THE AUSTRALIAN HOMEBUILT SAILPLANE ASSOCIATION

Volume 5 Issue 17 **June 2000**

G'day folks,

Time is passing by very quickly, unfortunately we can't stop it and we have to accept that we are getting older, anyway, here I am in front of my computer typing all the information that you send me which is not enough and my folder at the moment is looking very empty...so!...you need to send your articles to me now!

Thanks to Malcolm Bennett and our Secretary Peter Raphael (The Erudite) my "Woody-Roo" (Short for Kanga Bloody Roo) is in a stage of completion with only the finals coats of paint to go which will be done this coming Spring time - September-October . Malcolm has been a great help to me and I have been learning a lot with him, he has profound knowledge and experience on how to build an aircraft. He built a Monerai which actually flys and now he is building a Woody. The other person is Peter Raphael with his multifaceted skills as spray gun painter ("Raphael" The Painter Master Maravilloso) has been doing the paint work. Thanks a lot fellows.

As I am writing this Editorial, with sadness I have to inform you that Gerry Downs has passed away. Gerry was involved in an ultralight accident near Nagambie. Here is a note of appreciation from B. Berwick;

GERRY DOWNS...
I am sure the gliding and sport aviation communities will join me in deeply regretting the passing of our friend and colleague, Gerry Downs, in a flying accident on the 19th of May 2000. During his time as Regional Technical Officer (Airworthiness), in the Victoria/Tasmania region, Gerry was an integral part of many homebuilt projects. His standards are reflected in many current and soon to be flown aeroplanes. In case of my own Woodstock project, I was handed a well documented package from the previous owner John Tyson, Gerry had overseen the project to this point and headed John down the road to airworthiness with a knowledgeable guidance.
During the time of the handing over, Gerry came over and made suggestions for setting up my workshop, examined test-pieces, and sowed the seeds that resulted in the wing modification. Aviation is poorer for the passing of Gerry Downs.
My sincere condolences to his family and friends. ***Brian Berwick.***

Finally for those members who are reading this journal with the remark at the top page reading **"COMPLIMENTARY COPY"** it is your last issue, unless you renew your subscription. The fee is AUS$20.00 (Australia) and AUS$25.00 (Overseas). Please pay in Australian currency by international money order. We need your support for the benefit of all those involved in a homebuilt sailplane. We have got plenty of expertise and people with knowledge Why we don't use it?...

James Garay
Editor

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Inside This Issue

Presidents Corner

by Gary Sunderland

My early interest in gliding started when I became aware that gliding enthusiasts were actually designing and building their own sailplanes.

When I joined the VMFG at Berwick in 1954 all of the club's gliders were built by members or individuals.

Our T31` trainer was from a Slingsby kit, but the Coogee and Golden Eagle were designed by their constructors.

This was the golden age of Australians designed sailplanes, and enthusiasts like Keith Jarvis created the JOEY and JUMBUCK and Ted Pascoe the SPRUCE GOOSE and SUPER GOOSE.

I well remember meeting Ted Pascoe for the first time at Tocumwal in 1956. The Little SPRUCE GOOSE was the prettiest sailplane I had seen to that time, and I made a resolve to, one day in the future, design and build my own beautiful sailplane.

Incidentally, do not imagine that designing a sailplane is all easy, even back in those early days.

Designing an amateur built aeroplane, or an ultralight equivalent, is relatively straight forward by contrast. All you need to do is just adapt established materials and sizes from traditional aeroplanes to a smaller airframe. If the resulting design still has problems, you can usually salvage the design by fitting a bigger engine.

In contrast an efficient sailplane demands that every part is optimized for maximum strength and minimum weight. Excess weight in any part just throws more load onto other components, which in turn has to be strengthened, and in turn, need to be supported elsewhere. Structural inefficiencies the result in an aerodynamic loss in performance which cannot be rectified.

For an efficient sailplane there must be an optimized structure, and this requires that engineering calculations are carried out, certainly not to the level of a production factory built glider, but sufficient to establish the design.

People, like Ted Pascoe, have taught themselves to carry out these calculations, but the gliding movement, have been fortunate to have engineers within their ranks, who are qualified to carry out this job.

Thus Harold Bradley designed the structure of PELICAN and Douglas Lyon designed the ZEPHIRUS. Ron Adair, of course, designed the ALTAIR which at 18 metres span, remains the biggest Australian single seat homebuilt sailplane produced to date.

My hope is that, in the future, young engineers within our Australian movement will accept the individual challenge and attempt to both design and build their own high performance gliders.
While a small aeroplane or ultralight may be easier, there is nothing like the challenge and satisfaction of pure soaring flight.

Sailplane Design Symposium at Bacchus Marsh 10-11-12 June 2000.

The President is unable to attend this meeting, due to a previous engagements. However, John Ashford has agreed to deputise and is preparing some discussions and practical performance exercises to illustrate the design process.

Also Ian Patching, of the GFA vintage glider committee, will be displaying the Adair-Gurr ALTAIR sailplane and possible other local home built designs.

MAIL BOX

Dear Ed,
Just FYI: I expect a bookseller in Australia to begin stocking "Fundamentals of Sailplane Design" soon, they are:

The Technical Book Shop, 295 Swanston Street Melbourne 3000.
Phone:(03) 9663 3951 Fax:(03) 9663 2094
Email: <info@techbooks.com.au>.

Just in case you hear of anyone looking for the book. I assume (hope!) that when all is said and done it will be a lot easier and quicker than ordering it from us in the US. I still have a Letter to the Editor coming, will shoot for well before the end of April.
Regards, Judah

Dear Ed,
Many thanks for your letter, I must in principal support the sailplane homebuilders being one such person for over 6o years.
My position these days is still one of activity mainly with Townsville Gliding Club and as Patron of The Vintage Gliders of Australia.

I presently fly my latest and possible my last creation because of my age.

My Sunbird has now been flying for over 4 years and I serve as airworthiness officer for GFA and a level 2 for the Ultralight Federation.

I will be visiting members of the sailplane homebuilders of USA in July after attending the IVSM. International Vintage Soaring Meeting 2000 at Elmira NY. State in July. My last visit to Tehachapi in California was in 1997. I was to become involved with a Carbon Dragon and recently saw one here in Australia by Graham Betts at Lake Keepit.

I am happy to promote the Australian sailplane homebuilders but my time as far as the future is concerned must be in "the lap of the Gods". Yours sincerely. Kevin Sedgman.Cairns QLD.

Dear Ed,
Thanks for sending along that copy of the Australian Homebuilt Sailplane Association newsletter! I was pleased to

see not one, but two reviews of "Fundamentals of Sailplane Design".

A number of points came up in the review that I feel I need to clarify - can you make space for a letter to the editor? When's the next deadline? I need to consult with Prof. Thomas and he his out of town at the moment. Regards. Judah Milgram.

Dear Ed,
A pleasant surprise in the mail today: the March, 2000 edition of the AHSA newsletter with not one but two reviews of our new title, "Fundamentals of Sailplane Design".
Thanks for sending it along — I was happy to see such thorough and frank reviews.
Still, if I may, I would like to clarify a point or two:

First, a heartfelt apology. Both Mr. Champness and Mr. Sunderland lament the absence of Australian designs in the data tables and three-views. And rightly so! I should ex-plain that for this updated edition we put considerable time into expanding the sailplane data in the Appendix — and not just with American sailplanes. This involves more work than many people realize (certainly more than I bargained for) and although I very much wanted to bring in some Australian designs I wasn't able to put the data together before the press deadline. Please rest assured this was not a deliberate editorial decision.

Second, both reviewers find Fred Thomas' name worthy of comment. In fact, Prof.Thomas is German, even if "Fred" is not the most typical German name (his bio is on the back flap). His English is excellent and without doubt he could have done a creditable job of translating the book on his own, had he chosen to do so.

The reviewers are of course correct in pointing out that the book does not discuss structural analysis. The title "Fundamentals of Sailplane Design" is a direct translation of the original German. It never occurred to me to change it, perhaps because the book and its scope were so well known to me. I hope your readers are not disappointed.

Mr. Sunderland states that the flight test form in Appendix 2 is inadequate, perhaps dangerously so. This form is identical (except for typesetting) to the form used for years by Idaflieg in their flight test work and, as I understand, covers the main points in JAR-22 (which in turn, I believe, has nothing to say about use of dive brakes on tow) If the protocol is inadequate, the message has obviously not reached Idaflieg or the JAR authorities, and I'd be more than happy to help put the reviewer in touch with appropriate people.

Regarding page 163, static stability *does* require the stick force to become increasingly nose-down with airspeed; implicit here is the understanding that "nose-down" means "push". Perhaps we needed to be more clear on this point.

As for ultralights, I do wish we had found the time to add material on the latest developments. The same goes for a more detailed discussion of flying wing and canard aerodynamics, structural design, as well as a number of other topics. It simply came to a point where we had to bring things to a conclusion ("in this century", as we used to say). We do hope to produce another edition a few years from now, and since the translation is now complete, we will be able to devote our energies entirely to expanding the material.

By the way, the Technical Book Shop in Melbourne has expressed interest in carrying this title, and I am optimistic that they will actually follow through. That would make it easier for your readers to obtain the book. They are:

The Technical Book Shop
295 Swanston Street
Melbourne 3000
Phone: (03) 9663 3951
Fax: (03) 9663 2094
Email: `info@techbooks.com.au`
sincerely,
Judah Milgram
(301) 422-4626
(301) 422-3047 fax
`milgram@cgpp.com`

Dear Ed,
I am becoming very interested in the Carbon Dragon. Being in the main a hang glider pilot, the low speeds and sink rate look very attractive. I fit into the weight range (just on 15o lbs at present) which Lee Scott and Gary Osoba both mention is quite important. I found Gary Osoba's articles on microlift very interesting, and I have certainly noticed it a low altitudes in a hang glider but invariable too low and not large enough to be able to use effectively.

Ref. Building, I don't like to start something I'm not certain of finishing so I am considering my position. I realize there is a lot of work in it. Enquires I made with Gary Osoba indicate that the Light Hawk he is working on is not likely to be similar type of aircraft, his comments were that The Light Hawk is not yet done. It is going to be very high performance. and expensive to produce. We should have the prototype done late this year. So, as far as I know, the CD is currently still the only really low sink-rate homebuilt glider.

I talked to Lee Scott ref. hs CD, do you know the current where about of his and Graham Betts? I talked a bit about them with Craig Worth (from HGFA) last January, and I have the impression that they may be up in Manilla area. If I could get a contact for Graham some time I would appreciate it.
Best Regards. Brian Rebbechi.

Ed's Note:
Graham Betts and his Carbon Dragon (Yes ! he is towing it from NSW) will be here for our Symposium at Bacchus Marsh over the Queens Birthday weekend. Being the 10th, 11th & 12th of June 2000.

Lee Scott's Carbon Dragon is advertised for sale in the last issue of Australian Gliding and Sky Sailor. Price to sell $6,800. It is 70 Kilos in weight, has fully enclosed trailer. Suit pilot weight of 65-80 kilos only.

Dear Ed,
Please find enclosed the postage value for the back issues of the Newsletters that I have missed due to relocating back to Victoria.
Through the newsletter I would like to ask if any of our South Australian members have any information they may have heard about a complete set of Monerai plans that were stolen from my parked car.

Parked in Highgate, a suburb of Adelaide in mid November, taken together with everything else in the car including suit case and others valuables and probably dumped when found to be of no value to anybody else.

If anybody knows anything they could contact me at this address. Michael Williams 37 Sydney Parkinson Ave. Endevour Hills. Vic. 3802. Ph.03-9700-4-671

Dear Ed,
I sure enjoy your Newsletter. Keep up the good work. Thank you. David Muir. USA.

Dear Ed,
Many thanks indeed for your parcel of Newsletters. I have received similar from America, but had never received the Australian version.

Therefore I wish to say that I was very impressed with your Newsletter and specifically with the quality of the work contributed by the members.

Gary Sunderland is indeed an asset to AHSA and must be congratulated for the input he continues to make to the Australian Gliding in general.

I will be meeting with some members of SHA our counterpart in the States in July this year. As I told you previously I correspond regularly with Howard Burr of Tehachapi and through him are able to meet many homebuilders in and around Los Angeles.

Howie is assisting me in planning our itinerary for the many things we hope to do while in the States, primarily to represent Australia at the International Vintage Soaring Meeting at Elmira NY. I intend taking along these copies of AHSA newsletter to give to my friends over there.

Perhaps I should ask you while the opportunity is here. Has the Committee of the AHSA as yet thought of making some contribution by way of assisting our team in their trip to IVSM. We are taking the Golden Eagle also to America to show off Australia and will fly it at Elmira and maybe even Oshkosh as the EAA has shown an interest seeing we will have it over there.

Forgive me if you have already made a contribution through Alan Patching for this could be possible; but I mention this fact because few people are making a supreme effort to bring this visit about .

Fortunately the GFA have granted some funds and some State Associations are also helping, but it is not easy to fund a special expedition like this. Happily I might add, dedication and enthusiasm is bringing it all together.

Once again thanking you for your interest I am sure I will be able to contribute an article on return from the States in August
Yours sincerely. Kevin Sedgman.
***Ed's Note: Kevin..! I'll be looking forward to see* it.**

Dear Ed,
I very much appreciate the complimentary copies you have sent me. I enjoy reading them. The last two issues have been particularly interesting. Congratulations on the continued good work of all the team.

However, my conscience has been nagging me and, since I am in full accord with the aims and objectives of AHSA and want to encourage the ideal of home construction, I feel it is time I became a member of the association. So I enclose my subscription for the current year. With my best wishes. Allan Ash.

TECHNICALITIES

HOW TO SIZE THE CAPS IN A WOODEN BOX SPAR WITHOUT MATHEMATICS *by Stan Hall*
An excerpt from Sailplane Builder. JUL-AUG-99

Determining the size of the caps in a wing spar, be they of metal, wood or composites, is largely a process of trial and error; you estimate (or guess) the sizes and then apply the principles of stress analysis to see if they're strong enough. If they aren't, or are so over strength as to represent an unacceptable weight penalty, you try again. And you do this for several points along the span. The upper cap, being in compression most of the time, is the focus of our attention because as engineers like to put it, while you can stretch a wet noodle, it doesn't compress well. Unless stiff, structural members in compression tend to behave like wet noodles. Bad show.

Obviously, a certain engineering expertise is required to do the analysis and a great deal of patience is called for in the repetitive and time consuming nature of the cap-sizing process. Tedium City. Many potential designers thus find themselves turned off by the challenge. This can be dangerous because to keep your wings from coming off you have to depend on more than intuition, "feel" or Divine Intervention to assure they won't.

Many attempts have been made to simplify the task of sizing spar caps, and some have been successful - to a point, that point being that an engineer finds the new procedure simpler than the old ones. But the task still takes engineering expertise. To me, a vocal proponent of simplified engineering principles for use by non engineers who design and build their own sailplanes, that's not good enough. There has to be a better way. Fortunately, there is.

Enter Ian Lea of Lake Bluff, Illinois. Ian Lea, trained as an architect and presently in the process of designing and building his own motorglider, has developed a technique which takes a great deal of the sting out of sizing spar caps. He wrote about it in the May, 1996 issue of Sailplane Builder (updated version in the May-June, 1999 issue is a piece worth revisiting.

Ian's 1996 procedure is to first determine the width of a solid spar of given depth capable of taking the limit bending moment. By means of a curve he then computes how much wider the spar would need to be if it were a box, I-beam or C

beam - and the thickness of the upper cap corresponding to that width. He arbitrarily sets the thickness of the lower cap at 2/3 the upper one. In reversing the procedure by assigning a width to the new spar to begin with he can determine the cap thickness' needed for that width.
The process, while infinitely simpler than others I have seen, still requires a modicum of math. Not much, but enough to discourage some easily discouraged designers.

Recognizing this as a challenge, that's all I needed to try to further simplify even the already simplified procedure shown in Ian's Sailplane Builder articles. In going about this I had the pleasure of corresponding with him on several occasions. This is a man to watch.

My procedure is the same as his 1999 procedure except it involves the use of a logarithm-derived homograph or "alignment chart" instead of math. Like a computer, the chart does the math for you as you draw lines on it. Shown at the end of this article, the chart is based entirely on Ian's work and is to be considered supplementary to it.

You start off with three givens: the limit bending moment, the spar depth and the spar width. You determine the bending moment on your own, perhaps by the technique shown starting on page 265 of CWSH (Collected Work of Stan Hall). (the SHA markets this book, all the proceeds going to help support the SHA's good works. Buy it, you'll be glad you did).

If you are unfamiliar with the term "limit" load you'll find that discussed in CWSH, too, on page 162.

Assuming the spar width as a given, you don't need to know the width of a comparable solid spar - although it is vital to the process. The "Ref' line in the graph is the solid spar width ("b" in Ian's work). It has no numbers you can see but they're there. If you're handy with logarithms and are hard pressed to know, you can figure out what they are.

Your next effort is to establish the spar height and width. The first is dictated by your airfoil, the second from what you see on your drafting board, considering fittings, etc.

After studying the example shown on the chart and making several copies of it (you'll be drawing a lot of lines before you're through; this is still a trial and error procedure, and you'd like to see where you've been as well as where you're going), with a sharp pencil and straightedge draw a line (line 1) from the bending moment in the first column on the left and extend it to the spar height (h) in the third column over. In the process your line will cross that "Reft line. At that point start line 2 and extend it to the spar width "B". While so doing you'll draw through a fan- like shape bounded by vertical lines "a" and "b". Where your line crosses line "a" start line 3 and extend it to nearby line "b", trying to maintain about the same percentage of the distance between the sloping lines, at both ends. (the example shows about 5096 in the specific case considered)

From where line 3 hits vertical line "b" draw line 4 to the spar height (h), the farthest line on the right. Now slide your eye to the left along line 4 to the line labelled "READ tu," in. and READ tu, in. where line 4 crosses it. That will be the upper cap thickness. Multiply that by .67 (that's 2/3, right?) and you have the thickness of your lower cap. If you like what, you see move on the next point of interest and do the same thing. If you don't like what you see start over, using one of those copies you made. I suggest you check 5 places .on the spar at the root, at 2096, 40%, 6096 and 80% span.

The 2/3 upper cap thickness for the lower cap should show a comfortable margin of safety in the aircraft right side up condition because it is in tension. In the inverted flight condition (which you can get in severe down-gusts, among other situations), the lower cap is in compression but since the load factors are commonly about half those of right side up (and thus the bending moments), your 2/3 cap should still show a comfortable margin of safety.

The user of the data (both Ian's and mine) should note several important caveats. One, the procedure is based on the use of spruce. It can, however, be used for Douglas fir, as will be dealt with presently. Two, it provides a zero margin of safety over the allowable stress. Three, it ignores the spar shear webs because to do otherwise would complicate the procedure immeasurably; the work involved being assured, the benefits doubtful. However, webs do increase the strength of the caps a bit by adding a small amount of bending material and in stabilizing them some in compression. But common practice is to ignore the shear web as a structure taking bending because its purpose is to take shear, not bending. Consider the web(s) a thin icing on the cake insofar as bending is concerned.

The fourth caveat relates to Margin of Safety (M.S.) It is common practice to provide an M.S. of not less than 10% in most structural applications. For example, if you are using JAR-22's criteria (always a sound idea), where the minimum limit load factor is 5.3. (for non-aerobatic sailplanes), design to 10% higher, or 5.83 before going into the chart.

If you're using Douglas fir instead of spruce you will automatically realize about 11 percent in margin of safety without doing anything because fir is about 11%

the same cross section dimensions. Another way to say this is, if you size your caps for spruce and use fir instead, you end up with a built-in margin of around 11%. Good show.
Editor's Note: See at the end of this journal the appropriate diagram

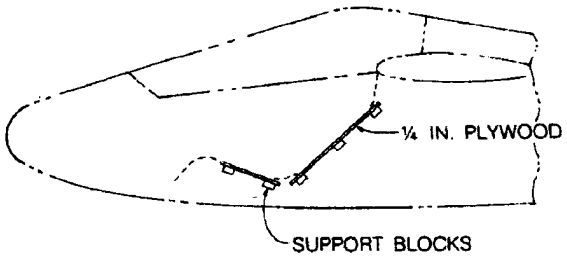
JOHN SINCLAIR'S FIBERGLASS SEAT

John Sinclair, Duster builder and proprietor of JJ Glider Repair of Placerville, California, has come up with an interesting and practical method for making a form-fitting fiberglass seat. Although the basic technique was designed with the Duster in mind, with a little adjustment here and there it would likely be applicable to other sailplanes as well. (WOODSTOCK). Here's how he did it:

He first made a rudimentary seat from two pieces of 1/4-inch plywood 22 inches wide (the width of the Duster cockpit) and secured them in the cockpit with blocks, screws, etc... He then put on his chute and climbed in. After several trips in and out, during which time he kept adjusting the positions of the blocks and plywood sheets, he finally found a bottom and seat-back position that seemed most comfortable.

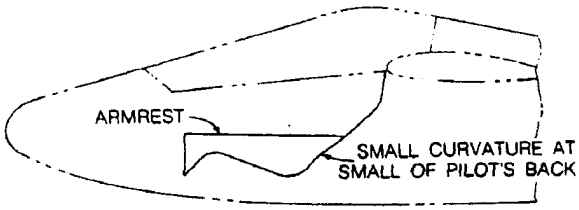
He marked the final position of the plywood sheets on the cockpit interior and drew a curved line between the back and the bottom to indicate where the outline of his posterior would be. At this point he had something looking like the sketch in Figure 1. He then removed the plywood and the blocks, leaving the pencil lines in clear view.

Figure 1. Temporary Seat



John's next step was to bend a .032-inch thick piece of aluminum-alloy sheet measuring 22 inches wide and 72 inches long so that it matched those pencil line drawn on the cockpit interior. Before doing this he drew another curved line to simulate the small hollow in the small of the back. With a thin, flexible back pack chute, you'd need this. With a stiff one, probably not. John also drew a curved line at the front of the seat where it curves down, below the legs. The final side-view shape looked as shown in Figure 2. He secured this aluminum alloy "pan" to the cockpit interior where the plywood seat had been before, again using blocks and screws.

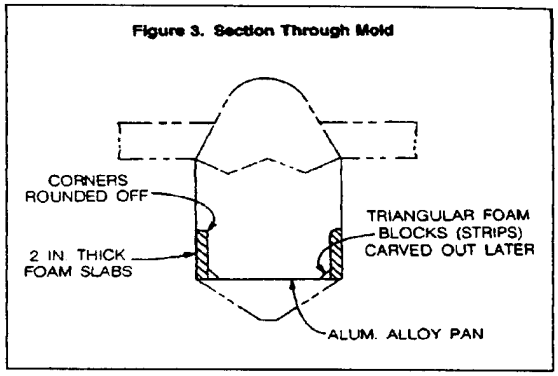
Figure 2. Side View of Seat Outline



Next he glued a block of 2-inch thick polyurethane foam to each of the cockpit sides to simulate arm rests. For glue, he used resin thickened with micro balloons. What John was doing here was building a mould -- right in the ship.

As shown in Figure 3, where the foam sides met the metal bottom he glued in a triangular block of foam along the entire length, on both sides. He carved this triangular shape into a rounded fillet by scrubbing away with another piece of foam which he had rounded beforehand. He also rounded off the arm rests the same way. The figure shows what the seat cross-section looked like just before the triangular blocks were carved to shape.

Figure 3. Section Through Mold



Next he gave the whole affair a good heavy coat of paste wax (TreWax floor wax works well. Automobile paste waxes with mixed-in moisture don't.) After it dried thoroughly, he began the messy part of the operation. This involved laying two layers of 9-ounce fiberglass cloth into the makeshift mold and applying resin as appropriate. After the resin had cured and John had exactly what he wanted, he carefully pulled his fiberglass lay up off the mold. He trimmed off the excess glass, filled here and there with micro balloons and resin, and painted the final product. Beautiful. The photo in Figure 4 shows the final product prior to painting and installing in the ship. Note the fiberglass instrument panel/console cleverly integrated with the seat. (Regarding the rather poor quality of the photo, John is at loss to explain this. After all, he says, he paid $2.25 for the camera!)

The next task was to pull the foam, the aluminium. alloy Pan, and understructure out of the cockpit and sand out the residue of the discarded mold still stuck on the fuselage interior. The final job was to install the seat in the ship, which he effected via bolts and screws. It was critically important, he observed, that the seat be carefully supported so that the loads might be properly distributed into the sailplane structure. After all, 200 pounds or so of pilot and chute, multiplied by an ultimate load. factor of around 9.0, represents close to a ton of weight to be carried by the seat and into the structure. Think about that. John says that the whole seat-building job took about three days. "But," he observes, "it was well worth the time and trouble." And, there's another potential advantage: not only is the. seat comfortable and attractive but the seat itself can, if desired, be used as a mold from which to strike other seats.

So, if you want the perfect seat for those long cross-countries and/or if you want to go into the business of making fiberglass seats, John has just told you how to go about it.

WHAT'S NEW?

SYMPOSIUM 2000

AT BACCHUS MARSH AIRFIELD

10th 11th 12th JUNE 2000

Now that Summer is behind us and the gliding days are few and far between, why not break winter monotony and join us for a thrilling weekend of glider chat. Once again, to build on the success of last year's event, we are holding our third **AHSA Symposium** at Bachus Marsh

over the Queens Birthday weekend. Being the 10th, 11th & 12th of June.
The theme for this years event is to be "**The Sailplane Design Workshop**", which although not being the ambition of most, will give us some insight as to how this is done, why some things are done the way they are and also give an appreciation of what we should consider before embarking on any modifications.

We anticipate a number of homebuilt gliders will be present for inspection and there should be some time to undertake some flying in the afternoon, whether permitting.

Several guest speakers are cooperating with AHSA and they will be lecturing on different topics.

Lectures are in the morning from 9am to 12 noon with a morning tea brake.

LECTURES

Saturday 10th June
John Ashford on "Gust envelope for sailplanes."

Sunday 11th June
Douglas Lyon on " Sailplane Design"

Monday 12th June
Graham Betts on "Carbon Dragon."
Malcolm Bennett on "Why did I Persevere"

Also there will be on exhibition of 4 Woodstock (¼ Scale) Gliders and they will be flying on Sunday afternoon.

The venue is the home of the **BACCHUS MARSH AIRFIELD**, 8 Km South of Bacchus Marsh on Geelong Rd.

Sleeping and Kitchen facilities are available in the Clubrooms and light breakfast (tea & coffee) will be in situ. An evening meal will be arranged at the nearby pub during this event.

Obviously numbers can vary tremendously for an event like this creating an organisational nightmare so, if you wish to attend any or all days of this event could you please **RSVP as soon as possible** to James Garay on 03-9367-3694 .

Look forward to see you there!

Peter Raphael
Secretary AHSA

JET CAPRONI PROJECT

We have opened a trial web site at HTTP://users. .aol.com/piskorzgj in response to a lot of interest from overseas in the jet project. The site is very preliminary and will be supplemented with more material as our test flying progresses. We completed taxi trials over January which cleared the way for completion to test flight stage. The taxi trials were done with the centre section wing only, no outer panels. We think we can claim to be the fasted billy cart in Australia!!! The purpose of the trials was to verify that at lift off speed and attitude the engine would breath properly and provide maximum thrust.

MOTOR FALKE/JABIRU CONVERSION

The SF 25b Motorfalke conversion to a Jabiru 2200 80HP engine has been completed, test flying finished and Certificate of Airworthiness issued. This has turned out to be an excellent conversion providing double the original climb speed, half the take off distance and cruise speed increase. All that a pilot load of 180 kg plus fuel. This conversion can be applied to any powered sailplane fitted with any model of Stammo Aeropower or Limbach engines. Even the Rotax powered Ximango will benefit significantly.

HIGH LOAD WOODSTOCK

Our member Brian Berwick is progressing with his Woodstock project which has an improved wing structure to allow a payload increase and perhaps a self launch configuration can be developed.

DUSTER

The homebuilt DUSTER VH-HDT owned by our erudite and multifaceted skills Peter Raphael, Malcolm Bennett and Terry Whitford has been weighed on the premises owned by Mike Burns at Tocumwal.

VH-HDT is a very good example of how to finally complete a homebuilt. Time was spent to get everything right on the ground: weight and balance: rigging: control stiffness: control friction: etc with the result that the test flying went without drama or problem. Well done guys.

POWERED SAILPLANE TUGGING

Combined with the Motorfalke/Jabiru conversion program is the development of aerotow hook installations for powered sailplanes. The introduction of this capability will make a lot of difference to the operations of small groups and clubs. Lower tow charges, more pilots to draw from, lower maintenance costs, and another activity for normal clubs pilots who do not have a PPL. High cost tugs have broken many clubs and keep most clubs poor. This is excellent for the homebuilt sailplane fraternity since most homebuilt are low weight and will be able to make the most of powered sailplane tow.

MODIFICATIONS

To build a new sailplane from scratch or even from a kit is a very daunting exercise, one which most people will not undertake. One alternative is to look for a suitable sailplane and seek to improve it by modification.

The work involved in the modification program can satisfy the creative desires and the end product is available to fly a lot quicker. The modifications or improvements can range from very minor things to very major things and they do not have to be done all at once.

The Jet Caproni project is a modification, as is the Jabiru/Motorfalke mod, as is the change of the Woodstock wing.

The best modification done in recent times has been to take a Schneider Arrow sailplane which was built with a full span one piece wing and change that to a more normal 2 piece wing. The difference in rigging, trailering etc is magic and well worth the time required to implement the modification. The sale value of the sailplane actually increases. Four Arrow owners have now carried out that modification helping to share design and tooling costs.

What sort of modification??

One proposed a few years ago was to add an engine to a Libelle sailplane, that could result in a very tidy self launcher, low cost and good performance. There are about 50 Libelles in Australia, they come in around $ 20.000 or less making it feasible to cost share with a syndicate and then co-ordinate with other interested owners to amortize modification costs.

A recent phone call to Mike Burns involved discussing the merits of fitting a jet engine under each wing of a well know two seat sailplane, that proposal was soon discarded with a far more feasible two seat conversion being proposed. No idea is too wild it all helps to get the brain working.

Basically there is a lot of room for creativity and originality. All it needs is imagination.

NEW MEMBERS

We have new members to welcome to the group:

Geoffrey A Pratt- 3 Mc Kinlay St. Whitfield. Cairns 4870.QLD.

Kevin Sedgman-19 Saxon St. Clifton Beach. Cairns 4879.Qld.

Brian Rebbechi- 310 Ninks Rd.St Andrews. Vic.3761.

Terry Baxter- 79 Mueller Rd. Malak.Darwin.NT.0812.

WELCOME ABOARD FELLOWS! We look forward to a long and mutual association.

HINTS & TIPS

ESTIMATED FIBREGLASS CHOPPED STRAND MAT TO RESIN RATIO

Chopped Strand Mat (CSM) will use approximately 2.5 times its own weight in resin for 1 layer. Subsequent layers would use proportionately less resin, say 2 times the weight of the CSM. (Resin weighs approx. 1.1 kg per litre).

Examples 1 layer of 450 g CSM would use 2.5 x 450 g = 1.125 kg of resin per m^2. This is approx. 1 litre of resin.

2 layers of 45og CSM would use 2 x 2 x 450g=1.8 kg of resin per m^2. This is approx. 1.6 litres of resin.

GELCOAT & FLOWCOAT

The recommended coverage for gelcoats is approx. 2-3 m^2 per litre i.e. ½ to 1/3 mm thick.

RESIN TO CATALYST RATIO

The standard catalyst ratio (depending on temperature) between 1 an 2.5%.

2.5% MEKP (by weight) would be reasonable for a single layer laminated of CSM in the colder weather. However 1% may be the best for a heavy multi layer laminate in Summer.

Proportion of MEKP catalyst is always calculated by weight. I litre of resin weighs 1.1 kg. Therefore the required amount of MEKP would be between 11 g per litre for 1% and 27.5 g per litre for 2.5%.

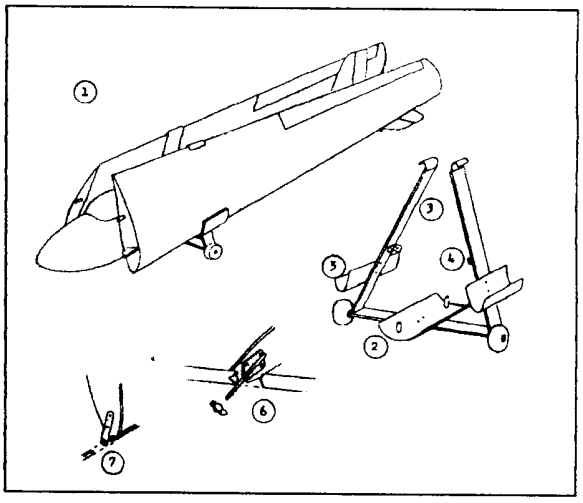
It is normally very difficult to accurately measure the correct quantity of MEKP for small amounts of resin. Guessing is not good enough! Suppose you have 46 ml of resin in a medicine measure. 46 ml x 1.1=56.6 g.

1.5% of 56.6 g = .759 of MEKP. 1 g of MEKP is approx. 1 ml. There are approx. 22 drops in 1 ml of MEKP. Therefore 22 x .759=16.7 drops of MEKP are necessary for 46 ml of resin @ 1.5%.

SAILPLANE HANGARING DOLLY

An excerpt from Soaring Magazine

Something interesting is the hangaring dolly shown below. This makes it possible to stow several sailplanes in a single hangar with the advantages of trailering but without the work. The two legged dolly is attached to the fuselage by bottom centering pins and fittings that hook into the drag spar fittings of the sailplane.
The wings then rest in cradles on the dolly with a leading edge fitting near the wingtip engaging a pin projecting from the leading edge of the fixed horizontal stabiliser. The whole assembly is mobile without the awkwardness of a trailer and can be " wheel barrowed" right out to the flight line or point of assembly.



1. Sailplane set up on hangaring dolly
2. Cradle and sailplane centering pins
3. Wing support arms (padded)
4. Sailplane drag spar fitting attachments
5. Forward wing support cradle
6. Threaded steel rod or sawed-of bolt welded to steel plate

and bolted to heavy stabilizer rib

7. Flat steel fitting (125"min) bolted to reinforced nose rib engages rod (6) when sailplane is on hangaring dolly

SHOP TALK

LAUNCHING GLIDERS

by Peter Champness

The cost of launching our gliders has probably not changed a great deal in real terms over the years but that doesn't mean that it is not a significant cost. Just as we notice the cost of petrol and think it a very significant cost of motoring every time we fill up at the pump the cost of launching gliders hits us every time we get a flying day. The other costs seem to be minimal except for accidental damage (which can be fairly hurtful when it occurs) since they are not directly related to flying hours. In fact the more you fly your glider the cheaper it becomes per flying hour since the other operating costs are more or less fixed each year. These costs include annual inspections and maintenance, insurance, depreciation and the opportunity cost of money. The opportunity cost of money is an accountants concept but is quite a real cost if you own your own glider. If you had invested the cost of the glider in an interest bearing account instead of purchasing the glider it could have earned about 7% each year, possibly a lot more if invested in the stock market over the past year. If the glider cost $40,000 (say the cost of a new PW5 these days) then the opportunity cost at 7%/year is $2,800 which pays for quite a lot of flying in club gliders if you don't mind doing that instead.

However, to get back to my subject, launching cost are quite high and they seem to be going UP! This set me to thinking about alternative launching techniques. Most of my ideas were impracticable such as foot launching, bungees, solid fuel rocket boosters, pulse jet engines and cable devices powered by falling weights. Ignoring for the moment self launching engines (because they are difficult to retrofit to existing designs and probably increase the cost of launching overall), three methods remained: car towing, winch launching and aerotowing.

Car towing seems to me to have been rather neglected in Australia. The Americans seem to have used this method successfully especially for the lighter gliders such as homebuilts but it does not seem to have been popular here. The probable reason is that dry lake beds in America are relatively smooth. By comparison a vehicle driven at 100kph over rough sheep paddocks in Australia has a very short life. None the less old unroadworthy cars are pretty cheap. The other requirements are a fairly large paddock, three crew members: one driver, one observer to look back and see what is happening to the glider, one launch assistant and 2000 ft of rope.

John Lynch told me of one rather interesting variation on this idea which he had seen used in England. If a turnaround pulley is used at the far end of the airfield the car then drives toward the glider and the car driver has the glider in view during the launch. It is usual to have about 4000-5000 feet of wire rather than rope for this type of launch because the wire is dragged over the ground which would cause rapid wear on rope with our usual surfaces. Because the wire is being pulled in toward the pulley, just as with a winch launch, heights of about 1/3 the length of the wire can be expected. After the glider releases the driver continues on toward the launch point thereby delivering the end of the wire back to the launch point. Another parachute is then attached to the end of the wire and another glider hooked on. The car drives back to the pulley end of the wire and unhooks the parachute and hooks on, ready to launch the next glider. The car driver should initially drive an arc of a circle around the pulley as he accelerates before straightening up toward the launch point. This gives a smooth rapid acceleration to the glider, similar to the technique used by powerboat drivers when dragging waterskiers. A lot of gliders can be launched in a short time with this method.

Winch launching is undoubtedly the cheapest practicable method of glider launching currently practiced. Regretably not all gliding clubs can use it because they use small airfields or because of restrictions caused by other aircraft sharing the gliding airfield. The danger is also relatively great not only to the sailplane and pilot due to stalls and other accidents at the launch but also to the winch driver and other helpers caused by flailing broken wire, wire dragging across people, cars or other aircraft and unexpected launches associated with poor communications with the winch driver.

Aero towing is the most convenient and flexible method of launching and can be done at a pinch with only two people, the glider pilot and the tug pilot so long as the grass is short so that the initial launch can be done with one wing of the glider on the ground. Unfortunately it is also the most expensive due mainly to the high maintenance cost of the tug aircraft and to a much lesser extent due to the cost of aviation fuel. The maintenance standards for general aviation are proscribed by the Civil Aviation Safety Authority for OUR OWN GOOD and the safety of others. However there is nothing wrong with at least considering variations or alternatives to our current practices with the aim of reducing aerotow costs.

Powered hang gliders have already been used overseas and possibly also here in Australia as tug aircraft. They have the advantage of being quite simple structurally and the even greater advantage that their regulation comes under the Ultralight Federation rather than CASA, both of which should help to keep maintenance costs down. The tow point on a powered hang glider is quite close to the C of G which is an advantage because an out of position glider does not exert such a strong destabilising force on the tug compared with towing by the tail. Finally the towing speeds are quite well matched to gliders compared to crop dusters which tend to tow a bit faster than the ideal speed for a glider. It is however quite good if the stall speed of the tug is slightly higher than the glider. It would be disconcerting if the tug took off and stated climbing away before the glider had got off the ground. Unfortunately powered hang gliders have two disadvantages which limit their usefulness as tugs: most are under powered for the job of towing and they do not enjoy flying in turbulent conditions. Since we want to launch when the thermals are strong this is a serious disadvantage.

Perhaps a more conventional ultralight with normal control surfaces could overcome the control problem in turbulent conditions. I looked though Pacific Flyer and other

publications looking suitable designs. The most likely to me is the Drifter, a wire braced high wing sailcloth covered monoplane with a pusher propeller mounted behind the wing. The Drifter can carry two pilots and has conventional tailsurfaces and controls. With only one pilot aboard it should have sufficient power to tow single seat sailplanes. Best of all a second hand Drifter can be obtained for less than $20,000.

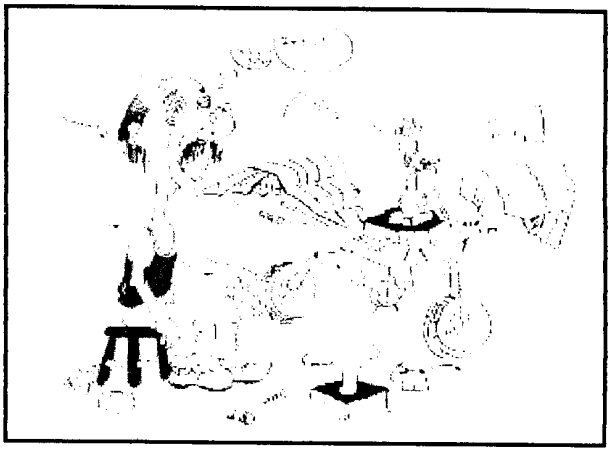
The greatest cost problem associated with aerotowing can be blamed on the air-cooled engines of normal tugs which are basically unsuited to our type of work. Lycoming and Continental engines are quite powerful and are lightweight for their power output but they require rich fuel mixtures to assist engine cooling which does not help fuel economy and they suffer from cracking of cylinder heads due to the thermal shock of rapid heating and cooling associated with full power climbs followed by rapid descents which is the normal cycle in towing operations. To prevent cylinder cracking the tug pilot gets to fly all over the sky after releasing a glider while he waits for the engine to cool slowly. Not only does this mean we pay for a lot more tug time than we should for each launch but other gliders have to wait on the ground waiting for their turn which means they miss the best of the conditions if the day is fairly short. The engines also cost a lot to buy and to overhaul.

The answer must be water cooled engines which are made by the million for cars. I know that previous attempts to adapt motor car engines to aircraft have nor been very successful. However having seen a reduced scale Mustang replica flying at Mangalore with a small block Chevy engine of 350 horsepower I am convinced that they can work. The Chevrolet engine might not seem at first glance to be an ideal engine because it has an iron block and should therefore be fairly heavy. It does have several things going for it. Firstly it is a powerful engine which meets our main requirement. Secondly the engine has been extensively used for racing over a long period and hence there are a lot of parts such as specially strengthened crankshafts, con rods etc which are fairly cheap. A lot of work has been done to ensure that these engines can run at high power outputs for a long period of time.

A requirement for a successful car engine conversion is a reduction drive. This is because the car engine does not produce much power at the low revs required for an efficient propeller. It is also a good idea because the car crankshaft is not designed for the stress of a heavy propeller hanging on one end. The reduction drive takes care of the propeller shaft and also provides a good spot to place a suitable thrust bearing which is not part of a normal car engine. Fortunately there are a number of reduction drives coming on the market thanks once again to our inventive cousins the Americans (what would we do without them).

Having discovered a suitable engine and reduction drive it is necessary to find a suitable airframe for it. Ideally one would simply adapt some suitable existing aircraft, particularly if is being scrapped because of the recent fuel contamination problem. Unfortunately this is not so simple because as I have already said the Lycoming engine is light but the Chevy engine is heavy. Therefore if we put the Chevy where the Lycoming used to be the aircraft will be too heavy at the front so it has to be modified. Also all the other structures probably need to be modified and the aircraft recertified at the new higher weight. Can you image getting all this past CASA. The best solution is to start again with a new aircraft design which not only takes the new engine but which is also specifically designed for the role of towing gliders. The design must be simple, robust, stable and easy to fly and optimised to climb best at glider speeds, about 50 kts. Above all it has to be CHEAP! Luckily I have sketched a suitable design on the back of an envelope. It looks a bit like a Volksplane, which I also saw at Mangalore but is a bit larger to take the Chevy engine. Now if you all come round and help me build the new tug we should have the towing problem **SOLVED**

DREAMS AND PERCEPTIONS

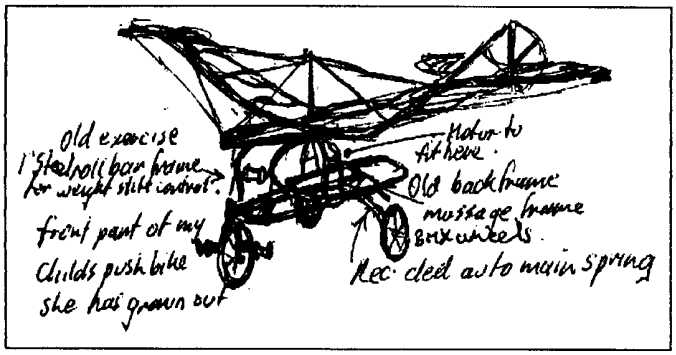


Ed's Note: Since I took the task as Editor for AHSA journal I have enjoyed the mail that you send me and I appreciate your deference to the humble Editor that I am... but seriously folks, have a read of the following letter that I've just received. Make your own conclusions.

Dear James,

Please forward info, subs, etc., as I am trying to build an ornithopter which has a sailplane ability. I am using recycled material where possible and using the wing shape of the pacific gulls which I watch hovering over the cliffs and hope to make it self launching using a trike base attached to the hang glider airframe.
I am using my old exercise equipment and health aids I had for my recovery from a bad accident where I was 3-1/2 months in coma in Darwin hospital. It is mainly 1" tensile steel framing.
I am trying to produce a lightweight craft that is self launched capable of thermal use and intend to combine wing warp with weight shift control, go-kart steering coupled to the rudder.
My initial idea was to use blade skates down an incline to achieve lift off and lever operated wing warp to flap the trailing edge of the wings to gain altitude, instead of flapping the wings up and down like other ornithopters. Due to my age and infirmities I have now decided to use a small motor in a trike form to get me airborne and to search for thermals.
I take it many people have used motors for self launching or small engines to sustain flight seeking thermals, please forward any old information you may have to hand and any old copies of the quarter newsletter and I will include and costs with my subscription in return mail.
I was selected to go to Point Cook No. 1 Flying Training School in 1948 as one of the first Royal Navy Aircrew. I am a member of the Top End Ultralight Club training in a Drifter for my ultralight license at present, but monsoonal weather is

creating problems at the moment.
Sincerely Yours
Wind in your hair! Terry (*The Tiger*) Baxter.



Ed's Note:
I passed the letter on to our Technical Editor Mike Burns. Here is his reply..

Dear Terry (*The Tiger*),

The dream of a light weight, self launch, soarable aircraft, is one that has been and will be shared by many people. There have been many solutions that dream but very few if any of them Ornithopters. The difficulty of creating a successful Ornithopter is extremely high with little prospect of success, so you are on the right track to looking into using a light weight 2 strokes engine of some sort.

The more innovation you undertake in a new design the more difficult it is to achieve success. The best approach is to stick to convention as far as possible. Remember that since the Wright Brothers every possible way of building a flying machine has been tried but keep coming back to conventional structure and systems, simple because that is the best way to succeed. There is of course room for innovation within reason.

The simplest form of aircraft you can build is a powered hang glider or "TRIKE" The wing is simple a light weight frame with tricycle undercarriage and a pusher propeller. The wing will fold up an whole thing sit in a box trailer for transport. A Trike will soar provided the wing loading is kept low, being able to work hill and thermal lift like any hang glider.

Back in 1972 Richard Miller put down some words which are recorded in the attached article which talks about the dream of light weight soaring. The article was written in 1982 and still there are no lightweight self launch soaring machines of any note. The article makes the point that the horse[power required to fly exceeds that available from a human being. We can put about 35% of 1 HP continually and flight requires 3 to 5 HP at least.

The man powered aircraft which have flown were very special and so were the pilots.

The article has a clear picture of what the end product will be, then start and work to that goal. A good design does just no happen at random. Good luck and please keep in touch with progress. Mike Burns.

NEW ERA IN SOARING

Hidden in the folds of the future, obscured by the time, are the forms and shapes of things not yet remembered, wrote Richard Miller in his "New Era In Soaring" (*Soaring, May 1972*) Author Miller was straining for a glimpse of an efficient man-carrying machine that could utilize the low-energy thermals which remained-and still remain- the exclusive realm of soaring birds. A decade has passed since then and this species of ultralight has yet to emerge, thought the folds have loosened from time to time in a sort of temporal strip tease.

The *Solar Challenger* and the *Monarch* have this potential. Both inflame our imagination with still-to-be experienced delights of (in the words of Joe Lincoln) "being aloft in the bright morning air to catch the early, toddling, unsure thermals". Of wheeling low and slow and calling down to taunt our ground-bound soaring friends. Of exploring with unhurried deliberation the intimate details of canyon, a ridge, or even the activities on a supermarket asphalt parking lot. Gone are the frustrating sleigh-rides of the "marginal" day. When the air of the whole valley is gently ascending in the early evening, our ultralight becomes a magic carpet that can keep us aloft in soft warm lift that is as smooth as the glassiest wave.

Mac Cready discounts this potential in the "*Challenger*". "Its control is not good for this kind of soaring" he points out. "One needs to have a clear goal and work backward. In the case of the "Challenger" this was to make a direct solar powered flight from France to England". But there is evidence his seminal mind is focusing on the category of aircraft. "Some of us on the Challenger team are exploring and talking about a small, light self launched sailplane" he says. "I have lots of sketches in my note books, but that is not a flying machine. A panacea has not been found".

One concept is a small "Challenger" using a 6-hp engine, light loading, not requiring an airport, only a little clear space. No ATC problem. Slow speed and low mass mean that if you had to, you could land in trees, or even hit the side of a house and escape injury.

Surrounding structure could act as further protection. Despite his work with human powered design, Paul rules it out, even as supplement. "No way", he says. You have to have 3 or 5 hp for a reasonable climbing machine and humans can not produce a tenth of that". Flaps are a trap. It is a temptation to have flaps to extend the speed range, but complexity means expense and weight, and so far none of the team has come up with anything.. But we are getting nearer'. He emphasises the design procedure. You must start from the conclusion. That is, you must have a clear idea of what you want to end up with. We ought to be able to soar like a buzzard, The machine ought to be strong, convenient, controllable, operate in the 20-50 mph range, and in case of real emergency have en explosively-opened chute that could deploy 30-100 feet above the ground. Those are things people should be working on".

Ed's Note: I have received two more letters from Terry (The Tiger) Baxter, one of four pages and another of eleven pages dealing mainly about the construction of an Ultralight aircraft. Due to the extent of these letters, it is impossible for me to reproduce them here because our space is very limited.

MODIFICATIONS TO HUTTER 17 SAILPLANE
by John Thirlwall

I have a Hutter 17 sailplane which I should like to consider converting to a self launching using a Rotax 277 or similar and wonder if you know of anyone who has converted this sort of aircraft. The problem is that the original design only allows for a payload of about 90-kg. Being strut braced I would have thought the ship could carry quite a useful load although I do not have any idea of the loading the main spar can absorb. In trying to get the feeling for this glider on ground towing I find that the adverse yaw on the aileron makes ground handling quite difficult. Do you have any tips on how to re calibrate the ailerons to prevent or reduce the adverse yaw?

Ed's Note: The above request was sent to me and I pass it to our Technical Editor Mike Burns and his answer is below.

HUTTER 17 POWERED CONVERSION
By Mike Burns

Your letter to AHSA is interesting in that a similar modification has already been done in Lismore N.S.W. by Joseph Kostevc. In that case a Kingfisher fuselage and tailplane was married to a Hutter 17 wing and a Koning 4 cylinder 2 stroke fitted. The end result flew and performed well. Because of GFA reluctance it ended up in the Ultra light category losing GFA a member and a sailplane.

The wing was build in Lismore to generally match Hutter 17 wing drawings and was proof loaded on completion.

The Hutter 17 is designed for "5G" flight load and a safety margin of 2.0 So it should permanently break at + 8G or more. That is based on early German design standards. Modern sailplanes are 5.3 G with a 1.5 safety factor.

So, you should be able to fit a 25/30 HP engine with some fuel etc. and come out with a self launcher rated at 4.0 G flight load capability with a 1.5 safety factor. The easiest way to build and fly would be in the Ultralight Recreational Category which allows indefinite operation without certification Certificate of Airworthiness etc. To stay with GFA as powered sailplane would mean structural justification, and going through the process for a C of A issue. There may be the possibility of staying a powered sailplane with a permanent Experimental Certificate from GFA.

The attached fuselage side view is Joseph's next project but very similar to how it was done. It had 2 main wheels one each side of the fuselage to allow taxi and one man operations. With thought and creativity this could be a nice light and easy to handle self launcher. Choice of engine will be important with Koning 3 or 4 cylinder the best choices. A folding propeller would help but not critical. (I suggest you talk to Joseph on 02-6621 4623).

AUSTRALIAN GLIDING MUSEUM
by Alan Patching

You may wonder why you should read an article about a museum, but the fact is that you are possible building museum items- because in 50 or 60 years time that is what they will be !!!

A group of us decided that the time had come to take steps to preserve our gliding heritage. All too often when a glider gets old or damaged especially if there is nowhere to store it the members have a barbecue and give it a hot farewell.

Amongst others things the Museum has the aim of establishing and operating a public museum in which to collect, preserve and display items of sports aviation historical interest. Also we will be promoting interest in the restoration, display and flying of Vintage gliders. So we will be working closely with the Vintage Gliders of Australia.

The Museum became a Committee of the GFA at the last ACM and was Incorporated on December 1999. Applications are underway for Institutional membership of Museum Australia and Taxation concessions under the Commonwealth Government's Cultural Gifts.

The site for the Museum is still be considered but it must be easily accessible and near a large population. Having this in mind we have joined the Save Point Cook Action Group since Point Cook has a suitable airfield along all other requirements.

The first committee of management consist of myself Pres. Dave Darbyshire Vice Pres. Graeme Barton Hon. Sec/Treas., with John Ashford, Jim Barton and Geof Hearn as the other members. There is also and Advisory Group assisting the committee: Ray Ash,Gulgong, John Buchanan.Geelong GC. Roger Druce FMFG. Emilis Prelgauskas SA. Bill Riley.Tocumwal.Kevin Sedgman Patron VGA. And Martin Simons SA.

Bill Riley has made a very generous offer of making available his larger hangar for the storage of gliders and other items until we get our own building. Already we have received two gliders, Garth Hudson's Grunau and the Plank from the GCV. This is currently being restored to static display standard by a group of which Reg Pollard and John King are volunteers. Other items have been contributed by Allan Ash and from the estates of Ray Garret and Merv Waghorn.

When established this will be the third National Gliding Museum in the World, the other two being at Wasserkuppe in Germany and Harris Hill, Elmira in the USA.

Applications for membership are now being accepted by any member of the committee and the Annual Subscription is $ 15.00

AN UPDATE ON MY WOODSTOCK PROJECT
by Brian Berwick

An update on my Woodstock project, I have started serious work on the wings at last, incorporating Mike Burns' mod E.O.9906,which will allow for an increased cockpit weight.

To enable the fitting of the extra laminations to the upper and lower spar caps, I reworked the standard assembly trestle which was becoming warped to a point of being a source of inaccuracy. To the top surface of the trestle I added five blocks along the centreline. On either side of the blocks I assembled two 50x25mm box girders 21ft long. Onto these I screwed 20mm MDF boards with an expansion gap between the ends of each piece. The result is a table capable of

producing a nice flat spar. For clamping pressure I have adopted the instruction manuals recommendation of threaded steel rods spaced about 7.5" along each edge of the table and drilled and slotted 2.5"x1.25" Ash clamping blocks cut to the width of the table. For quick assembly of the clamping blocks during the glue working time, I set up A pair of battery drills with a shaft suitable for driving tube spanners, these are much more efficient than say ratchet ring spanners.

So with this setup, I had to wait for cooler weather to allow for the glue pot life before covering such long glue lines. With the capable assistance of my old friend Kevin Broadbent,a retired aircraft engineer , we were able to lay down a spar boom a day onto the previously prepared spar webs.

Mike Burns called in to see how work was progressing on his mod. scheme and was quite complementary of the project so far, we may see more of Mike ,as his daughter has moved into a house nearby

Yesterday I was able to cut and assemble the verticals into the left spar assembly, it's beginning to look like progress.

In the mean time I keep current on a Ka6 at the South Gippsland Gliding Club in Leongatha, I imagine the handling must be fairly similar to a Woodstock. does any one out there know of a winch launched Woody? with the modified wing it should be quite feasible.

I visited Malcolm Bennett's workshop a while ago ,it's a real hive of industry, probably the centre of glider production in Australia. The Duster is looking magnificent in its eye catching blue and cream paint, final inspection for flight were imminent. Along side this was our esteemed editor's Woodstock ready for covering and beside that again was the ex Mark Stanley Woodstock project now in the capable hands of Mal, It appears to be at about the same percentage completion as my own, so watch out for the next installment. Happy soaring. *Brian Berwick.*

A SAILPLANE 'TEST' KIT FOR JOHN EVEREST

Ed's Note: This letter was sent to Brian Berwick and he passed it on to me for you to read.
Dear Brian,

The kit for John Everest will leave our workshop on 26th May. Soon you will have the opportunity to see it with your own eyes. We had to prolonged fine weather here I used both of them to fly my TST-8 DM. To date I have flown 35 hours with this ship, mostly solo, but sometimes with passenger.

The flight characteristics are even better than expected....four time I encountered a Blanik in the same thermal and I always managed to acquire about 100 m more altitude during 5-10 minutes of circling.

This means, that the sink rate is better, but highly probably that the glide ratio is a little better, as per my first primitive measurements it is slightly over calculated - 28 seems to be somewhere between 29 and 30.

In any case, it is not only possible, but also quite normal to use the engine only for self launching and for the initial climb, about 5 minutes is usually sufficient and then soar for hours with retracted power unit. I also land. In this configuration.

On 30 April, I flew 200 Km polygon Lysice-Kotvrdovice-Svitavy-Jihlava-Lysice in 3 hours46 minutes, the whole route with the engine retracted of course. On the last leg, I saw a local thunderstorm directly on my heading to home base Lysice, I had to fly wide around; fortunately the leading edge of this great dark cloud gave me good lifts and the altitude acquired was, with ample reserve, sufficient to reach Lysice in spite of expected downdrafts on this last leg of the task.

During the first weekend of fine weather , I also updated our web page at http://www.test.infoline.cz- the main modification is the modernised TST-9 JUNIOR 2000(round fuselage, T-tail) substituting for the predecessor TST-7. Hopefully I will hear soon something from you. Best regards. Zbynek Jaros. TeST s.r.o

☺ SMILE....by public demand!

(Disclaimer - No racial discrimination intended)
An excerpt from Free Flight Down Under Newsletter. Involuntarily contributed by Dr. David Whitten, "Australian Doctor Weekly" March 2000. As we all know, Strine is the English variant spoken in Oz, although many people pretend otherwise.

I have always had a fascination with language "as she is spoke", rather than the finer points of the Queen's English. I was impressed with a short book released in the 1960s, it was titled ***Let Stalk Strine***, by Afferbeck Lauder. Which I soon realised was an invitation to the public to participate in the vocalisation of the Australian language. I must admit it was several years before the penny dropped and I realised the author's name was Strine for alphabetical order.

I would sometimes read this book while munching on an emena marts semmich. While browsing on particularly humid days, I wished that we had an egg nishner in our house. With Sydney's hot summers, there was snow datter battered - we really needed one.

On the one hand, Strine was of value in understanding the everyday use of Australian language. On the other hand, it could also take in the poetic and romantic. I recall one poem which described a young man pinning for his absent girlfriend. The first lines were particularly memorable:

With air chew.
Whit air chew.
Lker Nardly liver there chew.
I dreamer badger kisser sniten day

Australia, of course, is not the only place where spoken English can be transmogrified. I was fascinated when I read the following piece, said to be a recorded phone exchange between a guest and room service in an hotel in ASIA. It was published in the ***Far East Economic Review.***

Room Service (RS): Morny, Ruin sorbees.
Guest (G): Sorry, I thought I dialed room service.
RS: Rye. Ruin sorbees. Morny! Djewish to odor sunteen?
G: Uh yes. I'd like some bacon and eggs.
RS: Ow July den?
G: What?
RS: Ow July den? Pry, boy, pooch?
G: Oh, the eggs! How do I like them? Sorry scrambled please.

RS: Ow July dee baychen? Crease?
G: Crisp will be fine.
RS: Hokay. An sun toes?
G: What?
RS: San toes. July san toes?
G: I don't think so.
RS: No? Judo one toes?
G: I feel really bad about this, but I don't know what "Judoone toes" means.
RS: Toes! Toes! Why djew Don Juan toes? Ow bow singlish mopping we bother?
G: English muffin! I've got it! You were saying " Toast". Fine. Yes, an English muffin will be fine.
RS: We bother?
G: No, just out the bother on the side.
RS: Wad?
G: I means butter- just put it on the side.
RS: Copy?
G: Sorry?
RS: Copy, tea, mill?
G: Yes. Coffee please, and that's all.
RS: One Minnie. Ass strangle ache, crease baychem, singlish mopping we bother honey sigh, and copy-rye?
G: Whatever you say.
RS: Tendjeberrymud.

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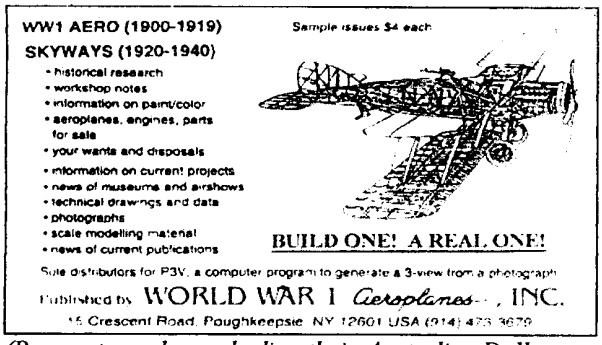

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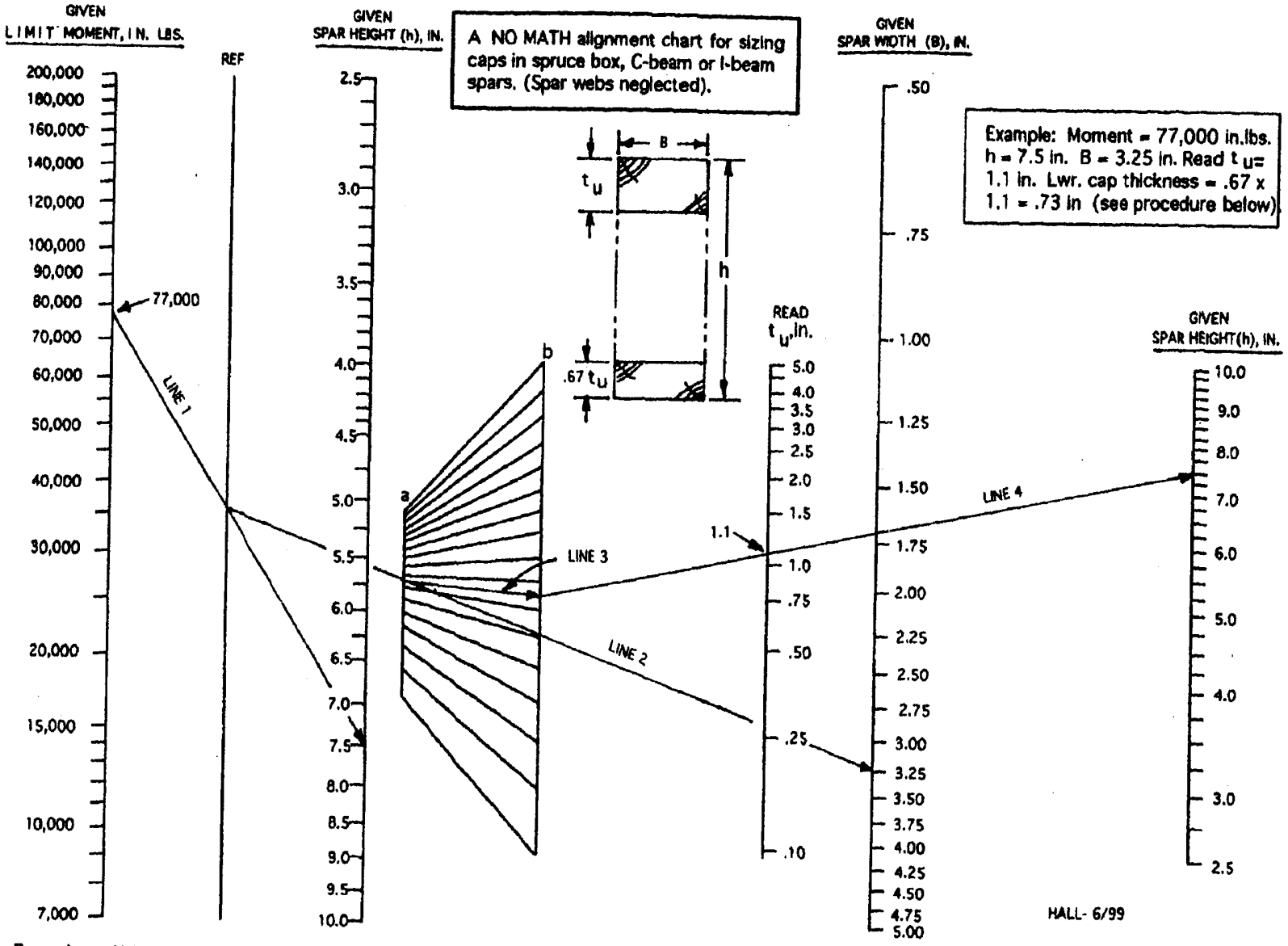

Procedure: Using example data in upper righthand corner, draw line 1 from moment = 77,000 in.lbs. to spar height (h) = 7.5 in.. Draw line 2 from line 1 intersection with "ref" line to spar width (B) = 3.25 in.. Draw short line 3 from line 2 intersection with vertical line "a" to vertical line "b", maintaining close to the same gap percentage between sloping lines at both ends (about 50% in this case). Draw line 4 from right end of line 3 to spar height (h) = 7.5 in.. Read upper cap thickness at "READ t_u,in." at 1.1 in. Lower cap thickness = .67 x 1.1 = .73 in.