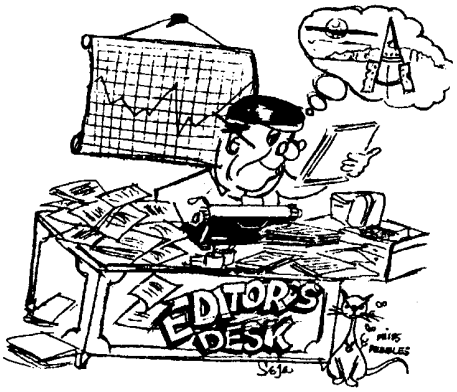
Volume 2 Issue 6 SEPTEMBER 1997



G'day People !

In this issue we start with a new section in our journal. A little bit of Gliding in Australia. Our own Allan Ash, a very well known aviation journalist is contributing with a series of articles from his book, Gliding in Australia, no longer available.

I am sure you will all enjoy reading this section, written by Allan in his peculiar style, making you submerge in your reading from the start to the end.

I must thank Allan for his generosity to share with us his profound knowledge in Australian Aviation History. His presence gives us and the Journal prestige and encourages us to follow in his foot steps. Once again...thanks Allan!

Don't forget the 4th of November (Melbourne Cup Day) we are holding our first technical symposium at the Smithfield Soaring Group in Nagambie, camping facilities and catering will be available for every one wishing to attend. Guest speakers on different topics will be invited and we guarantee a friendly atmosphere. Bring your wife, friend or girlfriend and join us. There's lots to see around Nagambie and plenty of Hotels, Motels to stay and have a good weekend. I hope to see you there..!

Peter Raphael your *Erudite Co- Editor* continues his article about how to build a trailer for the Woodstock, it's special due to the configuration with the fixed tailplane.

Under our `Technicalities' we have a brief history of Perspex, courtesy of John Ashford who facilitated the I.C.I technical bulletins. Perspex is a material in the construction of canopies and a very familiar material among aircraft builders.

Recently, I have received a letter from our Secretary and past Editor Mark Stanley who is telling me that he just got back from visiting his girl friend in Japan and due to some talks he held there, the time has come to get organized for the future. He tells me, "unfortunately the Woody does not have a place in my future" so hopefully someone will buy it and continue the project and get it in the air. What can I say! Love sweet love is blind, he will tie the knot soon. Look out for it in the Classifieds section.

James Garay.

Inside This Issue ☞

MAIL BOX

Hello Down Under,
I received my Newsletter from AHSA yesterday and tried today to hit you on the NET. As a former Monerai builder I am happy to see pictures on your site. As in Sweden, the Monerai's were the start of our sailplane movement within the EAA- Chapter 222, Sweden. Monerai is a nice flyer but my interest goes to self launching and with the Zenoah it was only at maximum performance that you could climb.

With a little jet engine geared to a propeller the thing will be less resistant to the air and more like a sailplane.

Well it is an old construction from the year of 1977. There are lots of ideas to make a set of drawings to another type, using the knowledge from metal and Monerai into some self launching. Starting with the power plant I believe. By the way I will soon send my renewal of subscription at your foreign rate.

In Sweden the home built movement is leveling at the moment in lack of inspiration from new construction sets or sets of drawings. Gliding rates in the range from 30 to over 40 would be inspiring if the cost were within limit for the average builder.
Composite construction is not safe to sunshine in the long run and usually an expensive way of doing things if made 100%. Combinations may be more cost effective. The description in the last issue from flights in the wooden glider/sailplane with a glide rate of 1 to 18 was a nice little piece.

Talking about spelling, to be safe I used the spell program but it will not be correct to your standards as it is a mix of US and GB English.

Many happy landings to all of you and I must tell you that we have a nice hot summer with 20 plus degrees centigrade.
Best regards Nils-Ake Sandberg

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Dear Ed,
Hi! Here is my subscription. I was wondering if anyone has built or is building a Marske PIONEER in Australia?

Is the web site correct in saying that you can only build from plans, not the kit? I'm not likely to be building in the next few years, anyway. ***R. Hilliard.***

From the Editor - Only one PIONEER has been built in Australia by John Lynch - RMB161, Tocumwal, N.S.W. 2714. No kits are built in Australia as far as I know at the moment.

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Dear Ed,
The recent meeting with GFA officials at Smithfield was of great interest and most informative. I had the pleasure of attending on the Saturday with my friend and neighbour John Biggs and it was good to meet a group of like-minded people keenly promoting the cause of gliding and home built sailplanes.

Of particular interest to me was the discussion on the testing of materials and the necessity of correct paperwork and good record keeping, having had some experience in the past with the manufacture and testing of aircraft quality materials.

Thus, in reference to the above, I submit a story with a moral, couched in somewhat archaic terms, perhaps to illustrate in a humorous way, the importance of such matters.

Happy building, safe flying and soft landings. ***Regards, W.Wood.***

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Dear Ed,
I want to congratulate you and your team of editorial workers on the June issue of the Newsletter. I have noticed that each issue somehow manages to be even better and even more interesting than the previous one-no mean feat. I know.

I thought your special coverage of the Golden Eagle was particularly good and well presented. The rest of the contents complemented the main feature to make it a very interesting and informative issue. Hearty congratulations to all concerned.
Yours sincerely. Allan Ash.

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Dear Ed,
I have seen your advert in TWITT Newsletter. Could you please send me $15 worth of copies. I built the only Stits Playboy SA 3B 2 seater in the 60's and I am trying to build a Dart Kitten motor glider. Mainly trouble with the drawings. I have the RF-3 Sperber Motor Glider drawings too, very similar to the RF-4 but have done nothing with them. I tried to build the Fauvel AV-60 but he used laminar airfoil and it was useless.

Have you ever heard of Resorcinol Glue failure (using DCA approved glue) I built the Playboy with it and no problems if the wood fit OK.

A Corby Starlet was chasing Kangaroos and hit a fence. The glue joints did not meet but no problem and definitely no glue on wing tip ribs. I used a steel bar to hold the leading edge on. Complete no glue so fitted a new leading edge and nailed it. Same glue, no problem. ***Yours sincerely. Alan Lewis.***

From the Editor - Alan, are you interested in selling the drawing plans for the RF-3 Sperber Motor Glider. Maybe one of our members might be interested??

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Dear Ed,
I would appreciate receiving your Newsletter please find cheque for one year subscription. I am the proud owner of a home built glider Schweitzer 2-22 VH-GNT built by club members at RAAF Richmond in 1963.
I look forward to meeting you. ***H.R.Walton.***

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Dear Ed,
I am writing to follow on from our recent phone conversation. Please find enclosed my cheque for subscription and any other information towards building a Glider/Motor Glider, preferably by kit form, which will reach me at the above address. Please also forward any information about the aircraft you mentioned during our phone call; The Wind Rose. ***Yours sincerely. John Fleming.***

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Dear Ed,
Please accept my congratulations for a great job you are doing with the Newsletter, it outstayed my expectatives.

My friend Roland Boticelli lent me an old issue of the Newsletter which I found to be very interesting and informative. Please find enclosed my application form and cheque for $ 15 bucks for one year membership.
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I believe it covers editing, printing and mailing the journal to the United Emirates.

One thing that intrigues me and I do not really understand how do you do a good Newsletter without the money and even have staff to do it.

I have been using my grey matter trying to work out the secret on how you do it. Putting figures on paper, I can only see that you have to be a genius or Jesus' cousin...! Don't tell me that you can walk on water as well...!

I think that you soon will be broke unless you're a filthy rich man, a Philanthropist, Masochist etc, etc, or you are doing the job as Editor just for the love of the cause, because the cost of the Newsletter is more than the $15 bucks charged for subscription.

By the way... my friend Roland, we call him Boticelli but his real surname is Happy Bottle... because the poor thing is a sort of Dipsomaniac addicted to the Brand of Whisky - Johnny Walker.

I would like to contribute to the Newsletter with some articles using my background as Professor in Physics and Mathematics on Kinetic Energy and Anti-Gravitational forces in Applied Sciences.

I think it will be in the interest of all your readers but I am not sure if I can be understood in depth covering new concepts on flying.

I have a new theory in which an amateur home built sailplane like the WOODSTOCK could be the ideal, because it is wood construction all around. With my new theory involving the magnetic fields of our mother earth any aircraft can remain airborne for ever using a small IONIC motor to generate enough energy to shift the magnetic field's polarity.

As you know different polarity means attraction, same polarity means repel. NEWTON or MURPHYS law... I am not sure..!

I am a Professor Lecturer here in Alabama and I have a wide range of experience around the world.

Incidentally, I had also been teaching some time ago in Australia in the Alice Springs and Northern Territory University where I had the opportunity to see for the first time a Flying Kangaroo, the same that you can see on the fin of all Qantas Aircrafts, I have not see a flying Koala Bear... yet... but I think the technology is here, and it will happen soon.

I also have a background in Meteorology and with my new theory and inventiveness we can change the weather as we like, making it more suitable for soaring with plenty of thermals around every empty paddock in Australia

My new concept on flying in square thermals will make an icon in the pattern of soaring and will add a new dimension in flying.

Please let me know if you are interested in my input to the Newsletter and I will send my very first contribution as soon as possible . Happy Soaring.
Belvedere Sample Tester.

Editor's note - We will be very interested in hearing from you and your contribution for our journal!

Dear Ed,
Please find enclosed my subscription to the Association. Would you let me know what services we have access to as members in addition to the magazine. I am particularly interested in a powered design called Radar Windex 1100 originally designed in Sweden by Harold Unden and S.O. Ridder in the mid 1980.
Perhaps you have more information on this design?
Yours faithfully. M. Williams

TECHNICALITIES

PERSPEX.

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

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

Pure polymethyl methacrylate resin is thermoplastic, colourless and little affected by prolonged outdoor exposure, even under tropical conditions. This clarity and light stability allow the production of a wide range of colours in transparent, translucent and opaque grades. Perspex has a high strength-to-weight ratio and good dimensional stability, and can be machined, heat-shaped and cemented with ease.

It is available in the forms of large flat sheets, corrugated sheets (curved and flat) and rods. This combination of properties makes 'Perspex' eminently suited to a great variety of end uses, such as aircraft canopies and windows, display an advertising signs, shop fittings, implosion guards, lightings fittings, food containers and trays, dome lights, and corrugated sheeting for roof lighting, etc.

THE STORY OF PERSPEX.

Commercial interest in polymethyl methacrylate did not arise until work in the Research Laboratories of I.C.I. culminated in the discovery of an economic process for making the monomer. This synthesis has been used throughout the world and was disclosed in a patent published in 1932.

The different steps involved in this synthesis are:

(1) Acetone is reacted with hydrogen cyanide to form acetone cyanhydrin.
(2) The acetone cyanhydrin is treated with sulphuric acid and methyl alcohol to give methyl methacrylate monomer

The process of polymerisation follows essentially the pattern of normal vinyl derivative chain growth, ie, free radicals are formed and unite with unactivated molecules to form long chains which are substantially unbranched.

To make 'Perspex' sheets the monomer is thickened by heat and poured into glass-sided moulds in which heating is continued until solid sheets are formed. The surface finish and high polish of the glass plates are reproduced on the ' Perspex' sheets and no polishing or surface finish is given to the sheets after removal from

the moulds. Coloured sheets are made in the same way as clear `Perspex' sheets with the appropriate dyes or pigments added to the monomer. ` Perspex' rods are made by machining from flat sheet.

The density of ` Perspex' is about one half that of glass. Its strength-to-weight ratio is high, and it is tough rather than brittle.

`Perspex' has a low water absorption and although it has high coefficient of thermal expansion ((about eight times that of steel) it is otherwise dimensionally stable.

It may be machined easily to close limits using standard wood or metal working equipment; after machining, clear material can easily be brought back to complete transparency, and coloured material to its high surface finish by polishing.

At room temperature ` Perspex' is rigid but as the temperature is raised, a gradual change takes place and at temperature of 120 oC and above it is soft and rubber-like. This change of state, which is reversible, is not associated with one particular temperature but occurs over a range of temperatures from about 8o to 120 oC.

In its pliable state ` Perspex' can be formed by bending or stretching under low pressure, and in principle any shape which can be imposed on a sheet of rubber can be achieved with a sheet of heated ` Perspex'. If the material is cooled with the shaping forces still applied, a rigid shape can be produced which is stable over a wide range of temperatures. At raised temperatures, however, the shape begins to demould and at 150 o C returns rapidly to its original cast state.

While this thermoplastic behaviour imposes an upper limit to the temperature at which any particular shaping can be used, it also makes it possible to re-shape when required, so leading to economies in prototype and fabrication development studies.

The fact that ` Perspex' may be shaped under low pressures has led to the development of production techniques characterised by simplicity and low capital outlay. Using such methods, it is possible to produce large single piece shapes such as have led to revolutionary developments in the fields of industrial and street lighting and in advertising, and have contributed in no small part to the evolution of modern aircraft.

Among other valuable properties of ` Perspex ' is its chemical resistance. Broadly speaking,` Perspex ' is resistant to inorganic chemicals and some organic compounds such as aliphatic hydrocarbons, hydrogenated aromatic compounds, fats, oils, etc., but it is attacked and weakened by aromatic hydrocarbons, esters, ketones, and chlorinated hydrocarbons, etc.

`Perspex' is a good electrical insulator and can be used satisfactorily at low and medium frequencies; it is non-tracking.

The burning characteristics of ` Perspex ' are comparable with those of medium density wood, it is not readily ignited, and is classified as 'slow burning'.

The surface hardness or resistance to scratching is comparable with that of aluminium, but because of the high surface polish of the material scratches are more clearly visible on clear sheet. They can, however, be readily removed by polishing, and with care should not develop during processing.
` Perspex' is non-toxic, odourless and tasteless and is suitable for use in contact with foodstuffs and beverages.`

Cleaning and maintenance of `Perspex' Acrylic Materials.

The best way to clean Perspex acrylic sheet or articles, whether clear or coloured, is by washing with soap and warm water, using a soft cloth or cotton wool. If a great deal of grease has to be removed, soda or other alkalis may be added, but they are not essential. Organic cleaning agents, such a benzene, turpentine, and paint removers must not be used, since they attack Perspex. Perspex should be given temporary protection, in the form of paper applied with a liberal dressing of soft soap, when spray painting is being carried out near it.

Materials based on phenol (Carbolic acid), cresol, iodine, etc. will stain the surface or cause it to deteriorate. If sterilising agents have to be employed, those based on sodium hypochlorite, hydrogen peroxide, or sodium perchlorate can safely be used.

Static Charge.

Because of the high volume and surface resistivities of Perspex, an electrostatic charge is built up on it when it is rubbed with a dry cloth. Treating the surface with Perspex Polish No 3 will prevent the development of static charge, and thus eliminate or reduce the collection of dust. A small quantity of the polish(Which may be thinned down with water if desired) is applied to the sheet and spread evenly, using a soft cloth. Finally the sheet is rubbed with a soft, clean cloth until a bright polish is obtained, as in furniture polishing. Harsh fabric must not be used. Alternatively Perspex sheets can be washed in a solution of about 10 % of Perspex Polish No 3 in water and then dried with a soft cloth.

This treatment eliminates the static charge and so reduces dust collection for at least two months under normally dry conditions. Frequent polishing with a dry cloth does not impair the efficacy of the treatment but washing destroys the anti-static effects, and polish must be re-applied afterwards. It is important to ensure that all surfaces of the article are treated.

WHAT'S NEW!

We have new members to welcome to the group. They are:

Robin Hilliard. 345 A Great North Rd. Abbotsford. NSW 2046.
Alan Lewis. P.O.Box 81. Paddington. NSW 2021.
Harold R Walton P.O,Box 3387. Weston. ACT.2611
Colin Collyer. 37 Cleveland Rd. Ashwood VIC. 3147.
John Fleming. 268 Bicentennial Drive. M/S 2293 Agnes Water Queensland 4677.
Michael Williams. PO Box 1078. Dalby, Queensland 4405.

Welcome aboard fellows! We look forward to a long and mutually satisfactory association.

The Australian Homebuilt Sailplane Association is now on the Internet!

By Eddy Garay (Web master)

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

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

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

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

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

The Australian Homebuilt Sailplane Association will be attending the next rally to be organised by the Vintage Glider Association to be held at Gawler, SA, from 3 to 10 January 1998. The event will be hosted by the Adelaide Soaring Club, and will celebrate twenty one year of the VGA, and 50 years of operations at Gawler by the Adelaide Soaring Club..

All AHSA members and visitors are welcomed. Catering will be provided on site, with camping facilities, and limited hangarage available.

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

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WOODSTOCK BUILDERS FORUM.

By Clint Brooks.

Well, summer is fast fading, and we will all be turning more and more to our respective workshops to progress or start on our Woodstock projects. I'm looking forward to rainy evenings piecing together the Woodstock, although I truly hope this winter is not a repeat of last years flooding....

I have some information for all you Carbon Dragon builders. I would like to strongly suggest that one of you from time to time might consider writing a column such as this one. I would think it would be of great interest to all, and very successful. For now, if you wish, I don't mind passing along information as I come across it, though I won't be going into much depth on the design itself (unless I get bit by the C.D. bug too...).

Awhile back I was soliciting builders of the Carbon Dragon for a few clues regarding details that were causing confusion among many builders, as a favor to Jim Maupin Ltd. One result was the great feedback from Jonathan Pitt which resulted in the article on the C.D. rudder horn construction. Another inquiry was to Graham Betts in Sydney, Australia, who is quite far along with his C.D. project. He kindly took the time to respond to my letter, and I gladly share it with all:

30Murray Farm Rd.
Carlingford
Sydney 2118
Australia

Dear Clint

Thank you for your letter 7/2/95. You are right about the joys of building Jim's aircraft. With reference to your inquiries regarding the building of the C.D.-following are some sketches and comments.

The horizontal tail: When gluing the cap strips to the shear web I used 5/16" staples tapped in gently with a hammer. In fact, I used this method where possible during construction. Installing the spar caps and placing the carbon was done by constructing a smaller version of the bath used in the wing spar caps: 1/4" inlet and about 1mm outlet (in bushings-CB) You can get it through the hole by wetting out the end in water. In fact, if I were to do it again I would even use this smaller bath for the wing spar caps. It would be a lot slower, but I believe you could get a better wetout. The 1/8" x 1/8" notches (in spar caps-CB) were cut on a table saw. The male & female hinges pages 6-7 molds were lined with plastic coated packaging tape, a method I used wherever I could. The rudder horn was not so difficult once I stopped trying to figure out why the jig was shaped the way it was; I just inserted it in the end of the rudder tube and placed the outside carbon on the tube. The jig just allows you to get the angle right.

Wings: gluing of the spar box sides to the 1/32 ply was done with pieces of timber clamped across the top of the boxes. The wing ribs were made up over the plans held down by 9/16" staples with gussets stapled with a 1/4" gun, then turned over the next day dry and installed the bottom gussets.

The tail boom mold was lined with 1/32" ply then covered with packing tape. You need about one sheet of ply-after you could re-use. I tried a few things, but ply was the best.

The attachment of the underside gusset on the rear of the wing not shown on the plans is the same as the gap cover but only smaller, about 2" wide. Also with the gap cover I placed a strip of fiberglass along the top of the cover. This stiffened the gap cover and stopped it buckling and fouling the flaperon travel.
There is conflict regarding pulley block sizes on page 29 and the plans. At this stage I am working on the cockpit controls and the

dacron covering. Completion is now about December. I hope I have been of some assistance.

P.S. I am happy to help anyone during construction, so feel free to refer to me at any time. Also when building the rudder and vertical tail build the vertical tail first then the rudder. Use the vertical tail as a template as it is nearly impossible to get the aero balancer to match up with the top of the vertical tail.

At the moment I am negotiating with the Gliding Federation of Australia (G.F.A.) for registration of the C.D. Initial indication last year was they were not interested and directed me to the Hang Gliding Federation (H.G.F.). The H.G.F. were interested for awhile, but just recently the G.F.A. has shown a lot of interest following a trip to England and other countries by some of their members whereby they saw the "Silence" ultralight glider flying, together with a membership drive. They are now forming an ultralight division of the G.F.A., and my glider is the first to be registered, that is if it meets their technical requirements. I shall keep you posted.

Thank you for sharing your experiences Graham, and hopefully you will keep us up to date on your progress.

While at the Western workshop, I met Bill Poole, who passed on a commentary on a question posed to Jim Maupin Ltd. regarding the carbon tow wetout tool (bath) shown on the C.D. drawing. Specifically, the question was in regard to the bushings on the tool. "On sheet 4 you're trying to figure out what the device at the bottom of the drawing is, and bushings BL-3 & BL-4 are to be 'flame smooth-see instruction manual'. It's not in the instruction manual..."

In reply: Carbon tow must be saturated with epoxy prior to placement into the structure. The device shown is a tool which will feed the dry carbon tow through a guide bushing, into a pool of catalyzed epoxy, and out to the structure through the other bushing which compresses the fiber bundle slightly and 'squeezes' out excess resin, which then flows back down into the main pool of epoxy at the bottom of the tool. This will result in a fairly uniform resin to fiber volume throughout the tow placement process, and avoid excessive weight due to too much resin. To use the tool, hold it in your hands by the handles at each end, and with the tow run anchored at the root end of the spar (after being threaded through the tool), you walk outboard slowly, allowing the carbon tow to roll off the its spool, feed through the resin bath, and be positioned into the layup by a helper following along, the two of you forming a poor mans fiber placement machine. The 13M Woodstock spar caps are built in exactly the same manner using the same tool, as I'm sure the Windrose caps are done also. Be sure to clean out the uncured resin at the end of the session with lacquer thinner or denatured alcohol.

The term 'flame smooth' refers to the process of removing scratches, small burrs and sharp edges from the machined features (countersink and hole edges) in the teflon bushing blocks utilizing a flame held lightly to the surface in such a way that the surface of the teflon melts slightly, making the tiny tooling marks disappear and the surface become glassy smooth. The bushing should be free of all imperfections that would allow the carbon tow to snag as it passes through, resulting in a fuzzed up snarl that will probably jam up the application of the tow, resulting in cutting off the tow prior to reaching the end of its path,resulting in a scrapped piece of tow. You want all the fibers in the tow bundle to be as straight and undisturbed (bent) as possible for maximum strength. A glassy smooth bushing is important in achieving this, and is quite simple to do (don't burn your fingers...).

As long as I'm on the subject of carbon tows and such, I guess there are builders who quite normally are not aware of what this material is, and some of the terminology I've used in conjunction with it.

Carbon tow is a bunch of individual continuos carbon fiber strands that are brought together in bundles consisting of 6,000 strands (6K tow), 12,000 strands (12K tow) or 24,000 strands (24K). This material is wound onto spools like string, and is totally unidirectional in fiber orientation, with all the fiber strands laying parallel to each other. This material is primarily used for filament winding and fiber placement machines, and may be had dry or pre-impregnated with whatever resin system the user of the material wishes to utilize. Tows can also be made from fiberglass, Kevlar, boron or other popular advanced composite materials. The most common tow application you may be familiar with is the "chopper gun" often used in high production fiberglass production. The chopped fiber is made from a continuos fiberglass tow fed to the head of the applicator where a reciprocating knife 'chops' it into short lengths and saturates it with resin and catalyst.

Another mysterious term I used when describing the test coupons I made for the 13M spar was that of the "caul sheet" or "cauling". My friend Guenther Scmidt looked up Websters definition and found "the membrane that surrounds a fetus..", which, if you follow what I'm about to explain, makes some sense, just in a different context.

When molding composite parts, the traditional tooling approach is to control the part surface from one side and allow the other side of the part thickness to be uncontrolled, hence the usual shiny, smooth tooled side of the part, and the rougher, less finished opposite side usually seen. A caul sheet is applied over the non-tooled surface of the composite layup (uncured), and depending on the intent of the process, will produce a much refined cosmetic appearance on the non-tooled surface, or in the case of autoclave cured parts, serves to distribute the vacuum bag pressure more uniformly into the laminate, averaging out thin and thick areas, and intensifying pressure into corner radii; in general improving the mechanical properties of the finished laminate.

Caul sheets are made of thin sheet metal, silicone rubber, fiberglass, graphite, rubber and graphite laminate, and generally form a membrane over the entire part, hence the origin of the term, I guess. I didn't make it up, it's common industry terminology. When I was making my coupons, I had constructed a simple wooden mold that controlled the cross section of the specimen on three sides, the fourth side was that of part thickness. On some of the specimens I used a caul that was a strip of wood with mold release on it held against the wet layup in an attempt to flatten the tows into a more uniform thickness and provide a surface finish similar to that of the tooled sides. This was accomplished using light 'C' clamp pressure against the caul. Anytime you want to extend or distribute clamping pressure into a joint, consider using the caul concept to distribute the force in a more uniform manner. Use stiff enough material to bridge

between clamping points and provide pressure against the workpiece.

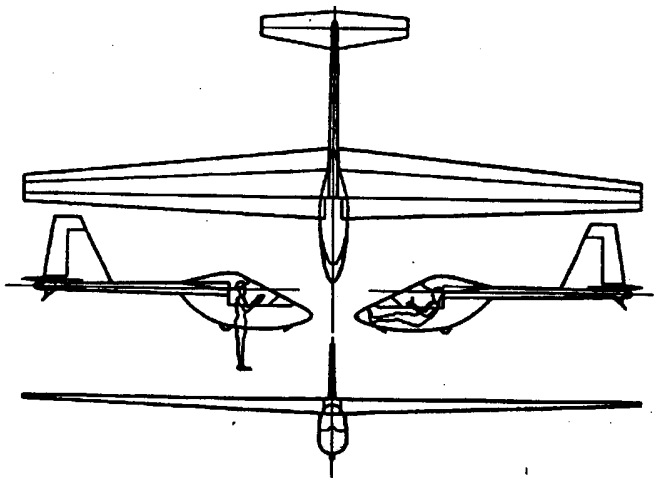
I kind of strayed from My Woodstock project this month. I'm just about ready to skin the horizontal stabilizer. The substructure of the stabilizer and elevator is complete, hinges fitted and the entire substructure faired together. It looks like an airplane finally. Next month I will dive back in with lots of detail.

I have found an excellent source for Finnish birch ply. It is from the same factory and is the same material sold as 'aircraft grade', but not marketed as 'certified', which means it has been insured for that application. So, it's the same piece of material, just sold without the certification insurance by the manufacturer (it doesn't carry an aircraft grade stamp on it). The name of the distributor is Anderson International Trading 1171 N. Tustin Ave., Anaheim, CA 92807-1736, 1-800-454-6720 or FAX (714) 666-0709.

They have all thicknesses from .4mm to 6.0 mm in 61" x 61" sheets. The prices are very competitive, and the material quality is superb, in my opinion. Check them out, and send a S.A.S.E. for their catalog (regular postage). Thanks to Peter Frith-Smith for this referral.

THE CARBON DRAGON FOOT LAUNCH SAILPLANE

By Jim Maupin.



The goal in designing and building the Carbon Dragon was to try and bring foot-launch glider performance up into the lower range of sailplane performance.

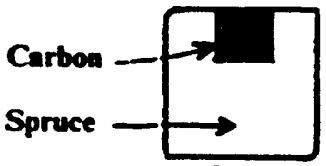
It is basically a conventional wood structure with judicious use of carbon fibre/epoxy composite in certain areas to a) save considerable weight, most specifically in the spar caps, and b) to achieve the necessary stiffness not possible with wood as necessary for the flaperons

The Carbon Dragon airfoils were developed by Irv Culver and the wing specifics are as follows:

Span 44 ft Area 150 ft2
Root Chord 50 in. Tip Chord 22 in.
Taper Ratio 2.72 to 1 Aspect Ratio 12.9
Thickness Ratios:
Root T/C=22%
19% of semispan T/C=19.3%
Tip T/C= 13.6%

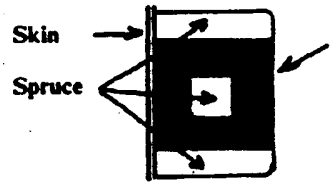
The wing utilized full span, 30% chord flaperons. As flaps, they operate from 12° down to 40° up. As ailerons they operate from 4° down to 24° up.

The flaperons are driven at the inboard end only, by push rods inside the fuselage. To be stiff enough for this arrangement they had to be made of carbon fiber.
The flaperons spar caps and ribs are made of 5/16" square spruce notched on a table saw with .01 sq. in of carbon epoxy laid in the notch.



Section View
Flaperon Spar Cap

The ribs are mounted 45o to the flaperon spar to achieve torsional stiffness. The structure will be covered with light weight Dacron at 45o.
The wing spar caps are carbon/epoxy in a box shape to prevent buckling. They have spruce core.



Section View
Wing Spar Cap

Ribs forward of the wing spar are sawn from ¼" 5-ply mahogany. Ribs between the spar are 5/15" spruce,notched for lightness.

Rib Sections

All forward of the flaperons are located on 21.3" centers.
The wing spar shear web and "D" tube closure are 1/32" birch ply.The "D" tube will probably be supported additionally with ½" foam ribs spaced between the wood ones.

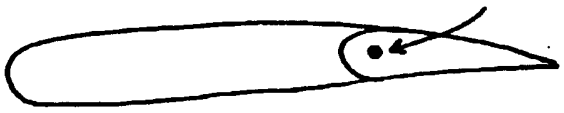
Tail boom

The tail boom is made of four carbon/epoxy longerons, ¼" ply wood rings on 17" centers, and a carbon fabric shell. It is elliptical in cross-section, 10" by 7.75" at the forward end and 5.5" by 4.5" at the tail. The outer shell was laminated in two halves within a female mold, the structure installed in one half, and the second shell half joined.

Tail Surfaces

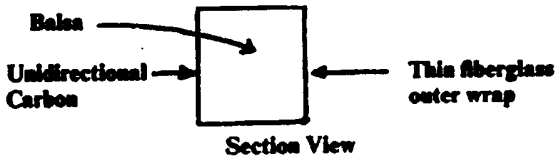
The tail spar cap are 5/16" square wood with carbon added in the high stress areas. Forward of the hinges, ribs are ¼" ply sawn. Aft

ribs are ¼" square spruce, notched for lightness again.Control hinges are molded of carbon/epoxy.



Pilot Pod

The forward fuselage will be built up by the stick and gusset approach. The sticks are to be balsa cores wrapped with carbon.



Foot Launching.

The plan is to have doors that open for foot launch. When closed, a small wheel in one door becomes the landing gear. The idea is to allow as versatile a launch range as possible. Foot, auto tow, bungee, horse, motorbike, ultralight aerotow,six Boy Scouts, etc.

Weights.

The following are educated target weights:

Horizontal tail	7.0 lbs.
Vertical tail	5.0 lbs..
Fuselage	38.0 lbs..
Wings at 30 lbs. ea.	60.0 lbs.
Empty	110.0 lbs.
Payload (Pilot)	190.0 lbs..
Gross.	300.0 lbs.

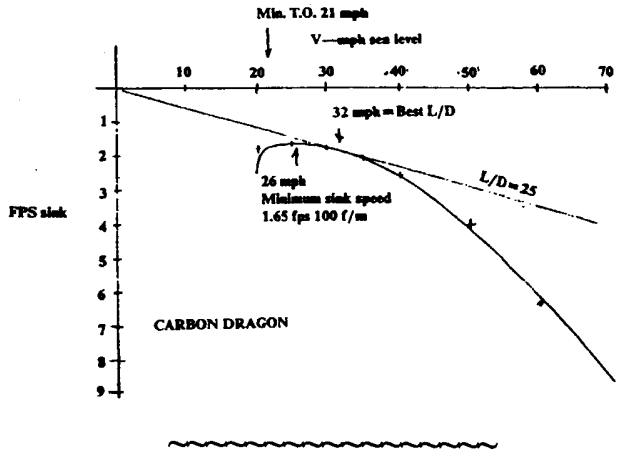
Using these weights, the aircraft is stressed for 7.5 g`s ultimate and 5.0 limit load.

Performance.

The following performance figures assume the wing is kept quite clean and smooth and the undercarriage doors and canopy fit well, at a wing loading of 2 lbs/sq.ft, gross/span=.155 lbs./sq.ft. Take off speed in 0 wind 19.7 mph (obviously there is no intention of launching into " 0 " wind) Minimum sink is 1.76 ft/sec. At 30 mph with max L/D about 25:1 at 34.6 mph. The Vne is 80 mph.

The thermalling circle at 45° bank is 35 mph and R= 82 ft.
Circling with 45° bank at 30 mph give a R=60 ft. A complete circle is expected to take 8.6 seconds.

The Carbon Dragon flew in the summer of 1986. One of the possible experiments with the Carbon Dragon will be the installation of vortex generators (full span) just forward the flaperons.
Calculations and wind tunnel data indicate they could considerably improve the low end of the envelope, with minimum or no penalty at the upper end.



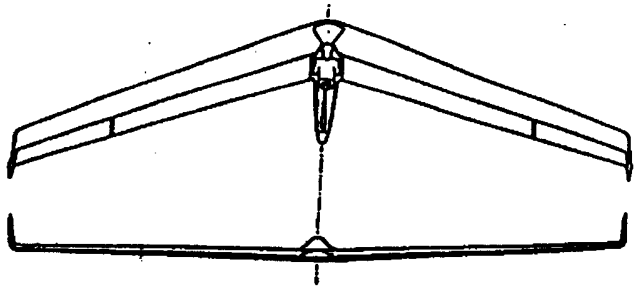
THE FLAIR 30

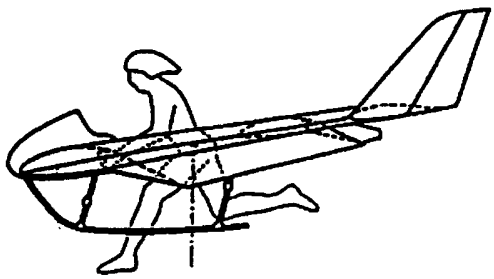
An excerpt from T.W.I.T.T. Newsletter. #128 February and #129 March 1997.

The Flair 30 of Gunther Rochelt is a foot launchable sailplane. Thus, it can be started from a ramp like any ordinary hangglider, but it has obviously much better flight performance. It is aerodynamically steerable around all three axes. This is a drawing of the Flair 30 and sketch of the pilot position during take off and flight.

THE WINGS

Span	12 m
Wing Area	11 m2
Aspect Ratio	13.1
Washout	5° linear





Empty weight	40 K Approx
Opt. Glide Ratio	30
Opt. Sink Speed	0.5 m/s Approx
Glide Ratio (braking flaps at 45°)	5
Profile	CM-140-K47 C. mo= -0.048

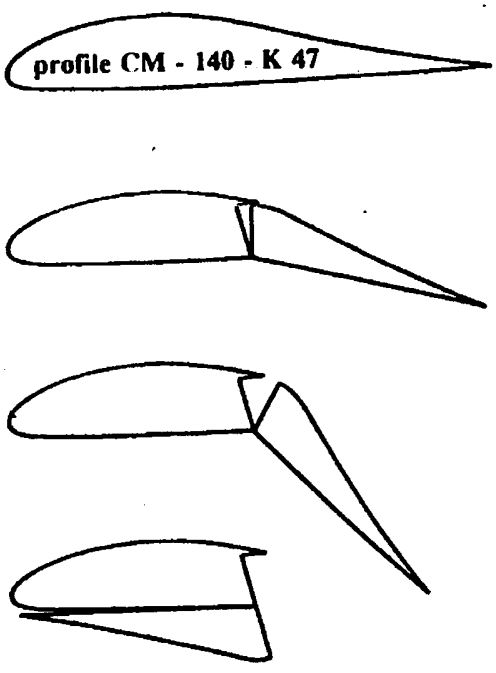
The profile has no fixed centre of pressure. Land on retractable skid (pilot in prone position). Take-off on foot, or skid with winch/engine pwr.

The following basic ideas have been used in the design of the Flair 30: on the one hand the machine is conceived for hangglider pilots, hence it has to be foot -launchable.

On the other hand it should be interesting also for sailplane pilots who want to take-off alone without ourside assistance. For these pilots the best flight performance was desirable. Hence the wing has not been built from aluminium tubes, wire, bolts and nylon(or mylar covering) as is the case with hanggliders. Rather a modern rigid sandwich configuration was used. This gives a very smooth surface and so produces an extremely low drag coefficient such as is know only with modern sailplanes.

To reduce drag further the pilot is (mostly) integrated in the wings and does not hang freely in the airflow as is the case with today's hanggliders. With this (fixed) pilot position, control by weight-shifting is not possible any more. Hence the Flair 30 has got a complete aerodynamic control system consisting of elevators, ailerons and winglet rudders. There was also an inflight picture included in the article so it has actually flown.

The Flair 30 also has pitch moment free landing flaps. At 15° deflection angle a minimum flight speed is attained. A deflection of 45° is used for the landing. They have a strong braking effect while the flight speed still remains quite low. Gunther Rochelt chose a relative chord length of more than 40% for these flaps.



Moreover, he moved the axis of rotation to the lowest point.With this trick it is possible to tilt the flaps over 180° which reduces the package measurements for easier transportation (see below).

In the last TWITT newsletter, No. 128, the tailless sailplane Flair 30 of Gunther Rochelt has been mentioned. Unfortunately, no reference was given to the source of the printed information. The drawings, technical data and the photo have been taken from the book:
Tailless Aircraft In Theory And Practice
Karl Nickel/Michael Wohlfart
Translated by Capt. Eric Brown, RN
ISBN 0 340 61402 1
Edward Arnold, London Melbourne Auckland 1994
Published in the USA by American Institute of Aeronautics, Inc.
L'Enfant Promenade SW
Washington DC 20024-2518

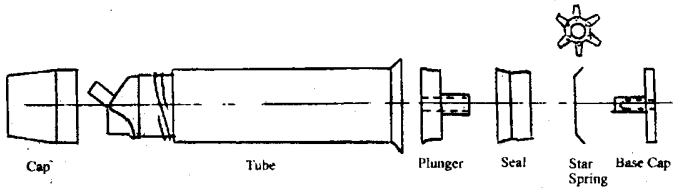
The 3-view , statistics and photo are on pages 469-472 with the photo having been taken by Ggerhard Marzinzik.
The book can be ordered at any bookstore.

From T.W.I.T.T. Editor. For those of you who do not have Karl's English version of the book, it is well worth the time and effort to obtain a copy. It is 474 pages of photos, graphs, illustrations, 3- views, specifications and text material on flying wing and tailless aircraft. It is fully indexed and contains an extensive bibliography.

HINTS & TIPS

PUMP ACTION GREASE DISPENSER

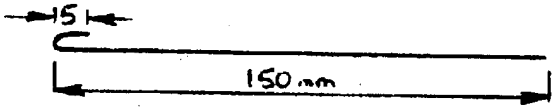
By David Delahoy.(An excerpt from the Newsletter of the Melbourne Society of Model and experimental Engineers)



At one of the club meetings last year, I heard some one suggest that they used an old pump action tooth dispenser as grease dispenser to grease those wing pins and miscellaneous where ever you need it . Not bad idea I thought, and as I had an almost empty one in use, it was a real incentive to brush those pearly whites. The following is a way of reclaiming the dispenser.

1 Take off the tooth paste label from the outside (we don't want anyone brushing their teeth with grease now do we?)

2 Bend up pieces of wire as below. Mig wire or general purpose wire is OK.



3 Screw a long 3/16" whit. Screw or bolt in the base cap. Clamp the fastener with a pair of long nose pliers and extract the base cap.

4 Now for the tricky bit! Hook the bent wires in the holes in the star spring. Let them dangle down holding the dispenser upright and clamp all the wires in a vise. Once clamped pull the dispenser up. It will take a bit of force because the star spring is supposed to be a one way acting devise, and we are going the wrong way!

5 Wash all parts clean with hot water.

6 Load with your favourite grease and assemble

7 Label what type of grease it is on the outer tube. And use.

SHOP TALK

THE PARABLE OF THE INSPECTOR.

By William Wood.

There dwelt in the land of Oz a tribe whose name was Ahsa, being famed for their skilled craftsmen who wrought many wondrous works, using fine timbers, metal and fabric. And the people marvelled to see these artisans bring forth winged chariots which bore them aloft ,yea, even unto the very Heavens.

But among them, certain wives did weep and wait, crying: why dost Thous not cutteth the grass or mendeth the roof and others did sorely lament saying: where are the shekels for the buying of Tukka? Yet other wives did exult saying: go for your life mate for we shall repair unto the Temple of Mac. And there was Harmony in their household.

And in those days elders of the great tribe of Gee-Effay did pass their wisdom, for they had flown with the eagles since ancient times and were wise in the way of rulers of the land. They did issue warnings of the powerful tribe of Casa who possessed the gift of changing names so that the multitude were sorely confused. And the elders of this tribe did send forth throughout the land many inscribed tablets saying: thou must do this but not do that the bowels of the winged charioteers were sorely loosened. And the elders of the tribe of Casa did also send forth minions to spy upon those who would dare to ride upon the wind. For these men were know as Inspectors, likewise in the far country of Usa being called eyeball engineers.

Thus it came to pass that an elder of this tribe spake unto an Inspector saying: Lo, there is in the wilderness of Oz a maker of bolts such as tribe of Ahsa would need to bind wings and others parts to their chariots. Get thee hence and inspect samples of there bolts. And take micrometer and things that thou shalt gauge them unto within the wideness of certain part of gnat. For I say unto thee, if thou shalt release them and they be found wanting I shall cause great misfortune to fall upon thee! And the Inspector who was sound bloke spake thus: Okay Chief, that which is asked for by Drawing and Specification shall be done.

And he departed and journeyed unto the maker of the bolts who spake unto him saying: Here they are, Charlie, want a sixinchrool?

But the Inspector chided him saying: Before I measure them, command your servants and your handmaidens that they may deliver unto me all paperwork thereupon. Then were carried unto him one hundred and seventy scrolls which were the Release Notes and Test Certificates for the raw materials and the MSI Certificate of the fiery furnace in which they did heat treat the bolts. And the Calibration Charts for the hardness machine in which they did test the bolts and a host of Certificates of Accuracy for the tensile and Izod machines in which they did stretch and smite the test pieces. And there were also brought unto him a dog licence, a copy of the Factories Act and various Tatts Tickets which were included amongst the papers in error.

And they delivered unto him many Certificates relating unto the Wickham Gauges used upon the bolts, there being also Certificates of Chemical Analysis and Radiological Reports and many other reports of which no one knew the meaning. And they brought a copy of the order and a set of drawings and a Pyrometer Record Chart which was fifty cubits in length.

For twelve days the Inspector looked upon these things and on the twelfth day he said they were good. Then did he measure the bolts, and all the dimensions there of were according to Hoyle. And he put them in strange positions and tested them upon a machine of Magnaflux. And he performed Rockwells upon them and cast his eyes upon them through a microscope, a horoscope, a telescope, a periscope, a stroboscope and other strange devices.

And he did project their threads upon a screen and gazed upon their form and it was fair. And he gauged the threads by the law of Go and Nogo and the law of Root Thickness. These things and many others which are in the Sacred Book did he perform with great cunning.

When all these things had come to pass it was the afternoon of the nineteenth day and he made out a release note and inscribed therein all the necessary details. And he signed it and put his stamp upon it and upon the bolts also. Then he spake unto the bolt maker saying: I do declare this batch of bolts to be pretty damn good. Dispatch them unto the tribe of Ahsa

But Lo, it came to pass that the bolts were rejected for they had been fashioned to an obsolete issue of drawing. And the grief of the Inspector was terrible to behold.

WOODSTOCK TRAILER

By Peter Raphael

Having detailed the construction of the trailer in the last issue ,I have now come to the part where we try and get the goodies into it in the easiest way possible. As far as possible my intention was to design loading gear that required a minimum of actions to use and minimum misplaceable pieces.

In order to load the fuselage on its side it was first necessary to build a cradle , the intention being to distribute its weight over a number of frames, these being stations 15.5,59 and 79. This cradle **(see Figs 1, 3)** is constructed of 2 longerons of 25 mm RHS supporting shaped crosspieces extending down the side and across the bottom and conforming to the relative curve of the fuselage frames at these points with appropriate stand off pieces back to the longerons. These were intended to establish the cradle square off the fuselage. Once this frame was built 100 mm wide FRP bands were laid up on the fuselage and the frame placed on position and glassed to these. Once cured and trimmed padding was glued to the contact faces. In order to retain the cradle in position two web straps extend around the fuselage. The main one at station 59 is fed through a ratchet enabling a reasonable tension to be generated, the other wraps around at station 15.5 through a divers weight belt clamp and helps maintain the cradle in position during maneuvering.

This cradle rests on a 4 wheeled trolley designed to run in the ribs of the trailer floor and is attached to this at Station 79 by a pair of slotted plates on the cradle. These rest on a crosstube on the trolley and close with retaining latches creating a pivot point which allows the fuselage to rock as it enters the trailer and provides for easy disengagement of both components. In practice it has not been found necessary to separate these components as the whole fuselage and attached trolley can be rolled upright by one person prior to removal from the cradle for rigging. Once rolled into the trailer the front of the cradle locates in a frame fixed to the trailer floor, this frame also serves to retain the trolley, this being achieved by a pair of trigger latches that engage over the front axle ,these can be remotely disengaged by the pull of a cord at the rear of the trailer. The rear axle is held to the floor of the trailer by a "U" shaped rod loop in the middle of the rear axle and this is picked up by a rearward facing hook bolted to the floor. The rear of the fuselage is supported in the trailer by the multifunctional tail dolly **(Fig 2)** with detachable castor and drawbar, with a forward facing protrusion on the uppermost side, this is designed to locate in a bellmouth socket welded to the roof of the trailer forward of the fin. This arrangement supports the fuselage at 3 points along its length but allows extrication at the simple pull of a cord, whereby the fuselage can be easily guided out of the trailer. Additionally the trolley carries a rearward extension providing a carriage point for the turtledeck and canopy.

Obviously the fuselage cannot jump up into that trailer so to facilitate this a long ramp lives underneath, guided into position along a pair of channels running the length of the trailer. The ramp consists of 75 mm rolled steel channel sections reinforced on the back by a 25mm steel strip on edge to reduce flexing and can be extended from the rear of the trailer and lifted onto the rear ledge. A pantograph style hinge at the front of the ramp maintains the ramps location and prevents it from hanging too low under the trailer while the rear lifts onto a ledge under the back of the trailer and is prevented from jumping off by a pin dropped through the floor inside.

Unloading of the glider simply involves withdrawal of the wings to the end of the trailer and extension of the ramp. The fin box flap is lifted and propped and after this, a pull of the cord and a tug on the elevator allows the fuselage to be guided gently out of the trailer and down the ramp. Once clear of the ramp a firm grip around the fuselage at the rear of the turtledeck allow the fuselage to be rolled upright.

The wings enter the trailer tip first, resting in 2 carpet slings supported on a 4 wheeled trolley, the small diameter wheels running in the ribs of the floor. Once this trolley arrives at the front of the trailer a steel tube fork attached to the floor locates its centre column and crosstube. The root ends of the spars rest on a padded cradle and a crosspiece with packing pieces attached to it to accommodate the differing spar thicknesses is pulled down by a highfield style lever at each end, effectively clamping the spars to the stand. The handle on this stand allows the wings to be lifted as a pair and rolled into the trailer. Once loaded this stand cannot be lifted and upon closing the door cannot move rearward to disengage itself.

Ground handling gear comprises of a tail dolly cum drawbar, a wingwalker and control locks, these I will detail in our next edition.


Fig 1

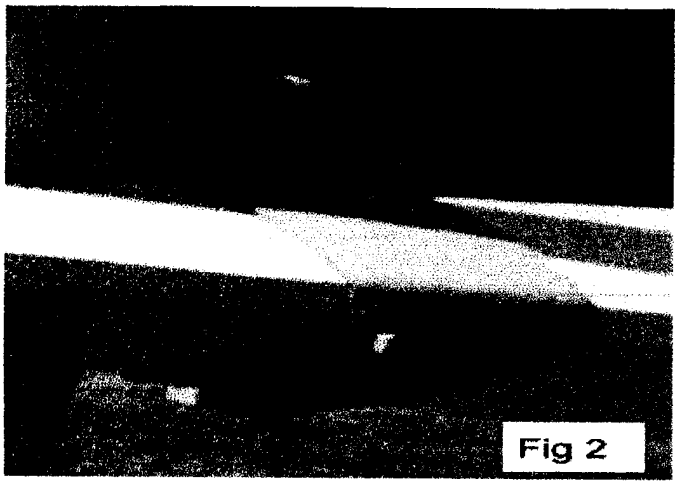


Fig 2

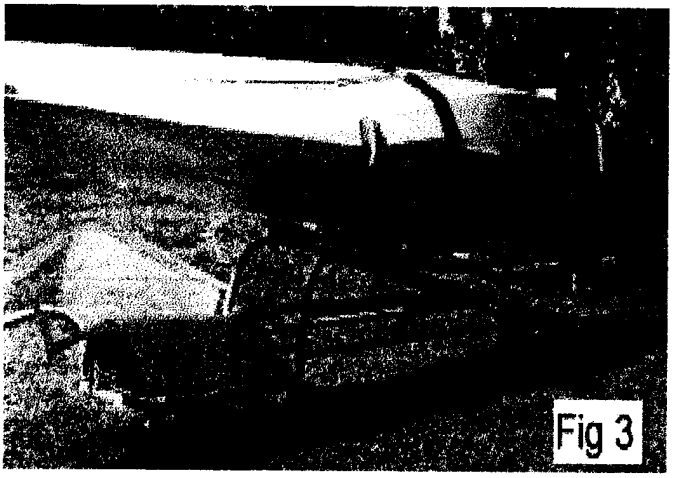


Fig 3

MEETING WITH GFA OFFICIALS REPORT.

By Peter Raphael.(**The erudite**)

On Saturday and Sunday 15/16 of May Representatives of the GFA met with a selection of AHSA members at the home of the Smithfield Soaring Group to hear about and discuss issues relevant to the home-building movement in Australia.

At around midday on Saturday John Ashford (CTO) initiated proceedings by informing members of the structure of the Federation and GFA's role and position in the determination of gliding policy. He made it clear to those present that should we, as a movement, desire to alter policy then this would need to be done via the relevant state councils, as it is these that steer the Federation, and that this in essence would require consensus of all state bodies. John touched on the delegation that GFA has been given under CAO 95.4 by CASA to operate with some autonomy and the roles of the delegates within the organisation. Brief mention was made of the new GFA Web page and the types of information and links that will eventually be available for access by members and interested parties. (The AHSA has also taken steps to create their own web page and we hope to link this to the GFA site).

After Johns introduction, Jonathan Shand (CTOA) took the floor and elaborated on areas of airworthiness and the current regulations our exemptions under CAO 95.4 and the impending new Civil Aviation Safety Regulations . John then went on to outline the proposed "experimental " category, this being basically a copy of the American system. One interesting aspect on this is a variation to allow aircraft in this category to be used for hire or reward. Under the Experimental Category it will be the builder of the aircraft who signs it out with an independent final inspection by a delegated person, after this the aircraft will be flown on restrictions until proven. GFA will still hold the delegation from CASA for the administering of these CASR's. During this discussion the question was raised regarding the ability of the constructor to perform his own maintenance. This question was unable to be answered at the time although mention was made of a "Repairman" certificate. Jonathan stated "GFA will not accept anything less than maintaining its current powers and authorities and the things that we do, we will continue to do. What we actually do and what we control will stay at least the same and probably get better". Concern was expressed at the value of this new system as we currently have a unique situation within the current system giving us the ability to construct an aircraft to an experimental design that is recognised, not as amateur built but under a full C of A without flying restrictions,

A lighter moment occurred during the proceedings when a humble and reluctant Mark Stanley was asked to speak briefly on his role in founding the Homebuilt Association and his reasons for doing this. Mark discussed the advantages and assistance he has found in bringing together people with a kindred interest and his hopes for the future growth of the movement.

Discussions then turned to the proposed certification process again , under the direction of Jonathan Shand and also its ramifications for the home-building movement. In the main it appears that these provide additional "pigeonholes" for classification of these varied activities. We currently have a developmental category within GFA which would allow us to built and fly a powered glider on 2 signatures and no drawings and this has been done, doubt was expressed as to whether we would be better off . Jonathan felt that under the experimental category "it would be at least as easy to fly, if not easier for individual one off designs" . Enthusiastic debate took place on the pros and cons of this, and our existing system. Concerns were expressed that we are relinquishing a workable system of some value for a system with doubtful benefits. Discussion then turned to anomalies in identifying and classifying aircraft types in respect of hangliders,

sailplanes, ultralights, etc. and who would be the responsible bodies for these. It was pointed out that the accepted definition for a powered sailplane is 'weight (kg) / Span (m) ^{2} < 3, and if less than 450kg can be classified as an ultralight, but conversely disallows ultralights under GFA. Desire was expressed that this information be expanded upon and published for the benefit of AHSA members. Discussions continued on aspects of design and construction including spar stressing ,structural testing control circuit stiffness and quality assurance in materials used.
Before adjourning for the day the President of the VSA, Wayne Mackley spoke briefly on the role of VSA and their desire to support the AHSA in whatever way they can .

An evening barbecue meal was provided by local club members with a number of guests who, unable to remain overnight, staying on till late. An enjoyable evening was spent in gliding conversation, discussing current and potential projects, and viewing aviation related videos.

Day two began with James thanking Mike Smith for the venue and those people made the effort to attend and support the movement. Jonathan Shand then went on to explain the steps required to commence a project and the stage inspections required . Interest was shown by those present in the use of accomplished homebuilders to support and inspect projects where no suitable RTOA exists. Certain obligations such as holding Form 2 rating would have to be met to allow this but the GFA Officials appeared supportive of moves to develop this further. Currently a builder of an aircraft is not necessarily qualified to conduct annual inspections on their aircraft. It was pointed out to us that the only people able to conduct a Form 2 Course are the CTOA and RTOA's and depends on their availability to do this, VSA are also responsible for the organisation of this course so would need to be approached in the first instance. It appears that there would be considerable advantages for AHSA to pursue this issue in order to provide qualified support to builders from within its membership as lack of support through historical sources is becoming scarce. John Ashford then elaborated on quality assurance for amateur builders and that ultimately quality cannot be inspected into a project but that it has to be built in.
Concern was expressed on the apparent lack of documentation on homebuilt designs and approved modifications held by GFA and it appears that there is a need , possibly with the help of the AHSA to correct this situation.

In summary it is apparent that GFA officials are supportive of our activities and are prepared to listen to us, and act through appropriate channels on our behalf. It is up to us to collectively decide those issues which are important to us and follow them through, some issues arising out of these discussions that we hope to follow up are to...

1/ Lobby for the continuing ability to have those currently accepted types registered under full C of A.
2/ Pursue the training of members to enable them to inspect and support projects under construction
3/ Assist the GFA in improving their documentation on amateur built aircraft.

Many other topics and experiences were shared over the weekend and everyone appeared to leave with a positive attitude and a feeling that we are on the right track. Thanks are due to the Mike Smith and The Smithfield Soaring Group along with our **illustrious** Editor, James Garay and our GFA officials for making this all happen.

A little bit of Gliding in Australia

By Allan Ash.

The Australian gliding movement developed in a manner distinctly different from the movement in other countries. The geography of our continent and its thinly-spread population, centred mainly in a few big cities, caused the gliding movement to begin simultaneously but without contact in a number of places. It was twenty years before these independent little cells came into regular and close contact with one another, but when this happened it was found that each cell had developed along very much the same lines as the others, yet rather differently from the various movements overseas. To put it very simply, isolation had two contradictory effects: it inhibited communications, with the result that Australians pioneers were in some respect behind the times; but it also forced them to be more self-reliant and more innovative, so that in other respect they tended to be in the lead.

Gliding as sport began in Germany in the 1920s and spread throughout Europe as visitors from other countries went to Germany and learned to glide. They took back to their homelands a knowledge of German methods and machines and started their own national gliding movements. Gliding in the northern an southern American continents and in Africa and Asia grew similarly from having a few people visit established clubs in Germany and other Europeans countries and from having visits to their countries by German glider pilots. So these movements had a common ancestry.

We in Australia did not have this direct contact with Germany. The nearest came to it was to read in newspapers and magazines of the progress of others. The pioneers of gliding in Australia designed and built their own gliders and taught themselves to fly almost entirely without contact with overseas development.

During the 1920s and 1930s, clubs sprang up in many places, operating gliders built from photographs or basic drawings in overseas magazines, or designed by local enthusiasts to their own original ideas. These clubs had sufficient initiative to introduce a number of design and operating ideas that did not develop overseas until much later. Here are some examples:

- Australia pioneered all-metal gliders, the first being built and flown in 1930. During the next few years, several others were built and flown.

- The lack of smooth, round hills, combined perhaps with a national air laziness, made bungy launching unpopular and car towing came into vogue very early in our history.

- The centre of gravity position for the launching hook was introduced in Australia in 1932 and was in use in several clubs by 1935.

- Without knowing it at the time, Australian clubs were in the forefront of discarding hemp rope in favor of steel cable or solid wire for launching. The change was thrust on the movement by intense abrasion of our local brand of dusty airfield.

- Between 1930 and 1935 several club did pioneer work in the use of radio in gliders.

By contrast, other aspects of gliding were late in being introduced but made rapid progress after they arrived.

- Winches for launching were not in general use until the late 1030s but it was not long before our clubs had progressed to self-mobile and cable-laying winches of considerable efficiency.

- The first aero-tow launch was carried out in Victoria in 1937. Local knowledge of the art was so limited that, when it was first attempted in New South Wales later that year, a rope 1000 feet long was used. This compares with the 150-200 feet ropes used today.

It was not until the mid 1940 that more than a dozen Australian pilots could claim experience in this form of launching, yet by 1951 we were undertaking double tows and perfecting the low-tow position for the glider.

As communications improved after World War 2 and as more Australians visited clubs abroad and a wave of British and European migrants swept into Australia in the 1950s, including many glider pilots, Australian gliding methods and equipment gradually became more like those in other countries,thought the visiting glider pilot today can still find some things that are uniquely Australian within our movement.

Gliding did not develop in isolation but as part of the growth of Australia. Its development was linked with every else that happened and in its turn was affected by the good time and the bad, the prosperity and the shortages, the employment situation, the urban development of cities and the expanding air transport industry and its associated regulation and restriction of private flying. TO BE CONTINUED.

CLASSIFIEDS

For Sale: Woodstock project at boat stage with tail feathers attached. Main spars completed. Some instruments and most timber/metal to complete the project.
Comes with log book with appropriate pieces signed out.
Selling for personal reasons, but would like to see it flying, not stagnating!

Asking price AU $ 2000 the lot. Phone/Fax Mark Stanley on (08)85413227

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

For Sale: Plans for Light weight gliders.
"The Plank" EPB-1 Flying wing L/D. 18:1 ..... A$ 200
"Monarch" Flying wing L/D. 20:1 ..... A$ 200
"Volmer Jensens" VJ-23. L/D. 9:1 ..... A$ 35
Note: Postage extra and more to overseas.
"Super Floater" Foot launched. L/D. 12:1. Ring for more information. James Jensz. R.M.B. 5100. Wangaratta. Vic 3678. Ph. (03) 5725 1519 (evenings).

VINTAGE Times

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

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Australian Homebuilt Sailplane Association

Journal published on the first month of each quarter.
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" Acrifix 192 " Acrylic cement. Peter Raphael recently had acquired the dealership for this well known stuff, if you want some for canopy repairs, give Peter a call he is selling it at AU.$ 15.00 a tube plus postage.
Peter Raphael.34 Ivan Ave. Edithvale.Vic. 3196 Ph. 97723929.

Attention "Woodstock" Builders...here is the good stuff! "Woodstock" sailplane sketchbook illustrated construction manual US $25. Also available are drawings for simple jig used to construct various components . Package deal of sketchbook and jig drawings US$85. Overseas customers add US$ 15 for airmail delivery. Send SASE for more information to:
C. Brooks. 2231 Vuelta Grande , Long Beach CA 90815 USA.

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

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

ULTRALIGHT SOARING NEWS.

The United State Ultralight Soaring Association's newsletter is now available. Their purpose is to foster a heightened consciousness about ultralight soaring to encourage an exchange of knowledge and information making possible the growth of this sector of soaring, and to serve members in their common ultralight soaring needs.
Donations are being accepted to cover the cost of sending the newsletter: suggested amount is $ 15 for one year(may be later credited towards first year's membership dues) or you can send $ 25 for your " Founding Membership"
Please make cheks payable to:
Chuck Rhodes.
130 Los Padres Drive.
Camp Pendleton, CA. 92054. U.S.A.

SYMPOSIUM

a date to remember.

Do not forget that on the 4 th of November at the Smithfield Headquarters we will have our first technical symposium with several guest speakers on topics about sailplane construction.
Camping facilities and catering will be provided to those who will attend.
Our last get together was the most pleasant for every one.
Do not miss the next. The Editor.

GOLDEN EAGLE UP DATE.

Alan Patching and Geoff Richardson have been making steady progress towards the recover of the Eagle a vintage Homebuilt.
All parts are now painted in glorious yellow and white and all that is required now is weight and balance.

Ian Patching is in the early stages of organising a dinner celebration at Bacchus Marsh on Saturday 4 October to mark the first flight which took place on 26th September 1937.

Whilst it won't be as big as the 50th celebrations a day of activities is being planned and a meal at a local reception centre will follow. Contact Ian if you are interested on(03) 94381497 or me your humble A.H.S.A Editor.

All correspondence to:
James Garay
3 Magnolia Avenue
Kings Park, Victoria, 3021 Australia.