THE AUSTRALIAN HOMEBUILT SAILPLANE

Editors: James Garay. Peter Champness

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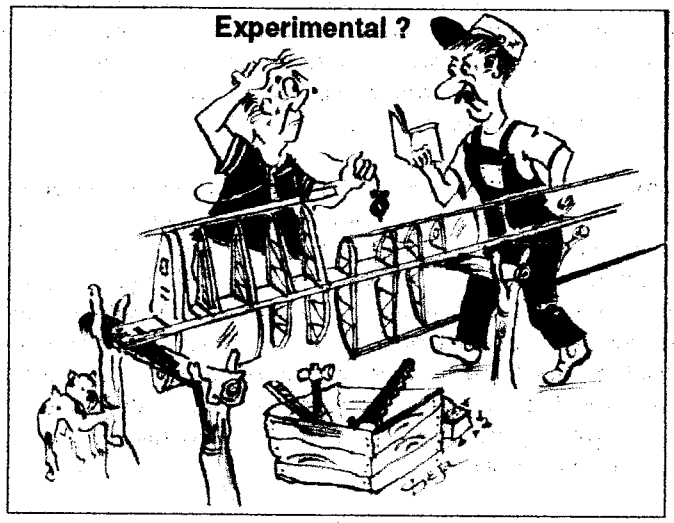
Editorial



G'day mate!

With this issue I complete my nine years as Editor of the Australian Homebuilt Sailplane. I hope you are satisfied with the content of the journal and as always, we're still counting on your support and contributions.

Peter Champness is now helping me with preparing each issue making things a little bit easier for me. I'm also getting help from Peter Raphael (The Erudite) and Malcolm Bennett (thanks fellows). We still need your support in the form of articles of interest to share the knowledge and the experience.

This is your last issue for the year 2004-2005 all subscriptions are due for renewal, you will find a subscription form on the last page.

I have been trying to diversify the content for you to read even though some don't agree, but it is very hard to satisfy every body.

Back by popular demand, we are going to have a **Symposium.** The date is 14th of May 2005 and the venue will be at the Club House - Bacchus Marsh Airfield. The topic to be discussed is **"EXPERIMENTAL".** Make sure that you book early and don't leave it for the last minute. There is accommodation facility in the Club House for your convenience. More details are inside and will be in the next Circular prior to the event.

This issue is jam packed with good news. Our cousin from U.S.A Stan Hall, is offering free of charge a computer program for estimating the weight of that sailplane that you are designing.

Peter Champness is talking about the Tasman Variometer. Gary Sunderland is on MATERIAL SPECIFICATIONS. Peter Raphael (The Erudite) is talking about the WORKING AREA IN YOUR WORK SHOP and gives us a full report on his attendance at the Vintage Regatta 2005 at Bordertown, a joint venture with Malcolm Bennett who went cross country in his Duster and Peter Champness who did 300 Km.

Enjoy the reading.

James Garay & Peter Champness.

Address all correspondence to:

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Australia

Inside This Issue

MAIL BOX

Dear James,

I was in France recently and had the pleasure of flying an odd aircraft called a" Flying Flea" that alone is worth a page or two but what I am writing about here is much more in line with sailplanes. Here goes:

This is the story of a Swiss gentleman Mr. Louis Cosandey who was a Flying Flea builder – he also built a Flying Flea sailplane and after many launches consisting of rolling downhill and sailing over the edge of cliffs, Cosandey obtained what was then licenses A,B and C

The flea glider was pushed/pulled up to 1450 metres of altitude out to a meadow suitable for a rolling start – the cliff side was vertical 600 m drop. That little glider was equipped with skis for flights in winter as well.

Flights were made in 80km/h. winds – the cliff top launches were done at speeds up to 120km/h – Ridge soaring was Cosandey's favorite mode of flight. The wings were standard HM 14.6 wings, with reflexed 23012 airfoil the fuselage was also based on the HM 14 with a few changes.
The wing spans of this aircraft is 6 metres for the front wing and 4 metres for the rear one – and yes it is possible to do distance, heights and time in such a little machine – the wings also fold to allow for trailering of the plane thus avoiding expensive hangarage fees.

Who's going to build a modern Flying Flea glider and do 5 hours non stop, 1000Km and climb it to 10,000 feet? , and prove once and for all that we don't need 17 metres wing span and $200,000 to have a good safe and cheap sailplane – that would be the ultimate in homebuilt sailplanes.

I have a lot of data on Flying Fleas so anyone wanting to have a go can contact me – my address is available from our Editor in Chief.

Keep building folks and fair weather as well as strong thermals.
Andre Maertens.

Eds Note.

Andre Maertens.
Eel Creek Rd.
Gympie. Queensland 4570.

TECHNICALITIES

FOR THE DESIGNER OF HOMEBUILT SAILPLANES

Eds Note. This is an excerpt from Sailplane Builder. Issue #3-2004. Official publication of the Sailplane Homebuilders Association a Division of the Soaring Society of America. With thanks.

A FREE COMPUTER PROGRAM FOR ESTIMATING WEIGHT By Stan Hall

Early in the design of a safe, well-performing sailplane the designer needs to have a good idea of what the sailplane is likely to weight. A sound stress analysis, an adequate static structural testing program, an accurate positioning of the vehicle's C.G and a host of other factors depend on it. The problem is, predicting weight can be an iffy and often tedious proposition, particularly if the designer hasn't well developed mathematical skills and/or doesn't have historical weight data to back him up.

In 1969 OSTIV published a remarkable paper on just that matter, written by European engineer and researches, Walter Stender. In studying this report in details it occurred to me that the job of estimating the weight could be simplified by eliminating or at least minimizing the math by recasting the fundamentals of this report in graphical form.

The result was an article, which did just that in the November 1976 issue of Soaring, which appeared in my column, HOMEBUILDER'S HALL (it also appears as a reprint in the *Collected Work of Stan Hall,* available from SHA headquarters and which many of you already have)

I never received much feedback on the article and I decided later there were two reasons outside the presumption that readers weren't really interested. The first was that my presentation was still not easy to follow by a designer who wanted to get on with his design. The second reason was, in following Stender's lead, I presented the data in metric form. Looking back, I wondered who in the U.S., besides nerdy scientists and researchers are comfortable with metrics?" It occurred to me that what we needed are data in pounds, feet, squares feet, etc. and not in kilograms, meters and kilograms/square meter.

In response to this belated idea I developed a computer program that recast Stender's data a second time, this time in both metric and English units. No graphics, no equations, just numbers in units you use every day. All you have to do is to decide which method you want to use, input the dimensions of your new design in 11 places and punch a final keystroke. By the time you get your fingers off that last key you have your answer(s). If you don't like what you see, change your design, in which case simple type in the new numbers over the old ones and try again an again until you get something you like. Actually, this is great fun.

If you take your sailplane designing seriously, I will give this program to you, ***free.*** If your computer, be it a Mac or a PC, is equipped with the Excel spreadsheet I will e-mail the program to you. A Mac floppy won't work on the PC but an e-mailed program will.

My snail mail address is: Stan Hall. 1530 Belleville Way, Sunnyvale,CA 94087. U.S.A.

My e-mail address is: shall@silcon.com. That is "silicon" with only one "i". Send me your e-mail address and I'll expedite it to you.

MATERIAL SPECIFICATIONS
By Gary Sunderland

Anyone with any interest in operating and maintaining a sailplane needs to know something about aircraft specifications for materials, parts and processes.

Aircraft materials and parts are not necessarily stronger or better performing than other machine equivalents, but they are usually much more tightly controlled to ensure that a specified minimum level of performance is achieved.

This not only embraces the initial production stage, but covers all subsequent stages of supply, storage, installation, service use and maintenance, up to an including their final removal from service.

Our maintenance system provides for any defect in a sailplane to be notified to the GFA, and such information can be investigated, and referred back to the manufacturer or other authorities. This complete procedure of "cradle to be grave" assurance is known as a system of quality control.

The system we use in gliding worldwide is far less documented than is used in the airline or the military, but has proved effective in achieving an adequate level of safety in flight.

At one time only aircraft parts met any sort of guaranteed specification. The so called "commercial" materials would fail prematurely unless a lot of excess material was built into the design.

It is obvious that quality materials and parts are vital to flight safety, given the need to reduce weight and, at the same time maintain strength and durability.

In recent times more and more industries have incorporated specifications and quality into their products, to satisfy customers demand, an some of these products have "crossed" and found direct applications in aviation: For example normal electrical and electronic components are used in light aircraft that not operate at high altitudes.

These days the situation is becoming more complex. Our glider fleet is getting older, and some agents and manufacturers have gone out of business. This means less support for our "Form 2" inspectors in the field, at the very time that parts needs to be repaired or replaced.

In addition more people who may not have a clear understanding of specifications or the need for quality in critical aircraft pats are getting involved in purchasing and using materials.

To illustrate the problem, let us consider the purchase of a piece of timber for repairing a wooden sailplane. There are many varieties, or species, of timber used in aircraft, but let's suppose we know the original is built from spruce.

The British Specification for aircraft spruce covers four grades or classes, the highest suitable for mainspars, down to timber for packing blocks. Therefore the customer must specify the timber species, the specification and the classification.

"...obtaining the correct replacement material is not a simple matter."

Where the customer is not precise as to the requirements, which in our game is nearly always, the reputable supplier would query the eventual use, and select the appropriate grade.

The very best timber selected may not even end up in an aircraft. In the British specifications the maximum grain slope permitted is 1 in 15, where straight grained spruce is a premium for the manufacture of yacht mast and rowing oars.

The British Spec. Class 1, Grade 1 spruce, as used in aero plane spars, is suitable for most-but not all sailplane applications. The important exception is the outer spar laminations of certain German and Polish sailplanes, where the designer nominates that specially selected spruce is required. This grade is a high density with a maximum grain slope of less than 1 in 20. This is equivalent to the very best spruce that our yachting friends use!

From this example you can see that obtaining the correct replacement material is not a simple matter. If the repair manual is not precise or in the absence of a manual always check with the manufacturer or the local agent.

In the situation where these no longer exist, then obtain advice from your RTO/Airworthiness and the GFA. The example given was for an old wooden glider, but the same considerations apply to any other aircraft. For example, you may need some resin for a fiberglass glider, or some rivets or bolts to repair a metal sailplane.

Obtaining replacement parts conforming to recognized aeronautical specifications such as BS, AN and the MIL. Specs is comparatively straightforward, using the established aircraft supply organizations. There are usually found near major airports.

Be aware that there is a trade in bogus parts from outside the normal suppliers. Bogus parts are defective, used, scrap or otherwise unserviceable parts which are not suitable for use in aircraft. These are usually available at a cheaper price but without documentation such as a release note or airworthiness tag. However these documents are easily copied so it pays to stay with the established supplier.

Incidentally do not place all your faith on a document like a release note. The material or part may still not be suited for your intended use. In the first example quoted you might obtain a release note for "aircraft spruce". As explained above this does not mean it is suitable for an aero plane main spar, let alone a sailplane main spar.

"Don't waste time and money, or risk safety, by installing defective or incorrect parts."

Another problem arises with the use of metric cap screws and other similar parts in German sailplanes. These seem to be identically manufactured hardware, but similar fasteners available on the local market, and presumably made somewhere in Asia, are decidedly inferior and not to be trusted. This is definitely a case where the buyer should be beware.

Civil Aviation Regulations 36 requires that any replacement part should be approved as suitable before being incorporated into an aircraft. Your local RTO/A has the necessary powers delegated to perform this function and should be consulted in advance. Don't waste time and money, or risk safety, by installing defective or incorrect parts.

On the other hand we can save money if we know what we are about. I mentioned that certain quality parts had crossed over into aviation. ***The original H301 Open Libelle wheel was a Honda motorbike hub, complete with holes for the spokes.***

Tost subsequently redesigned the wheel, but retained most of the internals, including the brake mechanism. This first Tost wheel is

used in the Libelle, the ES60b Super Arrow and the Standard Cirrus.
The Honda 1256 brake shoe, PN 45120-001-010 still available from Honda.

MATERIAL FOR GLIDER CONSTRUCTION

AIRCRAFT TIMBERS

Not all timbers are suitable for use in aircraft. A good strength to weight ratio is required and the species of tree used should grow to a good length with straight grained timber, free from faults.

TIMBER AND PLYWOOD

A large percentage of gliders still flying are constructed from wood and this material has many advantages as a structural material, being comparatively light and resilient.

Timber, unlike metals, is not isotropic (Having one or more properties that are the same in all directions) and its strength properties vary greatly depending upon the direction of loading relative to the grain.

VARIATION IN STRENGTH

Timber is a complex structural material consisting of large number of hollow fibers cemented together. The individual fibers are relatively strong in tension but depend on collective restrain against buckling for their compressive strength.

For this reason the compressive strength of timber is about half of the tensile strength and this fact governs the design of major parts such as the wing spars.

Because the individual hollow fibres are also comparatively weak in the transverse direction, the direction of orientation of the grain in a piece of timber is of vital importance.(homebuilt sailplane builder should refer to the CSIRO Forest Products Trade Circulars 26 and 48 for an explanation of these properties).

TYPES OF WOOD

Wood is divided into two types, Hardwoods in which the root food is conducted up the tree through vessels or pores, which are often clearly visible to the eye and Softwoods where the root food is conducted up the fibres in the absence of pores, which is the distinguishing feature between the two types. Unlike the term, hardwoods can be very soft, e.g. Balsa an Cork.

GROWTH

Each stage of the growth of a tree is visible by a dark ring formed during the latter part of the growing season, when the fibres have somewhat heavier walls. For timber grown in the Northern Hemisphere these rings represent yearly growth.

For any one species of timber dense wood is indicated by closeness of the growth rings. Widely spaced growth rings indicate faster grown, less dense, and consequently weaker timber.

Aircraft specifications always call up a minimum permitted number of growth rings per unit of radial width in any piece of timber. This is necessary to ensure that minimum strength properties used in design are achieved in practice.

For most timbers the growth rings should not be less than 18 in any three inches. When measured at right angles to the growth rings.

MOISTURE CONTENT

Wood is hygroscopic material continually giving off or taking in moisture in accordance with the relative humidity and temperature of the surrounding atmosphere. The strength is directly related to the moisture content, the higher the moisture content the lower the strength.

After felling the green timber is cut and then seasoned and kiln dried to a moisture content of about 15%. In service the moisture content of the wood in a typical glider will vary from almost zero in Central Australia up to 12% near the coast.

When wood loses its moisture it shrinks, and this shrinkage is greatest across the grain in the direction along the growth rings (tangentially), about half to two thirds as much across these rings (radially), and very little along the grain (longitudinally).

At high moisture content (over 35%) the compressive strength of wood is very low and this fact is used to advantage in glider construction for making difficult bonds in timber parts..(Steam is used to produce this high moisture content and also to soften the lignin).

Shrinkage and distortion in wooden gliders is often a problem, not only because the resulting "starved horse" effect destroys performance but also large internal stresses are set up and may even result in failures in the structure and loose fittings.

TIMBER DEFECTS

Aircraft specification timber should be free from rot, dote and all forms of incipient decay and or discoloration, deleterious shakes, knots, resin pockets and reaction or compression wood.

The wood is selected to ensure that:

"There shall be no grain disturbance which may constitute a weakness and the maximum inclination of the grain to length of the piece shall not exceed 1 in 15. The timber shall be free from brittleness to the satisfaction of the inspector.

Despite these through inspections some defects may still be found in aircraft specification timbers. It is not possible to inspect completely a large flitch of timber for example.

The detection of spiral grain in finished spruce is rather difficult, and if present is detected by examining the flower side or figured surface of a piece of timber. It is important to note that grain direction coincides with that of the gross stripe pattern only on quartered or near quartered faces. The most reliable check is to cut off a short piece and split it with a chisel at right angles to the growth rings. The maximum limit for spiral grain is also 1 in 15.

Dote is a disease which, when present in spruce, renders the timber very definitely useless for aircraft work. Advanced stages are easily detected as obviously decayed timber, but in the early stages it is present in the form of yellowish or brownish spots. However, small the evidence may be, the timber must be rejected because the

decay, once present, will spread.

Resin pockets are, because of their nature, a hidden defect, and if the surface indications are that 6the pockets are large the piece should be rejected. The presence of defects such as these makes it advisable to use laminated construction, since each lamination may be examined before gluing.

Although wood with small resin pockets is acceptable, wood with resin veins should always be rejected. A vein, as distinct from a pocket, runs with the grain in the form of a streak embracing one or more growth rings, can be detected by discoloration.

Brittlenness in wood may be produced by overheating in the kiln and by such defect as knots or sloping grain. Brittle wood breaks suddenly with a "carroty" fracture as distinct from the fibrous or splintering fracture of tough woods. The wood is usually low in impact strength.

If during the growth of a tree some effect, such as the prevailing wind cause the tree to lean over, then the tree grows what is termed reaction or compression wood on the low side in an effort to return to the vertical. Compression wood only occurs in the softwoods as hardwood use the opposite process of producing tension wood.

COMPRESSION SHAKES

"Shakes" are small waves or buckles in the grain of wood produced by overloading the wood in compression during the falling of the tree, or during manufacture, or as the result of overloads in service. Compression shakes will drastically reduce the strength of wood because the fibres are crushed at this point and have very little strength remaining. Shakes are often associates with stress concentrating design features, such as lap joints, and are usually very difficult to detect. *(Continue on page 12).*

WHATS NEW?

"A.H.S" SYMPOSIUM. 2005

.Again by members demand we are conducting a Symposium on the 14th May 2005.at Bacchus Marsh Airfield . Guest speakers are kindly cooperating to make it possible and the topic covered this time will be "EXPERIMENTAL".

The venue will be on the 14th May 2005. at 10.00 AM. Bacchus Marsh Airfield. Club House.

Speakers:

Norman Edmunds from the Sports Aircraft Association of Australia.

John Viney
Senior Technical Officer (Airworthiness) GFA.

Norman Edmunds is a member of the SAAA and has worked for Airservices Australia for several years. He, along with several other like-minded S.A.A.A members, has made the long awaited EXPERIMENTAL legislation usable and readily accessible.
C.A.S.A. has now appointed more than a dozen new S.A.A.A. trained "Authorised Persons" to enable they to issue Experimental Certificates.

The "Experimental" legislation offers many advantages for aircraft home builders. Compliance problems are minimized. American designed aircraft, for example, have caused problems in the past because it has not always been possible to establish that they were designed to an approved standard of airworthiness (eg JAR 22). Under the "Experimental Certificate no standard of airworthiness is specified. Modifications may be performed without needing to obtain the approval of the designer. The builder is responsible for every part of the design and the construction.

What really is "Experimental"?
"Experimental" is not a "Category", as in the commonly referred to "Experimental Category". It is simply a designation or a type of Special Certificate of Airworthiness otherwise known as "an Experimental Certificate".

When did it come in?
1998

How did it come in?
*CASA's new **CASR 1998 Part 21 Regulations** made it possible, with much input from bodies such as the Sport Aircraft Association of Australia..*

Isn't only for powered aircraft?
No! You can have an "Experimental" powered aircraft, helicopter, glider or balloon. If you can think of something else, yep, you can have that too! (Rocket ship?)

What can I build?
ANYTHING you like, OUT OF anything you like, POWERED by anything you like. Kits, plans built or own design.

Must the aircraft be registered?
Yes. Standard CASA Part 47 Aircraft Registration, done directly with CASA (No fee at present).

Is a "Final Inspection" required?
Yes

Who does the Inspection and issues the "Experimental Certificate"?
The choices are:
1.A suitable CASA employed Airworthiness Officer
2.An "Authorised Person" who is appointed by CASA to issue "Experimental Certificates".

What about Progress Inspections?
No formal progress inspections are required, but they are highly recommended. Suitable inspectors can be other experienced builders, SAAA Technical Councilors, GFA Inspectors, LAMEs etc.

Who signs that the aircraft is airworthy?
YOU the builder! The Authorised Person is signing that all conditions have been met for the issue of the "Experimental Certificate", not that the aircraft is "Airworthy".

What are the Flight Restrictions?
*The Authorised Person may impose Operating Conditions necessary to protect the public and third parties on the ground that are **not involved** in the activity. The conditions are not devised to protect the pilot.*

Where can I fly it?
Generally at any suitable airport, subject to the Operating Conditions.

Is there a Test Period?
Yes. For light powered aircraft the test period is typically 40 hours. For gliders it could be less, perhaps 10 hours or as otherwise directed by the Authorised Person. A powered sailplane may attract further hours. No passengers may be carried during the test period.

Do I need a Licence?
Yes. A GFA certificate is required to fly a glider. An experimental self launching sailplane may be flown by a pilot with either a GFA certificate or a Private Pilots Licence. An RAA (ultralight) Certificate may be used to fly a self launching sailplane under 544 kg MTOW.

What About Maintenance Requirements?
Generally you the builder may nominate your own Maintenance Schedule. You do not have to follow the GFA Form 2 route but you do have to have one.

If all this sounds a bit far fetched come to the **SYMPOSIUM** and hear Norm talk about the **"EXPERIMENTAL CERTIFICATE"**, and be convinced.
.There is an administration fee of $10.00 to be paid on the day, it is to cover the rent of the club house. Tea. Coffe & biscuits.
Guest speakers are kindly giving their time free of charge.

HINTS & TIPS

THE WORKING AREA IN YOUR WORKSHOP
From the Erudite files.

The location of your workshop where you are going to build your dream sailplane, depend upon the size of your home and the availability of the space. Frequently the garage will be used if it is big sufficient to build a half wing span. The sailplane home builder needs room for a large workbench, tool storage etc. In addition to location, other considerations should include adequate ventilation, temperature control, dampness control and lightning.

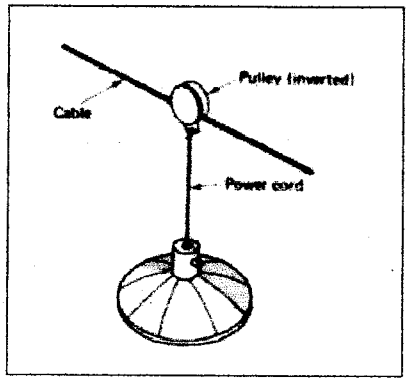
However, competition for space with the car (s) lawn mower and garden tools often significantly limit shop space in the garage.

Floor plans for your workshop should depend upon your needs, both present and future. How large and area do you need? What are your requirements? Do you need a timber storage area? Which power tools do you own and which do you plan to purchase in the near future?

When you have established your workshop and have built the work bench to build your sailplane, you are ready to locate it. Consider placing it near a window which will aid in lighting the work area during daylight. You might like to have a curtain or shade that can be drawn to block direct sunlight.

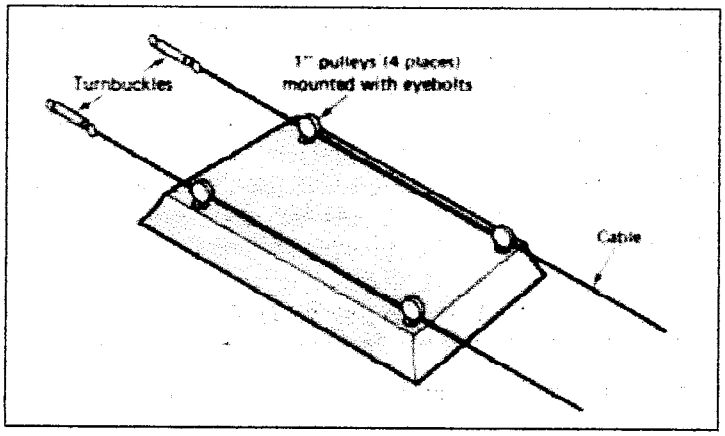
Artificial light suggestions include incandescent lights, fluorescent lights, high intensity lights and flexible arm lamps.

Incandescent lights of 100 to 150 Watts can be placed in reflector sockets. The complete unit can be hung by a half knot in the line cord to a pulley. The pulley can be attached to a cable (such as AWG no 8 or 10 aluminium TV antenna guy wire) so that it can be drawn across the work area. This enables you to place the light where you need it



If you like to vary the intensity of the light, install a dimmer switch or light dimmer control box.

Fluorescent lights my be purchased in either wall or overhead mounting fixtures. From one to four tube models are available. A fluorescent fixture may also be hung with pulleys from cables as shown below.



The pulleys are attached to the fixture with eye bolts. Turnbuckles attached to one end of each cable enable the cables to be drawn tight. This method of suspending the fixture allows the light to be moved to a convenient location over any work area along the length of the cables. Fluorescent light fixture that have light diffusers installed provide nearly shadow free light.

High intensity lamps can be mounted on the work surface or mounted to a wall behind the workbench or power tool. These lamps are recommended where high intensity light is needed over a small work area. Flexible arm lamps are fluorescent lights that may be bench or wall mounted. These lamps provide more overall surface light than the high intensity light.

ELECTRICAL POWER

You should have two or perhaps three electrical power circuit lines in your shop. One power line should be for lighting and for an accessory outlet strip across your workbench. A second line from a separate fuse or circuit breaker should connect to power outlets for all your power tools; convenience outlets should be located near your power tools. It is best if this second line comes from a circuit breaker that can be locked in the off position; this prevents children

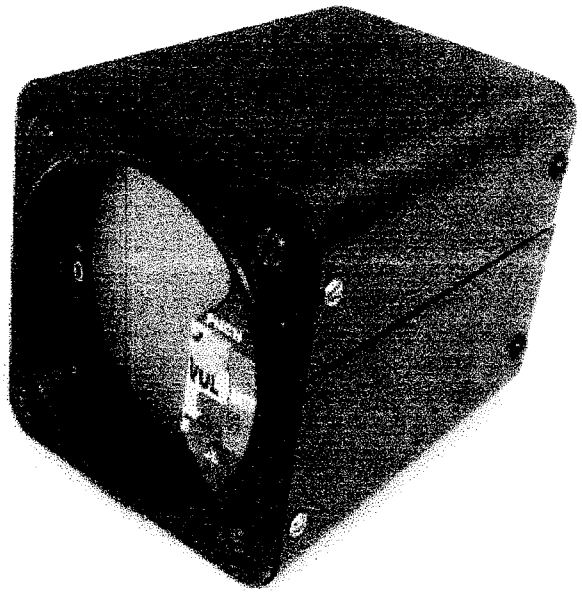
from being able to turn on any power tools.

The motors of some power tools such as bench saws are rated with higher horsepower of 1.1/2 to 2 –hp and may operate from the main 230 VAC.

SHOP TALK

The Tasman Variometer

By Peter Champness



Readers who are considering replacing or upgrading the variometer in their glider should take a look at the Tasman Variometer. One good reason is patriotism. The Tasman Vario is made here in Australia by our very own Malcolm Crampton, who is a member of the Beaufort Gliding Club. In the unlikely event that your vario ever needs repair, the manufacturer is here, right on our doorstep.

The Tasman Vario is not exactly cheap at $XXXX, but it is very reasonably priced compared with the competition. It is very easy to install in a glider and does a good job of finding the lift and guiding you into the core.

The vario has a built in audio so you don't have to look at the dial when circling. You can keep a good look out the window and check for the arrival of other sailplanes in your monster thermal. The audio tone is quite charming. In lift it gives a succession of beeps which rise in both frequency and tone as the lift increases. It sounds like a little bird tweeting. The noise is quite intuitive. That means that you don't have to think about the beeps. You just know when it is signaling increasing lift.

Sink is signaled by a steady Bong –Bong noise that reminds me of a funeral procession. If you find the sink signal depressing you can turn it off and still listen out for the lift.

The display is an LED screen that shows the essential information clearly. At the far left a coloured band indicates that lift (green) is displayed on the top half of the screen and sink (red) on the bottom half. Instantaneous rate of climb is displayed on a circular bar graph. The more little bars that are displayed the faster the climb. The figures in the middle show the average climb rate. The duration of the averaging is adjustable. I find that setting the average to 20 seconds gives useful results indicating when the climb rate is increasing or reducing. On good days I usually leave a thermal when the average climb rate falls below 4 knots. At the far right of the display are two buttons which are used for changing parameters such as the audio volume, averaging duration and full scale deflection (10 or 20 kts).

I installed a Tasman Vario in my Foka a few years ago just before the State Championships at Raywood. It didn't stop me coming last but I don't blame the vario because I did not get it installed until the first championship day. I spent the rest of the week learning how to use it. My Foka had some sort of audio vario when I bought it but it had never worked. I removed it and also the rate of climb dial and installed the Tasman in the same hole in the instrument panel.

The Tasman fits a 57mm hole. I wasn't sure how big that was but it turned out to be the size of the smaller instruments in a standard panel. The Instrument I had removed was the larger sized one (83mm). That meant I needed an adapter plate. Happily Malcolm was at Raywood that day and he had an adapter plate in the boot of his car. The adapter plate was already painted in matt black and already drilled with the mounting holes. Everything just screwed straight in. Much easier than making you own adapter, so I recommend using Malcolm's adapter if you need one

The rest of the installation is very straight forward. A power cable (supplied) plugs into the back of the vario and the other end is connected to the positive and negative power leads behind the instrument panel. If you don't have a battery in your glider you can use a nine volt radio battery, which gives hours of operation although the audio may not function for as long. I keep a nine volt dry cell battery in the glider for the odd occasion when I forget to bring the twelve volt sealed lead acid battery with me to the glider field.

The final step is to connect the tube from the total energy probe to the connector on the back of the vario. The Tasman Vario does not need a flask.

When I bought the Super Arrow I decided that it needed an audio vario also. I liked the Tasman Vario so much I bought another one!

Vintage Regatta 2005

By Peter Raphael (The Erudite)

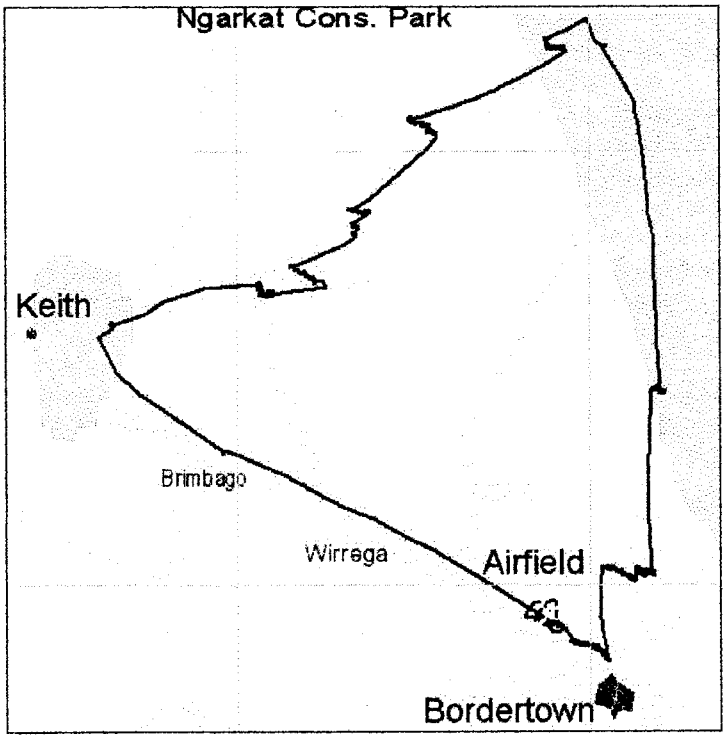
Once again the homebuilders made their presence felt at the Annual gathering of Vintage Gliders Australia. Held at the home of the Bordertown-Keith Gliding Club, this was what can only be described as a well organised and successful regatta. On arrival it was obvious that some effort had been taken to provide very pleasant surroundings with grassed lawns and camping areas around the extensive clubhouse infrastructure. When Malcolm Bennett and I arrived on Saturday Afternoon after a long drive from Melbourne via Bendigo we were greeted by a large proportion of the contingent already well established in the camping area. Peter Champness was already and there and tinkering with his R/C electric self launching glider.

Late in the evening at about midnight, we were disturbed by the whine of a turboprop in the circuit. Curiosity getting the better of us both Peter Champness and I wandered over for a look and were invited to view the cockpit of the RFDS Pilatus PC-12 that had

arrived to transfer a patient to Adelaide. After a brief but informative chat with the pilot it was back to bed.

Sunday dawned and we were able to rig the Duster and familiarise ourselves with the area. Unfortunately the lack of aero tow meant the Woody would not be able to be used this time around. The local pilots appeared concerned for the older gliders and were a little conservative with the launch speeds resulting in a lot of wing waggling from the pilots, however by the next day we were sorted out and acceptable launch heights were thereafter commonplace. Peter Champness was fortunate enough to arrange a flight in the Dimona of John Viney on Sunday afternoon and perhaps he will recount his impressions of this aircraft for us at some stage. As a bonus, Peter also took home with him the Geoff Gifford Trophy for the longest flight during the year for a vintage glider, a distance of 315 K and a task I am sure we will hear more about. A surprise visitor form our ranks was Grahame Betts who arrived in a Piper Cherokee having now obtained his PPL. He still has the Carbon Dragon but has not been flying it due to his focus on power activities. Unfortunately I didn't get a good chance to catch up further with Grahame so perhaps a return visit next year may be in order, when he can again test his navigation skills.

On Monday conditions were good and we were all able to venture further a field and although I took my launch late in the day at 4 pm I was able to manage a small triangle to the corner of the Gnarkat Conservation Park and then on towards Keith before returning and landing at 6:20



Tuesday turned out to be hot and windy and consensus was that it would be a no fly day. A number of us took the opportunity to visit the property of Emilis Prelgauskas in Monarto and where he has established a small museum and gliding operation. Much enjoyment was had watching the vintage enthusiasts poring over the collection of items salvaged from the closure of the Schneider Glider Manufacturing. It was also interesting to see the partially completed Miller Tern residing in the museum. As a homebuilt, it was a little sad to contemplate that for all the work done this aircraft would never fly

Back at camp the potential for disaster unfolded as 45 knot winds blasted the field and kept those left behind busy protecting the aircraft, fortunately with no damage to report. Tragically, it was also on this day that bushfires wrought death and destruction across the Eyre Peninsula.

Wednesday saw a continuation of the windy weather and pretty ordinary conditions and this generating a general reluctance to fly that was exacerbated by the tiresome hot day before.
Thursday was a better day although the soaring period was relatively short lived. Mal Bennett managed an interesting upwind flight where he was able to pursue a lift street upwind and afterwards dash back to the field.
Friday again was a day of rest with rain forecast and unsoarable conditions; however we were able to conduct some local flights on Saturday before derigging and preparing for the long drive home.

Saturday culminated in the magnificent closing dinner of spit roast lamb elegantly catered for by the club members, and to our surprise, among the awards distributed was the presentation of "Best Single Seater", to the Duster.

Certainly there is one aspect of these regattas that will never be available to the owners of fibreglass gliders in Australia and that is the spectacle of colour and diversity of form that this eclectic gathering of aircraft represent. The camaraderie and genuine joy of meeting again each year make this a truly worthwhile event on the soaring calendar. See you there next year!

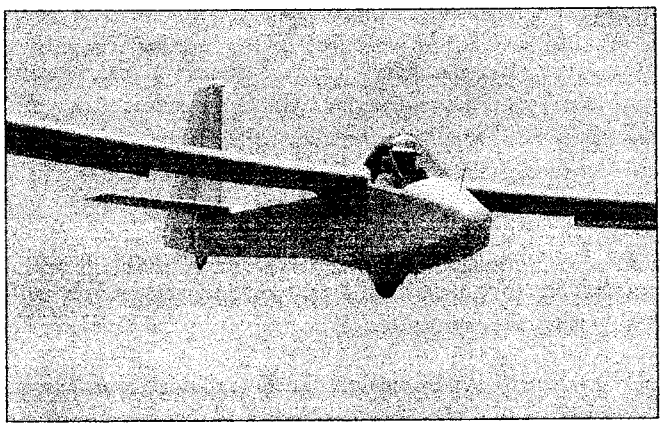
FROM THE CHEAP TOOL JUNKEY
By Peter Champness

Those sailplane home builders who are tempted to make their own "Trailer coupling guide" may find that a broken camera tripod can provide suitable telescopic tubing.

Powerful magnets suitable for this project can be obtained from old loud speakers. Old television sets are a great source for those speakers and are frequently seen on nature strips awaiting for the rubbish collection day.

Dusters Do Leave Spots (and go cross country)
By Malcolm Bennett

Two very nice flights on the 30-31 October 2004, left this pilot quite pleased with the two days flying.



Malcolm Bennett in his Duster.

Saturday with Peter Raphael in his Woodstock I flew Raywood – Pyramid Hill and return approximately 115 km in two and a half hours into a 10 knot headwind.

On Sunday, after bombing out on the first launch I again towed off and found a good climb to 8000 ft and headed toward Elmore locating exciting lift up to eight knots in the best cores, along the edge of the Kamanooka forest, where the cloud bases were good for 10,000 ft. After this I settled down to leave a thermal when the climb rate started to drop and cruise at 65-70 knots, taking three climbs. Sometimes I only made three or four circles if the lift was not better than 3 to 4 knots.

I turned Elmore at 9000 ft and flew up the road to Rochester, using two more thermals. Up to this stage the wind had been three quarters tail and cross wind as it was coming from the North West at about 10 kts at our altitude.

Rochester to Mitiamo was into wind but I managed to fly along some good lift streets showing ½ to 1½ knots on the vario when cruising at 65-70 knots. You had to weave your way up the street looking for the best area of lift such that as the vario dropped off you turned slightly the other way and the lift came up again. Height varied between 6 and 10,000 using 3 thermals.

Mitiamo to within 5 km of Bridgewater was crosswind where I found you hit lift but only 1½ to 2 knots and it took a lot of searching around to find the core. But when you did find the core the lift was terrific and you could see the altimeter needle winding around the face. Very satisfying and a great feeling being thrust up into the air by one elbow.

I had too much height and arrived back at Raywood at about 4500 ft. The flight ended 2 hours and 8 minutes after take off. Just over 150 km.

So wood is good and Homebuilts are even better!

HUMOUR HEALS

Norman Cousins was diagnosed with a terminal illness. The doctors told him that they could no longer help him and that he would soon die. So he checked into a hotel room and hired all the funny movies he could get and watched and watched them over and over, laughing as hard and loud as he could.
After six months of this self inflicted laughter therapy, the doctors were amazed to find that his illness had been completely cured-the cancer gone!. This amazing result led to the publishing of the book " Anatomy of an Illness" by Norman Cousins and the start of massive research into the function of endorphins.
Endorphin is a chemical substance that is released from the brain when you laugh. It has a similar chemical composition to morphine and heroin and has a tranquillising effect in the body while building the immune system. This explains why happy people rarely get sick and miserable and complaining people always seem to be ill.

Laughter and crying are closely linked from a psychological and physiological standpoint.

Think of the last time someone told you a joke that made you buckle up with laughter where you couldn't control your laughing. How did you feel after?. You felt a tingling sensation all over, right?. Your brain released endorphins into your blood system that gave you what was once described as a "natural high!!" In effect, you were "stoned". Those who have trouble with laughing at life often turn to drugs and alcohol to achieve that same feeling. Alcohol loosens inhibitions and lets people laugh and release endorphins which is why most6 well-adjusted people laugh more when they drink alcohol and unhappy people become even more miserable or even violent.

At the end of a big laughing session, you will often cry. "I just laughed until I cried !" tears have encaphilins which is another of the body's natural tranquillisers to relieve pain.

We cry when we experience a painful event and endorphins andencaphlins aid in self-anesthesis. The basis of many jokes is that something disastrous or painful happens to a person. But because we know that it is not a real event happening, we laugh and release endorphins for self-anethesis. If it was a real event, it is likely that we'd go immediately into crying mode and the body would also release encaphlins. This is why crying is often the extension of a laughing bout and why in a serious emotional crisis, such as death, where many people cry, a person who cannot mentally accept the death may begin laughing. When the reality hits, the laughter turns to crying.

The bottom line?-laughter anesthetizes the body, builds the immune system, defends against illness and disease, teaches better and extend life. **Humour heals**.

SMILE ☺

Grandpa had just told them the news- he was getting engaged to a twenty five years old nymphomaniac. The family was very concerned. His eldest daughter spoke confidentially to him.
"Dad, we're most concerned that s.x with a girl like that could prove fatal."
" So what?" said grandpa. **"If she dies, she dies."**

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Mary Maloney was a healthy, vigorous, octogenarian. She was being interviewed about her secret for such a long and happy life.
" I have seven gentlemen a day" she said. " I get out of bed with Will Power, then I go to my John. I follow this up with breakfast with Uncle Toby then I have Billy T. The rest of the day is spent with Arthur Ritis, then I have a bit of Al Zymer. Then I go to bed with Johnny Walker."

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A pompous Englishman arrived to pick up his Australian visitor in a Rolls Royce. The Australian sat next to him in the front seat.
"I suppose, being a Colonial, you've never ridden in a Rolls Royce?" said the puffed up Pom.
"Sure I have", replied the Aussie," but never in the front!"

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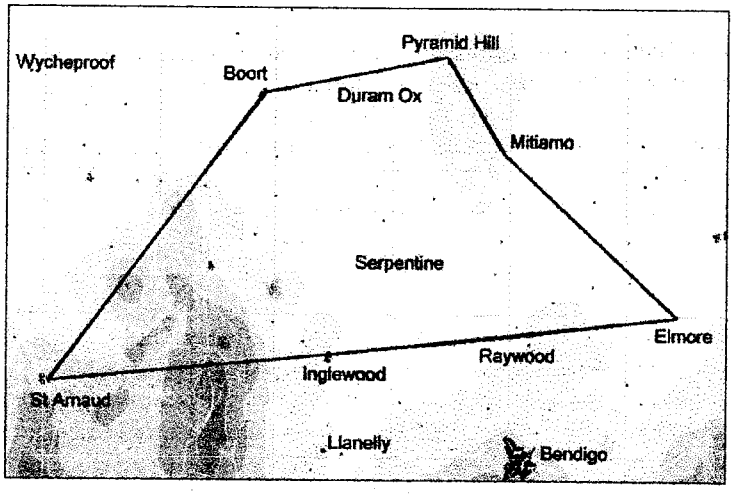
THE FUN STARTS WHEN YOU FLY CROSS COUNTRY.
By Peter Champness.

The Bendigo Gliding Club held a Cross Country Coaching Week, 30 October – 2 November 2004 (Melbourne Cup Weekend) I think the idea was to generate some enthusiasm for cross country flying this season and some funds for the Bendigo Gliding club at the same time. I couldn't take the long weekend but went along for a short (two day weekend) with my Foka 5 GZD.
The club plan was to set a cross country task each day with talks or lectures by experienced cross country pilots each evening. Apart from the members of the Bendigo Club, whose members include some very accomplished cross country pilots we had the Australian

team members; Terry Cubley and Peter Buskens, recently returned from the world championships in Finland. Terry Bellair had agreed to talk about some of his recent flights on shear wave over Western Victoria (see Soaring -----).

The drive to the Bendigo Club Airfield at Raywood takes me about 2 ¾ hours towing the glider and I had hoped to leave by about 9am so as to arrive before lunch but, as usual, the packing up took much longer than planned and I eventually left home about 10:30 am, arriving about 1pm. Malcolm Bennett and Peter Raphael helped me to rig the glider and after a bit of a rush I was ready to launch at about 3pm.

I was not well prepared and had lost my map of the area. None the less I decided on a limited cross country flight. I was told that Pyramid Hill was due north about 70 km ("just follow the road"). I had found a good climb to 7000 ft just after releasing from the aerotow so I set off Northward into a 15 kt headwind, following the road. The sky was blue with no clouds but I had several more climbs to 7000 ft and after about an hour I was passing a mid sized town with wheat silos about 10 km to my right. I didn't know the name of the town but it didn't matter at the time because I had been told that Pyramid Hill was situated at the left hand side of a large square of scrub and I could see the scrub up ahead.



By the time I reached the scrub the situation had changed somewhat. I was down to three thousand feet, having not found as thermal for over fifteen minutes. Within the scrub were some outcrops of rock. I decided to detour over the outcrops in the hope of better air and I did find a thermal but it was broken up and difficult to find a good climb. I got to four thousand and decided to press on looking for something better. The square of scrub was about twenty kilometers long. I found another scrappy thermal, topping up again to four and a half thousand and began to look about for Pyramid Hill. I spotted a small group of hills away to the right but they were not quite in the right position and I had expected to see a conical hill. I presumed that Pyramid Hill had been named for its local landmark. After a bit more searching about I found the pyramid shaped hill which was in the expected position and was a nice steep conical shape, all on its own. A small town was located nearby about three kilometers to the north west.

I headed directly for the pyramid hill which was within gliding distance and arrived over the hill below two thousand feet (QNH), which was quite a bit less over the terrain and not very far above the top of the hill. I was a bit desperate by now but the Pyramid Hill airstrip was quite close so I had an aerotow opportunity nearby if needed. I found a thermal over the hill which took me to five thousand feet and headed off for the wheat silo which was north of the town about five kilometers distant. I like to make a nice turn over a turn point if possible. This short leg cost me a lot of height when I encountered unexpected sink. I made my turn at about three thousand feet. I did not have Pyramid Hill on my Garmin GPS so I pressed the button as I passed over the silo to record the spot for future reference. I then headed back to the pyramid hill, hoping to find the thermal again. It was downwind this time so the distance was covered quite quickly. This time I was rewarded with a really good thermal with 8 knots of climb to seven and a half thousand feet.

As is so often the case when you are on top, the ball bounces your way. I flew home to Raywood with the wind at my back picking up several good thermals on the way, arriving overhead the airfield at five thousand feet. This seemed too good to waste so I took a detour further south over the Whipstick National Park (scrubland) before returning to the airfield to land just in time for dinner which was well underway when I landed. In fact I was lucky to get a feed before the locusts returned for second helpings.

After dinner we had some talks in the hangar. Terry Cubley and Peter Buskens gave a talk about their recent experience as part of the Australian Team to the 2004 World Championships in Finland. I had heard this before but it was still interesting the second time. Gliding in a cold climate is a bit different from the conditions we are used to in Central Victoria. Apart from the weather (we wouldn't even push the gliders out, let alone try to fly three hundred kilometers, which is what they did every day), but the terrain was all forested plateau with valleys between. The valleys contained small fields, almost all with a steep slope, which the team claimed were landable, but the photographs were not encouraging. The computer generated track plots, on the CU (see you) software, were most fascinating. The little glider icons were spinning like helicopters as they made their climbs. The maps were a nightmare patchwork of controlled airspace and military restricted areas. They made it home but not without a few scrapes and one glider written off.

The talk I really wanted to hear was by Terry Bellair. Terry has invested his retirement funds in a motorized self launching glider and has his own business with a degree of flexibility which allows him to make the most of the good soaring days. He has made many long distance cross country flights from Raywood (mostly on his own and flown on week days) and has recently been finding, previously rarely encountered, lift in shear waves in the mid flight levels.

Terry was not due to give his talk until the next evening. This was a disappointment because I was going home the next afternoon. However with a bit of encouragement he agreed to give a potted version of his talk to me and a few others. He had some good photos which he takes from the cockpit on his digital camera, which he showed us on his laptop computer. This was pretty good stuff. What seemed clear was that lift may be found on the upwind side of clouds. This lift is more likely to occur if the upper level winds blow at right angles to the ground level wind. This situation tends to organize the thermals in the lower levels into streets and the upper level wind forms a wave system over the top. According to Terry this situation occurs more often than we have previously realized. The presence of upper level waves may be suspected initially from the weather report (showing upper level winds blowing at a marked angle to the surface wind) and is indicted by the shape of thermal clouds which resemble the shape of rolling coastal hills. In some cases lenticular clouds form over the top of

the cumulus.

The next day we had a briefing on the expected weather by Terry Bellair. Surface winds were forecast at 10-15 kts from the NW with SW winds above eight thousand feet of similar strength. Thermals were predicted to eight thousand feet and Terry cautiously predicted the possibility of clouds with the inversion breaking about 1pm.

A task was set for the day which was a sort of polygon comprising with the major axis orientated East-West: Raywood, Llanelly, St Arnaud airfield, Mitiamo, Elmore and back to Raywood. A circle of 20 km was defined around each turn point. Pilots could elect to turn at any point in the circle thereby shortening or extending the course depending on the conditions and one's individual progress. I didn't take much notice of the task because I had to go home in the late afternoon and did not expect to fly cross country. I also neglected to enter the turn points into my GPS.

We sat around as the morning passed by and the temperature gradually increased. No one went for a test flight and we were all surprised when cumulus clouds suddenly appeared all over the sky at about 12:30. This prompted a sudden rush for the flight line with the first launches occurring about 1pm. The launching point was a dangerous place to be for a while with pilots towing out and jockeying for position and there was at least one minor collision. I was happy to hang back as I was planning local flying. I lined up in front of the Beaufort Club Super Arrow. The club member was being coached by the CFI to attempt his Silver C fifty kilometer flight.

I launched at about 2pm and was towed into a good thermal with increased in strength as I got higher until I had seven to eight kts up. At about three thousand feet I looked down. The Super Arrow was launched below me but he did not get settled in the thermal and I was clearly pulling away. I heard later he tried moving north looking for a better thermal and out landed about 15 km away which was a bit of a disappointment given the potential of the day. I took the first thermal to nine thousand feet, just below cloud base and decided to proceed to the West toward St Arnaud.

After the first very good thermal I changed my mind about local flying. Really good cross country days don't occur that often and shouldn't be wasted. If I out landed I was going to be very late home but the retrieve crew would help me box up the glider which I was going to do any way so that would save some time. I thought about my potential task. I didn't have Llanelly on my GPS and had not been there before so I decided to try for St Arnaud which I did have co-ordinates for and assess the options after that.

In front of me the sky had a good coverage of cumulus clouds with bases at nine thousand feet. There were no streets but the clouds were not especially far apart and I cloud choose to divert slightly left or right of track to fly under the better looking clouds in my path. Most of the clouds had some lift under them with occasional strong cores. I did not turn in the lift because I was still very high but I slowed down whenever the vario showed an up indication so as to "dwell in the lift as long as possible". I made about 30 km into the wind in this way without making a turn and was approaching the first forested area in my path. The township of Wedderburn lies within this forest. I had an out landing near Wedderburn on the slope of Mt Koorong two years ago and spent about 6 hours wandering from one empty farm house to another before I was finally rescued by a farmer spot lighting for foxes well after dark. This caused a bit of drama because the SAR plan had been instituted at sundown and the police notified of my absence.

I passed Wedderburn and found a good core under a cloud in which I recovered my height. Beyond Wedderburn the country is cleared farm land with another forest about 30 km beyond. I began to look around for St Arnaud. I couldn't see it but the GPS said I was on track and still had some distance to go. Soon after I saw a glider circling, ahead and somewhat below me. This was quite exciting because all the fiberglass gliders had departed before me. Disregarding the fact that they had been via Llanelly it meant I had been flying as fast as the others and had maybe even caught up a bit. I put the nose down and sped over to his thermal joining a few hundred feet above him. I recognized David Wilson flying the other glider. The thermal was not such a good one, I was only managing about four knots compared with seven to eight knots in other thermals. We each did about six or seven turns and the left. I didn't see him again after that.

Soon after this I started to see a moderate sized town beyond the forest in the distant haze. This turned out to be St Arnaud. The Airfield was about five to eight kilometers further on to the West of the town. The turn always seems to take ages since to keep the turn point in sight beyond the wing tip even during a steep turn requires one to fly somewhat beyond the turn point, particularly at high altitude. It takes even longer into the wind.

After turning at the St Arnaud airfield I made a course to the North East across wind. I was planning to fly to Mitiamo but I had a problem here because I wasn't sure where Mitiamo was and I did not have it logged into my GPS. The road sign on the Raywood turnoff at Eaglehawk says Pyramid Hill/Mitiamo. This lead me to think that Mitiamo should be North of Pyramid Hill on the same road. To make matters worse I thought it best to turn the GPS off since I had not been able to charge the batteries over night and I had flown about five hours since yesterday which meant that the batteries must be pretty low. I thought I might need it later to find the way home.

As I made my way North East I noticed an interesting cloud not far off track. It was quite a big cumulus with a cloud base at nine and a half thousand feet but it had a smoothly sloping face on the westerly side with some wisps of a lenticular cloud forming over the top. This seemed very likely to indicate a shear wave, just like Terry Bellair had talked about. I considered trying to contact the wave but decided not to waste time because it was now after 4pm and I was at my furthest distance from Raywood.

After about forty minutes on the North East course I came to a town with two lakes. This looked like a very nice spot. I flew over the centre of the town, which I later looked up on the map and discovered it was the famous township of Boort. I then began to wonder about the location of Mitiamo. From Boort I could see Pyramid Hill. I could not see any town North of Pyramid Hill and I could see almost to the Murray River. After flying on for another ten minutes I decided to turn at Pyramid Hill instead and changed course to the East.
Boort to Pyramid Hill did not take long with the wind behind me now. I had another good climb at PH to about nine and a half thousand feet and turned south toward Raywood. I thought about the options. It was down wind to Raywood and it looked as though I would easily get there with a lot of height to spare. I decided to take a detour toward Elmore to use up the excess height. The clouds were starting to disappear from the sky by now.

There was one good cloud on the way but it began to dissolve as I approached. I passed south of the town with the Silo which I had seen on the first day, the town south of the large square of scrub which marks Pyramid Hill. Could this be the missing Mitiamo? I checked the map later and found that it was.

I kept an eye on the distance to Raywood during this leg. . I had the height for a diversion back to Raywood if no further lift was found. It would be a pity to land out after such a good flight. I decided to avail myself of the discretionary turn point arrangements and try to turn within 20 km of Elmore so as to claim Elmore as a turn point. I switched my GPS back on and found I had about 30 km to go. In the end I flew to 9.5 km from Elmore on the GPS before turning back toward Raywood. As luck would have it I found buoyant air and lots of lift on the final leg arriving back over the airfield with three thousand feet to spare. A beat up would have been nice but the old Foka is supposed to have glue problems so it is best not to over stress the wings. I made a pass over the airfield then pulled the airbrakes, set up a fairly high circuit and landed about 6:45 pm, flying time 4 hrs and 19 minutes.

I packed the glider into the trailer as quickly as possible after landing assisted by Mal Bennett. The drive back to Melbourne was uneventful and the glider trailer was deposited in the back garden. The next day I had to go to work but when I got home I sat down with a map to check my flight. I thought I might have made about 250 km and was thrilled to find that the distance between my established turn points was 315 km. I entered it in my log book as my second 300km flight in the Foka 5.

Within a few days the Vintage Glider News Letter arrived and I read the article by Lee Bunting about his epic Flight in his Grunau 2B. I also read Ian Patching's note about the Geoff Gifford Trophy for notable cross country flights and decided to include a claim with my membership renewal. I was thrilled to win the trophy but felt that Lee's flight might have been a better one. Ian probably gave me the wrong handicap on the Foka 5. I hope you will forgive me Lee, however if I don't give it back now.

OBITUARY

On behalf of the Australian Homebuilt Sailplane members, I offered our condolences to Martin Simons and family on the passing of : **Jean Marjorie Simons** on 6th January 2005. Aged 77 years. Jane provided a wonderful support to her husband Martin, and particular for his passion for gliding. We all benefited from his passion as a result of many articles Martin wrote for the Australian Homebuilt Sailplane and other magazines on the history of gliding over many years and subsequently from the magnificent books on gliding he has published in more recent years.

Beloved wife of Martin and much loved mother of Pat and Margaret. Devoted grandma of Karen, Helen, Clare and Lachlan. Sister of Bery

AIRCRAFT TIMBERS

SPRUCE

Spruce is a light reddish brown coloured wood grown in Canada and Northern U.S.A. Most Australian and British Gliders were built from Spruce which is particularly easy to work.

Sub species are Red Spruce and Sitka Spruce Sitka Spruce is superior and his generally specified for spars. (e.g. Kookaburra, Arrow,Skylark etc)

KIEFER

"Kieferholz" is literally German for pine wood, also known as Baltic Pine, Polish Pine or Red Deal. Slightly more yellow in colour than Spruce, it is also more fibrous, the fracture is being less "short grained."

First grade Kiefer is slightly stronger and heavier than Spruce and repair to Polish and German gliders should only be made with the correct material.

DOUGLAS FIR

Douglas Fir or Oregon, is also heavier and stronger than Spruce. The growth rings are very pronounced and the timber is prone to split. It has been used as substitute for Kiefer.

BIRCH

Birch is a very strong had wood prone to defects. Veneers are sliced and glued to make TBU-7, having seven veneers per millimeter and TBU-11 having eleven veneers.(TBU-7 is used in the spars of the Boomerang, and Scheibe SG-27).

KLINKI

Klinki pine is grown in New Guinea. It is light in colour and selected grades are as strong as spruce. It has a very "green stick" fracture and is difficult to cut cleanly with an edged tool, the wood tearing. It is generally used only in plywood and for laminating.

BALSA

Balsa is a very light wood used as core material in sandwich constructions, particularly in glass fibre glider structures.

IMPROVED WOOD

Various grades of improved wood, or "Pregwood" are made from spruce and birch. Which is made by assembling resin treated veneers under pressures greater than normally required for a good adhesive joint. The pressure being accompanied by heating. The resulting, product is quite hard with a specific gravity of 1 to 2 compared with 0,3 to 0,5 for normal wood. The strength is entirely dependent upon the amount of impregnation and compression. The material has definite fatigue strength which is much lower than that for untreated timber of the same variety. Care must be taken to ensure a roughened for gluing processes an only resorcinol glue should be used to obtain sufficient penetration.

PLYWOODS.

"Three ply" is constructed of three veneers of wood glued together with a thermosetting synthetic type resin while under pressure. The grain of the outer veneers runs parallel with the length of the sheet, while the grain of the middle veneer (or core) runs at right angles to that of the outer veneers, or across the sheet. This does not apply to "diagonal ply" where the grain directions are at 45 degrees to the length of the sheet.
When more that three veneers are used, the material is termed "multiply", or "five ply", or "seven ply" as the case may be.

CLASSIFIEDS

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Editor: Geoff Hearn, 50 Jeanette Street. Bayswater. Vic 3153.Phone 03 9729 3889.
Membership AU$ 15
Museum Postal Address: 2 Bicton Street. Mount Waverley, Victoria 3140 Australia. Phone: (03) 9802 1098.

VINTAGE TIMES
Newsletter of the Vintage Glider of Australia. Editor David & Jenne Goldsmith. Phone (03) 5428 3558 Australia. Annual Subscription: AU $ 15

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TOPIC: EXPERIMENTAL
Guest speakers:
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John Viney. " G.F.A". Senior Technical Officer. (Airworthiness).
When: SATURDAY 14 MAY-2005. (10.00 A.M).sharp.
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If you are interested, please book earlier.
James Garay. PH. (03) 9367-3694.

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