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RECREATIONAL RFLYER

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RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

From The President's Desk

Gary Wolf RAA 7379

Credits

This issue is the result of the work of Ken Coyle, Larry Ernewein, Brian Heinmiller, Graham Luckhurst, Barry Meek, and Peter Whittaker. The art and layout are of course by George Gregory. These are the people who make your Recreational Flyer magazine. Ron Seyffer then prints it, and Dave Evans and the members of Barrie-Orillia RAA handle the packaging and mailing. This is how your magazine is produced.

Chapter Status Reports

Thank you to the chapters that have sent in their 2018 status reports. This report is an annual requirement to have your meetings and events insured under the RAA Chapter Liability Policy. I do see a couple of disturbing trends though. Some chapters do not ask members to produce their National RAA membership cards, and instead just ask the chapter members to state whether they are current. And believe it or not, pilots will sometimes be less than truthful. The membership secretary then sends in a statement that is not true, leaving the possibility that the chapter will not be covered under the policy. If you need to have some names checked, just send an email to ask and we will look them up for you, but first please ask for the membership card.

The other disturbing trend is that while some chapters require National RAA membership as a condition of chapter membership, there are some that barely maintain the minimum requirement, then fill their own roster with a large number of non-National members. The loss of dues to RAA is one matter but the real problem is the lack of human capital. The old guard are National members but the new blood are not. Because they do not receive the magazine they have no idea what RAA does and they do not care. Their immediate needs are satisfied by a night out every month to talk about airplanes. They never look beyond their own airport and assume that someone else will take care of the regulations that allow them to enjoy their chosen hobby. That will work for awhile until the old guard die off, and then these hangers-on will be left wondering what happened to aviation. Read the next item...

RAA ADSB Initiative

Like it or not, the aviation world is heading towards ADSB as a means of keeping order in congested airspace. The USA requires this by 2020 and Nav Canada is pressing for some time close to that, but without the benefit of supplying weather information to pilots. The savings would be to Nav Canada and Transport Canada and the costs would be borne by the pilots.

KW-RAA's President Dan Oldridge and VP Lee Coulman felt that pilots could either sit back and take what is decided, or they could become involved, and work to make ADSB less expensive while offering the same benefits as Americans receive. Dan is well versed in electronics, and Lee is an avionics specialist who has installed and maintained radar systems and around the globe.

Dan and Lee have been consulting to Nav Canada on ADSB systems, and at the April Nav Canada meeting at CYYZ Dan and Lee made a powerpoint presentation to Nav Canada and some fifty airline stakeholders. They provided documents to all

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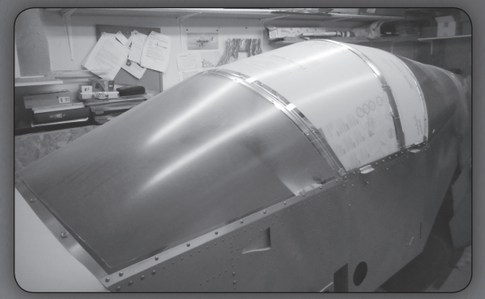


features

columns

Above: this immaculate Electra is a regular visitor at the Arlington Fly-In, July 2017. George Gregory photo.
On the cover: Larry Ernewein's amazing Bucker Jüngmann.

Update: Chapter 85 Cruzer Progress

Peter Whittaker

AT THE END OF 2017 the Chapter 85 Cruzer 750 project reached a stage where final installations were being made prior to closing in the cockpit area with the forward top skin, windshield, doors and cowling, all of which are activities for early 2018. The major steps taken in 2017 have included mounting the overhauled Continental O-200 engine and connecting engine controls, fixing the wings in place, building up the instrument panel and electrical system and mounting the Dynon Skyview system, radio, transponder, altitude encoder and ELT. Saturdays continue to be regular building days in the Chapter 85 workshop at Delta Air Park.

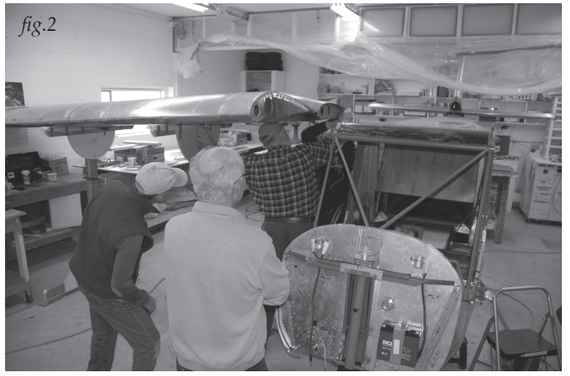
The rebuilt engine was picked up in April from Aero Sport Power (Progressive Air) in Kamloops. BC by Joe Circjel and was mounted to the firewall in mid-May (Fig.1).

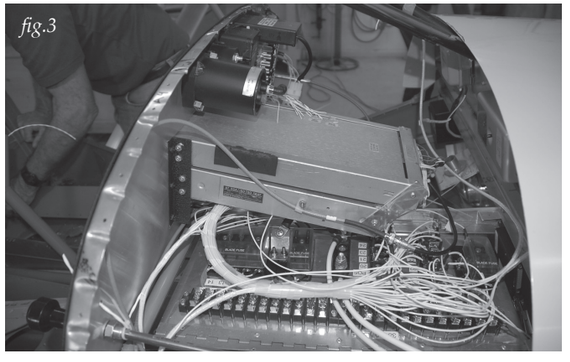
Final wing installation (Fig. 2) took several attempts to get the strut fittings filed to size so that the mounting brackets and strut ends could go together without binding, a minor amount of persuasion with a hard rubber mallet also helped. Two wing stands had been built by Helmut Gebenus and both were used to support each wing, inboard and outboard, while each wing was manoeuvred into position and the wing spar bolts and strut bolts were inserted.

Figure 2: The right wing is held by wooden supports while sheet metal is trimmed in preparation for lowering the wing root to align with bolt holes on the steel tube cockpit frame.

With the wings and engine in place work became focussed in the cockpit on the seat pans and adjustable seat mechanism, on instrument wiring and on pitot – static system plumbing. Access to the power distribution panel was in question until Eric Munzer designed and fabricated a drop down power panel (Fig.3). This is released by a Dzus fastener

Figure 1: Newly overhauled Continental O-200 engine installed in May. Standing left to right; Eric Munzer, Mark Garner, John Macready, Sean Connelly, Cyril Henderson, Peter Murphy and Helmut Gebenus (seated). Fig. 2 (right) attaching the starboard wing. From left to right; John Macready and Eric Munzer look on as Helmut Gebenus and Peter Murphy (trailing edge) trim and fit wing skins. Fig. 3 lower right: Eric Munzer designed and built a drop down power panel.





and extra wiring allows the entire panel to drop down above the right hand rudder pedals for servicing. The other instruments in the panel can be released by their retaining screws and slid out for servicing.

The final instrument panel configuration is centred around a Dynon Skyview system for engine instruments and flight instruments plus GPS moving map display. Traditional round gauges were also installed as backup for airspeed and altimeter (Fig. 4). A used VAL radio and NARCO transponder were installed and the ELT is an ACK-04 which was acquired as a used unit then refurbished and recertified.

Figure 3: The drop down hinged power distribution panel sits on the right hand side and below the radio and transponder. Added lengths of wire allow the panel to drop down.

Figure 4: Final instrument panel layout for the Zenith 750 Cruzer with Dynon Skyview, VAL radio, NARCO transponder and traditional round gauges for airspeed and altimeter. Labels for rocker switches and

controls have yet to be applied in this photo.

As work on the engine fittings and cooling baffles progressed, a trial fitting of the fibre-glass cowling was undertaken (Fig.5). At the same time the spinner backplate and propeller hub were also trial mounted to facilitate the cowling fitting. The propeller is a two blade Whirlwind ground adjustable propeller and the rear half of the propeller hub was temporarily installed.

Figure 5: The cowling was trial fitted with the propeller hub and spinner back plate in place. Peter Murphy (left) and Bill Bird (right) discuss air line routing for the pitot-static system.

During the building activities in 2017, the Annual Delta Heritage Air Park fly in took place at the end of June. At this event, the 750 Cruzer was rolled out to make its first public appearance (Fig.6). The fly in attracted a steady attendance throughout the day and the 750 Cruzer kept builders busy talking to visitors all day. A club project such as the 750 Cruzer is an effective way of demonstrating to people that this is a feasible undertaking.

For more, see Chapter 85's report in the Chapters section.

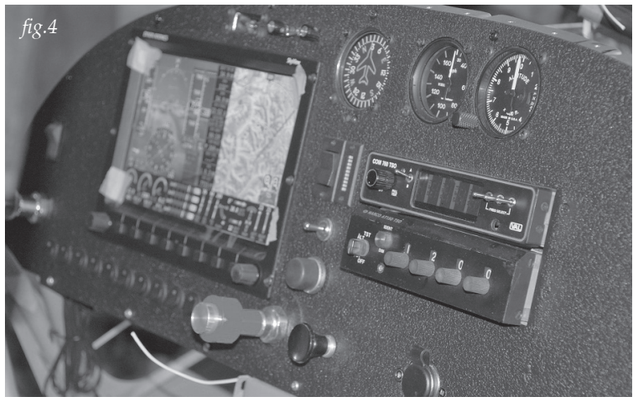


fig.4

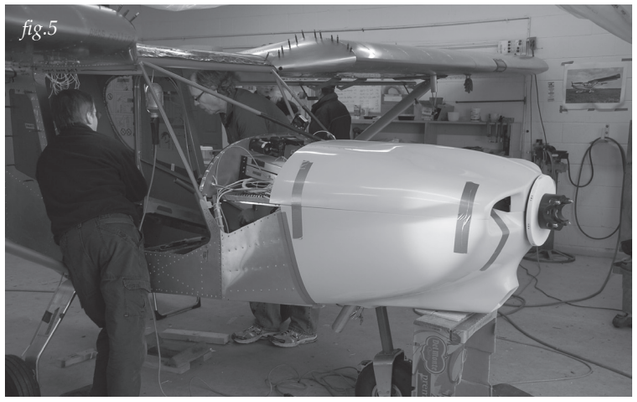


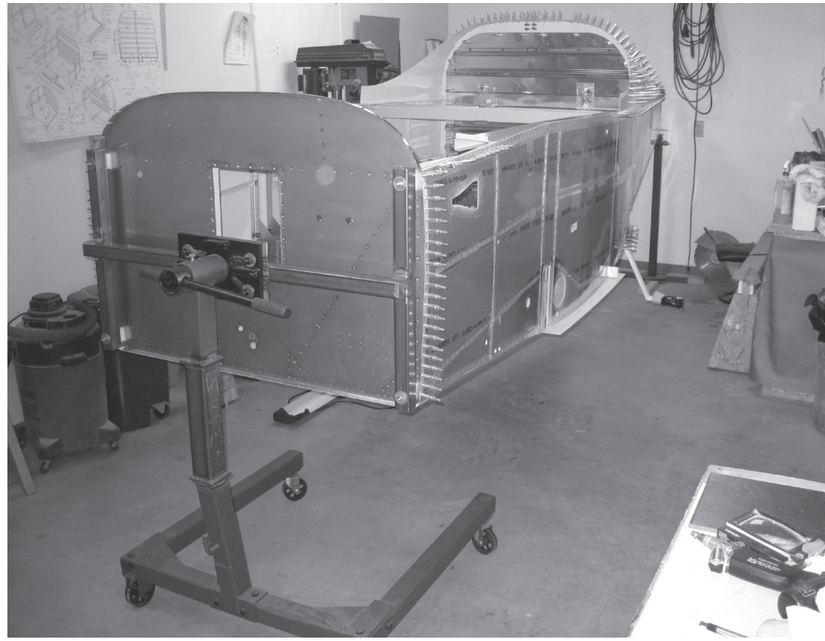
fig.5

fig.6

Figure 4: The Cruzer features a Dynon IFIS; The wiring was handled by chapter member Eric Munzer who recently finished the restoration of a Dornier 27.all wiring is now complete. Fig. 5: Trial fitting of the cowling. Fig. 6: The Cruzer's roll out at the July 2017 Chapter fly-in

Aircraft Rotisserie

Ken Coyle



THIS IS A QUICK aircraft rotisserie for the home aircraft builder. My aircraft is a Vans RV7A.

Please note that I'm not a metal worker, or welder. The object for myself was to make a system to allow me be more efficient on my project and to prevent myself from having to climb in and out of aircraft for numerous reasons. I would like to add that I was not going after pretty just functional as when my aircraft is complete I assume I will be also.

One reason is to prevent possible damage either from slipping and putting a foot into something, or simply dropping tools.

Second reason is accessible working conditions. There are many times in which I've turned the aircraft to numerous positions within a one-hour period.

There is so much interior work from fitting pieces to running fuel lines not to mention all the wiring that can be completed.

Many times I've said to myself, best less than a three hundred dollar investment I've ever made.

My intention is to use the rotisserie to prime and if possible finish paint the aircraft before the engine is mounted.

Keep in mind if you choose to purchase metal from the metal supermarket they will cut everything to the exact size you need. A quick run down was as simple as:

One Princess Auto engine stand

Cut stand in the middle

Decide how tall you need the stand to be to rotate a full 360 degrees and be tall enough to work on. Keep in mind closer to center will give you a better weight distribution as it rotates (it's a guess). I feel that the front and tail should rotate around the same center.

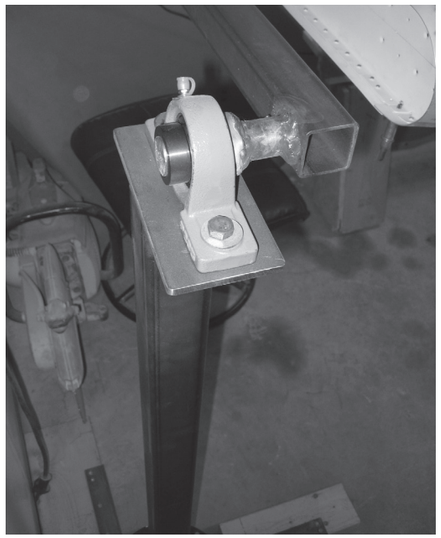
Cut piece of metal tube to fit between (I choose to put a 3" metal plate between each end to make fitting and welding easier for my experience level

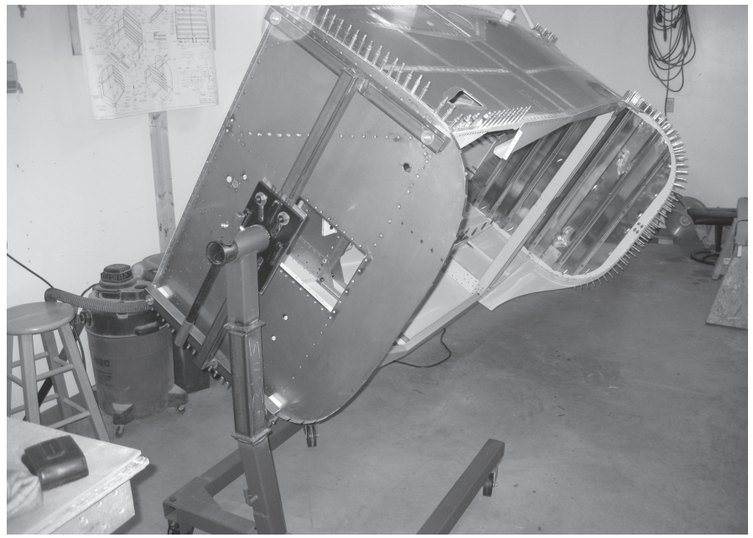
Next get a piece of metal, I chose 6x11" .100 or .125 thick drill the holes where it will mount onto the existing engine stand holes

Next I cut and drilled two vertical pieces of 1.5"X1.5" square tubing and bolted them to the firewall, I put a 1 inch Teflon spacer between firewall and tubing so the mount would not interfere with anything, but I'm sure that a piece of hardwood would also work.

Next I ran a piece of 1.5X1.5 square tubing across the center of the plate that will eventually be bolted to engine mount. Tack weld that in place.

That tube that you welded on the plate needs to be welded onto each vertical tube. Just so happens that I was comfortable with about 11 inches down from the longerons, that gave me enough height, which also told me where the rotating center needs to be at rear of aircraft. (If you choose not to weld you will need to place some brackets so that horizontal tube cannot shift)





Left: a pillow block with a 1" bearing was also purchased from Princess Auto to use as a rotating centre for the tail of the aircraft. Above, it's easy to see where the stand was cut and extended to whatever height suits the builder.

Once that's complete your front stand is 99% done. You can use the existing engine stand rotator holes or you can drill some holes, which will put your project on the angles you prefer.

Rear stand:

I feel this stand will depend on your aircraft. How you fasten the stand to your aircraft will have to be your design. I was able to use some 1.5" tubing, a 6" piece of angle, and some flat stock. I welded up a bracket, which I could clamp to fuselage while keeping in mind to use some scrap aluminum so the clamps are not tightened directly on fuselage.

At this point I would put your aircraft on the front stand, while having someone support the tail. (Trust me not fun to do alone, but can be)

Level your aircraft; just a regular level is sufficient.

Once you have come up with how the aircraft will be connected to the stand, the next thing will be to figure out where the center is. Mine was simple, 11 inches down from longerons because that's where I placed my stand on firewall.

I purchased a pillow block (Princess Auto) with a one inch bearing in it to use as a rotating center.

Weld a piece of tube 1.5X1.5 down from your aircraft mount, I would make it about 2 inches longer

Buy some round stock ,cold rolled or something along those lines. You won't get the exact size so you will need to file or sand it down until the bearing will fit on it. Remember it doesn't need to be pretty unless you want it to be.

A piece 3 or 4 inches is lots, once again an inner collar and outer collar must fit on it as you must tighten collar down so it does not slip out of pillow block once assembled.

Weld the other end of your pillow block axle onto your square tubing at your chosen aircraft center.

Slip your pillow block on, and then build a stand from the floor up. I used some stuff I had kicking around. I choose a metal 2" tube and a piece of flat stock to bolt pillow block onto it. I'm sure wood could be used.

RADIANT Technology Introduces BINGO Fuel Detector

January 24, 2018 — Sebring FL – Radiant Technology LLC, a Belite Enterprises company, has introduced the BINGO Fluid Detector which instantly provides an indication of fluid presence or absence. It is ideal for use in aviation and in fluid process control as well. It is typically installed at the point in the tank where the pilot wants to be alerted. For instance, at one-quarter tank remaining.

"This product continues our development of innovative, disruptive products for the fuel and fluid measurement industry," said James Wiebe, CEO of Radiant Technology. "Our products improve safety while flying, and thus reduces pilot anxiety. Pilots always want more accuracy out of fuel systems, and this product provides them with exact feedback when fuel is at a specified level."

The product is also ideal for industrial process monitoring and control, since it is compatible with an enormous amount of fluid types. The housing is constructed of a special kind of plastic, impervious to just about everything; and the sensing technology is also highly agnostic to fluid type.

The fluid detector screws into any 1/8 NPT port and works off of standard power, from 10 to 32 volts, so compatibility is universal with most electrical systems. The device includes a built in dual color LED alarm and also an external LED alarm which may be remote-mounted. (Green equals presence of fluid; red is for absence of fluid.)

Operating range is -20 to +85C; current consumption is minuscule at 0.01 amperes. Weight is 30 grams or one ounce. Standard output is LED driver compatible, 0 to 3.3 volts with current limiting. Other outputs available (special order) include serial data.

Application is certainly not limited to LED visual alarms. For example, the device is ideal for signaling start / stop of automatic fueling systems.

Tested fluids to date include: gasoline, diesel fuel, jet fuel, water, hydraulic fluid.

Other fluids which are believed compatible include: alcohol, acetone, ethanol, acids, certain oils, brake fluid, coolant. This is a very partial list.

Priced at $99.95, Bingo Fluid Detector is currently shipping. Part #RBINGO. Buyers can purchase BINGO at: http://www.beliteaircraft-store.com/bingo-liquid-detector/

The BINGO Fluid Detector is one in the line of aviation instruments offered by Belite Enterprises through its Radiant Technology line of products. The Radiant instrument line combines many functions into simple, small lightweight units and uses sunlight readable full color high contrast LCD screens.

CORE CHARGES

Canada Revenue Agency has specific rules for application of HST/GST to core charges when a customer is buying a rebuilt part and the transaction involves the return of a core. In brief, if you bring your core as an exchange for credit at the time of the sale, the vendor charges tax only on the rebuilt part.

Example – a customer buys a rebuilt engine for $30,000 and at the same time turns in his old engine as a $5000 core. In a 13% province the invoice would show $3900 HST charged on the $30,000 engine.

However, if the customer wishes to minimize downtime and elects to return his original engine after the rebuilt engine has been installed, the invoice would show a sale of $35,000 plus $4550 HST. Essentially the customer is paying a surcharge of $650 for the convenience of minimizing downtime. For a customer who does not have an HST/GST number there is no way to recoup the tax that was paid on the core. Returning your core engine will not result in return of the tax. You are deemed to have bought a $35,000 engine and later you sold a $5000 core to the engine rebuilder.

The full explanation is given in CRA info sheet G1-167, just google it. The document is not available on paper.

Calibrate Your Torque Wrench

Brian Heinmiller

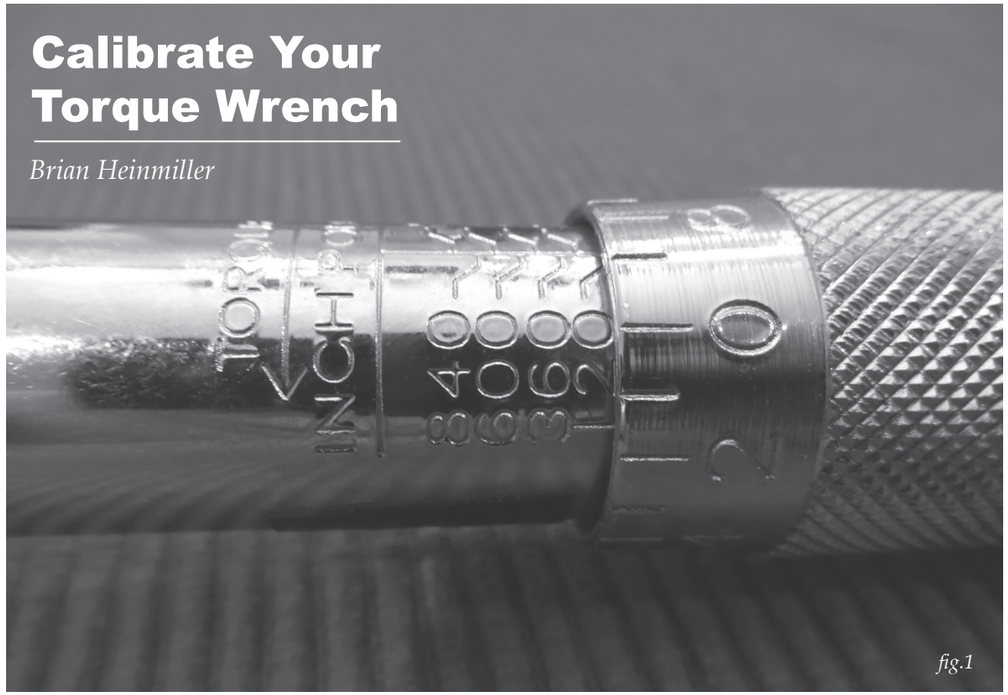


fig.1

MAINTENANCE ON MY SONEX requires that the following torque checks be performed at least annually:

Flywheel bolts 24 ft-lb
Cylinder head bolts 24 ft-lb
Propeller bolts 12 ft-lb

In addition, other maintenance tasks involving dis- and re-assembly often have torque requirements.

While my torque wrenches seem to work OK, I had never been happy that I'm really torquing to the specified value. Maybe it's because the markings are hard to read and a bit ambiguous (see Figure 1), maybe it's the country of manufacture, and maybe it's the suspicion that the characteristics of the tool vary over time, temperature or number of uses. For awhile I managed to cobble something together to enable me to convince myself that this time the setting is OK, but I soon realized that I needed a quick way to calibrate the torque wrench immediately prior to every use and torque setting.

Figure 1: So I made this torque wrench calibration tool from components available at my local hardware store for less than $20. It comprises:

1 piece of 1-1/2″ perforated steel angle – 36″
1 carriage bolt, 3/8″ x 2″
2 or 3 steel washers, ½″
1 steel washer, 3/8″
1 locknut, 3/8″
1 garage door cable pulley with 3/8″ bore
Light chain and s-hooks
Appropriate weights (see below)

The angle piece was cut down to 27″ such that a transversely-elongated hole is in the exact middle. That middle hole was filed out to a square shape so that the square part of the carriage bolt could be hammered in to the hole from the inside. This is important. It ensures that the bolt can't turn in the angle piece as a normal hex bolt surely will. Then ½″ washers were placed over the remaining exposed square portion of the bolt shank. The pulley, 3/8″ washer and locknut went on next and the nut tightened. The portion of the bolt that protruded past the nut was cut off. The ball bearing pulley provides an essentially friction-free pivot for the tool. See Figure 2.

The rim of the pulley is clamped in a vise so that the angle beam can rock back and forth a few degrees from the horizontal. See Figure 3. If the beam is unbalanced, add hardware to one side or shave the other side to balance it.

Weight(s) are then prepared. A weight that is numerically the same as the torque value is used. (A torque of 24 ft-lb requires a weight of 24 lbs). An accurate scale is a must – bathroom scales won't cut it here! Include the chain and s-hooks in the total weight. I used landscaping stones for weights and perforated steel strapping to connect them to the chain. Using the chain and s-hooks, connect the weight to a hole in the angle beam that is exactly 12″ from the pivot. Adjust chain length so it is taut with the beam horizontal. Make sure you connect the weight to the side that will cause it to be lifted when the nut in the middle is TIGHTENED.

Apply the torque wrench and 9/16 socket to the nut and rotate in an attempt to lift the weight. Initially the wrench should break without lifting the weight. Increase the tension on the torque wrench in small steps just until the weight can be lifted clear of its support without the torque wrench breaking. Back it off a bit and creep up to the break point in even smaller steps. Your wrench is now calibrated to W ft-lb where W is the weight in pounds. See Figure 3: Note that you don't need exactly the weight that corresponds to your torque spec. In my case the weight happened to be 23.4 lb. This gives me a calibrated torque of 23.4 ft-lb. The markings on the torque wrench are OK to adjust it up to 24.0 ft-lb. I have a smaller brick that provides my 12 ft-lb calibration point.

fig.2

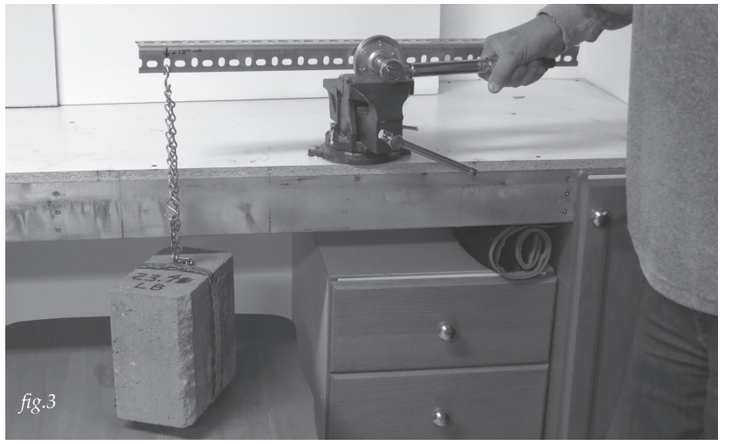


fig.3

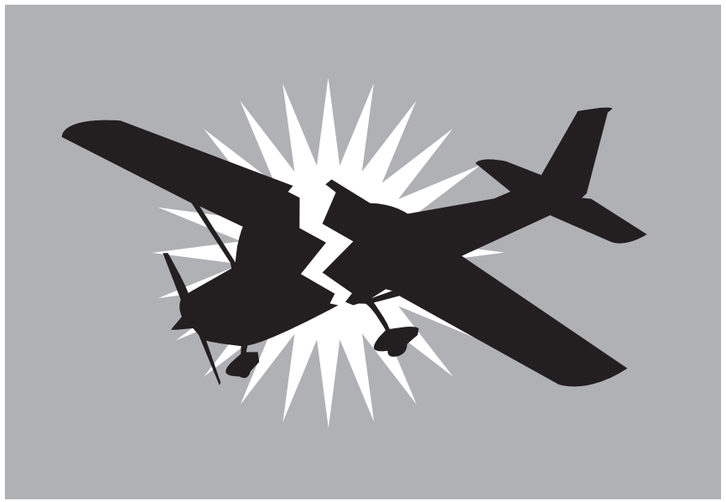
If you have one of those bending-bar torque wrenches, this tool can be used to calibrate it too.

This tool is easy and cheap to make and takes only a few minutes to set up and use. I won't use my torque wrench without it.

Brian Heinmiller can be reached at bjheinmiller@gmail.com

Navigating an Aviation Insurance Claim

Barry Meek



I DON'T PRETEND to know much about insuring an aircraft for private business and pleasure purposes. As pilots, we all go through the process of buying insurance on an annual basis. There are many choices to be made, most of them we don't totally understand. We rely on advertising by the insurance companies, the recommendations of other pilots, and the endorsements of various pilot organizations such as COPA, AOPA and EAA. In my opinion, aircraft insurance is far too serious to be casually approached.

Many pilots insure to the absolute minimum requirements, which is the liability amounts that Transport Canada requires. They don't buy the hull or even the not-in-motion coverage and often don't carry coverage for their passengers. Luckily, there are relatively few stories of tragic losses that were not insured. But they do happen!

I have been the sole owner of airplanes and have been in partnerships. Quite frankly, I never gave insurance much thought when it was time to buy or renew. It seemed pretty simple to do it all on the phone, and be instantly insured, ready to fly that same day with the policy receipt sent via e-mail. Too easy! When flying commercially, the whole process is handled by the company, so working pilots don't have much to do with those arrangements.

All this insurance business has been fine with me until an incident during the summer of 2014 required that I file a damage claim on a borrowed aircraft. It was a process that eventually ended positively, but it was stressful and a definite learning experience. There's a flawed suspicion the public has that insurance companies are unethical and will find ways to get out of their obligation to pay up. However, in spite of the easy process to buy the insurance, the buyer has an obligation to understand what he/she is purchasing. Having said that, I believe the insurance companies need to write their policies in a way that can be more easily understood by the average person. It may be true that all the warnings are included in the contracts, but they are written with so much legal jargon that only a lawyer can make sense of them.

I purchased my insurance that summer through The Magnes Group Inc. (Magnes), the administrator of COPA's aircraft insurance program. COPA members can buy VIP Gold, Silver and Bronze packages from this broker, each one offering different coverage. The Bronze plan is specifically for pilots who rent or borrow airplanes, which suited me at the time. I called the Magnes sales office, explained what I thought I required, asked a lot of questions, and then decided the plan would cover my needs. I also bought hull insurance for any aircraft I would be operating.

When an accident or incident occurs, all it takes is one phone call to get the ball rolling on a claim. In this case, the call was to Magnes. As my broker, they formally reported the claim to the insurance company, which is the AIG Insurance Company of Canada. The insurance company then has the option of handling the claim in-house or appointing an independent adjustor who works on their behalf. Due to the nature and location of the incident, AIG appointed an independent adjustor. All my discussions and contact from that point were with this adjustor.

For any pilot who has never had an insurance claim let me offer some advice and provide details of what happens in the process. First of all, you need to be proactive. You must be sure before you buy the insurance in the first place, that your bases are all covered. That means your pilots license and medical certificate need to be valid. You have to be meticulous about the paperwork with the airplane you fly. The C of A, C of R, annual inspection report, weight & balance document, operators manual (POH), your personal and journey log books and your radio operators license should be carried with you. Some STC's, if you have any on your plane, should be there too, along with the first-aid kit, your glasses and don't forget an up-to-date compass correction card. Think "ramp check" to be sure it's all there. To begin processing your claim, the adjustor will need copies of the last few pages of the technical logs and your own log book. Be certain all this is complete and current because claims can be denied based on missing relevant information. Then stay in touch with your broker as he/she is there to represent you in the event that the claim is not running smoothly.

If you're certain all is ready for the adjustor, you can be confident that your claim won't hit any bumps in the road due to a technicality. Think about the last time you went through all the paperwork to be sure it's there. On a rental or borrowed aircraft, the pilot in command is responsible, so you'll need to check every time you fly another airplane.

Once that part of the process is done, the damage will be assessed. I don't know if there's a common practice among all the adjusters, or if it's a case-by-case procedure. Some might require a few pictures of the damage, and/or estimates from an aircraft structures mechanic. The adjustor and/or your broker can be a helpful resource for explaining the various options and suggesting vendors if necessary. In the case where the insurance company assigns its own in-house adjustor, that person may even come out and do a personal inspection of the wreckage.

The adjustor, if he is independent, submits his recommendation to the insurance company, who will then usually act on it and pay accordingly. If the insurance company has elected to handle the claim in-house, then the process may be streamlined a bit.

The adjustor eventually assigned to settle my claim was fair and decisive. Following an initial stressful delay, with assistance from COPA and

continued

We all fear the ramp check, but nobody thinks there will be an accident to deal with. It would be tragic to have an aircraft damaged and the claim denied on a technicality.

Barry Meek / continued

Magnes the process ended favorably (for me). I was impressed and pleased. Although this was the first insurance claim in my flying career, I felt bad because it was the first time I had bought a policy from Magnes and the policy had been purchased just one month prior to the incident.

Some pilots don't worry about all of the procedures and the rules. For the most part, it is simply because they don't put in enough time and effort into understanding their responsibility in purchasing the proper coverage. We all fear the ramp check, but nobody thinks there will be an accident to deal with. It would be tragic to have an aircraft damaged and the claim denied on a technicality. The best advice is to be certain of all your regulations and requirements, then take care of it all before you fly.

One final note would be a statement of appreciation to Kevin Psutka (COPA) and to Belinda Bryce (Magnes Group) who intervened with assistance to get through the initial problems in this claim. Purchasing the COPA insurance gives the pilot a measure of security with the knowledge he's not alone if things go sour.

R

__Barry Meek__ is a retired ambulance paramedic, former broadcaster, mountain bike tour guide and commercial pilot. His articles have appeared in the COPA newsletter, the Aviation News Journal, and (of course) the Recreational Flyer. He resides on Gabriola Island in British Columbia.

CARTER AVIATION FOUNDER JAY CARTER PARTICIPATES IN CAFE FOUNDATION ELECTRIC AIRCRAFT SYMPOSIUM FORUM

July 23, 2017 (Oshkosh, WI) – Jay Carter, Jr., founder and CEO of Carter Aviation Technologies, LLC (Carter), was invited to participate in a forum at the CAFE Foundation Electric Aircraft Symposium this weekend in Oshkosh, Wisconsin. The symposium focused on 'Urban Air Mobility: Emerging Technologies and Early Market Opportunities', and featured many notable speakers from government and industry. Jay participated in the eVTOL Developer Panel Presentation and Discussion, highlighting Carter's new electric air taxi concept.

Carter's electric air taxi concept is being developed for the Uber Elevate initiative. Uber plans to start an all-electric air taxi service with initial demonstrations by 2020. They have partnered with several manufacturers and developers, including Carter. Uber has developed a challenging set of requirements for their project, including vertical takeoff and landing (VTOL) combined with efficient cruise at ~175 mph, low noise, and eventual full autonomy (although Uber expects initially to have a pilot onboard).

Carter's patented Slowed Rotor Compound (SR/CTM) technology uniquely fulfills Uber's requirements. The air taxi will be a 4-6 seat aircraft for the intra-city market. SR/C technology allows for efficient hover nearly equivalent to a helicopter, but with high speed cruise efficiency on par with a fixed-wing airplane. The slow turning rotor and scimitar propeller design offer much lower noise than conventional VTOL aircraft, while the high inertia rotor provides excellent safety, acting in effect as a built-in parachute that can be 'deployed' at any altitude or any airspeed, providing directional control all the way down to the ground.

Jay was excited to participate in this forum. The CAFE Foundation is a research and education organization with a 30 year history in testing and evaluation of small aircraft. CAFE's mission is to advance the development of low emission flight by fostering and promoting early entry practical market opportunities. They host the Electric Aircraft Symposium annually, bringing together experts in the fields of small aircraft, electric motor and battery technologies, and others.

For more information on the CAFÉ Foundation and the Electric Aircraft Symposium, please visit the CAFE Foundation Homepage or the EAS 2017 Information Page.

Zenair Introduces Super Duty Line

The STOL CH 750 Super Duty is the latest kitplane model in the Zenair high-wing line developed by aeronautical engineer Chris Heintz. The STOL CH 750 "Super Duty" (SD) is an expansion on the popular two-seat STOL CH 750 light-sport aircraft, but with an increased gross weight (and corresponding increased load). This allows the addition of a "jump seat" in the large rear cabin area and new engine choices for maximum short take-off and landing (STOL) performances.

The cabin itself is 42" wide (and up to 50" at the shoulders thanks to the standard bubble doors) and includes adjustable front seats . The huge rear cabin area is fitted with a rear jump seat and can easily carry up to 200 lbs., ideal for a passenger or all your camping and hiking gear.

With a gross weight of 1,900 lbs, the prototype aircraft introduced at AirVenture is powered by a 205-hp IO-370 engine (Titan). Like other Zenair models, a wide choice of engines will be available for the new CH 750 SD model, ranging from 160 - 205 hp. Fitted with a Sensenich propeller, the prototype CH 750 SD is configured for maximum STOL performance.

RADIANT Technology LLC (a Belite Company) Develops and Releases New IOS APP

January 24, 2018—Sebring FL – RADIANT Technology LLC (a Belite Company) has developed and released its first IOS App for iPhone / iPad. It is now available in the Apple App Store for $19.99.

Named "Precision Altimeter," it provides a comprehensive set of pressure based backup instruments for any pilot, including Altimeter and Vertical Speed (VSI). Every iPhone from the 6 and up has pressure capability built in -- you can take advantage with this App.

It's also fun to play with in a car, or while hiking. It also works perfectly inside buildings and elevators, and Apple's pressure sensor smoothly resolves to single feet increments.

An external BlueTooth sensor is optional, and opens up more capabilities like true temperature / humidity based Density Altitude. (SensorTag from Texas Instruments -- $29.00 (Part # CC2650STK).

A video is available on Youtube at: https://youtu.be/tCMaD6L4m_8

The video is a complete demonstration of the capabilities and features of the Precision Altimeter. The video also demonstrates the continuous climb capabilities of the Chipper Experimental Aircraft.

For more information see: http://www.beliteaircraftstore.com/ios-apps-precision-altimeter/

All photos courtesy www.palv.com

Press Release:

Production PAL-V Liberty Unveiled

ON THE 6TH AND 7TH OF MARCH (press only) and between the 8th and 18th of March (public days) at the Geneva Motor Show at booth 1210, PAL-V will unveil the world's first flying car production model - the PAL-V Liberty. Not only a decisive milestone for PAL-V, but also a historic breakthrough in the evolution of flying cars altogether.

About the importance of this milestone, Robert Dingemanse, CEO of PAL-V stated: "The production model is the moment of truth. The moment where the wall between fiction and facts is torn down. A production model is the last stage in the R&D process before starting full production and delivery. All certifications required for commercialization will be granted on the basis of this production model. It is the pivotal point that separates pioneers from dreamers".

The certification not only guarantees the safety of the flying car but also is the approval that the vehicle can be driven on the roads and flown in the air. Dingemanse said: " Once full cerification is granted in 2019 we will hand over the keys of the PAL-V Liberty to our first customers".

In past years, PAL-V concentrated all efforts on perfecting its design and setting up the production process and supply chain. Dingemanse is now proud to state that with the PAL-V Liberty, he and his team successfully brought the Netherlands back in to league of aircraft maufacturers.

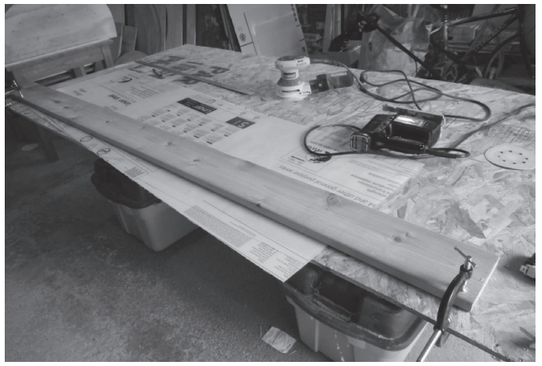
Immediately after the Geneva Motor show the PAL-VLiberty will be going through the last step of the certification process, compliance demonstration. "It takes a lot of testing to prove that the PAL-V Liberty complies with the regulations",said Mik Stekelenburg, PAL-V's Chief Engineer. He continues: "Our design philosophy of complying with existing road and air regulations saved us many years in time to market. Instead of opting for a flying car concept on the basis of not yet existing or immature technologies, requiring new regualtions, we deliberately chose to design, engineer and manufacturre a flying car with proven technologies.This approach enables a realistic and imminent first product delivery date".

In the meantime, PAL-V's pioneer clients are building experience at flying schools around the globe in preparation for deliveries commencing in 2019. For them, door to door fly-driving is closer than ever.

More information and high resolution images at www.pal-v.com

Canopy Compromise

Graham Luckhurst



Clockwise from top left: Graham created a 3D plywood template; a flat work surface and correct tools were essential; clamping the polycarbonate blank for cutting, and marking up the blank. Opposite, a rearword looking view of the finished canopy.

I HAVE READ SO MUCH about how building the Sonex canopy can be a challenge with respect to how sensitive an acrylic bubble is to cracking. Very careful cutting, special drill bits and very thorough edge finishing is required to ensure that no stress risers are present that will cause cracking during the build or later. Work on the acrylic must also be in warm conditions. My kit provider will only sell international customers two canopies.

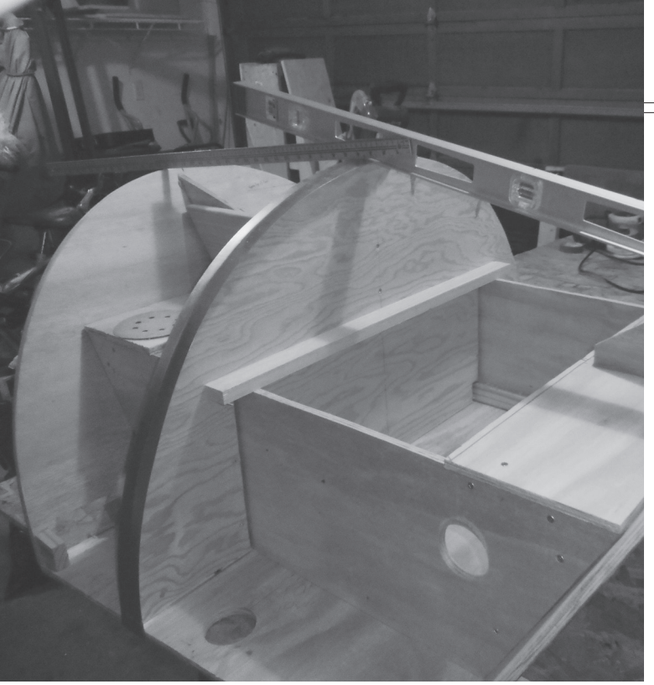
As a first time builder I was hesitant at starting this phase of the build and procrastinated for some time. Eventually I took the plunge and tried to take an approach that would minimize the risks. First, I looked at the way the canopy frame was constructed and did not like how the lower left and right attachments of the bubble to the frame used pulled 1/8" rivets spaced 1/4" from the edge. I redesigned the lower brackets so I could use #8 nuts and bolts lightly torqued in oversized holes 5/8" from the edge.

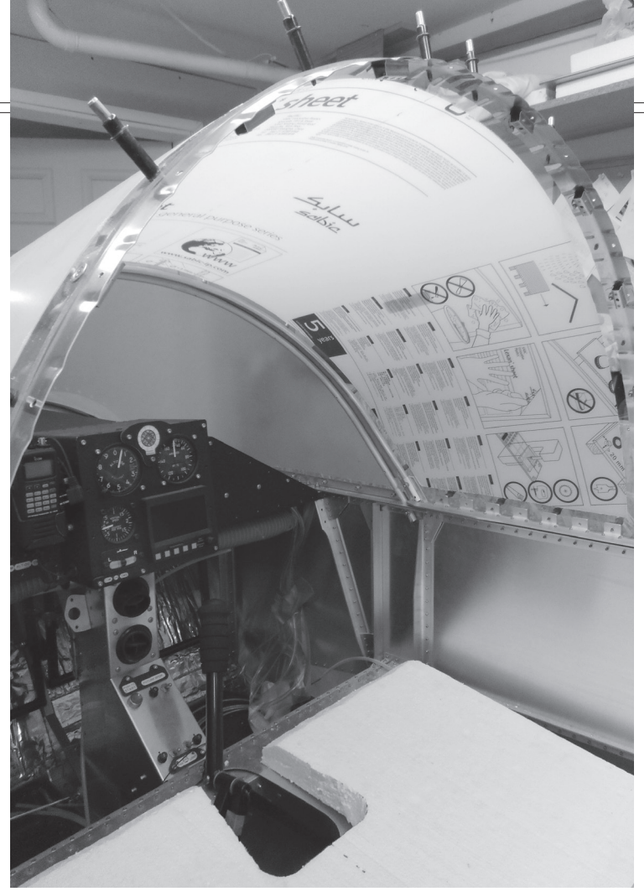
I also knew that getting any help to move the canopy from the plane to the work bench would be very limited. To allow me to work safely on my own I fabricated a three dimensional plywood template using the aircraft cockpit as a pattern so that it accurately reproduced the profile and geometry of the canopy. The idea was then to use the template for all the cutting and most of the edge finishing, avoiding having to go back and forth between the aircraft and bench 50 times as indicated necessary by the kit manufacturer.

I began work on the bubble and within one hour I had cracked it! It was totally my fault, and I won't make any excuses. But I was only upset for a few minutes and then actually became relieved, honestly. I had had a contingency plan in mind for some time and was actually eager to put it in motion. I only needed to accept a compromise….on appearance. What I planned to do was use two pieces of flat polycarbonate to approximate the profile of the canopy. Experimenting with some cardboard revealed that very little head room would be lost and the stepped angle changes between the windshield, the two polycarbonate canopy panels and the turtle deck would not be that large. The largest angle is fifteen degrees at the top where the two panels join. This is equal to the angle of the joint between the cockpit side walls and the tail cone side walls which is part of the aircraft's design. A local master builder of several RV's commented that the canopy has a significant impact on the appearance of the aircraft and questioned whether I should take this path. I was insistent on trying and my goal was to see if he would think it is not that bad once he sees it finished.

My idea to use polycarbonate sheet came from previous experience. This stuff is tough and will take a lot of abuse. You have to bend and crease it back and forth several times before it breaks, even if the edges have not been finished. Acrylic just shatters after a bit of bending.

The polycarbonate manufacturer's cutting instructions include a jig saw or circular saw and spade drills. I experimented with regular drill bits





Above, using the template to verify strap bend and curve; right, assembly starts with the inner straps. Opposite, top: locating outer strap ready for drilling using the inner strap as a guide; opposite, below, one of many rough fittings.

and they worked fine with no grabbing or visible cracking.

Had I bought the replacement bubble(s) each would cost me around $1000 after shipping, brokerage fees and taxes. I procured locally one 4′ x 8′ x 0.080″ thick polycarbonate sheet for $120 all in. I bought clear sheet because I was quite unhappy about the tint of the original bubble.

I had already decided to redo the windshield as the supplied part in the kit was already cut out and was too low, creating an awkward negative angle transition between it and the original bubble. I paid $120 for the material for a new windshield to correct this transition, but I do not count this as part of my canopy redesign cost.

The fabrication and assembly of the canopy followed along the same lines of the kit plans with a few changes I will highlight later. The primary difference was the joint between the two sheets of polycarbonate. I located the joint about 2/3rd from the front and arranged it to be vertical. I made a plywood template based on the profile I wanted and secured it at the desired location on the 3D template I had already fabricated. The template was used to mark up the shape of each of the panels, cut them out with a jig saw and again used as a template for most of the edge finishing, using an orbital sander to get fairly close to the profiles. All the final fitting was done on the aircraft, taping the panels in place, marking up slight adjustments, taking them off for edge sanding and repeating the cycle probably a dozen or more times. What worked well was that I could handle the panels on my own without fear of damage, and all cutting, edge sanding and final drilling was done on a flat surface made from a couple of saw horses and some particle board in an unheated garage. Polycarbonate is not temperature sensitive.

The panel joint needed some careful consideration as I had to form, align, and assemble everything on the aircraft on my own in a fairly cramped space. The joint is made up of several pieces.

A 6061 inner strap centrally bent along its long axis to follow the angle of the panels which changes from zero degrees at the sides too fifteen degrees at the top. The part was fluted to allow it curve and follow the joint profile. It was made in two pieces, left and right, to simplify fabrication and assembly

An outer strap that has the same bending requirements as the inner strap but I used utility grade aluminum so I could use a borrowed sheet metal shrinker to get it to follow the joint profile. The metal shrinker adds lots of fine scoring to the surface but the utility grade aluminum surface finish could be easily restored with fine sanding.

A 6061 strap cover to protect my head against all the protruding bolts that were used to connect the panels. To allow it to follow the joint profile the bent sides were slit every 2″. Rubber "U" channel was used to hide the slits and also to protect the panels from being scratched by the strap cover.

Ten strap cover securing brackets were fabricated and equally spaced around the joint profile.

Flat head screws with Tinnerman washers were used to first secure the inner strap and strap cover brackets in place. The outer strap was then bolted in place and the joint finished up with the strap cover.

Fabricating the joint components was not particularly difficult but was a bit fiddly, read not too much skill but plenty of patience. I was lucky to have a chapter member from whom I could borrow a metal shrinker. In all, this 'canopy compromise' was a pleasant exercise in problem solving and a new experience of different fabrication methods. Plus it looks not too bad and I think my master builder friend

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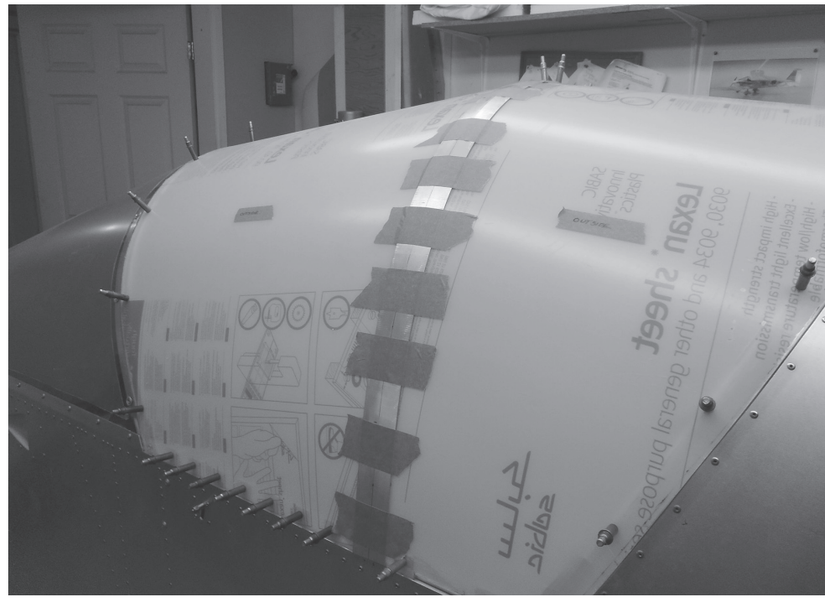


Jungmann

By Larry Ernewein

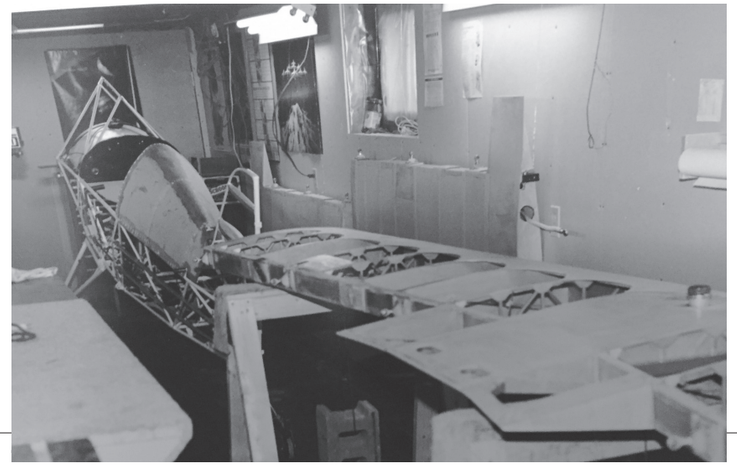
WHILE TALKING with Gary Wolf a few weeks ago, he persuaded me to write an article. Though I've done this before, my ramblings have been technical in nature and type specific. My current airplane is a Bücker Jungmann, which I built and fly in aerobatic competitions. There are 3 flying Bückers in Canada (all amateur built); the owners know each other well and often working together sharing ideas, information, tools and expertise. What I've learned over the years is that homebuilding is about the journey; the people you meet, the problems you solve, the lessons you learn and the support that you have.

In this article I hope to give you a glimpse of my journey. I'll talk about airplanes I've worked on; some of the dumb mistakes I've made, a bit of personal history; and hopefully encouragement for you to put pen to paper and share your adventures…. (paraphrasing Woody Allen) I started out as a child. One that wanted to fly.

On my "I-Love-Me" wall there is a black and white photo that shows a group of about 15 kids, all dressed in their Sunday best – siblings and cousins – at some church event; I'm the one with head up - eyes to the sky. My aviation affliction started early with balsa wood models, a subscription to Popular Mechanics magazine, Air Cadets, and countless hours biking to Waterloo airport so my friend and I could walk around the airplanes. Just prior to starting high school my family moved to a city that didn't have an Air Cadet squadron and I discovered music. I quit high school during grade 13 and joined a rock band to see the world and earn a fortune; ended up owing money and seeing a lot of northern Ontario… When I regained consciousness I learned to fly at Skyline in CYKF, got accepted into the aviation program at Seneca College then flew for a living.

While in college I was able to build low-cost hours by flying a Breezy. I also towed gliders, joined EAA, and rode my Honda

Feature



350 to Oshkosh. That trip got me thinking about building my own plane. Shortly afterwards I bought a flying Taylor Monoplane with a VW engine but it never flew with me in it. I tinkered with it 'til graduation, started working, and the plane sat at my folk's house until it was donated to the Air Cadet League (for a tax receipt!). I thought the Air Cadets would use it as a teaching aid, but discovered almost 30 years later that they sold it to a machinist in Toronto who rebuilt it properly and had been flying it for years! This gentleman sold it to a friend of mine in Guelph where it still flies.

The first project in my first house was to build a workshop in the basement. Once that was done I took a welding course at the local high school, got some oxy-acetylene equipment and bought a set of plans to build a Pitts S1. While searching to source the sitka spruce for the wings I discovered Gord Price was setting up shop at the Guelph airport to make Ultimate wings for the Pitts. Though I knew nothing about aerobatics, I decided I wanted to roll faster(!) - so I bought the plans for the Ultimate wings and started construction using wood from Gord's company. Being poor and cheap, I wound up working for him on a part time basis, which helped finance my project and gave access to his knowledge. As a first-time builder I knew very little.

Next I met Elaine, and she thought it was odd that I flew for a living and didn't own an airplane! So we pooled our resources and bought a Cessna 150 and then we married. In some relationships aviation gets put on the back burner – but she encouraged the addiction. My flight instructor background enabled me to send her solo at Guelph, and she finished her Private License at the London Flying club.

The home-building education continued at Ultimate and Gord asked me to ferry his Pitts to Calgary. Sounds romantic, but that plane had no trim – if you let go of the stick it would attempt a rolling outside loop! It was fun but a lot of work (pre-GPS and no instruments other than ASI and altimeter), and on the return flight a bad weather situation developed into a pranged airplane. Those of you who have hurt a plane know how terrible one feels after the fact, but there is often a silver lining. Re-building it taught me how to repair bent and broken airframes as well as the art of fabric work. One can discover that: "to err is human", and not to be so hard on yourself.

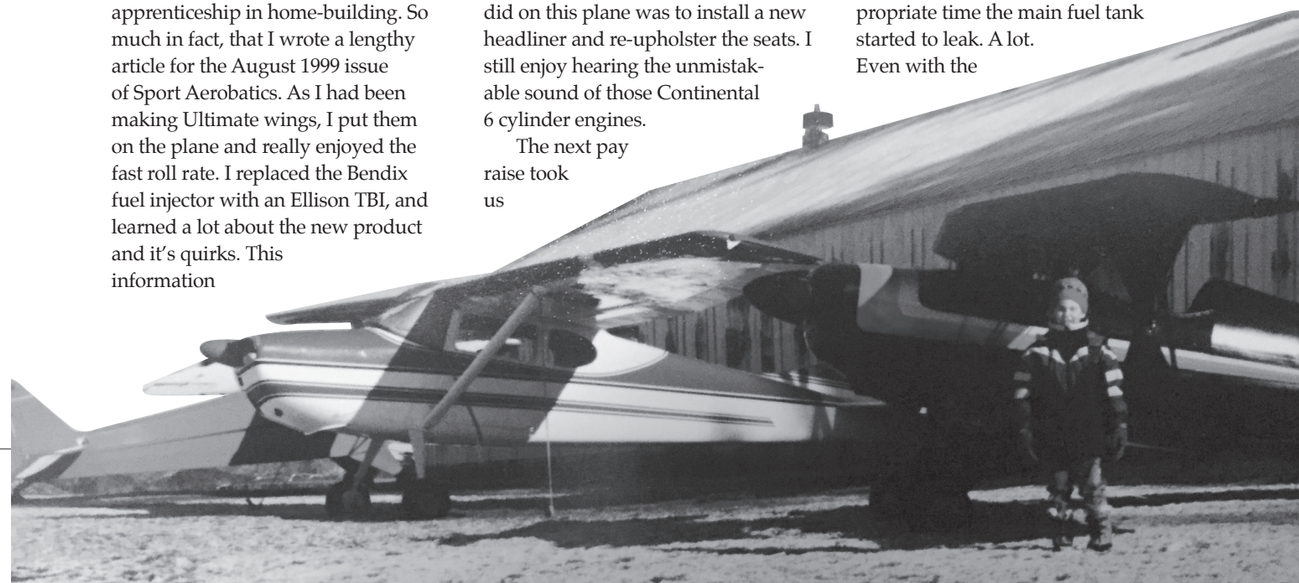
It's interesting what a pay raise can do! I borrowed money and bought a flying Pitts. This too, gave several life and airplane lessons. It was amateur-built and looked good, however it ended up needing a lot of work. It only bit me once, but it provided a real apprenticeship in home-building. So much in fact, that I wrote a lengthy article for the August 1999 issue of Sport Aerobatics. As I had been making Ultimate wings, I put them on the plane and really enjoyed the fast roll rate. I replaced the Bendix fuel injector with an Ellison TBI, and learned a lot about the new product and it's quirks. This information

Only someone who has actually done this can know how difficult it is to get the fuel tank OUT of a J-3 on a hot, sunny, summer day on a paved airport ramp with borrowed tools.

came in handy when making an old Spanish engine provide the power for one of my next projects. Main lesson from this adventure: Keep emotions out of decisions when spending a lot of money on airplanes. Ask around; get info; talk to those who've 'been there'. I was way too shy. There's a lot of experience out there waiting to be tapped…

At the Guelph airport, where we based our 150, we would often see a beautiful C-170 recently re-painted with Imron. Elaine had her eye on it. Whenever we saw the owner, she would compliment him and ask him to look after 'our' plane. It worked! When the time came for him to sell he didn't even advertise – he just called, and we took possession of a real classic. I learned about "Type Clubs". The Cessna 170 owners had a monthly newsletter and all kinds of great information. The only major work we did on this plane was to install a new headliner and re-upholster the seats. I still enjoy hearing the unmistakable sound of those Continental 6 cylinder engines.

The next pay raise took us down another path. When given the choice of a sports car or an airplane, my wife opted for a J-3 Cub. She would learn how to fly taildraggers, and I hoped to eventually do a restoration. It was not too expensive, had a recent annual, a half-time C-85 and was located in Williams Lake, BC. Nobody had shown any interest, so the pre-purchase inspection (by a much-wiser me) led to a cash exchange and my departure the next day for Ontario. First night camped at Maple Creek Sask. Early morning departure to Glasgow Montana with forecast headwinds. Groundspeed about 55 Kts. Take a look on a map – 152 NM and there is not much between these two airports. (A few readers might be saying: "Wait a minute! 152 NM in a J-3 with a headwind??" This Cub had a 15 gallon wing tank plus the usual 10 gallon main tank.) At a most inappropriate time the main fuel tank started to leak. A lot.
Even with the



Rich Isaac

doors open, all one could smell was 80/87. The rest of that day was spent removing, repairing and re-installing the tank. Only someone who has actually done this can know how difficult it is to get the fuel tank OUT of a J-3 on a hot, sunny, summer day on a paved airport ramp with borrowed tools. With 20/20 hindsight I should have just plugged the hole with J-B Weld. It took 5 days to fly home – good weather but headwinds all the way! Low and slow is a great way to see the country, but my sentiments are similar to someone who wrote: "…flying a Cub across the continent is much better to HAVE done than to BE doing…" The tank leak was the only problem we had with the plane until a year later. When flying back to our farm from Brantford with my mother in the front seat, the fabric started to peel off the left fuselage ahead of the window. She put her left arm out the window and held it in place until we landed. Our 2 young boys took razors to the ceconite and we began the restoration!

Being young - with a sharp memory (!) - I would easily remember how to put everything back together: right?? However, Elaine suggested I take pictures – just in case. Was that ever a good idea! I used several rolls of film (pre-digital era) and if I hadn't - I'd probably still be trying to re-assemble the Cub. I now do this with all dis-assemblies because I often can't even remember where I just laid down that wrench…

The re-build took 2 years, and since I had experience in covering with Ceconite 7600 (remember that water-based system) and the Stitts process we used at Ultimate, I decided to cover the Piper using dope. One of the airport locals told me of a chemical company close by that could mix the Butyrate and Nitrate for me for half the cost of Randolph products. A friend was covering his Eagle at the same time so we ordered the dope locally. I covered the tail feathers first and my buddy did a wing. After shooting the first coat of nitrate, the dope kind-of 'bubbled' and cratered. So I sanded it smooth and shot more. Same result. I thought: "… so this is what they mean when they say you have to sand between every coat". So I kept doing this. After about 5 coats I called my buddy.

He had the same trouble. Turned out to be a bad mix from the company. We both had to cut the fabric off and start over. Needless to say we both bought Randolph products and followed their instructions to the letter. Penny-wise and pound-foolish. Still looks good after 25 years, although I should probably wash it every few years…

While working at Ultimate I got to know Charlie Miller. He was (and still is) one of those guys who can do ANYTHING, and do it well. He's also a good salesman. His dream was to own a Bucker Jungmann, and because they were so rare and expensive he decided to make one. If you go to all the trouble to make one (they are a very complicated machine), you might just as well build 10 so you can sell 9 and get yours free! After leaving Ultimate he set up an airplane manufacturing company, called it Blackhole Investments and started making Bücker bits. Most of us didn't know what a Bücker was but after hanging around Charlie for years many of us bought one of his projects! Some even bought two as he built about 10 Jungmann and 3 or 4 Jungmeister fuselages. I started working on mine in 1993. 11 years later it flew. But what an interesting 11 years!

I did not have plans. Nor did I

BUCKER JUNGMANN
SPECIFICATIONS

+5/-3 g's (inverted fuel and oil)
Engine.....Spanish E.N.M.A. G IV B5, inline inverted four cylinder, 150 hp @ 2300 rpm

Prop: ..... Hoffman HO23F-212 143K

Empty weight..... 1050 lb

MTOW..... 1580 lb

ROC @ aerobatic weight ....1200 fpm

Vs.....90 km/hr

V approach.....120 km/hr

Cruise: 160 km/hr @ 1900 rpm..... 28 litres per hour

T/O ground run .....about 500'

Landing roll.....600'

understand what a big bite I was taking! To give an example of the complexity: The Pitts wing spars are essentially a one by six with a bevel. With less than one hour's work per spar, you can begin putting ribs on it. The spars in the Bucker are laminated (either 2 or 5 laminations depending on whether you are copying the Swiss or the Spanish example), routed with a special tool, have several doublers (all needing feathered edges) and complex holes drilled at precise locations, beveled top and bottom, tapered at the wing tip, very complex taper and doubler at the root with a special steel attach bracket that is riveted to the wood with 10 mm hollow tube rivets whose heads must be pre-shaped on a special jig to have an 11 degree angle and are then hand-hammered into shape using 3 different specially-made tools! Fortunately, the steel attach brackets were available from a surplus supplier otherwise the time spent per spar would have doubled. After finishing the eighth spar I had got the time down to just over 10 hours each. That's more than 80 hours on the Jungmann spars vs. less than 8 for the Pitts. That ratio is common throughout the whole airframe. The Germans were restricted to 80 hp for their trainers after the first war and so the design had to be light. And that means complex. A wing ready to cover weighs 25 pounds - and when pulling 5 G's each of the four wings is generating almost 2000 pounds of lift. Very few wing sections have that weight-to-load capability - even today.

How long a field is necessary? Well, my runway is 1800' with trees at one end and power lines at the other - lots of room for the Jungmann! (My son also flies a Pitts S1 out of here)

This project helped me become comfortable with shaping metal (mostly soft aluminum). The wing root fairings are a good example. I'm told the old craftsmen could hammer one in an hour with a leather shot bag and mallet. I could not! So I made forms out of wood (one form for each side) and hammered the aluminum over its complex curves. Just making the forms, however, took almost 100 hours! The benefit here is that I can pound out a set of fairings in a couple of hours, and have done so for a few restorers in Europe and the U.S.

One of my friends who had bought both a Jungmann and a Jungmeister fuselage from Charlie decided to spend his spare time getting back into gliding rather than building, and gave me the Spanish Tigre he had found for his plane. It's a 150 hp, 4 cylinder, inverted in-line engine the Spanish Air force had used in another type of plane, but very similar to the 125 hp Tigre that was used in their Jungmann trainers. Both of these types had a bad reputation in the U.S. which has resulted in just about all American Jungmanns using Lycoming engines.

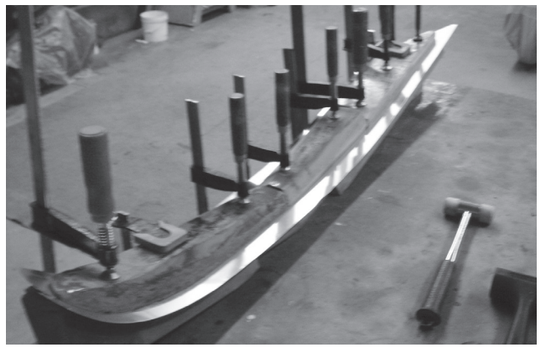
There is not a lot of information about Tigres – especially the magnetos. Their mis-behaviour has prompted several owners to place the Tigre in the "Boat Anchor" category! The timing is set to 38 degrees before TDC and there is a retard mechanism that if it doesn't work properly will not allow a slow idle. The impulse is also important – if it doesn't fire at the correct time it's virtually impossible to start by hand-propping. A lot of head-scratching and experimenting occurred before I was able to have it start and run properly. The addition of an engine analyzer during its second year of operation has given a tremendous amount of information, and has boosted my confidence in this 65 year-old powerplant. The Tigre valves are known to be problematic, and I found the seats were beginning to deform last year (the engine now has over 600 hours). I've just finished re-machining them and the engine is back on the plane. Soon I'll be able to fly again…

Over the years a few airframe components have failed: streamline flying and landing wires from Bruntons; several surplus Spanish Air Force fittings; but so far nothing I've made has broken. Of course it doesn't mean I've… "passed the audition". We are permitted to build and fly our airplanes for "recreation and education", and this continues to be the case for me.

Building a plane without plans involves lots of copying, which for me involved meeting and becoming friends with Bücker owners all over Europe and the U.S. They helped and encouraged me during the journey and I still socialize with many of them. I think it was Paul Poberezny who said something to the effect that our passion for airplanes and flying brings us together, but it's the people that make it all so rewarding. I have to agree.

Rich Isaac

Below: the wing root fairing form, and the finished product on the Jungmann.



Tech Tips

Shared Hangar Jack

Brian Heinmiller

In October 2005 when I finished building my Sonex life was good. I'd rented an enclosed 40' hangar -actually half a hangar, shared with a Zenith 701. The airplanes were very happy together. With the 701 nosed in and my Sonex nose to the door, either airplane could be extracted from the hangar without moving the other. As the Sonex was pulled out its low left wing passed under the upswept tail of the 701, and as the Zenith backed out its high left wing easily cleared the Sonex canopy and left wing.

Then one day the Zenith decided to relocate to another airport. For awhile life was even better, because my Sonex had the hangar to itself. Alas, all good things... my Sonex got a new roommate - a newly-completed Van's RV-6. These airplanes were not happy together, at least in the beginning.

There was no physical arrangement, even using wheel dollies, where the two airplanes could co-exist in a way that eliminated the need to extract one from the hangar before pulling out the other. Wing-on-wing interference was unavoidable. Neither I nor the RV-6 owner was comfortable moving the other airplane or having our own airplane moved. An outbreak of hangar rash would be sure to follow. Something had to give.

While I was whining to the RV-6 "why couldn't you have been another hi-wing?" I had an idea – maybe momentarily it could be a high(er)-wing, at least on one side, if I could jack it up. The RV owner wasn't keen on me applying a jack to his airplane's structure, but agreed that I could jack it – but only by lifting THE TIRE. So the jack I'm about to describe was born.

The Shared-Hangar Jack comprises a frame, a lifting yoke and a platform jack as illustrated in Figure 1.

The frame is welded up from 3/16" x 1.5" steel angle and has two lifting pads where it contacts the tires. (I actually made mine out of an old bed frame.) The length is a couple of inches less than the distance between the tires, and the width is what's needed to place the lifting pads snugly under the tires. Ensure that the frame extends outboard beyond the lifting pads to clear the wheel pants. Also check to ensure that the gap between the frame members is wide enough to clear the wheels on the platform jack. In my case with the RV-6 and its 5.00x5 tires the length is 70" and the outside width is 11.5". There are too many variables (tire size and spacing, platform jack dimensions) for a one-size-fits-all design but this article should provide enough info to make what you need.

In operation, the frame is placed on the floor between the tires


fig.1


fig 2


fig.3


fig.4


fig.5

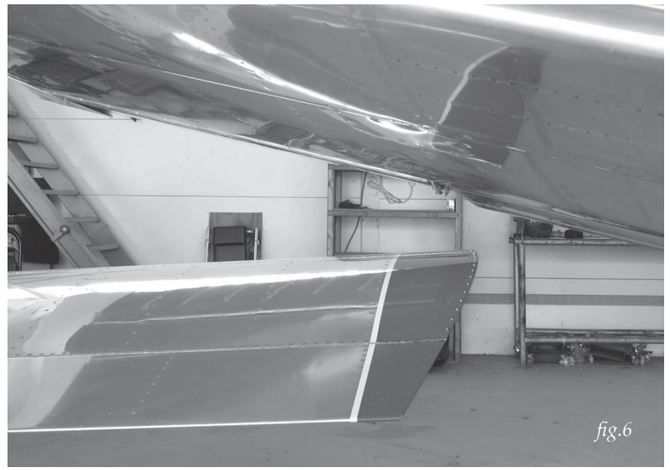


fig.6

and then slid outboard in position as shown in Figure 2. At this point the airplane's weight is still on the tire. Note the 5/16" quick links at the ends of the frame.

Figure 2: The lifting yoke is a piece of ¼"x2"x1.5" steel angle at least 1-1/2" longer than the width of the frame. It is fitted with two 3/8" eyebolts which are spaced on the centres of the vertical frame members and cut open to allow them to be hooked into the quick links on the end of the frame. The eyebolts have nylock nuts above and below the yoke which are one-time adjusted so the collapsed platform jack will just fit under the yoke as in Figure 3.

Figure 3: Make sure you choose a platform jack with the highest lift distance you can get. There is quite a range among jacks.

Now all that's left is the grunt work. A minute of jacking and the airplane wing is up and out of the way. See Figures 4 and 5 (previous page).

Now the Sonex right wing passes beneath the RV-6 right wing as the Sonex backs out of the hangar. It's close, but - hey - a miss is as good as a metre, right?

Figure 6 (previous page): I have found that this jack works well and I've used it more than 50 times. It adds about 8 minutes to the task of getting my Sonex out of the hangar – much faster than repositioning the other airplane. We chose to jack the RV-6 rather than the Sonex because due to the Sonex shorter wingspan and lower wing the required lift distance is less. In retrospect, jacking the OUTSIDE tire of the Sonex to LOWER the overlapping wing might have provided more clearance due to the dihedrals. But in our case the hangar layout would have made that solution harder.

A few caveats:

Chock the other wheel.

Make sure the tires are properly inflated.

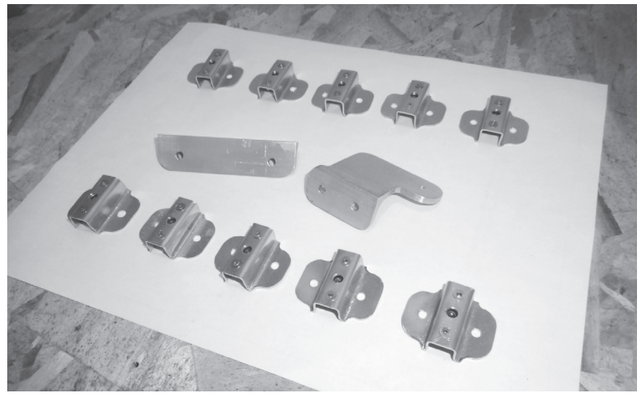
Don't lift one wing without confirming there's nothing under the other wing to get squished.

Watch for fuel coming out of a wing tank vent when the airplane is tipped up.

For safety reasons, don't leave the airplane jacked up when the second airplane is clear, and never put a body part under any component of the raised jack.

Don't plan on using this jack to change tires or service wheel bearings! On the other hand, I suppose you could jack the plane and gently lower the wing onto a well positioned and padded sawhorse and do exactly that.

I haven't tried this on a tricycle-gear airplane but it should work as well.



Canopy / continued from page 21

agrees as well. One concern is that this arrangement is tough. If the canopy jams while I'm in the aircraft for some unfortunate reason, a dot punch is not going to shatter it. I'll need to experiment with something like a drywall saw to see if that could work. If the polycarbonate does get damaged, crazed or yellows too badly over time, it should be easily replaced. Just a lot of unbolting, use the old panels as templates to make new ones and bolt it all back together. Perhaps a weekend's work and another $120.

As mentioned above, I made some additional changes to the canopy design not related to the changeover to flat polycarbonate panels.

The locking mechanism for the canopy is spring loaded where the kit design stops it inadvertently coming open in flight using an AN415-2 lock pin. I felt this could easily be forgotten or lost and if someone needed to open the canopy while you were inside and disabled with the lock pin in place, they could not get you out. I therefore implemented a spring loaded locking mechanism that can be accessed from inside or outside the cockpit. The lock automatically engages when the canopy is secured so it cannot be forgotten.

The kit design has the canopy

Oppsite, top: some of the custom canopy compnents Graham made for his project. Opposite lower left, the metal shrinker in action, and (opposite right) the setup to progressively bend the canopy straps. Above, a forward looking view of the finished canopy.

secured to the front and rear bows using 6-32 machine screws in tapped holes. The bows are fabricated from 6061 ½" diameter tubes that have a 0.058" wall thickness. This means only two threads would engage the tube wall. I have heard three is the recommended minimum and this likely in steel. Since these screws must not be too tight and loctite will craze the plastic, I selected longer machine screws, drilled out clearance holes through both sides of the tube and secured the screws with fiber lock nuts. Again, a compromise in appearance but worth it for the integrity of the canopy.

Editor's note: The Sonex canopy is unusual in that it is blown as a shallow acrylic bubble and the builder is expected to pull the sides together to push the ceiling up. Had the canopy been blown to the same height it would have become very thin at the top unless heavier sheet stock was used.

continued

COSTCO AND THE PILOT

Many handheld radios, gps, and intercoms use AA batteries, as do cameras. Rechargeables can work well but they do not have the voltage of conventional batteries, so sometimes performance is reduced. Duracell and Energizer batteries are the gold standard but they are expensive. Fortunately Costco has house brand Kirkland batteries that perform very well at low cost. Consumers' Reports gives them a high rating, just below Duracell and Energizer, but the rating does not take into account the purchase price. Factor in the price and Kirkland is a clear winner.

Kirkland AA batteries are sold in a package of 48 at a price of $13, (26 cents each) and Duracell at 48 for $26, so 56 cents each.

Photos for your pilot license or passport are also a bargain at Costco. At one time Shoppers Drug Mart took photos for $10 but then the price rose to $15 and now $20. Costco charges $6.95.

Ink for printers is a bargain too. Costco sells OEM ink, and also refills your own cartridges. Refilling cartridges is simple – the print shop is by the entrance and they weigh your tanks to see if they are empty; they will refill cartridges while the customer shops. I have been using these for years and have never had a problem. Regular refills are $12 either black or colour, and large refills are $14.

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The possibility of cracking a Sonex canopy during construction appears to be not uncommon. Purchasers of kits sent to countries outside North America are required to buy a second canopy at the outset. The canopy itself is not that expensive but packing and shipping is.

Graham Luckhurst was faced with the need to buy a second canopy and decided that he would instead design and make his own from polycarbonate sheet.

***Graham Luckhurst** graduated with a degree in Engineering Computer and Control Systems, and earned his Private licence in the UK. He is raising a family and has been building a Sonex in his home workshop as time permits. Graham has already assembled his Aerovee engine and is now nearing completion of the airframe.*

Inside view of installed cover strap.

Mark Garner writes:
As I mentioned at the RAA (Chapter 85) meeting, Ed Soderblom visited us at the Panckake Breakfast last month. He owns the Pober Pixie that the RAA built many years ago. Its life has survived since, and now lives at Meadowmist Airpark only 5 miles south of the border.

Upcoming Events

BRAMPTON CHILE PARTY
Sat. May, 5, 18:00 Chili Party – Our annual kick-off to the summer season, this is one of the Favourites. A full pot-luck banquet with salads and desserts. Cost is nominal, no charge to those bringing chili. Salads, desserts and rolls will be provided. Bring a full pot! RAA-TR Hangar, north end of Brampton airport. Pres. Pres. Fred Grootarz, 905 212-9333, fred@acronav.com ; V.P. Alain Ouellet, 416-709-2020, aouellet@icecanada.com

JOINT FLY-IN AND CANADIAN VINTAGE MOTORCYCLE CLUB SWAP-MEET AND GATHERING
MAY 26 (27th rain date), MIDLAND/HURONIA, ONTARIO, CYEE, UNICOM 122.85: The Motorcycle club will be collecting an admission fee on the street side. Fly-In visitors are free. Food services will be available all day at the RAA food trailer. For more information, please contact the airport at 705-526-8086 or the airport website at www.huroniaairport.com

BRAMPTON MONDAY NIGHT BBQS BEGIN
Mon. June 11, Brampton CNC3—18:00 Monday Night BBQs begin! Every Monday night to Sept. 3rd. Join us for our Legendary Monday Night summer BBQ. Going strong into our 12th season. Burgers, sausage, and all fresh trimmings. Nominal cost. RAA-TR Hangar, north end of Brampton airport. Pres. Pres. Fred Grootarz, 905 212-9333, fred@acronav.com ; V.P. Alain Ouellet, 416-709-2020, aouellet@icecanada.com

ANNUAL RAA NORTHERN REGIONAL FLY-IN
July 14, 2018, Midland/Huronia, ON, CYEE, Unicom 122.85: Annual RAA Northern Regional Fly-In (NRFI), hosted by the Midland RAA chapter. A Transport Canada approved seminar is scheduled for 10:00. Zenair factory and the Midland Model Railway Association, both located on the field, will hold coincident open houses. Antique/Classic cars and motorcycles will also be on display. Breakfast and lunch will be available. For further information, please contact Rob MacDonald at 705-549-1967, Ray McNally at 705-717-2399. airport at 705-526-8086 or raa.midland@gmail.com

BRAMPTON GRAND FINALE FALL FEAST
Mon. Sept. 3 Brampton CNC3—18:00 pm Grand Finale, Fall Feast. The last Monday night BBQ of the season. One of the largest turn-outs. Last year had roast beef and pork, roast and mashed potatoes, fresh corn on the cob. Nominal cost. RAA-TR Hangar, north end of Brampton airport CNC3. Pres. Pres. Fred Grootarz, 905 212-9333, fred@acronav.com ; V.P. Alain Ouellet, 416-709-2020, aouellet@icecanada.com

BRAMPTON CHRISTMAS DINNER & SILENT AUCTION
Sat. Dec. 8, Cocktails @ 6pm, Dinner @ 7pm The Do-Not-Miss event of the year in the Wings Restaurant. Completion, and First Flight awards are presented, among other recognition awards, followed by a key-note speaker. Donations to the Silent Auction gratefully received. All proceeds to RAA-TR. Pres. Pres. Fred Grootarz, 905 212-9333, fred@acronav.com ; V.P. Alain Ouellet, 416-709-2020, aouellet@icecanada.com

Classifieds / continued from page 39

Sealy, TX USA • Telephone: 1 979 987 4087

ZENAIR 701 PROJECT. Mostly completed Fuselage with landing gear, control and doors. Parts for wings, spars, ribs, seat cushions, fairings & flaps. Also have plans and builder number. See pictures for details. I also have a complete listing of all parts included and parts required (skins, etc) to complete the project (XL workbook format) . $5800. Contact me for more details if you are interested. Randy 519-843-1663, haselcheck@hsfx.ca

1938 110 CLIP WING MONOCOUPE project. Custom built, not from plans. No engine, no instruments. Wings, ailerons, full tail group and fuselage, all wood, not covered. $5000, make an offer or trade. Email for pictures tisr@golden.net

AVIAT HUSKY PROJECT. Salvaged fuselage repaired, on gear, header tank, tail wheel, tail feathers, new wings built, have fuel tanks, no panel, controls installed. Was built according to the 51% rule. No engine. $23000 or make an offer. Email for pictures. tisr@golden.net

ZENAIR FLOATS FOR ZENITH 701, 2 sets. Amphibs with all gear $5500. Zenair straight floats $4000. Tom 519-822-6693, millfly@sympatico.ca

Wanted - Lycoming 360 running engine or core for rebuilding, will consider carbureted or injected. bwelfred@rogers.com (Ontario)

Ads run for a maximum three issues depending on space available and then must be renewed for continued display. Please direct all classified inquiries and ad cancellations to: garywolf@rogers.com and place "RAA ad" in the subject line.

Classifieds On The Internet:
http://tvsac.net/BS1.html - more ads from our Kamloops chapter

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. Contact president Normand Rioux at NRIOUX@lapresse.ca or J-F Alexandre info@raa415.ca

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.

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 CHAPTER 4th Monday of the month at 6:00 PM at the Lake Simcoe Regional Airport for the months of June, July & August (BBQ nights) For other months contact Dave Evans at david.evans2@sympatico.ca or 705 728 8742

COBDEN: Third Thursday of the month at the Cobden airfield clubhouse 20:00 hrs. Contact Bob McDonald 613-432-8496 or bobkim.mcdonald@gmail.com

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. Skip Reeves 705-429-5154

FLAMBOROUGH: Second Thursday 8:00 pm at Flamborough Airpark. Contact Pres. Karl Wettlaufer 905 876-2551 or lazykfarm@sympatico.ca

KENT FLYING MACHINES: First Tuesday 7:00 pm at various locations. Contact President Paul Perry 519-351-6251 pkperry@teksavvy.com

KITCHENER-WATERLOO. Meetings are on the second Monday of each month at 7:30pm upstairs at the Air Cadet building at CYKF except during the summer months when we have fly-ins instead.

Please contact Dan Oldridge at kwraa@execulink.com for more information or visit our newly expanded website at http://www.kwraa.net/.

LONDON/ST. THOMAS: First Tuesday 7:30 p.m. At the Air Force Association building at the London Airport. Contact President Bill Weir 519-461-0593 wmiweir@gmail.com

MIDLAND/HURONIA

Meetings: first Tuesday of each month, 7:30 pm, at the Huronia Airport terminal building (CYEE). Contacts: President Rob MacDonald - 705-549-1964, Secretary Ray McNally - 705-717-2399, e-mail - raamidland@gmail.com E-mail – raa.midland@gmail.com .

NIAGARA REGION: Regular meetings occur the second Monday of every month at 7:30pm in the CARES building at St. Catharines Airport (CYSN). During the summer months though, June-September, meetings take place the second Monday of those months at 5:30pm in Hangar #4 at Welland Airport (CNQ3). Contact Elizabeth Murphy at murphage@cogeco.ca, www.raaniagara.ca

OSHAWA DISTRICT: Last Monday at 7:30 p.m. at Oshawa Executive Airport air terminal, ground floor, 1200 Airport Boulevard. Contact President: Jim Morrison, 289-675-0660, jamesmorrison190@msn.com Website raaoshawa.blogspot.ca

OTTAWA/RIDEAU: Kars, Ont. 1st Tuesday. Contact: Secretary, Bill Reed 613-858-7333 bill@ncf.ca

SAUGEEN: Third Saturday for breakfast at Hanover Airport. President: Barry Tschirhart P.O. Box 1238 27 Ridout Street Walkerton, Ontario. Home: 519-881-0305 Cell: 519-881-6020. Meetings are held every second Tuesday evening, at 7:30pm. Location(s) Saugeen Municipal Airport, Kincardine or Port Elgin. All interested pilots are welcome. Email: barry.tschirhart@bell.net

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 7:30 pm at Hangar 41 on north end of Brampton Airport. Contact: President Fred Grootarz - Tel: (905) 212-9333, Cell: (647) 290-9170; e-mail: fred@acronav.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.ca

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. Brian Caithcart is the chapter president. Contact email: president@raa4901.com.

ALBERTA

CALGARY chapter meets every 4th Monday each month with exception of holiday Mondays and July & August. Meetings from 19:00-21:00 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 Dennis Fox dennis77fox@gmail.com 403-443-8434 or Secretary Bruce Flach o2fly@yahoo.ca

EDMONTON HOMEBUILT AIRCRAFT ASSOCIATION: meets second Monday - Sept. to June. Contact Pres. Roger Smeland - 780-466-9196 or Jim Gallinger 780-242 5424. Website www.ehaa.ca

GRANDE PRAIRIE: Third Tuesday, (September to April), 7:30, 2nd floor boardroom of the Grande Prairie Terminal Building. Summer events on an informal schedule. For more information contact Lee Merlo at 780-518-4254 or e-mail arniesusanmeyer@gmail.com

BRITISH COLUMBIA

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 Mekong Restaurant.1030 Harvey Ave. Dinner at 6:00pm, meeting at 7:30pm Contact President, Cameron Bottrill 250-558-5551 moneypit@uniserve.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 7:30pm, Delta Heritage Airpark RAA Clubhouse. 4103-104th Street, Delta. Contact President Peter Whittaker pwhitt@telus.net Website www.raa85.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 Darren Watt 250-573-3036

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 Gerry at 250-782-4707 or Heath at 250-785-4758.

Chapter executives, *please advise of changes as they occur. For further information regarding chapter activities contact RAA Canada, Waterloo Airport, Breslau ON N0B 1M0 Telephone:* 519-648-3030 *Member's Toll Free line: 1-800-387-1028*

Emails can be sent to President Gary Wolf at: **garywolf@rogers.com** *and George Gregory at* **gregdesign@telus.net.**

President's Message / cont'd from page 2

in the room and a 20 page step by step treatise to Nav Canada personnel. After this they were invited to another meeting with Nav Canada's engineers, planners, and regulatory personnel to discuss their ideas in more detail. It is a bit like David taking on Goliath, but in this case David has considerable expertise.

It is worth noting that it is not just RAA members who will benefit from this work. Your chapter's non-National members get to tag on for free while you pay the costs. Dan and Lee of course have donated their time and energy, and RAA Canada paid their out-of-pocket travel and paperwork costs. Pilots received many thousands of dollars of expertise for small change. That is how RAA manages to punch well above its weight. We all owe a thank you to these two members.

You may read their proposal by looking up www.kwraa.net. At the masthead click on "about KWRAA" and scroll down to their April 2018 newsletter. ADSB is not going away, so you had better become familiar with it.

Classifieds

To submit or delete a classified ad, please send to raa@raa.ca and place "RAA ad" in the subject line.

The Recreational Flyer is pleased to offer you colour advertising within the magazine. Previously limited to the back cover, we have added 4 new colour pages which will be available with limited space for your advertising needs. Our rates for both black and white and colour ads remain very competitive and you reach a captive and qualified audience. Emails can be sent to President Gary Wolf at: garywolf@rogers.com and George Gregory at gregdesign@telus.net

Deadline for submissions is the first of the month preceding date of issue.

Artwork: Rates apply to camera ready artwork. Digital files are preferred and should be sent as email and in .txt format, PDF, JPEG, MS WORD, Photoshop or other common file types. Advertising is payable prior to printing of magazine unless other arrangements have been made. Payment is in Canadian funds. 10% Discount applies to one year (6 issues) insertion paid in advance. Commercial Classified ad rates 1/8 page minimum.

Advertising Policy: The Recreational Flyer Publisher reserves the right to refuse any or all advertising for any reason stated or unstated.

The Recreational Aircraft Association Canada does not assume responsibility for advertisements, but does exercise care to restrict advertising to responsible, reliable individuals.

Please note: Ads running more than 3 issues must be renewed to guarantee continued display in the magazine.

Recreational Aircraft Association Canada
President: Gary Wolf / Treasurer: Wayne Hadath

Recreational Flyer Magazine

Registration Mail Publication No. 09869

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Purchased separately, membership in RAA Canada is $35.00 per year, subscription to Rec Flyer is $35.00 per year; subscribers are elegible for reduced membership fees of $15.00 per year. Rec Flyer to have a single issue price is $6.95.

The Recreational Flyer is devoted to the aerospace sciences. The intention of the magazine is to promote education and safety through its members to the general public. Material in the Flyer is contributed by aerospace engineers, designers, builders and restorers of aviation devices and vehicles, used in an amateur capacity, as well as by other interested persons, publications and organizations. Contributions to the Recreational Flyer are voluntary and without remuneration. Opinions expressed in articles and letters do not necessarily reflect those of the Recreational Aircraft Association Canada. Accuracy of the material presented is solely the responsibility of the author or contributor. The Recreational Aircraft Association Canada does not guarantee or endorse any product offered through articles or advertising. The Flyer and its publisher welcomes constructive criticism and reports of inferior merchandise or services offered through advertising in the publication.

O200 L/H muffler (CESSNA) rebuilt by Acorn Welding. $450. 28 VDC voltage regulators, 2 ea. Kelly Aerospace, P/NVR500-0101 (Cessna 337)$150. ea.

Piper Pitot static tester adapter,P/N PS56620M2-4-4, with hoses and case. $650.

From the back of the Hangar.

24 volt starter, electro System p/n MHJ-4003SR, o'haul/2000. $350.00

24 volt starter prestolite, p/n MHJ-4003S serviceable. $300.00

24 volt alternator Delco Remy 50 amp. p/n 1100747 $300.00 Oil filter adapter kit Mod. BC700 for all Lycoming 235, 320, 360, 540, 720. $500.00

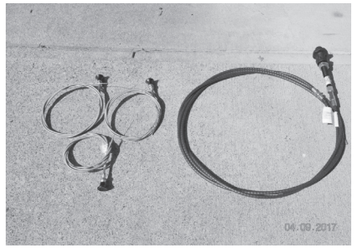
Cessna 172 nose cap cowling p/n 0552019-new. $100.00 Stabilator tip fairing p/n GF95620-07 Piper PA-200/220 $150.00 McCauley Propeller p/n 1A101GCM6948 bolt pattern 4 3/8in. $800.00 Prop spinner 10in.dia,. 12in. tall bolt pattern 4 1/2in $125.00 Cantact len Kennedy 506-622-0105, cell 506-623-8162 email - lenpat@nb.sympatico.ca Miramichi NB .

BELITE FUEL PROBE SYSTEM 1/8" A.S # 10-05866 never used $180; Sky Tec Solenoid A.S, # 07-03562 never used $50. Aerovoltz battery charger $80 Ask about 16 cell Aerovoltz lithium battery + shipping
Mike 519-762-3910 or mtyit@start.ca

AME / homebuilder retiring and selling a lifetime of collected parts - Beech Sundowner prop and exhaust, C-150 starters, Lycoming starters, ring gears, flywheels. Lots of control cables including from an RV-6 kit. Brand new Gill 35 battery. Spinners, props, you name it and it is probably here. The hangar has been sold so everything must go. Ron Fleet at Hanover airport, Ontario. fleetair@wightman.ca

NEW AILERON TRIM KIT – Van's part number AIL-T6 $45.00 CDN OBO Well-made wooden jig for RV 6/6A fuselage construction – open to offers Call Bob Stewart 204 853-7776 stewart@mynetset.ca

After completion of my RV7 (not for sale) I



have a few brand new project left overs that I want to sell them:

1-One (1) Van's Aircraft trim cable CT23V42-DF-2-181 / Tuthill Corp (brand new)-Original price US149.00 Asking US$75.00

2-Three (3) control cables ACS-CT-A-740BL 0720 BLACK / 6 FEET (brand new)-Original price US36.50 eachAsking US$18.00 each

3- Two (2) landing lights 100W/ 12V each with reflectors only, from Duck Works (brand new) Van's complete kit sells for US$115.00 each -Asking US$50.00 for both.

4-One (1) Kuntzleman Electronics Round Tail Light with strobe and white positioning LED lights, 25 feet cable and connector (brand new still in the box). -Original price US$240.00,Asking US$80.00

Jose Lins jlinsjr@shaw.ca 778-998-2718

BASIC ULTRALIGHT PROJECT for sale, all metal low wing tail wheel, not registered. Asking $8000.00 OBO, also have an EA-81 with belt redrive, willing to take trades, 701 or 750 Project or side by side 4 wheeler. Email billdonig@hotmail.com 705-842-0801.

MARANDA PROJECT on gear, at precover stage with all woodwork completed to a high standard. Includes engine mount for Lycoming. The Maranda is a spacious STOL with folding wings. The builder has passed on so I am selling for his family but now I need the space and it must go. $5000. OBO. Project is located in Erin Ontario. Please contact Brian at 519-806-8560 or brianoates@hotmail.com

SKIS FOR SALE Aluminum/Teflon skis for home built. Used one season on a Challenger, also suitable for Chinook. Full harness. Very good condition. $300 OBO. Call J.J. @ 778-684-0411. ALUMINUM WINGS Built at Edmonton factory for Griffin MKII. Wings are 136 sq. ft. for 1600 lbs. Finished with gas tanks installed. Can be used on high or low wing with modifications. $500 OBO. Call J.J. @ 778-684-0411.

ROTAX 503, 2 Carburetors, mounts for Challenger or Chinook. Runs very well. Electric and/or pull rope starter. Mechanical prop reduction. $500 OBO. Call J.J. @ 778-684-0411.

LYCOMING O-235C 100 hp with a mount for a Volmer. Little history but believed to have had a top overhaul. One mag and flywheel starter and carb. $2200 Hamilton Ont. 905-662-7111

Wanted - a set of presentable wheel pants with mounting brackets and intersection fairings to fit a C-150. 519-589-8352 Ontario.

BOWERS FLY-BABY for sale , asking $5,500 CDN. No Engine. Needs some Instruments. Test flight time has been flown off. TTAF 29.8 Hrs, built in 1970. The wings are off and it has been stored inside. B.C. Canada. bill.clifford@hotmail.com

AVIATION HEADSETS, 2 Pilot, 2 Flightcom, $100 each OBO. Also old Bendix turn and bank (air driven) and altimeter, best offer. 416-822-0438 or 905-787-0017 or 416-456-8411 or 416-221-2392

E.A.A. BIPLANE, Ron Riley's first homebuilt, airframe only, includes cowlings, motor mount, flying wires from Acro 1, N.O.S. canopy, fabric & other covering materials, wood etc. Dismantled," sold as is, where is" $3500. G Trimble 519 461 1665 ijtrimble@gmail.com

2004 Wag-Aero 2+2, Homebuilt, 130 TT, ICOM Com, GTX327 Mode-C, Current C of A, Mazda-13B Engine, RWS EC2 and RD1-C Redrive, always hangared, $42,000 as-is, $32000 less engine. 613-552-6277, jwhaley@datacast.com

1954 TRI-PACER, PA-22-135, O-290-D2, 4234 TT, 1320 SMOH, Terra Com, Mode-C, Current C of A, OM category, Mogas STC, always hangared, $23,000. 613-552-6277 jwhaley@datacast.com

ANDERSON KINGFISHER C-FBQF, a 2 seat amphib flying boat with a 2016 Aerotech overhauled 160 Lycoming. All new instruments and accessories. Maiden flight was October 2017. Asking $48,000. Contact Guy at gmlefebvre@outlook.com

1946 PIPER PA-12, rebuilt as Owner Maintenance in 2000. Lycoming 160 hp with 270 hours. New 2250 floats and rigging by Ed Peck Aero in 2016. Useful load 1000 lb. Long range tanks and all attributes and goodies required of a perfect bush plane. Overall condition is 9/10. $100K gmlerfebvre@outlook.com

WANTED - LYCOMING 360 running engine or core for rebuilding, will consider carbureted or injected. bwelfred@rogers.com (Ontario)

ZENAIR 701- BASIC ULTRALIGHT- 570 lbs. Empty weight with 912 80 hp engine 600 hrs. Ttaf approx. 1000Hrs. 3 Blade warp drive prop, jeep gear - matco mains, quick remove – 2 piece doors, extended baggage with locking doors, storage under seat. Beanie roof - new windshield. Panel has eis engine analyzer, narco transponder, icom 720 radio, ultra-com intercom with helmets. Currently set up for amphib or straight floats
$28,000.00 Cdn with amphib floats, $24,000.00 W.O. Floats. 519 822 6693, Millfly@ sympatico.Ca

AMPLANES is selling the Beaver line of light sport aircraft. This is your chance to own your own factory for a venerable and historic Canadian aircraft with a built-in market of thousands of aircraft sold over the past 30 plus years. Sale includes all intellectual property (parts plans, drawings, software code), jigs, molds, parts inventory, raw stock, completed and kit aircraft). Interested and qualified buyers only, call for more information (leave message) or email. • Contact John A. Couch - AEROPLANE MANUFACTORY, Owner - located

continued on page 35

RAA London St Thomas

The guest speaker for the March meeting was Rob Elford, Nav Canada on the subject of flying in Class "C" and "D" airspace.. In February there was a very interesting demonstration of 3-D printing and a small wing was made to show the potential of the technology.

Dave Hertner reported that he has sold his Corvette powered RV-10 project. Dave also introduced Lionel, operations manager at Fisher Flying Products. Lionel is building a finished Tiger Moth for a customer, and is simultaneously building a Celebrity as a company demonstrator.

Phil Hicks isoing a lot of riveting on the underside of the fuselage of his Sonex.

The June Fly-In will be held at Roy Rader's on June 5th with a rain date of June 7th, 2018.

Bill is again hosting the July Picnic at his farm near St. Mary's. Date is Tuesday, July 10th, 2018

Chris Staines will be presenting part one of a two-part series on the Rotax 900 series of aviation motors. Chris has prepared an incredible talk on the history of the motor, what makes it special and some of the things that need to be taken into consideration when using and flying with one of these motors. It promises to be a great evening.

RAA Midland-Huronia

The Feb. 17 Winter Fly-in was a hit, and Zenair's tour was appreciated as usual by all who attended. Thanks to CYEE management, staff and airport community to put in a lot of work to prepare for the event. Some flew in from as far as Parry Sound, Stratford, and Buttonville. 25 aircraft attended the event along with a significant number of drive in guests. a special shout out to the Georgian Bay Snow Riders who provided snow grooming for the snow runway!

The Northern Regional Fly-In is being developed and , a 99's event will be held at Oshaway Executive airport on April 21, and the "Rust Remover" seminar is happening at Hanover on Sunday, April 29. Adam R. reported on a opportunity to pick up a deregistered Aeronca Chief presently in the possession of Centennial College.

The CH-601XL Builders' Group continues to meet Thursday evenings and Saturday mornings. The project is coming along.

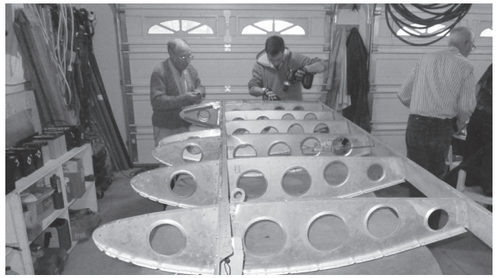


Photo Credit: gusair.com

Photo Credit: gusair.com

Photo Credit: gusair.com

Photo Credit: gusair.com

Top right, the Midland-Huronia chapter's 601 project is progressing. They continue to meet Thursday evenings and Saturday mornings. The club's fly-in (right and lower pictures, opposite) was a great success. 25 aircraft participated, plus a number of drive-in guests.

Across Canada

RAA Chapters in Action

Photo Credit: gusair.com

Photo Credit: gusair.com

Chapter 85 Vancouver

2017 wrapped up with a good wing ding of a Christmas Party for the December general membership meeting. The weather cooperated, meaning that it was only light rain rather than a torrential downpour. A cozy atmosphere was achieved by having a live burning log fireplace scene projected onto one wall of the Chapter 85 clubhouse via internet streaming. The New Year was kicked off with a January pancake breakfast hosted by RAA Chapter 85. The pancake breakfasts are held at "Mary's Place" on the Delta Heritage Airpark field and are open to the public.

The major events since the New Year have been the ongoing Saturday workshop sessions on the 750 Cruzer project. Sebastien Seykora, one of the Chapter 85 members gave a detailed discussion on the planned test flying program for the 750 Cruzer at the March membership meeting. The first 25 hours will be flown off within 25 nautical miles of Delta Airpark (CAK3), daylight hours only, not over any built up areas and with no passenger. It is intended to apply for an exemption to allow flights up the Fraser River corridor to Hope, BC and return. Sebastien's presentation focussed on the test flight requirements to be documented during flight which will be used to satisfy Transport Canada requirements for the eventual

Opposite and left: pictures from the Midland-Huronia Chapter's Winter Fly-in. Above: Chapter 85's Zenith nears completion. Here, a trial fitting of the cowling.

Special Certificate of Airworthiness without any restrictions. Sebastien also donated a complete set of upper level and low level IFR charts for use with the Chapter 85 flight simulator.

Building progress on the 750 Cruzer has been mainly centred on the cockpit and engine – firewall forward area. The registration mark for the 750 Cruzer was also applied for and was established as C-FZXC. Mark Garner has offered to make up two sets of vinyl letters, the first will be used during the 25 hour trial period during which the Cruzer will be unpainted. The second set of letters will be used after the Cruzer is painted.

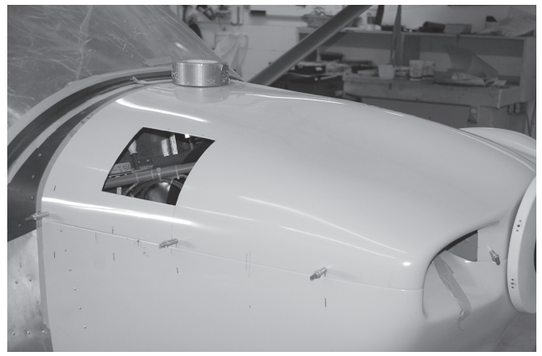
Finishing work for the 750 Cruzer has involved the firewall forward area and engine cowling (above) as well as fitting of the skylight cabin top and the windshield. After initial fitting of the cowling top and bottom halves, Peter Murphy worked on the extended position of the oil filler tube which he projected to the top cowl where he cut out the access panel (top right) and fabricated a door to access the oil filler tube.

While work on fitting the cowl and windshield progressed, Bill Bird began fitting the upholstery from the seat kit to the control stick and centre console (centre). Bill sourced FAA approved "contact cement" to attach Velcro tabs with a combination of cement and stitching. The stitching was accomplished using Bill's portable sewing machine.

One of the most recent activities on the Cruzer project has been the testing of the pitot – static system by Sebastien Seykora (below, right). Sebastien has acquired the equipment necessary to pressurize the pitot and static system and then allow controlled leak downs to simulate changes in altitude on the altimeters (round guage & Dynon Skyview system) and also test the altitude encoder. A few minor leaks were noted and are slated for corrections.

In summary, a lot of work has been done on the 750 Cruzer and with a good eye to detail and with much discussion over the safest and most secure way in which to build and install key components. Much detailed work is underway, which when you step back and look at the airplane, leads you to think that nothing has changed. However, the details make the difference so that wires don't chafe and parts fit the way you want them to.

The next event is the 2018 Annual Awards Banquet (for 2017 notable achievements). This will be held on April 7th at the Delta Town & Country Inn.



Top down: the oil door is located on the passenger side of the cowling.; member Bill works with the upholstery in the Cruzer's cabin; Sebastien Sekora works on the pitot system testing.

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