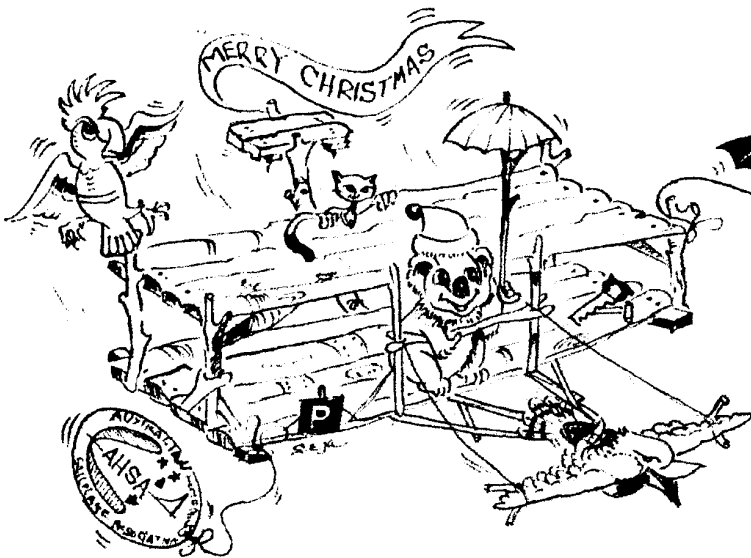


# THE AUSTRALIAN HOMEBUILT SAILPLANE ASSOCIATION

Volume 1 Issue 3

December 1996

## Greetings from Australia



Merry Christmas  
&  
Happy New Year

from all of us here at  
the Newsletter Headquarters!...  
James, Vicky, Eddy, Sergio & Peter



I have received several telephone calls from different people who are interested in our movement. To all of them I have sent the appropriate information requested and I hope more than one will join our association. Most of them are interested in ultralight foot launch sailplanes which seems a transition from hang glider to a full size glider with low operational costs.

The other interest is a practical and economical self launch glider (motorglider). In this issue there is an article by Gary Sunderland and John Woods relating to the role of the HGF and GFA so read on!...

James Garay

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#### Editorial Policy

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## MAILBOX

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*Dear Ed,*

Thanks for the cc from John Stockwell. Actually I was in Europe (England and France) from 19 July through 22 August and it was sunny and hot (22° - 35° C+) the whole time. So I guess John Had a nice summer and lots of good flying.

Also thanks for the information on the drawing changes. I shall incorporate these as soon as possible. A very informative letter. Thanks John!

The story on weights pretty well confirms my feelings, that is, even with the optimum materials and a lot of care, it is difficult to keep the weight down to the designers estimates.

We all have this problem, so it is just a matter of being aware and working away at it.

Manouvre load limits are another matter. Assuming that the original design was to FAR-23 normal category, the original load factor could be 3.8 limit and  $3.8 \times 1.5 = 5.7$  ultimate, so we don't have much to play with.

Gary Sunderland

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*Dear Ed,*

I am very pleased that you would consider running my ad for the Woodstock construction materials in your publication. I am also impressed with the quality of your newsletter. It seems as though Sailplane Builder and the Homebuilt Sailplane Association Newsletter have similar characteristics and problems with obtaining subject matter. I was amused to notice the same letter from John Stockwell in your newsletter that also appeared in the Woodstock Builders Forum in Sailplane Builder. John seems like quite a character, and I hope his efforts have been rewarded.

As to the Woodstock Sketchbook, I'm only aware of some of the modifications made for the design to be legal in Australia, and these have not been incorporated in any way in my book. Also, the wing spar detail is around the 13M spar, and doesn't address the 12M spar construction at all (I am/was serious about the 13M version, which is depicted in depth. At the end of my construction, I will certainly be needing to update some items, as it was impossible to envision everything in the beginning. Overall, I've found everything to work pretty much as it is shown, and it should be a useful planning tool for someone about to undertake the project.

I would like to contribute duplicate Woodstock Builders Forum articles to your newsletter, if you are interested. It is no problem to run a duplicate floppy disc and forward it to you, as it sound like you have a large population of Woodstock builders who might enjoy such trivia. I would certainly like to gain insight from the Australian versions. As of now, I'm doing bi-monthly articles, as work and such are very demanding, with little time left to tinker in the workshop with gliders. I'll send along the next article for your consideration.

{Editor's Note} In our next issue we will start the new section "Woodstock Builders Forum". Again, thank you for your interest. C. Brooks.

*Dear Ed,*

I'm writing to thank you for your kind gesture in placing me on the mailing list to receive a complimentary copy of your newsletter. I sincerely appreciate this action and will look forward to receiving news of what is happening in the homebuilding scene.

It is now more than 50 years since I got into the gliding movement but I'm now virtually retired from active flying, though still keenly interested in the sport. I started as a young teenager, helping others of my age to build a Zogling primary glider in the period 1943-44. Then, after reading a book on how to fly, we went out and taught ourselves how to do it.

Over the years I've helped on a number of other glider building projects as well as doing maintenance, repairs and other work. The gliding movement was started by people who built their own gliders, winches, hangars and anything else they needed. I'm still a supporter of those who carry on this tradition.

I wish the A.H.S.A every success in carrying on the tradition of "flying for fun" and helping people get great satisfaction from building and flying their own sailplanes.

With my very best wishes. Allan Ash

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*Dear Ed,*

Many thanks for your prompt reply to my request for information on the Australian Homebuilt Sailplane Association. Please find enclosed \$10 being membership fee for 12 months of newsletters and postage.

I am currently building and S2A. Designed by the late Alex Strojnik. It is a 15 mtr self launching sailplane. To date I have completed the centre section of the 3 piece wing and have the outer wings to skin all control surfaces, flaps, ailerons, elevators, rudder. Have been completed +- horizontal tailplane and fin. The aircraft is a pod and boom configuration with a pusher prop. I plan to use a Kawasaki 440 motor with 2-1 reduction swinging a 52 inch prop. Happy Soaring. Des Muir.

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*Dear Ed,*

Since the last time I talked to you I have shifted from Adelaide, resigned from SA Water and have started working for a company in Port Augusta. I am a surveyor and I am still planning to build the ULF-1. I am sending to Germany for my own set of complete plans.

Gunter Ziegler of Whyalla Club (I fly with both Whyalla and Port Augusta clubs) said he will be checking the construction.

I need a shed to construct the glider in and hope to start in September. I plan to get all the wood and have it sawn to size by then. I plan also to build a Grunnau Baby. The ULF-1 is a specialised glider restricted to winds of 16<M.P.H as it stalls at 18 M.P.H would operate of the sandridges at the top of the gulf also suitable for ridge sites.

One for the write ups of the ULF says that it can be built in under 100 hours. However, for a first attempt I think the time would be more realistic between 600-1000 hrs. I would appreciate any current info on availability of materials.

Happy soaring - John M. Harris.

Dear Ed,

I have not written an article about my winch but I thought the endorsed articles might be of interest.

I sent a fax to the editor and it is OK to reprint the articles so long as we give credit to Sailplane & Gliding. I don't know why I get sidetracked by winches and airfields instead of just flying but we have to get up there somehow and we then have to land somewhere, so I guess these things are important.

A sincere thank you for taking on the editors job of AHSA. I will look forward to meeting you. I would also like to wish Mark Stanley all the best and thank him for the terrific job he did in getting our group off the ground.

Best regards, Alvin Petersen

Dear Ed,

Sorry it has taken me so long to respond to your kind invitation to join A.H.S.A and for the complimentary copy of the most interesting newsletter! Congratulations!

Glad to see that you have Gary Sunderland, Mike Burns, Douglas Vaustan and Gerard Terry from England in the Association, all of whom have extensive knowledge and experience in this field.

Reading John M. Stockwells account of his Woodstock project I am concerned by this substitution of spruce for Douglas Fir as unless he has upgraded the sizing then it will be considerably weaker than the design call for.

The Woodstock has quite a thin wing and is already overweight so it may be wise to alert him to this. Most likely of course he has done so, but just in case.

Remembering all the time the overweight situation increases the loading all round.

My wife is not well and I have now retired, but I have to learn a lot about housekeeping, my gliding time will be severely limited until she is getting better.

I have a Sapphire ultralight which when I complete the current program, mainly drag reduction, I hope to make another set of wings to make it a modest motor glider. As Gary Sunderland says...we mainly fly for fun, just being "up there" still satisfies me after all these years. If I had my choice I would always go for a nice machine easy to handle with ability to climb on weak thermals, even in Mildura where I flew for years. We do not have as many booming days and people believe it is nice to be able to float around on 300 odd days that do not boom. Your Woodstock sounds as though it should fit that image. My old Olympia also fit in there, but it is getting a bit heavier to rig and derig as I get older whereas the Sapphire is light and okay for an "old bloke".

Hope to drop into Bendigo for a day or so, depending on how my wife gets on.

Safe happy soaring, Keith Nolan

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## SHOP TALK

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### *Collaboration with Hang Gliding Federation of Australia*

There have been discussions between the GFA and HGFA on matters of mutual interest for some time. A joint statement has now been issued by the two bodies, it is reproduced here for the information of all members.

Following meeting and discussions between representatives of both the HGFA and the GFA it has been agreed that:-

1. There is a need to provide a framework, in administrative, operational and airworthiness areas, to assist three-axis control hang-gliders and ultralight sailplanes which fall between the current requirements of CAO's 95.8 (hang gliders) and 95.4 (VH registered sailplanes).
2. It is the intention of both organisations to enlist the assistance of experts with specific expertise in operations and airworthiness with both the HGFA, the GFA and elsewhere by forming a joint committee to discuss and formulate a structure to cater for aircraft falling between the two established CAO's. It is intended, in as short a time as possible, that the joint committee will provide guidelines for the management of these aircraft jointly between the HGFA and the GFA.
3. It is recognised that the interests of the HGFA and the GFA are closely allied and the executives of both organisations are keen to explore and encourage closer collaboration in areas of mutual interest.
4. Ian Jarman, the national executive director of the HGFA and Roger Woods, the executive officer of the GFA, are authorised by their respective organisations to call a meeting of interested parties forthwith to form the initial joint committee to progress the development of a new class of ultralight glider in Australia.

The proposed meeting/seminar was to be held on the weekend 18-19 May, at Rylstone, where Bill Moyes hangars his ultralight tug and gliders.

### ROGER WOODS

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### *Shoptalk* by John Stockwell

I didn't think that my last published letter would generate as much response as it did, the AHSA might only have a small membership but they seem pretty active letter writers. Now before I reply allow me to bring you up to date with my Woody. The great news is she FLIES, but let me deal with events in a chronological sequence since my last letter, which finished with a completed glider sitting in the Hong Kong Aviation Club but nowhere to fly.

To get her home to the UK I decided to make the box according to the same principles that Jim used in designing Woodstock, ie:

- No. 1 Use the least expensive materials available for each job
- No. 2 Use as little of them as possible to keep it light

- No. 3 Keep it simple
- No. 4 Use common parts for as many jobs as possible



Flat 15b Wylie Court  
23 Wylie Path  
Kowloon, Hong Kong

There's not doubt I was considerably helped by making my Woody with a removable tailplane, so that my fuselage sits in a conventional fashion on a dolly in the middle of the box with the wings either side. To start, I set these three components on the ground and decided on a plan measurement of 20ft x 4 ft (two and a half sheets of ply end to end). The next stage was to make the base of a sandwich, 1/2" ply on top, 2" x 2" framework with cross strengthening and a 1/4" ply underside. This was glued and screwed and then two layers of varnish inside, followed by all the runners and guides. Before proceeding I had a few dry runs to check everything fitted, and could slip in and out easy, and then decided on the vertical measurements, 2 1/2 feet at the closed end and 4 1/2 feet at the open end.

The framework was made from 1/2" x 1 1/2" with no more than 12" spacing between verticals and horizontals, and the whole covered in 1/8" ply. 1/8" doublers inside at the ply joints followed by three coats of polyurethane varnish inside and out with a white finish coat. The door is 1/2" ply hinged at the bottom so it also serves as a ramp. For ease of movement around the smooth concrete floored hangar I fitted ten 2 1/2" casters.

I should explain that my plan was that Woody's plywood custom built suitcase would become my trailer with the addition of a suitable chassis. To this end I'd contacted a trailer manufacturer in the UK to make me a zinc coated chassis which was waiting on my arrival. It didn't take long to mate the two together, and although there is still work to do on my next holiday (like fitting electric's) at least she's dry and snug for the winter.

Now, I was trying to work to a timetable of shipping Woody out of Hong Kong by the beginning of May which is the start of the typhoon season here, so that she'd be in the UK by the time I went back for a holiday early in July and I had it almost ready, when on the first Tuesday in May I had one of those few lucky breaks in life. The Chief Pilot of one of our local airlines heard of my project and phone to offer transport back to the UK when they had spare capacity. (Between you and me I don't think he'd realised how big my glider was!) On the Thursday morning he phoned again, could I have it at the cargo terminal by 3 that

afternoon? Instant panic. The same team of Chinese who helped get her out of my flat arrived and suddenly it all happened, Woody was on her way to her new home. David, my son, renewed his acquaintance with her at Manchester and delivered her to Alan Roberts of the Marchington club at Tattenhill near Burton on Trent. Alan had agreed to do all the inspection that was required by the British Gliding Association for the Certificate of Airworthiness. Shortly afterwards Alan sent me a fax listing all the small points that required attention and I set myself four days to get it completed on my return to the UK on holiday, additionally she had sustained slight damage to the rudder in transit and the altitude capsule had blown and a replacement had to be obtained and fitted. I'm an eternal optimist, and even with Alan's advice and help, and what with family commitments it was eight days before I was ready. First thing next morning I was outside the British Gliding Association's office with everything in hand and after an hour or so I was on my way home with a new "C of A" plus a load of books, caps and T shirts I'd purchased from the shop whilst waiting. When I arrived back at Tattenhill my plan was to do a series of low hops just to check as much as I could as low as I could, which seemed a sound philosophy. The first hop on about 200 feet of rope behind a car to about fifty feet with a land straight ahead went so well I could see not point in prolonging the agony and went for an aero tow.

After discussion I thought 55 knots would be a good tow speed and throughout the tow to 3,200 feet the tuggie kept it spot on. In retrospect I thought this speed slow, so for the next flight I asked for 60 knots which produced a more stable tow with a much better rate of climb which I took to 3,000 feet. But back to the first flight, coming off tow I'd initially explored the speed range from cruise downwards then turns in both directions, very gently at first, then increasing up to about 45 degrees of bank, after which I'd exercised the spoilers, increased speed, and flown for a bit in the approach configuration. Everything went so well there is little to comment on. Was I elated when I landed?? You've no idea. Had a beer or two that night. The second flight I'd approached the stall, gone to VNE, used more bank in the turns and generally been a bit more aggressive in the use of the controls. Then, when I'd descended to 1,900 the Cav II emitted two bleeps, and, for the first time in her short certificated life, my blue Woody had rising air under her wing. Responding quickly with a snappy roll we centered and were rewarded with the audio singing away merrily as we smoothly ascended under a clear blue sky to the inversion at 3,800. (guess that sound pretty low by your standards). It was one of those rare English summer days when the sun shone (extremely rare) the inversion was unmarked and the visibility seemed unlimited. We spent a few minutes playing in the top of this thermal which seemed to be hurtling itself at the invisible inversion barrier with the climb stopping quite abruptly. In the distance the Blanik was marking another blue thermal so we increased speed and headed in its direction where we joined underneath. With our short, 12 metre, high lift wings, efficient thermalling means winding into small tight circles which Woody took to like a duck to water but which was completely at variance to the Blanik's way of flying. Well it was the Blanik's thermal, so after a few minutes we left and made our own way upwards again. Richard Harvey who is the only other builder of a Woodstock in the UK recommended taping the controls which I did before the first flight, consequently they couldn't be a better mix of lightness coupled with quick response and made today's thermalling so easy. Before the first flight I'd

also disenabled the elevator trim, and found the control forces so light that I'm not sure that a trim is really necessary in future. Singing Patsy Cline's "Crazy" in tune with the vario, (well, it seemed to be in tune to me!) we climbed again. Yes everyone said I was crazy to start building Woody four and a half years ago, but they should see me now. I felt I had breathed life into this concatenation of plywood, spruce and nylon and she was repaying me with the flight of my life. I digress, we're still flying, we're still at 3,500 feet, another glider not far away, lets go and show off our profile and colour scheme. Fibreglass gliders have a look of similarity from a distance and its not until I close that I recognise the DG 500 flying large lazy circles. We join underneath, and, quickly outclimb in our tight circles and are soon looking down at the plan view of the DG. I then recognised the tartan shorted figure in the front seat as my better half and we exchanged waves. Was she as excited as I as she looked up at HPG circling above? Were we exchanging more than waves? How can I ever thank her enough? Woody was a long time being built, a competitor for her attention and a lot of inconvenience as I took over more and more of the flat as construction proceeded but it was a lot of fun and we always had plenty to discuss over a beer or a gin and tonic when construction finished for the day. And now, absolute magic!! After the DG had shot off a roll of film they flew off leaving me standing, well I suppose you must get something in the way of performance when you spend all that money. The short thermal window on this July afternoon was weakening and it was a slower climb with a long gentle descent giving me time to look back over the years. At home I have a pile of the British Sailplane & Gliding magazines 238 editions high (They're published bi-monthly), and I know that if I read every article in each of those magazines I wouldn't find one where the pilot had more joy and satisfaction than this flight is giving me today.

Gosh, isn't it easy to get carried away with emotion! back to the airfield, prepare to join the circuit. Not yet, the DG is marking another thermal before he lands and I know he's doing it for me. (What faith I have in human nature!) As we fly over he leaves and lands, but we continue gently working our way upwards again, but not for long, and its soon time to join the circuit and land, Woody's second flight was just under an hour and a half. After 1880 hours in the making, was it worth it? You bet your bottom dollar it was, absolutely fantastic, to be there soaring in a machine you've built from plans, well, it beats any other flying I've done. This wasn't test flying, it was built to plan and it flew to plan and I've got a great little machine that as far as fun flying is concerned competes with nothing but effluence.

So there we are, what's next? renovation project, fibreglass power or boat? I don't know, but I do know I've got to have something to keep my hands busy when I'm not either singing happily to myself as I soar amongst the clouds in my Blue Woody, or, as I am now, back earning my keep in steamy Hong Kong sitting on my balcony with a cold beer in hand dreaming that first flight all over again and again and again. But in the meantime, I'm going to catch up on technology and update my computer skills, try [email stockwel@netvigator.com](mailto:email_stockwel@netvigator.com),

Responding first to Gary Sunderlands request for an update on my modifications. Sorry Gary, I can't send the drawings they wen back to the UK with Woody. Next year I'll sent them to you, in the meantime, from memory here goes.

1. The centre rear ribs of the tailplane have to be repositioned to be at 90 degrees to the spar as the original nicely canted ribs which took so long to position won't go round the fin.
2. The fuselage frame 181 is shown on the plans as closed at the top. This has to be opened to allow freedom of the elevator horn.
3. As the tailplane is now slightly higher, there is little more draggy profile at the front, to counter this I streamlined it with balsa wood and then made a fibreglass (more weight) fairing which fits under the tailplane leading edge and is fastened by two bolts into captive nuts in the fin. (A piece of spruce was built into the fin during construction for this purpose).
4. An access panel must be made to enable you to join the horn to the elevator circuit. Getting in and making the connection is quite a frustrating business if your hands are bigger than those of the average two year old. I've found the following procedure reasonably quick: Before you start, put the elevator fully up and prop it up with a small wedge in the centre section. (This brings the elevator roughly into the middle of my access panel). Hand into the access hole and insert a very sharp 1/4" rod through the elevator horn pierce the fuselage skin on the opposite side to your access panel, using this as a mark drill a 1/4" hole through from the outside. Now your in business. Prop the fuselage off the ground about 18 inches or so and insert a 1/4" rod through your hole and one side of the horn, push the bearing in the elevator circuit up into the horn and gently fix it by sliding the rod in another 1/8" or so. You can then easily insert your pip pin.
5. This next change came from Richard Harvey. The two steel fuselage fixtures are made with an additional web which bolts to F181.

Gary, regarding Spruce versus Douglas Fir. To start with I spent a lot of time trying to get Douglas fir, locally here in Hong Kong and through postal enquiries in the States and the UK. Nowhere could I get the required standard in the lengths require, so after consultation with Jim Maupin, the British Gliding Association and our local airworthiness surveyor I went the Spruce route from Wicks.

Plywood similar story, and in the end I used:-  
 1/4" ply. A marine plywood obtainable locally, made in India to the required British standard.  
 3/8", 1/2" ply. USA marine grade plywood, from Wicks.  
 1.5mm, 2.0mm, and 2.5mm birch plywood, from Wicks.

Adhesive T88 all construction, except woodworkers glue for cold moulded ply in the nosecone.

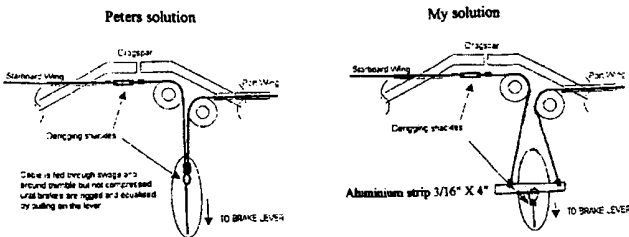
Yes Gary, you're right, I covered the whole of the aircraft in fabric and my estimates concur with your figures as follows:

Covering (Ceconite 1.8 oz)	3.50 lbs
Adhesive (Cecobond)	1.50 lbs
Filler (Ceccofiller)	8.00 lbs
Undercoat X1 System 3	5.50 lbs
Top coat X1 System 3	2.50 lbs
<b>Total</b>	<b>21.00 lbs</b>

So this leads us up to the weight problem. After talking to Richard Harvey I was quite convinced that mine would end up requiring nose ballast. Therefore everything heavy that could be moved I put as far forward as possible, in particular the batteries (9 lbs) which I installed under the floor forward of F15, and the hand held Delcom which fits through the floor on the RHS. Additionally I moulded lead weights to fit inside and around the nose cone (in the end these were not needed). Final empty weight 296 lbs which is 1/2 lb lighter than Richard's. The BGA's attitude seemed to be along the lines that no amateur built aircraft made from US plans will ever come out at the design weight. Also the weights quoted on plans would be or a 5g loading whereas the BGA would only require 3.5g for non aerobatic category and in the end I've been given a very acceptable load of between 160 and 210 lbs based on the C of G calculations. I think that also answers the points raised by Brian Berwick.

### Woodstock spoiler riddle

Peter gave a sketch of the rigging of his spoiler cables. My solution to the problem is similar to the way we used to adjust car cable brakes.



Well James I seem to have gone on a bit but there was a lot to say. Regards, John Stockwell

## GFA ACM REPORT 1996

### Convenor Design and Development

By Gary Sunderland

The D&D "Committee" functions on "as required" basis, and this year there was, again, no need to co-opt members to assist. Some advice was provided to executive officers and members, as noted below, but whether the result was worth the effort remains to be seen.

### Experimental Aircraft

Some advice was provided to the GFA president, the CTC and also the SAAA people. Basically the GFA can obtain some small advantage in the long term if we adopt international standards, such as FAR 21 or JAR 21, in this country, provided that the GFA retains control of all aspects of design, construction, maintenance and operation within the GFA membership, ie, CASA would then as now only control commercial factory products.

I am definitely not in favour of any more local "so-called" standards invented by CASA or bodies like the SAAA to suit their particular short-term goals. Local standards have always been an unmitigated disaster. Whatever the outcome of the current exercise we need to make sure that the GFA retains

control of all aspects of airworthiness and operation of our sailplane fleet. I am happy to say all of the Executives seem to be alert to this need.

We could, and should be doing a lot more to ensure our future in concern with other sport-aviation bodies, as recommended by the FAI. Henk Meertens is following up this approach, but a lot needs to be done. Unfortunately getting others to adopt a reasoned approach will be extremely difficult. For example, why do we need to conform to the regulations for the conduct of our sailplane maintenance when we can set out our own standards for pilot training and operations? Given that pilot error is the main cause of accidents, and airworthiness errors are of less concern, why does the current system require the reverse emphasis? Then again, why do gliders and balloons need to be registered and not hang-gliders, rotorcraft and ultra-light aeroplanes? The CASA can hardly say that the former are more significant, more complex, or "more-anything" than the latter.

What are we, the GFA, doing to overcome such bureaucratic anomalies? In short, very little.

The FAI provided some very good advice recently, which we ignore at our peril, ie if we in sport aviation do not hang together, we will one day be hung separately!

### Ultra-Light Gliders

Following on from the above topic, the HGF and the GFA have started co-operating at one level at least. No-one yet seems to be quite sure what constitutes an "Ultra-light Glider". According to Australian Gliding of July 1996, page 7, we have in Australia a new SLS of 15 metre span and 30 to 1 glide angle, weighing 300kg or 661 pounds!. This aircraft is right up there with the rest of GFA fleet, but not subject to GFA airworthiness controls.

The GFA Executive obviously need to get together with the HGF and the ULF to ensure we have a uniform approach, and uniform standards, for the design and manufacture of all sport aircraft in appropriate categories.

My own attitude is that there is no lower limit to the glider design standards and we can cope with any new design, whatever the weight.

On the other hand there is no need, in this day and age, to attempt to fly a prototype aircraft, of any sort, before performing a few calculations to ~~prove that it~~ <sup>prove that it</sup> is reasonably safe to take the thing into the air.

The calculations and tests required to justify a new design are somewhat laborious, but not very difficult to carry out. Many "so-called" ultra-lights are not very light at all, but their only claim to this category lies in the mistaken belief that the laws of physics are miraculously suspended if you adopt this title. On the contrary, very light aircraft of any sort are just as liable to structure failure as larger aircraft, if not more so.

In the last twenty years I have met many so-called "designers" of so-called "ultra-lights". All of them are now dead, which seems a terrible and avoidable waste.

Our leaders in sport aviation should be able to get together and arrive at acceptable procedures to avoid this unnecessary carnage

without waiting for the dreaded Government or their beaurocrats to take action.

For my part, the D&D committee is available to advise GFA members and anyone else, on the design and certification of gliders and sailplanes. This service is free, so there is no excuse, nor reason, why any local designer needs to risk a life unnecessarily. If I cannot cope with your query myself I can co-opt another GFA member to help. There is a lot a technical expertise available within the GFA to help people, so we do not need to venture into the unknown without advice.

#### First-of-type local designs

Following from the above, there are two, possibly three, local prototype sailplanes nearing completion. There have been no queries for some time, so I do not know if these projects are proceeding or not. Once again if you do not ask I cannot help you!

#### MOSP 3 Section 8

The amateur-built approval procedures in section 8 have been revised to include the actual procedures now in use, including the acceptance of USA designs in their EXPERIMENTAL system, on the basis of a demonstrated safe history of operation. This completes a project started some 25 years ago, which shows that we can eventually get our procedures right, given enough time!

#### Type Acceptance

Twelve years ago Bob Russ completed all of the flight testing of the first-of-type MONERAI-S glider. Two years ago I checked this data and recommended the issue of a Certificate of Airworthiness, to no result. All of which goes to show that the old CAA was not such an inefficient and beaurocratic organisations as we thought at the time! The CAA could usually complete a C of A in four years.

#### Minor Design Approvals

During the past year I was able to assist a few members with minor design changes. Only four designs were approved, which is a very small activity, given the size of the GFA fleet. I suspect that many sailplanes may be modified by incorporating non-approved design changes and component substitution, and another warning article has been completed for "Australian Gliding".

It is stressed that the services of the D&D are free to GFA clubs and individual members, so there is no excuse.

### **ARE WE DREAMERS ? " THE CHOICE IS YOURS "**

By Douglas Vanstand.

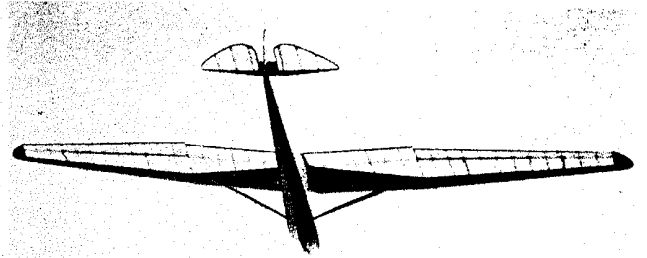
Amateur or home built aircraft have been with us since the birth of aviation, man had to design and build his own wings to meet the challenge of the skies. Men like Cayley, Pilcher, Lillienthal, Chanute, the Wright brothers and our own Hargreaves and Duigan all in their own way adopted different methods to achieve their goal of flight "THEY WERE DREAMERS".

We are all familiar with their histories, their achievements, their failures, often the price of failure was very high indeed because, they had to pay the price with their lives. Australia contributed her share of pioneers , however most of the publicity was

lavished on our powered brothers. Gliders were not only silent in flight but also silent in the press of the day.

Granted their achievements were modest compared with today , but many aircraft designers had built a glider first then continued on to a powered aircraft.

Prior to Edmund Schneider and his sons coming to Australia to manufacture gliders, most gliders in Australia had been built by amateurs , generally to their own design. In the early 1930's the only plans available to the home builder would have been the English Willow-Wren, Kestrel, Scud and the German Hutter H17, Grunau Baby and various primary types.



*The Willow Wren*

Percy Pratt and his brother build a limited number of primary gliders, some single seat secondary gliders, and their own design two seater glider, in the period between 1929 and 1939.

Over thirty locally designed home built glider types were built prior to 1945, not many have survived, the best known of this era is Geoff Richardson's 'OLDEN EAGLE' and Tom Proctor's 'COOGEE' presently being restored by Gerry Downs our R.T.O.A. After 1945 gliding slowly began its revival, continuing the homebuilt trend was Jock Barret's 2 seat 'PELICAN', Ron Adair's 'ALTAIR', Keith Jarvis's 'YOEY' and 'JUMBUCK', Jed Pascoes 'SPRUCE GOOSE' and 'SUPER GOOSE', Ron Sharp's 'SWALLOW' and Doug Lyon's 2 seat 'ZEPHYRUS' built by members of The Beaufort Gliding Club. During this period many homebuilt gliders were to plans from overseas designers, eg. Grunau 2 and 4, H-17 Olympia. ES. 49 Venture, Plank AV-36, R-3, Cherokee 2, BG-12, Tern and HP series.

The expansion of gliding following World War II was aided by commercial glider manufacturing companies such as Slingsbys, Schemp Hirth, Glassflugel, Schwaizer, Kaiser and in Australia, Schneidkers. These were some of the major suppliers to clubs and individuals in Australia who could order quality, high performance sailplanes, initially at fairly reasonable prices.

This easy availability of gliders curtailed the need for people to design and build their own aircraft, only the really keen builder built his own glider during this period; there were other factors involved as well, and the overall result saw few homebuilt gliders.

Probably one of the factors being a lack of plans available of gliders comparable to those available ready built 'FLY AWAY' from the previously mentioned manufacturers. The exception being some locally designed and built sailplanes, Gary Sunderland's 'MOBA' the late Reg Todhunter 'WREN'. There are a few other approved designs available today they are the

'DUSTER', 'WOODSTOCK', 'MONERAI', 'SUPER GOOSE' and 'AMERICAN FALCON'. However the advent of G.R.P. manufactured high performance sailplanes of more complex and refined structures specially instrumented to extract the high performance designs from these aircrafts has resulted in grossly increased prices, and to this unfavourable exchange rates, high shipping costs and administration.

*continued P14*

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## TECHNICALITIES

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### **HIGH POWER WINCHING WITHOUT TEARS**

By John Gibson. ( Sailplane & Gliding June/July 1996 )  
Courtesy Alvin Petersen.

There is still a lot of anxiety about the new breed of high powered winches but John, drawing on the experiences during the last year at Bowland Forest GC, tells how they can be operated safely and to everyone's advantage.

The winching scene in the U.K. has changed considerably since I wrote about winch theory and practice in 1985 and 1987. I suggested then that the absolute minimum power should be about 180bhp and that 240bhp or more was necessary for heavy gliders, possibly with further assistance from torque conversion as well. At that time, 300bhp Continental winches had been available for many years, but although a few UK clubs were using these or other high powered types, it wasn't common.

Partly due to the articles, I have been made privy to the trials and tribulations of certain clubs after their introduction to high power winching. Chance observations at other clubs have also indicated that all is not entirely well at times. In some quarters, it has been said that high powered winches can be operated safely only by very experienced or professional drivers.

When the Bowland Forest GC became the first customer a year ago for the production 340bhp Skylaunch built by D&M Engineering, we were very conscious of the huge step up from "G-Pull", our 180bhp Gardner diesel winch. The BFGC, determined not to joint the sufferers, set about a programme to re-train its existing drivers and to train new ones. With some 50% of its members now qualified, the first year's experience has been highly successful, and has entirely refuted the pessimists.

#### **Past Problems to Learn from**

A brief summary of typical problems that have been experienced will serve to illustrate that most are self-inflicted. Solutions have been readily available but sometimes ignored.

1. The torque-control diesel winch type is without question the easiest of all to drive, as the driver only has to make the correct torque selection based on the glider weight, irrespective of wind strength, apply it at a rate giving acceptable initial acceleration and then hold it constant until backing off before the release. The pilot is responsible for controlling the speed by adjusting the climb attitude. Because there is no direct control of engine rpm, the launch can overspeed rapidly if the climb entry does not match the acceleration. To make it work, therefore, a conscious change in technique is required of pilots as well as drivers.

Introduced by one club some years ago without understanding these changes, a period of poor launches and considerable aggravation ensued. A visual torque selection guide was then

fitted, which proved to enable even inexperienced but properly briefed drivers to provide excellent launches, though it was rejected by senior drivers. It was replaced by a single mid-torque spring throttle stop, to assist in judgment of the initial power setting.

My own experience of the type is limited to a few launches for a syndicate partner and myself at another club. A lack of adequate communication led to some rather anaemic launches, a problem whose solution was eventually demonstrated by the winch designer, there by chance. He provided a parking launch to my partner with 500ft more height simply by selecting the right torque. In the cab, watching the cable speed reduce from 35kt to 4kt without any driver action was a convincing demonstration to me of how easy it is to drive such a winch when it is fitted with a device to indicate the torque selected (as this was). It was obvious that any glider pilot could learn to drive it without difficulty.

2. Another club replaced their old diesel winch with a new high powered petrol engined winch. The immense increase in power and acceleration was applied indiscriminately. The launches were snatched off the ground with pilots holding the stick fully forward. With the glider held down and immediately excessively fast, shallow climbs were inevitable as the pilots would not pull up. Launch heights were lower than with the old winch and great was the gnashing of teeth.

An essential part of the solution was to introduce a timed 2 or 3 second movement of the throttle to the nominal power position, preventing an excessively abrupt acceleration, but I understand that launches are still often too fast. Blue weak links are broken by K-8 pilots at inconveniently frequent intervals, something which just shouldn't happen even with full back stick if flown at a sensible (for K-8) 45 to 50kt - or if pilots exercised more caution.

3. Lack of communication caused another problem at a club with a powerful multiple-drum turbo charged torque converter drive diesel winch. Driving this winch is straight forward. The throttle is opened smoothly over a short period to the appropriate rpm for the wind and the glider type, and is back off progressively in the later stages of the launch. The lag in proceedings as the torque converter winds itself up allows the driver to set the rpm and then switch attention to the gliders before they leave the ground, which they do very rapidly.

However, I understand that at one Vintage Rally, some pilots of the old gliders with low placard speeds experienced some undesirably exciting launches, clearly because there was no system in operations to cope with their unfamiliar needs. They tell me that on the Continent, they would be asked what speed they want before launches on equally powerful winches, and would be served with this almost to the knot. Clearly, launch point to winch communication is vital for such quality of service.

4. In moderately powered diesel winches with a conventional rpm governor, most single-seater launches will depend on speed control by the winch driver in the usual way. Two-seater launches are likely to use all the available torque, so the winch becomes effectively a constant torque device. Airspeed will be completely under the pilot's control almost regardless of he throttle position within a wide range up to the maximum.

This was addressed at one club by an rpm gauge marked with cable speed and by a cable speed guide beside the throttle. These enabled the driver to calibrate the day's launches from reference to the rpm during two-seater launches, which were usually at the correct speed, and to set a suitable initial take-off speed. However, many drivers would not use them. Excessive launch speeds for the lighter gliders were commonplace and the rpm gauge an irrefutable but unheeded witness to the fact.

Such winches typically have a rather low acceleration. Snapping the throttle wide open only slams down the tail skid of gliders sitting with the nose on the ground as the cable is snatched tight. It has no effect on the acceleration because the governor has already fully opened the fueled supply at a throttle setting far below the maximum. This kind of take-off also risks the classic "diesel droop" cable sag, occasionally heart stopping, as the governor shuts off the fuel if the driver backs off to a more reasonable setting too rapidly. A smooth two-second opening results in no discernible loss in performance, improved pilots temper, and relief to rear fuselages.

5. The respect accorded to placard limits varies enormously around the country. Having a professional driver can help, but it does not guarantee such respect, as visits to two sites I know will demonstrate. One hill top site has been the home of excellent launching for years, while one busy flat site is notorious for hurling everything off at a ferocious pace regardless of type, placard limit or tail wagging requests for less speed - 70kt in a K-8 is no fun. club with a converted car engine wild winch successfully use radio (in two-seaters) to get the launch speeds down to the right figures, and improved the launch heights in the process, a point often overlooked by the "speed doesn't matter - you got a launch, didn't you?" school of thought. Another club with imported German secondhand winches corrected their excessive speeds by reference to the winch speed indicators and discussing the launches with the pilots. It can be done, but you've got to want to do it.

6. Forty years ago it was accepted that you "climb gently to 200ft before steeping the climb". Is there a whiff of this old philosophy still hanging around to confuse pilots? A leisurely take-off and rotation is not a fundamental safety requirement but is simply imposed by a low acceleration launch to maintain a safe relationship between speed, attitude and altitude. Pilots accustomed to this may try to impose the same but inappropriate rotation on a high acceleration launch, with results discussed earlier. If pilots insist on retaining the old style with a high powered winch, then winch drivers must be prevailed upon to apply the power sufficiently slowly.

A reverse problem can arise with a pilot taught on a powerful winch. Accustomed to a rapid rotation, the pilot may try to impose hi when launched by a low acceleration winch at a different site. This can only happen if the pilot has been encouraged, or allowed default, to believe that an aft stick pull is necessary to rotate into the climb. This belief was so strong in one local temporary member, from a large club with powerful winches, that we were unable to eradicate it before he left.

For almost all gliders, entry to the climb will happen by itself as the air speed increases, with the stick half fixed in the position needed to fly smoothly off the ground, that is usually at some point forward of neutral. If it doesn't rotate automatically, there is not enough airspeed. The technique provides an elegant and

smooth transition with a safe relationship between the early speed, angle of attack, height and climb angle regardless of whether the take-off and rotation is slow and stately or breathtaking. It feels right from inside the cockpit and looks right from the ground.

### General Lessons

For historical but not necessarily very satisfactory reasons, winch driving in the UK has been neglected as a subject for formal instruction. Considering the potential for unsatisfactory launchings or even mayhem at worst., this does seem surprising in retrospect. It is as significant a part of a flight as an aerotow, and nobody would advocate leaving tug pilots to devise their own theories of launching. It is true that winch launching has made an appearance in BGA instructor's courses and there is a comprehensive chapter on it in the **Instructors' Manual**, but this is entirely directed to the flying task.

Some clubs have the luxury of a full-time highly skilled and conscientious professional driver, or they may rely on a small group of similarly skilled amateurs. This skill, usually based entirely on the previous winch, will not on its own avoid a period of chaos when faced with a new winch of monumentally different power or response characteristics or requiring new techniques. There are always technical and procedural solutions available to assist the skilled, the less skilled and the new driver.

Even with the low powered 70bhp winches I drove forty years ago, launch consistency benefited from an rpm gauge, a device used for years by Dick Stratton, BGA chief technical officer. With three, four or five times the power now available, getting it wrong (or at least only somewhere near right) with no appropriate driver aid is all too easy. Club management's who are content to put up with less than the best will continue to get it. Only they can put in place the necessary solutions and see that they are applied.

### The Lessons Applied

Having observed the prototype Skylaunch and experienced some excellent launches at the Mynd, and well aware of the risk of applying traditional winch training policy (ie haphazard) to such a high powered winch, the BFGC appointed its chairman John Wood to be responsible for training all drivers, old and new. Nobody was allowed to drive the Skylaunch until they had been trained to a standard operating method.

To start this process, demonstration and instruction was given by Mike Groves (with Dennis Jones, the "D & M") who is also an experienced professional driver. Very quickly, a few more drivers were cleared to drive and instruct. Over a period of several months. 16 three-driver duty crews were qualified, some of whom had never driven a winch before. Including some non-rotata drivers, over half the membership now contribute to a generally satisfactory service despite most performing only one third of a day's launches once in every eight weeks.

Excellent launches were achieved from the first day. On only the second day of operation 170ft was reached by two-seaters and 1900ft by K-8s in a stiff wind from the 850 yard cable run. Heights of 1200ft are readily obtained by the two-seaters in zero wind, a vast improvement on the 800ft achieved before. Weak link breaks are practically unknown. The whole launch is absolutely smooth, the sprung roller boxes eliminating the usual twangs and twitches of the cable. Over speeding is rarely

experienced, but the instant throttle response make sit easy to react to glider speed signals.

Full credit must be given to the design of the winch, in which greater attention was given to making its operation as simple as possible. One lever selects either cable drum; one guillotines both cables; one applies both to drum brakes; one applies the cable tow-out braking; the engine will not start unless "neutral" is selected and the wheel chocks are down; the air speed automatic gear box requires only the selection of "drive"; taking up cable slack requires only idle rpm and the throttle is moved to a pre-set position for take-off and early launch.

The throttle pre-set is a string-loaded stop bar set by two secondary levers in notched slots, one for the wind strength and the other for the glider type. The full throttle range is always available. By opening the throttle smoothly over about 2 or 3 secs up to the stop bar, or initially a little beyond for heavier gliders, there is virtually no snatch and the gliders leave the ground very rapidly, cleanly and controllably, typically in less than 2secs and occasionally within their own length. There is not dramatic pitch-up and even the K-8 needs less than about half down elevator to rotate nicely into the climb by itself.

The gear changes up through second to top gear are not felt in the glider. Further up the launch, power must be reduced in the usual way, the only part of the launch that needs a significant element of judgment. The glider type is passed to the winch by ground radio, and generally most drivers will not launch until this is done. The awesome but simply selected power has provided all gliders from vintage Gull 3 to DG-500 so far, with similar launch profiles but at appropriate launch speeds from 45 to 60kts. One good outcome is that because the K-13 and K-8 now have similar take-offs, early solo pilots converting from one to the other are spared the surprise of finding themselves at 100ft when they expected to be still on the ground, as would happen with the previous winch, for which no briefing ever seemed able to prepare them fully.

To the Skylaunch, all gliders seem alike.

### Conclusion

This experience has shown that it is perfectly feasible to step up to a very powerful modern winch with complete safety. When converting from an old to a new winch, whether similar in principle or requiring unfamiliar techniques and with greatly enhanced power and response, none is so mysterious in its workings that potential driving and piloting problems cannot be foreseen and their solutions prepared in advance. It is necessary to accept that existing drivers will need some re-training. Driver guidance devices of an appropriate kind will help them to adapt. Such guidance makes it simple to train new drivers. Pilots may need preparation for a major change in take-off performance and possibly in climb control technique.

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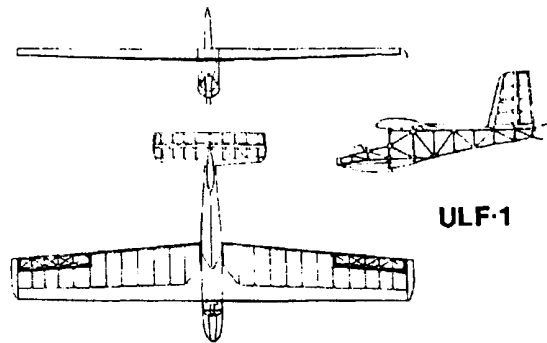
## THE ULF-1 FOOT

ULF-1 is a ultra-light glider with a weight empty of 46kg (100 lbs). The aircraft can be leg-launched from slopes of more than 15 degrees even at small wind speeds. The self launch is very simple and does not require any special skill. Before takeoff the elevator stick should be in a slight nose down position to lift the horizontal tail. The moment the pilot feels a pronounced seat pressure, the control stick should be pulled back until the aircraft

lifts off. After takeoff the pilot retracts his legs and puts them on rudder pedals. A sliding jalousie-type construction behind the pilot's back can be released in flight to provide a comfortable seat. Because of its small sink speed (0.8 m/s at max takeoff weight) and its excellent maneuverability, ULF-1 is sensitive to small currents. Car tows in calm air can be made. Cable length should not be more than 100 metres.

For glider pilots there will be no problem to fly ULF-1. However, normal hang-glider experience is not sufficient to handle the aircraft. At least some solo flights on conventional glider is recommended.

On the ULF-1 prototype a hang-glider parachute is used as a safety device.



### Handling Qualities

Dynamic pull-ups (up to 20° pitch attitude) result in a smooth nose down movement after the wing has stalled. Loss of height will be a minimum with stick in nose up position. In turbulent air and close to the stall speed, there is a possibility of a wing dropping. Recovery can be achieved by using the rudder against the turning movement. The loss of height will be about 10 meters (30 feet).

### Construction

ULF-1 is especially suited for D.I.Y - enthusiasts. The basic construction materials are spruce, birch plywood, balsa wood. The airframe is covered with fabric. For hinges, fasteners etc, fibre glass cloth with epoxy resin, aluminum and steel sheet materials are used. Steel tubes are used only for the control stick, control parts in the cockpit area and rudder drive.

The cost of material amounts to about \$1,000 and it can be built in: under 800 hours.

For road transport, the wings can be detached in two parts. In addition the horizontal tail can be removed. The airframe can be taken off from a trailer and reassembled in less than six minutes.

We can furnish you with a complete set of 30 blueprints, most of them full scale, including full scale computer generated rib layouts for wings and tail plus 32 photographs of all major components. We also provide a 38 page construction manual including a list of materials with their American, British and German designations. In addition a 15 page flight and operation manual authorized by LBA (Luftfahrt-Bundesamt = German Airworthiness Authority) will be provided. All descriptions and manuals are in English. We do not furnish a kit or materials.

## General Description

### Wings

Cantilever structure. Shoulder mounted, single wooden spar, plywood nose section, wooden ribs, fabric covered. Wing section Wortmann FX 63-137, 18% thick at root, 15% thick at tip.

### Fuselage

Wooden frame of triangular cross section, covered with fabrics.

### Tail Unit

Cantilever structure, fabric covered

### Landing Gear

Nose skid, fishing rod tail-skid (fibre glass tube)

### Accommodation

Single sliding seat.

### Instruments

Air speed indicator, rate of climb indicator.

### Dimensions external

Wing Span	10.4m
Wing chord at root	1.53m
Wing chord at tip	1.07m
Wing aspect ratio	8
Length overall	5.55m
Tailplane span	2.9m

### Areas

Wing gross	13.4m <sup>2</sup>
Vertical Tail	1.5m <sup>2</sup>
Horizontal tail	2.4m <sup>2</sup>

### Weights and Loading

Weight empty	46kg
Max. takeoff weight	136kg
Max. wing loading	10kg/m <sup>2</sup>

### Ultimate Structural Load

Factor : Positive 6g, negative 4g

### Performance

Best glide ratio	16
Min. sink speed	0.8m/s
Min. speed	32km/h
Max. speed	70km/h

## TECHNICALITIES

By Mike Burns

In Volume 1 Issue 1 Gary Sunderland offered some good information on the subject of "Wood Basics". The following may add a few items to that information.

The Gliding Federation of Australia can provide Section 2 of Section 50 of the Manuals of Standard Procedures which covers most aspects of timber and glue technology as needed for sailplane repair and construction. Those notes have been evolved from the 1960's 8 National Gliding School Notes, the British Gliding Association notes, plus other sources. GFA inspectors

repairing a glider can use those notes as their authority and sign off the repairs accordingly.

### Resorcinol Glue

When using Resorcinol Glue a lot of care must be taken. I personally have seen more failed Resorcinol Glue joints than any other type of glue, both while doing stage inspections for homebuilders and surveys on older gliders. The main problems being:

1. Not enough glue applied to BOTH sides of the joint, resulting in soakage into the timber and a "dry" joint.
2. The time from applying the glue to closing the joint was too long. This can be quite a problem in hot weather.
3. Resorcinol requires timber joints to fit very closely, recommended optimum joint gap being .0006 inches. this can be hard to achieve with hand tools. Resorcinol is well suited to factory production methods.
4. Incorrect mixing of the glue component due to misunderstanding of instructions.

In 8 lot of cases the glue problem was detected by examining the glue samples made up by the builders in accordance with the Manual of Standard Procedures requirements. That sample procedure has also allowed badly manufactured batches of glue to be found before they were used in significant structure.

### Epoxy Glue

The only Epoxy joints I have found defective in service were mixed with incorrect ratios, that resulted in joints remaining soft for up to 10 years.

Modern Epoxy glues offer good gap filing, but the aim must be for the best joint fit possible. A variety that helps particularly in hot weather. Epoxy should be cured off at around 40 degrees C for 12/15 hours to allow the joint to develop something close to its rated strength. The "EpiGlass" range of Marine epoxies has been in use since the early 1960's and has a good track record

At the end of a glue job, the excess epoxy glue can be thinned and used to varnish areas that need it, or the epoxy can be thickened with any one of a variety of fillers, to be used to fill staple holes, fair joints etc. All in all the epoxies are a good thing for the home builder.

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## WHAT'S NEW!

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By Mike Burns

The late Reg Todhunter's "BLUE WREN" self launch sailplane has now been registered in New Zealand and test flown by his knew owner who is tickled pink with the little gem. There is a possibility that the 'BLUE WREN' could be developed further, any reader interested in that should contact Neville Swan 90 Lukens Rd. West Harbour Auckland 8 New Zealand. Ph/Fax 0011 649 416 7125. The Power House Museum is establishing a facility at Bankstown N.S.W. where it is expected that several f Reg Todhunter's sailplane projects will be displayed and Reg featured in their "Hall Of Fame". Had G.F.A. assisted the 'BLUE WREN' it may have also gone into the Power House but at the time G.F.A was not interested.

As a body of people we tend to centre our attention on flying achievements, with little or no concern about those who contribute design and development without which there would be nothing to fly.

{Editor's Note} Here is a letter sent to me by Neville.

Dear Ed,

I have been meaning to contact your association since I read of its formation in my "SAILPLANE BUILDER" magazine. I have been a member of the S.H.A. for a number of years and it is good to know that there are kindred spirits a lot closer. I would be interested in subscribing to your newsletter if you could let me have the details.

I am a glider pilot/instructor/engineer with a particular interest in self-launchers (I even made the mistake of building an American Eaglet a few years back). My current steed will, I think, be of interest to your readers. It is the 'AUSTRALIAN BLUE WREN' built by the late Reg Todhunter which I imported last year. After a thorough 'going over' and a few mods, the main one being a new enlarged canopy, I flew it for the first time last April. The engine fitted at that time was a JPX horiz. opp. twin which although apparently an excellent motor was hand (recoil) start only. I do not consider it acceptable in a motorglider so I have just replaced it with a three cylinder Koning. I know have to find /make a folding prop (any ideas?).

I read with great interest that a Sydney company is developing a self launcher to be available as a kitset.. Do you have any information about this design?

Looking forward to hearing from you. Kindest regards, Neville.

#### A DATE TO REMEMBER

Next year from January 4th to 11th, the "Vintage Gliders Association of Australia" will hold The Annual Regatta at the Bendigo Gliding Club Airfield Raywood, Victoria. The Bendigo Gliding Club Airfield is located at Pyramid Hill Road, 30km from Raywood right on Elmore Road 3km. Position : 36° 32' 32"S, 144° 14'24"E. The A.H.S.A. in conjunction with them will joint in a get-together. Winch and aerotow will be available. Camping permitted near the Club house. Facilities in the Clubhouse. A dinner will be held on Saturday 11th January in the local pub in town. Keep the dates in mind and try to make it to Bendigo so you will have the opportunity to meet other members of our association and interchange ideas for the next future of the A.H.S.A.

In our last newsletter in our WANTED section, Brian Berwick was desperate for a TOST Release or drawings to make one. The response that Brian got was amazing!. Finally Alvin Petersen provided the stuff that he was looking for. Our sections are working so if you want something do not hesitate to drop me a few letters and I will insert it in our journal.

#### NEW MEMBERS.

We have new members to welcome to the group. They are...  
Keith Nolan 32 Woorite Place East Keilor Vic. 3033.  
John E. Biggs Port Phillips Village Unit 123 Stewart Ave  
Altona Meadows Vic. 3028.  
Dr. Jeffrey Farrow 6 Ocean Crt Altona Meadows Vic. 3028.

Des Muir 106 Crown St. Grafton N.S.W. 2460.

**Welcome** aboard fellows and we look forward to a long and mutually satisfactory association.

#### "Sailplane Builders"

Official publication of The Sailplane Builders Association U.S.A  
\$29, airmail \$ US 46)

Dan Armstrong, Secretary Treasurer, 211100 Angel St.  
Tehachapi. CA 93561, U.S.A.



**Pacific Ultralights** - Twelve monthly issues for only A \$ 45.00  
P.O.Box 731 Mt. Eliza, Vic 3930 Australia. Overseas  
subscriptions, credit card accepted.



#### 'TWITT' (The wing is the thing)

Twitt is a non profit organisation whose membership seeks to promote the research and development of flying and other tailles aircraft. Yearly subscription rates: US\$ 18 inside US, outside is US\$22. 12 issues per year. For more information write to PO Box 20430, El Cajon, CA 92021 USA.

#### Attention "Woodstock" builders...here is the good stuff!

"Woodstock" sailplane sketchbook illustrated construction manual US\$25. Also available are drawings for simple jig used to construct various components. Package deal of sketchbook and jig drawings US\$85. Overseas customers add US\$15 for airmail delivery. Send S.A.S.E for more information to: C. Brooks, Vuelta Grande, Long Beach, CA 90815 U.S.A.

Two excellent publications for those interested in early aeroplane scale models and history of "WW-1-AERO and "SKYWAYS" are published in USA by Leonard .E. Opdyke, 15 Crescent Rd. Poughkeepie, N.Y. 1261 U.S.A.



Leonard E. Opdyke, Editor



David Ostrowick, Editor

## Book Review

"Personal Aircraft Drag Reduction" By Bruce Carmichael. 207 pages and 195 illustrations contain information on aircraft drag reduction beyond streamlining. The cost US\$ 35. Publisher:- Bruce Carmichael, 34795 Camino Capistrano, Capistrano Beach, California, 92624 USA.

## WIND ROSE PROJECT.

By Paul Johnson.

It all started on the 29th of April 1984 as I turned off the engine of my "Wing-Ding" Ultralight, more Ding than Wing as a gentleman out at Sunbury recently remarked. I just happened to over hear a conversation between my minister of finance and boss of this office and supremo of this house, my wife...Lyn and my very good friend Keith Nolan (who recently joined our association).

For those who do not know Keith... which I can image that would not be to many people as he is a gliding instructor who owns an "OLYMPIA" well know as the "Yellow Witch".....Olly Mackerell!.. and is one of natures gentlemen and needless to say a great mate of mine.

The conversation went along the following lines...**Keith:** Yes Lyn, that's a deal, OK...next Saturday you're on ...of course I will take you for a flight in a glider. **Lyn:** "Oh!...thanks Keith that would be great!. **Keith:** "{Addressing to me}... OK Paul...Lyn would like me to take her for a flight in a glider next weekend....

They must think a blokes mad! Did they think that I would not be just a little bit suspicious, there are many things Lyn would like to do...but...flying is not one of them.

I became a member of Beaufort Gliding Club before I could learn to spell "ZEPHYR" as the Wing-Ding was grounded. !

Days and days were passing by...how to convince the Finance Minister, the Treasurer, the Planning Minister, the Purse Keeper in other ways the **boss** of the house {WHEN I AM SLEEPING} that we need a 4mt by 8mt shed. Not just in case I ever wished to build a glider but for a lots of other good reasons that I can not recall.

After much effort and dare and a convincing argument I got my shed because I am a very good boy and Lyn has me on top of the A-1, 'SUPA-DUPA', 'TRUE BLUE BOY' list.

{Eds Note: Paul...you have a very good wife, a Supa-Dupa gal too!}

More day and days passing by...what to build?... About the same time as I gained the shed I received a call from Keith telling me that he and Gordon Pope (another Beaufort member) were going to see the plans of a 'WIND ROSE' that Doug Cameron had purchased, that sounded like a great idea so I tagged along as well. The basic skid and pylon section of the 'WIND ROSE' was very similar to the 'Wing-Ding' and the experience I had gained on that project made me confident I would do a good job of the 'WIND ROSE'.

After obtaining some fabulous literature on timbers testing from Doug Cameron I purchased my plywood 'hoop pine' and wood for the fuselage, being Douglas Fir and Spruce. The first lesson I learnt after building my "Modules of Rupture" test jig and testing

the Douglas Fir was that those variegated stripes on the wood that I thought defined the grain did not. Splitting the wood indicated that the grain cut across the lines at gradients of between 8 and 11 to 1 not good enough. By the time I accumulated enough good timber I think I may have done better to have gone straight to PERFECTUS in the first place and buy the stuff from them, well maybe...the 'first of type' assessment on this glider was carried out by Mike Burns called for quite a number of mandatory modifications one of which was removing the tail wheel off the rudder and altering its design to remove a 'hook up point'.

At a meeting with Mike I also indicated that I wanted to remove the elevator without having to undo the elevator cable turnbuckles under the cockpit floor.

Now, who truly thought Mike would reach into the bottom drawer and draw out the plans of an XYZ and tell me to: "do this...drill a hole here, paint it yellow there...that's how it's done" Wrong, Mike's response was: "go away and see what you can come up with and run it past me". I must admit it is a great feeling to come up with modifications which are accepted.

The last structure built were the wings and ailerons which are hot wire cut from extruded Styrofoam then covered in glass. The thickest foam I could source was 50mm thick, this required considerable joining of foam prior to hot wire cutting, very important that no epoxy would end up fouling the wire or else there goes that smooth profile shape.

One caution to anyone about to build the wings of a 'WIND ROSE' the wings and aileron template do not allow enough clearance for the hinges. The wing and aileron glass, and the layers of strengthening doublers and finally any additional alignment layers that may be needed. The result is the trailing edge of the wing and aileron end up out of alignment.

I mounted my instruments in the panel, and yes, the corner of the vario that Mike Valentine donated to the "Vintage Gliders Association" I acquired it at Ararat last XMAS and it checked out just fine. It is a good thing that I wanted to modify the mount because I now have not only the justification but also the motivation. Any way....here...are some clues...completion date...1990...91..92..93..94..95..96..97..current D.O.C. February 97.

What can I say, the demands of a family and the subsequent lack of funds has seen each D.O.C. come and alas go, but I now have wings built (but not finished), fuselage built (Pilot pod not covered), motor and propeller instruments. Trailer and fitting built and registered. Fuel tank built and installed. The only remaining major items are: Harness (buy and install. Any one with an old one?) Cover pilot pod.

!GEE!... It sound like I should have it done in 2-3 months doesn't it?. I must conclude this report as I am over due on my promise to our Editor and I am in dread of the follow up phone call, particularly after Jim's kind words in the September 96 newsletter and Jim has just rung chasing his article.

## ARE WE DREAMERS?

The choice is yours !

Continuation from page 8

-has caused many pilots to take up other sports or consider building their own glider or Ultralite.

The question is what to build?

In the past there have been some popular well known designs available e.g. the classic Grunau Baby, the Olympia (anyone who has flown the "Yellow Witch" will appreciate this lovely classic) if plans were available for the EP-1 this would be a simple , convenient glider for the beginner to build.

Its performance was not too bad either or was it Merv Gill's skill that made it go so well?

Considering the selection of approved plans may be limited and perhaps dated ;it would seem a challenge for some enlightened designer to come up with a new design, developed especially for the home builder , to be relatively easy or straight forward to build using readily available materials,to be designed for two people to handle and rig, components of finished glider to be transported and stored in an enclosed trailer to solve the hangarage problems.

The glider should have good flight handling qualities and a reasonable performance, L/D 30:1 approx, something similar to the ES-59 Arrow with a two piece wing would be nice.

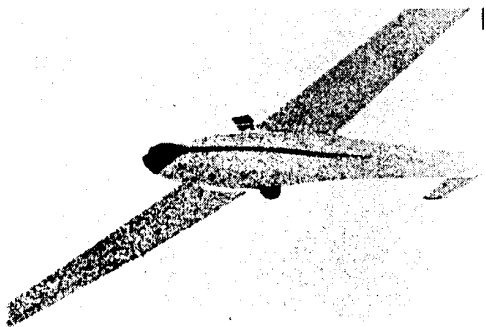
There have been design contests in the past, one can recall a G.F.A 13 metre design contest, what happened to it ? Have any of the designs resulted in an aircraft finished?

One of the entrants was Pete Bowers with an interesting new design called Bantam 2. It was described in Soaring June 1974, food for thought for budding designer/builders.

If building a classic replica is not your bag ( I know of one guy who wants to build a replica Minimoa 1935), and you feel daunted by the implications of designing and building your dream ship, then maybe you are interested in being completely independent and build one of the foot launched gliders, some of weight shift Rogallo types are probably the simplest and most portable.

Then you could consider something like the ULF-1, this lightweight German design has full controls of the conventional glider. (Soaring May 1986,Aircraft June 1986 ) , or the late Jim Maupin's Carbon Dragon.

THE CHOICE IS YOURS! If you are a dreamer.



## WAS SANTA A UFO?

After much research we present the annual Aeronautical Engineers report on the theory of Santa.

1) No known species of reindeer can fly. BUT there are 300,000 species of living organisms yet to be classified, and while most of these are insects and germs, this does not COMPLETELY rule out flying reindeer which only Santa has ever seen.

2) There are 2 billion children (persons under 18) in the world. BUT since Santa doesn't (appear) to handle the Muslim, Hindu, Jewish & Buddhist children, that reduces the workload to 15% of the total -378 million according to Population Reference Bureau. At an average (census) rate of 3.5 children per household, that's 91.8 million homes. One presumes that there's at least one good child in each

3) Santa has 31 hours of Christmas to work with.This is due to the different time zones and the rotation of the earth, assuming he travels east to west (which seems logical). This works out to 822.6 visits/second.

That is to say that for each Christian household with good children, Santa has .001 second to park, hop out of the sleigh, jump down the chimney, fill the stockings, distribute the remaining presents under the tree, eat whatever snacks have been left, get back up the chimney, get back into the sleigh and move on to the next house.

Assuming that each of these 91.8 million stops are evenly distributed around the earth (which, of course, we know to be false but for the purposes of our calculations we will accept), we are now talking about .78 miles/household, a total trip of 75.5 million miles; not counting stops to do what most of us do at lease once every 31 hours, plus eating etc.

So Santa's sleigh must be moving at 650 miles/second, 3,000 times the speed of sound. For purposes of comparison, the fastest man-made vehicle on earth, the Ulysses space probe, moves at a pokey 27.4 miles/second. A conventional reindeer can run, tops, 15 miles/hour.

4) The payload on the sleigh adds another interesting element. Assuming that each child gets nothing more than a medium-sized Lego set (2 lb), the sleigh is carrying 321,300 tons, not counting Santa, who is invariably described as overweight. On land, conventional reindeer can pull no more than 300lb. Even granting that "flying reindeer" (see #1) can pull 10 TIMES the normal amount, we cannot do the job with 8, or even 9, reindeer. We need 214,200.

This increases the payload - not counting the weight of the sleigh - to 353,430 tons. This is four times the weight of the ocean-liner Queen Elizabeth.

5) 353,000 tons traveling at 650 miles/second creates enormous air resistance. This will heat the reindeer up in the same fashion as a spacecraft reentering the earth's atmosphere. The lead pair of reindeer will absorb 14.3 QUINTILLION joules of energy. Per second. Each. In short, they will burst into flame almost instantaneously, exposing the reindeer behind them and create deafening sonic booms in their wake. The entire reindeer team will be vaporized within .00426 of a second.

Meanwhile, Santa, will be subjected to centrifugal forces 17,500.06 times greater than gravity. A 250 lb. Santa, being very conservative in terms of guessing Santas weight, would be pinned to the back of his sleigh by 4,315,015 lb. of force.

If Santa ever DID deliver presents on Christmas Eve, he's dead now.

A Merry Christmas to one and all!!