THE AUSTRALIAN HOMEBUILT SAILPLANE

Editor: James Garay

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Editorial

The Erudite's latest drum sander!

G'day mate!

With issue 32 I sent a notice saying that this is your last issue of your annual subscription. Renewal is now due. If you are reading this journal with the remark ***"Complimentary Copy"*** it means that you have not renewed your subscription. Our group relies on your support as subscriber and it is very hard for me to ask you to continue doing it. You will find the renewal form at the back of this issue.

For more than eight year we have been associated with a gentleman from USA, his name is ***Leo Opdyke***, he is the publisher of "WW1 AERO" and "SKYWAYS" two fine magazines devoted to those Magnificent Flying Machines of (1900-1919 and 1920-1940). These publications are one of the best must haves for those interested in the earlier aircraft era.

Leo Opdyke, just turned 75 years old and he's still young at heart, and life is easier with the support of his family. We sent Leo a birthday card in May...but once again, from all members of the **" THE AUSTRALIAN HOMEBUILT SAILPLANE" ...** ***Happy Birthday Leo!***

In this edition you will find good topics by Dr. Peter Champness, John Biggs, Malcolm Bennett, Sir Colin Collyer, Keith Nolan and Peter Raphael 'the famous Erudite' who is adding a drum sander to his disc sander, it is amazing how the Australian ingenuity works producing astonishing results. The disc and drum sander will be the "Supa-Dupa" in homebuilt machinery and the beauty of this affair is the minimum cost. Only the Erudite can do it with style and flair.

Also Malcolm Bennett's article tells us that his project is almost near completion. It is a very nice project and I am sure Malcolm will be very happy with his first flight!

John Biggs is presenting to us for our consideration, a project in the form of a motor glider, the 'Blowfly'...if you are interested, give John a call, he'll be very happy to hear from you.

That's all for now, see you next issue.

James Garay
Editor

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Inside This Issue

MAIL BOX

Dear Ed,

Please fin my re-subscribe application form. I will write something for the journal as soon as I come back from Narromine at Easter. I my have to go to France very soon and will report on that if I find some interesting subject to scribble about. Thanks for doing the job as scribe for the AHS . Regards. A. Maertens.

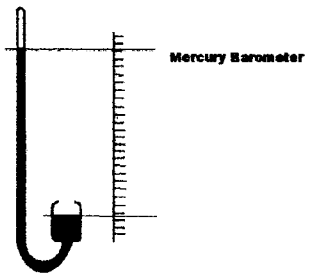
TECHNICALITIES

Barometry and Altimetry

Peter Champness

The Mercury Barometer

The mercury barometer is attributed to Evangelista Torricelli in 1643. Torricelli was an Italian scientist who became interested in the physical concept of the vacuum. It was found that a vacuum was very difficult to produce or maintain. Indeed the physical possibility of creating a complete vacuum was questioned and the phrase "Nature abhors a vacuum" had already been coined. It had been noted by mining engineers that water could be extracted from a mine using a suction pump but the maximum height the water could be raised by this method was 32 ft



Torrecelli was an associate of Galileo for a few months before Galileo died. Galileo had the view that different liquids could be raised to different heights depending on their physical density. Mercury is a liquid 14 times heavier than water and hence suction applied to a tube containing mercury would raise the mercury to a height of 30 inches. The Italians at this time had perfected the art of glass making and glass blowing. Torricelli obtained a glass tube about 36 inches in length, closed at one end and filled it with mercury and holding his finger over the end so that no air bubbles could enter, inverted the tube and placed it in a bowl of mercury. As expected the mercury sank part way, creating a space at the end. The space contains a high vacuum containing only a tiny amount of mercury vapour. The length of the Mercury column was about 29 inches and this length was maintained if measured in a vertical direction even if the tube was inclined.

The volume of the vacuum space at the top of the tube was noted to change over time as the level of the mercury went up and down. Another student of Galileo, Vincenzo Vivianni suggested that the rise of the mercury to a height of 30 inches was due to the pressure of the atmosphere pressing on the free surface of the mercury in the bowl. Variation in the height of the mercury column was due to variation in the atmospheric pressure. This view was later confirmed by the famous French scientist and mathematician, Blaise Pascal who took the Torricelli apparatus to the top of a mountain and noted a corresponding decrease in the height of the column as he ascended.

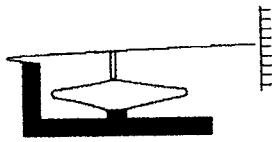
Evangelista Torricelli.

I have admired the mercury barometer for many years and had hoped to own one. Historic instruments are sold occasionally in antique shops and I suggested that maybe I might get one for a birthday present. Antique instruments are usually expensive and are often in poor condition. I called the Bureau of Meteorolgy and was told that mercury barometers are no longer available, are no longer made and are very difficult and expensive to calibrate. Each of these assertions is wrong! A search of the web using Google turned up a small business named Nautical Replicas (www.nauticalreplicas.com.au) who import new mercury barometers from Germany. The barometers are remarkably cheap, retailing for less than $300 (which is less than 10% of the cost of an historic instrument). Nautical Replicas have a stall at the Victoria Market, which is where I collected mine.

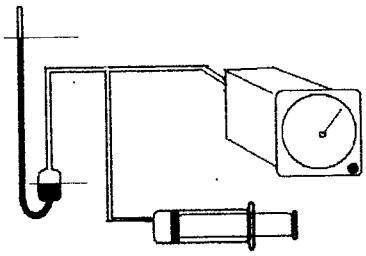
With respect to calibration of the mercury barometer it is apparent from the design that the height of the mercury indicates the exact air pressure at the time and place where the barometer is. The only reasons for inaccuracy are: air bubbles have got into the tube and risen up to the top of the column, or the height of the mercury is not measured accurately.

The Aneroid Barometer

The aneroid (= no liquid) barometer is the more common alternative to the mercury barometer. In general they are cheaper to buy and generally they are more robust and easily transported. The aneroid barometer does not have to be maintained in a vertical position to indicate the pressure.



Aneroid Barometer (Schematic)



The aneroid barometer is based on an aneroid capsule which is a sealed metal chamber in the shape of a disc. The aneroid capsule changes in volume with changes in the air pressure acting on it. Because of the disc shape the change in volume causes a change in thickness of the capsule. A system of levers magnifies the movement and which is displayed as rotation of a needle

Unfortunately the aneroid barometer is a complex and delicate mechanical instrument which is potentially subject a number of errors. The aneroid capsule is quite robust, however the system of levers is quite delicate. The levers are quite small and hence small variations in manufacture will introduce noticeable errors. The bearings may be loose or sticky. The capsule might leak and the printed scale on the instrument might not match the movement very well.

Units of Measurement

In the old days when mercury barometers were in common use atmospheric pressure was measured in either inches of mercury (Hg) in the British Commonwealth and America, or millimeters of mercury (Europe). In either case the units represent the height of the mercury column as measured on the scale on the side of the barometer or with a ruler. More recently the weather bureau has reported the pressure measurement in millibars. Since 1986 atmospheric pressure has been measured in Hectopascals.

One millibar (mb)is one thousandth of a Bar. A bar is one atmosphere (standard pressure at sea level).

A Hectopascal (hP) is one hundred Pascals. A Pascal is one Newton per square metre. The standard atmosphere is almost exactly 100 kilopascals/m2 (101.3 actually), which 100,000 Newtons per square metre. Hectopascals (hundreds of pascals) are used instead of kilopascals because millibars (the old measure) converted exactly to hectopascals (the new measure) with only a change of name at the end. I deduce from this that the Bar (one atmosphere) must have been defined as 100 kilopascals/m2.

A Newton is the force required to accelerate a mass of one kilogram at one metre per second per second.

The standard atmosphere is defined by the ISO (International Standards Organisation) as 1013.2 Hectopascals and 15 degrees C at sea level. While these conditions almost never occur exactly it does represent a sort of average condition for the earths atmosphere and is useful fro calibration and comparison of altimeters.

All of the following represent standard atmospheric pressure:
14.7 pounds per square inch
760 mm of Hg
29.92 inches of Hg
1.013 Bar
1013mb
1013hP
0 ft (altimeter reading when set to standard atmospheric pressure).

All of the above units can be easily converted from one to another except the last (ft altitude). To convert mb to Inches of Hg divide Mb by 1013 and multiply by 29.92. To convert lbs per sq in to hectopascals divide lbs/in2 by 14.7 and multiply by 1013.

Altimeter Units

The altimeter scale reads Altitude in feet but before we can convert other pressure measurements into feet we need to know something more about the atmosphere, ie how does atmospheric pressure vary with altitude. This could be done by taking our barometer to various known heights above sea level. If we were to read the pressure at the known altitude and subtract it from the local sea level pressure at the time we would then know the change in pressure for a given change in altitude. If this process was repeated a number of times at different known heights above sea level we could then construct a graph or a table relating change of height to change in atmospheric pressure.

While this is quite easy in theory, in practice it is a very difficult task, requiring years of surveying to establish known heights of mountains etc before we could start to take pressure measurements. Fortunately however others have already done the hard work and the following table produced by the ICAO (International Civil Aviation Organisation), gives the required information.

Altitude (ft)	Pressure Ratio
0	1.0000
1000	0.9644
2000	0.9298
3000	0.8962
4000	0.8637
5000	0.8320
6000	0.8014
7000	0.7716
8000	0.7428
9000	0.7148
10,000	0.6877
15,000	0.5643
20,000	0.4595

Altimeter

The altimeter is an aneroid barometer. The difference is case and the scale which is calibrated in feet of altitude instead of the more usual units of pressure. The case of an altimeter is designed to fit into an aircraft instrument panel and is (or should be) sealed except for a single port at the back which is connected to the static port of the aircraft. The altimeter case may leak, especially around the glass face, in which case it may be disconnected from the static port and read cockpit pressure instead.

The altimeter has a knob at the front which is used to adjust the scale to compensate for variations of atmospheric pressure associated with the weather. This setting is displayed in a small window at the bottom of the face of the instrument which shows the current setting. The altimeter may be set correctly either by setting the local sea level pressure in the window or by setting the needle to the current height on the scale. If the altimeter is set by either of these methods the altitude reading is referred to as QNH and represents the height above sea level. Local sea level pressure may be obtained from the weather bureau or from aviation sources such as air traffic control. If the current altitude is known (which usually the case when on the ground at an airfield), this may be used instead.

If the altimeter is set to read zero on the ground before takeoff the setting is referred to as QFE and the altimeter reading represents the height above the take off point. Civil Aviation Regulations require all aircraft operating below 10,000 ft to set the altimeter to QNH (height above sea level). This has the advantage that aircraft reporting their height by radio will all be talking in the same terms. Despite this requirement a surprising number of glider pilots still seem to set their altimeter to QFE, particularly when flying locally.

Testing Altimeters

As mentioned earlier the aneroid barometer and altimeter may be subject to a number of errors. Civil Aviation Regulations require aviation altimeters to read to an accuracy of +/- 100 ft. Unfortunately there is no easy way to measure the accuracy of a altimeter in service. The easiest method is to compare the questionable altimeter with another (hopefully more accurate instrument) by connecting both instruments via a T piece to a common chamber (eg syringe) and compare the two readings. Alternatively the altimeter may be sent to a testing laboratory.

The new mercury barometer suggested an alternative method of testing altimeters. If I could attach my altimeter via a T piece to the chamber of the barometer I would have an accurate and reliable instrument for checking the altimeter. This I have not yet done but the method is illustrated below.
Suction on the syringe reduces the pressure in the tubing which is connected both to the chamber of the barometer and the case of the altimeter. The main problem then is to make a new scale for the barometer which reads in feet of altitude. The scale will be drawn on a piece of paper which is them taped to the side of the barometer. Using the ICAO table given above and a calculator the scale is:

Altitude (ft)	Pressure (mmHg)
0	760
1000	733
2000	707
3000	681
4000	656
5000	632
6000	609
7000	586
8000	564
9000	543
10,000	523
15,000	429
20,000	349

The last step is to adjust for the local atmospheric pressure. The new barometer scale in feet must be placed so that the barometer is reading the current height (if known). If the current height is not known it can be derived by obtaining the current pressure from the weather bureau. When compared with the barometer pressure the height is derived. The barometer has a small moveable scale to allow this to be done quickly and easily and also to allow the current sea level pressure to be displayed. In my case the elevation at my house is 250 ft above sea level. The paper scale is taped on so that the top of the mercury column is level with the 250 ft mark on the scale. If the altimeter is set to same height ie 250(ft), it should display the current sea level pressure in the window at the bottom.

Suction on the syringe should then reduce the pressure and the altimeter reading can be compared with the barometer reading. Some adjustment may be required if the mercury level in the chamber rises significantly as the level of the column is reduced.

Assuming I am able to connect my tubing to the barometer chamber without damaging it and also with a good seal I hope to report on the successful trial in the next newsletter.

WHAT'S NEW!

THE GOAT

By Mike Sadlin.
This is an excerpt from the Internet,

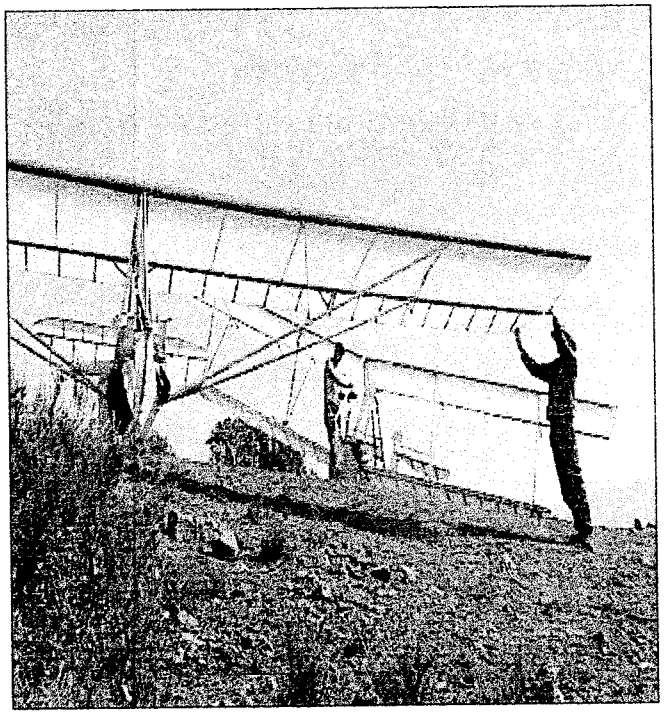
My new monoplane glider, the Goat, is well into its first soaring season. The Goat is technically an ultralight sailplane (under United States weight rules) with conventional three axis control, similar to the Bug4 and the commercial Super Floater. It is designed for slow speed

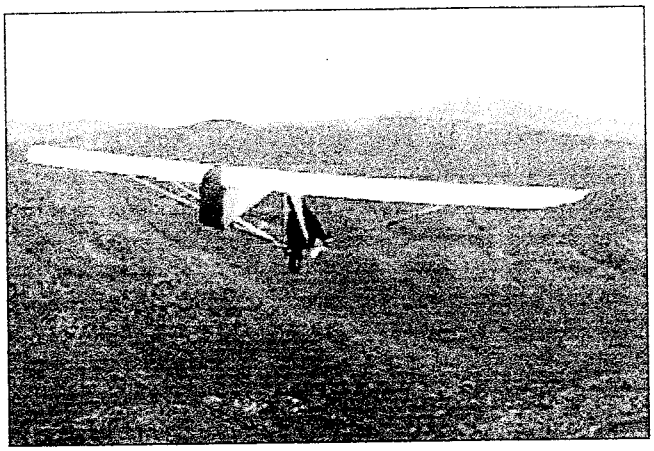
recreational soaring and training. I hope this glider will be an all purpose airchair, allowing comfortable open air soaring, good crash safety, quick assembly, and car top transport.

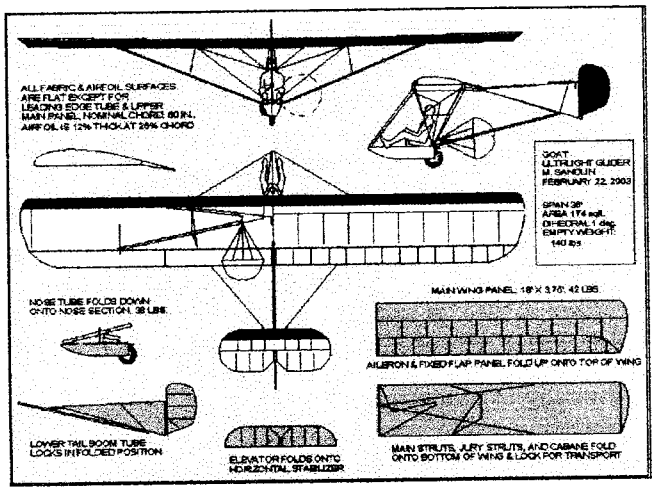
Like the Bug 2 and Bug 4, the Goat does not foot launch, but is either towed into the air or else launched by rolling down a hillside. My rolling launches are usually made at a site shared with hang gliders and paragliders. This is a home built glider, made with a low level of technology (no welding, special machining, or molds) from readily available materials (mostly aluminum tubing, steel cable, aircraft bolts and heat shrink fabric). The Goat is a non commercial project, with no product or plans for sale now or later, but I have posted complete descriptive drawings on the Web, as I did for Bug4, and these drawings are freely available for whatever purpose the user may choose.

My idea of an "airchair" is like a hang glider without the hang. The glider is kept at home and transported to the flying site on a simple car top rack. It can be assembled by one person in about 20 minutes. With a wing loading about the same as a hang glider, it flies and soars like a hang glider, making it compatible with many existing hang glider operations, using rolling launches, ground tows, or ultralight aerotows.

A high flying airchair pilot must be versed in sailplane procedures such as assembly, ground handling, preflight inspection, three axis mechanical flight control, emergency procedures, flying regulations, airspace restrictions, and the effects of wind and weather.







The experimental Goat prototype currently features:

- Five major separable parts, the heaviest being the wing panel at 42 lbs.
- Hand deployed emergency parachute, hang glider type, 22 gore round,
- 16" diameter wheelbarrow wheel, tube tire
- nose skid for braking (no wheel brake), tail skid at rear
- drogue chute, hang glider type, 5 ft. diam. (flat) canopy
- tow hookup with weak link loop, to break at 330 lbs.(110% gross weight)
- Altimeter/variometer mounts on nose tube or strut, hang glider type
- Quick assembly shear pins, all fasteners attached to airframe
- Flap panels in fixed position
- Folding boat seat with four point seat belt

Goat Design Concepts:

1. Open Air Soaring

The pilot sits in an open chair, belted firmly in place but out in the breeze, in order to experience fully the fun and adventure of soaring flight. The burden of dealing with a pilot enclosing structure is dispensed with, although a flight suit may be desirable at times. Open air soaring will usually involve higher drag, and thus lower glide ratios, than enclosed pilot flying, but this is just another tradeoff that calls for the development of new techniques and attitudes.

2. Crash Safety

As a survivor of many hang glider crashes, and a friend of pilots who did not survive them, I have considered the issue of ultralight glider crash safety as a matter of particular personal interest. Because of the inherent risks of aviation, crashes happen despite our best efforts, but the risk of injury is to a large extent dependent on equipment design. The two central ideas of ultralight soaring crash safety are: (1) minimize the energy of impact, and (2) protect the pilot.

To minimize the energy of impact (which is in proportion to the mass of the aircraft and the square of the speed relative to the ground), let the aircraft be inherently slow and draggy, as well as capable of very slow flight. Our best chance for a slow crash is to be flying slow in the first place.

Protecting the pilot means minimizing bodily deceleration, distributing loads over the body, and preventing direct contact of the body with external objects. In other words, the glider should do for the pilot's whole body what the helmet does for the head. To do this, let the pilot be secured in place with multipoint safety belts in the center of the airframe and surrounded by a substantial depth of collapsible structure (crumple zones). Impact from any direction will now result in localized structural collapse which will absorb crash energy and reduce the deceleration shock experienced by the pilot. Thus we adhere to the dictum: maximum damage to the airframe results in minimum injury to the pilot.

In the event of an emergency parachute deployment, let the parachute bring down the pilot and the aircraft together, in accordance with standard ultralight practice. This allows quick and reliable parachute deployment and makes use of the airframe to protect the pilot on impact. Many ultralight emergency parachute systems are rigged to lower the aircraft in a nose down position, but I use a nose up position, so that the wing or tail structure will contact the ground first and collapse, absorbing crash energy while the upward facing pilot is protected by padded seating.

Additional crash protection can be provided by a big, bouncy pneumatic wheel and a deep skid structure under the pilot. The kind of crash we want to see is a "bust the glider and walk away" crash.

3. Docile Flying Qualities

Many aerodynamic aspects of the Goat are intended to provide forgiving low speed flying characteristics with mild stalls and spin entries (or maybe even an absence of unacellerated stall breaks or spins). These design points include a light wing loading, main wing washout (accomplished by aileron rigging), ailerons that taper to nothing before reaching the wing tip, and an untapered main wing plan form. Elevator size has been kept to a minimum to reduce trouble from pilot induced pitch oscillations and other misjudgments.

4. Static Margin Check

The main landing wheel has been placed at the aircraft center of lift, so before any flight the pilot can be sure of having enough forward weight by doing a simple static balance test. With the pilot strapped in place and the nose released in the level position, the front of the glider must be seen to drop firmly to the ground, thus confirming adequate static margin. If the nose does not drop to the ground, the glider is too tail heavy and corrective measures must be taken before flight (to prevent a spin you can't get out of, basically). This system of balancing eliminates the need for load placarding, pilot weight estimates, etc. On the ground, the Goat is a nose dragger or tail dragger at the option of the pilot. I find it convenient to start and end most flights with the nose down, but for a stylish stop I sometimes roll out with the nose up.

5. Easy Towing

The single point tow hookup is simple to perform and the pilot always has one hand available just to pull the release. As compared to hang glider tows, no takeoff dolly is needed, and lockouts should be unlikely with mechanical controls and tailplanes. The tow hook is intended to conform to hang glider standards and incorporates a loop of line as a weak link.

6. Convenient Transport and Assembly

The Goat is designed for quick assembly and disassembly by one person, in order to be transported on a car top rack. My rack is an ordinary flat and padded hang glider rack, with no special saddles, straps, or additional padding, exactly the same setup I use to carry hang gliders. On my truck, I can carry the Goat and an additional hang glider or two, and some passengers.

Glider assembly involves handling five main parts, the heaviest of which weighs about 42 pounds. Assembly begins by unfolding and joining the wing halves to form the complete wing structure. The nose and tail structures are folding tube assemblies which are then pinned onto the wing (there is no continuous fuselage structure). The fifth part is the folding horizontal tail plane, which is put on last. The time and effort required for assembly is about the same as that required for a high performance hang glider, perhaps fifteen or twenty minutes depending on conditions and available help. A pilot landing in a remote field should be able to quickly disassemble the airchair and put the parts over a fence without assistance.

Ideally, all fasteners should be physically attached to the glider, so we can't walk away with parts in our pockets. The fasteners should be quick to attach and detach, and easy to check for preflight inspection.

7. Garage-Level Technology Construction and Repair

The Goat can be built or repaired with hand tools on a garage floor using materials and processes that are conventional and readily obtainable. The main structure is aluminum tubing bolted together in traditional hang glider/ultralight fashion. The fabric covering is light aircraft polyester, cemented onto the airframe and onto itself so as to form a continuos envelope, shrunk taut with an ordinary electric clothes iron, and then sealed with untinted Polybrush (Polyfiber process) or nontautening butyrate dope. There is no welding required and there are no specially machined parts (there are purchased parts which are stamped or machined). Much secondary structure is made from hobby shop composite materials. The control lines are made of 1/8 inch "Spectron 12" braided line routed through marine pulleys and plastic or metal line guides.

8. Traditional Stick & Rudder Controls

The objective is to have conventional, sturdy controls with "good control feel", which is difficult to define. The main control stick is in the center and operates conventional ailerons and an elevator, and the rudder is foot pedal operated.

9. Aesthetic Appeal

Goat styling leans toward functional simplicity and traditional forms when possible.

Current Status

The Goat made it's first flight on February 1, 2003, and is now flying regularly as my weekend soaring glider. It has proven to be a pleasant and practical glider for slope launching and local flying. At a popular mountain hang gliding and paragliding site I still fly with the same group as I did with my hang glider, but now I'm sitting down.

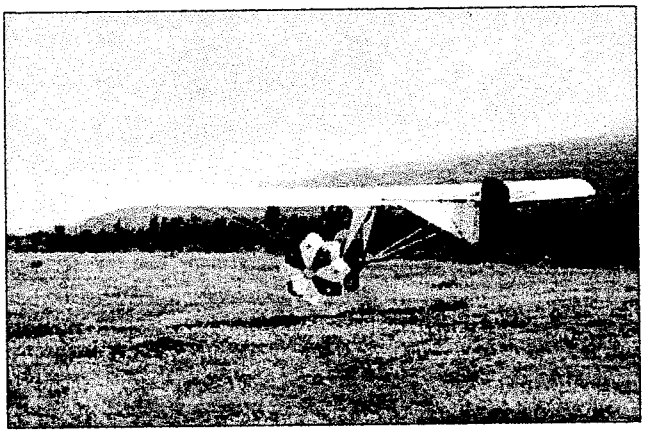
Goat flying is quiet relative to the biplanes due to lack of all those cables across the wind. Sink rate is also noticeably reduced, so I think the performance has now shifted closer to the higher end of the hang gliding spectrum. My weekend routine hasn't changed from my hang gliding days: first I get up as far as possible, hopefully 2 or 3 thousand feet over takeoff, then I fly around just for sight seeing, for which an airchair is well suited.

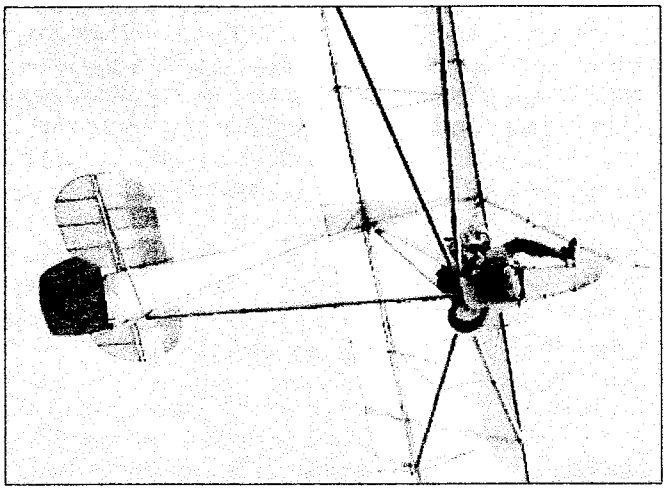
The control response and feel are good. I think the Goat is faster to maneuver than a hang glider and more stable in turbulence. This is still a true three axis aircraft, however, and that means that you need to use the stick and rudder together to get a decent turn. Slips are effective for steepening the glide slope but I usually use a drogue chute for landing instead.

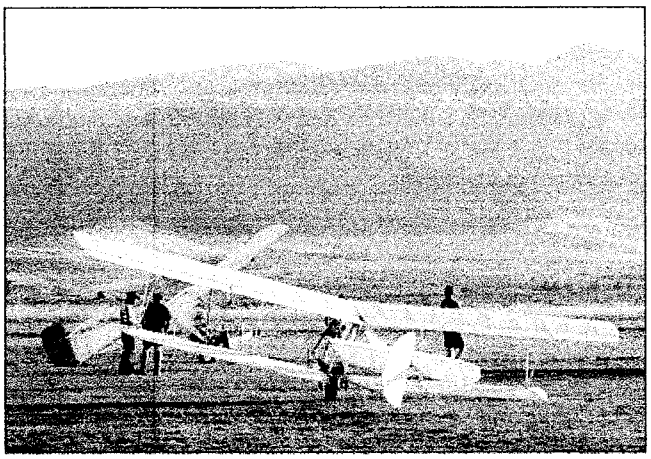
The biggest drawback to the Goat design has been the large size and heavy weight of the main wing panel with regard to loading or unloading it onto a car top rack. I make a point of carrying each wing panel by myself most of the time, and I find it stressful. The folded wing half weighs 42 pounds, which is about my upper limit for something big and bulky that has to be lifted and carried in the wind.

Thermalling speed is the slowest smooth speed, and often I will drop the nose a little for maneuvering from a thermalling attitude because I'm too slow for full good control authority. If I pull the stick back from thermalling speed in level flight, the controls become less effective and flight becomes rougher. There is a fairly wide band (in terms of stick travel) of unusable airspeed at the low end, with a lot of balking and buffetting when the stick reaches the full back stop. Sometimes enough of a stall will be achieved for the nose to drop (the wing stays level), following which conventional recovery procedures ("stick forward, apply opposite rudder") can readily reinstate a normal flight attitude. I have not attempted any spin entries.

Unfortunately there is no commercially manufactured glider that can do all of what the Goat does. Homebuilding is fun, but people who just want to fly gliders should be able to "buy and fly" instead. Maybe home built airchairs like the Goat, Bug2, and Bug4 will help generate enough interest to allow production of an airchair someday. Whoever might choose to develop and sell airchairs would be in a position to set new standards and make a great contribution to ultralight soaring. I don't yet know of anyone doing this, nor would I be a part of that enterprise, but I will encourage any efforts in that direction.







NEW MEMBER.
We have a new member to welcome.

Rene Jollin. 131 Hall Rd. Springwood. QLD.4127.

HINTS & TIPS

SELECTING AIRCRAFT TIMBER

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

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 1in 15. The timber shall be free from brittleness.

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.

Although wood with small resin pocket 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, and can be detected by discoloration.

Moisture content should be in the range of 12 to 15%

Density must be within the range specified for the type of timber being inspected.

The number of growth rings per inch must comply with the specification, or not less than 18 rings per 75 mm radial measurement.

Where possible structural timber should be bought from a recognized aircraft timber supplier, certified that it complies to relevant standards.
In the future it will become more difficult to purchase certified timber. Where the inspector/repairer has to select his own material, compliance with a relevant specification will allow the material to be used.

Trailer Talk 5 - The Tool Box

Peter Champness

This series of articles has grown beyond all expectations. It was originally inspired by an accident when a wheel came off my glider trailer. I should warn readers that there are possibly two to go. The next one should be a real beauty. Alan Patching gave me an article about dynamic trailer stability based on a paper presented to the OSTIV conference in Benalla in about 1986. A condensed version was published in Australian Gliding that year but left out all the mathematics. I was unable to understand the article but Caleb White of Vintage Glider fame has agreed to look at it and produce a translation that we can all understand! Caleb is studying aeronautical engineering at the RMIT so I have great confidence in him.

The tool box was mentioned in an earlier article. It was advised that the tool box should be placed close to the trailer axle in the interest of reducing the dynamic moment of inertia (that is the tendency of the trailer to develop the wobbles when traveling at speed). Most tool boxes are located inside the trailer at the front which is quite good for security and for access to the contents but less good for dynamic stability. If the tool box is placed close to the axle it is inevitable that it will be outside of the trailer. Hence a lock is advised. The Australian habit of borrowing or nicking things seems not to have changed much since the early days! I have decided to place my tool box on top of the mudguard. This is as close to the axle as you can get and it places the box at a convenient height for access to the contents without bending over.

Where do I obtain a tool box? Two economical alternatives are available (without resorting to nicking /borrowing someone else's). Auto discount stores such as Repco and Super Cheap Auto sell a range of metal tool boxes for $20-50. The boxes are made of rather light gauge metal but come with a built in lock and hasp. The length of the box is determined by the size of the sledge hammer and the bolt

cutters (which are discussed later). The width of these tradesmen's boxes is somewhat greater than is desirable since it is best if the box does not stick out beyond the width of the mudguard. For that reason I have chosen an ammunition box. The ammo box is narrower than the equivalent tradesman's tool box and is rather more robust. It has a good seal against water and dust. Mine even came with a little note from Corporal Jones certifying that all the original contents had been removed. The only negative is that the ammo box was originally sealed with wire and hence it lacks a hasp or lock. These could be a fitted with pop rivets if desired. The ammunition box was obtained from a camping/disposal store for about $40.

What do I need in the tool box? Well a Jack and a Wheel Brace are a good start. The Wheel Brace should fit the trailer wheel nuts. This of course is very basic but I have been caught out before, and I am sure I wasn't the first and won't be the last. As it happened the retread came off one tyre soon after I bought the glider and trailer. I didn't have a wheel brace that fitted the nuts but it did not matter because I did not have a spare wheel that fitted either. Since it was 11pm on a Sunday night there was little prospect of obtaining another. The tyre was not flat but since half the tread had come off it was so rough that I could not exceed 10kph. It took about an hour to reach Woodend by back roads. I left the trailer parked near a service station and was relieved to find it was still there when I came back two days later.

Another good thing to have in the box is a set of tie down pegs, not just for the glider but also for the trailer. I know this because my trailer rolled off on its own from the trailer park at Bacchus Marsh, propelled by a very strong westerly wind. It came to rest in a culvert after traveling about 40 metres and bent the front jockey wheel. Tie down pegs can be made by cutting a Star Picket into shorter lengths with an angle grinder. A Star Picket is a metal fence post that farmers use for temporary fencing. They can be obtained from Robot Trading Co. and other outlets that sell fencing materials. One star picket will make three pegs. Star pickets already have holes drilled in them for attaching rope or chain. A sledge hammer is useful for hammering the pegs into the ground and for getting them out again.

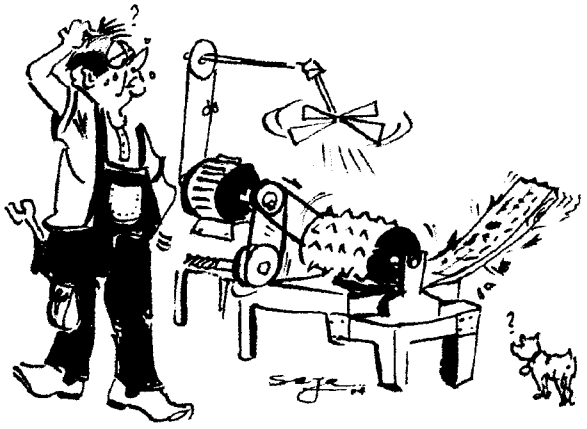
A set of spare wheel nuts can be useful. If a wheel comes off the trailer, it can often be found again but the wheel nuts will all be missing. Finding appropriate size spares can be a bit challenging if you are stuck on a country road. In an emergency you can rob two nuts from the wheel on the other side but you won't be able to drive very far with this number.

The final items in the tool box should perhaps not be talked about! You can put in some toilet paper and a folding spade if you want to but the problem I am referring to is that many farmers no longer live on their properties, preferring life in the nearby towns. The farms gates however are often chained and locked. It is good manners to find the landowner and obtain permission to remove one's glider following an out landing, and of course entering property without permission is trespass. It can sometimes be impractical however if the farmer cannot be found. Some people have a coil of wire and a fence strainer in the tool box but it is a lot a hard work to repair a fence. I was lucky enough to find a large pair of bolt cutters at my local discount store recently for $25. Of course it is essential to shut the gate again after passing through and like the legendary sheep rustlers we would like to leave everything just as it was before. The sheep rustlers are reputed to remove dozens of sheep from closely watched paddocks without ever being seen. They also leave no signs of entry or exit from the paddock. I have included a couple of spare padlocks in the tool box. If one of the links has somehow been cut and the gate opened it can be closed again and the chain repaired by using the spare padlock to replace the broken link. The chain then has two locks on it, one of which can be opened by the farmer because he has the key.

That is all I can think of about tool boxes at present but readers may have other ideas they would like to contribute.

The Virtual Drum Sander

By Peter Raphael

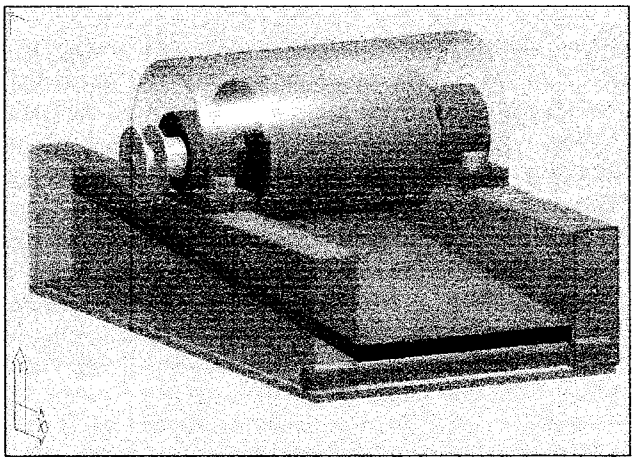


The Erudite at work

Hmmm, how do I write a 'how to do' article before I have even built the item in question? When I told James that I was planning to build a small drum sander his immediate reaction was to request that I write this article for the newsletter. However, deadlines appear before projects are completed, this is generally because I have several things on the go at once. One of these impediments is an old industrial Singer sewing machine, the components of which James has donated to me as a restoration project (*thinks: "shouldn't have mentioned that. He'll want me to write about that too"*). I have always felt a need to have a heavy-duty sewing machine available to me for a variety of tasks. But then again I guess the same could be said for all the other restored and manufactured bits and pieces I have in my shed, along with the object that is the focus of this story. While I am appreciative of his generosity I suspect that there is an ulterior motive here as I have heard that our Editor is building a mobile Flying Base and will eventually require the services of a heavy duty sewing machine in its completion. I am sure that he will keep us informed of the progress of his project. How about it, Jim?

Any how, enough digressing. Since the construction of the Woodstock I have long held a desire to build a small drum sander, capable of thickness sanding thin timber sections. During the construction of the Woody a home-made, (again), spindle sander was used to shape the insides of plywood frames and ribs and this also saw service, with the application of suitable jigs, in shaping the tapered section used as the trailing edge. This requirement, along with having occasion to produce other small section timbers, has fuelled this project.
While bigger is often better I decided that I would keep this sander rather small insofar as its intended purpose was that it should work with thin or small pieces that would be outside the scope of the bench planer or power planer, mainly due to difficulties in keeping them square or flat. Keeping an eye out for a suitable drum in my parts bins I noted that a Morris Minor starter motor comprised of a steel barrel of suitable dimensions so after stripping out the coils a couple of disks were turned and welded to the ends. A 12mm shaft was centred in the lathe and the drum locked onto this with setscrews enabling some truing cuts to be made along the drum. A bracket attached to the chuck end plate abutting one jaw dissuaded any attempt for the drum to slip on the shaft during turning. Likewise, once the drum is established in the machine, flats on the shaft should ensure the drum remains fixed. The final dimensions of the drum were 100mm diameter and 150 mm wide.

The drum is mounted on the shaft between a pair of self-aligning pillow blocks and a pulley of suitable diameter fitted to the outside. My intention is to mount this at the back of my disk sander being driven by a pulley on the back of the faceplate. It should be a simple matter of throwing the belt on when required. The additional inertia supplied by the faceplate will help to keep things moving too.
As a picture is worth a thousand words I will save some typing time here and refer you to the artistic representation below. This gives a simplistic view of the device I have in mind in case I have left you behind somewhere.



The platen sits under the drum and is hinged at one end. The other end is supported by a spring and it is this pressure that hold the work against the drum as it being fed through. After what may be a number of passes the work will have reached the desired thickness set by a backstop adjustment and the work should then slide through with little effect.
To attach abrasive paper or cloth to the drum I will be making a hacksaw cut of about 30mm into the face at one end. The end of a strip can be then inserted into the slot and wound back from the direction of rotation across the drum, both surfaces having previously been treated with a disc or contact adhesive. I expect that any gap between turns may even be beneficial in clearing sawdust away from the work An additional enhancement will be the ability to tilt the table with respect to the drum this will allow triangular or tapered cross sections to be produced, though obviously, the same this could be achieved by simple jig work.
To preserve the life and efficiency of the abrasive (not to mention the operator!) a method of dust extraction is warranted. This may well be in the form of a shroud over the top of the drum connected to a dust extraction fan that will also service the disk sander. It doesn't take too long to lay a film of dust everywhere when using these things! I will keep you posted as to the final result and as to how I implement the adjustment mechanism.

SHOP TALK

Scale Model News

By Colin Collyer

I have just spent Easter flying free flight at Narrandra (NSW) and scale gliders at Swan Hill on Anzac Weekend.

The trip to Narrandera also had a recce to Lockhart, home of the Wagga Gliding Club, to be used for a future scale glider event (May 15 & 16). The free flight had great weather, lots of gentle thermals that seemed to top out at about 2000 feet. The Hot Rods also have an event on in Wagga and on Saturday night the main street is closed to traffic, and the rods "cruise" up and down... Great spectacle, lots of kids, and an excellent PR exercise. A pity we can't do something similar with sailplanes.... Or vintage aircraft.

On the Swan Hill weekend we left Melbourne Friday night, leaving behind rain and strong winds. By Bendigo the stars were out, and the weekend was quite flyable, especially Sunday.

The Models present covered the spectrum – Homebuilt, from scratch or kit, to the modern Ready built models that only require fitting out. I hear of a ready built Reiher, 1/3 scale, 6.3mtrs, covered, complete cockpit detail, just add radio gear, and a bargain at about $4000, that has just arrived in Melbourne. Now I'm sure it will be a stunning model, but the owner will never have the satisfaction of being able to say..... I built that! No sir – For my money, something a bit less ambitious that I have built myself.

At Swan Hill there were many homebuilts, including some modern open class replicas.

A 6mtr ASH 26 and a 1/3 scale Fox aerobatic glider where both scratch built by John Copeland from Waikerie, He even has one with an "Up and Go" motor.

Also I had an ASK18 1/3 scale, built in Swan Hill 20 years ago by Win Proctor. He also built two Coojie's, one ¼ scale, the other full size!

A nice ¼ scale ASK 8, built from a kit by Gary McDougal.

What about 2 Fauvettes, both 5 mtrs, built by Murray Wills from Kaniva The first one now owned by Greg Voaik. There where also several 1/3 scale Schweizer 1.26's from the VARMS building project.

As for tugs, what about a Corben Baby Ace, 40% scale with a 120cc petrol motor, built and flown by John Gottcschalk. The real one was a Mechanics Illustrated project, probably from before the EAA came into being.

As for flying, the Sunday was a great thermal day, with many flights over 1 hour. The ASK18 did 2 hours.
Other things happening are: the "Woodstock" plan is in the magazine "Aviation Modeller International" March 2004 edition and our editor's Woody-Rooo is on display. I got the original drawings from him when I did the ¼ scale design. I hope people have better luck than I did finding colour schemes!

The Scale Soaring Group are going to Wagga Gliding Club on the weekend of May 15 – 16 for a Fly In. A good central point from NSW, Vic, and SA.

The VARMS group are about to start another building project, a Schweizer 1.34 in 1/5 scale, 3 mtrs, and aimed at the newcomers to scale.

I FLEW JIMMY'S WOODY-ROO

By Ged Terry

When out of the blue, James Garay offered me a flight in his glider "Woody-Roo" I could,t believe my luck. It is always a privilege to be invited to fly a homebuilt so I took the first opportunity (before James could perhaps think it folly to let me loose with his superbly built and finished glider and change his mind). So in I got. The cockpit is comfortable with all controls in easy reach. The rudder pedals are organ-type, hinged at the bottom. I was completely at home with these after years of flying from the back seat of K-13s. The field of vision is magnificent- like a Standard Libelle- making the pilot feel he has wings on his shoulders.

I had an aerotow from grass by a Pawnee at Bacchus Marsh. Even with only a light wind the ground round was short. There was the usual rumble of a wooden glider, ceasing immediately at the instant of becoming airborne. It was easy to keep station on low tow. Despite the lack of an elevator trim, the stick forces were completely acceptable throughout the tow to 3000 feet.

After release I tried gentle turns at 40-45 knots-easy to co-ordinate. Then a stall. Plenty of warning-light burble somewhat below 40 knots, high nose attitude with noticeable increasing stick force, reduction in aileron effectiveness and then a mild nose drop at perhaps 30 knots indicated.

Recovery was normal and straightforward, with no wing-dropping tendency.

On to steep turns, with reversals. Again, easy to co-ordinate. A quick check revealed that, as is usual with spoilers, deployment gives a slight nose down change of trim. A "fast" run to 60 knots showed a deteriorating glide angle, which was only to be expected, but, as I was then at 1000 feet and in sink I desisted and positioned for a circuit to land.

But my luck was in- I blundered into an "English" thermal and the Woodstock came into its own. I was soon up at 1600 feet. I thermalled at 40-45 knots perhaps a little fast in retrospect. The lift soon petered out. Nevertheless, it helped me to eke my flight out to 25 minutes. I pushed back into wind to resume my circuit.

I made a 50 knot, full spoiler side slipping approach with the Woodstock docile and steady. To the credit of the glider rather than myself, I managed a spot landing by dint of a deft nip on the bicycle type wheel brake handle to trickle to a stop.

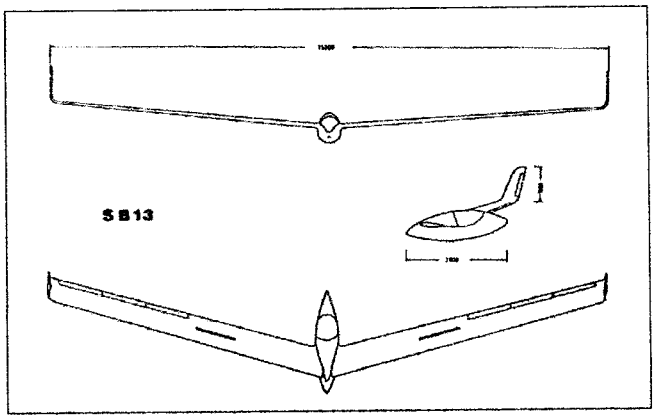
My overall impression is that the Woodstock is docile and pleasant throughout the flight regime I tested and despite the lack of elevator trim, the stick forces are light and unobtrusive. Gliders with somewhat similar characteristics which I have flown previously are the K 8 and the Hall Cherokee.

Woody-roo substantiates my utmost admiration of anyone who has built his own aircraft. It must give supreme satisfaction to fly your own creation. Those who know me realize that I am an inveterate type hunter. I have had the great good fortune to have flown 203 different types of aircraft (112 of them gliders), some, of course, better than others. This was the first time I have flown a Woodsock- I certainly will not have to be asked twice to fly one again!. Congratulations! James Garay. Well done.

FLIGHT TESTING THE SB-13

By Michael Bresser

Eds note: This is an excerpt presented at the International Symposium. Richmond, New South Wales Australia, October 1988.



To pilot an unconventional plane for the first flight w2as an exciting ambition. The main question was how the flight should be carried out.

It was clear that winch launching would be difficult, as the front gear might touch the tow cable and we did not want to

deal with this problem in the first flights.
So an aerotow seemed more appropriate. On the other hand we also knew that the downwash(induced vortexes) of the tow plane would affect the pitching moment of the swept wing. The inner wing section flew in the downwash area of the vortexes, the outer section in the lift. This produced a nose down moment that has to be compensated by pulling the stick. The exact distribution of the flow behind the motor plane was not easy to calculate. It depended on the wing geometry, t5 the mass, the angle of attack (speed) of the motor plane and on the distance between the two planes.

A second decision had to be made about the centre of gravity location. Normally first flights are carried out with a large static longitudinal stability (large distance between neutral point and c.g)

The advantage is that the glider has harmless stalling characteristics. This was especially so with the SB 13 as the elevator deflected more upwards and thus the angle of attack was reduced at the outer wing. The stall would at first take place at the inner wing section and produce a nose down moment automatically. For these reasons the first flights of the SB 13 were made with a large stability, too.

At first the reaction on the controls were tested in short hoppers. The glider was accelerated until it flew, released and landed straight ahead. When the pilot said he was satisfied with the reactions of the glider, a real take off was made on 18-3-88.

The effectiveness of the controls was good, only the roll rate was slow. The stalling behavior proved to be absolutely harmless. But soon the large stability showed some disadvantages. As the elevator flaps were deflected in the direction of back stick there were not enough reserves left.

If the motor plane rotated as soon as possible the strong downwash would make it very difficult to climb into a higher position. Furthermore, the pitch attitude was so large, that the towing plane was hidden by the nose of the glider.

Another disadvantage was the higher mi8nimum speed of the SB 13 with large stability. The outer wing did not come into the vicinity of the maximum lift coefficient, before the inner wing section stalled and thus the total maximum lift coefficient was reduced.

Another problem was the short period mode. Normally the damping of this motion was high (90-100%) and it was not perceptible to the pilot. With this stability the damping of the period mode was insufficient and the plane would perform a whole oscillation on any disturbance either by turbulence or by an elevator motion.

As mentioned in previous lecture the frequency of this mode is ascending linearly over the speed. At about 100 Km?h it is 1-2 hz, which means that the pilot is easily producing PIOs (pilot induced oscillation) if he tries to prevent them, instead of the ignoring them. This dynamic behavior takes a lot of concentration to cope with in still air. In turbulence it is nerve-racking.

The damping increases if the static longitudinal stability is decreased too. The stability was thus reduced step by step and the dynamic behaviour improved. The day came to demonstrate the SB 13 to the public. The pilot used the opportunity to thermal in weak lift near the place. The glider was flying just fine, but when he flew by chance into a region of descending air and the speed reduced a little bit, the SB 13 went into a steep spin without any warning.

He immediately stopped the spinning with the rudder, but came out of the spin in a light slip and the plane started spinning the other way around. The second try to end the spin was successful and he came out of it with high speed but was not very high above the ground and with one hand on the rescue system actuator. The invited spectators were delighted by the successful flight demonstration. The Akaflieg members and specially our pilot were not at all. What was the reason for this drastic change in the stall characteristic?

The next flights were made with increased stability again, and woolen tufts were fitted onto the wing surface to enable a study of the air flow, It shoed that a crossflow in the leading edge pressure point leads to the stall of the outer wing. The countermeasures known for this kind of problem are boundary layer fences. Several shapes of the fence have been tested, but only those fences which start at the leading edge proved to work. With the two fences, one on each wing between the two controls flaps, the stability was further reduced in little steps.

The stall characteristics and the stick force gradient have been watched. With now 7/ stability it is again possible to bring the SB 13 into a spin deliberately, but the warnings are sufficient. The force gradient is now zero (Indifferent) To give the pilot a better feeling of the aircraft little trim tabs have been attached to the outer flaps. The results are good. For this reason the flaps will be changed a little bit this Winter. With the flaps deflection necessary to fly the SB 13 through the whole speed range the stick motion is now very small. To get a larger stick motion the control transmission shall be changed.

The next problem that occurred was the position of the main gear. In the construction one wanted to bring it quite near to the c.g to need only a little moment to rotate the aircraft. But as the c.g. is moved now, even behind the design point and the c.g. is about 8o cm higher than the wheel axle, it needs only a little lifting of the front wheel and the CB 13 is dragging on the rear point of the fuselage, which makes a very inelegant impression. So the wheel has to be moved backwards too in Winter..

Maybe it will be necessary to do the lots of these little modifications and it will still take some time, until the SB 13 project is really finished.

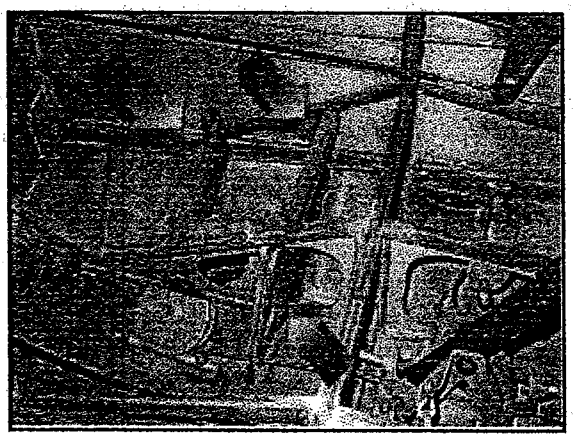
Today I think, nobody can tell whether the flying wing has a future in gliding, But in the beginning there was only an idea and looking back it still surprises me that it was possible to overcome all the problems and make this idea fly.

Mals 14.5 Mts. Woodstock

M. Bennett.

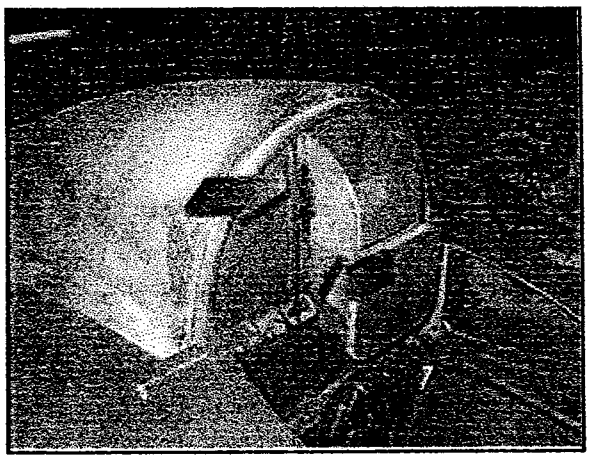
The apparent progress has slowed as no major assemblies are left to put together, but there are plenty of detail bits and pieces. For example, flasks for the varios. I only had one so had to make another. This was made as follows. First I wrapped a one litre detergent bottle in alfoil and then applied a coat of wax or release agent. A strip of glass cloth is saturated in resin and wrapped around the bottle, one layer. When dry this is split with a knife and peeled off the form A layup as a flat sheet is made and two circles are cut for the ends. The body and ends are glass wrapped together after peeling the alfoil out of the original tube. A nipple with flange is made up and glassed to one end. Finally Test for leaks with a manometer. The cylinder is then wrapped in foam insulation and then in a sticky back plastic film – One vario flask complete.

The Woodstock does not have a design for mounting a tow release for winch launch and upon laying out the geometry to get the position for the release I realised that it doesn't fall against a major frame. I therefore designed and installed two intermediate m frames spanning from the seat support to the fuselage side. I have made my own winch release allowing the front and rear attach flanges to be tapered enabling the release to be removed vertically even though it is between frames at each end and bolted to them and the keel when in position.
Six bolts hold the release, spreading the load into the timber structures.
I have progressed the paint to the UV protection stage and will make all the trailer mounting wraps etc before spraying the finish colours. This will save doing any touch up work as some damage is always possible done when the mounting wraps are laid up and bonded to the mounting framework in place on the aircraft.



If and when you build an aircraft, if it's to be fabric covered be sure to correct any surface defects in the structure before covering, as every little mark shows in the surface after cover. Any lumps or laps can be heat smoothed with a graduated iron using the correct temperatures as is clearly spelled out in the covering manual.

I have anchored my turtle deck with a hyfield lever and hook to an eye under the nut of one of the mainspar bolts- quick and out of the way. This is riveted to the side of the headrest. (see photo)



My canopy acrylic is cut and ready to bend as soon as we get around to forming another "top hat" for the top of the canopy.

The next major construction is the trailer along with the mounts for all the parts. Look for my progress update in the next issue.

Changing Times

By Keith Nolan

Did you know that a few clubs have gone from wire to rope for winch launching? Leongatha was the pioneer in this field and have perfected the system. It is well worth a visit to the club to sample it!

Country clubs, I believe, are more inventive and unafraid to try something different. Farmers are self sufficient types and are great modifiers and so are an asset to gliding clubs in particular. City people nowadays are less "hands on" compared to 40 or 50 years ago and are probably more highly skilled, but only in a narrow specialised field. In the "bush" not to be versatile and have a good workshop (and know how to use it) would spell doom for the non self-sufficient. Even people in the building trades, engineering, especially motor mechanics, have lost the ability to fix just about anything. Just unbolt the old part (the computer dictates) and bolt on the new one. Keep changing parts until by accident the faulty one is eliminated, the unnecessary parts are also there to be paid for.

Home builders and repairers of not only gliders, but engines and all the gear we need to fly, are a different breed. Flying is great, and so is associating with these types of people, and many good days in the workshop with friends, are days of satisfaction and mutual education. Even the ultra lights are fast becoming a "store bought" article, whereas they began not far from where the Wright brothers left off. The freedom we have to do these things, were hard won by sensible negotiators who demonstrated to the DCA, that we were responsible and able to acquire more skills and have safety at least equal to general aviation. We must be aware that government agencies will from time to time try to out regulate us.

In England right now they are in the process of surrendering the BGA's control and authorisation to the europeans with their bureaucratic empires in every little state or principality. We must be alert for the signs and "nip it in the bud" if our "pollies" and their advisors want to follow the leader

Wanted: A usable winch in working order for sale .... Contact Keith Nolan.

"BLOW FLY"

By J.Biggs.

The "BLOWFLY" is a single seat ultralight powered sailplane, which I reckon is the ideal type of aeroplane for the typical week-end amateur pilot, which I have been since 1967.

In 1968, I started building a "Taylor monoplane" a single seat (amateur built category) aerobatic aeroplane powered with a 1500 VW motor. It first flew in 1976 and "sniffy" was a great little toy, giving me lots of fun until December 1988, when we had a forced landing in a swamp, due to single ignition magneto failure.

My aerobatic harness prevented me from going forward into the instrument panel, but as we plopped down into the mud, I went down through the seat and the floor, hitting my head (encased in a meteor jet pilots helmet) on the left top fuselage longeron and spent all night unconscious in the cockpit.
I was found next morning and spent six months in hospital and 2 years in rehabilitation, recovering from severe brain damage, a broken back an a squashed left arm.

I started flying again in 1998 with Beaufort Gliding Club. No magnetos in gliders, I thought!.

I told the Beaufort friendly boys what I had been through and they said "Don't worry Biggsy, we will judge you on how you fly"

It was no long until I soloed. I loved gliding and if I had my time over again, I would not care much for powered flying.

NOW ENTERS THE "BLOWFLY".

Whilst it will never be a world beater, it would get the weekend glider pilot airborne without the hassles and expenses of a winch or tug-plane and it could be operated from any suitable paddock (That is my idea of enjoyable flying) get airborne, find a thermal, cut the noise, enjoy the countryside and not go anywhere in particular. Probably not a young buck's idea of heaven!

It would, of course, have to be built by the enthusiast and his mates at a cost, ready to fly; of no more than A.Dls $10.000 and I believe it could be done for that amount.

I will be designing it in detail to the Australian Ultralight Federation CAO 95:10, which makes it suitable for almost any enthusiast to build.

It will be al wood and as simple as possible although there is no such thing as a simple aeroplane it will incorporate many features of the TAYLOR "Monoplane" and as can be seen from the 3 view drawing,(see last page) I like the looks of the Fournier RF-4 of 1970's vintage.

I think the only interesting item in the "Blowfly" is the idea of a four blades folding paddle propeller driven on a shaft back to the motor, which would be mounted on the firewall/bulkhead.

There is a fair bit of design work to plough through yet, but if I can ever score some "Brownie" points from (like Alan Bradley) "She who must always be obeyed submissive submontane" I would love to help build the "BLOWFLY" as a Club project.

What do our members think?

If you are interested please give a call.
John Biggs. Phone (03) 9398-3557.

SMILE ☺

Editors note: This section is for your enjoyment if you do not like the content do not read it.

Mohammed el Caribe was in the village market one day when he felt a great rumbling in his stomach. He could not control himself and let go a fart that could only be described as a triple thunderclap. Everyone in the market stopped what they were doing and stared at Mohammed.

He was so ashamed that he left the village and wandered the desert for many years, too embarrassed to return to his home. Now in his seventies, he felt that he would like to return to the place of his birth. He was sure that no one would recognize him. Back in his home town again, he headed for the marketplace, and was surprised to see a big supermarket standing in its place. He asked one of the shoppers how long the building had been there.

"Ah!" replied the man..."this building was completed twenty years to the day after Mohammed el Caribe farted in the market place."

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Two Irishmen were visiting London and were walking down Pall Mall.
"This is not such a bad place", said Sean.
"Where else could you walk down the street, meet a complete stranger, have dinner with him and then be invited to spend the night at his house."
"B'golly, did this happen to you?", asked Seamus.

"Agh, no, but it did happen to my sister"

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Where's ya bin? The garbo asked Willy.
"Ibin on holidays" answered Willy.
"No-where's ya Wheely Bin?" demanded the garbo.
"I weely bin in prison, but I tell me friends I've bin away."

CLASSIFIEDS

AUSTRALIAN GLIDING MUSEUM NEWSLETTER

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.

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

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I,----------Signed----------Date----------

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