1B belonging to a consortium of Mal Bennett, Peter Raphael, Terry Whitford and Kevin Parkinson. Terry Whitford also brought his Monerai for the weekend.
The two days of the symposium followed a similar pattern. The morning from 10 -12 was devoted to Hints and Tips. Each afternoon was filled by guest speakers. Lunches and dinners were laid on thanks to the efforts of Peter Arnold for a very modest fee of $5. The evenings and early mornings were filled with flying of radio controlled models. Peter Raphael demonstrated a crash forced landing of his sports model into a paddock full of tall wheat. The model promptly disappeared from view and proved very difficult to find. At one stage it seemed that it might not be found until the crop was harvested which might have seen his model processed by the combine harvester and reduced to kit form again. The next morning he demonstrated aerotowing of a model glider by a scale model of the Citabria towplane, just like the real thing!

About half of the delegates had actually built a glider or at least built part of one and the rest of us had little experience. We gathered around the partly constructed Duster which is quite well advanced and had been jigged up in the assembled position and seemed almost ready to take off.

The consortium told us of how they had replied to a advert from Nowra NSW and had bought the glider partly constructed. Having driven to Nowra with a trailer it seemed a pity to waste the trip and they returned with the glider. Close inspection however showed that much of the work was unsatisfactory and many parts had to be made again. This was despite the fact that the items had been signed off by a GFA inspector! Problems included warps in the tailplane, excessive use of filler to achieve correct profiles and unsatisfactory bolts in some places. The bolts included aircraft grade AN bolts which shows that everything has to be checked carefully and nothing can be taken on trust.

The consortium bought the glider in 1992 but the original owner started work in about 1982. They hope to finish it before its 20 yearly is due. If you want to start flying next week it might not be practical to build your own glider first!

Mal Bennett later demonstrated scarf jointing of 1mm plywood using freehand planning of the scarf. This actually looked quite easy when Mal was doing it. The tricks apparently are to have a very sharp plane, to support the plywood on some sort of firm edge and to run the plane blade at 45 degrees to the edge of the plywood. Mal also revealed that he has had his plane dressed to perfect flatness on an automotive head grinding machine.

Peter Raphael demonstrated vacuum moulding of the hat of his Woodstock canopy. This must be harder than it seems because canopies are very expensive compared to the price of acrylic (perspex).

Allan Ash - The history of gliding in Australia and the Homebuilt Movement.

Alan Ash (aviation journalist, former editor of Australian Gliding and author of "The history of Gliding in Australia") is well qualified to talk about gliding in the early days. He was there in the early days! Although Alan says he missed out on a lot of good gliding because his deadlines always clashed with the good gliding weather he seems to have managed a good deal of flying as well.

Alan said "If you wanted to go gliding in the early days, first you built your own glider", just like we are trying to do. The first gliders in Australia were pretty basic machines, primary gliders consisting of open truss fuselages and wire braced wings such as the Zogling and the Dagling. Those were the only designs available at the time but the simple designs kept the building time down and just as important, repairs were not to difficult.

The first job a gliding club had to do after getting themselves together was to build their glider and after that they taught themselves to fly. This consisted of towing the glider down the paddock behind a car whilst the instructor ran along side yelling instructions to his solo pupil. First flight and first solo were the same thing! The instructor usually had little experience himself (two hours dual in a Tiger Moth qualified the chief instructor of Alan's club). Naturally accidents were fairly common with a few tragedies as well. The club members had plenty of time to discuss flying techniques whilst they repaired the glider.

Because gliding was, in a way, invented independently by each club that came into existence there was no uniformity of procedures. Every club did things their own way. One of the more glaring differences were the different signaling procedures for controlling winch launching. Some variations are still evident today. Of cause this could lead to confusion and dangerous situations if members visited different clubs.

One of the roles of the Gliding Federation of Australia has been to introduce safe and uniform procedures for all clubs. However particularly when the Department of Aviation has become involved the heavy hand of bureaucracy has created regulation for its own sake. Alan said that when he started gliding "anyone could fly anything they liked, any time , anywhere they liked at any time they liked." Mostly they did so sensibly and had a good time. Alan felt that regulation should be kept to the minimum consistent with safety and that the pilot should take responsibility for his/her own conduct. Given their way the bureaucrats would have us all sitting on the ground in the interests of smooth administration and "safety".

Alan Patching: Fatigue Failure in Aircraft Structures

Alan Patching introduced his talk by showing us examples of fatigue fractures in metal aircraft fittings including DH Vampire spar fittings. Fatigue fractures are fractures in materials subjected to repetitive alternating loads at levels less than the ultimate stress that would cause failure under a steady load. Apparently fatigue cracks are easy to distinguish from ultimate load cracks under an electron microscope. The fatigue load cracks pass between the grain of the material whereas the ultimate cracks go straight through.

All materials can suffer from fatigue fractures, although metals are much more prone to fatigue failure than wood or fibreglass. Metals after a period of repetitive stress lose more than 70% of their ultimate load strength whereas wood maintains more than

50% of its ultimate strength indefinitely after losing some strength in the initial period. If wooden structures are regularly subjected to loads of more than 50% ultimate strength they can fail due to fatigue.

The traditional method of preventing fatigue fractures has been to establish a "safe life" for a part or whole aircraft and this has usually been done by testing materials or whole structures until fatigue failure occurs. Unfortunately there is a wide scatter of fatigue lives in structures so the safe fatigue life is set at 25% of the average fatigue life established in the tests. This has resulted in many aircraft being retired prematurely over the years. However even with this very conservative approach to safe fatigue life there is still an approximately 1:1000 chance of an aircraft suffering fatigue failure during its normal service life. This would worry some of us but the engineers think it is acceptable, given the other risks in life that we take for granted such as driving cars.

Alan then detailed the Fatigue life tests on Janis Wings that were undertaken by RMIT over a number of years. A total of 35,000 hours was accumulated before the tests were abandoned due to re-organization of the RMIT. This is the longest fatigue life test of Fibreglass wings ever performed anywhere in the world. The outcome was very important for fibreglass gliders everywhere. The tests had a number of aims but the primary aim was to extend the service life of fibreglass gliders beyond the 4000 hours that had been fixed by factory estimates. At the time the tests commenced quite a few Australian gliders were approaching their fatigue safe life.

A second aim was to assess standard fibreglass repair techniques. One of the wings was deliberately damaged with an axe at several points and repaired by three different people. In the end none of the repairs showed any cracks in the duration of the tests. Thirdly the fatigue cycles used in the tests were validated by flying a real Janus under representative conditions including competition, aerobatics, training and general flying at many sites in Australia. RMIT purchased a new Janus for this purpose.

The tests were outstandingly successful. Most of the damaged occurred at the spar wing root fitting, which tended to come loose from it's surroundings. This was repaired a number of times. Fortunately the cracks were clearly seen for a very long time before failure occurred except for one occasion just before the tests were abandoned.

As a result of the success of the test Alan has recommend that: safe life for fibreglass gliders be replaced by period inspection similar to wooden gliders. Standard repair techniques have also be judged to be satisfactory.

Mike Burns: Causes and Cures for Flutter in Aircraft

Mike suggested at the beginning of his talk that the AHSA collect useful papers in a readily accessible form for members. He suggested a sort of information pack containing good articles on glues, materials, techniques etc which could be made available to members for a small fee. His idea is that a lot of good information comes through an organization such as ours but gets lost in old newsletters. To get us started he gave us a printed handout which he has promised to update and expand in the near future. Mike will doubtless explain his topic much better than I can remember it. I hope it will be published in the next news letter. Mike explained that flutter can occur form a lot of different causes and is not only a phenomenon of high speed. Flutter can occur a low speed and it is likely that a pilot will experience flutter at some time in his flying career. Flutter often occurs at a particular speed and hence it is a good idea to change speed if flutter occurs. Mike suggests a climbing turn as a first response as a way of changing speed and at the same time placing a load on the control surfaces which tends to damp out the flutter.

Some of the most common of flutter can be detected at the Daily inspection. Looseness in the control circuit is a particularly important cause and may be due to stretching of control cables, worn control fittings or damage in the control circuit. Poorly balanced control surfaces is another cause which could be caused by loss of the balance weights in some gliders. Excessive weight of control surfaces and associated lack of balance is another common cause due to painting, recovering in heavier materials or repairs.

Mike gave us a lot of anecdotes including crashes in Kookaburra gliders due to excessively slack control wires and one example of flutter which he caused himself by fitting a new superphosphate hopper to his cropdusting aircraft. When the hopper was opened turbulence affected the tailplane which vibrated so violently that it disappeared from view in his rear view mirror. By some miracle it did not fall off and the flutter stopped when the hopper was closed again!

Gary Sunderland: The GFA Safety System

Gary compared the system to a chain composed of many links. Flying in a glider is analogous to being suspended from the top of a cliff 300 ft above the ground by a chain. One has faith in the glider to bear one safely to the ground but that faith is dependent on a lot of different actions carried out by a lot of different people.

Links in the chain include: the daily inspection; the annual inspection; the certificate of airworthiness; modifications and customer options on that particular aircraft; the manufacturing process and quality control; aircraft type approval, initial design parameters and design integrity and materials quality control from the suppliers. All links must be strong for a safe flight but reinforcing any one link has no effect on flight safety. The chain is only as strong as the weakest link.

Failure of the chain can occur at any link and has occurred at every link at some time in the past. As we all know, nobodies perfect hence it is a good idea to be vigilant and look carefully at the glider whenever it is flown. The pilots only assurance that everything is well is the trail of paper work which accompanies each link in the chain.

A important principle of the chain of safety is that each link in the chain represents the minimum required for safety. Any more than the minimum adds excessively to costs or time and can easily prevent us flying altogether.

The system is theoretically capable of modifying itself in that suggestions by any person in the chain can lead to improvements.

Gary then showed us the engineering brief he had submitted for type approval of the MOBA, the sailplane he designed and built

himself. This came to two medium sized volumes, all neatly written out by hand. Gary is disappointed that there have been no other Australian designed sailplane in recent years and offered to give assistance to anyone who wants to come up with something new. What about it? Jim Jensz wants to design a flying wing sailplane. Is there anyone else who can put pen to paper.?

Mr. Walker or... "The Ghost Who Walks"

By Peter Raphael

Essential to independence on the flying field these days is ones ground handling gear. The humble wingwalker and towbar allow you the freedom to choose when you line up for takeoff and return to the hangar. Having constructed a number of wingwalkers I thought I should share with you my technique and theories on this.

Foremost, the design should minimize the potential for damage to the aircraft, keeping in mind that just because no-one has to walk the wing that you should not tow out at great speed. High speed towing subjects the glider to high G forces over rough terrain and a wingwalker can apply high torsional loads to the wing, notwithstanding the aerodynamic and inertial forces generated at speed.

I feel this design minimizes the risk of damage to the aircraft due to its flexibility and soft trailing arm suspension . The basic items of construction are a polyester fibreglass wrap for the wing a tubular steel frame and a bicycle wheel, the larger the diameter the better.

Initially some measurements are required to establish the height above ground, of the wing and incidence and dihedral angles which may be required to be built in. This should be done at a position most suitable for support of the wing with due respect for any hardware thereon.

The first step is construct the frame this I make out of 20mm steel square tube along the lines of the accompanying diagrams.

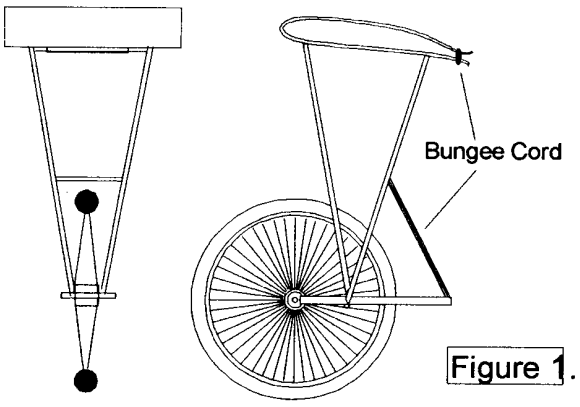
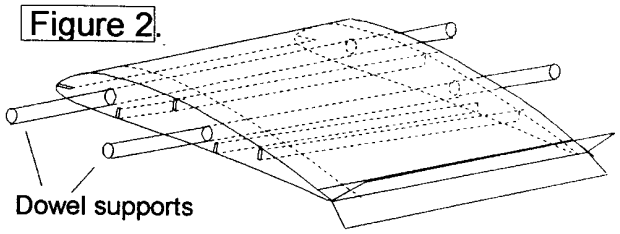


Figure 1.

The trailing arm is bent around with the application of heat to the outside of the bend moving along until the appropriate radius is met, generally the width of the wheelhub. The ends are then heated and flattened to be drilled, after which a couple of sawcuts into the ends create a convenient slot for the wheel axle. Bungee cord is used to provide the springing for the arm, as well a loop or two around the trailing edge of the wrap which will hold this closed .

I have found that the most convenient way to make the fibreglass wrap is to first construct a section of the wing at the particular station concerned.

Figure 2.



This I do by cutting cardboard profiles at the appropriate positions and using these, generate cardboard ribs. This rib or ribs in the case of a tapered wing is used to cut a pair of Styrofoam ribs that are then joined by a few appropriately positioned stringers before being clad in cardboard (corrugated cardboard run spanwise works well here.) The additional thickness added to the section by the cardboard compensates later for the lining of the wrap. At the trailing edge an additional piece of card or sheetmetal is added to deflect the wrap away at the trailing edge (see Fig 2.). As a suitable release for the lay-up I then cover this surface with aluminium foil bonded with a spray adhesive, after which release agent is used to aid later removal. This all sounds a little involved but it can be done relatively quickly and allows the section to be threaded on a couple of mandrels so that as one side of the lay-up is completed then the assembly can be flipped and work can continue on the other. My lay-up consists of polyester resin and 4-5 layers of Chopped Strand Mat depending on the size of the wing. I commence the lay-up on the top side and as this begins to cure the assembly is flipped over and wet out on the other side. At this point the frame is suspended over the top of the wrap by octopus straps and allowed to rest lightly on the lay-up. Further layers of mat are placed across the frame crossmembers and the assembly allowed to cure. The advantage of doing it all this way allows me to use waxed resin and not have to worry about the subsequent bonding of additional layers. One could perhaps complete the lay-up of the wrap and later attach this with mechanical fasteners or grind back the surface for a good key. Upon curing the plug can be removed and the edges trimmed with an angle grinder, a squirt of you favorite color and a layer of thin carpet or felt contact glued to the inside and you should be ready for a test drive. About the only thing you can't build in is commonsense and I suspect that more aircraft damage is caused in ground handling than flight, so please don't leave your wingtips behind in your enthusiasm to get on the field.

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 flying as early as 1850, when the population of the entire continent was less than half a million.

LAWRENCE HARGRAVE

One of the pioneers of the aviation in Australia was Lawrence Hargrave. Though he never piloted a glider or an 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 double 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 real 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 had 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 the 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 the cellular or box -kite, which evolved in 1894.

Hargrave found the box-kite design to have considerable lift combined with excellent stability and low drag. Linking four of them together Hargrave climbed aboard s seat slung beneath them and was raised to a height of 16 feet in tethered kite experiment at Stanmwell 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 he remained uncertain of the effects of the curved aerofoil section.

Thus in 1896 he began to experiment with test equipment and tethered monoplane and biplane soaring machines to compare the lift of flat and curve surfaces to understand the underlying principles.

Hargrave refused to patent any of his inventions and freely made information available to anyone who sought it. He exchange correspondence with Octave Chanute in USA and passed on the result of experiments with boxkites, dihedral, curved planes and other design features. Chanute includes this information in his book **Progress in Flying Machines** which was published in 1894.

Hargraves also published his experiments in journals in both the USA and England. Others interested in aviation extrapolated material from these sources carried out their own experiments to confirm the information and published the results in the aeronautical journals of the day. It is known that the Wrights selected the thickened leading edge for their wing form for their gliders on the basis of the confirmation of Hargrave's soaring kite experiments by Mr A.A. Merrill, secretary of the Boston Aeronautical Society, and published in the Aeronautical Journal in 1899.

Others also made use of the information freely provided by Hargrave, In France Alberto Santos Dumont acknowledged that his successful aeroplane of 1906 was derived from Hargrave boxkite. The Voisin brothers also conceded that their designs were based on the boxkites of the pioneer Australian.

In England the British and Colonial Aeroplane Company (later to become the Bristol Aeroplane Company) freely admitted that its first aeroplane, built in 1910, was based on Hargrave boxkite. In fact, it was named the Bristol boxKite.

It is sad that few Australians know the vital contributions made to the development of aviation by Lawrence Hargrave. During the early years of this century Hargrave offered to donate his many models and kites to the Australian and New South Wales governments, but the offers were politely refused. Disheartened , Hargrave offered them to anyone who would preserve them, saying, "science knows no international boundaries" . He wrote to his old correspondent Herrmann Moedebeck to offering 146 items. They were accepted and placed on display in the Deutsches Museum in Munich. One of Hargraves kites was given to the Science Museum in London, and his notebooks, sketches and records went to the Royal Aeronautical Society in London.

To be continued....

IS SANTA AN U.F.O,

By **Semaj Yarag**.

Let me present this little article for the consideration of the members of A.H.S.A. Last year in the December "96 " Christmas issue, after much research was presented on the annual aeronautical engineers report on the theory of Santa.

This year we continue with the saga of such theory trying to decipher this simple enigma.

While observing the sky over East Cowes at 7.15 p.m. on 24 December, I noticed a bright and very large object appear from the south-west , it appeared to be a very large yellow star. Then I noticed it was travelling on a level plane, and with the naked eye it now appeared to be an oval-shape, like a cluster of tiny stars. I waited for a favourable opportunity and focused on the object in my 3.1/2" reflecting telescope.

Bringing the object into focus, the apparent cluster of stars took on the appearance of a dome on a large flat disc on a sleigh. The dome had apertures placed at intervals around it, four of which were in my field of vision Light from these apertures made the disc on the sleigh visible. There was no noise to be heard from where I was observing, and the object kept a constant altitude. Under the disc a cavity could be seen, this glowed a dull red colour, and inside was a man with a long white beard and a red flying suit which ended on a pair of black boots, apparently made by Doctor Martens.

I saw no traces of gas or flame. The object travelled south-west to north-east and remained in my view for three and a half minutes. The sky was perfect with no cloud. All the constellations were visible, and this object was seen independently by at least seven others Isle of Wight people.

I would like to place side by side with these, next to me, priceless tidbits the case of Mrs. Helen Pade and her son John, of East Cowes, Isle of Wight, whom I had the pleasure of interviewing and getting to know well enough to ascertain beyond doubt the validity of their claim to have seen a similar sleigh -disc craft hovering low over trees one night in December Christmas Eve.

I took the precaution of taking along with me an independent witness, an impartial friend which I've know for a very long time, Miss Pebbles, and her collection of U.F.O photographs, together with my very well worn tape recorder, etc. No one listening to the subsequent recorded interview could doubt the sincerity in the voices of these two persons, whom I must point out were very reluctant to attract attention over the experience.

Mrs. H.Pade had told her husband Axcel of the sighting, but he and the painters decorating the house had laughed at her and she resolved to keep quiet about the affair. While viewing the TV that evening she was surprised to see another friend of her interviewed, who together with his wife had viewed a red disc through field glasses the same Christmas Eve. Puzzled, he had alerted the police. The following day the story got out and he was whisked off to the television studios at Southampton, where Mrs. Pade saw him being interviewed concerning the affair.

Mrs Pade was staying overnight at her son 's flat on the top floor of a large house which stands overlooking the whole of the seaside resort of Savoy, with splendid views and surrounding..

At about fifteen minutes after midnight of that December Christmas Eve, John decided to collect some mail from the letter box down below a duty he does regularly every day in earlier hours, but this time he forgot to do it.

Visibility was very good, they could see the mainland lights quite distinctly, yet there was cloud cover for none of the stars were visible.

Suddenly Mrs Pade pointed out to sea where there was a row of lights, but this was no ship for, as of lights, apparently from a distant ship on the horizon, as another person pointed out, they were above the horizon and rapidly getting near. At first, thinking it might be an aircraft. Mrs. Pade was not unduly concerned and, even when she realized it was not, felt quite certain it was some kind of hovercraft, for at that time the Saunders Roe N 1 was having its trials. Anyone having seen the N 1 could easily understand how it might be mistaken for a saucer.

But this thing was uncommonly silent and less than a quarter of a mile away, where it hung, almost at eye level, over trees. Mrs. Pade said they could see the shape of the U.F.O distinctly, it being lit up by a row of five porthole light on the sleigh shape. She remembers this, for when thinking it might be a ship she had counted them.

The rounded dome -like structure at the top was reflecting a brilliant light and the bowl-shaped lower body was surrounded by soft glow showing clearly the front Reindeer full ahead.

As the object tilted now and then, they could see that it was for sure an sleigh and the familiar face of Santa and even his Doctor Martens boots. The trees below being lit up by the furnace-like glow emanating from the underside.

By then the two witnesses were pretty scared and when the U.F.O started to come nearer. They backed down the stairs, thinking it was coming straight . But then the U.F.O had tilted, showing its glowing red base for an instant, and was gone at vertiginous speed. Said Mrs.Pade, one moment it was there and the next instant it was going away fast it made me feel dizzy at the speed of it, and in a split second it looked just like a bright star in the sky, heading to the North Pole.

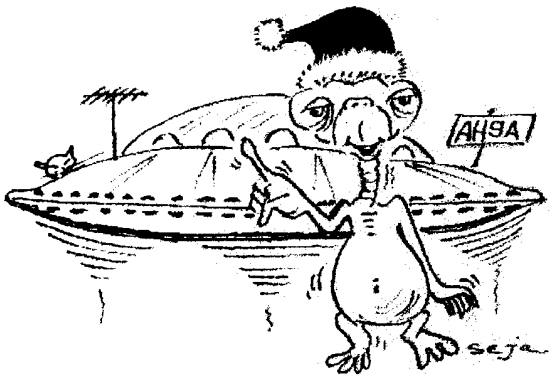
I then asked the witnesses if they could identify the craft, were they to see it again, and then Miss Pebbles produced the

photographs. They assured me with laugh that they would have no difficulty doing this, for they would never forget the experience as long they lived. Looking trough the photos that Miss Pebbles produced, they said "perhaps" yes to this and that, but when I produced more photos, their reaction was spontaneous ;there could be no doubt, they said, they were certain this was it .It so happened that Mrs Pade was a fine artist, and she now, half apologetically, produced a coloured sketch she had made of the U.F.O.

There could be no mistake about the likeness; any U.F.O. student would identify it immediately. During the interview with Mrs. Pade , miss Pebbles had said that she new the area over which the disc-sleigh hovered, as she had a friend living there, and now, sure enough we found that these same trees were adjacent to this man's house.

Miss Pebbles suggested we call and ask if anything unusual had occurred on the night in question, which we did. After cordially inviting us in , miss Pebbles friend listened patiently to our questioning. ' No' he said, nothing unusual had happened, but I was disturbed in the night by a cat knocking the lid off the dustbin, which made a hell of a noise. The time?.... I believe it was twenty or maybe more past mid night I noticed the time as I got back to bed. The strange thing was, the following morning I found the dust bin lid about 15 ft from the dustbin. It could be thrown away by the wind , but that night was not wind at all. It could have then rolled away.

Merry Christmas and Happy New Year .



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

For Sale: **"Cherokee"** completely restored to as new condition. Enclosed trailer. Ground handling gear. Ready to fly. Gary Morgan. P.O. Box 722 Sutherland. N.S.W. 2232.

For Sale: Plans for Light weight gliders.

"Monarch" Flying wing L/D. 20:1 ..... A$ 200
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"Super Floater" Foot launched. L/D. 12:1. 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
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Australia.

"Acrifix 192" Acrylic cement. Peter Raphael recently 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.
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C. Brooks. 2231 Vuelta Grande, Long Beach CA 90815 USA.

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

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.
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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.

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