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Recreational Flyer

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Destination or Journey?

Page 4: Mandatory Action on Advanced Ultralight Zenith Designs

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

From The President's Desk

Gary Wolf RAA 7379

CHAPTER STATUS

To be covered under the RAA Chapter Liability Policy it is necessary that your chapter send in an annual status report. This must include names and membership numbers of the chapter president, treasurer, and secretary, plus two other members who are specifically named. As well the chapter must include a full chapter list with names and contact information. When this has been received at the RAA office your chapter's coverage will be in force.

MEDICAL REFORM

The US has instituted a relaxed medical to validate their Private licence, while Canada appears to have no intention to do anything like this. JC Audet has produced a questionnaire to ask whether your flying needs could be met by our Rec Permit, which has a lower category of medical for validation. Please read the article in this issue and respond.

ROTAX UPDATES

Rotax has now globally standardized its independent Rotax Maintenance Technician training program to provide a high standard of maintenance worldwide. This will provide an assurance that a maintenance facility has a suitably high level of expertise. Only current and valid holders of the iRMT certificate may display the Rotax iRMT logo. For a list of Rotax Authorized distributors or Independent Service Centres you may check the www.FLYROTAX.com website.

Rotax has recently introduced upgraded spark plugs and connectors for 9-series engines. It is not mandatory to retrofit these but if it is done all eight plugs must be changed. Similarly if one connector is upgraded, all must be done at the same time. It is not necessary to change both plugs and connectors simultaneously.

www.rotaxowner is the comprehensive website at which Rotax regularly releases all information that would be of interest to owners of Rotax aircraft engines.

DRONE REGULATIONS

Transport Minister Marc Garneau has announced new regulations to restrict the use of recreational drones and he suggests to call 911 to have police handle infractions. The limits are that their ceiling is 90 metres and they cannot be flown within 9 km of any place at which aircraft fly. They cannot fly within 75 metres of buildings, people or animals, vehicles or vessels, and no further than 500 metres from the operator. It is illegal to fly over forest fires and emergency response scenes or in controlled airspace. Operations must remain Day VFR and clear of cloud, and most importantly within line of sight.

All drones must have the name, phone number, and address of the owner marked on the drone itself. This stops short of requiring registration but it is a good step. Fines of $3000 may be levied for infractions. The new rules do not apply to people flying at sites and events sanctioned by the Model Aeronautics Association of Canada, a national model aircraft association Garneau said has an excellent safety record.

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features

columns

Above: Sean Walker's Ermeraude, built by his father, Colin of propeller making fame.
On the cover: Sunset viewed from Dan Oldridge's Highlander

Getting it Right

Zenair Orders a Mandatory Action AULA fleet following the crash of an uninspected aircraft

Gary Wolf

IN SEPTEMBER 2016 a Zenith 601 Advanced UL was on final for Guelph Airpark after a long flight from eastern Ontario. A witness on the ground saw the plane pitch abruptly downward at about 500' and crash into the ground, killing the pilot who was fortunately flying solo. There was a lot of speculation as to the cause, including the possibility that the pilot might have had a heart attack or that the pilot had been trying to stretch a glide and had stalled it. The switches had been turned off, the engine was not running at the time of contact, but there was fuel in the tanks.

LIAISON

I began a dialogue with the Transport Safety Board because I had known this particular plane very well. It was hangared near my own hangar and I had several hours in it. What piqued my curiosity was that the stall in this plane was a gentle mush. The only way to pitch the nose down was by holding down elevator, so why did the observer see it pitch abruptly nose down? The plane had positive pitch stability so if the stick were released it would have resumed a level attitude.

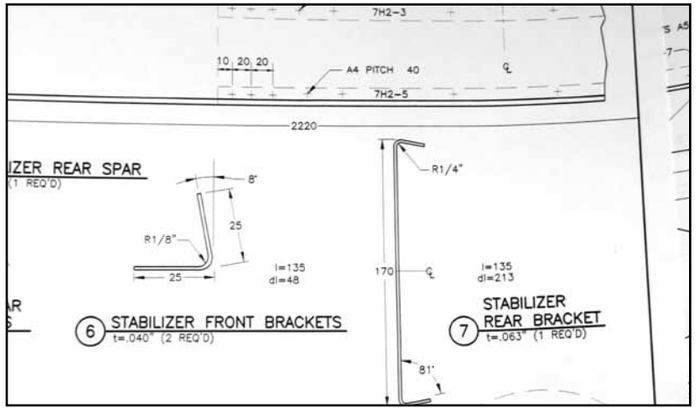
The TSB asked about previous damage but although there had been several landing accidents none had involved the stabilizer. After examining everything else the TSB sent the stab to their lab where it was unskinned, and they found that the forward spar had failed.

HISTORY

The builder was a novice working in a cold garage and he made many mistakes in the build of the stab. Despite this the builder fitted and riveted the skin to close the stabilizer. Because the plane was an Advanced UL there was no precover or final inspection requirement. This part would never have been allowed to be used in an Amateur Built. This builder used the plane for many years and later it was sold to a private pilot who flew it until his fatal crash.

The procedure in the early nineties was that the builder himself signed a document that affirmed that the entire plane had been built correctly; there was no requirement for a second set of eyes, let alone a real and thorough inspection. I had complained many times to Transport that this did nothing to ensure safety but it appeared that all that really mattered was they were free of liability.

Shortly after, this builder opened a flight school using the plane for training for the UL Permit. It amassed nearly a thousand hours and when the school closed it was sold to a private pilot who flew it until his fatal crash.

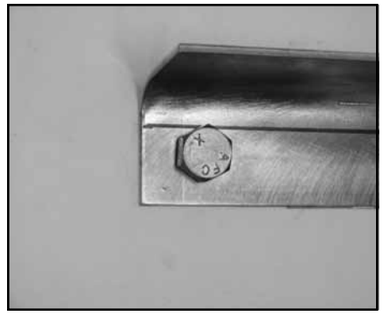


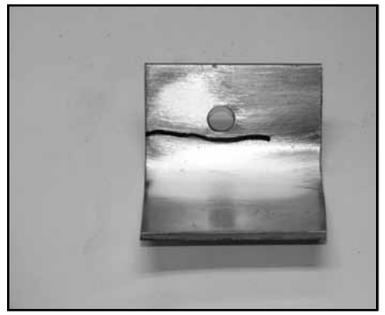
The attach brackets for the 701 have a wider 25mm flange, so easier to achieve edge distance of the mounting holes

TSB INSPECTION

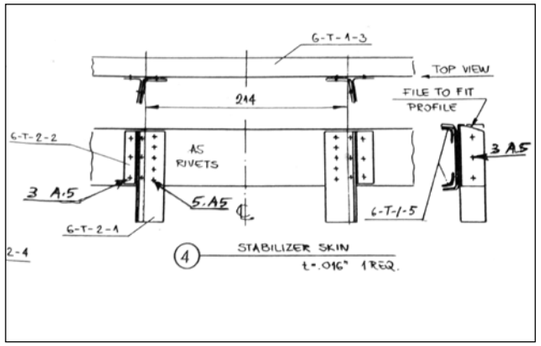
The TSB did a very thorough investigation and until they disassembled the stabilizer there was nothing found that could have been the cause of the crash. They found that the forward spar of the horizontal stab had broken. The left forward attach was supposed to have been fastened to the spar with five rivets, one in each spar cap and three through the web. Only four rivets had been fitted and none of them into the upper spar cap. Another line of rivet holes had also been drilled and had been left unfilled.

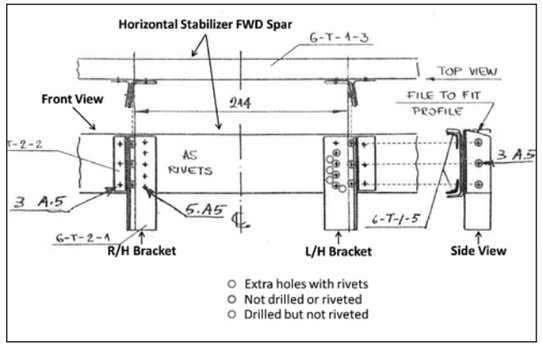
Next to the bracket was a reinforcing piece that was riveted to the spar but the builder had neglected to drill and rivet it to the spar attach bracket. The result was that the loads went into the spar through four rivets instead of eight, and the bracket and





Top: A 22mm flange and 2D edge distance positions the head of the bolt right at the beginning of the curved section of the bracket Centre: Clocking the bolt head can result in its point pressing into the curved section when it is tightened. Above: The line drawn on this test coupon shows where the cracks have been found, surprisingly not emanating from the mounting hole.





Left: The 601drawing shows that the stab brackets are positioned on the spar by dimension.
Right, The TSB report shows the extra unfilled holes and the missing rivets in the 6T-2-1 bracket and its 6T-2-2 reinforcement.

spar were weakened by all the extra unfilled holes. None of this could be seen without removing the skin of the stab. The Transport Safety Board is to be congratulated for having pursued this matter to the end.

MANDATORY ACTION

In the Advanced UL category there is a requirement for the manufacturers to handle the dissemination of safety information. Zenair has issued a Mandatory Action that must be complied with before next flight, effectively grounding much of their fleet. The details may be found by googling "Zenair 601 horizontal stab". The Mandatory Action must be complied with by all of their products registered as Advanced Ultralight. Amateur Built and Basic UL aircraft are not legally required but owners would be foolish not to comply. The stab construction is similar for all 601, 601xl, 650, 701 and 750 variants, and the 801.

PROCEDURE

The stab must be removed and inverted, and the skin must be cut open to expose the attach points and forward spar. Zenair requires that the attach brackets be inspected for conformity with the drawings and for the integrity of the riveting. The opened area is then to have a patch of aluminum sheet riveted in place to close the area and to restore the original strength of the structure.

OTHER PROBLEMS

The Zenair site shows other problems with build quality of the stabilizers. Cracks have been found in the four attach points near the bolts that fasten the stab to the tabs on the upper longerons of the fuselage. The 601 attach is a fabricated angle of .063" aluminum bent to ~80 degrees over a ¼" radius. The flange of the attach is 22mm, so 0.866". The mounting hole is 3/16" and its position is critical if it is to satisfy 2D minimum edge distance requirement given in the 601 build manual and also in AC 43-13. If the centre of the hole is positioned to be 3/8" from the edge of the angle, the head of the bolt will be at the edge of the curved corner of the flange. If the head is clocked so that one of the points is over the curved part it will be 1/32" into the curve. And if the builder increases the edge distance the head of the bolt will be further into the curve.

When the bolt is tightened, the head can bite into the curve, and the Zenair site shows cracks running through the curved section of the attach bracket. One would normally expect a crack to begin at the mounting hole but these are starting near the hex head of the bolt.

UPDRILLING MOUNTING HOLES

Some of the brackets shown on the Zenair site have mounting holes that are ragged and/or elongated. The temptation is to updrill them to ¼" but this means less than minimum edge distance and an even larger bolt head that will bite further into the curved section. The only solution is to replace the brackets. Advanced UL's must buy the part but owners of A-B and basic UL aircraft can make their own. It might also be necessary to replace the four attach tabs that are riveted to the upper longerons.

Looking at my own set of 1995 Zenair 601 plans I see that I made a notation to make my attach brackets with flanges that are 25mm wide because this makes it possible to improve edge distance without the head of the bolt biting into the curve. This is the dimension used for the similar parts on the STOL 701. If you are making your own part keep in mind that because of the 1/16" material thickness all bends must have an inside radius of ¼". Almost everything else on the plane is bent over a 1/8" inside radius so it is easy to miss this point.

Another point of concern is that the four attach brackets must fit exactly against their respective fuselage tabs. Unfortunately until recently none of the holes in a kit were CNC drilled so the builder used a tape measure to position the tabs along the spar. The plans did not caution to check against the lateral positions of the fuselage tabs so there were bound to be build tolerances. I was plansbuilding and when I went to fit the stab I found that I had to shim to ensure that tightening the mounting bolts would not put a side load on the brackets, imparting a shear load to the rivets holding the attach bracket to the front spar. When you undo yours you might find that the tabs and brackets spring apart.

Keep in mind that may 601's and 701's were plansbuilt so dimensions will vary with the builder forming the two rear bulkheads of the tailcone. In reality one should build the tailcone first, position the clecoed stab

UNINSPECTED?

How did we get to the point that uninspected planes became allowed to carry passengers? No one ever proposed this when the Advanced UL category was conceived. The category was supposed to have had a more rigorous inspection that the one for the A-B category, to affirm that each plane met its type definition as well as having a suitable build quality. MD-RA inspectors went to a training weekend and realized that they were being asked to inspect for more than was covered by their delegation. Transport Canada refused to expand their delegation and LAMAC (Light Aircraft Manufacturers Association Canada) had no funds for insurance. The category was about to fail but there was immense pressure from manufacturers to make it go. LAMAC offered to Transport that they would set up an inspection procedure and provide a signed document to affirm each plane that was to be registered. Whose idea it was to allow novice builders to sign themselves off will probably never be made public, but that is what we ended up with, and that is how the shoddy workmanship that killed this pilot came to be hidden.

About 1998 Transport changed the rules and it became the responsibility of each manufacturer to inspect each finished plane and then to sign the Statement of Conformity. Some manufacturers did a reasonable inspection, some just wanted photos taken of the important areas, and some blithely signed the document without seeing anything. And many chose to stop supplying a Statement of Conformity.

Transport used to maintain a list of manufacturers of these aircraft and they named it the Approved List of Advanced Ultralights. Many of us thought that Transport had actually stood up to the plate to ensure that each manufacturer was building a product that met the design standard. Unfortunately Transport had been inspecting nothing except that the one paragraph affirmation was signed by the manufacturer. At a 2005 meeting in Ottawa I brought to their attention that they were misleading the public and opening themselves up to lawsuits. Immediately they changed the title to the Eligible List of Advanced Ultralights.

LAMAC owns the DS 10141 document that is the 30 page design standard for the Advanced UL category. Any plane that meets this standard will be a good one but unfortunately many manufacturers do not see the need to concern themselves because they knowTransport never wants to see their proofs and calculations, if these were even performed. LAMAC went to sleep many years ago, and lately they appear to have closed up shop.

on it, and then position the mounting brackets and fuselage tabs.

MOVING THE PLANE

The tailcone of the 601 and 701 is made from thin sheet and there is no handle for moving the plane around. On a 601 many will push backwards on one blade of the stab, yawing it and loading the spar and attach brackets asymmetrically. It is also common for a pilot to push down on the stab to lift the nosewheel, again loading it in a manner that is not part of the design standard for the category.

LEGAL

As stated earlier there is no legal requirement for owners of A-B or Basic UL aircraft to do any of this but if you ever decided to sell the plane you can be sure that the buyers will be asking whether the inspections have been done. All they would have to do is to look at the underside of the stab to see if the inspection plate has been fitted. Insurers might also have a few questions to ask if a plane had a crash that could be attributed to the horizontal stab.

Keep in mind that may 601's and 701's were plansbuilt so dimensions will vary with the builder forming the two rear bulkheads of the tailcone.

All it takes is a couple of 3/8" wrenches to remove the rudder and then the stab. It would be a shame to miss part of the flying season by putting this off.

OTHER AIRCRAFT

Zenith sells construction plans and many manufacturers have gone into business building copies, changing only superficial details. Owners are well advised to inspect these horizontal stab components too. Your manufacturers will not likely be telling you about this but you know who you are. *R*

Absolutely Mint Ercoupe for Sale

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Control Cables 101

RAA

CONTROL CABLES ARE A VERY IMPORTANT part of our aircraft – some use cables for all flight controls and some use pushrods for everything except the rudder. Somewhere there might be a builder who has incorporated fly by wire with servos, and that fellow can ignore the AC 43-13 requirement for an annual 100 hour cable inspection.

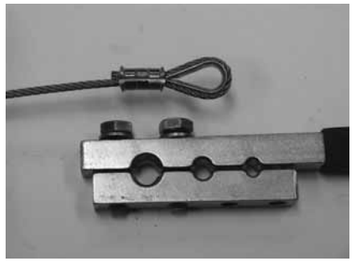
The basic AC 43-13 inspection is with a cotton-gloved hand or a rag attached to a long rod. These are run over all cables to search for a snag that indicates a broken strand. Even one broken strand in a critical area requires replacement. Critical areas are the pulleys and fairleads or anywhere the cable is flexed or rubbed. One broken strand within one foot of a swaged cable fitting is also a failure that requires replacement. For the full story on inspecting and maintaining cables read AC 43-13 either online or in a paper copy available from aviation suppliers. There are thirteen pages devoted just to cables.

PREMADE CABLES

If you decide that a cable needs to be replaced, there are two methods. The simplest and most expensive is to have someone make it for you. Spruce offers this service and a typical ten foot galvanized 1/8" cable will cost around sixty dollars. The tolerance is +/- 1/8" which means that you will inevitably use turnbuckles for final adjustment and tensioning. These days turnbuckles cost in the range of $50 so if you are building from scratch it might be advisable to buy the cables first and make the airplane fit them.

SHOP MADE CABLES

The alternative is to make your own cables, which is not as daunting a task as one might imagine. The typical cable is 1/8" 7x19 galvanized with a break strength of 2000 pounds. There are commercial cables that have the same break strength, but real aircraft cables are lubricated as part of the manufacturing process, and domestic cable available from aircraft suppliers has specs that can be believed. Offshore cables from across the Pacific can have the same claimed break strength but they are sometimes more brittle than domestic cable. Stainless aircraft cable is also available but it has lower break strength at 1760 pounds, so if substituting you should do your homework to ensure that it will be strong enough. Stainless work hardens and is initially stiffer so unless the plane is operated in a salt environment there is little reason to use it.



Top left: A thimble eye loop in 1/8" cable, formed with the Swage-It. AC 43-13 requires three squeezes with ridges between each. with a little ridge each side. Lower left: Prepare the thimble by spreading the tips to ~.100" separation. Above, begin by cutting some test pieces. The $350 swagers include a cable cutter.

THE BASICS

To make your own cables you will need end fittings, a tool to swage them, and a gauge to ensure that the swaging has been done to the correct diameter.

The most common end fitting is an eyelet with a steel thimble to protect the wire, held in place with a copper sleeve that is swaged to hold everything tight. For galvanized cable the sleeve is plain copper while for stainless it is plated copper.

The raw galvanized aircraft cable itself is ~$1.50 per foot; a thimble will cost a quarter, and a copper sleeve will cost fifty cents. If you need a shackle (forked end) it adds about $15. Still it will be half the price of a premade cable, and if you work carefully to get the correct length you can eliminate some of the turnbuckles.

MAKING A CABLE

Let's make a 1/8" 7x19 cable with one eyelet end and one forked end. An eyelet end requires one AN 100-4 thimble if you use plated steel or AN 100C-4 thimble if you wish stainless. You will also need one bare copper sleeve MS 51844-44 to be used on galvanized cable, or MS 51844-24 for zinc plated copper to be used on stainless.

The sleeves are commonly called Nicos (short for Nicopress) although this is a brand name but it has become generic, like Aspirin. Buy twice as many Nicos and thimbles as you think you need. They are cheap.

CUTTING CABLE

The next consideration is how to cut the cable. Proper cable cutters are available even from home improvement stores, and do an effective job because the cutting surfaces are notched, surrounding the cable and forcing it together while shearing. A sharp cold chisel and a smooth steel block will also do an effective job if the hammer is in the range of five pounds. Practice cutting short pieces until you can cleave the cable in one blow, and resharpen the chisel if necessary. A sidecutter will do a ragged job and a torch is strictly verboten.

TEST PIECES

Before making your first real cable, cut off half a dozen short test pieces of cable and be prepared to use up a few Nicos and thimbles to learn the technique of swaging.

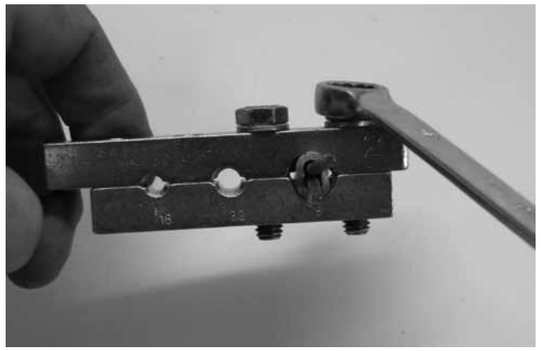
PREPARING THE THIMBLE

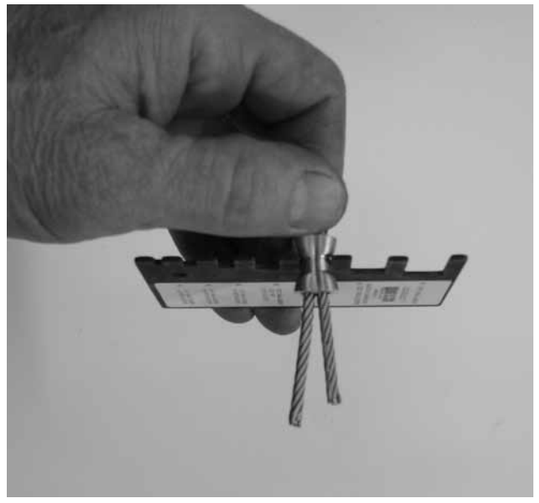
AC 43-13 has an illustration that shows the ends of the thimble as being spread apart, in the range of .100". The thimbles I bought had the tips touching so I spread them apart with a screwdriver. Some AME's suggest to snip off the pointy ends but if you are using plated steel this leaves the tips exposed to rusting.

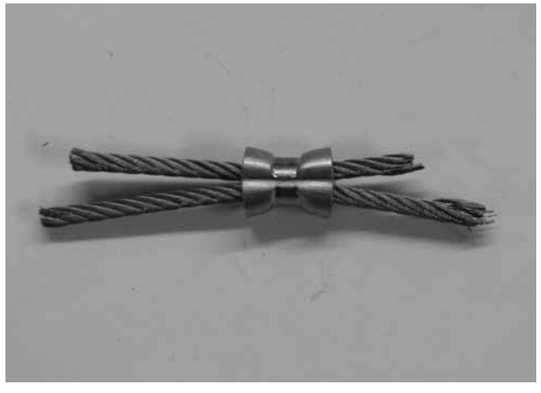
CHOOSE YOUR WEAPON

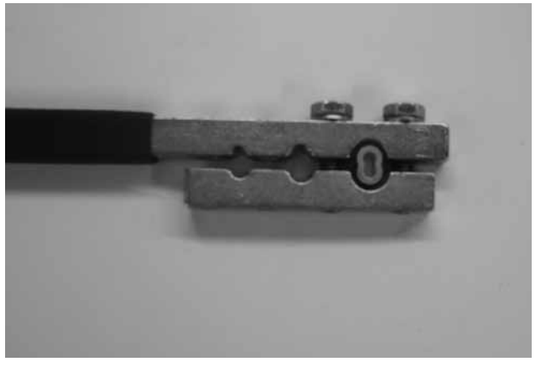
The gold standard for swaging tools looks like a bolt cutter, and is made by Loos or Nicopress. Each costs in the range of $350, difficult to justify for one use. Many chapters have one for members' use, and some AME's will reluctantly lend theirs. These tools are accurate and straightforward but they are large, so they are difficult to use in confined quarters. The best way to use them is to clamp one leg horizontally in a vise and pull the other leg downwards. If you have borrowed a tool be sure to protect it from scratching by using cloth on the vise jaws. Stay away from the fence tools sold at hardware chains.

There is a much less expensive alternative to the Loos and Nicopress. Aircraft Spruce sells a small hand

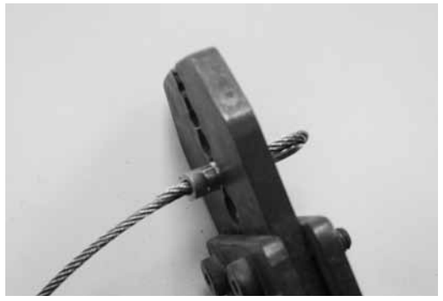


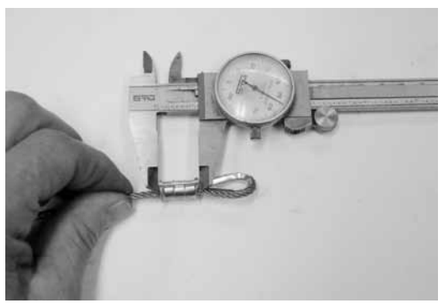






Top left: First test swage is the centre one...and results in a little bow tie (above). Top right: Check the swage with the go-no go gauge. Lower right: Forming a thimble eye begins with centering the Nico and squeezing just enough to trap it in the jaws.





tool called the Swage-It for $30, and I bought one for comparison. It looks like the clamp of a brake line flaring tool but with three stations for 1/8, 3/32, and 1/16″ Nico's. The two bars are ½″ square steel and the squeeze force is applied by two 5/16″ bolts. I clamped one of the bars in the vise and before use I lubricated the bolt threads with anti-seize compound.

POSITION THE NICO

A 1/8″ cable must have its Nico squeezed in three places if it is to provide a grip equal to the cable strength. Whether using the squeezer or the Swage-It, the Nico is centered in the jaws with the long axis of the oval hole on the axis of squeeze. A 1/8″ Nico has an initial length of 9/16″ so with the Swage-It there is 1/32″ protruding past each side of the tool. It is important to get it centered and square, so take your time. Tighten the bolts alternately and give the Nico just enough initial squeeze that it does not move around.

FORM THE LOOP

Feed the 1/8″ cable through the Nico, form a loop, and feed the end back through the Nico. Let the end protrude no less than ¼″ beyond the Nico. Longer is OK but because the Nico grows in length with each squeeze you will initially want at least ¼″ protruding.

Insert the thimble and pull the loop tight, but not so tight that the tips of the thimble touch the end of the Nico. I pull just enough to have the tips 3/32″ from touching the Nico. This clearance diminishes to nearly zero when the Nico has been fully squeezed.

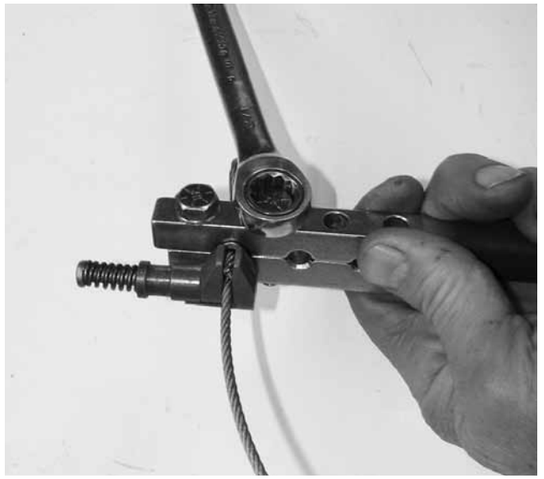
At first it felt as if three hands were necessary to hold everything in place, so I made a little clamp from a small vise grip to hold the cable and thimble together while I positioned everything else. After half a dozen test pieces I became more comfortable and found that the vise grip was not necessary.

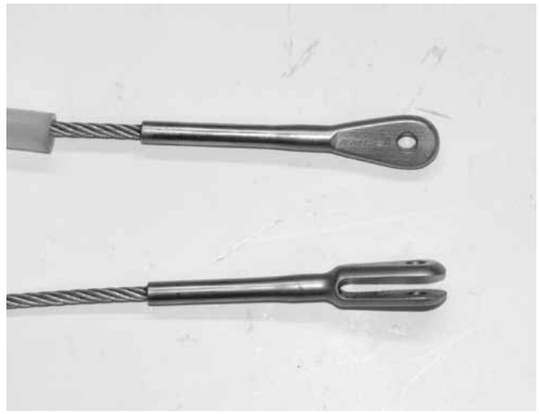
If you pull the loop too tight and do not have any initial clearance between the Nico and the thimble, the tips will enter the Nico and the finished loop will end up cocked off to one side. This is why it is important to have the 3/32″ initial clearance.

MAKING YOUR FIRST CABLE

Rather than cutting the cable to length plus some extra, instead leave the cable on the reel or in the bag while swaging the first end. That way if there is a problem you wasted only six inches. Make your first thimble eye using

Top down: form the loop with at least 1/4" sticking out of the Nico, insert the thimble and pull the loop until there is 3/32" clearance between the Nico and thimble. Tighten the bolts and then check with the go-no go gauge. Second from top: The second swage is next to the loop. The lever tool makes it easy to see that it is centered so that there will be a ridge each side of the swage. Centre: With the Swage-It the edge of the first swage is placed just outside the edge of the tool. This will position it for the second swage with a little ridge each side. Bottom: The third swage is the mirror of the second. The finished Nico will have four ridges and be 3/4" long.





Left: For the second end, if another set of hands is not available, a cleco clamp can help to hold the cable. Right: Here are typical cable ends that Spruce will fit to order, +/- 1/8" length tolerance

the three swages. If you need an AN 115-21 shackle you can slip it into the loop after the swaging is finished. Sometimes this take a little help from a screwdriver to spring it open enough to slide. It could alternatively have been fitted before making the loop but that means one more loose part to deal with.

THE OTHER END

This one requires measuring. If you are replacing an existing cable you can whack two nails into a long board or your building table to establish the fitted length. Then replace with your new cable and make it fit the two nails.

Trap the Nico in your tool, and form the loop around the thimble and back through the Nico, pulling the cable as before but with a much longer tail piece. Remember the 3/32″ clearance between the thimble tips and the Nico. If a friend is there he can keep the cable tensioned while you tighten the bolts of the Swage-It. If you do not have anyone available a cleco clamp can hold the cable while you give the Nico a squeeze. Once the first Nico has been squeezed you can remove the cable from the nails and work in the vise. Next do the squeeze nearest the thimble and lastly the end away from the thimble. Gauge each squeeze and the cable is finished.

If this is a new build the procedure for a rudder cable is to fit the first end in place on the pedal, run the cable down the length of the plane and fit it in place on the rudder horn. The rudder can be clamped, the pedals positioned as required, and the first rudder end Nico can be squeezed in situ and gauged. Then remove the cable and do the second and third squeezes with the tool held in the vise.

RAA Chapter 4975 Annual Fly-In/Drive In Breakfast and Safety Seminar

May 27th Chatham Ontario (CYCK) Kent Flying Machines. Aviation Flea-Market. Breakfast served from 8:00 to 10:00 am Chatham Municipal Airport 8528 Fourteenth Line RR#2, Merlin, Ontario 1-519-676-345 For more information call Armel at 1-519-798-3286.

Barry Meek

Back...to the Future

Barry Meek

I WAS LEARNING TO FLY in 1971. Back then at Prince George, British Columbia, CP Air still flew orange 737's in and out. In winter, refuelling those jets in the icy cold winds was one of the hardest jobs a young fellow could have. The flight school had a couple of Cessna 150's. The flying was all right, but it took a while to preheat and prepare an airplane for the day's lessons. For some reason, I vividly remember that nobody used headsets in aircraft in those days. We had a speaker on the ceiling and a hand-held microphone.

Headsets today are more than just a tool for a pilot. They've become somewhat of a status symbol. You see the students around the airport all carrying their little "lunchbags" containing a personal set. They make a statement .... "I'm a pilot". If they're not David Clark, they're not cool. That's changing however, as D.C. seemingly has lagged behind in the ANC department.

Just as it became a necessary item for a pilot to own, the headset now has reached a new status height and must be and ANC model. I would be in the trenches with those who still resist the new technology, figuring that I've flown this long without them, why would I spend that kind of money for a new "fad"? However, it turns out they are not a "fad", or they shouldn't be. I'd say they're an absolute necessity if you care about your comfort, your sanity, and tinnitus, not to mention your hearing capability. Old pilots lament the fact they can't hear as well as they once could, and blame it on the high decibel levels in the cockpit over time. Tinnitus is also a problem though, something which so far, medical science hasn't found a cure for. It is a condition of a ringing or roaring sound in one's ears. I wonder if ANC headsets had been around 25 years ago if most of those problems would not exist today.

A tangible and immediate benefit of the ANC headset for me is the relatively low noise level once I turn it on. When your job is climbing into a small, noisy airplane every morning to fly for 6, 8 or sometimes 10 hours, it's always a welcome relief when that "rumble" magically disappears.

Headsets are a tiny example of the way technology is changing aviation. Some of the changes are slow and will be recalled only on reflection at some period in time down the road. The ATC system, although way different from what it was back in the '70's, seems to have "evolved" more than suddenly changed. Pilots roll with the punches of change, absorbing the small details over time, until one day we wake up and say, "Wow, this transponder requirement, or this controlled airspace, or this GPS approach stuff is really different". None of it was around when we did our training, just as there were no headsets.

In 1996, Nav Canada privatized the ATC system, and is now in the process of transitioning to employ more satellite technology much of which most G.A. pilots probably don't yet understand. The FAA is attempting to download it's role in the U.S. while developing the next generation air transportation system, called NextGen. That will see pilots requiring new equipment and learning new procedures in the coming years.

How about this scenario? You're approaching an airport in your 172. You push a button signalling a satellite which broadcasts your intention to only the aircraft in the vicinity of 10 miles (transponder equipped linked via GPS). Your data head shows other traffic, much like a TCAS, so you can plan your approach, push the buttons that broadcast your downwind, base and final legs. Alarms will sound if you're too close to traffic at your altitude, minimizing the need to keep a constant watch. All is co-ordinated through GPS, transponder-type equipment and satellites which have yet to be invented. Satellites could be monitoring your position via the barcode on the top of your plane. There's no chatter on the radio, because there's no human controller. A computer will sequence you, based on the information other aircraft transmit through the satellite, and the intentions you transmit to it.

Can this be so far in the future? Real-time weather is already available in your cockpit. You can do your banking, buy gas, check out a library book, pay your credit card bills, obtain a boarding pass for a flight, order a meal, park your car, it's all done without talking to anyone. The technology has been around for several years. All this is rudimentary compared with ATC in the year 2030, just as using a hand-held microphone and overhead speaker were 25 years ago.

Sometime in the future, I'll be asking my yet unborn grandchildren if they know what a VOR is. Or an ADF, glidescope, ILS or a stormscope. Even if they're pilots, they won't know what I'm talking about. Just like Benny Goodman, Frank Sinatra, Johnny Cash and the Beatles, most of what we have today will be unknown by the next generation, and forgotten by ours. One bit of advice about the headsets. Always carry a spare. If your main set lets you down, those hand-held microphones and overhead speakers aren't there anymore for backup. You'd feel pretty dumb trying to remember the light signals. 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.*

Altimeter Tune Up

RAA

SOME ULTRALIGHTS have altimeters that do not have the correct relationship between the altimeter pressure setting in the Kollsman window and the field elevation. Typically the pilot sets the field elevation and just goes with that because the flights are an hour or so and the landing is at the home field.

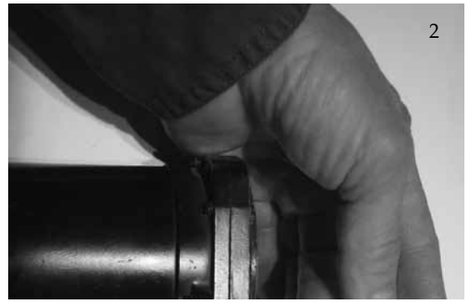
It is not difficult to adjust the Kollsman knob. Set the field elevation in the window and get the altimeter setting number from ATIS. Next to the adjuster knob on the face of the raised boss is a screw that must be removed. If you look inside the hole you will see a pin with a threaded hole, the threads into which your face screw was fitted.

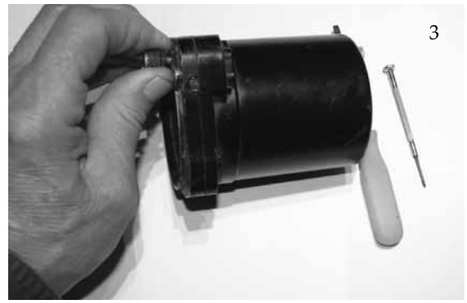
Now that the face screw has been removed the pin can be slid out about 1/16" using a paper clip or a small jeweller's screwdriver. This will then release the adjuster knob and it can be pulled away from the altimeter about 1/8", which is enough to release its gear from the altimeter geartrain. It will still be engaged with the geartrain for the Kollsman window, so you can just turn the Kollsman window to the current setting number.

Gently push the knob back in to engage the altimeter geartrain. You might have to wiggle it slightly. Once it is home you can push the retaining pin back in, and check that the knob can no longer be pulled out. Set the pin's slot to position the threaded hole and gently refit the face screw.

The altimeter will now have correlation between the field altitude and the Kollsman window. This is as much as one should do to an altimeter. The accuracy required of an altimeter is in the range of 25 ft at low altitudes and 80 ft at 10,000 ft, and resetting the Kollsman does nothing to verify or correct accuracy throughout the range. The real question is, at one time the altitude and Kollsman presumably had correlation, so what happened to put them out of whack? If anyone knows, please email the office.

There is a leakage test that you can perform to ascertain the general condition of an altimeter. Connect a hand operated vacuum pump or a syringe to the static port and pull enough vacuum to raise the reading 1000 ft above airport elevation. The standard for a VFR altimeter is no more than 100 ft altitude loss in one minute. If yours has more leakage than this and you already had a Kollsman correlation problem, it is time to take the altimeter to a repair shop. R





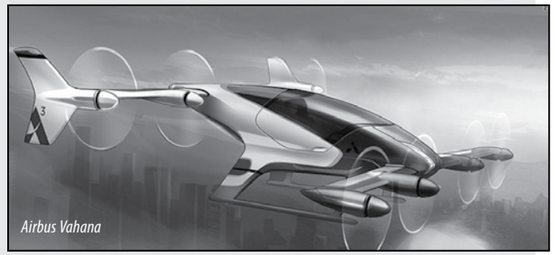
Above: Begin by setting the field elevation, then removing the brass screw that holds the lockpin.
Fig 1: Look in the hole and you will see the threaded hole in the lockpin.
Fig 2: insert a paperclip or a small screwdriver into the threaded hole and slide the pin outwards. It will probably be stiff, but it will click and move 1/16". This frees the adjusting knob.
Fig 3: Now pull the adjuster knob outwards. It will click and move 1/8". This uncouples the altimeter but retains engagement with the Kollsman.
Fig 4: Keep the knob pulled out while adjusting the Kollsman to correspond to the ATIS altimeter setting
Fig 5: re-engage the gear and push the lockpin back in place. Ensure that the threaded hole is aligned to receive the screw. On this altimeter the slot aligns with the axis of the threaded hole.
Fig 6: Pull a vacuun to raise the altitude to 1000 ft above airport elevation. The altimeter must lose less than 100 feet in one minute (CAR 571 Appendix B)

Jetsons 2.0

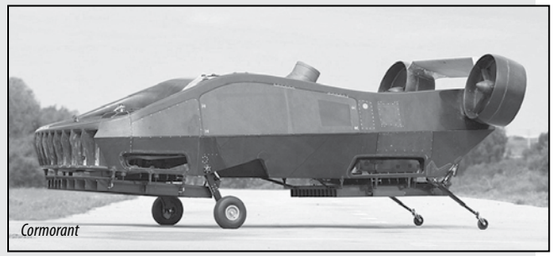
FORGET YOUR SELF DRIVING CARS. What about self-driving aircraft? Some major players in the aerospace industry are starting to describe their own concept of what they'd like to see.

This is different than what most people think when they talk of a "flying car". The traditional idea is of a vehicle that can fly cross country and requires a pilot, who could then drive from the airport to the destination. These are short range vehicles, only meant for commuting into cities. Using electric motors for propulsion offers a lot more flexibility in design as the motors can be placed nearly anywhere, and can be controlled by fly-by-wire —simplifying control and mechanical issues. They are remotely or autonomously piloted: you just input your destination and the vehicle does the rest. Not really a pilot's craft, and not really dual use—more like a new kind of aircraft, a non-piloted air taxi.

Most of these are in the early development or concept-tual stage, but it's plain that some serious people are thinking hard about this. Here's a few examples that are making the news:



vahana.aero



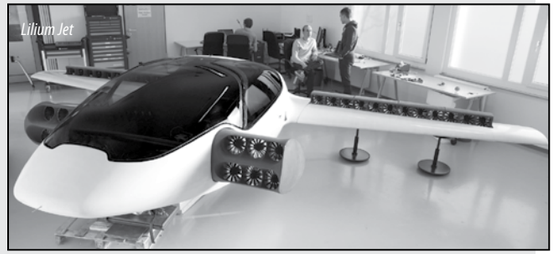
Urbanaero.com

Airbus (Vahana Aero) Vahana

The advanced projects and partnerships outpost of Airbus Group in Silicon Valley is working on a driverless flying taxi. VTOL, it's all electric with helicopter like landing skids. They hope to have a prototype by end of 2017, production 2020.

Urban Aeronautics Cormorant

Designed in Israel by an outfit called Urban Aircraft. It features two ducted lift fans front and back, and two pusher fans to assist in forward flight. Originally meant to be an "air mule" to lift supplies to soldiers in the field and to bring wounded back, it just screams Military Industrial Complex and looks like something out of the Terminator movies. It can be remotely piloted or use its own autonomous guidance and programming to fly. It can take off vertically, and speeds of up to 115 mph, 1100 pound payload are predicted. There are videos online, but they mainly seem to be operating in ground effect. A fly-by at speed and out of ground effect would be helpful.



Lilium.com

EHang.com

Lilium Jet

German tech company Lilium Aviation, 2 seat aircraft, 36 electric fan engines arrayed along its /*continued on page 20*

PAL-V Unveils the Liberty Roadable

The PAL-V Liberty Pioneer and the PAL-V Liberty Sport, the first commercial flying car in the world is now a fact. Images of the PALV-Liberty are now available on the PAL-V website.

Prepared For The Next Phase

"After years of hard work, beating the technical and qualification challenges, our team succeeded in creating an innovative flying car that complies with existing safety standards determined by regulatory bodies around the world" says Robert Dingemanse, COE of PAL-V.

Following the successful test programs of their concept vehicles in 2009 and 2012, PAL-V started the design of the commercial products that have been launched today.

PAL-V is now nearing an exciting phase for its continued business growth namely fulfilling the first client orders. While other flying car manufacturers' concepts require modified regulations and in many cases not yet existing technologies, PAL-V deliberately chose to engineer, design and build a flying car with proven technologies and fully compliant with existing regulations. This leads to a first product delivery date that is realistic and imminent.

The New Model

The new model design has a distinct Italian flair, thanks to collaborations with leading Italian design agencies. It incorporates a unique dual engine propulsion that further increases the safety of the PAL-V Liberty. While driving, the lowered suspension and tilting "cockpit" adds to the sports car feel on the road. A novel design approach serves to avoid a number of common pilot errors by design, making the PAL-V Liberty very safe and easy to operate.

The PAL-V Liberty has a strong appeal all over the world says Markus Hess, Chief Marketing and Sales Officer of PAL-V, who introduced the PAL-V Liberty to selected clients last year.

"We are very pleased with the response so far. Now that the new deign is public I expect to see great interest from customers that have waited for the flying car era to start" says Hess.

Production

"Later in 2017 we will start building a preproduction series followed the the manufacturing of the first PAL-V Libertys for our early 'pioneer' clients. Deliveries of road and air certificated models are scheduled by the ed of 2018. This truly is a pivotal time in aviation and mobility history" adds Dingemanse.

Jetsons / continued from page 18

wings. It looks pretty slick, and its shape and design suggest it might be intended for longer ranges. One is tempted to speculate on possible hybrid propulsion.

Ehang 184
This Chinese effort features a single place cockpit with four arms equipped with two rotors each. Basically a human-sized electric drone, it's about as straighforward as you could expect for a short range commuting aircraft. For some video of this craft, check it out on Youtube: https://www.youtube.com/watch?v=HAvYwM70zH4

Volocopter
2 place, electric multicopter from E-Volo of Germany. 18 rotors, looks like a cross between helicopter and a drone with 18—count 'em—smallish drone rotors. It looks funny, but it works and like most drones, it avoids the complications of swash plates and tail rotors by virtue of having a multitude of small, simple rotors controlled by fly-by-wire. https://www.youtube.com/watch?v=OazFiIhwAEs

Zee
This has some serious money behind it. The company is not providing details at this point, but it look like a canard aircraft with wings that fold to road width. A series of lift fans run along both sides of the fuselage.

Joby S2
Joby Aviation of Santa Cruz, California. 2 seats, all electric, 12 tilt rotors along wings and tail. The aircraft takes off and lands vertically and can achieve speeds of up to 200 mph. Despite its multitude of propellers, it's a fairly attractive aircraft.

The common denominator is that these are not pilots' aircraft; they are short range air taxis, and sort of a flying version of the self driving cars that are in the news. As society continures to urbanize, these type of craft are looking more and more like a necessary development. Automated flight means they could be run by some sort of master control centre, eliminating the possibility of mid-air collisions to boot. They still don't address the larger idea of cross country travel, but nevertheless give pause to wonder if the interest (and economics) in alternative aircraft is approaching some sort of critical mass. The next 10 years are going to be interesting. It may lead to positive legislation by bringing small aircraft to a new level of utility.


Joby S2
Joby Aviation


Terrafugia TF-X
Terrafugia.com


Aeromobil 3.0
Aeromobil.com

WHATEVER ELSO YOU CAN SAY, there's still a need for a type of aircraft that can fly between cities. These would be more like aircraft with the ability to take you right to your doorstep. This would have to feature at least a hybrid drive structure or a conventional internal combustion engine. Here's a few, some of which previously mentioed in this magazine.

Terrafugia Transition/TF-X
The Transition is built, and has been discussed at length in this magazine and others. The TF-X is a substantially more ambitious project, capable of vertical take off and featuring a ducted fan for forward flight with a conventional wing. The rotors store for everything except takeoff and landing.

Aeromobile 3.0
A serious effort with a flying prototype. It was damaged in a recent crash, where the ballistic parachute functioned as planned; the pilot walked away. Czechs design beautiful machines, and the Aeromobil is certainly easy on the eyes.

PALV- Liberty
The company recently opened a gyroplane training school stateside with the express intent of readying potential customers for flight in autorotation. A redesigned aircraft - fundamentally the same as the flying prototype but obviously tweaked - is being shown around the internet, and it looks like a winner. The autogyro platform adapts well to dual use aircraft by virtue of being about as idiot-proof as an aircraft can be, capable of landing in very small spaces, and of pendular design, thus eliminating many of the problems associated with true dual use aircraft. See page 19 for more details .

The RAA Midland Fly-in featured the first flights of a pair of Zenith 4-place CH-2000 kitplanes that had to put aside their first flights until the weather permitted. Happily, the weather got good enough for the Fly-In and their first flights. For more pictures and a report on the event, see Across Canada on page 40. Photos courtesy Gusair.com.

Destination or Journey?

Dan Oldridge

WHEN LEE COULMAN asked me if I had ever considered flying up to the Bushplane Museum in Sault Ste. Marie, it got me thinking about how cool it would be to visit the museum, but more interestingly how cool it would be to fly an amateur-built float plane to the museum.

Having flown with Lee on a number of other occasions, I knew he felt the same way about flying that I do. Sure, the destination is important, but getting there is half the fun… and more often than not, most of the adventure!

A little research quickly revealed that the museum is in a large seaplane hangar that previously operated as an MNR base on the St. Mary's River. The building has a large ramp and aircraft parking area making it ideal for amphibious aircraft and a large docking area for those on straight floats.

For land-based aircraft, the Sault Ste. Marie airport CYAM is a 25 minute drive from the museum. For information on CYAM go to http://saultairport.com where you can find out more about user fees, parking fees, runway information and other important details.

Since Lee would be making the trek in his Searey and I would be in my Highlander on amphibious floats, the semi-protected waters of the St. Mary's River were the logical choice, giving us a long runway and less dependency on wind direction for our landing at the Sault.

As the plan started to come together in the days before our trip, it appeared the weather would be good, so we added the possibility of a low and slow flight up the Agawa Canyon for a fall colours tour afterward. Lee arranged for an overnight stay on St. Joseph Island at his nephew's cottage, which was another great opportunity for a couple of aviators in amphibious aircraft.

On the day of our departure, the weather wasn't looking quite as rosy as the predictions a day or two earlier, but as I drove to the hangar at CYFD in Brantford, Ontario the skies cleared and I knew that at least the first part of my flight would be great. On the other hand, Lee's home airport CPR3 where we planned to meet to start this adventure wasn't looking good. Lee advised me of the low ceilings there and that the WX advisories showed slow clearing throughout the morning. It was obvious we would be delayed, but given the clear skies in Brantford, I figured I would at least get in a little flight time and head toward CPR3. I could always turn back and call it a day if I couldn't get to Lee's hangar.

As it turned out the skies were clear as far as Woodstock, where it became obvious that VFR would not be possible beyond that point… at least for a while anyway. Luckily the sky was clear to the west far enough for me to do a few circuits at Wildwood Lake as I killed a bit of time waiting for the ceiling to lift, which it eventually did. An hour or so later, I was flying over scattered cloud on my way to Teviotdale, which was also slowly clearing out.

We decided to wait a while longer given that things were still a little sketchy around the higher elevations north of CPR3 towards Mount Forest. Eventually, we decided to make our way to Williams Lake and determine whether it would be feasible to continue north or call it a day and return to Teviotdale. Flight Services was still advising us of gradual clearing.

As it turned out, I encountered a technical difficulty that almost scrubbed the trip altogether, but weather reports from Flight Services indicated that flights on our intended route up the Bruce Peninsula were not advised. After making the repair, we decided to return to CPR3 and start fresh the next morning.

As with the previous day, morning fog prevented us from leaving early, but things cleared out enough by 10:30 to fly north.

As we passed over Williams Lake where we had stopped the previous day, the water reflected an iridescent teal blue characteristic of a marl lake as the sun streamed down through scattered cloud on that beautiful October day.

Flying past Owen Sound and up

the east side of the Bruce Peninsula gave us an opportunity to get some magnificent views of the Niagara Escarpment only available from the air.

Adjustable zoom lenses on our cameras really helped to capture the scenery as we flew past the rock outcroppings, occasionally at low level, over the open water of Georgian Bay.

On our way up the eastern shore of the Bruce, we flew low past Flower Pot Island and the lighthouse on Cove Island, before heading across open water toward Manitoulin Island.

Being in seaplanes meant that we could fly only a few hundred feet off the water rather than thousands of feet a land-based pilot would do; ensuring great views along the way.

At Gore Bay, where we refueled, the skies began to close in, but ceilings remained high enough to safely continue to the Bush Plane Museum in Sault Ste. Marie.

As we neared the Museum, we made a courtesy call to the controllers at CYAM to advise them of our intentions, even though we remained outside the control zone. Descending into the St. Mary's river, we could see the Sault Locks ahead and the docks along the Canadian side of the river, which helped us to pinpoint the location of the museum and set up our final approach to land in front of it.

Upon landing, we taxied up the long wide ramp of the museum between numerous other aircraft at the docks there, including a Beaver and a number of Cessnas on floats.

The museum has a secure compound at the top of the ramp where planes can be left for just $25 per night, but Lee and I hoped we could be out of there before lock-up time.

Finally after a few hours of flying and a day's delay, we were ready to experience the history and legends contained in the exhibits at the Bushplane Museum. Once inside, we were approached by a grey-haired young fellow who spent most of the next hour and a half showing us a number of the exhibits and relating stories and history of the planes, pilots and explaining how the museum acquired and restored many of the aircraft and other exhibits.

Forestry was a major driver in opening up the north and bush firefighting was heavily augmented by air support from a number of different aircraft modified for the purpose.

Top: a lighthouse adorns Cove Island. Centre: the Soo Locks and Sault Ste. Marie. Bottom, the Bushplane Museum's ramp as seen from Dan't floatplane. Opposite, Dan's Highlander and Lee's Searey sit on the museum ramp. What could be better than flying to a floatplane museum in a floatplane?

Most of the aircraft at the museum are refurbished original aircraft, but some are replicas, such as Amelia Earhart's FriendShip. This Fokker F. VIIb-3m Trimotor "FriendShip" was constructed specifically for starring in the 2009 movie "Amelia" starring Hillary Swank, Richard Gere and Virginia Madison and displays the original registration NX-4204.

The Canadair CL-215 is one of the larger aircraft in the museum. F-ZBBT served in France and Corsica recording over 20,000 water drops during its lifetime.

A number of the large aircraft like Stinson Reliant CF-BGN, deHavilland DHC-2 Beaver CF-OBS and deHavilland DHC-3 Otter CF-ODU served in the Ontario Provincial Air Service. CF-OBS is the oldest production Beaver in flying condition.

Norseman MkIV CF-BFT served in the Northwest Territories and Fairchild F-11 Husky CF-EIR was the last Husky ever built.

These aircraft have been meticulously restored and in many cases access to view the interior of these aircraft is provided through sets of solidly built steps and platforms.

Accessories like collapsible canoes and small outboards are also on display to emphasize some of the cargo these air pioneers of the north often carried into remote areas as prospectors, lumberjacks and tourists made their way north into the wilderness.

Many smaller aircraft such as Fox Moth CF-BNI currently under restoration as a replica, an Esperanza 4, MacGregor MG-65 Biplane CF-RCZ and Republic RC-3 Seabee CF-BNI round out the displays and add a lot of interest to the tour.

There are a number of other aircraft on display that I have not mentioned in this article, but I think you get the idea that The Bushplane Museum is certainly a place that is well worth the time and effort to visit.

The museum has a large collection of the forest firefighting equipment used to tame the northern wildfires on display in a dedicated area of the museum. There is even a fire watch tower inside the building, which acts as an educational prop and provides an excellent scenic viewpoint for an overview of the museum and most of the aircraft therein.

All of the displays are very well done!

After a great day of touring the museum, we grabbed some supper at a nearby diner and made our way back down the ramp and into the skies over the St. Mary's River.

Feature

Most of the aircraft at the museum are refurbished original aircraft, but some are replicas, such as Amelia Earhart's Friendship.

Top right: a DeHavilland Fox Moth. Opposite top left, Canada's iconic, home grown bush machine, the Dehavilland Beaver. Lower left, a replica of Amelia Earhart's Fokker Friendship. Opposite right, another indigenous design, the CL-215—a purpose built water bomber—is one of the larger aircraft in the museum. The Norseman and (bottom) a Stinson Reliant are other aircraft that helped open up Canada's vast spaces.

As the sun set, we flew toward St. Joseph Island where we would be spending the night. We enjoyed a beautiful sunset at the dock and got a good night's sleep in preparation for a flight up the Agawa Canyon the next day.

Unfortunately, October weather can be a little unpredictable and we experienced lingering morning fog once again! After numerous calls to flight services and checking the weather reports on the internet, we decided to scrub the Agawa Canyon tour this trip. There's always next year… right? As the day went on the winds picked up from the south and we knew it would be a long slow trip home with 20 to 30 knot headwinds along the route, especially long given that we were flying 75 to 85 knot airplanes.

But you know what they say about lemons… we decided to make lemonade and flew just above the water most of the way home, experiencing some of the most scenic and spectacular waterscapes imaginable.

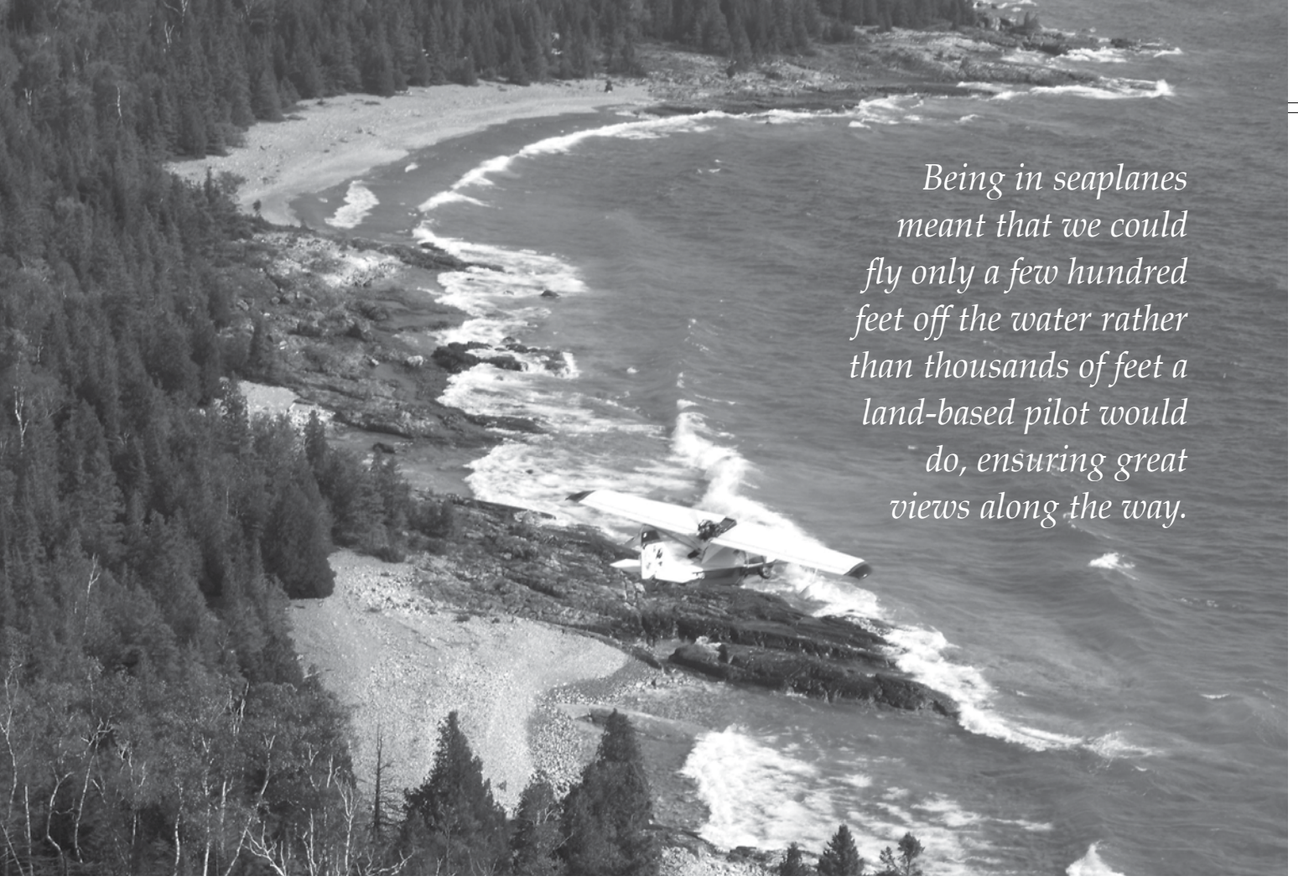
The slower speeds meant we were able to shoot some amazing photos of the west side of Manitoulin Island and the Bruce Peninsula from low altitude in our seaplanes. In my opinion, the rugged wind-swept and wave-battered shoreline yields some of the most scenic views in Ontario.

Many of the forested areas on Manitoulin Island were displaying their full fall colours, which softened the blow of not getting to fly the Agawa Canyon as we had planned.

There seemed to be a full rainbow of colours available to the eye with violet, red, orange, yellow and green to one side, and teal yielding to deep blue on the other side of the airplane.

Lee's blue-on-white Searey often blended right in with the scenery below, so I had to keep a sharp eye on his location. But then maybe he had the same issue spotting my fire-red Highlander C-FDEP as I flew over the autumn forests of Manitoulin Island.

I managed to photograph Lee and his Searey C-GJIB in the same frame as the MS Chi-Cheemaun ferry as it crossed from Tobermory to South Baymouth. It would have been interesting to get a bit closer, but there was low-flying helicopter traffic on the radio advising he was coming up the east side of the peninsula. Getting closer may have put us in conflict with that traffic.



The palate of colours in the waters of the Great Lakes varies from light green to the deepest of blues with every shade of turquoise imaginable, interspersed with the brown and gray influences of sand and rock just below the surface of the water and wind-swept white caps lapping the rugged shoreline. It's little wonder why so many of the Group of Sevens' paintings were done on the shores of Georgian Bay. Not being artists, Lee and I just had to let the photons captured by our digital cameras speak for us as we tried to capture the incredible scenery passing below.

I would highly recommend a trip to the Bushplane Museum in Sault Ste. Marie, but as with most adventures, getting there is half the fun … even when things don't go as planned.

If you are within a few hours' flying time, it is well worth the time and effort to make the journey in your own amateur-built aircraft, especially if it's on amphibious floats! Don't forget to take a good camera along!

Explore the Bruce Peninsula by air if you get the opportunity. As Canadians we are so lucky to have so many wonderful scenic places to visit. As pilots, we also have the advantage of getting an exclusive seat for the show, with views that others can only dream about.

Check out the Bushplane Museum website for much more information on the exhibits, the history of the aircraft, and some interesting stories about the early bush aviators and MNR firefighters at… http://www.bushplane.com

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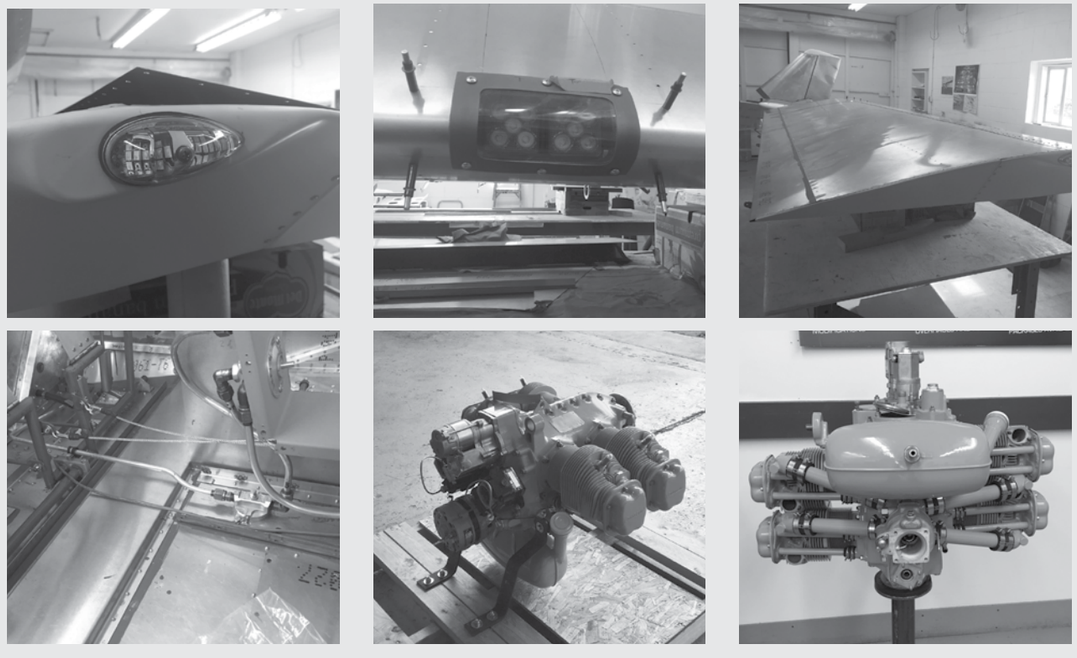
***Dan Oldridge** is a retired firefighter who began his career in Cambridge, ON before eventually rising to the postion of senior manager in London. He is a member of RAA National, two local RAA chapters and President of KW-RAA.*

Vancouver Chapter's Zenith 750 Cruzer Nearing Completion

Chapter 85 was recently notified by Rob Wharf at Progressive Air in Kamloops that the Cruzer's engine had a successful 2 hour test run. The final item our O-200 needs is a new magneto harness and that has been ordered. We are very close to having the engine and in addition to that, Eric Munzer will be taking delivery of the Dynon Skyview system within the next day or two. One wing has been closed and the other is ready for closing.
With all of these developments, we will be getting close to re-arranging the workshop to facilitate mounting the wings and the engine all of which are major steps in getting closer to a flying project! Everyone's support and enthusiasm for this project is greatly appreciated and it would not have progressed to this point without a committed effort from the membership.



Progress continues on Chapter 85's Cruzer project. From top left: the nav lights combine strobe, beacon and position lights; the wing lights have both taxi and landing lights. The starboard wing is now closed up; the port wing only needs the pitot tube and its plumbing installed and it can be closed too. Across from lower left: the fuel lines are mostly run and the fuel selector and ignition switch on the lower panel are installed. The Cruzer's O-200 has been overhauled and had a successful 2 hour test run. All it needs is a new mag harness and it's good to go. Flying by this summer, hopefully!

TC Category 4 Medical vs FAA BasicMed

JC Audet

JC Audet provided the information below to COPA for their questionnaire and we are publishing it here for pilots who are not COPA members. Please send your response to garywolf@rogers.com or mail to the office at RAA Canada, 22-4881 Fountain St. N. Breslau ON N0B 1M0.

IN LIGHT OF THE BASICMED class recently issued by the FAA, numerous pilots have inquired as to the potential for a similar category in Canada. In order to better assess the situation, we wish to survey all holders of a Recreational Pilot License as well as holders of a Private Pilot License issued by Transport Canada. The purpose of this survey is to collect information on your needs as a pilot. This information will be used to assess the adequacy of the privileges associated to our Recreational Pilot License and the Category 4 Medical that validates it. While the Category 4 Medical validates the Recreational Pilot License and is not associated with the Private Pilot License, we would still like to take this opportunity to canvass the private pilots on the same topic. We feel it is appropriate to address the needs of both types of permit holders at this time as there may be some private pilots in our country who would view the Category 4 Medical very positively if it offered privileges closer to their needs such that these private pilots might then opt for a Recreational Pilots License.

When responding to the survey, keep in mind that we are trying to find out what our pilots really need, not necessarily the wishes and/or dreams of each individual. We also recognize that asking outright for a duplicate of the American BasicMed will not fly. Let's be practical and honest in defining how we really believe we want to fly and what privileges we need on our Recreational Pilot License and the medical category that validates it.

1 – What Maximum Take-Off Weight do you need (in lbs)?
a) 1500 b) 2000 c) 2500
d) 3000 e) 4000
2 – What engine configuration do you need to fly?
a) Single b) Multi
3 – How many seats do you need to have available?
a) 2 b) 4 c) 6
4 – How many passengers do you need to take with you?
a) 1 b) 3 c) 5
5 – Under which flight rules do you need to fly?
a) Day VFR b) Night VFR
c) OTT d) IFR
6 – What maximum altitude do you need to fly at (ft MSL)?
a) 10,000 b) 12,500 c) 15,000
d) 18,000
7 – What maximum speed do you need to fly at (KIAS)?
a) 135 b) 160 c) 200
d) 250

SUITE À LA RÉCENTE publication par la FAA de la nouvelle classe BasicMed, de nombreux pilotes souhaitent voir la même chose au Canada. Afin de mieux évaluer la situation, nous lançons cette enquête auprès des détenteurs du Brevet de Pilote Récréatif ainsi que les détenteurs du Brevet de Pilote Privé émis par Transport Canada. Le but de cette brève enquête est d'obtenir de l'information visant à définir vos besoins comme détenteurs d'un brevet de pilote émis par Transport Canada. Cette information sera utilisée pour évaluer l'ensemble des privilèges associés au Brevet de Pilote Récréatif tel que validé par la Catégorie Médicale 4. Bien que la Catégorie Médicale 4 valide le Brevet de Pilote Récréatif et n'est pas associée au Brevet de Pilote Privé, nous croyons néanmoins important de discuter aussi les besoins des détenteurs de ce dernier brevet à cette conjecture. Il y a possiblement des pilotes privés qui percevraient cette catégorie 4 sous un œil beaucoup plus positif et pourraient opter pour un Brevet de Pilote Récréatif tel que validé par une Catégorie Médicale 4 si les privilèges qui lui sont associés se rapprochaient un plus des besoins du pilote privé.

En répondant au questionnaire, gardez à l'esprit que tentons de mieux connaître vos besoins réels, et non pas les rêves et les désirs de tous et chacun. Nous reconnaissons qu'une demande pour obtenir la même chose que le nouveau BasicMed américain ne serait pas acceptable. Prenons donc ensembles une approche pratico-pratique et honnête pour définir nos besoins réels pour voler et quels privilèges devraient être associés à notre Brevet de Pilote Récréatif et à la catégorie médicale qui valide ce brevet.

1 – Quelle charge maximale au décollage avez-vous besoin (in lbs)?
a) 1500 b) 2000 c) 2500
d) 3000 e) 4000
2 – Quelle configuration motrice avez-vous besoin pour voler?
a) Monomoteur b) Multimoteur
3 – Combien de sièges disponibles avez-vous besoin?
a) 2 b) 4 c) 6
4 – Combien de passagers avez-vous besoin d'emmener avec vous en vol?
a) 1 b) 3 c) 5
5 – Sous quel régime de vol avez-vous besoin de voler?
a)VFR jour b) VFR nuit c) OTT
d) IFR
6 – A quelle altitude maximale avez-vous besoin de voler (pi MSL)?
a) 10,000 b) 12,500 c) 15,000
d) 18,000
7 – A quelle vitesse maximale avez-vous besoin de voler (KIAS)?
a) 135 b) 160 c) 200
d) 250

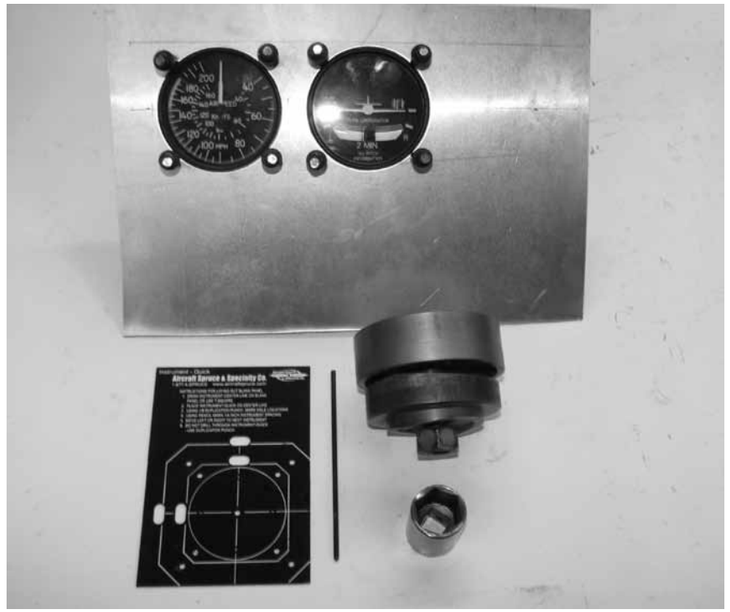
Nav Canada Fees and Policies

If your plane is registered with a gross weight under 1360 pounds you do not need to read this. If you own a Balloon, glider, or ultralight you can stop reading too. If you own a plane that is registered at 1360 pounds or above, read on.
The current annual fee for a powered aircraft between 1360 and 4410 pounds gross weight is $68 plus HST, and the anniversary date is March 1st. For planes between 4410 and 6614 pounds the fee is $227. For most aircraft the fee is not prorated. If you fly only one day in the period the full fee applies. The owner of the aircraft on March 1st has the obligation to pay the annual fee, so if you buy a Canadian registered plane March 2nd the vendor pays the fee and you do not.
The only time a fee is prorated is if the aircraft is new and has never flown. In that case the fee will be prorated for the part of the year since its registration.
A newly built Amateur Built aircraft is a special case. The builder must register the project before it has had its final inspection, so that triggers your invoice. If you do this in the fall you will be invoiced despite that you might not have the final inspection until after March 1st the next year. In that case you should call Nav Canada to explain the situation and they will issue a credit.
Some owners take a plane out of service to do a rebuild, but unless they notify Nav Canada that the plane will not be flying, the invoice will arrive as usual. You may notify Nav Canada before March 1st and they will put your fee on hold, but if you decide to fly at any time during that year you will have to pay the full year's fee before the wheels leave the ground.
At one time Nav Canada had the exemption form on their website, but so many people misunderstood the situation that Nav Canada now sends it out only after speaking with the owner. Their rep says that their policy is that you may inform them any time during the year or even after the year, and they will credit your account.
A landplane that is under 1360 pounds might subsequently have floats installed and if that means that its gross weight becomes higher than 1360, that will trigger the fee. Nav Canada looks only at the TC registration database and uses their gross weight numbers.

Should you wish an exemption form or if you need more information you may call 1-613-563-5588.

LAYING OUT AND CUTTING CONTROL PANELS

Gary Wolf



Above, The Spruce gauge template and the ATS panel punch

YES, SOME STILL USE steam gauges but these days it is getting harder to justify the choice when I-Pads and glass panels are taking over. However if you are Old School or your plane does not have a generator, mechanical gauges are the choice.

The most useful material for a panel is 1/16" aluminum, either 6061 or 2024. They are stiff enough that even the narrow webs between tightly packed gauges provide good stiffness. The problem is how to cut the 3-1/8" or 2-1/4" holes and to lay out the four holes for the mounting screws.

PROTECT IT

Before doing any layout or cutting, protect the finish of your panel blank with wide masking tape to cover its face, and maybe the back too if you are ADHD. This is a lot less work than polishing the scratches out later.

LAYOUT

The standard gauge has a mounting surface 3.25 x 3.25 with a 3-1/8" diameter gauge face and four mounting holes in a square pattern on a 3.5" circle.

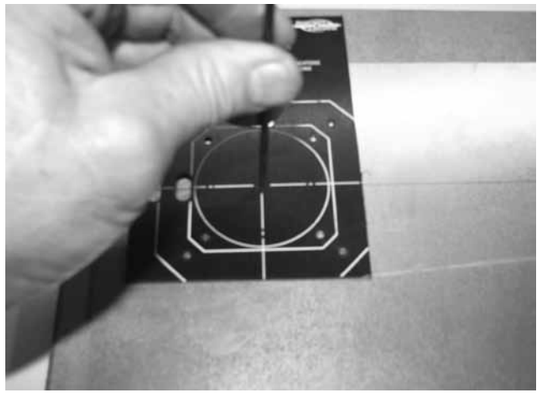
Typically adjacent gauges have the edges of the case no closer than ¼" from the neighbour, leaving a half inch spacing between faces. Aircraft Spruce sells a handy layout template that works for both 3-1/8" and 2-1/4" gauges. It comes with a 1/8" transfer punch and a caution to use the punch instead of drilling through the template. You could alternatively dig out your Grade 11 geometry book and your dividers and swing arcs to lay out your own template.

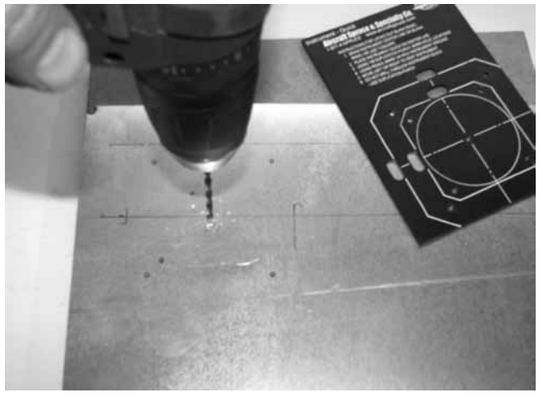
Draw a horizontal line on the panel and put a mark at the centre of each future instrument, then write above each layout which size the gauge will be. Drill the centre mark for 1/8" and cleco the template in place. Clock it to be level, clamp it in place, and transfer punch the corners. Remove the template and drill the corner holes and you can proceed to the difficult part – cutting the gauge hole.

ATS PANEL PUNCH

The class act for cutting gauge holes in an aluminum panel is the ATS panel punch that will quickly cut either 3-1/8 or 2-1/4" holes. A 5/8" bolt draws the punch and die together

Top: The Spruce gauge template and the ATS panel punch Left, the transfer punch is used to lay out the hole centres.
Right, do not drill through the template or you will lose its accuracy.
Left, test panel with template and tools





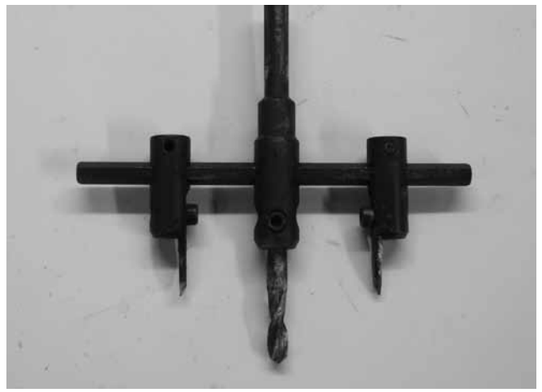
so you will need to enlarge the centre hole. A step drill works well but you must work carefully to keep it on centre. Most step drills have a pilot of ¼" diameter so drill the centre hole to that size. Use a drill press to upsize to 5/8" and deburr, and you are ready for the punch.

It takes a lot of force to cut a 3-1/8" hole in 1/16" aluminum so you will not be doing this with a 3/8" ratchet. A long pattern 15/16" box wrench is the minimum. I used a socket on the air hammer that I use for changing snow tires and it breezed through. The slug will be trapped in the die but it has a knockout hole so you can remove the slug with a punch and hammer.

Fit your gauge to check if the mounting holes are still on centre with the gauge face. If you worked carefully they will be.

HOLESAW

A holesaw will do an effective job of cutting the gauge hole if you use a good one like Morse or Milwaukee. Make certain that you use the drive pins of the arbor to drive the holesaw so that it can self centre. Holesaws are rarely perfectly on centre and the cheap ones will sweep a wide line, and the resulting hole can be as much as .030" oversized. Do a test cut in scrap before committing to the panel. It is possible to drive the holesaw with a hand drill but it works a lot better in a drill press. Back the aluminum up



Left, Updrill to 5/8 with a step drill and use the ATS punch for the panel hole. A pneunatic wrench makes this easy. Right, try to avoid anything that looks like this

with a piece of MDF and clamp them together.

A sharp holesaw can be used dry but when it wears a spray of WD 40 will help clear the chips. Do not use oil for aluminum as it encourages clogging of the teeth. My Morse holesaw cut only .010" oversized.

FLYCUTTER

If someone suggests using a flycutter, that person is not your friend. The only way to have any success is when it is in a drill press, the table has been leveled, and the feed is very gentle. The sheet must be well clamped to a board and you had better do some test pieces to get the diameter right. Make certain that if it catches and throws the part across the shop there is nothing valuable that could be damaged. If you try to use a flycutter in a hand drill there is little chance of doing anything but damage.

THE KOLLSMAN CUTOUT

Altimeters will need a cutout for the Kollsman adjuster and no two manufacturers seem to use the same location or size. I have measured many and the outside radius seems to be 3/8" larger than the gauge face. Measure yours with a vernier. The ends of the cutout are frequently ¼" radius and the width vary from 7/8" to 1-1/8" depending on the manufacturer.

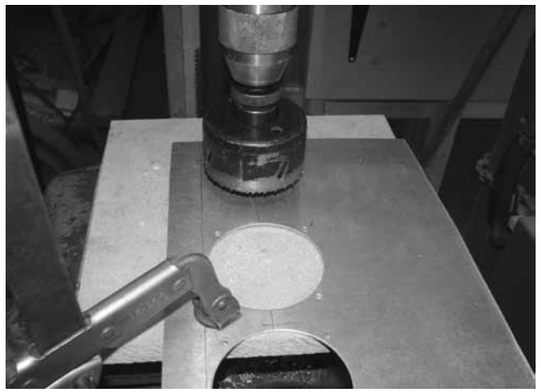
I made a template from .020" aluminum and tried to cleco it to my gauge. Of course the adjuster knob prevented this but it looked as if it was on the same centre as where the mounting hole would have been for that corner. I drilled it for 3/8" and found that it slipped over the knob. Then I scribed the outline on the backside of the template and gradually filed the cutout to fit the adjuster lump. This template was then cleccoed to the panel blank, the line was scribed, and I filed the cutout.

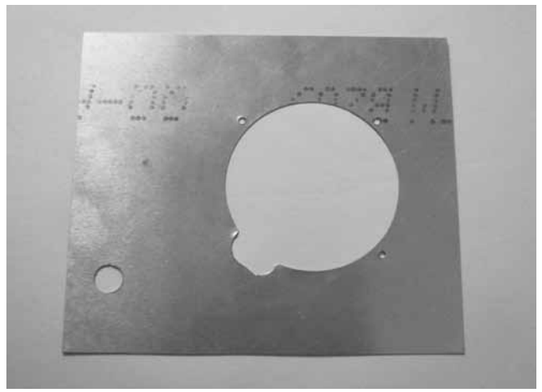
GAUGE AS TEMPLATE

Instead of using the Spruce or a shop made template, a gauge can be used for this purpose. Lay out and cut the 3-1/8" holes and place a gauge to be square. Using a transfer punch in one corner you can centre punch the first hole. Drill it and cleco the gauge in place and you can punch the other three holes and then drill them. A dead gauge is better for this and if you are determined you can remove the faceplate to become your template without having to work around the case.

OTHER HOLES

Holesaws and step drills do an effective job for the small gauges and the switches. The mag switch hole has a little tongue to keep the switch from rotating but most builders just tighten the switch down.





Left, A good holesaw does an effective job if the panel is backed up and clamped Right, a shop made template will aid in laying out the Kollsman adjuster hole

Rocker switches are a frequently a pain because they do not use round holes. To cut a small square hole drill the corners, staying inside the line. Then drill the bulk of the cutout and file to finish. Snips have no place here. This is all a bother but no one makes rectangular drills. A large square cutout can have a start hole step drilled to about ¾" and a little air saw or a jig saw with a fine blade will handle the edges. Stay inside the line and file to the finished dimension. Pull the masking tape back for the filing so that you can see the aluminum. Nobody said you had to buy square switches; toggles are round.

ALTERNATIVES

There are companies that have CNC laser or water jet cutters and if you can supply a cutting file they will hand you back a finished part and it can even include the tongue for the mag switch. Spruce sells a software package to design your own, or if you are building a popular plane like an RV-7 there are companies that are set up with their own software to make your panel for you. Check with your kit manufacturer and the type support groups to see what is available. In some cases it might be faster and less expensive than doing it the Old School way. For 51% purposes writing a cheque counts the same as cutting and filing your own panel, but for some the pride of accomplishment is more important.

ATS panel punch (ATS #123C) ACS #12-02743 ..... $220.00
Gauge template, Aircraft Spruce #140 .... 28.00
Milwaukee 3-1/8 holesaw, Aircraft Spruce #49-56-3120 ..... 22.00
Milwaukee 2-1/4 holesaw, Aircraft Spruce #49-56-2250 ..... 22.00

Aviation Definitions

HOLDING PATTERN: The term applied to the dogfight in progress over any radio facility serving a terminal airport.
BI-PLANE: What you'll say to your bird if flying costs keep going up
WALKAROUND: What you do when waiting for weather to clear.
LANDING FLAP: A 4000' roll out on a 3000' runway.
CRITICAL ENGINE: That part of your airplane which used to be under the cowl, but is now in intensive care at the maintenance shop.

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 Phil Hicks p.hicks@tvdsb.on.ca 519-452-0986

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 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.**

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.

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

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

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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.

"CLEANING OUT THE HANGAR" Best Offer: New Fly Baby fuselage and vertical tail/rudder. Thorpe 18 fuselage, gas tank, lots of small parts and front landing gear. Call or email for photos and information 705-653-4525 davidcarlaw@prototyperesearch.com

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 .

CONTINENTAL A75-8 ENGINE. Approx 30 hours SMOH.Stromberg NA-S3A1 carburetor, Slick mags. Was mounted on my Pietenpol. Am selling because I bought a Continental 0-200 instead – wanted an electrical system! $5000 OBO. Located in Ontario. contact Pat pjb@ornithopter-pilot.com 519-925-3639

MOVING AND CLEANING OUT:
Continental A65-8 with logs, #1166018. TT930, 130 STOH - $3000. 4 cylinder BMW motorcycle engine - $150
Project, a McDonald S21,single seat all metal low wing. 1st inspection done. No engine, $1000 Metal prop for Continental with 43 hrs, 74 x 45. $600 Bendix mag, 4 cyl. New style. $495 A-B project Aeronca S-7EC. Complete overhaul of airframe 2010, Lycoming O-290-G 125 hp with 90 hrs. Zero time metal 74-52 prop. 1500 Federal skis and 1800 PK floats.600-6 wheels. Intercon and ICOM radio, xponder, cyl temp and exh temp gauges. Make an offer. Beechcraft LH landing gear assy - $100 Beechcraft RH landing gear assy - $100 Lycoming oil pan 150 hp rear mount carb TO 320 81A One set NEW 500-5 wheels and brakes $600
2 used Goodyear brake wheel cylinders, complete with axle. $375 600-6 4 ply tires (used) 6 available, $20 ea. 600-6 6 ply tires (used) 6 available $25 ea. Lycoming O-435 case and crank assy, complete with mags $500 Lycoming O-435 prop hub for splined shaft $50 Hartzell 76" adjustable prop, fits Lyc O-435 $100
Stinson 10A LH and RH gearlegs complete with tires and brakes. Both $400 Pair of NEW Cleveland wheels and brakes, 500-5 with 1-1/4" axle $650 Prop governor McCauley 762092, $50
NEW aerobatic carb, Ellison EFS-4, serial # 1061, $500 NEW, 3 pieces 600-6 x 15 tires 6 ply, $150 each Aluminum shrinker and stretcher, $40 each 2 available, 600-6 4 ply Goodyear wheels, brake cylinder and discs, $450 pair
Piper nosebowl mould for fibreglass, $90 8 x 3 tailwheel assy $250 4" tailwheel assy $350 Lycoming GPU 4 cyl O-290G 125 hp, no mags $400. Differential cylinder tester $50 400 running ft of square tubing 5/8" .035, $200 the lot 50 running ft of square tubing 7/8 x .035, $25 the lot. Several Lyc O-290 cylinders and several Franklin 350 cylinders, Make an offer Stinson 10A fuselage static display only, $100 Fleet Canuck fuselage static display only, $160 Jodel D11 fuselage and wings, static display only, $200 1 set seaplane floats-to-fuselage rigging, J3 Cub to EFO 1400, $500 Contact Lawrence Shaw, Orillia Ontario. Phone/fax 705-325-8017

RV-7 WING AND EMPENNAGE for sale. Varying states of assembly. Right wing top skin riveted with leading edge installed. Left wing in jig with 20% of top skin riveted, leading edge assembled. Wings set up for conduit. Tanks set up for capacitive fuel quantity senders. Right tank complete, left tank complete but rear not yet installed. Empennage assembly halves riveted. All assemblies primed with Boeing epoxy primer.
Included in package is Gretz Aero heated pitot, Mac trim tab servo, RMD wing tip lighting kit, Whelan 650 PR-14 wing tip strobe/back lights and Orndorf assembly videos. Not yet inspected as aim was to complete 50% of riveted sides before inspection. I have personally completed all assemblies.
Buyers must arrange their own shipping. Potential buyers welcome to inspect project in southern Ontario Call Tad, 905-627-6901, Asking $9500 CDN

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

1990 ROTORWAY EXEC Helicopter for sale. TT 92 hrs. Quick sale $10,000. Always hangared. Contact Chris 807-854-0524 or email at dkeats@tbaytel.net

ZENITH CH701 120HP JABIRU. -$35,000 USD OBO- FOR SALE BY BUILDER- 2008 model with all current updates and options. Jabiru 3300 factory sealed and still in crate stored in my living room, Sensenich Ground Adjustable Carbon Fiber Prop, Cummins 9.5" Aluminium Spinner, Firewall Forward Kit, JFC Cabin Heat System J Style Cowl 2" x 2.25", Dual throttle, GRT Horizon Sport EFIS w/High Res. and Graphical Engine Monitor, GRT Horizon Internal GPS, EIS 6000 with 6 CHT Probes and 6 EGT Probes Plus Pre-Wired Cable for Jabiru Tractor installation, Outside Air Temp Probe, 4 x 10gal. Fuel Tanks, Folding Wings, Bubble Doors, Electric Trim Tab, Also have approved Gross Weight increase to 1250 lbs. from MDRA, useful load 650 lbs.. Complete Tool Kit with Air Drill. Current pricing new is approx. $48500.00 USD plus taxes.

I have an engineering back ground and have meticulously assembled the following components less skins in my heated garage, Rudder, Horizontal Stabilator and Elevator are riveted, the right wing is clecoed together. All skins still factory wrapped and stored on base of crate, Corrosion proofing also done on all lapping parts. Contact Darren: Cell 604-862-9580 or e-mail: jubilee@okanagan.net

ESTATE SALE. Pegasair Stol Aircraft, Kit manufactured by Tapanee Aircraft, Leading edge slats & full length flapper ins. 0 time 0-320 A engine. New 406 ELT, Radio, Float fittings, 30 MPH stall speed (approx) cruise 120 MPH. useful load 700 lbs. Preliminary Inspection Completed, ready for MDRA
Inspection. Check Out Pegasair Aircraft.com. Asking $ 30.000 OBO Call Cary @ 416-407-4423 or Ken @ 416-454-2400

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
http://www.lyncrest.org/sfcclassifieds.html - more ads from our Winnipeg chapter

Midland Huronia

In December, Ray M. updated the group on the progress of the CH-601 Builders Group, including the construction of a heated 12′ x 20′ shop in the corner of Bob's hangar and the current activity of assembling the second wing. The CH-601-XL Builders Group meeting in Bob's hangar, Thursday evenings (6:30-9:00) and Saturday mornings (9:30-12:00). Everybody is welcome.

In the January meeting, the chapter received a thank you card from the Spick family as well as a receipt from the Heart and Stroke Foundation for our donation on the passing of John Spick.

The Christmas party was a great success with an attendance of 35.

Rob M. reported progress on the project to draft a "hand-out" style pamphlet for our organization to be distributed to visitors at the airport and at Zenair .

Things have been hopping at Midland/Huronia. On the left is a series of pictures showing the creation of their new build space for the 601-XL; on the right, their recent winter flyin included two Zenith CH-2000s (both made their first flights that day) and a pair of visiting Evektor Sportstars that flew over from Edenvale. Photos courtesy of Gusair.com

LondonSt. Thomas

Chris Staines has been working on wing tips, landing gear adjustments and electrical on his GP-4, as well as testing flap operation.

Roland Kriening now has 110 flying hours on his Murphy.

Eric Bartlett is working on a side project (a power plant) that he hopes to be able to demonstrate in about a year.

Dave Hertner reports that his company, Fisher Flying Products, is purchasing a partially completed but engineless FP-202 Koala to be used as a non-flying display at shows such as Sun 'n Fun and Oshkosh. It will be fitted with either a Polini gas powered engine or an electric power plant; no decision on that yet.

At the December Meeting, Dave had made a presentation; the primary purpose at the February meeting was to discuss Dave's proposal that the chapter take on the assembly of a Dakota Hawk at the Fisher Flying Products facility.

This would provide the chapter with a tangible hands-on project with a certainty of moving along and being completed and resulting in a flying aircraft at the end. It could stimulate new enthusiasm and purpose while still maintaining the social aspects that so many members value.

There was considerable enthusiasm and discussion over the potential of bringing guests to an aircraft building project that they could see, touch and work on side by side with experienced people who have done it. This might be a very practical way to excite additional people (children, grandchildren, friends, etc.) toward building.

Construction meetings would be held weekly beginning at 6:30 pm, most likely on Tuesdays, although other days could be considered based on the consensus of the members. Grilling hamburgers and hot dogs is a possibility.

For Dave's part, he would benefit from tapping into the wealth of collective skills, knowledge and experience of the group and would end up with the

Across Canada

RAA Chapters in Action

ED Hollestelle (Midland-Huronia) has his new RV 6 ready for flight. Looking forward to hearing more about this beautiful airplane!

new FFP demonstrator aircraft that he needs. The aircraft would include some new ideas such as tricycle gear, a better wing folding mechanism, a liquid cooled D-Motor engine, and possibly a float system down the road. He may also incorporate a hybrid carbon fiber / wood wing spar. The aircraft would be registered in the Amateur Built category.

Dave has a partner coming on board who is immigrating from Belgium and will be in charge of shop operations. Dave will then concentrate on engineering and marketing. He would not be able to start the Dakota Hawk project until his partner is here.

March Meeting: It is proposed that we make the chapter membership fee $1 per year and that members cover their RAA National membership. The rationale is that the club has sufficient dues in the bank to cover meetings and newsletters for several years and is not doing anything with the money. One issue with this is that we have already started collecting membership fees, these would need to be returned.

The issue of self-addressed and stamped envelopes to be provided by those members that wish to have the Slipstream mailed to them was raised in a previous meeting but was not resolved. There are 9 people that we mail them to. Costs is about $20 per month. This proposal seems at odds to the first motion, but would help encourage people to use e-mail.

It has been proposed that we make RAA National membership mandatory as part of the Chapter membership. The rationale is that we are a RAA chapter, we should all be RAA members.

It has been proposed that the club look at purchasing a sound system to help with meetings. Several members are having trouble hearing the meetings and guest speakers.

Finally, it has been proposed that we merge the positions of Membership Officer and Treasurer. The rationale is that both positions handle membership money and we are having trouble filling it.

Chapter 85 Vancouver

Activities at Chapter 85 over the last 3 months have again been related to continued work on the Chapter homebuilding project, the Zenith 750 Cruzer. Kirk Kleinholz from Dynon Avionics was the guest speaker for the March general meeting and gave a comprehensive overview of the inner works of Dynon avionics. A Dynon 10" Skyview SE system has been purchased to be the primary flight display and engine monitoring system for the Cruzer. Eric Munzer has prepared the Cruzer instrument panel. After many layout discussions amongst the builders group, the panel was finished with a matte black powder coated surface. Eric also drafted the wiring diagram for the Cruzer which has provided the design layout for lights, instruments, fuel pumps and all other electrics.

The Continental O-200 engine was sent to Progressive Air and Aero Sport in Kamloops for a rebuild. The engine was essentially a core as purchased and has undergone a complete teardown and overhaul. The test run was completed the week of March 20 and should be available for pickup during the week of March 27th.

During the time the engine has been away for rebuilding, work on the Cruzer has concentrated on the wings, power distribution panel, aluminum fuel lines in the fuselage and cockpit, firewall fittings, engine mount and control cables. The right wing has been closed and riveted (Figs. 1 & 2. next page) while the left wing only needs the pitot tube mount to be installed before closing. Eric Munzer fabricated the power distribution panel such that it can be dropped down on


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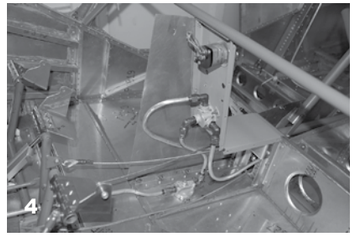
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Right: the Zenith's panel is looking really sharp. It features a Dynon Skyview EFIS

a hinged mount to give future access once it is closed in behind the instrument panel (Fig.3).

One of the topics debated at length by the builders was whether or not to run rubber fuel hoses from the wing tanks and throughout the fuel system to the firewall. The decision was made to run rubber lines from the wing tanks to AN fittings mounted on the top sides of the fuselage opposite the wing attachment points. The rubber lines will accommodate any differential movement and vibration between the fuselage and wings. From the fuselage AN fittings through to the Andair fuel selector valve and from there to the firewall, aluminum tube fuel lines were bent and fabricated by Eric Klassen and Peter Lenger. Working around the rudder cables at their crossover point just below the fuel selector valve required some dexterous and precise bending (Fig. 4).

After a lot of dedicated work from Chapter 85 members, it was time to recognize achievements for 2016 and party! The Annual Awards Banquet was held at the Delta Towne & Country Inn on March 25th and this provided a good feed from their Baron of Beef buffet. Forty-four members and guests turned out and were greeted at the door by Terry Johnston and Susan Munzer (Fig.5). Terry and Susan cut the tickets in half for the door prize draws. This year there were several notable door prizes which included four winners who would get 1 hour on the Air Canada 767 simulator in Vancouver, another winner took home an oil change with 8 litres of oil and labour courtesy of AeroSpace at Pitt Meadows Airport and another winner would get 1 hour of flight time on the Chapter 85 Zenith 750 Cruzer when it is completed and flying. The Cruzer prize was donated a member of the Chapter 85 Executive.

The guest speaker was Joe Hessberger (COPA – BC and Yukon) who spoke about his far ranging career in commercial aviation which spanned everything from flying tubs of fish in a Noorduyn Norseman in Northern Manitoba to helicopters in the oil exploration business in the Arctic and the Middle East. Joe had everyone enthralled for an hour, but the time came to move on to the awards. There were numerous well deserved awards for 2016 and these went to:

Heidi Bekker ..... Woman of the Year
Cliff DawsonCraftsmanship (Pietenpol building project and wood work)
Tim Saxton ..... Homebuilt Completion (Murphy Super Rebel)
Bruce Prior ..... Ira Jameson (Unsung Hero) Award
George GregoryPeter Chick Award for editing the Turn & Bank Newsletter
Tom BoulangerMost Valuable Member Award
Eric Klassen..... Safe Flying Award (Vancouver-Caribbean Islands return in their C-172)
Peter Whittaker .....Old Frank Award; Presidents Shield
Evie Chan ..... Pilot's Licence Award
Luke Chen..... Pilot's Licence Award

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