RECREATIONAL FLYER

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The Voice of Canadian Amateur Aircraft Builders $6.95

Rupert Gruen's Pelican

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

from the president's desk

Gary Wolf

WILL CANADA EVER GET LIGHT SPORT?

Leading up to Oshkosh 2004 and the announcement of the US Light Sport regulations, Canadian manufacturers appeared to be in the catbird seat, as they had been manufacturing 1232 pound AULA aircraft for fifteen years, and everyone expected that the US would be adopting our 30 page DS10141 standard for Light Sport. Fortunately for US manufacturers and to the detriment of ours, at their last meeting the US standard was raised to 1320 pounds. Our manufacturers were immediately out in left field. They could build and test aircraft in Canada for the US Light Sport category but they could do this only at the maximum of 1232 pounds. RAA Canada began lobbying Transport Canada and LAMAC (Light Aircraft Manufacturers Association Canada) to set up a "B" category of Advanced Ultralight with weights and limits identical to the US Light Sport. Unfortunately LAMAC had its own agenda to set up a category similar to Advanced Ultralight but with a weight limit of 3900 pounds, and Light Sport would have been a subset of this proposed category. Unfortunately there was scant chance that Transport would have considered this proposal, since LAMAC had never yet stepped up to the plate to police their Advanced Ultralight category in twenty-five years. It took a year for RAA to convince LAMAC to shelve this proposal and focus on the 1320 pound Light Sport category. Transport and the industry could then concentrate on getting the US Light Sport document adopted into our regs. This was pursued through six months of intensive meetings, and the final document was presented and accepted at the January 2007 meeting in Ottawa. The industry reps expected that it might take three months for Transport to review the document and accept it, but how naïve we all were. We had not counted on the lethargy for which Transport has become notorious. Meanwhile our manufacturers sat on the sidelines wondering what to sell, and to whom. Canadians became reluctant to buy Advanced Ultralights when the same money would buy a Light Sport with greater payload.

Our manufacturers had two choices, neither good for Canadians. Zenith had already taken the path of setting up their own manufacturing facility in Missouri, with subassemblies being made at their Midland Ontario plant. Many jobs were exported to the US, but there was little choice if Zenith was going to be a player in the largest boom in aircraft since the ultralight revolution of the late seventies.

Pelican aircraft took another tack –they set up with Kolb aircraft in the US, with Kolb handling final assembly and marketing. Pelican of course had to hand over all engineering documentation to prove compliance of their planes with the ASTM Light Sport standard. Two years later Kolb ceased to distribute Pelicans and they began promoting their own Light Sport which bears a strong resemblance to the Pelican. Ultravia, the Canadian manufacturer of Pelicans closed the doors, with some of the rights going to Kolb, and some going to Ballard Sport Aircraft in Sherbrooke.

In neither case were the Canadian aircraft workforce served well. There were some Advanced UL manufacturers whose products would require a wholesale redesign to meet Light Sport, so they stayed with the Advanced UL category, but this is small change compared to the enormous Light Sport market. European manufacturers meanwhile got their governments to put appropriate regulations into place and they have for the past four years been having a field day selling into the US. As each new European manufacturer announces that it has been accepted for Light Sport by meeting the ASTM standard, RAA has been sending these to Transport as a reminder that our manufacturers are not making any similar announcements.

Awhile ago, when Transport had been sitting on the industry recommendations for 15 months, Mo Simoneau of Transport called RAA to say that he had reservations about using these planes for fight training, and about who would be authorized to perform maintenance. RAA responded that no one had yet been asking for these planes to be used for flight training, and the Light Sport regs had already dealt

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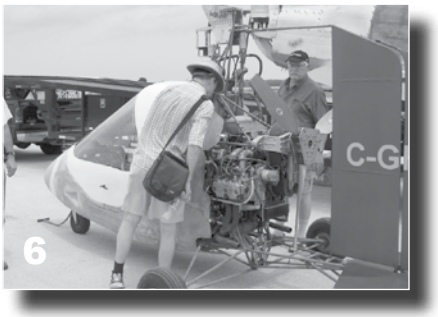

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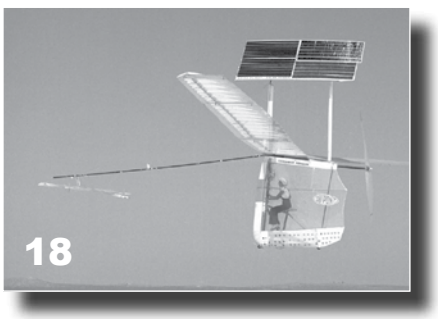

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On the Cover: Rupert Gruen's immaculate Pelican. David Madison Photo.

Canadian Aviation Expo 2008

By Chris Gardiner

Above: The RAA's tent with Barry Haley's lovely Pelican on amphib floats in the foreground. Ed McDiarmid's CH601 was also on hand as an example of the homebuilder's craft.

This year's Canadian Aviation Expo was once again the home of "all things aviation"

for the weekend of June 20-22 at the Oshawa Municipal Airport (CYOO) in Ontario. This year was especially significant as the local Oshawa City Council had just ratified the 25 year plan for the airport guaranteeing that it would remain open and viable for many years to come. A welcome relief for those of us with aircraft in need of a home base on the east side of Toronto as well as many local aviation professionals who earn a living there every day.

RAA Oshawa and RAA National were represented by a small number of keen volunteers as usual who hosted a large tent display of activities and aircraft components under construction. Also showcased was a couple of completed examples of the homebuilder's craft. Two local RAA members Ed McDiarmid and his completed CH601 with a Jaibiru 3300 6 cylinder engine was on hand for all to see and touch. Barry Haley had just installed floats on his Ultravia Pelican 914 and was eager to show off his amazing professional installation and "way cool" paint scheme.

A wing rib building session was organized by Doug Raine, Peter Snaith and Weldon Howell to attract the young kids and keep them occupied building parts they could take home as a souvenir. Composite construction was also demonstrated by Wayne McCarron and Jim Morrison who made several vacuum bagged parts for all to see and learn.

This year's airshow had some top attractions such as Patty Wagstaff , who flew 2 shows daily to the awe of all in attendance in her new Extra 300 aircraft. There were four Harvards in the daily fly past as well as an immaculate Spitfire and Hurricane flown in real warbird style to the amazement of the crowd. All the major aircraft manufacturers were represented such as Cessna, Cirrus and Diamond aircraft as well as a host of aviation suppliers.

Definitely the place to be next year in June 2009 as the annual event continues. Plan your calendars around this event in late June for another great weekend of fun and entertainment.

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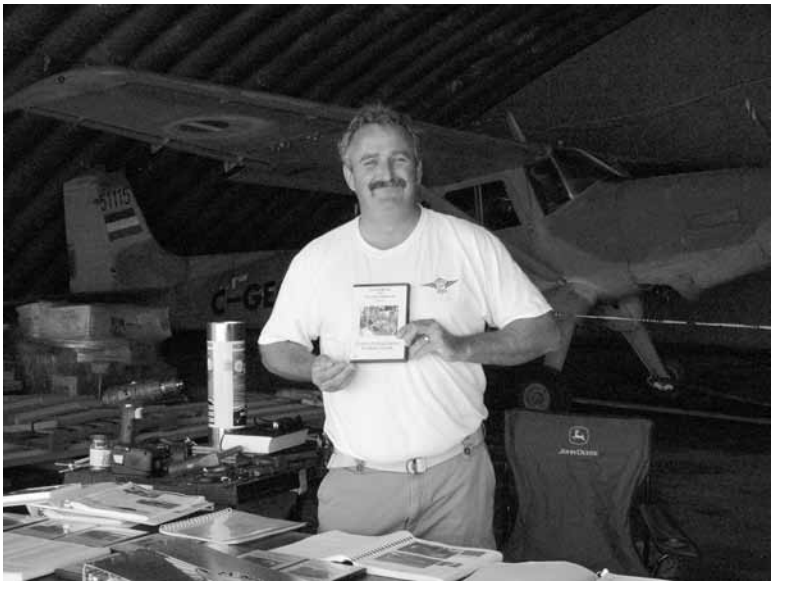
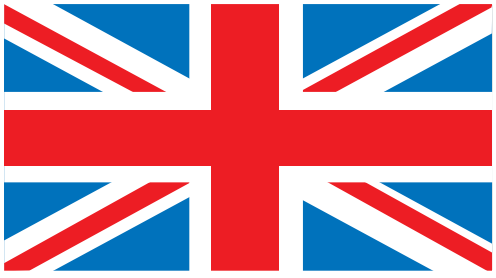


Opposite, top: A beautiful restoration of a Cub by Kevin Elwood of Stayner Ontario;
Keith Weston's Barnett gryocopter always draws a crowd. This year it has a new cowling.
Top, left: Ernie Weightman and compatriot take a coffee break from their barbecuing duties.
Top, right: Mark Townsend shows off his Sheet Metal Techniques DVD. Knowledge is indeed power.
Fighterwerks rep explains the construction of their Spitfire to Paul Turner and his daughter. It looks like an incredible project: the Canadian company will be producing 100 percent scale replicas of the Spitfire MkV. From their website: "The Fighter Werks MKV will share many components that have been painstakingly replicated from the original to retain the flavor of the original fighter while at the same time providing the builder with easily accessible new parts". For more information: www.fighterwerks.com



ONCE MORE OVER THE PUDDLE

ONE THING about a visit to the UK in November is that it is well out of the normal tourist season, and for a really good reason: the British Winter. Why then would I go there in November? The usual aviation events such as fly-ins are done. Snow is not usually a problem but cool days and nights, early darkness and wet cold rains are very real, not to mention home heating that is not taken quite as seriously as it is here. By Bill Tee

WHAT REALLY MADE ME DECIDE was an invitation to from the PFA [now LAA] chief inspector Ken Craigie to attend the PFA [now LAA] inspectors' annual seminar taking place at the PFA headquarters at Turweston Airport, Buckinghamshire.

This all day event was attended by over 100 aircraft inspectors from all over the UK and was a very informative session, both for them and for me.

I had missed my usual annual summer trip to the UK because of illness and had resigned myself to 'no trip in '07'.

This all changed though when I received the invitation.. I was even asked to say a few [from me???] words about things in Canada concerning recreational aviation of the 'amateur build' kind.. Just before morning tea break I had ten minutes to make my pitch, a challenge that I failed to meet by some 50%.

I began by explaining that I was not there to determine right from wrong, but to explain our differences which are oh so numerous.

The most significant item concerns the great degree of responsibility and trust assigned to and accepted by the Canadian amateur aircraft builder.

In Canada the builder is responsible for almost every thing, the choice of aircraft, the integrity of any aircraft that one cares to design himself, the integrity of any aircraft that a person cares to build or modify, the filling out of forms such as the fuel flow test, climb test, weight and balance, annual inspections, welding, flight testing [must have over 100 hrs PIC] etc. These are all legal documents and if you lie on them you leave yourself open to legal action should you get caught making a false statement.

In the United Kingdom the builder of amateur built aircraft is not permitted to make changes or repairs of any consequence without the engineering approval of the LAA engineering department. The weight and balance report and annual inspections and any significant mods must be carried out and signed off by an LAA inspector whose services must be paid for.

A builder is not allowed to flight test his own aircraft unless he is an 'approved' test pilot, regardless of how much time a builder has on type. Even mods to an aircraft require an approved test pilot. although the 'approved' test pilot may have little or no knowledge of the type he is testing. All welding must be done by an 'approved' aircraft welder [read expensive].

What is it that I am trying to say here? It's just that in the UK there is little financial advantage to operating an amateur built aircraft over a type certified aircraft as in Canada.

With all the bureaucratic procedures in effect in the UK is their amateur built aircraft safety record better than ours? I have seen nothing yet that would confirm that.

So much for the alleged reason for my UK visit of last year. Needless to say I filled in the other nine days with many things of an educational and social nature such as visits to Lincolnshire to view a new diesel powered Jodel [Recreational Flyer Jan-Feb '08], Birmingham for SPLASH '07 [Recreational Flyer Mar-Apr '08], Bruntingthorpe to see the only flying Avro Vulcan in the world [it was all locked away] and the Newark Aviation Museum just south of the great cathedral city of Lincoln, not too far from RAF Scampton where the dam busters Lancasters departed from on their daring raid some many years ago.

With all the bureaucratic procedures in effect in the UK is their amateur built aircraft safety record better than ours? I have seen nothing yet that would confirm that.

One item of great interest was a visit to RAF Cranwell, the college where recently another Royal earned his wings. My host for this trip Mike Jackson had tried to set me up for a tour of the Rolls Royce aero engine plant at Hucknall but to no avail. Apparently there is less and less work being done there now with so much being farmed out to foreign countries. So perhaps Cranwell was a better bet. It certainly was fascinating!

ALTHOUGH ESTABLISHED in 1916 as an aviation training base by the Royal Navy Air Service for its aviation personnel it soon became a training base of the Royal Air Force [RAF] in 1918 when the RNAS and the Royal Flying Corps amalgamated to form the RAF.

The corner stone for the present college building was laid in April 1929 with the completion of the building in September 1933.

Used now mostly for advanced training the college operates Beechcraft Kingairs, DH125 Domines and Grob 115 Tutors.

OPPOSITE: Picture of Bill and Mike in front of RAF Cranwell College, November '07. Bill Tee Photo.

One of the many very Impressive sights to be seen on the site was the vast dining room capable of seating over 200 people. At the time I as there it was being set up for a cadet's dinner where they will be judged on their table manners and deportment. Not only must a candidate be proficient at academic subjects but also on their table manners and behaviour. This behaviour must be becoming of an RAF officer so that he does not embarrass himself [and the Crown] in public. Always an officer and a gentleman!

Not only was the best silverware laid out but the chairs were positioned with a gauge to ensure that all were in perfect line. Nothing less than perfection!

Prior to World War 2 only the sons of the very rich attended Cranwell. It was quite expensive to attend Cranwell and this fee was paid by the family of the students as with any other college of university. At the beginning of WW2 this breeding showed in the deportment and attitude of the Battle of Britain pilots but as the war continued and pilots were in short supply almost anyone with the skills could become a pilot regardless of family connections

I asked about any war damage to the college. The answer was that there was none. It appears that there was an unwritten agreement between the Brits and the Germans that 'if you do not bomb ours, we will not bomb yours. Who says that war cannot be civilized!

The Newark Aviation Museum was on the route back to digs in Derbyshire so naturally I had to make another visit here to see what was new.

This facility is based on old Winthorpe WW2 bomber airfield that was home to the Nottingham and Newark Gliding Club until recently when they were kicked off to provide space for an expanded show ground or some mundane thing as that..

This museum consists of 68 aeroplanes and helicopters along with a number of cockpits of significant aircraft.. A few of the aircraft include a Vulcan [that flew in], Avro Anson, Canberra [4 and 3 cockpits], Handley Page Hastings, meteor, Canadian built T33 and a Flying Flea among many others with both piston and jet engines.. The original buildings are of wood construction but on adjacent property are a couple of new all metal buildings

I even learned of a UK resident who not too long ago had imported from Canada some Lancaster parts, many of which the Toronto Aerospace Museum are in need of for Lanc FM104 presently under restoration at Downsview.

Needless to say all are quite full. This place is well worth the visit to the aviation enthusiast.. Until one actually flies over the site a person has no idea just how big an airfield this was when it hosted Lancasters and Halifaxes during WW2. From the air the severed thresholds of the runways are spread at considerable distances from the central core. Modern progress makes islands of these still black runway buttons. Ah! The history!

A LITTLE CLOSER to my base of operations the next day was an interesting visit to 'The Silk Mill' museum. in the Midland city of Derby. Originally a silk mill of Mr. John Lombe, it is said to be the world's first modern factory when it employed a revolutionary 300 people in one place. Built on an island in the Derwent River in 1702 it continued as silk mill until 1908. In 1974 it became a museum that contains historic Rolls Royce piston and jet aero engines and various railway equipment among other industrial items harking back to the industrial revolution.

I was pleased to note that the chap on the counter was quite familiar with the Avro Arrow and its demise. I was even more pleased when this person shared my sentiment about said demise.

Another touch of home was at the display of a RR Derwent jet engine with pictures not only of the Gloucester Meteor in which it was originally used but also pictures of our very own Avro C102 Jetliner which used four of them in its final configuration. The Jetliner was originally designed for 2 larger engines which were not available in time.

Much time was spent relaxing in an all singing all dancing diesel locomotive simulator that took us on a self driven railway journey through the centre of England.

The next day another 2 hour trip north took us to see the diesel Jodel formerly mentioned.

This was followed within a few days by a visit to SPLASH at Birmingham also mentioned previously.

Not one to let grass grow under my feet it we were soon off to Bruntingthorpe Airfield to see the only airworthy Avro Vulcan in the world. Unfortunately it was locked away and the people with the keys were not present.. No Vulcan, but we did get a tour of a

Super Guppy with its huge 7.8 metre cabin height and floor width of 4 metres providing a volume of 1100 cubic metres. This particular aircraft built on a Boeing Stratocruiser airframe first flew on August 24 1970 and arrived in France in 1971 to carry bulky aircraft parts around Europe until replaced by the even larger Beluga based on the Airbus 300 frame. The Super Guppy was powered by four Allison turboprop engines of 4680 SHP each which propelled the giant 77,5T [45,8 T empty] craft at 460 Km/h over a distance of 900 Km.

This was followed by cockpit tours of several smaller aircraft such as English Electric Lightening [I was completely lost in there], Canberra [this one much more familiar] and a Hawker Hunter almost complete aircraft in which they are installing an engine to enable them to taxi it about.

Apart from the interesting hardware on site I was warmly welcomed by a fine group of men holding out in an old caravan nestled among trees in one corner of the airfield. These overall uniformed gentleman plied me with tea and biscuits and much interesting conversation regarding their activity of salvaging, restoring, maintaining and dismantling old neglected aircraft. I even learned of a UK resident who not too long ago had imported from Canada some Lancaster parts, many of which the Toronto Aerospace Museum are in need of for Lanc FM104 presently under restoration at Downsview.

Last but not least by a long shot was the PFA inspector's seminar at Turweston as mentioned early in this article.

This event took place in a brightly lit room on the second floor of the LAA headquarters building and looked out on the lightly used airfield with a pastoral pond just outside the windows where diving ducks and swimming swans could be casually observed.

My turn to speak came right before the morning tea break which I am guilty of encroaching on. However judging by the satisfying degree of applause that my talk received I think that I was forgiven [or was it because I had shut up?].

If you think that we have confusion in our regulation you have heard nothing until you hear what the Europeans are going through right now. The European unification of regulation for aviation has presented a near impossible dream of unity. On one hand we have the 'joie de vivre' attitude of one major European country and the strict and rigid by the book attitude of another nearby major European country with the rest falling metaphorically in between. Mr. Graham Newby formerly of PFA [now LAA] was the expert on European matters here and represented PFA [and the UK] numerous times at the European Union meetings and explained what the Brits had to deal with in these negotiations. I predict that it will be many years before all this is sorted out, if ever. Queried as to what one country with more liberal attitudes would do if really strict regulations were imposed Mr. Newby replied "probably ignore them"!

Eventually lunch time came around. Lunch is much too moderate a term for this meal. No cold cuts, tiny sandwiches and cookies here. To me it was a banquet consisting of a generous portion of delicious shepherds pie with a variety of veggies and ample deserts. That was my main meal of that day!

The next day I was headed home. That was my trip 'over the puddle', a lot of pleasant action for only 10 days thanks mainly to my good friend and chauffeur Mike.

Tower: 95 Delta, do you read the tower?
95D: 675, sir
Tower: 95 Delta, Say Again
95D: I think it is 675.
Tower: 95 Delta, What do you mean by 675?
95D: I mean I think I read "Elevation 675 feet" on the tower as I taxied by for takeoff, but I am too far away to read it now.
Tower: 95 Delta, you are cleared to land. Please give the tower a call ON THE TELEPHONE after you have tied down.

Slow Going:

A Look at the Low Speed Range of Light Aircraft

High speed is usually mentioned as the most useful attribute of aviation. But in the Canadian north and in other sparsely settled areas it is not only speed but the lack of necessity for an infrastructure that is the most compelling reason to use aircraft for travel. / By Paul Ralph

When the final chapter on fossil fuels is written it may well be low fuel consumption that remains as the aircraft's most enduring attribute. Modern small cars like the Suzuki 3 cyl. derivatives achieve about 60 mpg on rural roads at speeds of 30 or so mph. As early as 1934 four sear aircraft were performing at 30 mpg together with transoceanic capacity. Modern four seat can deliver 60 mpg at around 100 mph. Higher values can be attained by specially designed aircraft with few comfort restrictions. These are mostly straight miles not the winding million dollar miles that the car on a road travels.

What the fixed wing aircraft can't do with ease is fly slowly. But it is the low speed of an aircraft that enables it to perform best in mountainous and 'bush' conditions. A well controlled low speed allows the aircraft to turn tightly in mountain valleys, is of paramount importance for short take of and landing, is a major factor in crash survivability, and minimises the vulnerability to airframe icing. As a consequence the aircraft's low speed often increases the real trip speed by allowing the use of small local airstrips and enabling its use in less favorable weather.

Low speed design includes both stall speed considerations and more importantly aircraft control at low speeds. In this article we examine stall speed, its character and its design influencing factors. In a further article we will discuss the factors that make up the stability and control at low speeds.

The lift equation is well known;

L = (1/2).rho.S.Cl.V^2

where L = Wing lift (almost equal to aircraft weight) in lbs

Rho = air density in slugs/cubic ft
= 0.002377 at sea level, 0.002048 at 5000 ft

S = wing area in square feet

CLw = wing lift coefficient

V = air speed in feet/sec
= mph x (22/15) or knots x (22 x 1.151/15)

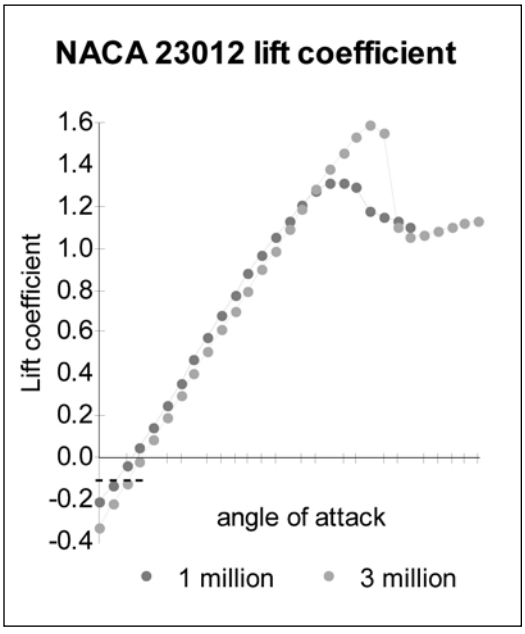
A typical two seat homebuilt aircraft with a weight of 1200 lbs, wing area of 100 sq ft, flying at 100 mph at 5000 ft would have a wing lift coefficient of

CLw = 2.L/rho.S.V^2 = 0.45

To calculate the stall speed of an aircraft we need an estimate of the maximum lift coefficient, denoted CLmax, of the wing.

There can be a considerable difference between the maximum lift of an airfoil section (Clw) as measured in a wind tunnel and that same section used on the wing of an aircraft (CLw). The major factors that make up this difference are in order of magnitude; roughness, wing plan form, scale effect or Reynolds number. There is also some dependency of the values on the wind tunnel they were obtained in. These factors are outlined in what follows to give an estimate of airfoil section maximum lift.

Ref.2 & ref.3 give extensive data for a number



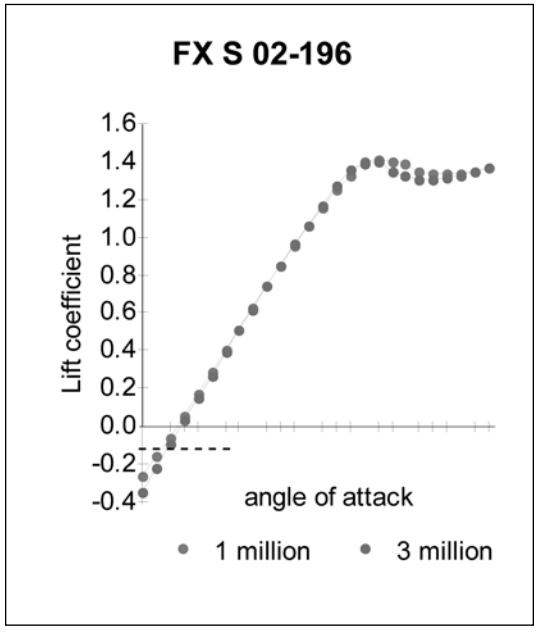
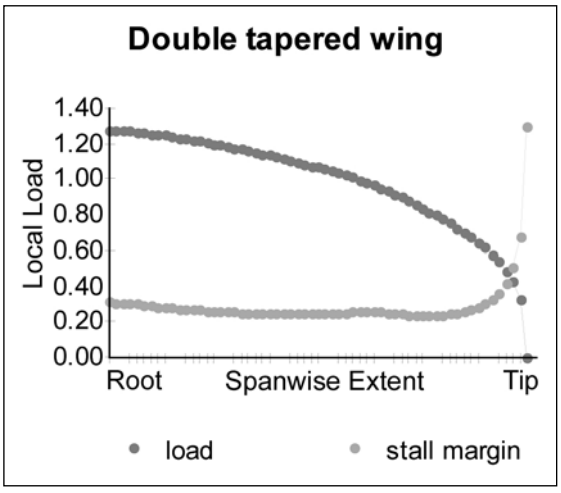


Fig. 1 NACA 23012 and Wortman FX S-02-196. Opposite: the author's Santa Anna, an ultralight motorglider.



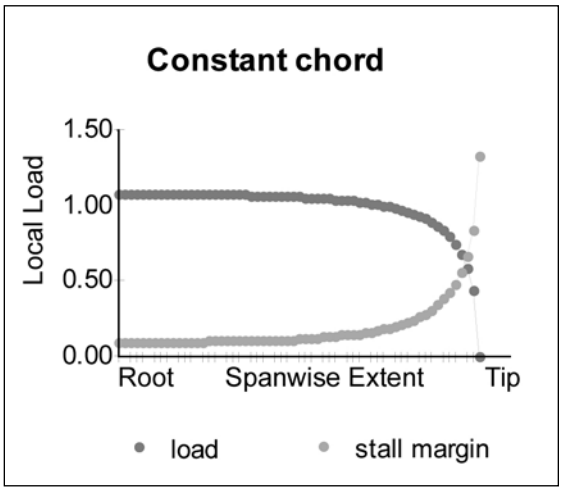


FIG 2 and 3 Load distribution and stall margin - Double tapered wing (CLw 1.06) and Constant Chord (CLw 1.14)

of airfoil sections. The data in ref.2 is given for large scale sections at high speeds as usually collected in wind tunnels for military and commercial aircraft. The data for smaller wings at lower speeds is somewhat different. This scale effect is expressed by giving the Reynolds number at which the data is measured or the aircraft flies. For a wing the Reynolds number is given by:

Re = 9331 x chord(ft) x airspeed (mph) at sea level

and

Re = 5592 x chord(ft) x airspeed (mph) at 20,000 ft

For our typical homebuilt with a wing chord of 4 ft the reynolds number is about 2 million at 50 mph. Sailplanes and high efficiency powered aircraft land and cruise at altitude with reynolds numbers of 1 million.

The most common source of airfoil data is probably ref. 2, The reynolds numbers are above our interest, starting at 3 million. Unfortunately in the reynolds number range of 2 million and below the airfoil character changes rapidly so that extrapolation of data from higher numbers is a unpredictable. A better source for low speed data is ref. 3. The mean of all this data at a reynolds number of 1 million is about 1.3. As a rough guide maximum lift coefficients decrease by about 0.2 from 3 million to 1 million for the older and newer naca sections. However some of the low drag sections of interest in ref.3 show much lower changes.

If the wing is rough one can expect a decrease in the maximum lift coefficient of the older 4 and 5 digit naca sections of about 0.25 for roughness of 0.01 inches, and about 0.1 for roughness as small as 0.002 inches. At a reynolds number of 3 million the decrease is higher at 0.4. For laminar flow airfoils the decrement is about half this, 0.15 at 1 million and 0.25 at 3 million. Roughness of the extent of 0.002" is about what would get from good fabric finish with 0.01" somewhat smoother than frost, mud splatter or insect remains. All this under lines the importance of selecting airfoils using the appropriate data and of using it throughout the wing and tail design.

Using a smooth maximum lift coefficient of 1.3 and rough of 1.1 our example aircraft would stall at:

V = square root (2.L/rho.S.Clmax)

= 88 ft/sec = 60 mph smooth

= 96 ft/sec = 65 mph rough

Of considerable interest in selection of an airfoil for low speed is not only the magnitude of Clmax but the range of angles of attack over which this maximum lift coefficient occurs. Some airfoils, i.e. NACA 23012 (fig 1) have high max lift coefficients but once reached the lift rapidly drops. Other airfoils i.e. Wortman FX S 02-196 have high lift coefficients that extend over several degrees. These stall characters are usually described as 'abrupt' or 'gentle'. As a general observation many airfoils display much more gentle stall character at low reynolds numbers than high ones. Thicker sections 18% or so have more gentle stall character than thin ones. Outside of the wind tunnel on real aircraft the rise in parasite drag at the stall is also considerable importance. A high drag section will much more easily pull an aircraft into a stall than one of lower drag and keep it there. Aircraft with low inertia such as ultra light suffer more from this effect than bigger heavier aircraft with 'penetra-

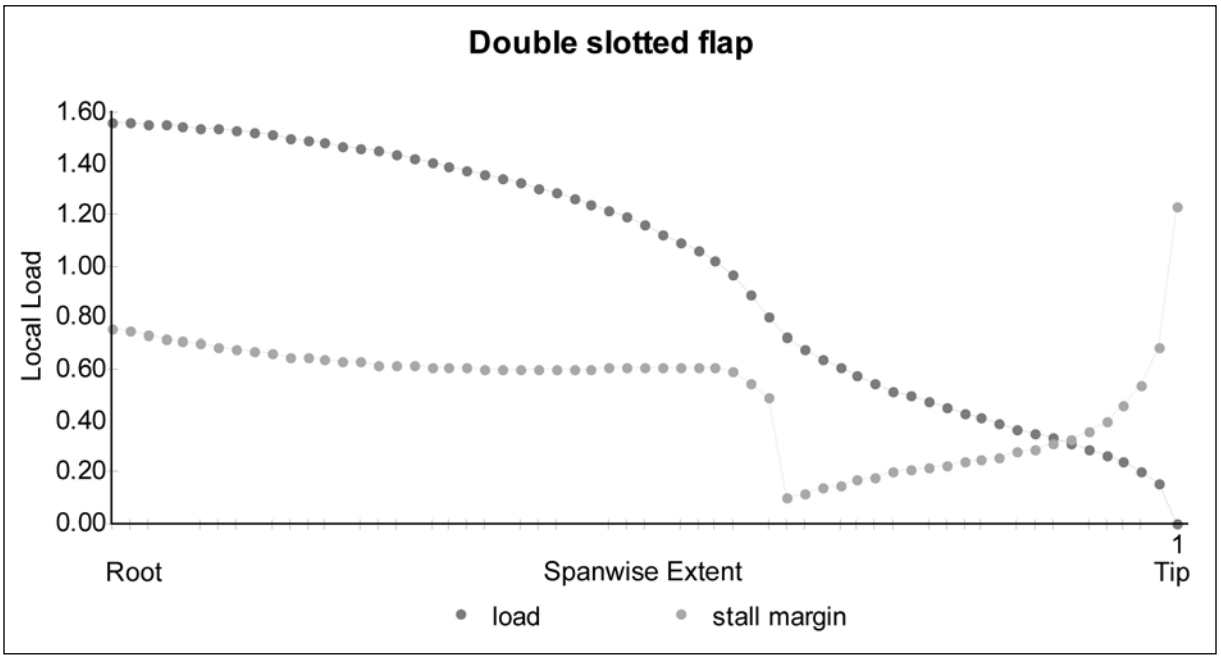


FIG 4 Load distribution and stall margin, Double tapered wing, double slotted flap deflected 40 degrees. CLw 1.9

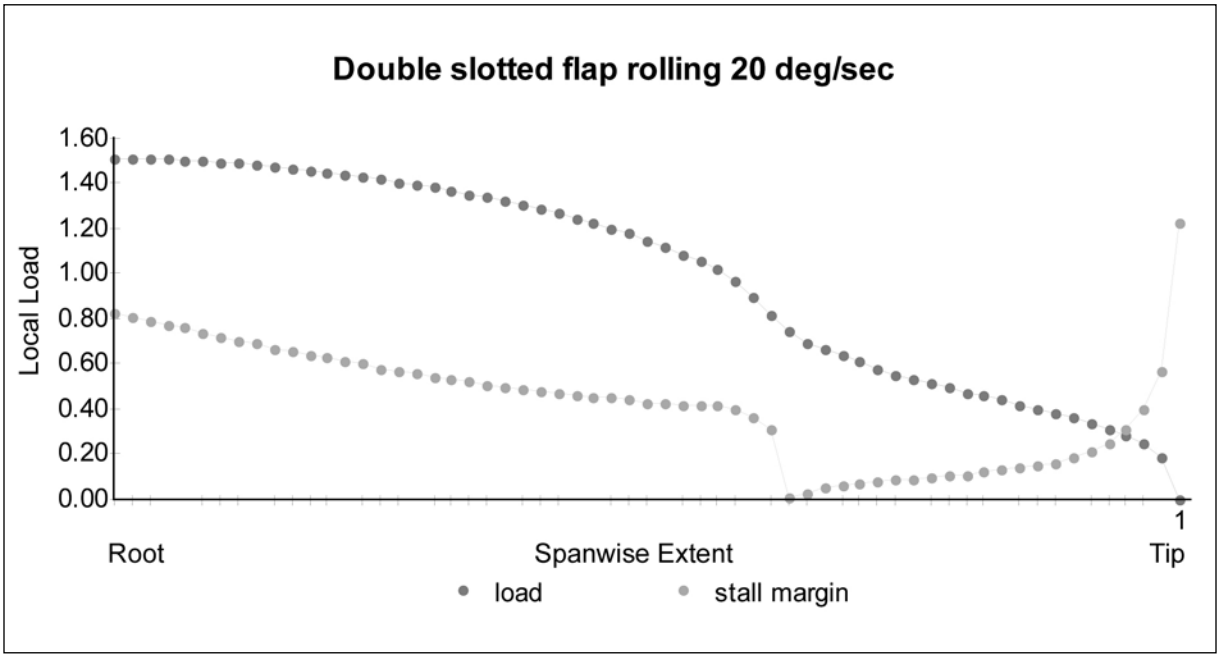


FIG 5 Double slotted flapped wing rolling at 20 degs/sec CLw 1.9

tion'.

Whether the aircraft wing itself realises that same maximum lift coefficient depends on the wing plan form and twist. Fig 2 and 3 show the local lift distribution for a double tapered wing and a constant chord wing respectively. The lower curve shows the stall margin, that is the difference between the local lift coefficient and the local maximum lift coefficient. Where it reaches zero is the span wise commencement of the stall. This is important because the nearer the wing tip this occurs the greater will be the likely hood of a spin occurring. The maximum lift coefficients of

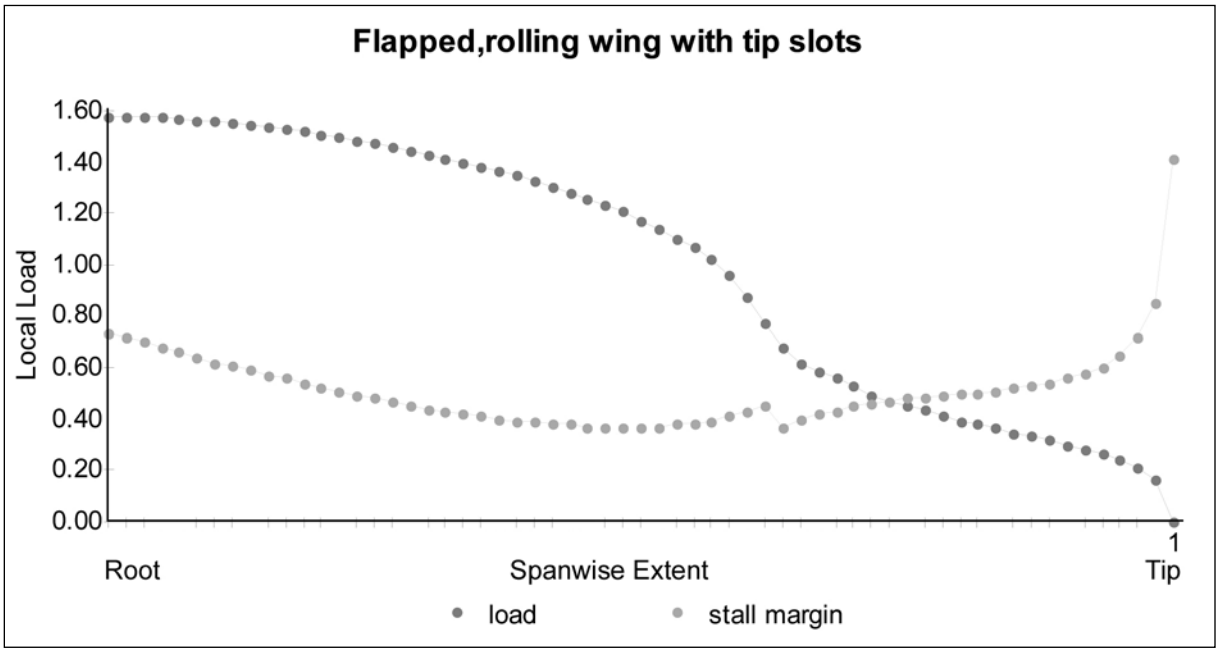


FIG 6 Double slotted flapped wing with wing tip slots rolling at 20 deg/sec CLw 1.9

each wing is shown. The constant chord wing stalls at about 88% of the section maximum lift but it does so with a stall commencing near the wing root. The double tapered wing stalls at a higher wing lift coefficient (1.3) but the wing stalls almost simultaneously along its span.

There is also a small effect of the fuselage on the wing that depends on the fuselage shape, wing position and aspect ratio. The example aircraft with a rectangular wing will achieve a maximum lift coefficient of (0.88x1.2) 1.06 and stall at 67 mph

Most general aviation aircraft, and any aircraft designed for high fuel efficiency, will use flaps for landing and takeoff as well as low speed flight. Here it is the stall character with flaps deflected that is of importance. Not just the wing section but the wing itself. Wings with partial span flaps take on the span wise lift distribution of highly tapered wings with their nasty tip stall habits. Fig 2 shows the span wise lift coefficient distribution of an unflapped wing designed for low induced drag. Fig 4 shows the distribution for the same wing with flaps deflected. Note how the local stall margin approaches zero just outboard of the flap tip long before the rest of the wing.

If this problem is not solved then the wing maximum lift coefficient is much less than that for a flapped wing airfoil section. Fig 5 shows the same flapped distribution for a wing gently turning where the inside wing stalls long before the outer wing. This wing tip stall on one side of the aircraft is what precipitates unwanted spins and down wind turn accidents. The problem is much more pronounced with effective flaps but can be controlled with various wing tip devices . fig 6. Shows the same wing and flap rolling but with open wing tip slots. This wing at the same overall lift coefficient as in fig 5 has a remaining stall margin of about 0.4.

Depending on the flap type a flapped airfoil section can attain values of clmax of about 3.2 at low reynolds numbers. A partial span flap on a wing without wing tip stall control will exhibit a wing maximum lift coefficient of 2.1. This translates to a stall speed for our example aircraft of 47 mph. This stall will however commence just outboard of the ailerons in coordinated flight and will tend to dissuade the pilot from approaching at speeds near the stall or even as low as the usual 1.3x stall speed. For a practical example of this just compare the stall character of a Cessna 172 with and without flaps deflected. There are various means to control the tip stall. If a good scheme is developed the wing max lift coefficient can be raised to about 2.6 giving a stall speed of 42 mph. However this wing can be flown at 1.2x the stall speed and maintain a good stall margin at reasonable roll rates. (Fig 6) Because of this low speed control the pilot is much more likely

to use the lower flight speeds than if the stall character was less benign.

Aircraft with constant chord wings are designed that way for ease and cheapness of manufacture at a time when fuel was cheaper than today. Unflapped wings of that shape also have relatively benign wing root stall characteristics. This character is lost when partial span flaps are deflected. It is the control of the stall character of the wing with flaps deflected along with low induced drag for the flaps up wing that determines the effectiveness of the aircraft at low speed and its cruise fuel efficiency.

Summary
Re 1 million

	Cl or CLw	Stall speed mph
Airfoil smooth	1.3	60
Airfoil rough	1.1	65
Constant chord wing (rivets)	1.06	67
Airfoil plane flap	2.2	46
Airfoil double slotted flap	3.2	38
Wing/aileron plain flap	1.7	53
Wing/aileron double slotted flap	2.1	47
Wing/aileron double slotted flap, tip stall control	2.6	42

References

1) Perkins,C.D. and Hage,R.E., Aircraft performance stability and control

2) Abbott,I.H. and Von Doenhoff,A.E., Theory of wing sections.

3) Miley,S.J., A catalogue of low Reynolds number airfoil data for wind

turbine applications, Available from NTIS no RFP-3387

For more information on Paul Ralph's Santa Anna motorglider, featured at the beginning of the article, visit: http://www.tiswildeair.com/index2.htm

PAO Tower: "Mooney 23D, traffic is a Cherokee just entering downwind from the left 45."
Mooney 23D: "Uhhh, tower, 23D...only traffic I see is a Cessna."
(pause)
PAO Tower: "Mooney 23D, follow your traffic directly ahead, an, um, inverted Cherokee just abeam the numbers."

Power Play

Power Density. There's been nothing like oil when it comes to the most horsepower per pound of fuel, and in aircraft, weight is everything. But it takes vast amounts of effort and money to extract it from the earth's crust, so the consumer is at the mercy of those who collect and process the precious commodity.

And now it's is getting expensive. *Real* expensive. Transportation presently accounts for 63 percent of US (and by extension, Canadian) oil use: with oil over a hundred and thirty dollars a barrel and supplies dwindling, consumers are starting to look for alternatives. Besides, even in relatively good times, oil companies are not as inclined to refine niche fuels like 100 LL as they are the more marketable automotive grades. / **By George Gregory**

Electricity is rather more democratic. We can buy it from large companies, but there are many ways we can make our own: solar, wind, mini-hydro, tidal, nuclear, or even human powered generators. If you can harness mechanical motion or sunlight, you can make your own electricity, and in a reasonably economic fashion. Up till recently, the trade-offs made it unattractive and impractical: especially in the critical area of power density. In a word, there just isn't enough punch in batteries.

That could be changing.

Automotive Right now, the buzz in Detroit is electric. GM has committed to production of their upcoming new plug-in hybrid, the Chevy Volt. It will offer a 40 mile range in pure electric mode before a small Flex-fuel engine starts, connected to a generator whose sole function is to recharge the Lithium-Ion battery pack. While this isn't exciting in aviation terms, what it will do is drive battery technology, especially in propulsive applications. Even more powerful Lithium-Polymer units are starting to appear; batteries and electrical propulsion are going to go mainstream, and the spin-offs can't help but benefit flyers. Market forces will drive innovation as automakers try to outdo one another for the consumer's dollar - in fact, Dodge, Toyota, Honda, Nissan are all flirting with electric and plug-in hybrid drivetrains.

Tesla Motors is a small California-based automaker producing an electric roadster, called (appropriately enough) the Tesla. Backed by PayPal co-founder Elon Musk (who is also Chairman of the Board and principle owner), it has some pretty solid financial ground under its feet, and is in production as I write. The roadster is based on a Lotus Elise chassis, and boasts 0-60 in about 4 seconds. It can go 220 miles per charge at a 135 mpg equivalent and costs less than 2 cents per mile to drive. The designers chose to simply adapt the batteries from laptop computers to their car: this was a deliberate strategy as there is already much pressure on battery developers to improve their product in the search for lighter, more powerful, more dependable product. Tesla's magic is in how it's incorporated into the car, both in the way the case for the batteries is configured, and the computers that manage the batteries.

Certainly not your average golf-cart. It's been raced against Ferraris and Porsches, and always wins. Oh yeah: it looks *real* cool.

Feel Good Motors of Toronto is a manufacturer of a neighbourhood car called the ZENN, an acronym for Zero Emission No Noise - that is sold worldwide (but not in Canada. Regulations are handled on a provincial basis and only BC has legislation allowing such creatures. Go figure). Presently using conventional lead-acid batteries to power their vehicle, they have a highway car in the works that will use a new ultra-capacitor for energy storage. More on that below.

Power Storage In recent years, cell phones and laptop computers have been the driving source in battery development. A new generation of Lithium-Ion and Lithium-Ion-Polymer batteries hold great promise for energy storage, and these are showing up in more and more daily applications. We are approaching a critical mass in battery development as we are becoming more dependent on cordless technology. That means better batteries.

A real concern is the extra volatility that comes with Lithium-Polymer batteries in particular. They can experience thermal runaway, and when one overheats, it tends to ignite its buddies. Clever engineering can minimize this problem, however, and some of the new technologies waiting in the wings are hinting towards batteries of a less volatile nature. Altairnano (www.altairnano.com) has developed a battery with no such issues, using a titanate component in place of the normal graphite. It is literally bullet-proof.

A new generation of Lithium-Ion Batteries are being developed made not of solid materials, but of microfibres, allowing energy densities 2-3 times what is possible now. Dr. Yi Cui of Stanford, stated at a recent syposium on electric aircraft (more on this in a bit) that this is not more than 2-3 years away from market.

A secretiveTexas-based company, EEstor, is developing what some consider game-changing technology in energy storage: the company's goal is nothing less than to replace the electrochemical battery. The company claims that its product, which is a hybrid of a battery and ultra-capacitor, will outperform the most advanced batteries in the critical areas of price, charging time, energy density and safety. It will not require toxic chemicals (no chemical reactions occur when it stores power) and is supposed to have 10 times the power of conventional lead-acid batteries at a fraction of the weight and about half the cost. It's been suggested a unit capable of producing 52 kilowatt-hours, (about 72 hp for one hour) would weigh about 400 pounds and cost about $3200 US, dropping to $2100 as production ramped up. This is rather on the heavy side for aviation applications, but it's still a nascent technology. If it goes mainstream, improvements will probably follow.

And then there's the Canadian connection: Feel

Good Motors (the ZENN people) have invested in this company and have secured first dibs in the use of EEstor's "electrical energy storage units" for personal transportation applications under 15KW drive systems and a curb weight of under 1200 kg. It is alleged it can charge within 5 minutes with enough energy to power a car 500 miles - on about $9 worth of electricity. ZENN is planning the release of an 80-mph highway capable car in the next year or so, and are planning to use EEstor technology in it.

It sounds too good to be true, and EEstor does have its detractors, who cite a number of technical issues. And EEStor *has* been rather secretive from the get-go. This could indicate any number of possible negative outcomes - or perhaps, world-changing, disruptive technology: a reluctance to release the technology until they really have it right. If it was that big, I'd be secretive too. It's interesting enough to get Lockheed-Martin on board, who have followed ZENN's lead, albeit for military and homeland security use. Time will tell.

Aviation

The Electric Aircraft Symposium was held in San Francisco on April 23 and saw participants from MIT, Boeing Phantom Works, Stanford, and NASA Langley to name a few. A gathering like this will naturally centre on technical issues - especially batteries. Also at the symposium was a zero-iron motor presented by Alan Cocconi of AC Propulsion (creators of the T-Zero electric roadster) that operated at 99 percent efficiency.

One aircraft that got (and is getting) a of attention is the Taurus Electro, an electric motorglider being developed by Pipistrel of Slovenia. Its first flight was last December, and interest has naturally intensified with the increase in fuel prices. The normal Taurus is powered by a Rotax engine, but the glider's aerodynamic efficiency and light weight - a scant 705 pounds - seemed a natural for electric power. It is expected to sell for about the same price as their gasoline powered aircraft at $100,000, and is by any measure an attractive vehicle. If Dr. Cui's envisaged battery was incorporated into this aircraft, it is estimated it would have a 6 hour range at 90 knots.

Electraflyer is an American company that is now offering a Lithium-Ion Polymer powered Trike for about $18,000 with the medium battery pack. They've also recently put their 18 hp motor on a Moni and were slated to begin flight testing in early June of 2008. Gizmag reports the aircraft can fly for 90 minutes on 60 cents of electricity and has a top speed of 90 mph. Videos of their trike can be seen on YouTube, as well as the Electric Moni (dubbed the Electraflyer-C, which was demonstrated at Oshkosh 2008).

At Oshkosh a year ago, Sonex announced the E-flight intiative, but their involvement goes all the way back to the early 90's when they were looking to build a small electric aircraft for record attempts known as Project Flashlight. The technology of the day defeated them as the aircraft was only good for about 10 minutes in the air, so they back-burnered it. Since then, battery technology, improvements in micro-circuitry, lighter motors and motor controllers have improved to the point where they now feel it's worth investigating.

The motor is a 3-phase, 270 volt 200 amp motor that boasts 90 percent efficiency. It's slightly larger than a coffee can, weighs 50 pounds, is modular and scalable: by making the motor shorter or longer, horsepower can be varied. The controller is a proprietary unit designed by AeroConversions, as no practical controller unit exists on the market at this time. Connected to 200 pounds of Lithium-Polymer batteries, they expect 25-45 minute endurance (though Monnet has suggested as much as an hour in a recent video) with top speeds in the neighbourhood of 130 mph in their proof-of-concept aircraft, a converted Waiex. Not quite up to par with gasoline, but a promising start: and if industry heavyweights like Sonex are willing to give this a look, there must be something to it.

The simplicity of electric propulsion systems is another plus. No more oil changes, filters, mess, better reliability. No carb ice. No need for a turbo or supercharger for high altitudes (electric motors don't need air). Going into multi-engine configurations becomes somewhat simpler as well, and over all design flexibility will improve dramatically.

Developments in flexible thin-film solar panels

may have applications as wing coatings on metal airplanes. While real-time practical solar flight may be a way off, they could at least function as range extenders for flight on sunny days, and would help charge the aircraft's batteries for nothing when it was soaring or sitting on the ground. There has been talk of a new generation of photovoltaics that can harness infrared light - making cloudy-day flight more practical. It would essentially quintuple the efficiency of cheap amorphous solar panels.

Larry Mauro flew a solar-charged ultralight flew at OSH in 1979, and it's been nearly as long sincc Dr. MacCready and company flew the Gossamer Penguin. It's been possible, but hardly practical. Now, the technology is better... and oil is getting more expensive.

There is a confluence of technologies and perceptions occuring:

-awareness of peak oil. We are starting to run out.

-awareness of the geopolitical problems with basing our energy security on oil, most of which is in areas problematic for western access.

-awareness of global warming, whether man-made or otherwise

-advances in solar and battery technology, especially through nanotechnology.

These things are creating political will for change, which bodes well for R&D funding for alternatives. This is far bigger than just the needs for affordable aviation.

Finally, EAA has approached the Feds in the U.S. about and exemption to LSA rules to allow the development of electric aircraft in that class.

The need to go green aside, I love this whole paradigm for its sheer elegance. It's fun to get something in a more efficient package, and electric flight shows immense promise to do just that. I doubt that petroleum will be entirely supplanted; I just can't see an F-16 or an airliner being powered by any kind of electric propulsion. Jets will always need something to *burn*. But for consumer-level transportation use, be it aircraft or autos, the next decade should prove very interesting indeed.

For more information:

-Electraflyer and Electraflyer - C
http://www.electraflyer.com/
-ZENN Cars*: http://www.zenncars.com/*
-Ultracapcitors:
http://www.zenncars.com/media/documents/Economist.pdf
http://www.technologyreview.com/read_article.aspx?ch=specialsections&sc=batteries&id=18086&a=
-Chevy Volt: http://gm-volt.com/
-Tesla Motors: http://www.teslamotors.com/
-Sonex E-Flight Initiative
http://www.sonexaircraft.com/press/releases/pr_072407.html
-Altairnano battery information:
http://www.altairnano.com/documents/NanoSafeBackgrounder060920.pdf
-Electric Flight:
http://www.popsci.com/military-aviation-space/article/2008-05/who-birthed-electric-plane
http://www.greentechmedia.com/articles/will-electric-planes-take-off-839.html
http://www.portfolio.com/news-markets/top-5/2008/04/29/-Electric-Airplanes-Take-Flight
http://news.bbc.co.uk/2/hi/technology/7384788.stm
-Cafe Foundation Electric flight
http://www.cafefoundation.org/v2/pav_eas_2008.php
-Electric Aircraft Symposium:
http://kitplanesmag.blogspot.com/2008/05/electric-airplane-symposium-2008.html
-Pipistrel Motorglider:
http://www.pipistrel.si/news/739

Student Pilot: "I'm lost; I'm over a lake and heading toward the big E."
Controller: "Make several 90 degree turns so I can identify you on radar."
(short pause)...
Controller: "Okay then. That lake is the Atlantic Ocean. Suggest you turn to
the big W immediately ..."

2 New Models From Zenith Aircraft

A pilot's view of the 750's forward visibility.

Zenith Aircraft

introduced two new Light Sport Zenith models at Oshkosh this summer. The CH 750 is based on the 701 but shares only the tires and the rudder with that model. The new 750 fills the gap between the original 701 and the four seat 801. The cockpit is a full 50 inches wide and has rear quarter windows, and the panel has sightlines along each side, for better rear and downward vision. The door cutouts are much larger, and new for Zenith are adjustable seats. Two six footers can fit easily in this new plane which grosses at 1320 pounds with an O-200. In Canada this plane will be an Advanced Ultralight at 1232 pounds with a Rotax 912 engine.

The new CH 650 is based on the 601 XL, but has a new canopy and a roll bar. The lower turtledeck improves rear visibility, while the new swept-back rudder improves streamlining. In the US this is a Light Sport at 1320 gross with the Continental O-200, while in Canada it will be an Advanced Ultralight at 1232 pounds.

Chris Heintz has maintained his longstanding policy of selling plans to scratchbuilders, and these two new planes are no exception. Builders may buy partial or full kits, or they may scratchbuild the whole plane.

Rupert Gruen's Pelican

by Rupert Gruen and Gary Wolf / Photos by David Madison and Rupert Gruen

Rupert Gruen's Pelican

project began in 1998 when he ordered his kit from Ultravia in Quebec. He had researched a lot of possibilities and was impressed with the Pelican built by his friend Carl Matoon in Kelowna. The plane looked good and performed well, and with the right engine there was also the possibility of fitting floats later.

The Pelican has a fiberglass fuselage reinforced with aluminum sections at critical points, and aluminum flying surfaces. It is stressed to 4.5G's and as an Amateur Built it can be fitted with the Rotax 914 turbo engine, handy for mountain flying. Some Pelicans may be registered as Advanced Ultralights but they are limited to 1200 pounds gross, while Rupert's Amateur Built is at 1400 pounds. Rupert's garage, 25 feet square, would be the aircraft workshop but even in balmy Kelowna it was necessary to add a heating system for winter evenings. Once that was done Rupert set to work, beginning with the tail and proceeding to the wings. These are all aluminum, riveted with Avex and Cherry Q pulled rivets, all supplied with the kit. This was before the match hole drilling became available, so there was quite a bit of layout, drilling, fitting and deburring to be done. The wing was built nose down in a jig braced from floor to ceiling. The Riblett wing ribs were hydroformed but not drilled. The front spar has an aluminum sheet shear web

Top: Ingenious use of a hydraulic hose to actuate the heater shutoff valve.
Above: Commutator and brushes for the Airmaster prop.

with aluminum angle caps, and the rear false spar is a formed C channel. Skins were cut to size and the nose skins were factory formed, but they were not drilled either. Rupert is a high school shop teacher at Kelowna Secondary School with good CAD and machine skills, and with plumb bobs and cradles to support the spar he aligned, drilled, and riveted the flying and control surfaces. The wing tanks are composite and came in two pieces each, with the builder installing all fittings and glassing the assembly together. The drawings were a combination of CAD and hand drafting, and if the Van's plans are 10/10, these would rate 6/10. The fuselage is a composite casting and this shell is partly fabricated by the factory. some of the hull/shell structural work was factory performed, including fitting the tubular wing carrythroughs, but the aluminum channel boxes for the landing gear and the strut attachments had to be fitted and glassed in by the builder. Rupert had to fit all the fiberglass interior panels, and some cutting and trimming was necessary to achieve a good fit. The vinylester resin was supplied with the kit but delays in building resulted in half of it going time expired. So new vinylester resin was sourced from Viking Plastics in Edmonton. There was of course sanding to be done so a mask was de rigeur, and the shop vac got a lot of use. Assembly and rigging went well and the dimensions in the manual are accurate and achievable. The lift struts are made to length, and the builder drills the attach points to achieve the dihedral. The ailerons are mass balanced, and the elevator is aerodynamically and mass balanced and has an electric trim tab actuated by a Mac system. The elevator also has an anti-servo tab to acheive solid stick forces. Rupert's Pelican also has an electric rudder trim. Landing gear is by tapered heat treated steel rods for the mains, with bungee for the nose. The engine chosen by Rupert and Philip - the 115 hp Rotax 914 turbo - is fitted with an Airmaster inflight adjustable prop with Warp Drive tapered blades and a fixed/variable/constant speed controller. Complying with the Amateur Built rules means two electric fuel pumps feeding the Rotax pressure regulator, and because the plane has a turbocharger, carb heat is not required. The panel was built just as glass cockpit was becoming popular so the majority of information is through traditional steam gauges. The Grand Rapids EIS supplies engine monitoring of four EGTs, two CHTs, rpm, oil temp, oil pressure, manifold pressure, OAT, battery, and can do fuel flow, fuel pressure and a myriad of other stuff if you so choose. A Lowrance 2000C GPS is prominently featured on the panel, canted slightly towards the pilot.

Centre: The Pelican's turbo'ed Rotax 914 delivers a1000fpm at gross, and 1500 fpm with one pilot at full gas. Left: Well laid out panel is a combination of analogue and digital

Cabin heat is by a heat exchanger inside the cabin. A summer of testing showed that there was always some residual heat provided, so Rupert designed an innovative water shutoff for the heater hoses. A short length of three wire hydraulic hose takes the rotary motion from a knob on the panel through a ninety degree turn to the water shutoff valve. This is a very elegant and light solution to the problem.

All Amateur Builts are a work in progress and this plane is no exception. Rupert is now equipping the Pelican for night flying and has made up two red LED lights (from Princess Auto) that clip onto the forward spar carrythrough. One is fed from a panel switch and the other from an alternate electric source for redundancy. Rupert flies from Kelowna Airport which requires Mode C throughout an inordinately large portion of the valley. There is a corridor for Nordo and non transponder equipped planes but the terrain is rugged and Rupert felt that it was worth buying the transponder to have Nav Canada tracking his flights. Since his plane is over 1320 pounds the Pelican attracts the annual fee, and with the transponder Rupert is getting his money's worth. Right now the question is whether to install a 406 ELT or to buy one of the personal locator devices as an interim measure. The comfortable seats have the Pelican logo stitched in, all work performed locally. The floor is fitted with light weight boat carpeting. Paint was applied by Terry Nagy of Kelowna Flightcraft. Courtney Hunter of MD-RA did the final inspection and signed the Pelican off for its 25 mile radius/25 hour testing period. First Flight was by Dan Cattoni, who gave Rupert five hours of transition training so that he could do THE rest of the hours himself. What does it fly like? "A dream". The plane trims well and is light and balanced on the controls. A rate one turn requires very little rudder - an effortless plane to fly. This turbo bird climbs easily at 1000 fpm at 70 kts at gross, and at 1500 fpm with just the pilot and full gas. With the 115 hp turbo engine there is plenty of

Rupert and wife/cheerleader Cheryle relaxing at the Arlington, WA Fly-in.

power even at altitude when crossing the mountains. The 914 Pelican can maintain sea level performance up to 16,000 ft ASL.

The cockpit is quiet and comfortable, the bulged cabin doors allowing 46 inches of elbow room. Baggage is limited to seventy-five pounds, certainly enough for most pilots and their wives. Rupert's better half Cheryle was a frequent passenger when he was renting 172's in South Africa where he got his private license back in the mid-70's and she has already done their first fly-out to Arlington, WA this past July, where they spent two nights camping under the wing.

Climb is excellent at 5700 rpms with the governor setting the pitch. True airspeed is 125 knots cruise, with 135 achievable at altitude. In the circuit the max flap speed is 80 knots, and the approach is at 70. Stall is a long way below that number at 44 knots and is almost a non-event. One wing drops slightly but it can be easily picked up with rudder. All in all the Pelican with 914 Rotax is a versatile sports airplane that will provide many years of enjoyable and economical flying.

Rupert estimated that the project took 1500 hours to complete.

Rupert would like to thank the local RAA 433 Okanagan Chapter members for their assistance, and above all his wife Cheryle for providing support when the project was dragging. Without a "kit-wife", says Rupert, the project would have been doomed. A special note of thanks to his co-owner Philip White who sponsored the project. Also, a *very* special thanks to Peter Cattoni who is a fellow RAA builder and has an immaculate Glastar in the hangar next door. Peter acted as Rupert's technical advisor, and was amazingly helpful and encouraging for the last 18 months of assembly, rigging and final tweaking. Good builder friends are and essential part of completing a project, as they have "been there" and know the "95 percent complete, 95 percent to go" syndrome which messes with the minds of all kitbuilders in the latter days of construction. Peter's knowledge and tools, which he generously shared, together with many hardware odds and ends, made it all come together for Rupert.

What does Rupert have planned next? Well, besides a lot of flying, there is still the building bug, but Cheryle tells me he'll have to find another "kit-sweetie" to do that with, so I guess he will just have a lot of fun drooling at airshows, and just enjoy his Pelican for the forseeable future.

Pelican aircraft are now being sold by:
Ballard Sport Aircraft Ltd.
2696 du Pimbina, Sherbrooke, Qc Canada J1R 0G3
Tél: 819 563-5847 Fax: 819 829-5677
The air-to-air photos are courtesy David Madison of Aerial Imaging Photo Service - Specializing in Aviation Journalism and Photography. 1390 Camp Road Lake Country, BC V4V 1J9 Ph - 250 766 3397 Cell - 250 878 0867 http://www.homeandweb.com/okanagan-aerial-photography.htm

MD-RA


Al Mahon and Jaime Alexandre of MD-RA

The May MDRA seminar largely clarified Transport's new policy on the incorporation of formerly certified major components to Amateur Built aircraft. It will remain legal to incorporate these into a project under certain circumstances.

Parts which are attached by bolts came under scrutiny. The removal and replacement of these components does not qualify towards a 51% determination, not does the opening up of parts for inspection.

Repair and rebuilding of components can qualify towards 51%, especially if the rework is to pieces that were originally assembled by permanent methods such as welding, gluing, bonding, soldering. Dismantling and reassembly of these components can be considered to be repair and rebuilding.

Riveting was not dicussed in the document, so RAA has already sent an email to TC for a clarification of this point.

For awhile it had been TC policy to fast track OM aircraft into AB, but this will now become much more difficult. Earlier, the work that had originally been done to become an OM had been allowed to qualify for the AB 51% determination. Now this earlier work will not qualify, so it is unlikely that there will be any more fast track conversions, unless the OM is being largely rebuilt again.

Borescopes and video cameras had prevously been allowed for internal inspection of closed components, but these will no longer be allowed. It will henceforth be necessary to unrivet skins or remove fabric to determine whether formerly certified major components are suitable for reuse.

Rebuilding a major component can qualify it towards 51%. If for example a builder had begun with a complete Cessna wing but found that he had to remake more than 50% of the components, he could get credit for having built a wing.

Every major component reuse will trigger the requirement for a 51% determination. There will initially be a peer review by MDRA, then a determination by TC.

Projects which have already had their 51% determination will be allowed to proceed to final, to become AB aircraft.

Jaime Alexandre thanked RAA for being the only organization that worked to change Transport's initial policy into this current, more palatable version. RAA is able do this work because we have members across the country who support the organization with their membership. Please encourage your chapter members to become National members so that we may continue to work on behalf of Amateur Builders in Canada.

Gary Wolf

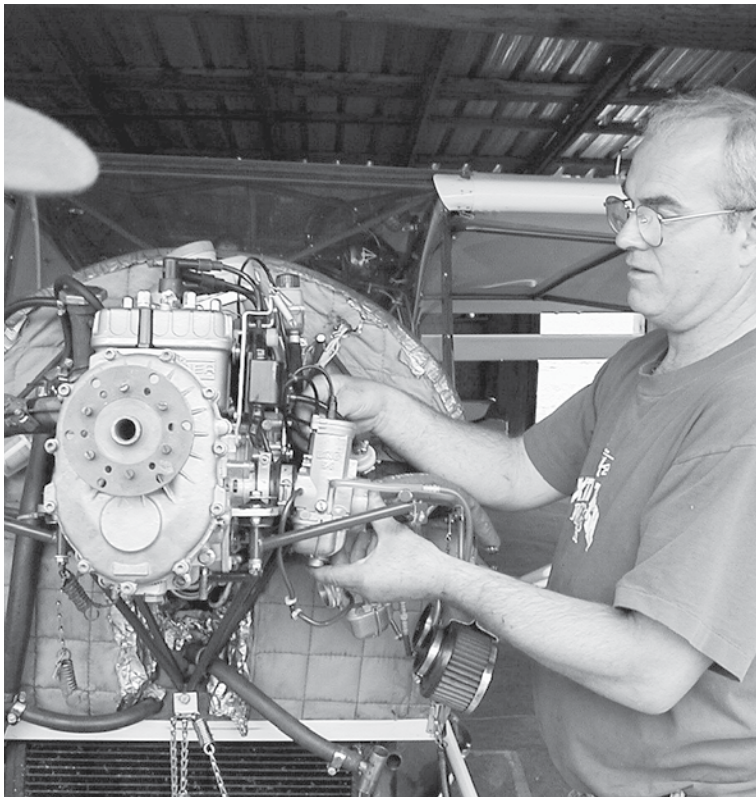
HKS ENGINE UPDATE

A while ago RAA reported on the valve guide problems in a batch of 300 HKS engines. RAA had asked the US importer H-Power to replace heads on engines in this batch and they have recently agreed to do this. Member Harish Jadeja has a new in-the-box HKS that is in the affected range and reports that H-Power in Connecticut handled the situation very professionally. Harish and his wife went to Connecticut for a weekend holiday and dropped the engine off to H-Power at 9:00am. By noon they had exchanged both heads at no cost.

Harish also reports that HKS has announced at Oshkosh that they will shortly be introducing a model with electronic fuel injection, and another with a turbo.

Across Canada

RAA Chapters in Action



RAA-Toronto

The **8th Annual Sonex BBQ** was a great success once again. Sponsored by the Toronto Region chapter of the Recreational Aircraft Association the event was held at the Brampton, ON airport CNC3. We had good weather this year and we were delighted to have Chris and Joe McNally fly in with their gorgeous Sonex all the way from Carp, some 2 hours to the east. Ken MacLeod also launched out of Carp toward us, but found his trajectory blocked by weather and sadly had to turn back.

We had 20 people with name tags and a few more without, and drop-ins from the Chapter for the burgers, sausages, salad, and Nancy's brownies. Probably our biggest and best BBQ yet.

Fritz Deininger demonstrated some superb spar riveting with the G-frame he invented and built, and Lach MacLean and Graham Luckhurst had pictures of their projects, both in an advanced state. There are some terrific airplanes in the works in this part of the world. Lots of good conversation, technical talk and acquaintances renewed. The RAA and the Sonex both attract great people and we proved that once again on Saturday.

Events like this show what a privelege and benefit it is to belong to RAA. The National RAA organization provides publicity and event insurance and the local Chapter provides a superb venue with excellent facilities as well as helping hands. The Sonex builders community really appreciates it. Probably attracted a couple new RAA members. Check out the report also at www.sonexaircraft.com.

Brian Heinmiller President RAA-TR
Sonex C-GSBH

RAA - Kamloops

Dan Berwin flies quite often from Cache Creek the Knutsford strip in his white and blue Challenger C-IEGM that he bought and rebuilt in 2005.

Bill Huxley built his yellow Challenger C-IWIL from a kit, and started flying it in 2007, and already has many hours on it.

Gerald Gibbons has owned his Kitfox C-FPWN for many years; he also flies a Murphy Renegade from his own airstrip within sight of the Knutsford strip. So when he saw Bill and Dan in the area, he came to join them.

They often fly to Quilchena for a coffee, or to Merritt, Salmon Arm or Cache Creek. Sometimes Larry L'Heureux joins them in his Kitfox, so does Tony Bellos in his Murphy Renegade.

The activities have restarted lately at Knutsford,

Why do we belong to a chapter of RAA? We share skills and help each other out. Opposite, Don Hayward does an engine inspection on the engine of another Kamloops RAA chapter member. Centre: Dave Jones' DJ-14 plus companion. From top down, more planes of Kamloops: Gerald Gibbon's Kitfox, Bill Huxley's yellow Challenger C-IWIL, and Dan Berwin's Challenger C-IEGM. Bottom, right: a few shots from the Toronto Chapter's Sonex Barbeque.

and we expect to have more airplanes flying this year: Dick Suttie has just finished painting the wings on his RX-550 Beaver and should be airborne sometime in May. He also has been working on a Super Koala, but the completion date on that one keeps being pushed back! One new member is coming form the Coast this summer and will be flying a Breezy. Another one wants to buy a Beaver, but we are running out of hangar space!
Camille Villeneuve

RAA Scarborough/Markham

We wish to thank Claude Sherwood for describing to us the current activities at the Toronto Aerospace Museum, including the restoration progress on the Lancaster bomber, rescued from the Toronto waterfront. Claude also described some recent acquisitions: a Kiowa helicopter; all records of the aircraft built at Downsview by de Havilland Aircraft of Canada Ltd. donated by Bombardier; a Russian AN2 flight simulator with vast software on which one can buy time. Claude also mentioned the annual Wings & Wheels event which was held at the Museum on May 24 and 25. It featured indoor flying models, a range of flying activity and classic cars on display.
Bob Stobie

New Products

Princess Belt Grinder
By Gary Wolf

A hand held belt grinder is a very handy tool for the amateur builder. Black and Decker at one time made an electric one that was a treat to use, well balanced and light. Belton made an air powered unit in the nineties, and it too was well balanced but it was very expensive, nearly $300 at the time. Princess Auto appears to have taken some of the features of the Belton and now sells an inexpensive Power Fist model that uses a 3/4 x 20.5" abrasive belt that is available in many different grits. Unfortunately the Power Fist has many problems, the first being that some of the housing screws were stripped. We returned the unit, no questions asked with the Princess warranty, and took the replacement back to the hangar. Immediately upon powering up, the nose wheels lost their screw, and the wheels went shooting across the shop, not a good omen.

After finding the wheels and cobblng them together with another screw, more problems surfaced, mainly ergonomic. The unit is heavy, but the handle may be swiveled to centre more of the weight over the hand. Unfortunately this positions the operator's thumb close enough to the abrasive belt that contact may be made. Swiveling the handle farther away results in too much cantilevered weight, making it difficult to keep good control of the abrasive belt. One other problem -the handle is too short for a North American sized hand. The air outlet is next to the air inlet fitting, and the exhaust air chills the palm of the hand. If the unit has just been oiled, the operator's hand and sleeve become oiled by the exhaust air.

Not recommended.

BLACK AND DECKER HAND BELT SANDER # PF 260

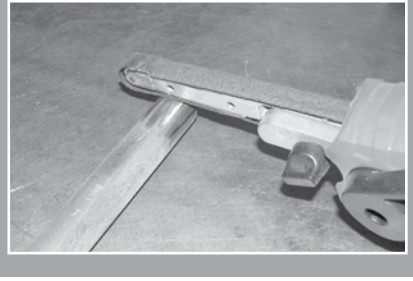
This is one of the handiest tools I have ever owned. I first saw one of these being used by a shop that welded custom bandsaw blades, and it made short work of leveling the welded joint.

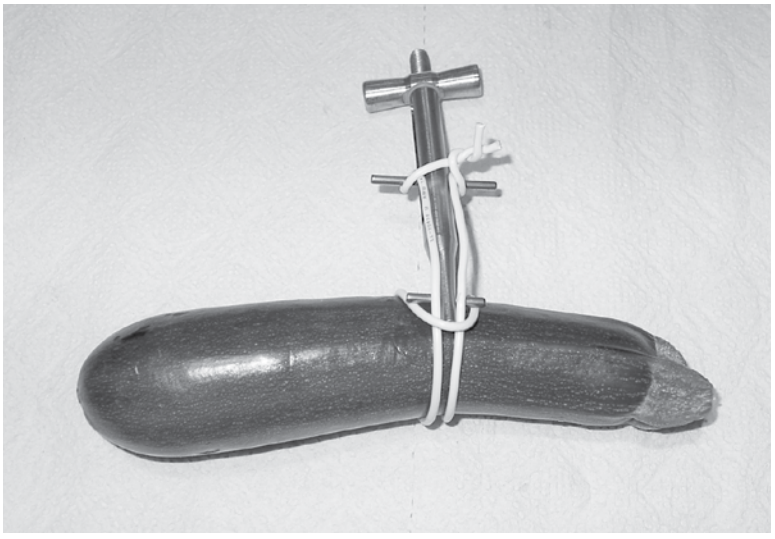
Hand held air tool belt sanders are somewhat smaller but require a compressor running somewhere in the background. This handy electric unit is well balanced and light, and can be used to prep for welds, remove rust and paint, and dress the edges of fiberglass, wood, and aluminum parts. Once you have one, you will find even more uses.

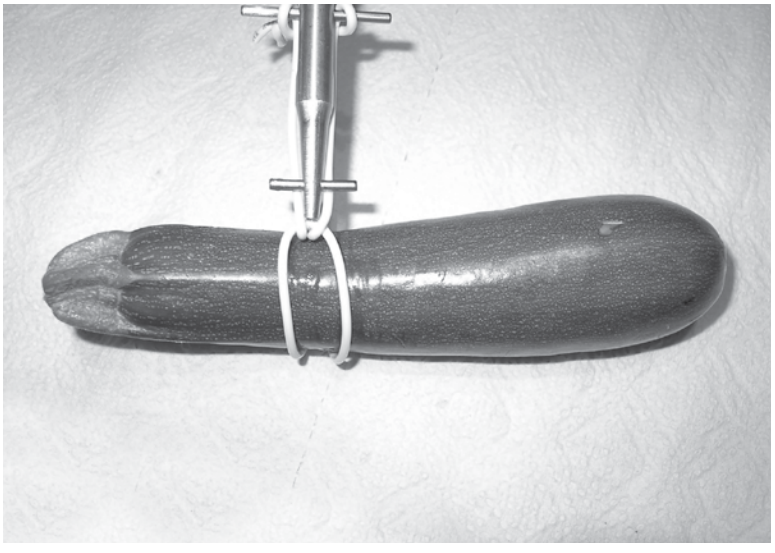
The nose of this tool may be used to sand the inside corners of fittings. Edges may be sanded lengthwise to remove cutting marks, saving hours of hand sanding to remove these stress risers. Chrome Moly tubing comes with a brown coating that must be removed before welding -this usually involves a lot of shoe-shining with a ribbon of abrasive cloth, tedious work. This becomes a few seconds work for the B&D sander.

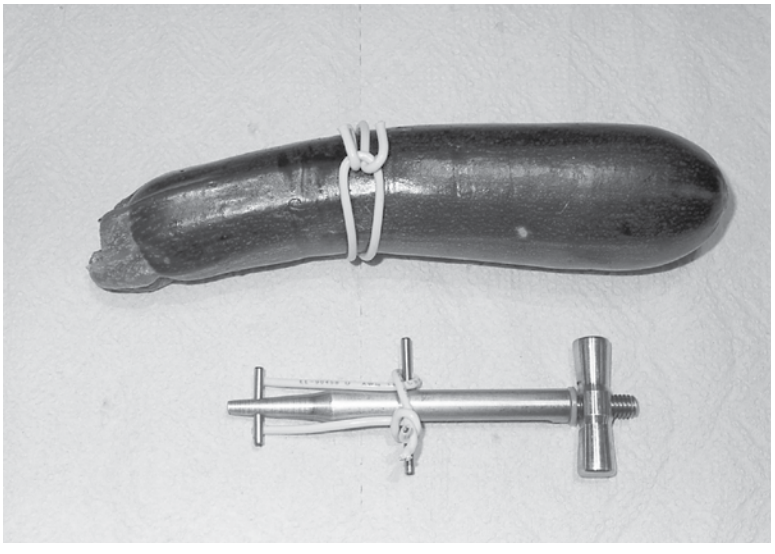
One downside of a small belt grinder is the cost of abrasive belts, usually a dollar each. Fortunately this unit uses belts that are 18" long, so I buy 3 x 18 cloth-backed belts, and with a razor knife slit the glued joint at ½" stations. Six belts may then be ripped from one belt. Sixty grit is as coarse as anyone would want to use on an airplane. Most of the time 80 to 120 does the job.

The PF 260 sells for $50-60 but CTC has had them on sale for as low as $40. Buy a few 3" belts at the same time.
-Gary Wolf









Say you have a hammer...

with a cracked wooden handle, a hose that needs a clamp, or perhaps a zucchini that is in danger of splitting. **Clamptite** has a nifty wire tool that will make an on the spot repair. Any semi rigid wire may be used including light coat hangar wire, handy if you are in a corner and need a quick repair.

Begin by choosing a piece of wire a foot longer than is required for a double wrap around for example, a zucchini. Double the wire on itself and wrap the free ends around the zucchini pulling both ends through the loop. Fit the forked nose of the Clamptite to the loop and run the free ends over the lower crossbar, then around the upper drawbar and finally twist the two free ends together. Turning the brass wingnut will pull the drawbar up and tighten the wire onto the zucchini. Next tip the Clamptite 180 degrees to lock the wire. Snip off the free ends leaving 1/4" and press these down to finish the job.

$69.95 from www.clamptitetools.com, with a lifetime warranty, made in USA.

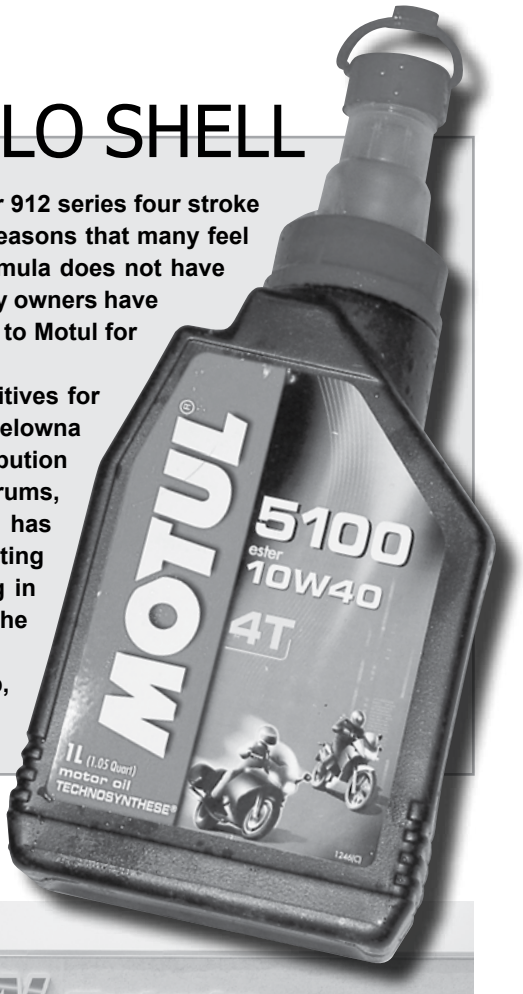
Centre: wind the wingnut around your hapless zuchinni to tighten the wire, then tip the tool 180 degrees to lock the wire.
Bottom: Snip the wire ends within 1/4"and press down to lock.

FAREWELL MOTUL, HELLO SHELL

For many years Motul was the oil recommended by Rotax for their 912 series four stroke engines. Lately Rotax has recommended Shell Formula instead, for reasons that many feel have more to do with politics than tribology. Unfortunately Shell Formula does not have additives to protect the gearbox which shares oil with the engine. Many owners have been using the Shell Formula during the warranty period, then switch to Motul for the rest of their flying.

Shell has recently announced a new oil that has the correct additives for the 912 series engines and gearboxes, but member Rupert Gruen of Kelowna reports that Shell refuses to include this product in their Canadian distribution system. This was reported on the RAA Announce and National email forums, and Jeff Leavens of Leavens Aviation responded immediately. Jeff has now ordered a supply of AeroShell Sport Plus 4 and will be distributing it from Leavens warehouses in Toronto and Calgary. Jeff is ordering in large enough quantities that the price will be competitive with what the Americans pay on their side of the border.

Thank you Rupert for bringing this to the attention of the membership, and kudos to Jeff Leavens for rising to the occasion.



New Distributor: Sayal Electronics

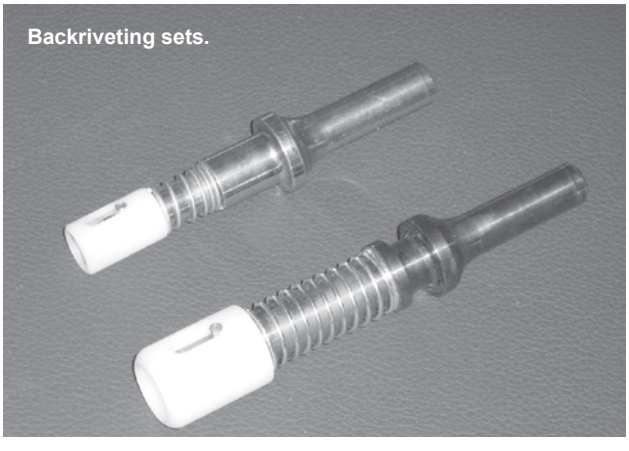
Sayal Electronics is a distributor of many of the elctronic and electrical hardware items required for wiring an airplane panel. Although they do not carry aircraft wire they do have all the nuts and bolts, electrical cable ends, BNC connectors, plugs and sockets, switches of all types, shrink tube and soldering supplies. Packaging for hardware is usually in two sizes -packs of 10 and packs of 100. One of our members had called an aircraft radio supplier for a 12 ft coax cable with BNC ends to connect his handheld to an external antenna and was reeling at the quote of $120.00. I sent him off to Sayal and he had the cable for under $10.00.

Sayal has half a dozen stores in southern Ontario and does a busy mail order business across the country. Their website is easily navigable and is at www.sayal.com.

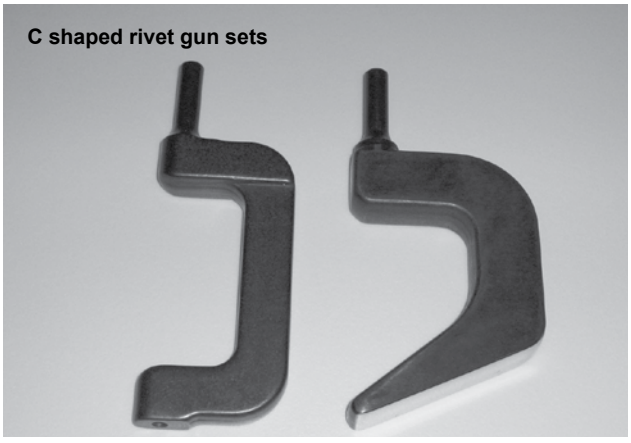
Tool TidBits (Alternative Rivet Sets)
Text and Photos by Don Sinclair

It seems every few weeks I run into a situation where using the standard riveting tools for solid rivets are less than optimal in getting the job. Since I like coming up with new ways to do things (translation: I like to buy or make new tools) I waste, or should I say invest, in this endeavor.

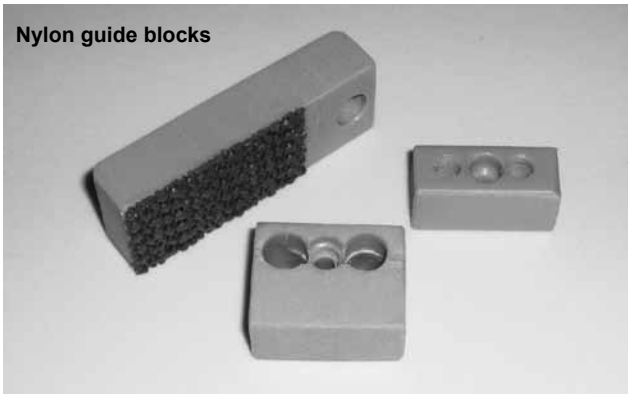
In some cases it can be more convenient to hit a solid rivet from the shop side while holding a bucking bar to the factory head. This procedure is commonly employed to potentially improve the result with thin skins, places where sufficient space for a rivet gun is difficult to find, or where the setup is so rigid that it is difficult to transmit enough force via the factory head side of the rivet. Standard type back riveting sets are shown in the first photo and can produce excellent results where required clearances exist, but sometimes it is just not possible to position one of these tools perpendicular to the shop end of the rivet. For anyone that has attempted back riveting in tight spaces, they will immediately recognize places they could have used the rivet sets shown in the second photo. While single and double offset rivet sets exist, they are normally for universal round head rivets and not great for when you want to back rivet due to the limited space available to get by obstacles. The first c-shaped rivet set has a standard 3/16" hole that accepts your flat sets meant for a squeezer, you could even use universal sets or dimple dies if the need arose. The second angled c-shaped set is great for getting into spots where perpendicular access just isn't possible. Caution must be used when not hitting perpendicular to the shop head, as the rivet set will tend to wander a lot easier. Padding the set nose area, holding it solid with one hand, or setting up some clamped or handheld guide are just some of the ways you can limit movement and potential disasters. The fewer non-intended degrees of freedom you give your rivet set, the better.


Backriveting sets.

In keeping with the theme of preventing the set from wandering, here are a few examples of guide blocks that can be used while back riveting. The two guides with multiple holes are useful when back riveting nut plates in locations where using the standard back riveting sets shown above are not possible. It is not always a space issue that dictates not using the standard back riveting sets, it is sometimes a lack of sufficient hands. When riveting by yourself you need at least one hand on the rivet gun, at least one hand to hold the bucking bar, and yet a third hand to hold the sleeve on the standard back riveting set. In my case the total contingent of shop hands available is two, so something was needed to balance the equation. What I did is place the rivets through the all layers and hold them in place with rivet tape of some type, then add the nut plate and guide block that has been drilled in such a way that it sits flat against the backside of the nut plate. By securing the guide block with a long small machine screw smaller than the nut plate threads, the necessary reduction in the number of hands required was obtained. The setup now only requires one hand on the rivet gun and one to hold the bucking bar. As an added bonus, the thickness of the guide block ensures the shop head is formed extremely parallel to the material it is being attached to.


C shaped rivet gun sets

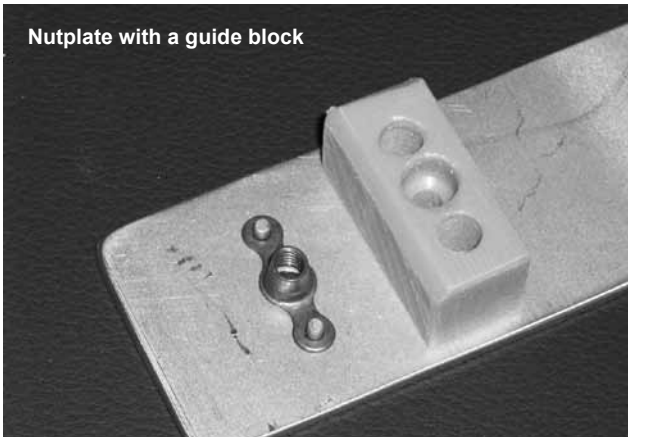
There are lots of options for a back riveting sets that can be used with guide blocks. A standard c-frame rivet/dimple tool comes with a long set that can be used in a rivet gun. The drawback here is that it is 1⁄2″ in diameter and may be too large for

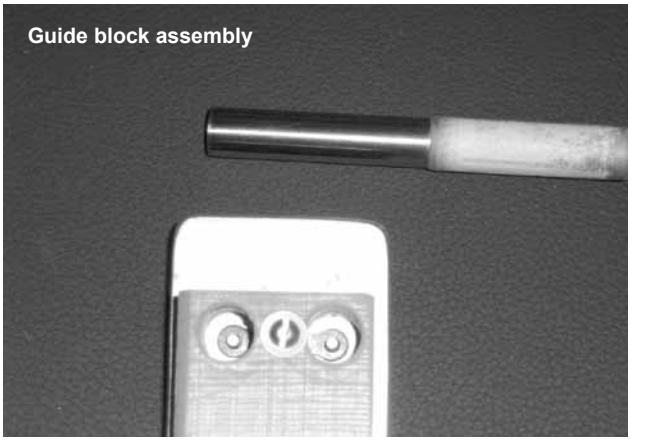

Nylon guide blocks

use with a guide block in many cases. If you have a rivet gun extension set, polish the end of some 3/8″ diameter steel rod and wrap some tape around the other end to bring the diameter to about 0.4″ so that it fits tight in a rivet set extender. You could also purchase a flat rivet set made for your rivet gun, or buy a cupped set and file/polish the end flat, I've done them all. Putting a 3/16″ hole in the end of one these flat sets opens up even more possibilities to use this technique in tight or hand quantity restricted situations. Using that angled c-shaped set to hit a short steel rod in a guide is yet another combination that might be handy. There are lots of ways to hit a rivet and produce a good result that don't involve the common methods.

Production tools shown here were obtained from either:

-Avery Tools *www.averytools.com*
-Brown Aviation Tool Supply
www.BrownTool.com
-Cleaveland Aircraft Tool
www.CleavelandToolStore.com


Nutplate with a guide block


Guide block assembly


Various sets.

Pilot: "Approach, Federated 303's with at 8000' for vectors ILS, full stop.
Approach: "Unable Federated 303. The ILS is out of service."
Pilot: "We'll take the VOR then."
Approach: "Sir, the VOR's in alarm right now. Standby."
Pilot: "OK, guess it'll have to be the ADF then."
Approach: "303, unable the ADF right now for traffic saturation."
Pilot: "OK, approach. State my intentions.

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For Sale

68" 3 blade GSC prop. 75mm pattern for Rotax 2 stroke pusher or early Rotax 912 tractor application. Appears to be unflown. $300 or best offer. Clare@snyder.on.ca or 519 574 4322 Feb08

Cougar (like Tailwind) frame and tail feathers welded, on wheels, Lycoming 0235 zero time mounted, some instruments installed, spars and a/c plywood for wings available $16,000, (519) 945-8731 nseiler@netcore.ca. Feb08

1967 Beechcraft Musketeer, fixed gear, fixed prop, low maintenance, stable IFR platform. Call Ian @ 416 318 4541 days, 905 693-0298 evenings for details Feb08

Re-drive and components for Subaru EJ 2.2. Ross 2.17:1 Re-drive with flywheel and starter, Warp Drive 3 Blade 72Ó HPCF prop with spinner, all less than 200 hrs total time with original documents, also includescustom 4 into 1 SS header system. Package for $3500.00. Also have an Andair FS20-20-D2-6 duplex fuel selector for $250.00. Located Cochrane,AB, contact Gene at 403-932-4238. Feb08

Sonex TD project for sale: Precover inspection done, all surfaces now closed, partially polished, Flight and Engine instrumentation included,

New Aero-vee engine assembled and mounted. Experienced builder. Everything included to complete. Could be flying this fall $30,000.00 Cdn. (cost of materials) Lost medical. 905 892 9649 or bestofbo@cogeco.ca

Continental O-200A for homebuilt. Bead blasted and painted,full electrics.C/W Log Book, accessories and baffles. 1400 Hrs. SMOH 0 STOH $5900.00 . Video clip running on test stand available. Barrie On. Jim @ joloan@csolve.net 705-721-9276 Feb08

N3 Pup,1/2 VW engine,skiis,three gas tanks(main and two wing tanks),single seat.C-IBBE;hangered at Redeau Valley Kars south of Ottawa.Asking $11,500 cnd negotiable.Call Harvey Rule at 613-739-5562 or email me at harvey.rule@bell.ca Feb08

Maranda - Wood & Fabric, side-by-side, 630 TTAF, 110 TTE, Lycoming O-290D2B, VFR panel, night VFR approved, 8.00-6 tires, brand new seat belts,new seat cushions, new interior (7/10 exterior, 9/10 interior), This airplane has float option built into it. Located at Brampton Aprt. Contact: Peter 905-884-8598 Peter@MarandaForSale.com $30,000 OBO. www.MarandaForSale.com Feb08

Filage neuf (HARNESS) jamais utilisŽ pour moteur LYCOMING 0235. Prix $250.00. - DŽtecteur monoxide de carbone. $ 5.00. Alain Lacasse (819) 563-8622 Feb08

AVID MK IV STOL. SN 1474D. Subaru EA 81 engine. Warp Drive 3 blade ground adjustable propeller. Icom IC-A200 air band transceiver. Ameri-King ELT Model AK-450. Tundra Tires. Apart from final propeller pitch / cooling adjustments, aircraft ready for final inspection. Always hangared. 2 x 14 gall fuel tanks, one each wing. Blue & white colour scheme - beautiful construction. Reason for sale & low price - lost medical. Cdn $20,000 negotiable. Graham @ 604-983-3588 or seacap@shaw.ca Feb08

Subaru 150 hp conversion twin cam CF-2-22 by Crossflow, with belt redrive. Fuel injection and engine mount included. Low time. $3500 sacoutism@aol.com 819-778-1442 Feb08

1500 Federal Skis with Teflon Bottoms Please call Jerry Hanstke at 705-268-4098 or email mill@ntl.sympatico.com Feb08

RV-4 project. Empennage finished. Flaps and ailerons finished. Wing spars finished..(Ribs were drilled and attached with clecoes. Now removed, numbered and boxed) Fuselage on the jig. All parts primed. Good workmanship. Call for details/pictures. Asking $11000.- (519) 461-1464 ed@solairecanada.com Feb08

RV-8 Project. Empennage finished. Complete wing kit. Pre-punched skins. Main spars finished. Tanks and outboard ÒDÓ tubes are finished.Flaps and ailerons are finished Very good workmanship. Manuals, all parts and drawings included. Dynafocal engine mount. Please send an e-mail for detailed or pictures. $ 10000.- ed@solairecanada.com (519) 461-1464 Feb08

Pegasair Fuselage,Tackwelded,stainless steel firewall $3000 Subaru EA 81 with gear reduction O time,$2500 Warp Drive 3 blade ground adjustable propellor very good condition $ 600 Heinz Genrich 905 648 0766 tandt@coceco.ca Feb08

Maranda AMF-S14F for sale $20,000. High wing taildragger. Stall 40. Cruise 100. Lycoming O-320. 655TT 225STOH 600 lbs useful load. Flies regularly, but my wife says I have to sell something before I"m allowed to build anything more! Fancy a vacation down south? The airplane and I are both Canadian (C-FXKH), but are currently living in Texas. If you buy it, I"ll reimburse your airfare. Please see http://home.earthlink.net/~daforster/marandasale.htm for more details. Dave 281 992 2713. Feb08

Wanted to purchase good or rebuildable IO 540 for Steen Sky bolt project, also any airframe or parts for the same. OFFICE 1-705-653-4525 or davidcarlaw@prototyperesearch.com Feb08

Zenith CH-250 Project For Sale. Tricycle configuration First inspection done. Ready for rigging. Have 3 in 1 engine gauge, VSI, ALT, Compass, Tack, and air speed gauges. Have a dinafolcal engine mount for 0320 engine, prop, some pneumatic tools. Plus lots of old news letters for the project and pictures of different configurations. $10,000.00 Ph. 604-859-6884, John.

FOR SALE 1940 PIPER J5 Ground up restoration 2007 and complete conversion to PA12 with the installation of Lycoming 0-290 125HP 35Hrs SMOH

New stainless firewall and cowlings. New Slick mags. B&C Alternator. Sensenich metal prop New Stainless exhaust system with XM Mufflers. Oil Cooler with cockpit control. New Cleveland wheels and "double puck brakes" New Garmin GTX 320 Mode "C" New ICOM A200 with Flightcom I/C. All new instruments. New Windshield and side windows. Tinted Roof. New "lifetime sealed struts" with 5/8 forks. Dual pulley trim system mounted overhead. Left side window outward opening. New upholstery. Aircraft completely recovered in Ceconite. New pulleys.

Aircraft licensed in the Amateur Built category and can be flown in the USA. Wonderful aircraft to fly, with excellent climb performance. Aircraft is at AK3 (Delta) $45000 OBO Call Bob at 604 220 6385 Jan 08

CAVALIER 102.5 with a new Lycoming "Aero Sport Power" O-320-B2B installed in 2005 with only 61.4 hours total. Because of this fantastic engine, the Cavalier can climb out at 1,500 fpm! Attached to

this potent engine is a Sensenich metal prop that has 61.4 hours since overhaul. The airframe was totally rebuilt in 1997; therefore, total time since then is only 265.1hrs. 1750# gross weight, leaving a whopping 622 lb useful load; VFR instruments + Garman GTX 327 TXP Mode C & Val Radio; Furthermore, the plane has been kept in heated hangar keeping her appearance 8/10 inside and out. You can fly this incredible plane away for only $38,000. If you are interested, I can be contacted at: moneypit@uniserve.com or 250-558-5551; ask for Cameron. Apr08

PARTS FOR SALE: Low hours Colin Walker wooden prop a 7256 off a O-290D ($600); New RAPCO dry air vacuum pump model # 211CC ($80); New Flightcom model 403mc voice activated intercom ($100); New ICOM IC-A200 VHF Transceiver ($600); New ROTAX 9" UHS 2 blade spinner ($80). moneypit@uniserve.com or 250-558-5551; ask for Cameron. Apr08

FOR SALE McCauley Propeller Model 1A101/DCM6948 fits Continental 0-200. Certified and zero time since overhaul. Also available overhauled Directional gyro and altimeter. Don Bentley 250-764-0880 Apr08

Christavia Mk1, 2 place rag & tube; all major structures & engine mount complete; Subaru auto conversion with NSI reduction drive and dual electronic ignition; graphite 3 blade prop on gear; elevators, ruder and control table complete; wings and ailerons fitted and complete; pull-up and cables not attached; 100 hours of flight time on proven engine; instruments, fabric, tape, cord, hardware enough to finish; cowling complete; (no chemicals for fabric covering); used instruments fitted to panel. Contact Bill Weir. billweir@lom.imag.net Apr08

Rotax 582 firewall forward with motor mount and rad, GSC 3 blade prop, cowling. oil tank, some engine instruments, exhaust. All were removed from a Zenith 701 being repowered by a 912S. Everything to get flying for $3500 OBO. millfly@sympatico.ca 519-822-6693 Apr08

Geo/Suzuki 1300 firewall forward package including dynafocal engine mount and rad, to fit Zenith 701. Includes cowling, starter, alternator, carb, exhaust, GSC prop, and some instruments. Package was replaced by a 912S. $3500 OBO millfly@sympatico.ca; 519-822-6693 Apr08

Zenith 701 project. All formed parts made, spars riveted, jeep landing gear, Matco wheels and brakes, dash and most of the fuselage components, pedals and some welded assemblies, $6500 millfly@sympatico.ca 519-822-6693 Apr08

All parts to convert an RV-6A to RV-6 taildragger configuration. 519-372-1383 kinger@bmts.com Apr08

Compete Zenith 701 kit, only the rudder done, Warp Drive prop, 912UL engine with 245 hrs, logs complete with mount. Includes engine instruments, ELT, transponder mode C, tundra gear, exhaust, oil tank, rads, radio, wing tanks. No cowl or air instruments. $19,000 obo. Call Don 519-372-1383 or email kinger@bmts.com Apr08

HP with Engine Mount, custom 4130 Prop Hub and rolling engine stand to ship.$1750.00 obo. New Colin Walker wooden Prop 6856 with fibreglass L.E. SAE 1 $500.00 G.B. Lewis wooden Prop 7441 metal L.E. very good, no nicks or damage. SAE 1 $500.00 Super Cub 8:00 X 4 wheels, tires, brakes and reservoirs. $500.00 for set. C85 starter and NAS3 carb. $200.00 each, or will trade one for C85 generator. 780- 460- 6841 Aug08

PIETENPOL Air camper modified with zero time C85-12F. New wooden Prop. Final inspection complete. Ready for test flying. Free hangar space until November 30th. $17,500.00 obo. 780-460-6841 Aug 08

1992 MURPHY RENEGADE

Professionally built and maintained. Excellent condition, powered by Rotax 618. $23,000. Still flown by retired Air Force pilot Tony Bellos from his own strip in Knutsford, near Kamloops, BC. 250-374-6591 or tbellos@telus.net Aug08

Wanted

WANTED Aeronca Champ. Preferably 85 to 100 hp Continental. Located Ontario or Quebec. Contact <tingle@ionsys.com Feb08

Do you have a 12 ft table taking up valuable space. I need one for my Pegazair project. Toronto area but will travel distance to pick-up. Also need an assortment of clecos. Larry 416 526 2602 or larry@patronproducts.com Feb08

WANTED: Alternator or generator for C90. Must have gear intact. Contact Jeff Deuchar 780-352-4268 or f1rocket@telus.net Aug 08

Ads run for a maximum three issues depending on space available. Please direct all classified inquiries and ad cancellations to: classified@raa.ca and place "RAA ad" in the subject line.

RAAC has sets of electronic scales that are available to all members for doing the weight and balance calculations on their aircraft. Only $30 for weighing. Contact the RAA office at 1-800-387-1028 to reserve a set.

New In Canadian Skies

Jeff Deuchar's

F1 Rocket

I spent 2 ½ years building the Rocket. Another 2 years before I painted it. I was having too much fun flying it! I think I can finally call it done. I have to thank the usual suspects: My wife (Sandra), and kids (David, Nicole, Eric and Alex), all helped out on this family project. Ken Fowler for answering the "stupid" questions, Eric Hansen for keeping me motivated, and Chris Davis at Vintage Air for the paint job.

I now have 130 hours on it and the Rocket does everything it is advertised to do. Speed is great, climb is amazing, it is an excellent plane all around.

Send us Photos of your completed projects

Share your accomplishment with others - you've earned it!
Please include a brief description of your aircraft and any other details you want to include, and send us a colour print with it. Mail to:
Recreational Aircraft Association of Canada
13691 McLaughlin Road, R R 1, Caledon, Ontario L7C 2B2...
or email us the information and a high resolution digital picture (jpeg format please) to: raa@zing-net.ca

Supermarine Spitfire MK 26, 80% scale Australian kit. LOM 250 hp supercharged, 40 hrs TT. VFR +ICOM A-5, Garmin 196, GW 1785 lbs, limited aerobatics. $115,000.00 CDN. 416-282-5252. daveaustin2@primus.ca

GO ANYWHERE!.....Lake, Glacier, Bush strip.
New '07 Merlin Ultralight, 582 Rotax,
Tundra tires, Floats, Skis.
Priced: Same as new pickup truck.
Will deliver. 204-727-3485

A beautiful summer day with good thermals, near Billund airport, Denmark:
Billund ATC: "Gliders 82 and D5, state position and altitude?"
82: Overhead Coal Lake, 6400 feet."
D5: "Same position, same altitude."
ATC (cool, dry voice): "So should I go get my collision report form??"

Tower: "Aircraft on final, go around, there's an aircraft on the runway!"
Pilot Trainee: "Roger" (pilot continues approach)
Tower: "Aircraft, I said GO AROUND!!!"!
Pilot Trainee: "Roger"
The trainee doesn't react, lands the aircraft on the numbers, rolls to a twin standing in the middle of the runway, goes around the twin and continues to the taxiway.

RAA recently received a notice that the 406 ELT regulation is now published in the Canada Gazette. These ELT's will be a requirement from February 2009. To read the news online, go to www.gazetteducanada.gc.ca and click on the newest posting.

Controller: "CRX600, are you on course to SUL?"
Pilot: "More or less."
Controller: "So proceed a little bit more to SUL."

President's Message *(continued from page 2)*

with maintenance issues. That was a year ago, and RAA has since spoken with Simoneau's boss several times. Each time the answer has been that Transport has been too busy to deal with Light Sport, but maybe a bit later they might find some time. Part of the problem is that Transport is always downsizing its non-commercial aviation staff, and every TC bureaucrat is looking over his shoulder hoping to avoid the axe. It is a lot safer to do nothing than to do something, so no one wants to take the chance of pushing the Light Sport category through the process.

Meanwhile, back in the States, their Light Aircraft Manufacturers Association (LAMA) quickly stepped up to the plate to set up a verification process so that customers would be assured that Light Sports being sold actually meet the ASTM standard. Candidates have been undergoing audits by LAMA and those that meet the standard receive the LAMA seal of approval. Further, even the FAA has recently announced that they too will be performing follow-up spot audits of manufacturers' documentation, not as thorough as LAMA's but a darned good idea to let everyone know they are keeping a watch. By comparison, Bob Bancroft, Chief of RecAv at Transport Canada refuses even to peek at an Advanced UL manufacturer's calculations and proofs. More than one Advanced UL manufacturer has had a fatal accident due to noncompliance with our Advanced UL standard. In one double fatality even the most cursory examination would have revealed serious design and manufacturing problems, but Bob Bancroft refused to take the step of looking at the manufacturer's paperwork. Further, without verifying any paperwork, Chief Bob even allowed this same manufacturer to add yet another model to our Advanced UL List a few months ago. I guess he has his reasons for feeling that the planes are safe, but no one can determine what they are. Bob's answer about audits is that it is the responsibility of the purchaser to do his own audit, while Chief Bob Bancroft blithely adds more unverified planes to our Advanced UL List.

What will it take to move Transport Canada? Well, pressure from Canadian manufacturers certainly hasn't had any effect. There is hope though, because Cessna has announced their Skycatcher Light Sport. Some 800 of these have already been presold in the US, and it will not be long before Cessna and its Canadian dealer network will be pressuring Transport to allow these to be registered here. Some bright spark at Transport will then decide that it just might be a safe career move to recommend that Canada include Light Sport in our regs. Four years after the US started this revolution in light aviation, the US economy appears to be on the skids, but finally Canadian manufacturers will have a way to sell into the US market, and Canadian pilots will be able to buy these aircraft here. -well not quite yet but maybe in the near future.

"There is a tide in the affairs of Man which, taken at the flood, leads on to fortune." Canada has missed this particular tide through the lethargy of Transport Canada. Sad but true.

Classifieds On The Internet:
http://www.ocis.net/tvsac/buyandsell.html -more ads from our Kamloops chapter
http://www.lyncrest.org/sfcclassifieds.html -more ads from our Winnipeg chapter

David Madison

RAA Chapters and Meetings Across Canada

The following is a list of active RAA Chapters. New members and other interested people are encouraged to contact chapter presidents to confirm meetings as places and times may vary.

ATLANTIC REGION

HAVELOCK NB: Weekly Sunday morning get together year round, all aviation enthusiasts welcome. Havelock Flying Club - 25 mi west of Moncton. Contact Sterling Goddard 506-856-2211 sterling_goddard@hotmail.com

QUEBEC REGION

COTE NORD (BAIE COMEAU): Meeting times to be advised. Contact Pres. Gabriel Chouinard, 418-296-6180.

LES AILES FERMONTOISES (FERMONT): First Sunday 7:30 pm at 24 Iberville, Fermont. Contact Pres. Serge Mihelic, 418-287-3340.

MONTREAL (LONGUEUIL): Chapter 415, Meeting in French second Wednesday at 8 pm, at CEGEP Edouard Montpetit 5555 Place de la Savane, St. Hubert, PQ. President Pierre Fournier, pierre.fournier@cmcelectronics.ca (514) 645-4355

OUATOUAIS/GATINEAU: Every Saturday 9:00 am to noon at the restaurant l9Aileron in the airport terminal. Contact Ms N.C. Kroft, Gatineau Airport, 819-669-0164.

ASSOC DES CONSTRUCTUERS D'AVIONS EXPERIMENTAUX DE QUEBEC (QUEBEC): Third Monday 7:30 pm at Les Ailes Quebecoises, Quebec City Airport. Contact Pres. Ray Fiset, 418-871-3781. rayfiset@qc.aira.com

ASSOC AEROSPORTIVE DE RIMOUSKI: First Saturday at 9:00 am, La Cage aux Sports, Rimouski. Contact Pres. Bruno Albert, 418-735-5324.

ASSOC DES PILOTES ET CONSTRUCTEURS DU SAGUENAY-LAC ST JEAN: Third Wednesday 7:00 pm at Exact Air, St Honore Airport, CYRC. Contact Marc Tremblay, 418-548-3660

SHERBROOKE LES FAUCHEURS de MARGUERITES. Contact Real Paquette 819-878-3998 lesfaucheurs@hotmail.com

ONTARIO

BARRIE/ORILLIA: Fourth Monday 7:30 pm, Lake Simcoe Regional Airport. Contact Treas.Gene Bemus 705-325-7585 gene@encode.com

COBDEN: Third Thursday 8:30 pm at Club House, Cobden Airport. Contact Pres. Clare Strutt, 819-647-5651.

COLLINGWOOD AND DISTRICT; The Collingwood and District RAA, Chapter 4904, meets every first Thursday of every. month, at 7:30 PM except July and August, at the Collingwood Airport or at off-site locations as projects dictate. The January meeting is a club banquet held at a local establishment. For more information contact Pres. Keith Weston at 705-444-1422 or e-mail at kcweston@georgian.net

EXETER: Second Monday 7:30 pm at Summers-Sexsmith Airfield, Winters-Exeter Legion. Contact Pres. Ron Helm, ron.helm@sympatico.ca 519 235-2644

FLAMBOROUGH: Second Thursday 8:00 pm at Flamborough Airpark. Contact Editor Frank Ball fdnmeball@sympatico.ca 905 822-5371

HAMILTON: Second Friday 8:00 pm Months of Feb, April, June, Aug, Oct, Dec, at Hamilton Airport. Contact Pres. Brian Kenney, 905-336-5190

KENT FLYING MACHINES: First Tuesday 7:30 pm at various locations. Contact President , Jim Easter 519-676-4019 jim.easter@teksavvy.com.

KITCHENER-WATERLOO: Meets the third Monday of each month in the upstairs meeting room of the cadet building at CYKF, except during the summer months when we have fly-ins instead. Please contact Clare Snyder clare@snyder.on.ca

LONDON-ST. THOMAS: First Tuesday 7:30 pm. At the Air Force Association Building, London Airport. Contact President Angus McKenzie 519-652-2734 angus@lweb.net

MIDLAND-HURONIA: First Tuesday 7:30 pm Huronia Airport. Contact Tom Massey 705-526-5304, fax 526-5310

NIAGARA REGION: Second Monday 7:30 pm at Niagara District Airport. Contact Pres. Len Petterson swedishcowboy29@aol.com http://home.cogeco.ca/~raaniagara/

OSHAWA DISTRICT: Last Monday at 7:30 pm at Oshawa Airport, 420 Wing RCAF Assoc. Contact President Chris Gardiner 905-668-5703 cgardn628@rogers.com

OWEN SOUND Contact President Roger Foster 519-923-5183 rpfoster@bmts.com

OTTAWA/RIDEAU: Kars, Ont. 1st Tuesday. Contact: Secretary, Bill Reed 613-831-8762 bill@ncf.ca

SAUGEEN: Third Saturday for breakfast at Hanover Airport. Contact: Ed Melanson 519-665-2161 meled@wightman.ca

YQG AMATEUR AVIATION GROUP (WINDSOR): Forth Monday, 7:30 pm Windsor Flying Club, Airport Road, Contact: Kris Browne e_kris_browne@hotmail.com

SCARBOROUGH/MARKHAM: Third Thursday 7:30 pm Buttonville Airport, Buttonville Flying Clubhouse. Contact Bob Stobie 416-497-2808 bstobie@pathcom.com

TORONTO: First Monday 8 pm at Ch 41 Hangar on north end of Brampton Airport Contact: President, Earl Trimble 905-787-8524 northerntailwind@aol.com

TORONTO ROTORCRAFT CLUB: Meets 3rd. Friday except July, August, December and holiday weekends at 7:30 pm Etobicoke Civic Centre, 399 The West Mall (at Burnhamthorpe), Toronto. Contact Jerry Forest, Pres. 416 244-4122 or gyro_jerry@hotmail.com.

WIARTON: Bruce Peninsula Chapter

#51 breakfast meetings start at 8:30am on the second Saturday of each month in the Gallery of Early CanadianFlight/ Roof Top Cafe at Wiarton-Keppel Airport. As there are sometime changes, contact Brian Reis at 519-534-4090 or earlycanflight@symptico.

MANITOBA

BRANDON: Brandon Chapter RAA meets on the second Monday of each month at the Commonwealth Air Training Plan Museum at 7:30 PM except in the months of July and August. Contact Pres. John Robinson 204-728-1240.

WINNIPEG: Winnipeg Area Chapter: Third Thursday, 7:30 pm RAA Hangar, Lyncrest Airport or other location as arranged. Contact President Ben Toenders at 204-895-8779 or email raa@mts.net. No meetings June, July & Aug. RAA Winnipeg info also available at Springfield Flying Center website at http://www.lyncrest.org/sfcraac.html.

SASKATCHEWAN

Chapter 4901 North Saskatchewan. Meetings: Second Tuesday of the month 7:30pm Prairie Partners Aero Club Martensville, Sk. info at www.raa4901.com

ALBERTA

CALGARY chapter meets every 4th Monday each month with exception of holiday Mondays and July & August. Meetings from 19:00-22:00 are held at the Southern Alberta Institute of Technologies (SAIT) Training Hangar at the Calgary Airport. Join us for builder discussions, site visits, tech. tips, fly out weekends and more. Contact president Calvin Thorne at 403 932-4325 or email: cbthorne@telus.net

EDMONTON HOMEBUILT AIRCRAFT ASSOC: Second Monday of the month at the Alberta Aviation Museum, 7:30 pm. Contact President Bill Boyes 780-485-7088 Secretary: Trevor Howard (secretary@ehaa.ca)

GRANDE PRAIRIE: Third Tuesday, Chandelle Aviation Hangar, contact Jordie Carlson at 780-538-3800 work. or 780-538-3979 evenings. Email: jcarlson@telusplanet.net

MEDICINE HAT: Last Thursday of the month 7:30 pm RAAC Club Rooms, Airport. Contact Secretary, Boyne Lewis 403-527-9571 handblewis@thehat.ca

BRITISH COLUMBIA

ABBOTSFORD: Third Wednesday 7:30 pm Abbotsford Flying Club, Abbotsford Airport. Contact President, John Vlake 604-820-9088 email javlakeca@yahoo.ca

DUNCAN: Second Tuesday 7 pm members homes (rotating basis). Contact Pres. Howard Rolston, 250-246-3756.

OKANAGAN VALLEY: First Thursday of every month except July and August (no meetings) at the Kelowna Yacht Club. Dinner at 6:00pm, meeting at 7:30pm Contact President, Cameron Bottrill 250-558-5551 moneypit@junction.net

QUESNEL: First Monday/ Month 7:00 p.m. at Old Terminal Building, CYQZ Airport. Contact President Jerry Van Halderen 250-249-5151 email: jjwvanhalderen@shaw.ca

SUNCOAST RAA CHAPTER 580: Second Sunday 13:30 pm Sechelt Airport Clubhouse, sometimes members homes. Contact Pres. Gene Hogan, 604-886-7645

CHAPTER 85 RAA (DELTA): First Tuesday 8pm, Delta Heritage Airpark RAA Clubhouse. 4103-104th Street, Delta. Contact President Gerard Van Dijk 604-319-0264, vandijkg@yahoo.ca. Website http://raa85.b4.ca.

VANCOUVER ISLAND AVIATION SOCIETY (VICTORIA): Third Monday 7:30 pm Victoria Flying Club Lounge. Contact Pres. Roger Damico, 250-744-7472.

THOMPSON VALLEY SPORT AIRCRAFT CLUB: Second Thursday of the month 7:30 pm Knutsford Club, contact President - Dick Suttie Phone 250-374-6136 e-mail - richard_suttie@telus.net

ALASKA HIGHWAY: meetings held every third Thursday of every month (except July & August) at the Taylor Fire Hall at 7:30 p.m. For more information call Richard at 782-2421 or Heath at 785-4758.

Chapter executives please advise of changes as they occur. For further information regarding chapter activities contact RAA Canada, 13691 McLaughlin Rd, R R 1, Caledon, ON L7C 2B2 Telephone: 905-838-1357 Fax: 905-838-1359 or call toll free: 1-800-387-1028 email: raa@zing-net.ca www.raa.ca

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