THE AUSTRALIAN HOMEBUILT SAILPLANE ASSOCIATION

Volume 3 Issue 10 **September 1998**

EDITORIAL

G'day folks!

We are in the middle of Winter in this part of the globe and my glider construction activities have been minimal due to the cold weather. The boss (my wife) is keeping me inside the house. She looks after me extremely well and I oblige. Not bad! for an old bloke like your scribe.

There's plenty of news for you in this edition. Finally after 13 years, Terry Whitford got his Monerai C. of A. from the Gliding Federation thanks to the co-operation of John Ashford and Jonathan Shand to solve the problem. We are in very good relations with G.F.A. and we are willing to get positive solutions trying to make everyone happy.

The G.F.A. has offered one metallic cabinet for files and plans and we are going to run a plans perusal service. One of our members, Malcolm Bennet has volunteered to be in charge of this facility. Another member from Western Australia, Wayne Rhodes has also offered to be in charge, but we think that for the benefit of all of us it would be much better if it were centralised here in Melbourne.

The cabinets offered by the G.F.A. are free to us and they are donated by my friend John Buchanan, a member of The Geelong Gliding Club. Thanks.! John we really appreciate your generosity. Read all about it somewhere in this Newsletter!

Again this year we will have our Annual Symposium on Melbourne Cup Day Weekend. Try to attend this year because it's going to be much better and there'll be lots of new good hints and tips! Also our President Gary Sunderland will be running a course in Major & Minor repairs in Gliders. I hope to meet you there.

Finally after 13 years Paul Johnson got his Windrose up in the air. I had the privilege to assist in such a memorable day and witnessed the first flight. It was a very cold morning and my friend Alex Adams was in charge of the photos. I could see the satisfaction on Paul's face when he landed after his first flight...a memorable moment...all his dreams had become a reality!

I video taped the whole event so we will have the opportunity to see it during our next Symposium.

PLEASE NOTE → The Victorian Soaring Association is running a Basic Airworthiness Course to be held at Bacchus Marsh Aerodrome Gliding Club House and the VSA workshops from the 10th to 17th October 1998.

AHSA members are cordially invited to take part in this course. If you are interested please contact our President Gary Sunderland, Course Director, 70 Underbank Blv., Bacchus Marsh, Vic. 3340. Australia. Ph. (03) 5367 5374.

James Garay

Inside This Issue

MAIL BOX

Dear Ed,
Just recently the Windex builder in Sweden, Bengt Gook has started an engine project in companionship with the original construction team. (Last time they had to reject the project of their own engine.) The test run so far is only one hour. It is a 3 cylinder 2 stroke belt geared unit with a feathering prop.
Weight 20 Kg and it says giving 32-35 Hp with a home made ignition system. It consists of 3 cylinders of 119 cc each from HUAQVARNA arranged in a row. Today the use of a Konig engine gives only 20 Hp but it is marked 24 Hp.(The 80% rule of practice) Windex is rated with 16,5 Kg/Horse power, compared to SF-25C and Grob 109B with only 12 Kg/Hp.

Our grass strip at Talje in the very middle of Sweden has dried out and we are flying as often as possible. Two new members are under training to be certified in gliding.

We use a SF-25 C for training purpose and a Grob 109B for longer flights. So far only one has done a 300 Km flight. The members starting to realize the relatively good performance, become interested of doing, at least 5 hours flight and 50 Km distance.

The Swedish gliding community is facing a new threat, Air Space 98 which will be implied in late Autumn this year.
The need for a transponder in all gliders above 5000 ft is the problem at the moment. There is no such transponder available.

Behind there is a multibillion dollar project of anticollision system. Why test it in a area where we usually are to far away from each an other to be seen anyway?

There is a Swedish system far better and much cheaper to be used. GPS plus Radio, sending our position to all who need it. There are 3 area controls in Sweden Sundsvall, Stockholm and Malmo. When listening to the area control it is silent for more than 30 minutes now and then.

Gliding in Sweden are in a down period since 1989 in flying hours and new gliding certificates. A small exemption for the 1997 year which was extremely good for gliding. A 1000 Km first flight ever in Sweden was made.

The home-building activity is in a stable mode at present, but I have made a proposition to the community about build 60-100 Windex with engine. Built at clubs to get more interest and turning the curves upward again.
The only way to expand flying when people are drying up from clubs is to make more self launchers available. Gliders in that mode, at reasonable cost and performance are very rare.

I came to think of making Mr. G. Sunderland,s MOBA, into a MOBE with E standing for engine. The gasoline/petrol (which you prefer) is very expensive in Sweden and Europe, compared to US, so the aerotow method is a contradiction area. The MOBA still stands for very good performance and the paperwork will be only slightly more with MOBE. Yes, you are right, it is not as simple as that. Building gliders are no problem at all, compared to fit an engine inboard and make it retractable. The most successful solutions so far are made inboard with a beltdriven propeller outboard. Two seaters use to have the propeller in the front
Best regards to you all. N.A. Sandberg.

Editor's note: MOBA stand for My Own Bloody Aircraft.
MOBE will stand for My Own Bloody Engine..??? I have My Own Bloody Confusion..!!!!!

Dear Ed,
G'day mate! Please find enclosed the fee for reaplication of A.H.S.A. I am very busy at the moment (isn't every body ?)
and the reapplication form got lost in my pile of paper work.
Please note the new postal address . The phone & Fax is still the same. It's nice to see the A.H.S.A still growing. Your Newsletter is excellent! Top marks.
Regards. Mark Stanley. PO Box 1102. Waikerie, S.A.5330.

Dear Ed,
Please find enclosed cheque for membership renewal. I am getting back to my WOODSTOCK project which was placed on hold.
Thanks for the latest issue of our Newsletter, another great issue. I am sorry I missed the A.G.M at Smithfield. We seems to have a solid committee in place. I support the initiative with GFA and particularly Gary Sunderland's efforts towards airworthiness skills.
With regard to Wayne Rhodes proposal. I have a complete unused set of blue prints for a Hutter-17 which may be of me to some one out there.
My own project now has a complete upper decking so the fuselage and tail are mobile enough for a journey to Smithfield for our next gathering as required.
I have had no response to request for availability of other wings, so I shall approach Mike Burns for reestresing to allow a greater cockpit weight before commencing the wings.
Regards. Brian Berwick.

Dear Ed,
Please find enclosed cheque for renewal fee, plus extra for 2 or 3 small advertisements.Regards. Mike Burns.

Dear Ed,
I have sent you, AU $ 25 via postal giro account for a one year subscription.
Last year, I can see from my files, I missed to send you the last five for overseas. That is why I added the remaining today.
The newsletter size have become very Swedish. There is a positive air in the newsletter which tells without figures that the AHSA is growing.Congratulations. N.A.Sandberg.

Dear Ed,
Well I took your hint and spent two days typing with two fingers something about myself, I do not know if it is worth the printing but you can do what you like with it, as long as you do not change any of the scrip.

I am looking forward to another day at Smithfield and I hope to see you there along with other nuts as well.
I did get the June newsletter Ok. Thanks... I too would like to see a membership list and projects as Wayne Rhodes wrote in the June issue.

As I said I would like to design and build a flying wing glider, just something small and bungee it off a hill, but it takes me to long to do what I could when I was younger, I would work all day on the farm and at night work until midnight on my projects, but now it seems all I can do is sleep and babysit grandkids. Regards Jim Jensz.

TECHNICALITIES

REPAIRS TO STEEL PUSHRODS IN GLIDERS

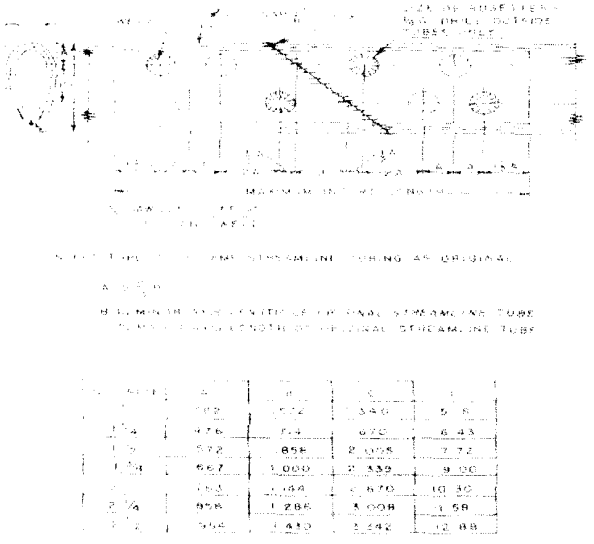
By G. Sunderland (GFA Design and Development)

Welded steel tube pushrods are widely used as the primary control drives in many sailplanes. For example in the ES 49 "Arrow ", the ES 60, ES 60B, all KA 6, KA 7, K 13 and most fibreglass sailplanes from the Libelle on.

Typical pushrods are welded from seamless low carbon, T 45, or AS 4130 steel, usually ¾ inch diameter, or the metric equivalent, and of minimum thickness. This is .035 inch thick in the American MIL-T-6736 system.

Streamline tube splice using split insert (applicable to landing gears)

I am not sure if the Europeans get any thinner, as less thickness makes welding very difficult.



Typical pushrod damage results during major accidents when the rod is bent and or compressed, resulting in the collapse of the tube at one point and a fold, or perhaps a complete fracture. A common accident is from a loop on take off resulting in a tail boom break including failed pushrods.

The standard method of repair, used worldwide from all reports, is to saw through the pushrod at the failure point and hand work the ends back to approximately the original, circular, section.

A small length of smaller diameter tube id then inserted at the break, the ends are nested together,and butt fillet weld is made. The resulting repair is shown as Figure 1.

The repair looks quite neat, and is presumably justified on the basis that the original pushrod end fitting terminates at a single circumferential fillet weld, which is " obviously " strong enough.

The repair restores the pushrod to its original length, which is an advantage in a bad tail boom break, as the tail control rods are repaired first, then the tail is set up in position and the tail boom repair " filled-in" to the correct length. A method which works for both wood and fibreglass tail boom repairs.

Unfortunately this method as shown in Fig 1, does not take into account the stresses in a column (pushrod) which may involve compression and bending.
Considerable bending loads also may occur in a pushrod between supports. For example, imagine what happens in the centre of an elevator pushrod as the tail is thumping across the air strip. Any bending loads are made worse by the added weight of the sleeved repair, if this happens to be located between supports.

There has been one report of a failure in a repaired elevator pushrod, from the USA. This was in a Kestrel sailplane and the repair description was similar to Figure 1. The weld repair cracked right through in service, with a complete loss of elevator control, resulting in a fatal accident.

A weld deposit is effectively just a cast low carbon steel. This is fairly though and strong in shear, but fairly weak in tension, with a low fatigue strength in comparison to the pushrod tube steel.

Such repairs really need to be reinforced to increase their strength in bending.

In Australia the GFA have always specified that steel tube repairs should be carried out to CAM-18, or its replacement FAA Publication, Advisory Circular 43,134 Part 1.

The current GFA Manual of Standard Procedures Part 3 Airworthiness calls up AC 43.13 in paragraph 6.8.7." Metal Tube Repairs".

Unfortunately AC 43,13-1 does not contain a specific repair scheme for pushrod controls. Most of the welded steel tube repairs provided in Section 2 are external patches for major airframe trusses. These are not suitable for pushrods, where we may need to extract or insert the rod with limited clearances.
Splicing repairs, using an inner sleeve, are shown in Figures 2.7 and 2.14. These should be used as a basis for designing our pushrod repairs, but need to be modified slightly to suit

A recommended scheme is shown in Figure 2.

Finally there is no mention in AC 43.13-1 Section 2 of the need for protection against subsequent corrosion in the repaired components.

After welding the steel tube must be flushed with raw linseed oil. The exterior surfaces should be painted with zinc-chromate primer, A two part zinc-chromate epoxy primer is recommended. For those people inspecting old gliders, particularly during 20 years inspections, all pushrods need to be inspected for weld repairs.

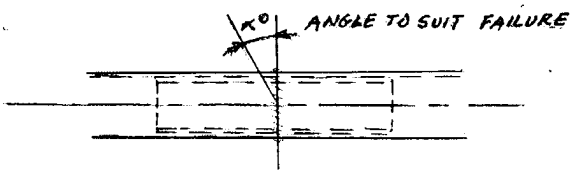


FIG. 1

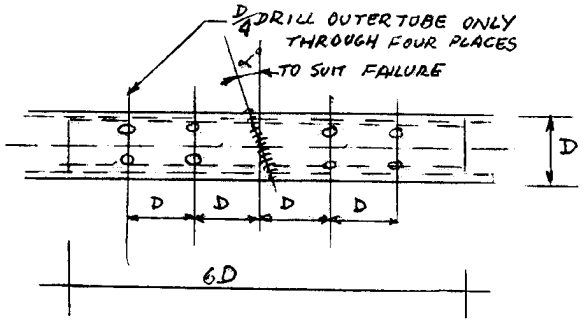


FIG 2

Any repairs similar to Figure 1 need to be carefully inspected for cracking at the weld. Personally I would remove any such repair, and remake the whole pushrod with new steel tube. Steel tube is still relatively cheap, and replacement removes any doubt about such vital controls.

MORE ON WOODSTOCK.

By Peter Raphael

Jim has asked me to respond to the question in the last newsletter as to how Australian Woodstock's have faired in their weight and balance. So at the risk of eliciting a flurry of technical argument here it is.

There are, so far as I know, only 2 Woodstock's flying in Australia, HNH, built by Les Squires, and HNW built by Terry Whitford and myself. The resultant figures for these 2 aircraft is as follows.

VH-HNH	Empty weight	117.5 kg
	Max Pilot	87 kg
	Min Pilot	73 kg
VH-HNW	Empty weight	124.8 kg
	Max Pilot	84 kg
	Min Pilot	75 kg

These relatively low maximum pilot weights are brought about by the desire to maintain the glider's envelope within the designs C of G limits and to limit achievable G loads at manoeuvring speed in line with JAR 22 requirements.

The primary concerns within the weight and balance are those of C of G position and of G loading. At minimum pilot weights the aircraft will be flying at the aft limit of its C of G, transgressing this can introduce adverse pitch controllability and unpredictable spinning characteristics. At maximum pilot weight the aircraft will be at its forward C of G limit, beyond this, elevator authority may be compromised, leaving insufficient travel to effect a roundout at low speeds. More significantly, excessive fuselage payload increases the wing loading and the potential for maximum design loads to be exceeded in thermal gusts or at maximum manoeuvring speed.

Obviously the all up weight is not only single factor influencing payload. As the fuselage also has to be carried by the wings, the weight of this becomes significant in calculating maximum pilot weight, and this is why the wings are weighed separately. Because the Woodstock's flying in Australia were built with the intention of obtaining a full C of A, practices such as sealing of the structure with durable finishes along with the use of alternative and sometimes heavier materials ie. coachwood and birch ply's were used. This means that the Designers weights are often difficult to achieve and therefore building should always proceed with this in mind.

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FLUTTER

By M. Burns

CONCLUSION

We have very broadly touched on Flutter in its many forms. It is a normal aspect of sailplane operations but can be avoided if each of us carries out our work, whether it be design, construction, maintenance, repair or flying, in a careful and responsible manner.

Flutter is a common denominator. All aircraft can suffer a flutter incident, ranging from benign wobble to a catastrophic buzz and structure failure. This information brings together many aspects of flutter, its causes and its preventions. Hopefully this contributes to better understanding, lessening of the occurrence and when it does occur the pilot involved may be better equipped to cope with it.

As a designer or homebuilder it is important to be continually aware of the criteria developed in the following material and the need to apply it to any project you are working on, not only homebuild design or construction but also maintenance and repair.

REFERENCES:

EAA Design Publication # 3.
B.C.A.R Sect E.
GFA National Soaring Symposium Papers JAR 22.
Flutter video from the GFA office.

End of the article.

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PERSPEX

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

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

SCREWING AND TAPPING

Standard taps and dies are used for cutting screw threads in Perspex. Where a choice is possible, coarse threads are advisable. It is usual to tap by hand, when the taps should be backed out slightly to help clear the swarf. Lubricants are essential, water soluble oil being the best. In blind holes, it is good plan to fill them

with coolant as the light pressure developed during working helps to clear the tool.
Threading Perspex is not advised where frequent dismantling is likely to take place or the parts are likely to be subjected to high and/ or sudden loads. In such condition metal inserts are recommended.

ENGRAVING

One of the ways of marking Perspex is by engraving, using the normal pantograph machines as for other materials such as metal. The shape of the tool will depend on the section of cut required but as for other cutting operations, tools should have no rake and adequate back clearance (say 7 to 12 degrees). The use of coolant is no necessary, but a jet of compressed air directed at the cutting point is an advantage in keeping the tool cool and removing swarf. Filling the engraving can be carried out by applying some of the usual setting waxes or paint. With the later, drying in a warm, well ventilated oven at say 50 to 6o degrees Celsius for at least three hours as soon as painting is completed, is advisable.

FINISHING AND POLISHING

Perspex surfaces, which have been machined or scratched can be easily, polished so as to reproduce the original surface finish. The same principles apply as for polishing other materials. Deep surface blemishes or machine marks must be sanded down by using in turn successively finer grades of abrasive and this followed by buffing on rotating calico mops. Scraping with normal steel scrapers (as used for wood) can take place of sanding, and hand polishing can be used instead of buffs. Hand polishing is of course much slower. It must be emphasized that careful sanding or scraping so as to remove scratches, tool marks etc. must be done before polishing is attempted if good results are to be achieved.

SANDING OR SCRAPING

After sawing, the edges of Perspex are ground on an abrasive disc with grits of # 3 emery and rotating at about 3000 r.p.m. for a 10 inch (25 cm) diameter disc. With the larger diameter disc the speed of rotation is of the order of 1500 r.p.m.
Alternatively, a linishing belt can be used but the grade of abrasive can be # 1.1/2. #2 or #4 emery depending on the roughness of the work. The speed should be about 1200 ft (350 m) per minute.These sanding operations are done dry and the pressure must be judged by the operative so as to avoid overheating.
Deep surface scratches can best be removed by sanding by hand, using a wet/dry abrasive paper #2 followed by # M2 and #0. The paper should be wrapped round a wood or cork block, and sanding should be spread over a large area around the blemish so as to reduce the resulting distortion as much as possible.
The sanding should be done with a circular action so as to change the direction of motion frequently. Before sanding, the surface should be clean and free from swarf or grit, which might be trapped under the abrasive paper and cause deeper scratching, and so spoil the surface instead of improving it.
Scraping with metal scrapers is only used for edges which are already reasonably smooth from preceding operations.The tool generally follows the actual contour of the surface in contact with it and is the inequalities are large wavy surface may result.

To be continued...

CHAIRMAN TECHNICAL COMMITTEE REPORT

HOMEBUILDERS GROUP

The homebuilder "subset" of the GFA have been very active over the last year and now have a regular newsletter and have regular meetings. In view of the high price of imported gliders these people should be given every encouragement. At this time, because we do not have an experimental category, those types which do not have an Australian Type Certificate cause a lot of angst when the owners come wanting a C of A. When these have been built in America under experimental they need not conform to any design standard. Also designers are sometimes reluctant to provide a lot of detail anyway, probably because of the ever-present sport of litigation. I have difficulty explaining to many members that once the GFA CTOA issues a Certificate of Airworthiness it is his neck on the block if there be later found to be a deficiency in the design or in service behavior of the glider. Therefore the CTOA will examine everything closely before issuing any type certificate or C of A. This takes a lot of time and has to be fitted in around other work. Meanwhile these gliders are not left stranded as they continue to fly on a Permit (which G. Sunderland has pointed out is our "Experimental Category").

The policy I have pursued is that if previous GFA officers gave an undertaking to progress a glider to being issued a C of A, the GFA is going to honour that promise no matter how long ago it was given.

In respect of any new types the homebuilder should have two ways to go about getting his aircraft flying. The easy way is to call it "experimental". The hard way is to insist on having a C of A. In the latter case I think it will be reasonable to say that the homebuilder wanting to go this way will have to do all the legal work himself to provide the GFA with a document package which can be easily checked in the minimum of time by the CTOA.
A good example of what can happen to a homebuilder with no "experimental" category in his homeland is in an extract from a letter written by my opposite number in the BGA. (I won't mention the design.)

"Based on the examples evaluated (2) they fall far short of the current JAR22 requirements on a number of counts and have serious deficiencies in their flight handling characteristics. Both designs exhibit an acute lack of roll control apparently due to ineffective ailerons. When combined with high sensitivity of the pitch control this results in a lack of control harmonization which is well below what we have come to expect on the basis of glider design, as seen over the past 30 years controllability should not require exceptional piloting skills."

The letter goes on to quantify all the deficiencies including airworthiness matters of non compliance or poor execution of the engineering and finishes up by saying...." I have to advise you that

our committee is not prepared to issue a UK permit to fly on these designs in their current form".

Since there are similar gliders under construction in Australia you can see what a head ache they could be if the owner/builder wants to go the whole way for a C of A. I do hope the "experimental" category is in by the time these things are hard to fly. (By the way, the BGA evaluation panel are pretty tough and have been known to knock back types submitted by recognized manufacturers until they were modified. to their satisfaction!)

I had a few calls from members who said that they had heard that there was a new version of the "Europa" with long wings and it would qualify as a motorglider, so therefore would be able to fly it without a license do your own maintenance etc. whacko! (And what did the GFA propose to do about it!). I contacted the manufacturers. They have built one prototype with long wings, which is not yet fully tested. They have no intention of having it qualify as a motorglider. How these rumors get started I do not know but they travel far and wide - beware the phone caller who starts off "Have you heard..."

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AN OFFER TO THE AHSA

In the last newsletter it was mentioned about drawings and [plan that the GFA no longer makes any plans it has available for study purpose. I would like it said that the reason why is that we loaned drawings and never got them back. See AG July 1997 "Some of our aircraft are missing"

1 We will make available one vertical A2 plan file ("PLANEX" TYPE CABINET) and one 3 drawer filing cabinet, for AHSA to keep plans in, courtesy John Buchanan of the Geelong Gliding Club.

2 The GFA will keep one set of master drawings, which will not be loaned out to anyone or removed from the office without good reason. Recently some plans were borrowed by a member who copied them to CD ROM and seemed satisfied. We did not see the result. If this technology can be shown to be satisfactory as to cost and quality we want to use it. Can you please investigate this idea further with your members and contacts

3 AHSA may keep as many sets of plans as it wishes and may loan them out to anyone they trust. I Suggest you should insist that they join AHSA and charge a deposit as least as much as it would cost to have the plans re-copied if they are not returned. Whether you charge a fee for the loan as well is your business. We need to look at the cost of setting everything up too, so it may be that a fee would be needed just to cover the cost of getting everything up to scratch.

Please let me know if you want to take this offer up. We will be cataloguing those drawings, which we have over the next few months. Obviously no all of them will be of interest to the AHSA.

Yours faithfully. John Ashford.

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The GFA
Attn. John Ashford

I am writing on behalf of the Australian Homebuilt Sailplane Association to accept the kind offer by the GFA to transfer control of superfluous plan sets to be used as a lending library by our Association.

As noted in your letter, we can appreciate the difficulties associated with the distribution and recovery of plans and will put into place an equitable system of management and maintenance, obviously this should be a self funding activity and your suggestions are duly noted.

Unfortunately, one of our members in Western Australia had offered to institute such a service but in view of the current situation this would not be logistically feasible, perhaps this could continue as an annex of our service. However, another of our members, Malcolm Bennett, has agreed to become the custodian of the plans and is happy to manage their dispatch and retrieval. Malcolm lives in Melbourne area and is able, by prior arrangement, to pick up the items you have offered.

We will undertake to notify our members of the reason for the discontinuance of the GFA loan service and the new arrangements that we will put in place. Perhaps a notice in Australian Gliding to inform the general membership would be in order once the arrangements are settled.

Yours Sincerely, Peter Raphael.Secretary AHSA.

FROM MY GRAY MATTER

By Peter Raphael

Here are a couple of good ideas we use in assembling wooden structures.

We use Epiglue, a gel-like epoxy and the instructions dictate a 2:1 glue/hardener mix by volume. We find that the most convenient way of measuring this out for the usually moderate quantities required, is to use the large plastic syringes obtainable from chemists. Don't be self conscious in asking; by now people are probably convinced there is something wrong with you anyway! Two are required, one for hardener and one for resin, and marked accordingly. By cutting away the end of the syringe , this can be pushed into the glue as the plunger is drawn back , the calibrations allowing for accurate calculation of ratios. The excess is scraped off on the side of the can and once measuring is complete the syringes can be wiped with a piece of disposable paper towel ready for their next use.

Application of the epoxy to the structure can be messy at the best of times and when tackling major areas like wing skins, time is of the essence. A successful technique that we have adopted is to place the mixed epoxy into small ziplock plastic bags, similar to the type that bank store coins in (if only we could convince them not to punch holes in the top, [tape these!]). These are perhaps a little heavier duty than the domestic variety and so can be dragged across a sharp edge to extract the last of the contents. A corner is

cut off to give about a 3mm nozzle and allows the glue to be "piped" onto the structure. This must then be spread to completely coat the glueface and with a little practice will result in a very even squeeze-out. The couple of added advantages with this method is that the glue is still being mixed during application and that quick application minimizes the exothermic heating of the glue which would reduce the open time.

When skinning wing structures like the Woodstock or Duster the 6mm ribs used do not provide a good target for the staples, usually resulting in a number of misses. As part of the skin preparation we have found it useful to use a builders chalk line to lay out the positions of the riblines and spar margins on the outer skin surface. This provides for quick and accurate placement of tacking strips and assists in ensuring quality gluelines.

When rigging the aircraft incidence and attitude during initial assembly, several metres of clear plastic tube will be useful. This can be used as a water level and will allow the fuselage datum to be set accurately by extension to the extremes of the aircraft. With the ends taped to a straight edge a long and accurate level can be made to set washout and compare incidence settings. When construction is complete the tubing can be put to work in plumbing the instruments.

Of course we all wear gloves when handling epoxy, but there is nothing worse than hands covered in glue or resin when you are reaching for tools. Keep a can of talcum powder handy and sprinkle this onto your gloves when this happens. This will take care of the problem. A sprinkle over the hands before pulling on the gloves makes this task a little easier too.

A dab of bright nail polish (sneak this out of the bathroom), on the threads of bolts that have been final fitted will identify these when assembling the aircraft. This will prevent everyone having a go and overtightening the hardware

SHOP TALK

From The Oval Office

By G. Sunderland

Elsewhere in this issue you will find part of John Ashford's report to the GFA Annual Council Meeting, held 19-20 September 1998. This part of the CTC Report deals with our Association subset and John has some nice words to say about our activities.

Unfortunately these good impressions are somewhat overshadowed by reported criticisms, by the British Gliding Association, of two homebuilt designs with "serious deficiencies in their flight handling characteristics'... 'which fall far short of JAR22'... and... 'our committee is not prepared to issue an UK Permit to Fly..."

This is not the sort of message we would like to have given to the A.C.M. A lot of influential members are likely to go away with the impression that homebuilt gliders are likely to be difficult to fly, if not dangerous. They will then tend to discourage other G.F.A. members who want to start a project.

My experience of homebuilts is just the opposite, and I have flown quite a number of different designs, from the Golden Eagle to the Monerai. Of all these gliders the only ones with positively bad handling were the Coogee, an ancient H-17 derivative and the Miller Tern.

The Tern was a sort of long wing "Cherokee" and had very spongy cable drive to the ailerons and ineffective split flaps. The poor ailerons could have easily been fixed by installing Ka-6 type pushrod drives, and simple spoilers could be fitted to provide adequate glide path control. However, it was not dangerous to fly, just not very pleasant.

On the other hand, gliders like the Woodstock and Monerai are fun to fly, partly on account of their small size. No glider with bad controls is likely to be around for long. The word will soon get around, within the home-building movement, and the design will either be fixed, or it will disappear. No one wants to build a "lemon".

Up to this time homebuilts have been accepted under one of two systems, provided in the M.O.S.P. Section 3-8.

Either on the basis of a foreign Type Certificate, leading to a "normal" Certificate of Airworthiness as for example the ES 57 Kingfisher and the Ka8.

The alternative path, for designs from the USA "Experimental" system, is on the basis of safe operation, as for example the HP-14 and the Woodstock, which were awarded an "Amateur Category" Certificate of Airworthiness. In the future this may be changed to the new Australian Experimental Certificate, but it is unclear what limitations will be imposed on this new category.

Currently the only limitation on an Australian homebuilt with an "Amateur Category C of A is the placard in the cockpit.

It is not clear from John Ashford's report, what objection he has to a C of A being issued to a homebuilt. There has been no difficulty in the past, and only minimum documentation has been required. For an amateur builder to provide "a document package... to the CTOA", presumably similar to an aircraft factory is bureaucratic nonsense.

It would surely be more efficient and effective, for someone like the CTOA to take a quick flight in the aircraft and make sure it handles in a normal way. Down with unnecessary paperwork. Lets save a few trees.

Note that "Amateur Category" aeroplanes and gliders have never been expected to meet formal design standards, like JAR22. They just have to be reasonably controllable and safe to fly.

As for the BGA "evaluation panel" criticisms of a couple of homebuilts, I have a long memory. This same group back in the 1950's tried to convince us "colonials" that the Slingsby Skylark was the greatest, and that German gliders i.e. the Ka6 and Libelle, were too slippery and dangerous. Fortunately we Aussies did not take too much notice of this "advice".

There are minor faults in all Sailplanes. In the case of a homebuilt, it is up to the builder and the G.F.A. Inspectors to sort out any problems.

Note that the flight standards for USA "Experimental " designs are given in the MOSP Section3.8.8.1 and are NOT JAR22.

On completion of testing a C of A will be expected to be issued to 8.1.2.

If anyone has any problems, or experiences any delays in this process, please let me know and I shall personally take the matter up with John Ashford and Jonathan Shand.

The Flying Memoirs of Jim Jensz. 1932-1998

Ever since I can remember I have been mad about flying, flying machines, being raised on a farm back in the 30s I had little money to spend on models aeroplanes or flying, but when I finally did save a few bob by selling rabbit skins and plus a little my dad gave me, I bought a model spitfire for 5 bob, now about $5, after a while, I did get it to glide.

I attended a state school at Parwan South about 10 miles from Bacchus Marsh, during the WW2, an aerodrome was built there, and from the school we could see it taking shape, with all the dust made by the dozers, graders etc, it was soon finished and many Wirraways, Ansons , Oxfords used to fly up from Laverton and Pt Cook for daily training, at the weekends my cousins and I would ride our bikes to the drome to watch the planes taking off and landing, we used to stand on the fence posts and some of the pilots would dive at us making us jump off!!

One day I got a ride in an Anson and had to wind up the under cart, that made my day, then. later I saved a few £ and bought a Motorcycle " BSA bantam", 2nd hand for £100, I used to ride it all over the place to see gliders flying at Berwick, and down to Geelong to visit Percy Pratt, a well known early gliding pioneer in Australia, Percy lived at Batesford he used to tell me about his building gliders and light planes, he also put me in touch with other nuts like Tom Mulcahy whom Percy had built a Flying Flea for.

I did not like school much but did learn to read and write, I finally got more money by share farming , in that time the Adelaide Gliding club were holding a gliding school, much, to the disappointment of my parents I enrolled and learnt to fly in a Munn Falcon designed and built in WA, it was a bit of a pig to fly, full forward stick on take off, then you gradually eased the stick back as it climbed the Falcon was a very tall machine and the tow hook was a bit far back , the winch tended to pull the tail down on take off, so the correct procedure had to be used to get off OK! there were only 3 of us in that first course, myself Gerald Moody and John Fischer, (John was and still is quite a character) 2 other guys also stayed with us they were Alf Humble and Vic Cashmere these blokes used to drive to Parafield each day to learn powered flying. Ron Adairs wife Marriane was the cook for us, Ron did some instructing also Cliff Gurr and Brian Creer, we were taught to drive the winch, lay out and check the cable as well as fly, after 26 dual flights I was sent solo this took 4.5 hr., then it was just up and down in the Falcon , by the end of the course I was ready to give Gliding away, on the Saturday I was told I could have a fly in the Grunau, after an hour and a half I was really hooked!!!

Back home the Geelong gliding club was re formed , of course I was in it, we started out in a pig shed near the Barwon river just up from the Belmont common, we were given an old primary Glider to work on to keep up the interest ; soon the club bought the Falcon from Adelaide , we used to train at Little River, a winch was built by Howard De Grandi, from a Cadillac V8 Hearse!! it worked very well and served the club many years, Howard built a hanger on the Belmont Common , we got permission to train from there , finally. the Falcon came to grief, much to the relief of some of us! Tom Thompson was instructing in it, the elevator cable got stuck on a bulkhead and jammed the elevator down fortunately it was not very high , so Tom and Falcon came down rather hard it was bent beyond repair, the club then bought a Kookaburra from Benalla and also had the Coogee, a single seat machine much like the Grunau, a lot of fun was had by all who flew these machines.

I bought a H17 from WA I had it air lifted over here by Ansett Airline , I did a lot of

work on it before I flew it I was the first person to get permission from the then DCA to fly gliders from Bacchus Marsh Aerodrome, I used to auto tow the H17 with a Holden ute driven by another nut Doug Vanstan, I sold the H17 to the Armidale club for £300.

I went to another gliding school in 1958 for a refresher course, there I flew the then new ES49s built by the Adelaide club with the help of Schneiders Co, they were very nice machines, tandem 2 seaters, they used a Mustang canopy fitted on back to front, I bought one of these canopies for £5 from disposals!! I soloed in these after 10 flights dual, the instructors were, Reg Harris, Wally Woods & Forbes Walker.

In Feb of 1959 we bought the Black & White Grunau from Derik Reed for £475, a syndicate was formed with myself, Dave Rees, Doug Vanstan and Alan Scheils, Alan only flew the Grunau a few times, but the rest of us had many hours of fun flying it. We bought an old Oldsmobile stripped it right down to the chassis , Dave got the idea to lay the cable (wire) in a series of (S) down the strip, then we would hook up and thru the gears flat out, the wire would straighten out and we were off just like a winch launch but without the jerks of changing gears it worked great.

We were asked to give a gliding demonstration at Maryborough, so Dave talked DCA into giving us some aerotows to let their pilot have some practice , because he had not done any before, Dave also had not done any aero tows, so we just told him to take off and fly in low tow position until he reached release height, then go to high tow and release, Dave sure did this, he pulled the tail of the new Auster right up till the nose pointed to the ground, it must have given Doug and the pilot plenty of warning he was going to release!!! Dave flew the Grunau up to Maryborough behind a Tiger Moth,it was a very rough trip, there being plenty of thermals about, I flew the Grunau at the show , did some loops , then flew it back home Behind the Tiger, I had ½ hr of soaring while waiting for the crew to arrive and help derig the machine for the trailer.

Another time we were asked to fly at the Avalon Air Show, the very first held there, on the 6/12/59, we trailered the Grunau there, I flew, did 5 loops, gained 399 feet, I had to open the dive brakes to get down in our alloted time. The Berwick Club had their new Skylark 4 there and also flew in the show.

I went to another gliding school and learnt to do repairs and maintenance on the gliders, (this was much better than state school!!) another friend, John Potts came over with me, we drove Johns Triumph TR3, had it up to 115 MPH, we had great fun at the school at Gawler, chasing girls in our time off!!!

In 1960 Dad sold the farm, we moved to another farm at Wangaratta, I sold my share in the Grunau to Bob Jancey, while we were at Wangaratta Dave decided he wanted to fly in the comps in SA, so he asked me to come and help as ground crew and also fly, I did get Silver height, distance but not the 5 hrs.

In 1962 I got married, but did have another glider with a friend Alan Rundle it was a Joey by Keith Jarvis, this one I smashed up rather badly! we were auto towing from a paddock, I used to have 2 bags of sand to hold the ute down, Alan a University student said the sand was only slowing us down so removed them, I climbed very steeply and lifted the back of the ute off the ground, I Spun in from 50 feet so I am told, broke one ankle, one wrist, nose and fractured the other ankle, I should have been more careful but so much for the University training!! this happened in front of my wife who wasn't very impressed!! but it still didn't knock any sense into me, I started to build a Flying Flea this had been my passion after seeing a Flea in a friends book as a kid, I didn't get it finished, I bought a couple of Skycraft Scouts and we had moved to 20 acres

just out of Wangaratta I had a lot of fun in these, 40 hrs! Again I started to build a Flea, I got this one finished but tipped it over broke the prop and knocked the rudder out, this one is still in existence in Melbourne, minus the VW engine which is in a Jodel D9 at Bendigo.

The Scouts were a very clever design and flew well provided U didn't weigh over 12 stone or70 Kgs I installed a 250cc Robin in the MK2 , it flew great I did have a few engine outs which made for good forced landing practice!! but never much damage to myself or the machine.

Again I started to build a Flea, this time I got it finished, I completely redesigned it so as to have room for a normal size person plus designed it to fit our Ultralight regs, I had a Rotax 277 in I, it flew hands off right from the start, I got 19 hrs in it, then I suffered two Heart Attacks, which slowed me down for a while, but I did build another Flea, this one with ½ VW in it, I haven't flown it, I reckon I am too old and stupid, but one never can tell?? I would still like to design and build a flying wing glider and bungee it off a hill!

FOOT LAUNCHED GLIDERS

By Peter Champness

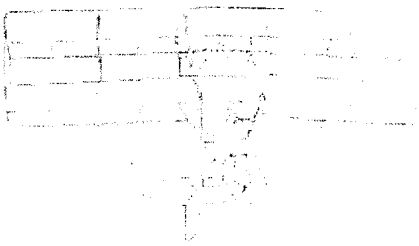
Part 2: Percy Pilcher and Octave Chanute

Otto Lillienthal inspired several other pioneers following his demonstration that practical gliders could be constructed and flown with considerable success.

The Hawk glider of Percy Pilcher of England. Had he not been killed, Pilcher might have well have pre-dated the Wright brothers, as he intended to fit an engine to a developed version of this successful design.

Percy Pilcher, a British engineer, twice visited Lillienthal in Germany and his gliders were influenced by the Lillienthal designs. He built and flew four gliders. Two were built and flown in 1895 which he christened the "Bat" and "Beetle" in which he had many successful flights. In 1986 he built his third glider, the "Gull" followed in the same year by his fourth and most successful glider, the "Hawk", in which he achieved his most productive flying. Four homebuilt gliders in two years was an incredible output. If only we could achieve the same rate today!

The "Hawk" glider is illustrated here. Clearly the design has many of the features of the Lillienthal designs. Unfortunately the illustration is not very detailed but it is the only one I have found. The glider is a monoplane and appears to be constructed with radial ribs supporting a fabric covering. Two king posts above the wing anchor multiple rigging wires and presumably there were king posts below the wing with further flying wires to support the wing "in lift". A tail with both horizontal and vertical surfaces is seen at the rear, again supported by a rather flimsy boom. Control is by weight shift, the pilot suspended by his armpits and swinging his torso and legs in the desired direction of flight.



Among the disciples of Lilienthal was Octave Chanute of America, who built this much improved glider for display at the World's Fair at St Louis in 1904. The wings were rigid with a cambered shape, as suggested by Cayley.

Pilcher then turned his attention toward the goal of powered flight. By 1899 he had almost completed his powered machine, for which he had already built his own engine, when his "Hawk" glider broke up in the air. Like Lillienthal Pilcher died of his injuries.

Another early pioneer who knew of Lillienthals flights was the American Octave Chanute. Chanute was born in France but migrated to the USA with his parents at an early age. Chanute was a railway engineer and had considerable experience building railway bridges before he became interested in aviation. His biplane glider used the Pratt truss construction (adopted from Railway bridge design), which was later also used by the Wright Brothers. Chanute was 64 years old when he constructed his first glider so he didn't fly it himself, leaving the piloting to someone younger. He and his friends set up a gliding camp on the sand dunes of the shore of Lake Michigan near Chicago. Chunute was particularly interested in the problems of stability and equilibrium. So successful were his designs that his group made over 2000 flights without a single accident! Later he was in constant communication with the Wright Brothers, visiting their camp several times at Kitty Hawk during the period of their gliding experiments in 1901-1902.

The Chanute glider was foot launched and controlled by weight shift. Whilst lacking the bird like elegance of the Lillienthal and Pilcher designs it had the advantages of simplicity of construction, a strong and rigid frame, a moderately high aspect ratio and a well supported wire braced tail unit. His design was taken up again in the 1970s by Jack Lambie with the famous "Hang Loose" which will be the subject of a future article.

To be continued...

SECOND ANNUAL SYMPOSIUM

31st October to 3rd November 1998

As usual the venue will be at the Smithfield Soaring Group in Nagambie, camping facilities and catering will be available for every one wishing to attend. Guest speakers on different topics will be invited and we guarantee a friendly atmosphere.

Last year Symposium was a complete success, so try to make it this year and you will not miss any excitement.

This year in conjunction with the Symposium , our President Gary Sunderland will be running a short course on Wood Mayor and Minor Repairs on Gliders. There is a lot to see around Nagambie and plenty of Hotels, Motels to stay and have a good weekend.

Please be earlier and books well ahead your Hotel, Motel. That time of the year the tourist area's attraction are very busy. More details in a separate circular to the members. I hope to meet you there.
The Editor.

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

Next year A.H.S.A. will join as usual The Vintage Glider Association at Locksley not far away from Nagambie. The planning for the 1999 rally is progressing well.
Locksley is located on the edge of the Great Dividing Range in central Victoria offering great soaring conditions and a wide variety of tourist activities for the family and friends.

Accommodation is available on site in caravans which are booking fast. Contact the Editor for details. A small clubhouse and kitchen is also on site. Hangarage is extremely limited. If the weather turns, it may be possible to squeeze a few but the nightly needs of gliders will be restricted to tie downs outside. For those with no accommodation, there are two excellent Hotels approx. 10 Km from the field. Owner of the operation Peter Johnston has kindly reduced the cost of a winch launch to $ 10.00 to vintage gliders. Aerotow is also available. We hope to see you there.

Windrose VH-UII – She Flies!

By Paul Johnson

Our editor, James, has been at it again, calling in the promises, talk of deadlines, even threats of instructing my wife in the use of whips. Now this is scary stuff so, up bright and early, get the work out the way and despite it being a lovely Sunday afternoon just right for sitting down, beer in hand, to watch the footy here I am James, pen in hand as promised.

Wednesday the 1st of August

Together with my mates Keith Nolan and Doug Cameron, ever ready to assist, we took the Windrose out to Beaufort

Gliding Club's hanger at Bacchus March where we rigged it and made it ready for an early start the next day. The plan was for a series of autotow's to check out the general handling.

Thursday the 2nd of August

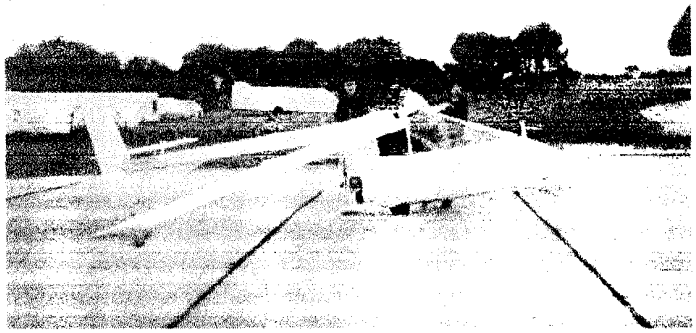
0800hrs and the selected observers/helpers started to assemble. John Ashford was to bring out the "permit to fly" and the tension was mounting.

Building an aircraft is a is strange affair, for unless you have the room at home to rig it, you spend a lot of time 'visualizing' it as an assembled item because you work mostly with subassemblies. I found myself walking around it just looking.

Nothing could be done until John Ashford arrived with the "Permit to fly". For years now I've been 'conservative' in my estimates of how long it's taken. Along comes John permit to fly in hand and what does he tell everyone? "It's been a long time Paul, 13 years, you started in 1986." What could I say!

First autotow

We towed, pushed and pulled the Windrose right up the boundary fence where the ground is pock marked with diggings of a 1000 rabbits. The plan was for tow vehicle, driven by Keith Nolan, to start from the edge of the grass side runway and to pick up speed so that by the time he straightened up in front of me he would have good speed so that I would quickly gain aileron control.



Unfortunately in the longish grass the rope pulled tight the instant the car started to move. Number one son Rohan was to run the wing, with everyone either with a job to do or a video recorder in hand all was ready, even I felt relaxed and ready.

With my hand on the release, I gave the ok for "ALL OUT, ALL OUT". Immediately the glider swung towards the tow vehicle some 20 degrees off the centre line. Release yes/no flashed through my mind I held on and found no difficulty in bringing the glider around back on to the runway centreline. I had been instructed to not take off until I had around 45 kts indicated so as not to stagger into the air with ineffective controls. It seemed like forever and I wondered if it was actually going to leave the ground, just then I was off the ground.

The aim was to keep it just off the ground, the observer in the car later commented that he thought I had kept touching the ground, I hadn't but being so low made it difficult for the car to know when I actually released. It was good to find that the ailerons, which are inboard, controlled almost to the point of stopping.

After the congratulations were handed out we decided to operate off the cross strip and time our runs to commence immediately a powery had passed.

2nd run

This time it was decided that I should take it up higher.
Unbeknown to me at the time a stone or mud had lodged in the brake arrangement and as I accelerated away there was a load groaning/graunching sound and fearing this might be my last flight for the day I decided to stay with it. This time again a long takeoff run but finally up I took the Windrose up to about 40 feet and was pleased that she handled beautifully, except for the need to push firmly against the stick. AS confirmed from the video (smoke from the wheel as she left the ground) the takeoff and landing were, If I do say so myself, lovely to watch, and watch again and again.

3rd and final run

After disconnecting the brake and discussions on the previous flight it was decided that I should again take it higher. This time the tow vehicle started in line with the glider and the takeoff and was smooth and I climbed to around 120 feet and had to release so that I could be sure of stopping before the far end.

On this flight I was able to look inside the cockpit, and noted that I was indicating 53kts during the climb. After release I found that I still needed considerable forward stick force to stop the glider pitching nose up. I approached at 55kts and the landing produced a longish float and an even longer roll out and she rolled and rolled and rolled right off the end of the runway.

After a debrief with those present it was decided that I had achieved all that was required prior to my first aerotow and it was agreed that I could leave my glider in Beaufort's hanger until my first aerotow on Saturday.

Saturday the 4th of August

John Ashford had organised a tuggy for 0830 and the same crew of helpers was there to lend a hand, I was surprised how relaxed I was feeling. Not an early riser my wife Lyn, who was to take photos, turned up and before I knew it we were at the launch point. Keith said he thought I had a leak in the vario circuit and said don't be suprised if it goes straight to full up. I wasn't when it did just that.

With every one there with their video camera Lyn, camera around her neck, would run the wing. The tug pilot was told that I would take the tow to 4000' AGL.

Take up slack, all out, and away we went. Immediately I was airborne I was amassed how much forward force had to be applied to the stick, and I wondered if I had the stamina to go to 4000' and BACK. The takeoff and tow were magnificent (exclude trim issue) with no tendency to drop the wing and the glider tracked the tug as if on rails. I remember calling 'last land ahead point' and whilst congratulating myself on a bloody good takeoff I was surprised to see the tug commence a left hand turn at about 400', Moment of truth I thought now I'll see if she turns. Turn she did again like both tug and glider were on rails.

I had noted passing through 3500' and I was sitting there singing my version of Rod Stewart's "Sailing" when I was rudely snapped out of my self satisfied indulgence, there was the tug waving me off.

Pulled the release and great to see the rope snake away as I rolled right. There was a slight reduction in the force required to hold 55tks. First item to check after a couple of gentle turns was the stall speed, 45 kts, higher than I had hoped, the stall was 'normal with the nose and left wing dropping away.

Turns to 40 degs L & R were carry along with a second stall, this time she mushed until just as the stick hit the stop the elevator stalled and the Windrose and I were looking at the ground, forward stick and normal recovery as the speed built up. After a little meandering around it was time to join circuit. Based on the 45 kts stall I completed the circuit at 60kts and as we already expected the spoiler when deployed only altered the noise level in the cockpit. The spoiler produced no change to the aim point, the speed, or the 'feel' in the seat of my pants. The landing was one of my better ones and capped off a great flight.

Summary

Not withstanding the trim issue my over riding impression during all phases of the flight was what an "Easy glider to fly".

I have attached copies of my flight reports on this flight and on the next three aerotows, all of which confirmed my first impressions that the Windrose is an easy glider to fly with no vices found to date.

I have brought the Windrose home to complete the engine installation (exhaust) and the next phase will be self-launching.

Photo courtesy Alex Adam.

Flight Test Report VH-UII

Type	*Windrose*
Pilot	*Paul Johnson*
Flight #	*4*
Location	*Bacchus Marsh*
Date	*4/7/98*
Gross weight	*336Kg*
CG position	*rear of 29% MAC ?*
Temperature	*8 degs C*
Air pressure	*1024mb*

Take off Aerotow

Wind strength	*3kts (variable)*
Wind direction	*Northwest*
Runway surface	*Grass*

a. **Rudder control**
Fully effective I'm not aware of any effort required - (no feel)

b. **Aileron control**
Fully effective, no wing drop experienced.