Brisbane Valley Flyer

July - 2016

Brisbane Valley Sport Aviation Club Inc

www.wattsbridge.com.au
www.bvsac.org.au

Watts Bridge Memorial Airfield, Cressbrook-Caboonbah Road, Toogoolawah, Q'ld 4313.

A Pitts S-2B doing aero's at Watts Bridge.

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Don't get Dis-Gusted

By Rob Knight

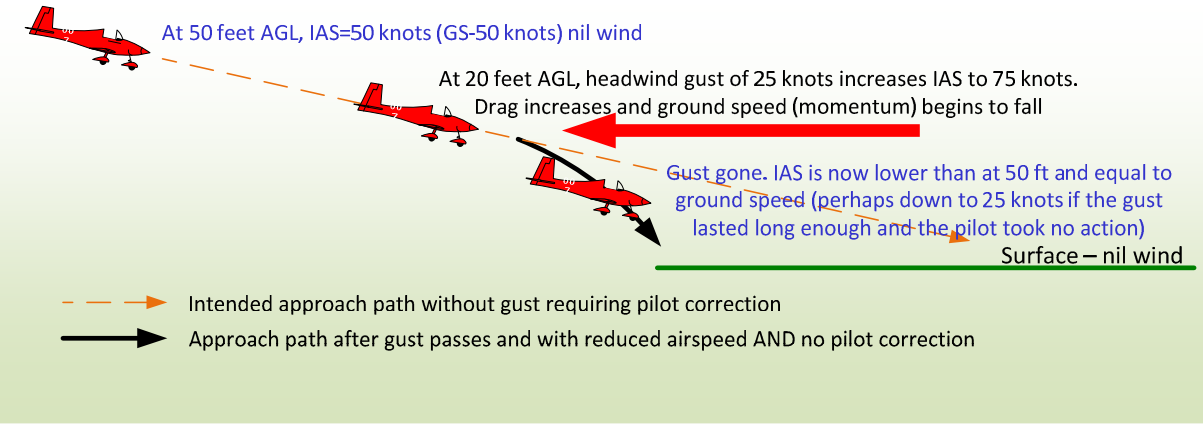
Do you get dis-gusted? Do gusty winds give you grief on your approaches? Let's have a look at what is happening to your aeroplane and its airspeed when wind gusts abound and you are trying to slide down the perfect approach path.

Once again, good old Sir Isaac Newton and his laws of motion are to blame. Similar to the issues with wind gradients, gusts cause changes to an aeroplane's IAS that a pilot must either counter until the landing occurs, or the pilot must abort the approach and carry out a go-around. It's a case of the aeroplane having inertia and not being able to change its momentum in an instant. As also happens in the case of wind gradients, a change in wind speed will reflect in the aeroplane's airspeed after being factored by the aeroplane mass and its state of motion.

The fundamental cause of the issues lie in the transiency of gusts, they appear and disappear so quickly. This is a good thing otherwise a good gust of headwind could see an aeroplane robbed of its entire airspeed and with the passing of the gust, no airspeed left at all.

Let's look at this in the simplest scenario. An aeroplane is on approach at 50 knots in a dead calm (nil wind condition). The ground speed is steady at 50 knots to match the airspeed when a sudden 25 knot gust of headwind strikes the aeroplane's nose. Accepting that a 600 kg aeroplane could be generating 480 kg of lift as it descends on its approach and if we assume it has a lift/drag ratio of 10:1, it will be suffering 48 kg of drag. Remembering that aerodynamic drag rises as the square of the airspeed change, a 25 knot gust is half the value of the current speed and will therefore double the drag. So, with no input from the pilot, the aeroplane's drag increases from 48 kg to 96 kg. The pilot may notice a tightening of the shoulder straps as the ASI needle swings up the dial and the increasing drag causes the aeroplane's momentum to diminish as the groundspeed falls.

In other words, the effect of the wind gust is to temporarily raise the airspeed which, in turn, temporarily increases the drag. The increased drag will then reduce the newly risen airspeed and with this reduction will come a reduction in the groundspeed. If the gust lasts long enough, the ground speed can be reduced by the full strength of the gust – in this case by 25 knots – to (60-25=) 35 knots. This could easily leave the aeroplane below its stall speed.



However, it is seldom that gusts just appear in times of calm air and, unlike squalls, gusts rarely last long enough for their full strength to take effect. But even half gust strength can cause anxiety as

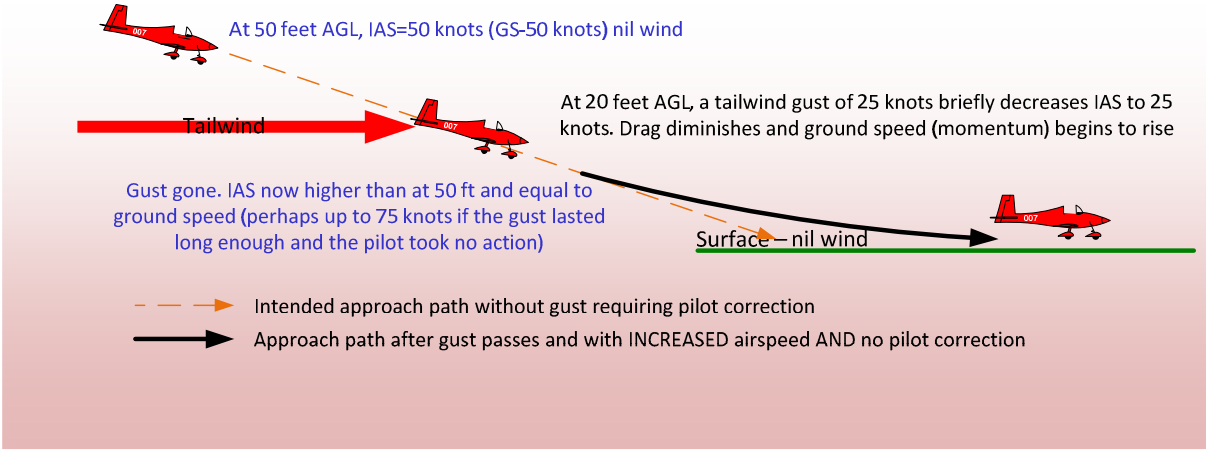
they drive the ASI needle around the dial and magically take away the ground speed and lead an unwary pilot into a short landing, short of the field, that is.

A crosswind will reduce the effect of gusts. A quick look at the crosswind table factors shows that an increasing angle between the aeroplane's heading and the wind direction provides a reducing headwind component and so a reducing effect on the groundspeed. With less headwind component the airspeed rise is less so, in turn drag rise is less and less ground speed and thus momentum is lost.

° off	Headwind	Crosswind
0	1.0	0.00
10	0.98	0.17
20	0.94	0.34
30	0.87	0.5
40	0.77	0.64
45	0.71	0.71
50	0.64	0.77
60	0.5	0.87
70	0.34	0.94
80	0.17	0.98
90	0.00	1.0

As the table on the right depicts, a wind blowing at 60° to the aircraft's nose will provide a headwind component of only half (0.5) of the wind speed value. Thus a 20 knot wind blowing at 60° to the nose will only provide a 10 knot headwind effect. However, this is only a partial relief to the pilot as the crosswind component quickly makes for directional and even geographic challenges.

A tail wind condition will have the reverse effect. A gust "up the tail" whilst on finals will see a temporary fall in airspeed because gusts will temporarily reduce the effective IAS and thus reduce the drag. The reduction in drag will cause the groundspeed to increase as the aeroplane's mass overcomes its inertia and, when the gust passes, the IAS will reflect this increased speed on the ASI reading. To look at this process closely, the tail wind gust reduces the drag so, when the aeroplane overcomes its inertia, it will accelerate and increase its ground speed. When the gust has gone, the aircraft is left holding a higher groundspeed which then reflects in a higher airspeed.



Unless the pilot does something about it as soon as the gust passes and the airspeed rises past the desired value, it can cause considerable difficulty fitting into the runway length available as the float and the landing distances quickly become excessive. Considering tailwind gusts experience during and after landing, as aerodynamic drag assists with braking after landing, any reduction in drag caused by a tailwind component or condition will make more work for the braking system to land in the same length.

So what can/should a pilot do about gusts when they manifests appear on approach and landing? Conventionally, in light aircraft, pilots control airspeed with attitude (elevator) and approach angle with power (throttle) and this is no exception. With a headwind condition, first the airspeed rises as the gust hits the aeroplane, and then, after the gust passes, the airspeed begins to fall. During the span of these occurrences the pilot should be adjusting the attitude to maintain airspeed and simultaneously adjusting the throttle to maintain the desired approach path. These corrections, if done at the beginning of the change, are seldom substantial control movements and over-control is easily achieved. The secret is in keeping the aeroplane doing what is required, not having to return it from a substantial deviation in either airspeed or approach angle. If substantial changes appear necessary it would be wise to go around and make another approach. I don't recall any aircraft accident occurring because it went around.

Exactly the same process needs to be followed with a tailwind gust except the airspeed first falls and then rises – the opposite of the headwind condition. The pilot's response is the same – to control airspeed with attitude (elevator) and the approach angle with the throttle (power).

Headwind gusts on take-off are also an issue. Imagine that you are charging down the runway almost ready to lift off. Suddenly a headwind gust adds 20 knots onto your airspeed. Your aeroplane leaps into the air and all looks good until the gust passes when the aeroplane may have insufficient speed to remain airborne. It hangs on the prop as it stalls and settles onto the ground again. If the stall occurs high enough and the pilot exercises insufficient pitch control, a wing drop stall is easily possible.

Tailwind gusts on take-off may reduce the IAS at any point including just on lift-off, Sure, when the gust has passed, the airspeed will be returned to the same value (or even a little higher), but until that happens a loss of lift and potential stall are both possible. "Take-off with a tailwind", now sounds a bit like a Mother-in-Law's advice, doesn't it!

Another factor to consider is the frequency of the gusts. A single gust may be easy to handle but a series of gusts can hammer the ultimate speed reduction to very uncomfortable levels unless quickly countered by the pilot. Also bear in mind that a gusting wind that is also swinging in direction varies its effect and the closer to being a direct headwind the more severe will be that effect.

So what can a pilot do to avoid the hazards of wind gusts? One is to approach with a little extra airspeed when the windsock is flicking like a horses tail, and the other to simply be alert and fly the aeroplane. If the hand holding the stick adjusts the attitude to control the airspeed, and the hand holding the throttle adjusts the power to correct the changing approach path, the effects of gusts should be controlled. However, the bottom line remains (as always) - if the pilot is in any way concerned, then a go-around will resolve all the issues: go back and start the procedure from the beginning.

Pilots should ensure that their piloting skills are always up to scratch. For this reason, a few circuits with the local CFI when the wind is having a hissy-fit is always a good investment.

Happy flying

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The e-GO

From the UK's FLYER Magazine.

Thee-Go, designed by aeronautical engineers Giotto Castelli and Tony Bishop, arose out of a design competition nine years ago andlightweight craft is now officially on the market.

The e-Go struts its stuff

Like other personal aircrafts, the e-Go doesn't require a private pilot license to fly in the US, owners need only a light-sport license. However, in the United Kingdom where the e-Go Aeroplane Company is based, the plane is classified as a microlight.

Made mainly of carbon fiber, the e-Go weighs a little more than 136 kg, and because its wings and canard can be easily removed, there's no need to park it in a hangar. You can just park it in your garage.

According to the website, the e-Go runs on unleaded fuel and gets about 65 miles to the gallon when flying at 90 knots. It has a range of about 330 miles cruising.

What is an SSDR? That's short for a *Single-Seat DeRegulated* aircraft – deregulated by the UK's CAA – with a maximum all-up weight of <300kg. The requirements are easy to understand and being deregulated means freedom from worrying about certification, so exactly how difficult can it be to build one?

The e-Go in flight

This year's UK FLYER Live Show at Telford showcased a wide array of SSDRs, and among them was e-Go, the UK-based project that was featured in the UK's FLYER magazine in July 2013. The plan had been to deliver the

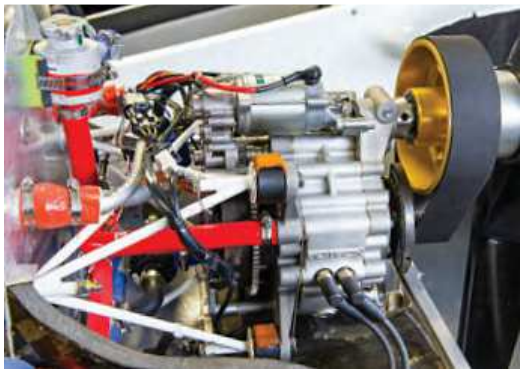
first customer aircraft in June 2016 but alas - the launch customer's hangar still has an e-Go shaped hole in it. After the Telford show, Malcolm Bird, e-Go's Chairman and Acting CEO, invited us to visit and talk through the future, the challenges and the opportunities.

For anyone who's unaware, the e-Go won the LAA's design competition in 2007. The e-Go is a canard design utilising a carbon fibre sandwich construction that keeps weight to a minimum. Powered by a Wankel pusher engine, it cruises somewhere between 80kt and 90kt while sipping fuel at a miserly rate. Designed by Giotto Castelli to meet the UK's original 115kg SSDR specification, the goal for the e-Go is to deliver a fantastic and safe flying experience in an ultra-modern package with a negligible running cost.

The prototype first flew in 2013 and has since flown 130 times. The final aerodynamic configuration has now been set and tested, and the prototype continues to be flown while the first customer aircraft is being built. The first delivery is unfortunately running late because of issues surrounding the concept of designing, testing and building such a remarkable first-off aeroplane.

Although the SSDR category doesn't call for any airworthiness standards, testing, handling qualities or much else for that matter, it should be obvious that sewing a couple of sheets to some bamboo isn't the recipe for long life or a successful aeroplane company! To be fair, a simple single-seater shouldn't take an experienced team too long, but there's the rub, the e-Go is anything but simple. Pretty much every major aspect of it is different and different takes time. Then there's the extensive flight-testing programme, led by Keith Dennison FRAeS, Chief Test Pilot of e-Go Aeroplanes. The e-Go will probably be the world's most tested SSDR and as a result the airframe components have seen major changes. Since its first flight, the winglets and rudders have grown, the canard's characteristics have changed, and the braking system (which is also the steering) has had a lot of attention.

The Rotron Wankel engine was initially controlled by a military spec ECU, which would no doubt have passed the Whitehall procurement process, but its development was driven by the needs of a drone's engine rather than a GA pilot's engine. Think full power or idle, but no in-between. Such a characteristic is not useful for sport-flying purposes and ultimately e-Go ended up sourcing and configuring its own ECU (with the blessing of Rotron) which has required a lot of extra testing. It's also meant building an engine test cell.



The Rotron Wankel engine

While all this has been going on, every time the design of a part has been finalised (which thanks to Giotto's drive for perfection sometimes happens more than once) a mould has to be built and tested and the production team have to learn to build the part correctly. The process hasn't always been completely smooth and trouble-free. In one case, after curing the first production wingit was discovered that the pre-preg carbon had failed to adhere correctly to the underlying foam. The wing grew some unintentional ripples and the whole thing was scrap. To resolve the issue and produce wings with all the required characteristics, the team identify the problem and them correct the underlying cause … more time… more delay. However, thanks to all of the testing and specific design

standards that have been used along the way, certification is a very likely possibility, particularly as there's interest from various business customers who see the low operating cost as advantageous for certain kinds of aerial work.

As it is a single seater and no two seat training version is available (yet), there's an online learning portal being developed. The plan is to be able to link an owner's e-Go on the ground to a sim so that they can sit in their actual aeroplane and fly the model on the instrument panel glass cockpit screen. In the future there are plans for a two, three, or even five-seater. An electric e-Go is also being considered.

The team at e-Go has achieved a huge amount raising funds, winning awards, designing, developing, flying, testing and ultimately building aeroplanes. The two immediate and significant challenges are finishing the first customer aeroplane and recruiting a new CEO, but if hard work, persistence and honesty count for anything there'll be a bunch of pilots enjoying their e-Go before too long.

The e-Go has been designed to ensure good ground-handling, even in windy conditions. Giotto achieved this partially by giving the mainplane zero incidence whilst on the ground and this has proved very successful. The aircraft has carried out trials in gusty winds exceeding 20ktand at all points of the compass the aircraft sits solidly and can be taxied around with confidence. This feature also influences the take-off as the mainplane does not help reduce the weight on the undercarriage as the airspeed builds. It is only at rotation when the nose rises that the mainplane has a positive angle of attack and then provides lift such that the aircraft lifts eagerly into the air... which absolutely minimises any concern about prop strike!

The e-Go – a pretty little aeroplane

In the design philosophy it was always intended that the aircraft should operate off short strips including grass and the canard has been specifically engineered to facilitate this. On hard runways the prototype rotates and lifts off in around 120m but this can be longer, around 200- 400m on grass, depending on the length of the grass and the surface condition. For the production aircraft the modified design shifts the main undercarriage forward by 11cm, which makes it much easier for the aircraft to rotate and the take-off distances will be improved.As for landing distances, touching down at around 45kt the aircraft can easily be stopped within 80-100m or so (grass or hard). That's partially because there is so little weight and thus little inertia.

The prototype achieves 650fpm in the climb and cruises level at 83kt. This gives an economical cruise burning around seven litres of fuel per hour. At full throttle, which you can have all day if you want, the prototype cruises at 86 kt.

Because of the additions, changes, and modifications made to the prototype, its drag is certainly higher than will be on the production aeroplane and the expected economical cruise will be close to 90t for the initial production aircraft. Then, with some further engine improvements, it is likely the future cruise will be around 100 knots. The listed Vne is 120 kt on the current design

The fully enclosed trailer tailored for the e-Go

Two variants of the aircraft are immediately planned – the e-Go ande-Go + which are priced atAUD$90,000(+GST) andAUD$108,000 (+GST) respectively. Also note that the aeroplane can also be supplied with a tailor-made trailer.

Why I want to be a pilot

When I grow up I want to be a pilot because it's a fun job and easy to do. That's why there are so many pilots flying around these days.
Pilots don't need much school. They just have to learn to read numbers so they can read their instruments and I guess they should be able to read a road map, too.
Pilots should be brave so they won't get scared if it's foggy and they can't see, or if a wing or motor falls off.
Pilots have to have good eyes to see through the clouds, and they can't be afraid of thunder or lightning because they are much closer to them than we are.
The salary pilots make is another thing I like. They make more money than they know what to do with. This is because most people think that flying a plane is dangerous, except pilots don't because they know how easy it is.
I hope I don't get airsick because I get carsick and if I get airsick, I couldn't be a pilot and then I would have to go to work.

Written by a fifth grade student at Jefferson School, Beaufort, SC.

B.V.S.A.C. FUN FLY POKER RUN 2016

THE EVENT

The Brisbane Valley Sport Aviation Club's Fun Fly Poker Run will be held on Saturday 2nd July 2016.

Starting time is 9:00am and finishing at 2:00pm.

It doesn't matter what you fly– Recreational, Homebuilt, General Aviation, Gyroplanes – we would love to have you join in the fun !!

THE GAME

Fly to any three of the participating airfields, Bradfield, Kilcoy, Gatton Airpark or Mc Carron's Field and collect an envelope which contains a playing card from underneath the primary windsock.

DO NOT OPEN ANY ENVELOPES UNTIL REGISTERING AT THE BVSAC CLUBHOUSE – WATTS BRIDGE.

You can start anywhere you like and go to the airfields of your choice in any order that suits you.

Then just fly on to Watts Bridge Memorial Airfield where you pay your entrance fee of $5.00 and register your hand.

BBQ, Drinks and Snacks will be available all day long.

THE WINNER

The organizers will have drawn two cards at random prior to the start of the game. These cards will complete the five card hands for all players.

The best Poker Hand wins the Trophy for 2016.

THIS IS FUN FLYING AT ITS BEST, SO COME ON AND GIVE IT A GO !!

AIRFIELD LOCATIONS

BRADFIELD	S 27° 25.1' E 152° 24.1'	KILCOY	S 26° 58.2' E 152° 34.0'
GATTON AIRPARK	S 27° 35.4' E 152° 15.4'	MC CARRON'S FIELD	S 27° 05.9' E 152° 36.2'
WATTS BRIDGE	S 27° 05.9' E 152° 27.6'		

If you have any questions : please contact :

Richard Faint
Phone: (07) 5427-0816
Mobile: 0412-317-754
Email: richard@auav.org

FLY-INS Looming

16 July	Dunwich	Straddie breakfast fly-in
22-24 July	Thangool	Thangool Fly-in and Races

Mystery Aircraft (July Issue)

What's this?

Mystery Aircraft (Last Issue)

This image is of a DH71 Tiger Moth. This seemed to confuse a lot of people because they thought that there was only ONE vintage de Havilland aircraft called by this name. Alas – there are two – one a monoplane (as depicted here) and the other the ubiquitous DH82a biplane that has its image is so well known right around the world.

Keeping up with the Play (Test yourself – how good are you, really?)

1. A pilot departs from Watts Bridge airfield with a QNH of 1015 hPa. He has planned for and is experiencing port drift. The QNH at the destination likely to be which of the following?
   A. higher than 1015 hPa.
   B. lower than 1015 hPa.
   C. The QNH could be higher or lower depending on the weather system present.
   D. There is no link between drift and QNH.

2. The angle of incidence on an aeroplane is defined as which of the following?
   A. The angle between the center of pressure and the centre of gravity.
   B. The angle between the wing chord and the relative airflow.
   C. The angle between the wing chord and longitudinal axis of the aircraft.
   D. The angle difference between the wing chord line and the tailplane chord line.

3. From the following options select the correct statement
   A. "P" factor reduces with increasing propeller diameter.
   B. Ground effect is the aircraft wheels being too close to the ground.
   C. Induced drag falls as the aeroplane's airspeed rises.
   D. Aileron drag reduces adverse yaw.

4. Considering an aeroplane in a steady climb……
   A. Aeroplane weight is less than lift.
   B. Aeroplane lift is less than weight.
   C. Aerodynamic drag is equal to thrust.
   D. B and C are both correct.

5. An aeroplane is accelerating when it is:
   A. Taking off.
   B. Whilst banked and is turning in level flight.
   C. When in a descending turn.
   D. A and C are correct but not B
   E. A, B. & C are all correct

ANSWERS: 1. B, 2. C, 3. C, 4. B, 5. E.

If you have any problems with these questions, call me(in the evenings) and let's discuss it! Ed.

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BRISBANE VALLEY SPORT AVIATION CLUB Inc.

MINUTES OF THE 04.06.2016 GENERAL MEETING

MEETING LOCATION:	Watts Bridge Memorial Airfield – BVSAC Clubrooms
MEETING DATE:	4th June 2016
MEETING OPENED:	11:06AM
MEMBERS PRESENT:	11
APOLOGIES:	Mark Purdie, Liz Cooke, Max Bain.
VISITORS:	Gail McKenzie
NEW MEMBERS:	Nil
MINUTES:	May 2016 meeting of the BVSAC Inc. Proposed: Peter Ratcliffe Seconded: David Ratcliffe Acceptance motion carried.
PRESIDENT'S REPORT:	Wayne Petty updated the membership on the progress of the clubroom extensions advising that the Final Inspection by Somerset Council had been passed for the clubroom component. The free-standing pergola / car port has yet to be completed and inspected. Mike Smith, on behalf of all club members, thanked Wayne for his fantastic efforts.
SECRETARY'S REPORT:	Richard Faint detailed the inward and outward correspondence for the month of May. This included emails to members regarding flying events in the district, the distribution of the newsletter and the promotion of the Fun Fly Poker Run. The Gathering of Eagles (GoE) sub-committee has been updated regarding the BVSAC catering activities to be undertaken at the fly-in and the non-use of the club's facilities during the GoE. The planning, approval and promotion of the BVSAC Fun Fly Poker Run has been completed. There have been several emails to and from the hangar customers regarding the vacant position in the club's hangar.
TREASURER'S REPORT:	Priscilla Smith presented the financial statement summary and advised that the BVSAC INGaccount balance is $557.46 and that the BVSAC NAB account balance is $1291.82. Priscilla noted that there is to be a hangarage increase of $5.00 per calendar month for the "grand-father accounts" effective July 1st, the secretary to notify those affected. Priscilla also mentioned that there are still some outstanding reimbursements to be made for clubroom extension materials.
WBMA REPORT:	Peter Freeman reported that the May 29th "Watts 4 Breakfast" mini fly-in enjoyed good support with approximately 30 aircraft attending and over 60 breakfasts served. Peter also reported that the WBMA Treasurer Cheryl Brown had

been successful in obtaining a community grant for the purchase of a cement mixer and a D-Handle brush cutter.

BUSINESS ARISING: Ian Ratcliffe advised that the lock on the club hangar's personnel access door has been changed as requested at the May meeting.

GENERAL BUSINESS: Members present discussed the floor coverings to be used in the clubroom extensions.
The result of the discussions was a motion, placed by Mal McKenzie, seconded by Richard Faint and passed unanimously "That the vinyl material as used in the existing clubroom be carried through to the extension." The need for an expansion gap between the existing building and the extension was discussed.
Members were reminded of the tasks they have undertaken for the catering at the Poker Run:
Sandy Walker: Sausages and onions,
Mike Smith: Bread rolls, butter, sauce,
Richard Faint: Restocking the drinks fridge and generally organizing the event,
Glenda Faint: Soup.
The secretary was tasked to write a letter of thanks to Les Wilson for donating the roller doors for the clubroom extensions.

NEXT MEETING: Membership is reminded that there is no July Meeting due to the Fun Fly Poker Run
The next meeting will be 06.08.2016 in the BVSAC Clubrooms Watts Bridge at 10:00AM

A BBQ lunch will follow the meeting.

MEETING CLOSED: There being no further business, the meeting was declared closed at 11:28AM
A BBQ lunch was held after the meeting.

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For sale

Aircraft for Sale

Bantam B22S in excellent condition with Rotax 582 engine which runs perfectly. Engine and airframe have logged just 124 hours to date. A STOL aircraft, registered. A pretty machine that flies as good as it looks.
Ready to fly away

$15000 (no offers please)

Contact Bert on 0428 735 294

MicroAvionics PELTOR Pro100 headet for sale.

Designed to plug direct into either an ICOM IC-A6E or an IC-A24E ICOM hand held aircraft VHF radio. This means no expensive adapter to use a headset with either of these radios. Each side headphone has its own dedicated volume control

All in good working order.

Any reasonable offer considered

Contact Rob Knight 0400 89 3632