From the home of the *Scottish Gliding Centre*

Portmoak Press

Editorial-*Ian Easson*

This is my tenth issue of Portmoak Press – doesn't time fly when you're enjoying yourself. While on the subject of time, did you know that 2004 will be the 70th anniversary of the SGU? To commemorate this event, I am planning to write a book on the history of the club. The book will also include all sorts of stories from members (new and old) as well as those epic flights from our numerous visitors. If you have any good stories and/or photos for consideration – and for a place in history – please send them to me either at the club or to "Overhill", Ferntower Road, Crieff, Perthshire, Scotland PH7 3DB, or by e-mail to ian.easson@btinternet.com.

During the year I have visited a number of clubs in the UK and have always been impressed by the warmth of welcome received. Whenever I mention the SGU or Portmoak there is always someone who has just been or is about to visit. We too have a reputation for a warm and friendly welcome and I'm proud to say what club I belong to. Can I thank all club members and encourage them to continue with this excellent attitude to our visitors.

On a similar vein, the Scottish Tourist Board (STB) has awarded the Scottish Gliding Union a **3 STAR** Activity Centre rating. We are firmly on the Tourist Map now! The SGU Board would like to thank everyone for their help on the day (of the inspection) and throughout the year. Well done everyone. An extract from the official STB report can be found in Club News on page 10.

Check out Bruce Marshall's summary of the recent Information Meeting on page 3.

Fancy flying a motor glider or achieving a NPPL licence? You are invited to attend a meeting which will take place on Saturday 18th of January at the SGU for anyone interested in flying a motor glider or a NPPL licence see attached word document. any problems contact sender George Ross on 0131 653 6000.

Thanks to everyone who has contributed to this issue (all 16 pages!). We are still keen to get as many issues out by e-mail so if you don't already receive this by e-mail, and would like to get an instant copy, drop me an e-mail with your details please.

Please note the cut-off dates for future issues: End of March for April, end of June for July, end of September for October and end of December for January. Material can be sent to me either typed or hand-written and dropped in my mailbox beside the payphone in the clubhouse or you can e-mail me at ian.easson@btinternet.com.

In this issue:

Board Members.

Chairman	Brian Cole-Hamilton
Secretary & Caravans	Bruce Marshall
Treasurer/Buildings/Property	Kevin Hook
Vice Chairman and Gliders	Chris Robinson
Chief Flying Instructor & Duty Rosters	Neil McAulay
Tug, WOA and Tech. Officer	Joe Fisher
Winch & Ground equipment	Douglas Tait
Safety Officer	Neil Irving
Cadets	Bob Jones
Membership Comms, Office re-orgs and Publicity.	Ian Easson

CFI Notes

You will probably know by now that I have handed over the CFI's role to Neil McAuley as of 1st January. It's been 3 years since I took up the CFI's mantle and it's been a great experience, certainly one that I'll never forget. I have very mixed feelings about giving up the role, its a great privilege to be the CFI of the SGU but its also a lot of very hard work. When Vic handed over the responsibility to me he told me "no matter how much you do as CFI its never enough" and he was absolutely spot on with that.

I would particularly like to thank the all of the instructors and the board of the SGU who have given me their support through my time as CFI. The job could not have been done without them.

I have now joined that ever-growing band of ex-CFIs and my plans are to do some flying for myself especially some cross country flying. I also plan to revive the SGU cadet scheme and I think with a bit of help from the board and the club as a whole it can be got going again.

Finally I wish Neil every success, I'm sure he'll be a great CFI!

Bob Jones

The Safety Officer's Bit

Medical Standards

All members should have received a letter about the BGA's new medical standards, and a form to fill in. **Please fill this in, and return it to the club**. The club is required by the BGA to track members' medical status – if we do not know what your medical status is (and for more than half our members we don't know what their date of birth is!), then we cannot do this. If we cannot establish your medical status we cannot let you fly.

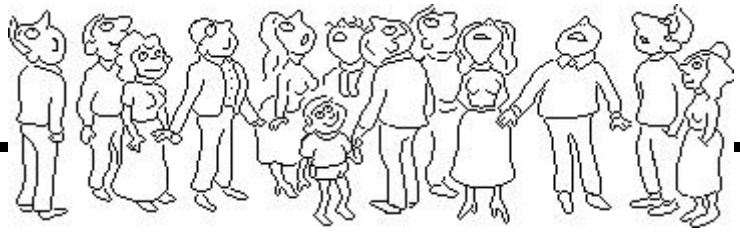
Some further points:

- No-one who is currently fit to fly solo, should have a problem meeting the new medical standard. If you are fit to drive a car, you are fit to fly a glider.
- The requirement is for the pilot to make a medical declaration, which the GP countersigns. This is not the same as a medical – it may not even require an examination.
- All club members completed a self-declaration when they joined the club. This remains valid until the first renewal interval. The renewal intervals are 45, 50, 55, 60, 65 and annually thereafter. This includes pre-solo pilots.
- All new members will need to complete a medical declaration before flying solo.

I appreciate the hassle of this, and thank you all for your co-operation.

Currency and the privileges of cards

The weather has been even more miserable than normal for this time of year. Consequently quite a few of you may be feeling a bit rusty. The club rules for pilot's currency and check flights are on the next page:



Card	Currency
White (post solo)	Need a daily check flight
Red	Need a check flight after every 10 solos, and a briefing before every flight from an instructor.
Yellow	Need a check flight after every month without flying, at least once a year, and a daily briefing from an instructor.
Green	Need a check flight after two months without flying.

If you are flying outside these restrictions and have an accident, it is entirely your own fault.

Airspace

A lot of work has gone on behind the scenes recently to try and preserve our access to local airspace. Apart from myself, John Williams, Bob Jones, Glenn Douglas of the SGA, Roger Coote, Bruce Cooper and Carr Withall at the BGA have all been working on our behalf.

It is very important we all obey the rules regarding airspace. Even if you are local soaring there are 5 areas likely to affect you. These are:

- The Edinburgh CTR
- The Scottish TMA
- Airway P600
- Airway B226
- The Glenrothes ATZ

If you are unclear about any of these, please get a briefing from an instructor before you fly.

Also could pilots making class D airspace crossings please fill in the class D airspace crossing form. If Scottish air traffic is being obstructive about access to class D airspace I would very much like to know.

- I can be contacted at the club on most weekends, or via email at Neil_Irving@bigfoot.com

Neil Irving

Information Meeting

The clubhouse was packed to capacity for the Information Meeting held on Saturday 4th January 2003 at 1600 hrs.

The Chairman, Brian Cole-Hamilton, welcomed the members, and reviewed the progress which had been made towards the goals set out in the five-year plan, which had covered the period 1998 to 2002. Most major objectives had been achieved, except that membership had risen by only 10% instead of the planned 40%, and that a replacement clubhouse was now not considered financially possible in the foreseeable future. He indicated that a new long term plan, which will cover the next ten years, is now under development, and the intention is to present it to the membership at an information meeting in November 2003. Key elements of the new plan will include the replacement of the existing winch in 2005/2006, the appointment of a full-time instructor, and the early provision of a new hangar, which is becoming urgent due to the deterioration of the existing building and the uneconomical cost of repairs.

Hangar Project

Kevin Hook then explained the logic behind the location and design of the new building - plans for which have been on display in the clubhouse for the last few months. It will be possible to remove any glider from the hangar without moving any other one, and it is hoped that the utilisation of club aircraft will thus be significantly improved. The incidence of hangar damage should also be reduced. He also reported that the take-up of spaces by private owners has been good, enabling the construction to be increase to the maximum possible size of 20 bays. The cost of the entire project is estimated at £120K, of which the SGU contribution will be £70K. A grant application was being prepared, but grant aid is thought to be unlikely and is not essential to the funding of the project. Construction is envisaged during spring 2003, with demolition of the old hangar during the following winter.

The general concept of the project was favourably received, but various members expressed concern about the proposed tensioned fabric doors, on grounds of durability,

security and resistance to vandalism. John Galloway asked if any steps had been taken to reduce condensation, and was informed that the roof design had been revised to incorporate anti-condensation measures. Other members objected to the plan to demolish the old hangar, and urged its retention. The Chairman confirmed that all comments and criticisms made at the meeting would be considered by the Board.

[At a Board Meeting held on Sunday 5th January, a decision was taken to proceed with the project, but in view of the member's reservations on the door design, the architect will be instructed to incorporate steel sliding doors, at an estimated additional cost of £15 - £17K.]

New BGA Medical Requirements

The Safety Officer, Neil Irving, explained the new requirements, which start to become effective on 1st March 2003. Medical standards for solo pilots are the same as the DVLA standards for car drivers, while instructors will have to be fit to the DVLA standard for light trucks. It was explained that each pilot will be required to self-declare that he/she is fit to the appropriate standard, and that his/her G.P. is only required to certify that the declaration is, to the best of his knowledge, correct. No medical examination should be required, and the cost to the pilot should be about £12. Members expressed concern that G.P.s may not be familiar with the requirements, and it was pointed out that guidance notes are available beside the medical forms in the clubhouse information centre. The requirements are also the same as those for the new NPPL.

Young Person's Protection Policy

The Chairman explained the legal obligation to take steps to ensure that young persons may participate in club activities without risk of abuse, and pointed out that instances of abuse had already occurred elsewhere in the gliding movement. An S.G.C. policy document is now ready for publication, and all members will receive copies of a Code of Behaviour and Guidance Notes along with the forthcoming A.G.M. documentation.

Glider Retreival on the Airfield

Douglas Tait gave a review of the equipment currently available for winch cable and glider retrieval. He demonstrated that, although the capital expenditure for second-hand vehicles is low, the running costs are considerable, and it is not therefore economically feasible to consider any additions to the existing fleet of four vehicles.

He therefore recommends replacing of one vehicle at the end of 2003 and another in 2005, with future plans depending on whether a retrieve winch system is then purchased. After a review of the various types of vehicle on the market, he concluded that, to obtain the benefits of standardisation, all future purchases should be diesel Land-Rovers fitted with low ground-pressure tyres. Jim O'Donnell offered assistance in identifying competitive sources of supply, and this was accepted by Doug.

BGA Communications Officer

Brian Cole-Hamilton introduced Keith Auchterlonie to the meeting. Keith is now a member of the SGC, and he gave a short overview of his work, which involves both communication between the BGA and the club membership, and various initiatives to increase awareness by the general public of gliding as a sporting and leisure activity.

SLMG Instruction

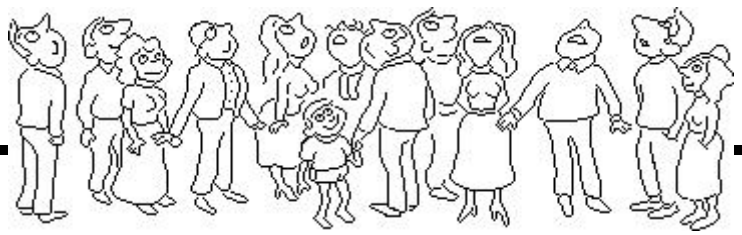
George Ross pointed out that the new NPPL regulations now make it very simple for glider pilots to obtain motor-glider licenses. A show of hands confirmed that a sizeable proportion of the membership would be interested in this type of conversion. George explained that Portmoak is now approved for SLMG NPPL instruction, and the Falke now has the appropriate insurance cover. He intends to obtain the appropriate instructor ratings, and would also like to use motor gliders to provide some aspects of normal glider pilot training. George's presentation concluded the meeting, which closed at 1810 hrs.

Bruce Marshall

Uni News

1st - 3rd November: Sam attempts Diamond distance at Feshie Bridge

In a unique attempt at trying to get her diamond distance, while at Feshie Bridge, Sam was caught trying to hide a data logger in her tent (set up the night before).



Nobody understood what her cunning plan was until later that night, when, in gale force conditions Sam and Andy's tents tried to take off. Andy (who failed to anticipate Sam's plan) had the following to say: *"Well, clearly this was an unanticipated move on the part of Sam. She's obviously really going for her badges now that she's newly solo and I think some of the older veterans of the club should be worried at this level of commitment"*

Upon discovering what Sam was trying to do, it emerges that other members of the club, including: Alan Boyd, Andrew Bates, Tim Sands and Dave Allan attempted to foil Sam's trickery by weighing her tent down with tyres, bricks, more tyres and wheels that were scattered around the airfield. Rumour has it that Sam had previously been able to incapacitate Gordon Watson, Andrew Gray and Peter Williams, all of whom had been seen flying earlier that day. Sam's tent poles were discovered to be severely bent by the morning. This reporter is unsure of when Sam might next attempt a Diamond distance, but one thing is for certain...she cannot be allowed to continue these cunning plans to get her diamond badge. Sam was unavailable for comment on this story.

Easter Week at Portmoak Sat 29 March to Sun 6th April

Easter wouldn't be Easter without a uni gliding week at Portmoak. So, for the fourth year running, we'll be doing it again! Everyone is welcome, more information will follow nearer the time. Email gliding.club@ed.ac.uk for details.

Inter University Task Week 2003

IUTW 2003 will be hosted by Birmingham Uni, probably at Snitterfield.

The gliding club fly every weekend, weather permitting, if you want to go flying, come along to our meetings Wednesdays at the Blind Poet, 8 p.m., email us at gliding.club@ed.ac.uk, or phone one of the committee. The first meeting of autumn term will be on October the 2nd. You can check out our web site, which has lots of interesting stuff: http://www.eusu.ed.ac.uk/clubs/gliding//

Coaching Corner – Trimming

Frequently, when checking pilots, I'll ask them to release the stick and fly "hands-off". The resulting change in attitude and speed is often quite remarkable. The reason for this fluctuation is that the glider wasn't being flown in a trimmed-out condition. Or in other words the pilot was flying the glider with a certain amount of stick force present to obtain a particular attitude/speed.

To be able to fly a glider within respectable speed limits, you must be able to trim the glider for all aspects of flight situations and conditions.

Continuous turning when thermalling with the glider out of trim is both wearing on the pilot as he tries to keep speed under control, and also leads to reduced safety as he keeps watching his air speed indicator. Inevitably, the stick forces present will prevent the pilot from turning accurately and almost certainly cause him to lose his thermal.

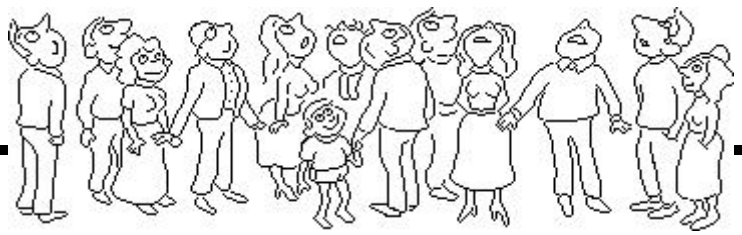
The ability to trim the glider quickly for all aspects of flight, whether hill or thermal soaring to flying wings level in the circuit will lead to more accurate and relaxed flying.

Just to refresh people's minds on how to trim a glider, I've included the following passage.

Say we were flying at 50 knots and wish to increase speed to 60 knots. Firstly, we lower the nose of the glider and hold a new attitude and wait for the speed to settle. Of this is 60 knots then fine, if not reselect attitude and again wait for the speed to settle. Once we have 60 knots registered on the ASI, feel the forces at the stick to hold this attitude. In this case, the forces will be forward. Now move the trim lever forward just enough to remove this force. If successful, the glider will now be in trim flying "hands-off" with the speed remaining constant.

When slowing down, the reverse sequence will take place. A desired speed is chosen, the nose of the glider is raised and a new attitude held, speed allowed to settle, stick force recognised (this time it's backward pressure) and removed by moving the trim lever back. Once again, hands off stick to confirm.

For beginners, trimming can often be a very frustrating and time consuming exercise to master. Persevere, the rewards are great.



It's only by continually practising that trimming will come naturally, as it should. Try to always have the glider in trim at an attitude or speed suitable for the flight conditions. This applies to pundits as well as ab-initios alike. Whether flying fast between wave bars or just in the circuit. A glider in trim means you are in control, a glider out of trim means it's in control.
So are you in control? If in doubt, next time you are fling, just let go of the stick. See what I mean!

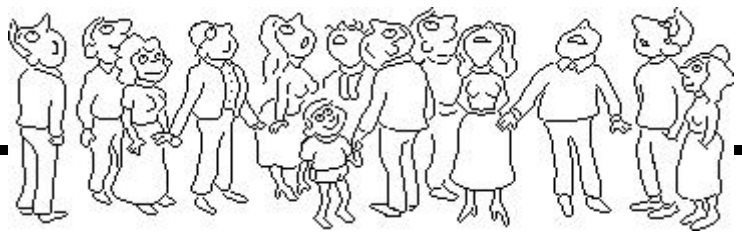
Frank Smith

Young Persons Protection

The following letter is being sent to all SGU members:

Many young people visit each year and are taught to glide at Portmoak. This may be through our own cadet scheme or as a one-off lesson. Or maybe a child of a member or non-member is just visiting our site.
Members and instructors often get to know individual youngsters quite well, they form trusting relationships, and as a result they are in a unique situation to see significant changes in behaviour which may indicate abuse. Additionally, they are an adult with whom young people can share such concerns. We have a duty to react to such concerns.
Regrettably in today's litigious society there are occasions within clubs and societies where child abuse is alleged or suspected. To meet current legislation and BGA recommendations, the Scottish Gliding Union Ltd. is treating this matter with the seriousness it requires. As a result we have created a Child Protection Policy to safeguard the welfare of children and all others involved in its activities and protect them from physical, sexual and emotional harm.
Additionally, your board has to be seen to have taken every reasonable step and precaution to ensure the protection of children and the Club generally and its members, against any false accusation of Child Abuse.
Your board strongly recommends that everyone should become familiar with the contents of our Child Protection Policy.
It is the responsibility of each adult to ensure that his or her behaviour is appropriate at all times.
To give positive guidance, our Young Persons Protection Policy Code of Behaviour attached to this letter (*11 pages, on the club notice-board – Ed.*) outlines the requirements for all adults in the club. It is essential for all adults to follow this Code of Behaviour whether they work with children, young people or adults. The Code also contains the steps to take if abuse is alleged or suspected.
The Scottish Gliding Union is not an investigative agency. If there is an allegation or suspicion of abuse then this must be reported immediately. At all times a young person's welfare is paramount. Swift reporting will enable the correct authority to give advice and take appropriate action.
As most adults at Portmoak have contact or are with young people at some point, everyone will be issued with this letter and Code of Behaviour.
Those having particular contact with young people (e.g. Instructors), will, for their own protection, have to be in possession of a positive certificate of vetting from "Disclosure Scotland", the body set up by government to provide such clearance. The Club will bear the cost, if any, of this procedure.
All Instructors, Staff and Board Members will be required to sign a copy of our Young Persons Protection Policy. This and vetting disclosures will be held securely under prescribed conditions to ensure confidentiality.
These procedures are put in place not to discourage keen pilots but to ensure the well being of all young people and make sure that people who may abuse children do not get the opportunity to do so at the Scottish Gliding Centre.
If you have any thoughts or concerns please discuss them with the, Chairman, any Board member or our Child Protection Officer, Fiona Scougall.

B. M. Cole-Hamilton
Chairman
For the Board of the Scottish Gliding Union Ltd.



Strathclyde University Flight Test Course 2002

I have been very fortunate that the Heads of the Department of Mechanical Engineering at the University of Strathclyde have always been very keen to promote CPD (Continuing Professional Development) for their staff. However, I was a little surprised when my suggestion that learning to fly would improve my teaching of flight mechanics and aerodynamics was well received. It was with their support that I finally flew solo at Portmoak in 2001 and took the wealth of knowledge that I gained from learning to fly into the lecture room where it now adds a new dimension to the classes I teach. My tortuous route to solo was recounted in "A long Days Journey into Flight", Portmoak Press, Jan 2002.

During my flight training, towards the end when I could fly and talk at the same time, I had a number of conversations with George Ross, in the back. We discussed how our students might benefit from flight experience in a K21 at Portmoak. At that time I was in the process of implementing a new course, Aero-Mechanical Engineering, which was to be accredited as an Aeronautical Engineering degree by the Royal Aeronautical Society. Part of the accreditation requirement for this degree was some form of flight experience and flight test. There are currently 20 Aero Eng courses in the UK and over 75% of these have their flight test/experience provided by the Flight Test Laboratory at Cranfield University. The course they provide consists of a number of flights in an instrumented Jetstream with the students in the rear taking data from LCD displays in the back of the seat in front. I participated in this course as an undergraduate back in the 80s and thought then, as now, that there was considerable scope for improvement and the time in the air could be better spent.

Strathclyde University is extremely active in the ERASMUS and SOCRATES schemes and has exchanged a large number of students with universities in Germany. During these exchanges my attention has been drawn to the excellent work, on sailplane design and manufacture, carried out by the AKAFliegs, (Academic Flying groups). These groups are voluntary and membership is not a prerequisite of the German Aeronautical Engineering degrees. However their influence may been seen in the fact that the sailplane manufacture industry in Germany is the world leader with 90% of the sailplanes designed and built there. They also provide a focus for undergraduate and postgraduate project work. The success of the AKAFliegs and the possibility that the simplicity of a sailplane would lend itself to analysis made the development of a course, based around sailplanes, an attractive proposition.

I discussed my ideas with George Ross and Kevin Hook and, as they were both very supportive, I approached the board to see if the SGU would help. The board agreed to let me run a trial course so I buckled down to write a syllabus.

The Syllabus is loosely based around the types of testing undertaken in the Cranfield Jetstream. However, the limited flight instruments available in the K21s restricted the test possibilities. But, even with these limitations, a comprehensive course was developed. The trial course was run at the beginning of September 2002, over three days, with four of our fourth year Mechanical Engineering with Aeronautics students as guinea pigs.

Day 1

We arrived early on Monday morning and, after a quick coffee were given a safety briefing by John Northern as one of the holiday courses was running in parallel on the site. This covered general airfield safety and how to handle the aircraft. When this was complete we proceeded to the hanger and extracted the aircraft we were to use for the day. At the aircraft the students were instructed in: Fitting of Parachute, Use of Parachute, Protection of canopy (wind, misuse of DV panel), Harness and quick release, Canopy release handle, Adjustment of rudder pedals, Cable hooks, Cable release, Flight Instruments, Flight controls, Check for ballast requirements.

This pre-flight briefing was so that, when the instructor and tug pilot (George Ross and Ian Dandie) arrived, we could commence flying straight away.

The Weather on the first day of the course was ideal for test flying, zero cloud and zero wind, a flat calm day, so a decision was made to start flying as soon as possible in case

flying conditions changed over the next couple of days. The aircraft was towed to the launch point and the flying, aero tows to 4000', commenced.

Flight 1: Demonstration of aircraft controls,

The purpose of the first flight was to demonstrate the aircraft controls and instruments to the student and get them used to flying the aircraft before the more rigorous exercises commenced. The effects of deflecting the rudder, elevator, ailerons and trimmer were demonstrated and then the students were allowed to fly the aircraft; attempting to control heading, airspeed and co-ordinated turns. They were also introduced to the effect of reducing the airspeed too much – the stall. Each flight lasted about 30 minutes as some attempts at soaring were made.

Flight 2: The stall

The second flight's purpose was to investigate the stall and stall recovery.

Mushing stall – the aircraft speed was allowed to reduce gradually and the indications of the stall; buffet, increased rate of sink, reduction in aileron effectiveness and decrease in wind noise were demonstrated. The changing effect of the rudder as the stall was approached (as the rudder is deflected the aircraft rolls) was demonstrated. The possibility of a wing dropping at the stall creating the possibility of a spin was also discussed.

Steep stall – from level flight the aircraft was pulled into a steep climb and the speed allowed to decay. When the aircraft now stalls the low airspeed causes the tailplane and elevator to lose their effectiveness and the nose drops. As the nose drops the elevator is still ineffective and this was demonstrated.

Accelerated stall – to show that the aircraft can stall at any speed, the aircraft was established in a 2g, 60°, banked turn and the speed reduced until the stall was approached.

Flight data – During the flight the students recorded the indicated air speed (IAS) at which the aircraft stalled in level flight and the airspeed at which the aircraft stalled in the 2g turn. If the load factor was not exactly 2 they recorded the actual g for post flight analysis

By the end of day one we had carried out all of the introduction flights and two students had investigated the stall. Ideally the students should have calculated the stall speeds pre-flight but it was considered that the flying program should be flexible to accommodate possible changes in the weather.

I took a dual flight at the end of day one to check my calculations for flight 4 which indicated that the phugoid oscillation was divergent! I thought this unlikely but thought I had better check that this was not the case – plus I would get a flight in as watching everyone else fly was getting me down. I was surprised to find that, with the cg forward, the phugoids stick fixed and stick free were neutrally stable and my calculations were not too far out!

Day 2

Up bright and early and into the briefing room at 9 o'clock to do some sums. The pilots would arrive at 11:30 to start flying at midday so there was a lot of work to be done.

Task1: the students calculated the gross mass of their aircraft and, given the wing area from the a/c handbook and the C_L-vs-α plots for the wing sections calculated the IAS for the stall of the aircraft in straight and level flight and the 2g turn. This data was then compared to the actual values from the flights of the previous day. The calculations produced a result within 1kt (typically 37kts) of the stall speed for the aircraft in level flight and within about 5kts of the measured stall in the 2g turn. Post flight they recalculated the accelerated stall speed for the actual g they pulled and got better results

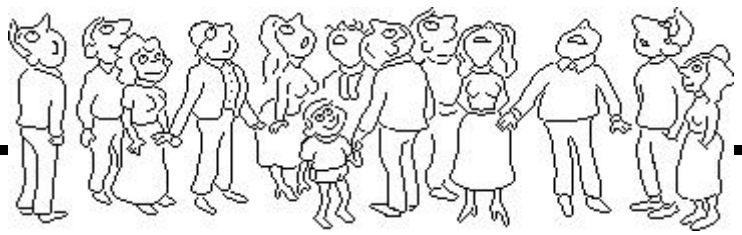
Task 2: The students were asked to calculate the drag coefficient of the aircraft;

$$C_D = C_{D_o} + kC_L^2$$

where C_{D_o} is the parasite drag and k is the induced drag coefficient. Working from very limited information and using analytical and empirical equations and ESDU data sheets. the students calculated these values.

Typically the drag coefficient was estimated as

$$C_D = 0.0096 + 0.0208C_L^2$$



Using an ESDU data sheet the effect of deploying the airbrakes was also calculated as;

$$C_D = 0.0241 + 0.0208 C_L^2$$

Note that the effect on increasing the induced drag coefficient was assumed to be negligible and was ignored. With this data the following parameters were calculated (the values are typical of those calculated);

IAS for minimum sink rate (max endurance) 40kts
Minimum sink rate 120 ft/min
IAS for minimum glide angle (max range) 52 kts
Sink rate 60kts full airbrake 350 ft/min

It was noted that the sink rate with full airbrake was low but as, we could flight test, we could find out whether or not the result was valid.

Flying started again at midday with the last two "stall flights" followed by the performance flights.

Flight 3: Aircraft performance,

The aircraft was towed to 4000' and then flown at a number of constant airspeeds. At these airspeeds the IAS and rate of sink were recorded. With the ideal flight conditions it was possible to record up to four different IAS and VSI readings. The airbrakes were then fully deployed and rate of sink and IAS recorded for two airspeeds. It was found that the VSI went off scale (>1000 ft/min) at airspeeds above 60 kts and 900 ft/min recorded at 60 kts – indicating that something was wrong with the theoretical estimate!

On completion of the a/c performance flights, two dynamic stability flights were completed as the Met forecast for Wednesday was not favourable for the afternoon.

Day 3

The poor forecast for the afternoon caused us to start flying early and, after some difficulty getting the tug started we started flying about 11 o'clock with the weather beginning to close in. The final flight was to investigate the dynamic stability of the aircraft.

Flight 4: Static and Dynamic Stability,

The students had demonstrated the short period oscillation, the spiral divergence, and the phugoid oscillation. The aircraft was then placed into four phugoid oscillations with initial conditions of 60kts IAS 10^o and 30^o pitch angle stick fixed and stick free. During each phugoid the student recorded the maximum and minimum IAS and made a subjective assessment of whether or not the oscillation was damped. At the end of the flight, if there was sufficient height the student had the opportunity to request either more instruction in the handling of the aircraft or aerobatics (most chose aerobatics). Because the course was not compulsory for these students and they had volunteered for the course. I rewarded those who requested with a 15-minute flight, off the winch, to experience some ridge soaring.

By 1 am on day three all flying was complete and we retired to the briefing room for some post flight analysis and a debrief on the course in general.

The performance flight data was analysed and the data produced was, typically;

Drag coefficient C_{Do}=0.016, k=0.0018
IAS min sink 41 kts
Minimum sink rate 110 ft/minute

Analysis of Schleicher's own polar gives C_{Do}=0.011, k=0.0.021

The data for the airbrake was significantly in error because the ESDU data sheet only calculates the drag increment for a single airbrake – we have two. I'll need to correct that for the next course and include the effect of change in the lift distribution.

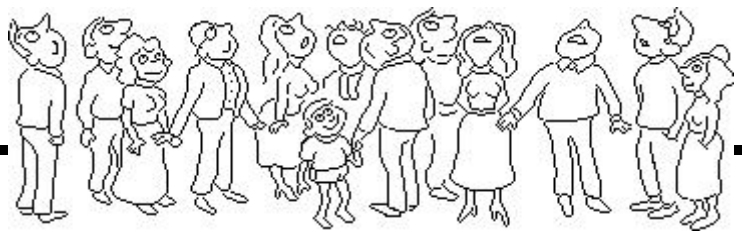
When all the performance analysis was complete there was just time to have a debrief about the flying and a discussion about the course.

Conclusion

The course met, if not surpassed, all expectations. The students found the course to be an educational experience as well as a lot of fun. The flying and theoretical work complemented each other and reinforced the students' knowledge of flight mechanics and aerodynamics.

The cost per student was below what we would expect to pay Cranfield for an equivalent course (please don't tell Kevin or the board).

It was also decided that the course should be run for Aero-Mech students at the end of their second year. During their 3rd year they have the large design project and by the end of the third year the



educational value is reduced.
The course still requires development in a number of ways:
The instruments used were the standard flight instruments within the aircraft and their state of calibration was unknown. The VSI is not a very accurate instrument to determine rate of sink. Recording the time to descend 100ft is probably a better method. The use of electronic barometers to record altitude during the performance and dynamic stability flight should be investigated as well as GPS. Also, the possibility of measuring elevator position so that the a/c neutral point can be determined needs to be investigate.
The theoretical work should be carried out pre-course as the time available on site was limited and it would be better to utilise this time for post rather than pre flight analysis.
The performance measurement became rather repetitive as each aircraft was tested several times. It might be preferable, for the performance estimation, to use the DG505 which has removable wing-tips, and therefore the aspect ratio can be varied and the effect of AR on induced drag investigated. Also the variable centre of gravity in the DG could be used during the dynamic stability flights.
Aeronautical Engineering is an extremely popular course and the numbers of students that we would like to put through the course could be quite high. If I can get my hours up I would love to get up to instructor standard so that I can help out in the air as well as on the ground. But, until then, we rely on the goodwill of the club to provide instructors and tug pilots. Care needs to be exercised in the way that the course is integrated into the running of the SGC so that it does not interfere with club members flying. Experience from the trial course shows that, as we only use aero-tow, we do not interfere with flying off the winch and, because the tug is available, the holiday course and club members have easy access to the tug. The Board and the U of S are currently discussing how we can develop this course to the advantage of both the SGU and the U of S.
I have also found that the gliding club could offer a wealth of possibilities for undergraduate projects. I currently have a fourth year student modelling the wind flows over Bishop Hill with computational fluid dynamics. This should indicate the regions of best lift for different wind speeds and direction. When this is complete he will then look at the flows off Benarty in a south-westerly to see how the wind flow over the airfield is effected by the curlover and, hopefully, show the problems that could be encountered during launch and landing. I would like to put his results into Portmoak Press (I've already allocated the space *Ed.*) and on the web towards the middle of next year. I would also like the student to fly the ridge to see if his results are correct. So if there is a willing volunteer out there please let me know.
There are tremendous benefits to both the SGU and U of S if we can work together. For us the academic value is undeniable. For the club it will provide a useful income stream, increase the utilisation of the tug, create good publicity and introduce a large number of aviation-minded people to the possibility of gliding as a hobby.
None of this would have been possible without the hard work and enthusiasm of Ian Dandie, Kevin Hook and George Ross – Thanks.
If anyone is interested in seeing the students in action they can be found on my homepages at http://homepages.strath.ac.uk/~clcs20/

Matt Stickland

Club News

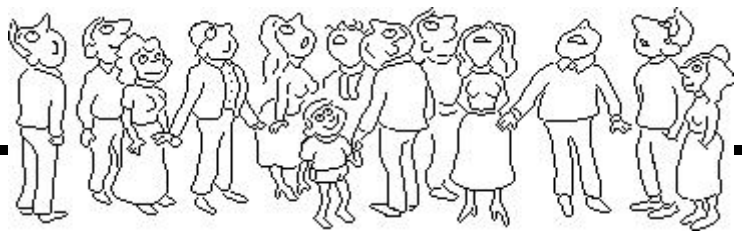
The Board would like to join all SGU members in wishing Bob Jones all the best on his "retirement" from CFI. Bob has worked hard over the past three years and he has now handed over the reins to Neil McAuley, with George Ross as Deputy CFI.

2002 Awards

A number of pilots won trophies last year and I thought it would be a good idea to provide, in addition to the names of the winners, a summary of what these trophies are about – to encourage more people to "go for it".

The Thorburn Two-Seater Trophy

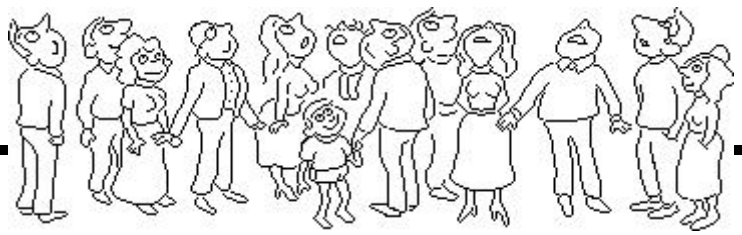
For the longest handicapped distance flight in any two-seater – John and David Williams in K21 HPW on 11th May. PCS-MVN o/r 68km handicapped distance.



The Boyle Altitude Trophy
For the greatest gain of height – Kevin Hook in DG400(17) on 27th June, height gain of 22,900ft.
The 100km Triangle Trophy
For the fastest handicapped speed 100km (28%) triangle (but less than 125km) – Dave Thompson in Std Cirrus 650 on 13th July. PCS-MVN-STI-PCS, 103km actual distance, handicapped speed 57km/h.
The Andy Penswick Trophy
For the longest handicapped distance in a club glider – Chris Robinson in Junior FUS on 27th June. PCS-FES l/o 107km actual, 129km handicapped distance.
The Parker Distance Trophy
For the longest distance flight originating from Portmoak – Dave Clempson on 27th June. PCS-TAR-BTR-OBA-PCS, 617.9km actual distance at 82km/h handicapped speed.
The Docherty Handicapped Distance Trophy
For the longest handicapped distance flight originating from Portmoak -–Dave Clempson, same flight as previous, 657km handicapped distance.
The Sutherland Out and Return Trophy
For the farthest handicapped distance turn point achieved from Portmoak for a flight originating and ending at Portmoak -–Dave Clempson (same flight as previous). Furthest TP is TAR, which is 133.2km from PCS. Dave was also runner up for this trophy when he turned at OBA which is 130.9km away.
The Lomond Trophy
For the longest 28% triangular declared flight achieved from Portmoak – Dave Thompson on 5th May, 11th May and again on 13th July. PCS-MVN-STI-PCS, 103km actual and 115km handicapped at handicapped speeds of 43km/h, 51km/h and 57km/h respectively.
The McClay Championship Trophy
For the winner of the Open Club Ladder competition – Kevin Hook, with 10582 points.
The Peter Copeland Trophy
For the winner of the Weekend Club ladder competition – Kevin Hook with 6095 points.
The "Hot Wings" Trophy
For the winner of the "Hot Wings" ladder competition – Kevin Hook with 2406 points.
The Junior Ladder Trophy
For the winner of the junior ladder competition – Guy Hall with 1410 points in a single flight on 27th June in Pirat P19. PCS-EDZ-BDO-BCN l/o near home, 306km of a declared 316km task. Handicapped distance of 392km and handicapped speed of 66km/h.

There are still some tickets available for our Burns Supper night - 22nd February 2003.
Tickets for all events can be obtained from the club.
Calling all talented (or not) club members. You have a chance to show everyone how good you really are, at the Burns Supper in February. If you are keen to help out with Burns' songs, recitations or speaking, please contact the famous Douglas Tait at the club.
We have invited the Vintage Gliding Club to visit Portmoak during the weekend of 5th & 6th July. This promises to be a colourful weekend with lots of vintage gliders taking to the air over Portmoak. More details will be issued in due course.
Our club member database is completed but new entries can be added at any time by sending your e-mail addresses to:
office@scottishglidingcentre.co.uk

The Scottish Tourist Board Activity Centre Award
Three Star Rating
The following are extracts from our report:
General Comments
The Scottish Gliding Union is situated at Portmoak Airfield beside Loch Leven at Kinross. As well as full club membership, visitors can access the club and facilities with trial lessons and courses varying from half-day to five-days. There is a clubhouse with toilet and catering facilities and a specially adapted glider for disabled flyers.
Particular Strengths
- *The promotional leaflet and brochure give a very good level of background information including contact details and location map. This could be improved if produced on a ⅓ A4 size which would rack more easily with other tourist attraction leaflets.*
- *There is an excellent system of road signs*



that direct visitors to the airfield and there is good clear signage at the entrance to the airfield

- *The grounds around the clubhouse are very well tended and create a very good first impression.*
- *The welcome from all members of staff and volunteers was excellent. All necessary documentation was dealt with professionally but in a relaxed manner. Generally throughout the day there was an excellent air of infectious enthusiasm from all at the airfield.*
- *Very good verbal orientation was given for the whole site and the activity to be taken was introduced with a tour of the airfield and facilities.*
- *Instruction was clear and an explanation of the glider, launching and landing was given before the flight, including an explanation of the aircraft and its maintenance procedures.*
- *The instructor was excellent with a calm and patient manner that remained completely unruffled at all times in the air and on the ground.*
- *The opportunity to take control even on the first flight is very exciting and in fact the whole experience of flying in the glider in general is extremely enjoyable. Though care must be taken, as it should be pointed out that my cheek muscles were aching from smiling by the end of the day!*
- *The "Walking on Air" initiative is excellent and is something that could possibly be promoted further through contacts with the media.*
- *The clubroom catering is very good with a tasty range of meals and snacks served in a friendly chatty manner.*
- *The toilets are fresh and clean and well maintained with good provision for disabled visitors.*

Holiday Courses for 2003

1	27th April – 3rd May
2	4th May – 10th May
3	11th May – 17th May
4	18th May – 24th May
5	25th May – 31st May
6	1st June – 7th June
7	8th June – 14th June
8	15th June – 21st June
9	22nd June – 28th June
10	29th June – 5th July
11	6th July – 12th July
12	13th July – 19th July
13	20th July – 26th July
14	27th July – 2nd August
15	3rd August – 9th August
16	10th August – 16th August
17	17th August – 23rd August
18	24th August 30th August
19	31st August – 6th September
20	7th September – 13th September
21	14th September – 20th September
22	21st September – 27th September

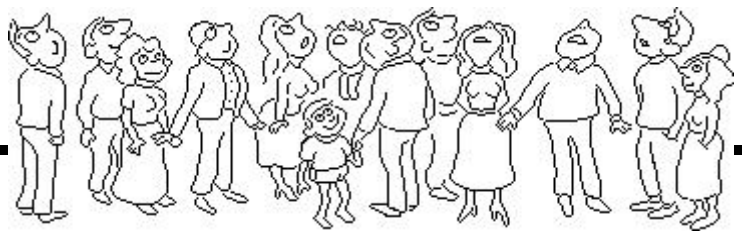
To book any of these courses, contact Irene at the club.

The following is a summary of a letter received from Wing Commander CS Cunningham RAF, Central Gliding School:

Air Cadet Advanced Gliding Training Detachment to Portmoak

I am writing to thank you for the assistance received by my staff during our advanced gliding training detachment to Portmoak in the summer. Although this detachment was not blessed with the good weather that we have enjoyed in previous years, and so qualifications were down on last year, we still managed nearly 1600 launches and 250 flying hours. All the cadets and staff gained a great deal from the experience. I certainly enjoyed my Silver height claim flight; I'm not so sure that "enjoyed" is the correct word for my five-hour endurance flight! The training opportunities available to the students were excellent and I am most grateful that you were able to accommodate us once again.

Please pass on my thanks to Steve for his calm professionalism in the kitchen and to Irene for her expertise in the office. Those two are without doubt a great asset to your organisation, indeed our detachments would not be anywhere as easy to manage without their assistance. We also appreciated Sandra and

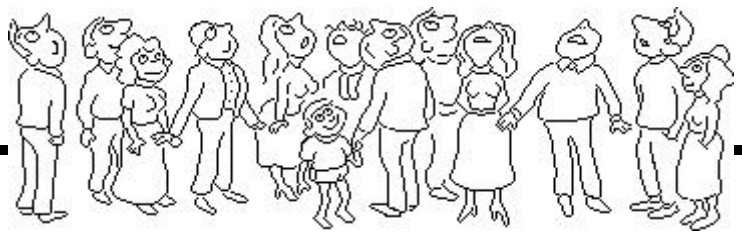


John's efforts in welcoming our staff, particularly the airmen drivers. Throughout the detachment, the airfield operation worked well – thanks to the efforts of the members and instructors. Our special thanks go to course instructor John and winch-driver Steve who ensured that we were able to derive the maximum from operating times and areas available. We appreciated the use of the recently re-seeded grass areas, which made operating in a North Westerly wind far easier for our relatively inexperienced students.
Looking forward to the 2003 season.

CS Cunningham

Your Choice

Had a good season? No? Well I'm not surprised, the weather has been very disappointing. It's even more frustrating when on those very days that look good, things don't go to plan.
Our gliding site at Portmoak is blessed with two very good hills for soaring. Both are easily reachable from a winch launch. With Benarty and the Bishop hill in such close proximity, and with the size of the field we fly from, it could be argued that we have one of the finest club sites anywhere in the UK. Folk come on pilgrimages from afar to sample the delights of flying with us. And yet it's these very hills that let us down on occasions. How so, you may ask? Well, I'll tell you. Let me recount the happenings on two Saturdays back in October 2002. The forecast for both of these days was giving the wind as being NW and light to moderate in strength. Showers were on the cards for more northerly areas, but in the east a dry day was being predicted.
I don't know about you, but when I hear NW winds in any forecast my brain immediately locks on to one thing – WAVE!
On both the Saturdays in question, a quick peak through the curtains early in the morning confirmed the presence of lenticulars in the brightening sky. As I drove over the Forth Bridge from Edinburgh, the sky to the north looked very promising.
Hours later, I watched pilots struggle to get into the wave. On one Saturday they started from Benarty, the other it was from Bishop. One or two did manage to climb away, but the majority was firmly pinned at 1400 – 1600ft. Why was this? Simple! A wave bar sitting up-wind was creating a steady torrent of down-going air, sufficient to squash the hill lift above a certain height, and certainly preventing a dash forward to gain the front edge of the wave-bar.
During one of these Saturdays, changing conditions meant that pilots even had to land as the hill lift was completely eradicated by the wave.
The hills that normally provide an aerial staircase to the sky were now trapping those pilots at lower levels.
So, what's the answer? Again, very simple. Take an aerotow! This way, you can get dropped straight into the wave and enjoy the immense pleasure of soaring high. This eliminates the frustration of trying, and failing, to get into the wave, together with avoiding crowded airspace on the hill. Another very important factor is time. If one does struggle into the wave from a winch launch, it's usually at the expense of time. This commodity is a factor which has to be considered if (a) other members of your syndicate wish to fly, (b) you are flying a club glider, (c) there's a possibility of the wave collapsing, or (d) flying in winter months with its shortage of daylight hours.
Of course, the above solution does pose an interesting question - are you current on aerotow? If not, then I would suggest a couple of rides with an instructor. Staying current on aerotow can pay handsome dividends. I know the cost of the launch comes into the equation, but what price missing out on exceptionally good wave days. Just a piece of advice here – if you do aerotow, don't release too early, or too low. If in doubt, ask to be waved off by the tug pilot. Our guys are all pundits and will happily drop you in the right spot.
Of course, there are days when the transition from hill to wave is achieved relatively easily and without tears. You might ask me how I know when to aerotow or winch launch. Well, first of all you should watch the performance of those gliders being launched by winch and see if they are rapidly gaining height above the normal hill lift. Or you could use radio and ascertain if the wave is being contacted from the hill.
The duty instructor will give useful advice if asked and should always be consulted by pilots of lesser experience -



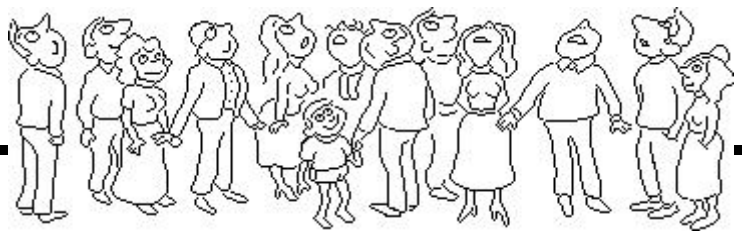
before they go wave flying – to obtain a full briefing for that particular flight.
So don't miss out on some great flying when the weather relents, at least consider both options. But in the end – it's your choice!

Frank Smith

Another Day, Another Diamond

(Written 05/11/98 and revised June 2002)

Wednesday 4th November Adi and I arrived mid-morning to find that we are first and second on the flying list for the Juniors and its a wave day! Adi wants Silver Distance and I am hoping for Diamond Height. So Adi (kind fellow that he is) suggests that I take FUS, with Oxygen and that he takes HRG, with the leaky regulator.
It didn't look too promising as Kevin Hook had just landed back twice, having failed to soar both Bishop and Benarty.
A week ago I'd taken a day's holiday to attempt a 500k and Diamond height. Although airborne for 9hrs the furthest I got was 20k and the highest 7,000ft. A visitor got to 19,000ft and Richard and Nevile Alcoat managed to get out to Crianlarich and back (180k). Not my day, would today be my day? With help from Fred Joynes, we got both gliders to the launch point in time to see Tony Brown get away from Benarty in wave; shortly followed by Kevin Hook.
I launched next just after 12:00, followed by Adi ten minutes latter. Unfortunately the wave was out of sync with the hill and we were both stuck at 1,200ft. Adi abandoned and took a re-light to Bishop. Ian Trotter was about to launch when I advised him that Benarty wasn't working.
Adi and Ian both quickly became established on Bishop and pressed forward from West Lomond in wave.
I stuck to Benarty hoping to pick up the secondary wave. Then the hill stopped working completely; it left me contemplating the cost of a re-light. (I am not Scots but living here for twenty years I may be becoming "careful" with money).
At 1,300ft, in sink, the track into wind to reach Bishop will take a lot of luck. So I dial 3 kts on the McReady ring and advise the launch point that its going to be a dirty dive for Bishop or the start of a right hand circuit into North Field and go for it.
55-60kts then up to 75kts, past the winch at 1,000ft, just before the South West corner of the hill at 750ft I set a decision point. If its going up on the hill at 600ft I will turn left and start a pass of the hill, if there is no lift then its a right (final) turn for a landing direct into North field. At the hill there is lift, not much but enough for one pass over the SW face, I'm at 600ft so there is no way I'm going close to the buttress guarding the entrance to the bowl with a NW wind, there would be curl-over. So turn early, head South, keep the speed up to 50kts below hill top height, a good right turn in lift and I've made 20ft. The next circuit 50ft, the next 100ft, then whoosh 8kts up to 1000ft and safe to enter the bowl. The rest would be easy.
I press North along the face of Bishop climbing rapidly straight into wave. Ian and Adi are well established at 9,000ft somewhere between West and East Lomond.
I had declared a simple out and return to Kippen (100k) in an attempt at the second part of the cross country diploma, but having wasted an hour on Benarty it is obviously impossible to get round at the required average speed of 60kph. Time for plan "B"; where could I get Diamond height? Well not to the East where Ian and Adi were flying, both had jumped bars and were heading across the Tay; they reported maximum altitudes of about 12,000ft. What of the West, well as its a weekday *P600* is operational (and I still have no R/T licence – *obtained the following year*), but I'm at 4,000ft in lift 12kts up and the bar looks solid all the way across the airway. To the NW the sky is booming. No time to be faint hearted, I turn West along the bar and speed-up. A few knots below $V_{ne,}$ and still climbing, I move North slightly out of the lift. With a ground speed of over 80kts I cut diagonally across, and just below, the airway and I'm clear in 12 minutes.
A quick climb to 12,000ft, jump forward a bar, climb and jump again, another climb and jump. This bar is not working! There must be some sort of interference from an upper system. I cannot go over the next bar, but from the shadow I can see a very good clean edge to the cloud. Unfortunately I'm only at 10,000ft not high



enough to jump over the next bar. A decision is required, either fall back to the bar behind and gain sufficient height to jump over two bars or press forward under the next bar. Today the height loss for one jump has been about 2,000ft, so I would need at least 4,000ft above the next bar; as the cloud tops are about 10,000ft that makes a minimum altitude of 14,000ft. I don't think the lift in the bar behind will go that high. I gamble and press forward flying through a slight gap in the trailing edge of the next bar and then under the cloud. It is cold, dark, and the base extends down much further than I'd estimated. Flying at max rough air speed to keep out of the cloud and then way past the cloud out into the blue and suddenly into lift. I'm back at Crieff, where on my 300k goal day I arrived at 2,500ft, today its 6,500ft a little more margin and no rotor.

The lift is not bad - 4kts - but it is usually better nearer to Comrie, today isn't an exception. At 14,000ft the lift begins to fall off and its getting very cold. To the NW I can see Ben Lawers on the edge of Loch Tay, this is a good spot for Diamond height, but it is late - nearly 15:00 - and last landing is just before 17:00. To get to Ben Lawers would require at least three jumps into wind and three climbs all on Oxygen and I have only 1/3rd of the bottle remaining. It is safer to leave Ben Lawers for another day. A little to the SW I can see an upper system very high, probably in the Stratosphere, the clouds in the lower system appear to be better formed and may produce more lift, so I slide across still climbing slowly. Parked in front of the hot spot I press forward and the lift improves. Passing 16,000ft I switch the Oxygen regulator to 4 l/min.

Time for a quick calculation of how long it will take to reach 18,200ft climbing at less than 1kt; more than 30 minutes and I've just got sufficient Oxygen to get there and get back down. (Why 18,200ft? On a wave day a typical Portmoak winch launch is 1,600ft and the dive on the way to Bishop will give a low point of 1,000ft. A 5,000m height gain is about 16,400ft, this makes 17,400ft and our altimeter is supposed to be accurate to within 2%, 400ft so double it 800ft, this gives a target height of 18,200ft easy! But to make it easier in flight I've a card marked "Diamond =18,200ft" stuck next to the altimeter).

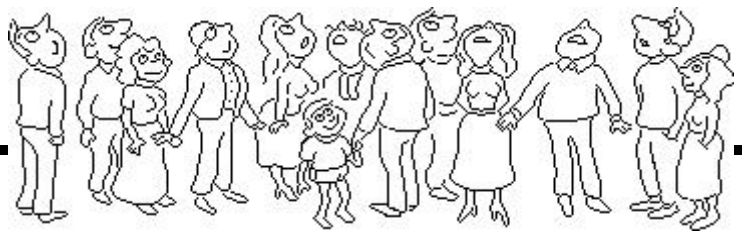
Luck is on my side. The lift increases to 4kts and I quickly climb to 17,500ft where the lift falls back to 1kt. Gradually the needle on the altimeter creeps up to 18,400ft, that's got to be good enough, it had better be because the lift has dropped off to zero and its past 15:30; time to go home.

A nice co-ordinated turn to the right, that's odd, I can't feel my feet, I expected that but something else feels wrong - my boots have frozen to the rudder pedals! Pressing very hard with my toes I lever my heels free. Latter Kevin Hook told me that it was -28°C at 18,000ft. *(Now I have fleece- lined boots and heated in-soles).*

The canopy is covered with small ice crystals and the sun is beginning to be hidden by the distant clouds, the next problem is how to prevent the canopy from completely icing over as the glider descends through wetter levels. I also have to consider that my track back to Portmoak is down-wind and down-sun. There is of course the small matter of 13,500ft to lose before I can cross under the airway. Pulling the airbrakes would work but if they ice up I may not be able to close them, which may result in, at best, an embarrassing land out. At altitude the indicated speed (IAS) is well below the true airspeed (TAS) and glider speed limits relate to TAS. So I choose to letdown in sinking air, heading NW into the sun at 80kts (IAS) - over max rough air speed -but well below V_{ne}. This keeps the canopy clear but I'm heading the wrong way; so I execute a 40 degree banked turn to the right and "thermal" back down wind to my starting point having descended 500ft. Repeating this pattern I gradually get down to 5,000ft and approach the airway.

I'm in lift, its the same bar I used earlier; cruising at 60kts to keep my sink rate around 100ft/min, with a 85kt ground speed I'm across in less than 10 minutes. A few high-speed turns to dump height (I'm too cold for aerobatics) then back to the hill to re-calibrate my height judgement.

Gerry Marshal calls down wind, he is flying Z10 - a DG-202 that he, Fred Joynes and Tony Brown have just bought. It is a 18m flapped machine which should be good for Scottish conditions. I congratulate him on his (first) landing. They have all had a flight today and are impressed with their new toy. I ask if one of



the syndicate will be the O.O. for my claim. Tony Brown volunteers.
At 2,000ft in lift I check that the airbrakes haven't frozen shut, they are OK. Out to high key a good circuit and land in the South field.
I'm back on the ground, although I can't feel it through my frozen feet.
And another handshake from Hamish.
Adi has landed out at Melrose and has got his Silver distance. We must bring each other luck.
I hope so, as Adi has suggested that we team-up and buy an Open Jantar or something similar. *(Adi bought a DG400 self-launching motor glider and has gone to Australia).* A piece of a Libelle would also be nice too. Steve Nutly has just bought a Std Jantar 2, a bit of a "Lead Sled" - a good wave machine. *(I now have a ¼ share in a Jantar).* Maybe (in lieu of a lottery win) the answer is like Platypus to have shares in several machines. I wonder if the BGA would let me have the letters MON, TUS, WED, THU, FRI, SAT and SUN? There must be a market for stickers that read "My other glider is an ASH25". Is it the affect of altitude or has my sense of humour thawed out? (*You said it - Ed*).
A complete set of badges (Bronze, Silver, Gold and three Diamonds) in one season would be good, if only to see my three Diamonds recorded in S&G with the caveat "(In Scotland)".
To complete a 500k task in a Junior is a bit of a challenge and realistically its too late in the year. Still, its not quite the end of the wave season (4th November) and there is this 500k task and on the right day it might just be possible, as Hamish says "Its all to be done boys".
Four years later and I still want a 500k flight for diamond distance, but I've had a lot of fun trying.

Chris Robinson

Rotas for Duty Pilots

I am pleased to announce that we have welcomed seven or eight more pilots to the duty rota. Eligibility being current members who are solo with more than ten hours flying in the last 12 months. Instructors and those with other responsibilities or good excuses are excluded.

I would like to add my thanks to Sally Pearce for her sterling efforts over a number of years with the Duty Pilot rotas. This is a difficult job and often goes without thanks.

Pete Benbow

Duty Pilots

Sat	4th Jan	W. Grieve
Sun	5th Jan	S. Cervantes
Sat	11th Jan	D. Hanlon
Sun	12th Jan	P. Sharphouse
Sat	18th Jan	A. Mochar
Sun	19th Jan	C. MacAlpine
Sat	25th Jan	A. Taylor
Sun	26th Jan	P. Benbow
Sat	1st Feb	P. Clayton
Sun	2nd Feb	D. Higson
Sat	8th Feb	J. Miller
Sun	9th Feb	S. Hartley
Sat	15th Feb	K. Cowie
Sun	16th Feb	A. McGirr
Sat	22nd Feb	B. Smallman
Sun	23rd Feb	H. Eagleton
Sat	1st Mar	F. Reilly
Sun	2nd Mar	R. Mackie
Sat	8th Mar	D. Thompson
Sun	9th Mar	G. Packer
Sat	15th Mar	A. Young
Sun	16th Mar	K. Byrne
Sat	22nd Mar	I. Norman
Sun	23rd Mar	D. Hyde
Sat	29th Mar	B. Adamson
Sun	30th Mar	R. Birch
Sat	5th Apr	J. McGouldrick
Sun	6th Apr	S. Kennedy
Sat	12th Apr	A. Rougvie
Sun	13th Apr	S. Buchan
Sat	19th Apr	I. Armstrong
Sun	20th Apr	D. Allan
Sat	26th Apr	S. Pearce
Sun	27th Apr	E. Wilson

Duty Instructor rotas are notified to instructors by Neil McAuley.
If unable to attend, PLEASE arrange a swap with someone on the list and update the list on the notice board.