July - August 2009

RECREATIONAL FLYER

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The Voice of Canadian Amateur Aircraft Builders $6.95

First Glass

Shona Hirota's Glasair

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

from the president's desk

Gary Wolf

HAMILTON TC OFFICE FOLLOWUP

Last month I wrote about the administrative problems of the Hamilton Transport Canada office, with particular reference to one member whose release from restrictions paperwork was in the pile, awaiting the return of Wayne Juniper from his various other duties. We solved the problem for that member by recommending that he should recreate the paperwork and take it to a different TC office. He did this and three-quarters of an hour after arriving at the TC office he had his release from restrictions, and that afternoon went flying. It is that simple folks – you do not have to take "no" for an answer. Shortly after publication of the last issue I received an email from a Transport official thanking me for having written that column. Meanwhile the member's original application is probably still in that pile but it will be months before anyone notices.

IN FLIGHT WING FAILURES

This summer there have been two inflight wing failures, one in a wooden Jodel and another in a metal Hummel UltraCruiser. The Amateur Built Jodel is the subject of a TSB investigation but the Basic UL Hummel is not. RAA's recommendation is that all aircraft with wood structure, particularly those that have been tied down outside in a damp environment, should be inspected rigorously and regularly. Low points and control surface hinge areas should receive very close scrutiny. The TC regulation that governs the inspection of wood is in this issue of the Rec Flyer.

The Hummel is a different issue.

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Because it was designed for the US ultralight category that has a very low 254 pound empty weight, every possible ounce must be eliminated. The UltraCruiser has a cantilever wing with an unusual carrythrough that has its upper surface cut down for leg clearance. In 2004 the designer found that this was a weak point so he added a plate aluminum stiffener inside the cabin.

The failure in this particular Hummel was immediately outside of the reinforced area, and the crack began at or near a rivet hole in the lower spar cap, then proceeded up through the shear web and finally through the upper cap. Fortunately this happened just after the plane had lifted off, so the pilot did not die.

RAA has been investigating the damage with the considerable assistance of Wayne Winters of Blue Yonder Aviation. The plane had earlier had a failure of the landing gear but that was on the left wing. What is curious is that the right wing spar failed at a 1 G load. Hummel has also been very helpful with information but so far there has been no definitive cause found for this failure.

Wayne Winters

We have already put the news out on our email forums to warn other builders but inevitably there will be some who still will not know. If you know of anyone building a Hummel UltraCruiser, please ask that he contact RAA.

ELT's and SPOT TRACKER

The ELT regulation still requires only a 121.5 ELT and some mem-

continued on page 36

The Recreational Aircraft Association Canada
13691 MCLAUGHLIN ROAD, R R 1,
Caledon, Ontario L7C 2B2
Telephone: 905-838-1357
Fax: 905-838-1359
Member's Toll Free line: 1-800-387-1028
email: raa@zing-net.ca
www.raa.ca

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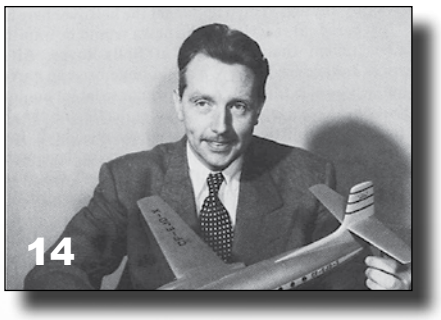
features



On the Cover: Shona Hirota's immaculate Glasair. Below: Chapter 85's Turbi at the recent Fly-In.

George Gregory

Electric Flying

George Gregory

Mark Beierle is from California, the land of Haight-Ashbury, granola, solar panels and electric cars. It's no surprise he likes things you can plug into a wall: back in the 70's, before lithium-ion batteries and *long* before it was fashionable, he even built an electric car - clunky lead-acid batteries and all. I think that qualifies him as a True Believer.

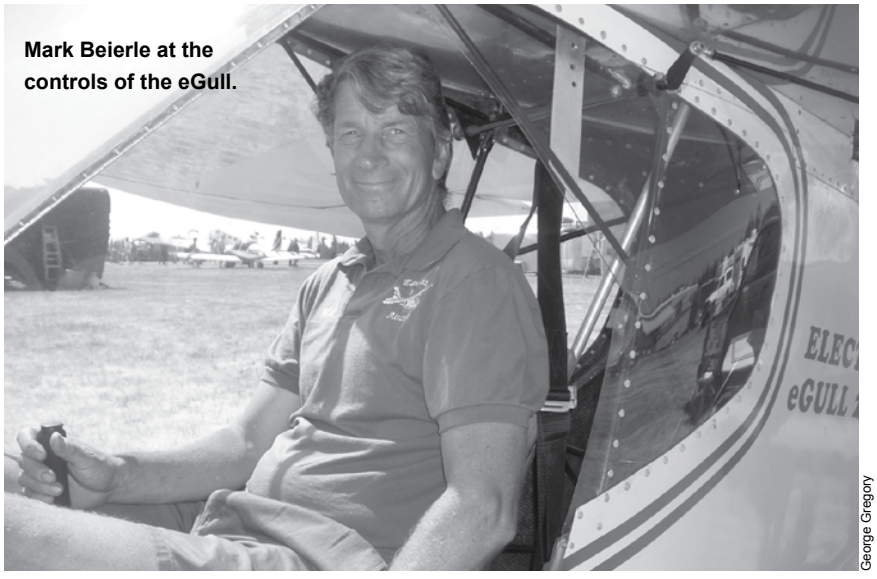
by George Gregory

He's also been around aviation most of his life. His first airplane ride came when he was 5, and his first flying lesson came at 12. He soloed at 16 and got his private license at 17 with over 200 hours of flying time; he paid for those lessons building and testing radio controlled airplanes. He's restored and modified aircraft and has put in time with Teledyne Ryan and General Dynamics. Mark's a tool and die maker, so he's experienced with his hands; he started building his own designs when he became dissatisfied with some of the sketchier ultralights that first appeared on the market. Eventually he founded Earthstar Aircraft, which has for a number of years offered a series of sophisticated, fully enclosed ultralights featuring cantilevered wings and enclosed cockpits. It seemed a matter of time before he thought of electrifying one of his designs.

My first look at this aircraft was early on during our recent visit to the Arlington Fly-In, sort of a "lite" version of OSH, but nevertheless the third largest fly-in on the continent. Located on Washington State's west coast, it's more or less at sea level and by happy coincidence, just a few hours south of my home.

I did sort of a double-take as we walked past it; the wing seemed too streamlined. Where was the bulky Rotax? Then I noticed the motor (which greatly improves the aircraft's esthetics) as similar to the one used in the Electraflyer unveiled at Oshkosh a few summers ago. Mark seemed pretty busy answering questions and there was often a group around the airplane poking and prodding. Of *course* I had to join in.

On Saturday he took the eGull up a couple of times, once in the morning, and again in the afternoon when things were considerably hotter. During the first flight, I watched what appeared a fairly normal take-off for an ultralight. It was about 11 am on a sunny July morning, and I'd say the temperature was in the mid to high 70's.



Mark Beierle at the controls of the eGull.

George Gregory

The engine was quiet enough, but prop noise was quite noticable. In future iterations, Mark says he'd use a reduction unit and larger prop for the optimized aircraft. Mark figures he was turning about 2900 rpm though the engine is rated for about 3400 rpm.

Mark flew 27 minutes on 25 pounds of batteries, and when he landed he had some charge left, but didn't want to risk damage to the batteries. Obviously (and especially at first) electric aircraft will tend to be motorglider types so you can have fun with the motor off as well as to optimise powered operations. Mark suggests a 100 pound battery pack would be good for about 1.5 hours flying time. At these speeds it's not going to be a cross country machine, but an hour of fun flying is a reasonable endurance.

The Thunder Gull - or rather the "eGull" as this electric iteration is called - is a single place ultralight with a steel tube cage forming the structure the pilot sits in with a streamlined fibreglass pod dress-

Yuneec, a Chinese company developing an electric aircraft of their own, has suggested that 500 cycles is roughly equivilent to 250 hours flying time

ing things up. Ample glass yields great visibility as the pilot sits forward of the high-mounted wing's leading edge, a thick cantilevered affair with no struts or wires; an aluminum D-box from the spar forward gives torsional rigidity while the aft part of the wing, flaps and ailerons are fabric covered. The 18 horsepower motor is mounted in the trailing edge of the wing in typical ultralight fashion, and the empennage is attached at the end of an aluminum boom fuselage. The battery box - obviously not a production affair - was a simple fibreglass box between the pilot's legs. A larger battery array would undoubtedly find its home in the roomy space frame behind the pilot.

There are two wings available for this aircraft; the short wing (demonstrated at Arlington) and a longer soaring wing. The rate of climb is reported to be in the vicinity of 250 fpm with the short wing, and more around 500 fpm with the long wing, which spans 28 feet. Span loading would certainly be something to pay attention to here, and work to great advantage in any electric aircraft. This is no rocket ship, but not bad for 18 horsepower. There's a brake on the prop shaft to prevent windmilling when soaring; with the propeller aligned with the trailing edge of the wing drag is reduced.

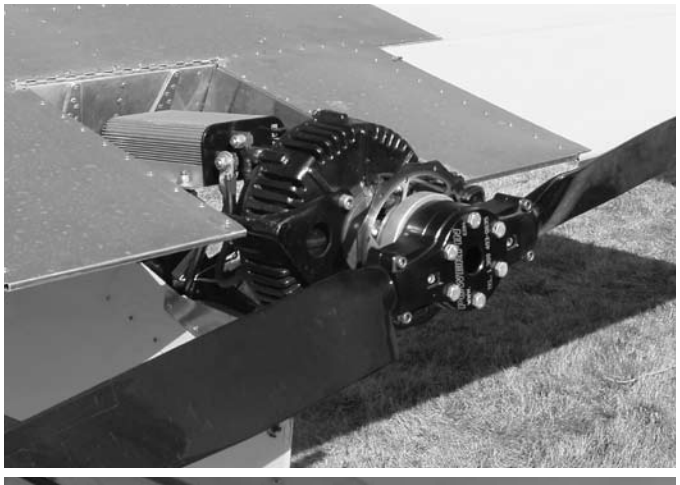
A Kelly controller (model 7-401 400 amp with regenerative capabilities) is used; besides putting a little bit of juice back into the batteries if left to windmill, the prop can be used to steepen the descent for glidepath control while doing its regenerative thing.

For batteries, Mark uses lithium polymer (4900 milliamps) Rhino 4900 20c 5 cell batteries rated at 18.5 volts. LiPo's feature better power density than the more stable Lithium Iron Phosphate (more on that later). A Zivan Charger was purchased from Thunderstruck EV is used for charging.

It's been suggested that this battery pack should be good for about 500 cycles but it's hard to get a good number because sometimes they will be recharged when they haven't discharged fully. Does that constitute a cycle, or a half cycle, or what?

Yuneec, a Chinese company developing an electric aircraft of their own, has suggested that 500 cycles is roughly equivilent to 250 hours flying time. This seems pretty conservative; if a battery pack is good for an hour and a half between charges, I'd imagine the number could be quite higher. At any rate, assuming 3 gph (about what a Rotax 447 would drink), at today's prices for avgas, 250 hours

the technology we have now is beginning to show practical application, especially for sport flying



George Gregory Photos

Top: obviously not a production setup, these batteries (25 pounds worth) still gave 27 minutes of flying time with some to spare. A hundred pound pack would yield up to an hour and a half. I'd think a firewall between pilot and batteries would be a good idea. Above, centre and bottom, two views of the 18 horsepower motor. Certainly cleaner than a big Rotax, it seems a good fit for motorglider applications. The motor features a disc brake so the prop can be lined up with the trailing edge when gliding. Opposite, the engine with its simple fairing in place. Pretty clean.

costs about $7500 worth of fuel. 100 pounds of batteries, which would give the eGull a duration of 1.5-2 hours would cost about $6000. Keep in mind also that the electric motor is practically maintenance free: it only has one moving part, so when you add to the mix not having to factor in engine rebuilds and TBO's (at least in the conventional sense of the word) the economic picture is further altered.

Mark can recharge a 25 pound pack of batteries with a standard 110 volt outlet and Zivan charger (available from Hobby City) in about 45 minutes; a hundred pound pack would take about six hours.

Lithium Polymer cells have become the battery of choice for aviation endeavors because of their superior power to weight ratio. This extra oomph comes with a price, however: if handled wrong, especially when being charged, they can overheat. But while the potential for trouble is there, people in the industry feel any potential hazard can be ameliorated. Proper charging and battery care are essential; further, the cell installation can be engineered to minimize problems and isolate cells that may experience overheating. Mark has encountered no problems with his setup, and says he hasn't babied them. Nevertheless, it would seem a good idea to keep cells separated and vented with perhaps a firewall of some sort. That's simply a design issue, however; Tesla's sports car uses 900 pounds of laptop batteries and has engineered them so if one does experience thermal runaway it won't ignite its neighbours. Besides, we ride around with gallons of high explosive in our wings every time we get in an airplane or even ride in an automobile. Instances of fires *have* happened, but they are so rare they don't really figure in our daily use. You treat gasoline with the appropriate respect and you're fine.

This aircraft is a prototype of an electric production version Earthstar will be offering, albeit with the longer soaring wing. The motor, charger, and batteries are off the shelf items, and a simple adapter can be made by Earthstar that bolts onto the Rotax engine mount to receive the electric motor. At this point, I'm not sure if a propriatory engine mount will be made for the electric motor or if Earthstar will simply use the adapter.

To those hesitating to buy into this technology, one particularly interesting feature is that of upgradability. As better battery packs come on line, one can replace just the batteries. And controllers can have output information programmed into them; the regenerative capability of a control-

Earthstar Aircraft

Earthstar Aircraft

Earthstar Aircraft

A few pictures of the soaring (28 foot) wing on the eGull 2000. This is what would more typically be used on the electric version. When it comes to span loading, size *does* matter.

AGM Reminder

On October 3 at Brampton, Ontario: the RAA Annual General Meeting will be hosted by RAA-Toronto Region Chapter. Keep this date open!

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ler, for instance, can be a programming issue. Wouldn't it be neat to think that you could modify the particular characteristics of your motor with a few minutes at the computer?

Until a few years ago, people who liked electric cars (and aircraft weren't even an issue) were regarded as cranks, or more charitably a small, elite subset of enthusiasts. Now, with environmental issues front and centre and pressing geopolitical needs for energy independence, people - and significantly carmakers - are starting to think along new lines. Battery development is being pushed hard right now, and a number of manufacturers are exploring electric propulsion. What intrigued me about Mark's effort was its use of technology available here and now.

Electric aircraft have a way to go. Batteries are better for automotive applications - a car's motor is just loping at cruise settings, and unless you are driving cross country, the limited range isn't as much of an issue. Just plug it in each night and you're good to go for the next day's running about. Airplanes are different; they have higher power requirements in flight - typically the top 40 or 50 percent of the engine's output. Battery technology, then, seems to be the main hurdle to overcome.

...things have a way of migrating from a group of enthusiasts all the way down to Main Street.

But it has to be remembered that though batteries can't touch gasoline for energy density - the best batteries are only about 1/80th as energy-dense as gasoline - the motors are considerably lighter, virtually maintenance free, and don't need air to run: an interesting advantage at altitude. They are much more efficient; gasoline engines waste a considerable amount of their energy in the form of heat that cannot be recovered. Despite the 80-to1 advantage gasoline has over batteries, when you factor in the superior efficiency of electrical systems, the ratio falls to a more palatable 30-to-1. And we're just getting started. Exciting times.

It's amazing how creative people can be when they have to. But even the technology we have - here and now - is beginning to show practical application, especially for sport flying. And things have a way of migrating from a group of enthusiasts all the way down to Main Street. RAA

Earthstar Aircraft

Delta Heritage Airpark / Chapter 85

Fly-In 2009

By George Gregory

On July 5th, Chapter 85 had its annual fly-in, and it was arguably the best in years.

What a day! The weather was great and attendees were not only treated to a wonderful variety of aircraft, but a display of antique engines and classic automobiles. Food, fun, and flying were the order of the day.

The event is usually well attended, but this year was unusually good, with an estimated 54 planes registered besides local aircraft that were already on the field or just dropping in. Joan Cox's spotless Cessna 150 won the People's Award and the furthest away was Dale Holeman from Washington State.

Many non-aviating types dropped in to the event as well, and the fly-in represents a great opportunity for positive exposure to the general public.

The event couldn't have happened without the

Rob Prior

Opposite, clockwise from top: A gorgeous Steaman is readied for flight; a Starduster is marshalled in; a Nanchang CJ-5 on departure. Clockwise from top Left: Great food was available throughout the day at very reasonable prices; right, two of many volunteers, Judy Brenneman and Carol Foley work at the registration table. Chris and Joan Cox' award winning RV-7 and Angela and Joe Schweers' newly minted RV-4 dropped in for a visit.

many volunteers who worked setting up, tearing down, registering aircraft, taking pictures and generally maintaining order. In a word, the fly-in was simply perfect.

Chapter 85 is in a rather unique position. It has been running the airpark under the auspices of the Greater Vancouver Regional District for a number of years, and is the first of its kind in the park system: a public facility that pays for itself, generating operating revenue through rental income of the hangars and tiedown spaces. Since parks usually represent an output of tax dollars, Delta's situation is a winning outcome for both enthusiasts and government.

The club had occupied the field for the previous 30 years, building a clubhouse and hangar replete with a paint and workshop. When the owners sold the field to the provincial government, it was thought that Delta's days were numbered. But decisive action by the National RAA, COPA, and local chapter members turned what looked like disaster into a positive development.

All in all, a great day, well planned and executed. I, for one, had a ball.

Above, chapter member Alex Routh shows the club's Turbi to a couple of prospective aviators. Right, top down: A number of antique farm engines were on display, as well as some rare and exquisitely maintained examples of collectable automobiles. Below left, a Corvair engine on display. There seems to be a continuing development on these engines, with aftermarket products showing up at many airshows.

Rob Prior

Rob Prior

Friends, four wings, the smell of grass, good food and avgas: what summer's all about. A great start to a great summer.

Classifieds On The Internet:

http://www.ocis.net/tvsac/buyandsell.html -more ads from our Kamloops chapter

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

Voices:

Jim Floyd

in his own words as contributed by Bill Tee

The name of James C. Floyd, born in Manchester England on October 20 1914, is not unknown to the Canadian aviation community due to his association with Avro Canada, whose buildings have now been totally eliminated at the site of Pearson Airport near Toronto.

Mr. Diefenbaker must now be resting more comfortably in his grave knowing that not only has the company that he so hated is long gone but any physical evidence of its existence is now gone as well.

Mr. Floyd came to Canada in 1946 from Avro UK, where he started at the age of 15 in 1930, bringing with him the concept of the Avro C102 Jetliner, the first jet airliner in the Americas and within 2 weeks of being the very first purpose designed jet powered airliner to fly in the world and the very first of what we now call a 'Regional Jet' to fly in the world. A few years later Mr. Floyd conceived the Avro Arrow to meet a specification of the RCAF for a supersonic interceptor.

Before emigrating to Canada and Avro Canada Mr. Floyd, a prominent member of Canada's Aviation Hall of Fame, had a great deal of experience in the employ of Avro UK in the Manchester area where he worked his way up from a fifteen year old apprentice to a very skilled designer and engineer. The story that follows is in Mr. Floyd's own words.

In my early teens I learned about a special training scheme that had been started at the Avro plant in north Manchester, where, based on your school record and reports and a successful interview with the boss Roy Dobson, you were either chosen or rejected to start on what Dobson called his Special Apprentice scheme. You learned the trade by working in every part of the plant and the airfield in Cheshire and at the same time continued with your education to university standard at the Manchester University College of Technology, all paid for by the company.

I was one of the lucky ones and was accepted into the scheme. My first job was cleaning an Avro Avian biplane, with half a bucket of kerosene and a few rags, while my foreman worked on the aircraft smoking a cigarette! My second job was working a lathe in the machine shop turning out thousands of small bolts every day for around 10 shillings or about two dollars a week .

I was finally glad to escape from that hell hole and get to working on the main assembly floor. At that time, the plant was filled with biplanes, various marks of 504 trainers, many different marks of the Avion, the 621 Tutor trainer and the 626 Prefect advanced trainers. There were only two monoplanes on the assembly floor, a Chadwick designed 560 monoplane racer and a very large Avro 10, which was really a Fokker F7b transport built under license by Avro. Incidentally Chadwick had designed over 35 different aircraft types, between the two world wars.

I remember being given the job of installing the electrical system in a 621 trainer from a sketch that I got from my foreman, written on an old post card.

Another job that I remember during that time was the installing of the communications system between the front and rear cockpit of a 621 trainer. The system consisted of a large funnel in each cockpit and a plastic tube joining

Two views of Avro Canada's Jetliner.
Left, Jim with the model.

them together. Since the funnels reminded me of the emergency bladder relief funnels that I had installed on other biplanes , I was hoping that the student did not finish up with wet ears.

Anyway, after about three years of that kind of activity, I finally finished my training with a four month stint at Avro airfield at Woodford, which is where I really wanted to be. I was attached as a sort of a 'pilot's slave' to the assistant Chief Test Pilot Bill Thorn. He was a great guy and I had many wonderful flights in the co-pilot seat with him during which he taught me to fly in a beautiful biplane Avro Commodore. That was the cabin aircraft specially fitted out for one of the Indian maharajas with a cream and pink leather interior. I think there were only six of those aircraft built, mostly for overseas customers.

I was at Woodford when the bits and pieces of the first type 652 aircraft which later became the Anson arrived for assembly and flight test. The two original 652's named Avalon and Avatar were the passenger aircraft for Imperial Airways. I was one of the three young guys finishing their training at Woodford and we were given the job of first clearing the snow off the wings and then mating them to the fuselage. One episode of that time I remember very well.

The aircraft was fitted with a manual landing gear retraction and extension system. When we hoisted the aircraft onto the trestles and tried to operate the gear retraction handle nobody could operate it, because the gear ratio was way out. Since the Imperial Airways pilots and engineers were due the next day, we were in a mess until someone remembered that our Works Manager at Newton Heath, Jack Green, who was a massive guy, could regularly be seen carrying a heavy acetylene bottle under one arm and an equally heavy oxygen bottle in the other, all the way from the stores to the welding area, almost the length of the plant, so Jack was called to do the honours on the gear retraction for the demonstration. Needless to say the gear ratio was changed before the aircraft was delivered.

The military version of the Anson first flew on March 24th. 1935 and the almost 11,000 Ansons designated 652A were built in many countries, including Canada. The Anson was such a sturdy aircraft. During WW2 Ansons were used on maritime reconnaissance roles and some Ansons returned to base with half their tail plane shot away, a piece of wing missing and in one case the fin loose and flapping around like a wounded duck. Incidentally I noticed that in one of the CAHS journals some time ago that one Anson pilot on a training operation successfully landed his Anson at Trenton with the port tailplane completely missing and the remaining elevator jammed. He simply used the throttle to land.

Anyway, I finally finished my apprenticeship and graduated from College of Technology in 1934

and joined Roy Chadwick's design team as a design draftsman working on the Anson military versions.

I thought that before leaving the subject of the Anson, which was one of my favorite aircraft, I should mention that the Anson connection kept popping up for may years after my work on it with Roy Chadwick.

When I left the Chadwick team and went to the Avro satellite design office at Yeadon in charge of new projects (although my main job was to study the use of the use of the new gas-turbine technology for both civil and military aircraft designs), some members of my team there were allocated to designing a metal wing for the Anson, since the wooden wings were coming 'unglued' on some of the Ansons located in hot and humid environments.

Also the landing gear was not going down to the fully locked position on some other Ansons, causing some belly landings, so we had to find a quick solution to the problem. Stuart Davies decided to leave that one on my desk, and I came up with a quick fix by fitting a couple of flat sheets of Aluminum to the gear struts so that the airstream would force the struts to click into position.

We equipped one of our factory Ansons with the plates and I went on a test flight with Captain Worrel, our Chief Test Pilot at Yeadon. He did some low-level flying and did a number of landing gear extensions and the fix, which Worrel had christened the 'Floyd dinner plate fix' worked every time, so we finished up with a lot of Ansons equipped with these shiny plates flying around the Yorkshire countryside until we could obtain more powerful actuators for the gear. Remember it was war-time and quick fixes were almost the order of the day until the proper equipment became available.

I remember that flight very well because we finally got lost in a thick Yorkshire fog and Worrel was getting a bit edgy until we saw the smoke-stack curling up from a train through the fog and he finally located the train and followed it into the plant area, since the train station was adjacent to the plant. It was a good thing that the train was going the right way!

Back to the future --- many years later, in the late 40's when I was at Avro Canada, we had purchased a surplus Anson and had it fitted out as a company transport. On a snowy day in 1952 I was one of a party of engineers flown to Ottawa in the Anson for various meetings at the RCAF headquarters and the NRC. I was going to brief the RCAF brass on our studies for their supersonic interceptor.

One Anson pilot on a training operation successfully landed his Anson at Trenton with the port tailplane completely missing and the remaining elevator jammed. He simply used the throttle to land.

In 1938 the Avro design office moved to a new plant on the north side of Manchester, Chadwick reorganized his team and Stuart Davies, who had been Chadwick's deputy, became Experimental Manager in charge of building the prototype Manchester for flight testing. I was again assigned to the Structures analysis section of the design office, but during the next two or three years I alternated between that facility and the new high security Initial Projects Office that Chadwick has set up at the start of WW2 to do some initial design work on new projects from his ideas and sketches. It was locked

at all times and out of bounds to everyone except the engineers working in it.

There was never more than three design staff in that new 'holy of holies' and I spent much of my time as the sole occupant, doing the first layout drawings of the Lancaster and York, and the Tudor aircraft.

The York was a military transport that Chadwick thought might later lead the company into the civil aircraft field. The York was a particularly hectic job for yours truly because of the urgency which Chadwick put on it. I was told that I had one week to do the three view drawings. When that was done to Chadwick's approval I was given the job of designing the fuselage and doing the structural analysis on it. That was not an easy task, because Chadwick had stipulated that we provide a large hole in the side of the fuselage to allow armoured vehicles to drive in as well as paratroops.

Getting the adequate structural strength around that massive hole to prevent torsional instability was a nightmare and I think I had more sleepless nights on that job than most others that I remember. However, we had the York flying within six months from Chadwick's sketches of what he wanted on my drawing board and less than three months from the time that we released the first drawings to the Experimental shop.

So, that is a very brief account of my ten years at Avro Manchester on Roy Chadwick's design team, a very hectic and formative time.

In 1944, Stuart Davies, who had been Chadwick's assistant chief designer, later becoming chief of the Experimental Department which produced the first Lancaster, was appointed Chief Designer at a new satellite design office at the company's facility at Yeadon in Yorkshire and Stuart asked me to join him as his Chief Project Engineer. My mandate was to study new projects, particularly aircraft using the new jet engine technology, which was just unfolding.

I had a very small but highly experienced team and we studied both military jet aircraft and jet transports. In fact, that was where the idea of the C 102 jet transport was born, later becoming the Avro Canada Jetliner, when I brought that project to Canada in February 1946.

Avro Canada, which had been established in the former Victory Aircraft plant at Malton where the Avro Lancaster and other warplanes had been produced was established in December 1945. Davies had been over to assist in setting up the design office and had discussions with TCA about the work we were doing at Yeadon on the Jetliner. TCA showed considerable interest so Davies suggested that I continue with the Jetliner project at the new Malton design office.

That is how I came to Canada in February 1946. However, I found that in addition to getting a team together on the jet transport I was also given the job of setting up a technical department, initial project office and aerodynamic and structural analysis departments. I was given the title of Chief Technical Officer, reporting to the Chief Engineer, Edgar Atkin. That was one of the most hectic periods of my working life, but also one of the most exciting and formative. After the technical facilities were in place and working, I was allowed to concentrate on the Jetliner design, with the title of Chief Project Designer Trans-

What might have been: Toronto Aerospace Museum's Arrow replica on rollout

ports. What's in a name!

I was at Malton for a little more than thirteen years, becoming Chief Engineer in January 1952 and Vice President and Director of Engineering in mid 1954. Most of you are familiar with what we did at Malton, so I don't need to cover that period in the same detail. There are many books and articles on that period.

After the senseless cancellation of the Arrow project and the final abandonment of all of the other projects that we had coming along in our 'think tank' operation, among a number of job offers that came my way (mostly from the United States), Stuart Davies, who was by that time Technical director of Hawker Siddeley Aviation in the UK offered me a job as Chief Engineer of a new Advanced Projects Office at the HAS head office in Surrey.

My first job was to put together a team of senior engineers in a 'think tank' type of operation, to determine and study advanced projects that HAS might undertake in the future. HAS were anxious at that time to make a bid for the design and production of a supersonic transport that the UK government was considering. After getting together some of the best engineering talent in the UK, we started on the early studies of the project which finally evolved into the Concorde.

At the same time we were studying a number of other projects including a VTOL transport, an atomic-powered military aircraft and we had also set up a Space group to study projects in that discipline. We also carried out joint studies with a group from BAC on the SST, until a contract was placed with BAC and French partner Sud Aviation to go ahead with the design and build of an Anglo-French supersonic transport which later became the Concorde.

...unfortunately the British government were at that time beginning to act somewhat like the Canadian government and were canceling new projects left and right

In APG we carried on with our other studies, including a supersonic transport that would not make a sonic boom, since we were convinced that the boom problem might end up as a restriction in the routes that would be available to Concorde. That certainly turned out to be the case.

The no-boom SST, HAS 1011, was one of my favourite study projects and it should have been actively pursued, but unfortunately the British government were at that time beginning to act somewhat like the Canadian government and were canceling new projects left and right, including Hawker's excellent supersonic Harrier project, the Hawker P1154 and later the BAC TSR2 fighter project.

In late 1962 I decided that I had enough of governmental 'antics' on both sides of the Atlantic and left HAS, with the thought that from that time on I would chart my own course, whatever that might be.

After considerable 'soul-searching' I decided to 'take a flyer' at setting up an aviation consulting practice, where I could chart my own course without government or other interference. Floyd Associates was registered in early 1963 and over the next seventeen years grew from a small practice with myself and a secretary, to a substantial company with offices in Esher, Surrey, Yeovil, in Somerset, to service the clients in that area, such as Westland Helicopters, Dowty, BAC at Filton and others. Our main offices were in Lloyd's Bank Chambers in Epsom, since I had to spend considerable time at the Ministry of Technology in London, in my role as their consultant on the Concorde project from 1965 to 1973.

Our overseas clients included Litton Systems Canada and their main office in Woodland Hills CA., DAF Indal in Mississauga, Dixon Speas Associates in the USA and others. So the move to take a

continued on page 29

Two members of the Lothian and Borders traffic police were out on the Berwickshire moors with a radar gun recently, happily engaged in apprehending speeding motorists, when their equipment suddenly locked-up completely with an unexpected reading of well over 300 mph. The mystery was explained seconds later as a low flying Harrier hurtled over their heads. The 'boys in blue,' upset at the damage to their radar gun, put in a complaint to the RAF, but were somewhat chastened when the RAF pointed out that the damage might well have been more severe. The Harrier's target acquisition computer had locked on to the 'enemy' radar and triggered an automatic retaliatory air-to-surface missile attack. Luckily, the Harrier was operating unarmed.

Across Canada

RAA Chapters in Action

Chapter 85 (Vancouver)

As reported in this issue (see page 8), the chapter's July 5 fly-in was a resounding success. Good weather and the dedicated work of many volunteers combined to make it a memorable day.

A number of chapter members flew into the Langley fly-in June 27. Member Joan Cox won third place in the People's Choice with her tidy little straight tailed Cessna 152, and Shona Hirota made an appearance with her stunning Glasair.

The chapter is mourning the loss of longtime member Don Souter, who died in the crash of his Jodel in early August. Don was involved as a volunteer in many chapter functions as well as local aviation events and organizations. He will be truly missed.

Thompson Valley Sport Airplane Club

The July meeting saw 4 people fly in: Dan Nelson flying a PA-18, Ken Martin in his Raven, Dave Jones in his DJ-14 and Bill Davidson.

On June 18, six members had a fly-out to Quichena, with a repeat journey July 2, and Cache Creek on July 4. A couple of us went on to fly over Cornwall mountain while others, deterred by the turbulence, headed back to Kamloops.

RAA London-St. Thomas

President Angus McKenzie writes that ..."the 2009 Wings and Wheels Show at the St. Thomas Airport was a spectacular success. By all accounts it has become one of the premier air shows in the country". He continues: "July

Cam and Nancy Wood joined the Cross Canada Century Tour at Brampton. RAA-TR and Brampton Flying Club did their part to entertain and host the participants. Jeff Leavens of Leavens Aviation generously provided ground transportation to and from hotels. Cam said that Northern Maine is beautiful but it would be a bad place to have an engine out, especially in the marginal VFR and sometimes IFR conditions en route to Baddeck.

Left: RAA-KW held weekly barbecues as an extension of their mid-week coffee gatherings. Centre, RAA KARS/Rideau and their shiny new clubhouse.

brings our annual Rice Ranch Fly-in Picnic and as you know there will be some amendment for those flying in this year with the toughening of Transport Canada's regulations governing the requirement on Mode C altimeter-encoded transponders within the control zone for YXU. Our Chapter has assured RAAC and Nav Canada that our group will make every effort to adhere to the new rules".

The June meeting was held at the Pfister ranch. 35 members attended, and there were discussions about proposed airspace changes. Bill Weir, our member with a passionate interest in automotive power in aviation, introduced the guest speaker Ken Lehman. Ken gave the group details about his Subaru-powered Murphy Rebel and how he developed his redundant electronic fuel injection system.

RAA- KW

KW-RAA has had a busy summer season of events. Early in June we held our annual fly-in at John Kunz's strip near New Hamburg. At the end of the month Mike Thorp hosted a very well attended fly-in at the strip belonging to his friend Goswin Roth. In July Pat and Mac McCulloch hosted the KW-RAA chapter fly-in at their farm near Arthur. Pat and Mac now have a second runway and new tenants. The hang gliding club now hangars their tow plane and flies hang gliders from their strip. Steve Younger impressed our members with the impressive slow speed climb rate of his Dragonfly tow plane.

Since May the members of KW-RAA have been having weekly lunch barbecues as an extension of the Wedneday morning coffee gatherings. These lunches have been attended by upwards of a dozen members, with some rescheduling their workday to come out to meet and eat. This has been a great way to keep the chapter active and we plan to continue the Wednesday lunches until Thanksgiving. The chapter will also be hosting a swap meet on September 26th as the start of the building season.

RAA KARS/Rideau

We're pleased to announce that we're taking delivery of our new Chapter Clubhouse soon. Site preparations are about done and we're just waiting for the field to dry out a bit more to install our newly aquired Portable School Room. Tom Bennett has been a generous host for our Club meetings for a very long time and this will afford him a bit more time for his own projects. We've been gathering tables, chairs, cupboards etc. and can't wait to get set up.

Alberta News Item

Here's the latest news about the re-enactment flight of the first police pursuit by air, which occurred in 1919. Pilot Wop May and Edmonton police detective James Campbell flew from Edmonton to Edson at the start of a police chase to capture John Larsen, wanted for the shooting death of Edmonton police constable William Nixon.

Pilots for the re-enactment flight will be (RAA member)Tom Hinderks, executive director of the Alberta Aviation Museum, and Staff Sgt. Chris Barbar, a helicopter pilot with the Edmonton Police Service. Calgary pilot Curtis Peters, who has flown as co-pilot in previous re-enactment flights, had planned to fly with Tom on the return flight to Edmonton, but is now unable to make the trip. Staff Sgt. Barbar will fly both ways. We are very pleased to have his involvement as an Edmonton policer officer in this commemorative flight, which remembers Const. William Nixon.

Top: Eugene August of Moonbeam Ontario is smiling now, after verifying the CG to determine the position for his engine. Eugene began flying in 1953 on Yales, and he maintains his currency on a Kapuskasing Flying Club Cessna 150. For the past thirty-three years has been working on his project, a wood and fabric Esperanza flying boat with seating for three. Calculations showed that he would need a 2" prop extension to be able to mount the engine where it would have the most beneficial effect on CG.

Above, Tom Hinderks is an RAA member and was formerly our RD for Northern Alberta until he had to resign to assume duties at the Museum. This plane was built near Toronto, then sold to someone in Winnipeg. This past winter Tom flew it from Winnipeg to Edmonton with delays for the difficult weather. He is now recreating the flight described above. The TV reports had Tom and another unnamed fellow wearing an RAA hat.

Our Kelly-D open cockpit biplane is still set to leave the Alberta Aviation Museum on Saturday at 8:00 a.m. A convoy of hot rods and vintage vehicles to follow the flight will be escorted out of town by the Edmonton Police Service. The cars will be met near Edson by an RCMP cruiser to escort vehicles to the Edson airport. En route and near Edson the convoy will be joined by additional cars and some from Edson.

At Edson, the "Spirit of Edmonton" biplane will be on display along with a "show & shine" of all vehicles. Our little biplane has always stirred up a lot of local interest in communities where it has flown. It looks like Edson will do the same, and the mayor, Greg Pasychny, will be there. A barbeque of burgers and hot dogs to be served at the airport is sponsored by the IGA in Edson.

While it is often the pilots of the biplane that get the attention, our ground crew, usually consisting of two more volunteers, are important team members and have put in more miles in our van than the biplane has flown, as the earlier winter re-enactment flights took several attempts. Our van, donated by Norden Autohaus, has made all the trips as well as to other special events. Ground crew in the van (shown below) for this re-enactment are Ed Doucette, a member of the board of directors of the Alberta Aviation Museum Association, and Rod MacLeod, president of the Edmonton Aviation Historical Society. The AAMA and EAHS are co-owners of the biplane.

John Chalmers
for the Alberta Aviation Museum

Chapter 85's Shona Hirota has a dream job. She works for Transport Canada's Pacific region in the commercial helicopter division, and gets to fly as part of her job. She's been a pilot since 1989, and is rated Multi-IFR, holds a helicopter endorsement, and wiles away her work day keeping commercial operators honest and safe. She's also a person who appreciates quality.

by George Gregory

In the summer of 2006 she spotted a Glasair I-TD for sale by the widow of a fellow chapter member, George Spence, but what attracted her was not the fact that it was a sexy, high performance airplane, but its sheer quality. Anyone who would pay that kind of attention to the outside would be equally attentive to structure, and one's mind could rest easy. 19 years in building, this Glasair stands as a wonderful example of the breed.

The Glasair was the first fast, supersexy composite kits to become available to the homebuilder way back in the late 70's. Based in Arlington, WA and founded by Tom Hamilton they were an immediate hit and became the vanguard of a new breed of high performance aircraft. Later versions were introduced with larger engines, featuring retractable landing gear, and speeds in excess of 300 miles per hour for the III series. Some have even gone to turbine power - for those with the money to spare. By late 2007, a thousand Glasairs were in the air.

Shona's airplane is technically a Glasair I TD - which is no longer offered - but George incorporated some modifications that were to show up on later product lines (the II series, still offered, is a modification of the original design, offering easier construction and improved cockpit ergonomics). The most obvious on Shona's aircraft is the larger tail, which is in fact from a Glasair III, resulting in improved yaw and pitch stability - in an aircraft of this performance envelope, no doubt a good thing. Another obvious modification are the back windows, which were never offered in the origi-

First Class

Look, ma, no seals: not necessary. George Spence's construction is so tight none were needed.

The Glasair is, first and foremost, a cross-country cruiser

nal series. Actually adapted from a Lancair kit, the windows have worked out well, and besides offering improved visibility, update the appearance of the aircraft. Back windows are standard on the II series aircraft.

What's It Like To Fly?

First, the numbers: a typical takeoff run is about 1500 feet - well within Langley's runway - with a rate of climb of between 800 and 1500 feet per minute, depending on load and temperature. She climbs out at 140 miles per hour, and typically cruises at 200. Approach is 80 miles per hour, touchdown at 75, and she usually opts for a wheel landing. Shona says it's impossible to overload the airplane; full fuel and baggage and people are a cinch (another of George's prescient choices was to incorporate a gear mod that became available during the build that effectively increased the aircraft's gross weight) and with the 180 horse 0-360 in the nose of such a small airframe, power is not an issue.

Comparisons with Van's aircraft are inevitable. Handling is described as "sporty" and "precise", though perhaps not as docile as the RV series. One sits lower in the aircraft, and the smaller wing gives a steeper, less forgiving descent. Speeds are not that much different; but whereas Van's airplanes are meant to be an all-around sportplane, the Glasair is, first and foremost, a cross-country cruiser, where the small, high lift wing works best. The trade-off is in climb rate and approach.

The lower seating combined with the tail-dragger configuration make it a challenging aircraft to taxi. Shona describes the process as taxiing like "a drunken snake", and in fact some builders have even installed "taxi-cams" to help; a mod that Shona eschews as she feels it would be too easy to mis-

Almost fanatical attention to detail results in an airplane that looks like it was carved from a single piece of glass.

takenly use it on approach, with disasterous results.

Shona's ride is powered by a Lycoming 0-360 with an inverted system and a Hartzell two-bladed constant speed aerobatic prop and the Glasair does quite well as a "gentleman's" aerobatic mount. She gets 9 gallons per hour at cruise which, given the speeds she normally travels at, yield a reasonable fuel economy 22 miles per US gallon in still air. Better than my Cessna. She can throw full fuel, passengers and 80 pounds of baggage and stay within CG and gross.

In the front office, instrumentation consists of a basic six-pack with a Garmin 396 to take the work out of navigation. The dash is a piece of art: chapter 85's late maestro of mahogany, Colin Walker (of prop making fame) handcrafted the panel out of hardwood that yields a sporty ambience akin to some of the finer British sports cars, be they Jaguar or Triumph.

Trim is controlled in three axes by a hat switch on the stick, and the command seat on her Glasair is on the right side. As an ex-military type, builder George wanted it that way (left hand throttle) and being a helicopter pilot, this doesn't bother Shona at all.

Considering the performance envelope, insurance isn't quite as awful as one might expect, though Shona says what other pilots of the type do can have an adverse effect on her premiums. If a low time pilot bends his Glasair, it hits all owners of the type in the pocketbook, regardless of their time on type.

We met to fly on a sunny August afternoon. After taking pictures, we strapped the airplane on and prepared to commit aviation.

The aircraft's quality was evident the moment I set eyes on it. Shona pointed out the canopy joints - fibreglass on fibreglass, with no rubber seals required. It's that tight: in fact, everywhere I looked - control surfaces, the wing intersection, the cowling - the fit was simply perfect.

Boarding the aircraft wasn't particularly hard, though there is a set procedure: feet on the seat, then sit on the top of the seat back and position your legs before easing down into the cockpit. The dash is fairly low, so I was warned to watch my shins as I wiggled into the airplane. Piece of cake.

I'd been forwarned about how blind the aircraft was on three points, and it was no exaggeration. The engine, combined with the short airframe results in a noticably nose-high stance. One sits low in the airplane, but once the canopy was closed, the cockpit seemed roomy enough; in fact, what struck me was how *long* it was. I had to use my tip-toes to reach the rudder pedals.

The noise at start-up wasn't objectionable, and Shona's Sennheiser headsets attenuated cabin noise to an acceptable level. I noticed that the airplane rocked from side to side a bit when the 0-360 first started up; the composite gear is quite springy, and Shona likes it that way.

We taxiied out to Langley's runway 19, lined up, and were off. Acceleration was solid and rewarding, with a climb rate of 1500 feet per minute.

Before long we were settled down to a cruise of about 200 miles per hour, and after demonstrating some of the aircraft's characteristics, she waved the controls over to me.

What fun! The aircraft defi-

The aircraft's quality was evident the moment I set eyes on it.

nitely has a tight, sporty feel. True to Shona's description, it has numbers like an RV, but the small wing doesn't give as much room for error as one of Van's planes. At altitude, this isn't really an issue as the stall held no suprises, but near the bottom of the performance envelope - close to the ground and slow - you'd want to pay attention. This is a capable, honest airplane, but requires due respect. It is a pilot's airplane.

I started off with some gentle s-turns, and found the aircraft quick, but not twitchy; compared to a Cessna, pretty sensitive though the controls seemed well harmonized. As I started into more aggressive steep turns, I found myself picking up a hundred feet or so. After a while, I started flying with two fingers and things settled down appreciably.

We explored a few aileron rolls - simply raise the nose a bit and then hard over with the stick. I didn't time it, but I'd say we rolled right around in about two seconds; I liked it so much we did a another. And then another. And then... another. While not a purpose - built aerobat, the Glasair is quite capable of sportsman-class aerobatics.

Slow flight was explored next. As expected, the controls lost some of their tight, sporty feel; as we got down around 100 miles per hour with 30 degrees of flaps, it started to feel a *bit* more like my 172. The stall gave plenty of warning with a definite shudder just before the wing unhooks. We dropped to the left on our first stall, but Shona pointed out that the aileron trim was set, and subsequent stalls were straightforward at about 60 mph. The Glasair is equipped with stall strips on the inboard leading edge; Shona told me they were pretty important, and that stall behavior was pretty dicey without them.

We did a touch and go at Chilliwack before heading home. On approach, we seemed high

George sits in the Glasair shortly after its completion in 2003. Below, inset: George and Eleanor Spence with their award-winning DHC-1 Chipmunk.

(remember I'm a Cessna driver) but as Shona pointed out, when the power comes back, this airplane comes down fast. The smallish wing area becomes quite evident on short final; this is an airplane you don't get complacent with. It's no floater, and precise speed control is essential. She usually flies it on to give a litte extra margin: if you try a full stall landing and you're not exactly where you need to be, it's done, and down it goes. Nobody likes to make a scene: it needs to be flown until it's stopped.

Despite dire warnings about this, Shona greased both the touch and go at Chilliwack and when we arrived (too soon) back at Langley. It's not an airplane you'd want to learn on, but with the proper training and due repect shouldn't be beyond the capabilities of most pilots. This is a fine airplane that fulfills its mission: a fast cross country mount that can be used

George Spence

George Spence joined RAA's Chapter 85 in the 1960's, but his involvement in aviation stretched back to World War II. He got a job at the Boeing plant in Vancouver in 1941 before joining the RCAF the following year, where he subsequently earned his wings - presented by none other than Billy Bishop. During his enlistment he met and married his sweetheart Eleanor in October 1944.

After his discharge he worked two years as a fireman in Whitehorse, followed by a brief stint as a tinsmith before settling on a career with BC Tel. He remained an active flier, building one of two Evans Volksplane with chapter mate Larry Thompson and eventually purchasing a DHC-1 Chipmunk in April of 1979. After a restoration period of a little more than 2 years, she flew, and soon became a fixture at fly-ins spanning two and a half decades, garnering a number of awards. Several hundred people were granted the privilege of a ride in the blue-on-blue beauty during this period.

But a need for speed lurked within. The Glasair was one of the first of a new generation of fast, superslick composite kits, and in the early '80's the design caught George's eye. In July of 1984 a kit arrived on their doorstep, but the Glasair didn't fly until 2003. George took his time with the kit - 19 years, in fact - perhaps because he had a lovely Chipmunk to fly, and certainly because that he was unwilling to compromise in the quality of what he was building. This aircraft stands as a testimony to George's love of aviation and his skill and dedication as a builder. He passed on just after Christmas of 2005, and had been an active pilot just weeks before his passing. He was 82.

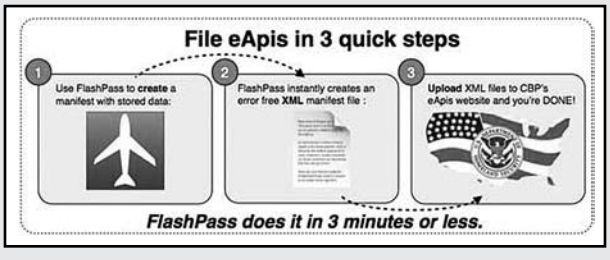
for recreational aerobatics. Not that it's above the occasional pie run either.

Glasair still offers the II version of the aircraft; a present day TD kit will set you back $38,341 in American dollars. In the past, support hasn't been as good for the model as some would like, as the company has been focusing more energy on the Glastar series, especially the Sportsman: but here are rumours that the Glasairs are about to be brought into the company's "Two Weeks to Taxi" program, which, if true, is a good sign.

Shona mentioned a number of times how privileged she felt to be flying such a fine aircraft. Indeed. The airplane is a tribute to the builder's craft, and it's great to see it appreciated by someone qualified enough to explore the aircraft's potential. RAA

http://www.glasairaviation.com/

Top, right: another example of George's meticulous work is on the cowling. Below, the stall strips make the stall managable.



AIRCRAFT SPRUCE OFFERS eAPIS SOFTWARE

Aircraft Spruce has introduced FlashPass, a new software program that will make filing your eAPIS manifests for international flights a breeze. FlashPass allows you to streamline and meet eAPIS and CBP requirements in a fast and simple way. It will keep a detailed database of yoru crew, aircrafts,manifests, and passengers in an easy to use interface designed for quick data entry. FlashPass makes future filings quick and simple by allowing you to quickly create new manifests and create your return trip fast by cloning the arrival manifest and swapping your departure and destination airports. A free 15 day trial period is available, after which FlashPass is available for $125. For more information, contact Aircraft Spruce & Specialty Co. at 1-877-4SPRUCE or (951)372-9555 or online at www.aircraftspruce.com.

Jim Floyd *continued from page 18*

'flyer' at charting my own course turned out to be a very good move and we never had a day without interesting and productive work.

I finally retired and closed down Floyd Associates in 1980. My staff all went to top jobs in industry and most still keep in touch. I have to say that was a period which I enjoyed very much, away from the 'slings and arrows' of big business.

The last chapter of this story should have been about my retirement, but that never really happened! We returned to Toronto in 1981, hoping to relax and pursue our favourite pastimes of boating and travel to parts of Canada that we had previously been too busy to see. However, the curiosity of some fine young Canadian engineers and students and the mindless ramblings of a few self-styled historians have made the word RETIREMENT totally meaningless - until now - because I now have to agree with my wife and family that it really is time to wind things up and enjoy the roses.

But I really had a ball.

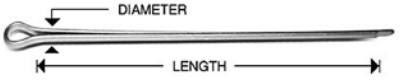
The forgoing is from a text supplied to me by Mr. Floyd and is presented with his permission. It is a draft of a talk that he was going to give our Toronto Region RAA chapter a few years ago before, as Mr. Floyd puts it "When father time stuck". With reference to the birth date at the beginning of this item you will see that James Charles Floyd is now well into his 90's. If ever there was a more kindly, understanding fine gentleman born I know not where he may be. What does he think of Canada? Well, he came back, didn't he?

Cotter Pins

Michael Adams

Cotter Pins – Part Number MS24665 - are used to secure bolts, screws, nuts, and pins. Some cotter pins are made of low-carbon steel (Formerly AN380), while others consist of stainless steel (Formerly AN381), and thus are more resistant to corrosion or where heat-resisting qualities are desired, such as forward of firewall. Use stainless steel cotter pins in locations where nonmagnetic material is required. Regardless of shape or material, use all cotter pins for the same general purpose - safetying.

Most Cotter Pins have uneven-prongs; the length measurement is to the end of the shorter prong.



Cotter pin installation is shown in Figure 1. Castellated nuts are used with bolts that have been drilled for cotter pins. The cotter pin should fit neatly into the hole, with very little side play.

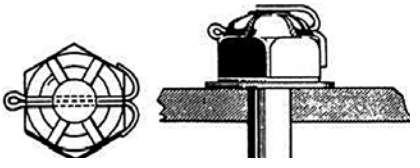


Fig. 1
(Alternate method) (Preferred method)

The following general rules apply to cotter pin safetying.

Do not bend the prong over the bolt end beyond the bolt diameter. (Cut it off if necessary as this end may interfere with other structure – Reference Fig. 5. This will also save excessive lacerations and scaring on your hands!)

Do not bend the prong down against the surface of the washer. (Again, cut it off if necessary. Reference Fig. 3)

Do not extend the prongs outward from the sides of the nut if you use the optional wraparound method.

Bend all prongs over a reasonable radius. Sharp angled bends invite breakage.

Tap the prongs lightly with a mallet to bend them.

Install cotter pins in rotating parts such as propellers, rotor heads, and the like, with head in direction of rotation.

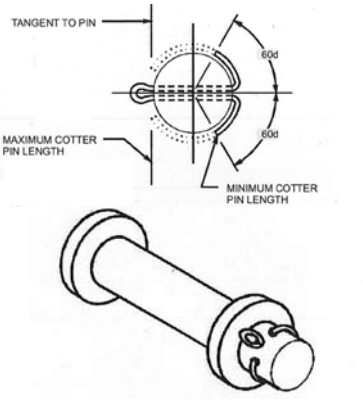
Install cotter pins in stationary bolts with heads up or facing forward whenever possible. When installing a cotter pin in a stationary bolt in a moving control (such as elevator control push rod end to elevator, carburetor mixture control rod end to carburetor mixture arm, etc.) the head of the cotter pin should be up or facing forward throughout the range of that control as much as possible.

Fig. 2 (Correct Cotter Pin Installation)

Fig 3

When safetying a clevis pin, install the cotter pin with the axis of the eye parallel to the shank of the clevis pin or rod end. Bend the prongs around the shank of the clevis pin or rod end, as shown in figure 4.

Fig. 4



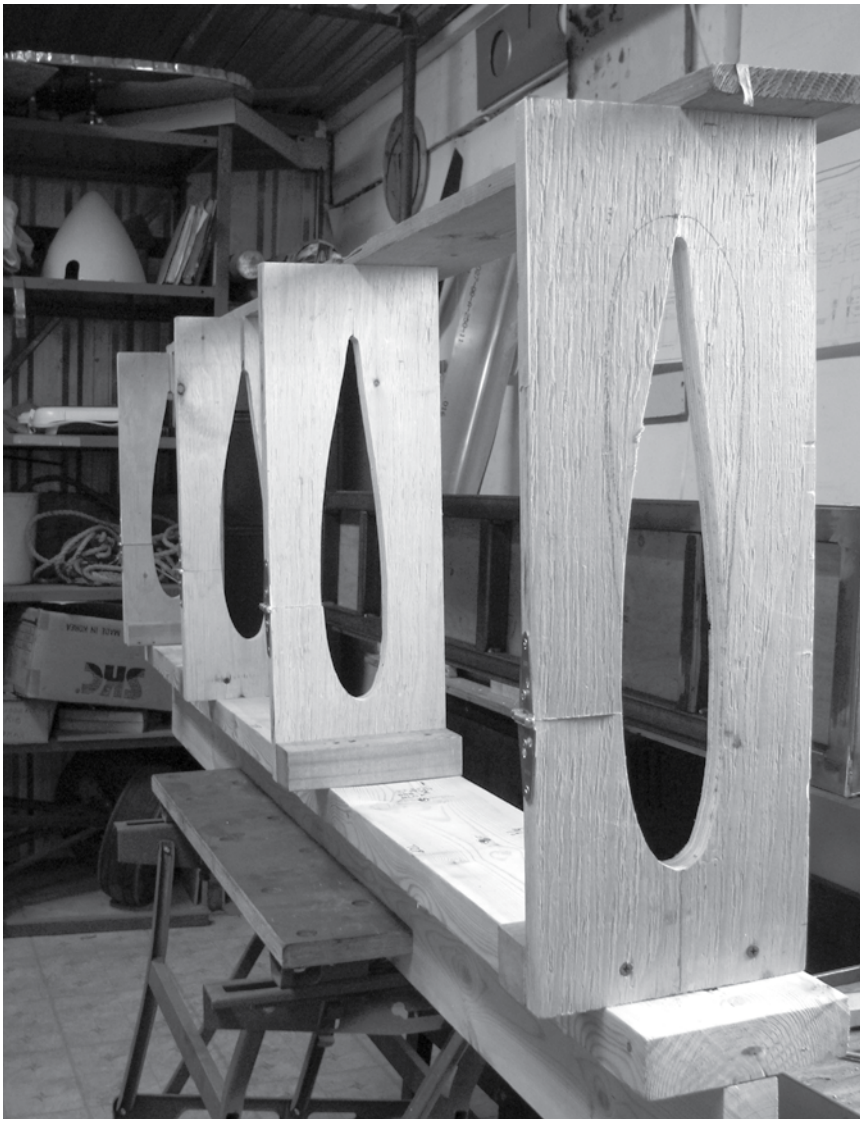
The cotter pin installation shown in Figure 5 is a photo is of an aileron trim tab pushrod attach bolt. This is incorrect, as the bent prongs were not cut to the proper length and due to this had caused holes to be worn through the leading edge of the trim tab.

Fig. 5

Related References:
FAA Advisory Circular – AC 43.13-1B (Section 6)
Standard Aircraft Handbook – Sixth Edition.

Pegazair Flaperon Jig

For those of you who are not building from prepunched kits, it is always a challenge to keep the flying surfaces straight and true. Here is Gord Reed's jig for the flaperons of his Pegazair. The plywood pieces are gang-sawed, then levelled and attached to strong-backs. Each station is right next to a rib, allowng space to drill and cleco. The same method may be used for wood or composite structures. It might seem to be unnecessary work to build a jig for each part but there is considerable time in the fabrication of the flying surface because it cannot wiggle out of shape while it is being riveted, glued, or bonded.



Cable Tensioner

For the past year there have been questions about aileron flutter on Zenith 601XL aircraft, and Chris Heintz has consistently maintained that if the cables are properly tensioned there will be no flutter. Zenith recently contracted to an independent engineering firm in Germany for wind tunnel testing, and they have been exonerated. What was found was that if the aileron cables are tensioned to the factory numbers, there will be no flutter. Some builders have omitted the flap stop, and it is necessary for that to be present too.

Some members have even called to ask about flutter in the earlier 601 UL and HD models. There have been no flutter concerns with those models.

Aircraft Spruce sells a cable tensiometer that lists at $130. P/N 3375D, designed for 1/16", 3/32", and 1/8" cables. Not only Zenith 601 XL's need proper tension. Consider buying a tensiometer for the chapter tool crib.

AD's and Amateur Build Aircraft Using ECI Cylinders

Gary Wolf

RAA members may want to take a look at American AWD 2008-19-05 affecting Lycoming models 320, 360 and 540 engines (this affects their clones as well) with certain Engine Components Inc(ECI) cylinder assemblies. The problem is cylinder heads that are separating due to a manufacturing defect in the area where the head threads onto the cylinder proper. Many of these ECI cylinders are installed on non-type certificated engines built up and sold to the amateur-built/home-built/experimental aircraft operators. On certified aircraft the AD limits the use to 350 hours but this assumes a stock compression ratio. Higher compression ratio engines appear not to make even that number of hours before fracturing. See http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/MainFrame? for more from the FAA.

OpenFrameSet will take you to the FAA AWD data base. The FAA and Transport Canada do not provide a notification service of AWDs to recreational aircraft owners operating non-type certificated aircraft, engines and propellers. However if your AAIR to Transport Canada reflects that your engine or propeller model (example Avco Lycoming O-360-2A2) is based on a type certificated product a list of applicable AWDs will show up on their data base under your registration. This data base is available and searchable by the public at http://www.tc.gc.ca/aviation/applications/cawis-swimn/awd-ly-cs1401.asp

Searching the FAA site for other AD's brings the information that there is a 2006 AD concerning the use of ECI connecting rods that have their bearing surfaces mismachined. We are heading into the building season and invariably there will be many used components for sale in magazine and online classifieds. Please check the AD list before incorporating these or any components into your engine build.

Where would an airshow performer go when he needs tools and hydraulic oil for his Corsair? Why to his local RAA chapter, of course.

Inspection of Wood Aircraft

571.101/5
May 26, 1988
AIRCRAFT WOODEN COMPONENTS - INSPECTION FOR DETERIORATION

1. PURPOSE. This advisory material provides guidelines for the inspection of wooden components of aircraft primary structures.

2. REFERENCE AIRWORTHINESS STANDARDS. Chapter 549, Amateur-Built Aircraft Section 549.19, paragraph (b); Chapter 571, Maintenance of Aeronautical Products - Appendix A.

3. BACKGROUND AND DISCUSSION. Experience has shown that in addition to the normal routine maintenance inspections, all aircraft which have wooden components in their primary structure require very thorough repetitive inspections, especially of the glued joints, to determine continuing structural soundness.

While excessive moisture has been the cause of both glued joint failures and delamination of plywood, another factor to be considered is the deterioration of the structure with time. Tests have shown that even in well maintained and properly stored components, the loss of linear strength of a glued joint can amount to 60% in ten years' time.

Fungi may, under conditions that favour their growth, attack the wood resulting in a condition designated as decay. Decay can occur at temperatures that favour growth of plant life in general. Serious decay occurs only when the moisture content of the wood is above the fibre saturation point (average 30 percent). These conditions are particularly prevalent in the Southeastern United States but may also be encountered in Canada. Only when previously dried wood is contacted by water, such as provided by rain, condensation, or contact with wet ground, will the fibre saturation point be reached. The water vapour in humid air alone will not wet wood sufficiently to support significant decay, but it will permit development of some mould. If excessive moisture is not allowed to enter the wood fibres, there is virtually no limit to the components structural life expectancy.

4. ACCEPTABLE METHODS. To ensure the structural integrity of the wood, the following inspection procedures are suggested:

4.1 Exterior Surface Inspection

(a)Inspect the entire exterior surface of the component (Wing, fuselage, tail, etc.) for the following characteristics:

(1)Signs which indicate that the wood immediately below the fabric is soft or contains excessive moisture (i.e. swollen). Soft wood may be located and/or confirmed by depressing the components surface in the vicinity of the area in question with a rounded, blunt instrument and comparing its hardness with that of good wood. Note that the areas being compared must have identical substructure.

(2)Signs which indicate that the fabric/paint is delaminating from the wood surface (bubbles, discoloration, boils, soft spots and other surface flaws).

(3)Cracks or breaks in the paint. Water is prevented from entering the component by the fabric/paint barrier. Any cracks in this barrier, no matter how small, may comprise its ability to prevent water from entering the wood.

(4)Exterior damage which would allow water to penetrate the fabric/paint barrier and enter the wood.

The surface features described in (1), (2), and (4) may be accentuated by illuminating the surface with a light source placed at a shallow angle.

The following technique may be used by an experienced person to detect soft and/or decayed wood in the wing spars. Tap the wing directly above and below both spars with a small rounded, blunt instrument, approximately the size of a small pocket knife. Start at the outboard end and work inboard, listening to the sound generated by the wing. The sound quality will change slowly. If the change in sound is abrupt, the wood directly below the surface may have decay.

The above method may also be adapted to check other components for decay.

(b)Mark the areas which have the characteristics described in paragraph 4.1(a) and refer to paragraph 4.3 for additional inspection procedures.

4.2 Internal Inspection.

(a) Remove all inspection/access covers.

(b)Using a flashlight and a mirror, inspect the entire interior of the component for the following characteristics:

(1) Wood decay;

(2) Water stains on wood or covering;

(3)Pooled dust/dirt which may indicate evidence of previous standing water;

(4) Rust or corrosion on metallic surfaces; and

(5) Detectable moisture.

(c)Make note of any areas which have the

characteristics described in paragraph 4.2(b) and refer to paragraph 4.3 for additional inspection procedures.

(d)Be certain that all drain holes are completely open and free of burrs and/or pieces of fabric which would cause water to be retained.

4.3 Moisture Test and Probing Inspection.

(a)If the inspection described in paragraphs 4.1 and 4.2 identify any questionable areas, continue the progressive inspection by testing these areas per the following procedures:

(1) Test for soft/decayed wood with sharp probe.

(2)Test for moisture content using suitable resistance type moisture meter (model G-2, Delmhorst Instrument Company, Boonton, New Jersey, or equivalent).

The probing inspection is designed to identify wood by penetrating it with a sharp object such as an awl or sharp pocket knife. You may wish to "calibrate" yourself and your probe instrument by testing known good wood of a quality equal to that used in the component. Note that the airframe is constructed with several different kinds of woods, each of which have noticeably different hardness.

(b)If during the inspection of a component you suspect that the structure has decay close to the surface, you may remove a small plug of the wing skin (1/16 inch thick or 1/8 inch thick) to probe inspect the structure material directly. Sharpen a ¼ inch drill bit so that its point angle is very flat and provide it with a stop which prevents it from penetrating to a depth greater than the thickness of the skin; test the drill bit on a separate piece of plywood to ensure that it cuts clean and penetrates the proper amount. If the probing inspection indicates good wood, the plug must be replaced using standard repair procedures such as those specified in FAA AC 43.13-1A.

(c)If the inspection described in paragraphs 4.1(a)(3) gives you reason to suspect that there may be decay in a fuel tank area, a more thorough inspection may be conducted by removing fuel tank covers.

(d)If moisture content is below 15% and the wood is solid as determined by probing, the structure can be considered airworthy. If moisture content is 15% or above and the wood is solid as determined by probing, the structure can still be considered airworthy but repetitive inspections of suspected areas are required every 15 days until moisture content is below 15%. Moisture content will decrease provided no additional water is allowed to enter wood fibres. The drying process may be assisted by directing warm, dry air over the entire suspected area, taking moisture readings daily; do not allow the moisture content to go below 10%. All deficiencies which would allow water to come in contact with wood fibres MUST be corrected prior to exposing the aircraft to high moisture conditions.

(e)If probing indicates soft or decay wood, the affected structural members must be replaced. The repairs may be accomplished with reference to the following documents:

(1)FAA AC 43.13-1A: Acceptable Methods, Techniques and Practices AIRCRAFT INSPECTION AND REPAIR' Department of Transportation, Federal Aviation Agency 1972; available from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C.
U.S.A. 20402

(2)ANC-18: Design of Wood Aircraft Structures, Chapter 4 Detail Structural Design, Munitions Board Aircraft Committee, June 1951; copies of this document may be obtained from:

USA Naval Depot
5801 Tabor Avenue
Philadelphia, PA
USA 19120

(3) Designer or Kit Manufacturer drawings and repair schemes.

(4)Modifications and repairs recommended by the Regional Manager Airworthiness.

M. Khouzam
Chief
Airworthiness Standards

The best joke I know dealing with the word Superman is the true story about Muhammand Ali.
Once he was on an airplane. The flight attendant came and asked him to buckle his seatbelt.
He replied, "Superman don't need no seatbelt."
She responded, "Superman don't need no plane."

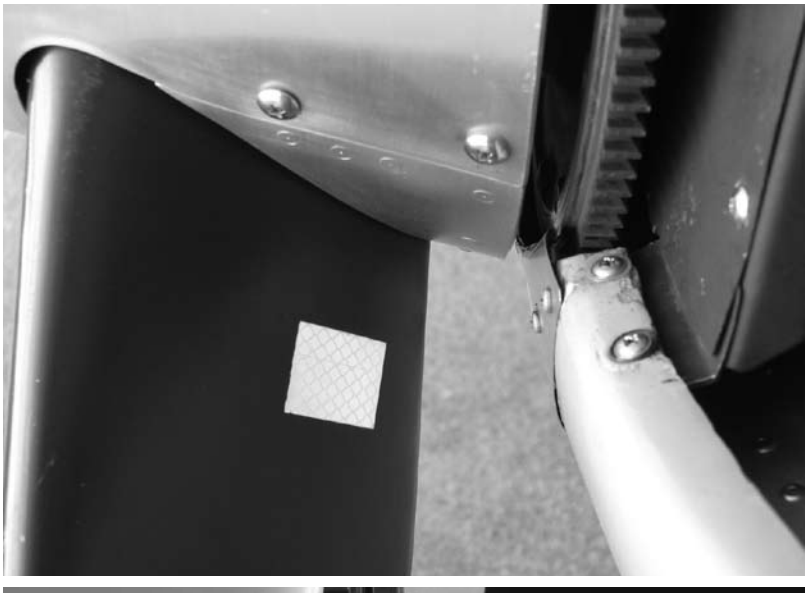
Using the Dynavibe Prop Balancer

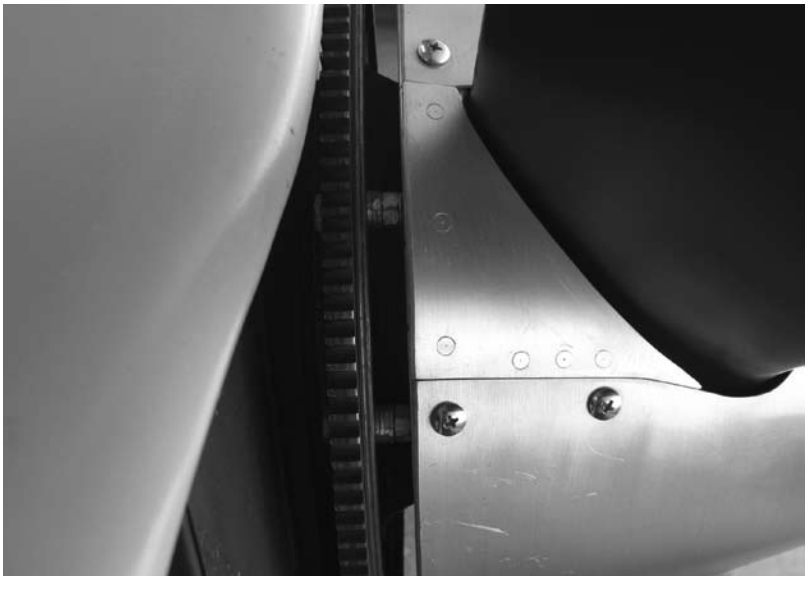
Gary Wolf

RAA-Toronto Region has a comprehensive tool crib for the use of its members, and the latest addition is a Dynavibe prop balancer. Members who have used it report that they can immediately feel that the engine runs more smoothly. The device consists of an accelerometer and an optical pickup, and both must be mounted to the engine, typically to an engine case bolt. Some fabrication of a simple bracket might be required. For safety the cables must also be secured to prevent their contact with the rotating prop. Thirty feet of cable is supplied so the operator can be just about anywhere in or around the plane.

A piece of (supplied) reflective tape is stuck onto the backside of one prop blade and the engine is then run up to the desired rpm. The readout will indicate the amplitude of vibraton in inches per second, and it also gives the offset of the point of maximum amplitude from the reference prop blade.

The procedure is then to add or subtract washers to the prop or spinner bolts, with the object being to reduce the amplitude below 0.20 inches per second. This will take several iterations but in practice RAA-TR members have been able to achieve even better than that number. The unit is supplied with reflective tape, and the manufacturer is willing to sell replacement tapes. However it is possible to use the inexpensive reflective tape sold in the aviation aisle of Princess Auto. RAA





Top: the unit in its case; Centre, reflective tape is adhered to the back side of the blade, in line with the optical pickup. Bottom: Adding or subtracting washers reduces the amplitude to an acceptable range.

President's Message
continued from page 2

bers have bought the inexpensive SPOT locators as a supplement. Unfortunately two members have been reporting that the devices are much less useful than they are represented to be. When monitoring their friends' flights they have reported that the location reports have been as great as 45 minutes apart. Even for a slow plane this means a very large radius for a search. One member complained to the manufacturer and received a response that indicated that these units are not really meant for use in aircraft because of interference from ignition and radio gear. He then mounted it to a fence post post and the results were the same. That was in BC, and the same has been reported in Ontario.

TAXES AND USED AIRCRAFT

Ontario is now attempting to merge the provincial sales tax with the GST. If this happens, that will mean that used aircraft will then be taxed the additional 5% GST. This has motivated some members to do their shopping now. It makes sense to do this while aircraft prices are still low, especially as we head into the end of the flying season. RAA

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

Keep in Touch With Your Board of Directors!

Gary Wolf ..... President
..... 519-648-3030 garywolf@rogers.com
David Moore ..... Vice President (programs)
..... charlotte.moore@sympatico.ca 905-659-3454
Wayne Hadath ..... Treasurer
..... whadath@rogers.com
Chris Gardiner ..... Secretary
..... 905-668-5703 cgardn628@rogers.com
Ed Butler ..... landed@sympatico.ca
Dave King ..... kingdws@shaw.ca

RAA Regional Directors

Mainland BC:
BC Coast ..... Terry Wilshire terwil@telus.net
604-721-7991

Interior BC/Technical Director: ..... David King
contact best between noon-10pm 7days work
ph. 250-868-9108 homep ph. 250-868-9118.....
..... emailKingDWS@Gmail.Com

Alberta North:
Tom Hinderks ...780-453-1078 or leave a message at
780-451-1175 .... e-mail eahs.execdir@interbaun.com

Alberta South:
Gerry Theroux ....403-271-2410 grtheroux@shaw.ca

Saskatchewan:
Laura Drinkwater..... 306. 955-1361
lauraprd@shaw.ca

Manitoba:
Jill Oakes....204-261-1007 jill_oakes@umanitoba ca

Ontario SW:
Tom Martin .....fairlea@amtelecom.net

Quebec:
Raymond Fiset.418-204-9448 rayfiset@videotron.ca
.....7925 Hamel Blvd., Ste Foy, PQ G2G-1C8

Appointed Positions:
Translation:.....Pending
Magazine Mailing: .....Dave Evans
Ultralights: .....Wanted
Web Page .....Nicholas Grose
Insurance Committee ..... Gary Wolf
AirWear.....Dave King

A flight attendant is on the red-eye to Manila when a water leak develops in the galley, which eventually soaks the carpet throughout the aft cabin of the 747. A very sleepy woman who becomes aware of the dampness tugs at the attendant's skirt as she passes by. "Has it been raining?" she asks the flight attendant. Keeping a straight face, she replies, "Yes, but we put the top up." With a sigh of relief, the woman then goes back to sleep.

AGM Announcement

On October 3 at Brampton, Ontario: the RAA Annual General Meeting will be hosted by RAA-Toronto Region Chapter. Keep this date open.

Classified Ads

To submit or delete a classified ad, please send to classified@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.

Ads can be emailed to : ***classified@raa.ca***

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

Advertising Policy
The Recreational Flyer Publisher reserves the right to refuse any or all advertising for any reason stated or unstated.
The Recreational Aircraft Association Canada does not assume responsibility for advertisements, but does exercise care to restrict advertising to responsible, reliable individuals.
Please note: Ads running more than 3 issues must be renewed to guarantee continued display in the magazine.

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George Gregory
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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.

For Sale

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

Parts for sale: Low hours Colin Walker wooden prop a 7256 off an O-290D ($600); New ROTAX 9" UHS 2 blade spinner ($80). If you are interested, I can be contacted at: moneypit@uniserve.com or 250-558-5551; ask for Cameron. Oct08

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

PARTS FOR SALE--- Corvair 110 HP with Engine Mount, custom 4130 Prop Hub and rolling engine stand to ship.$1750 obo. New Colin Walker wooden Prop 6856 with fibreglass L.E. SAE 1 $500.00 G.B. Lewis wooden Prop 7441 metal L.E. very good, no nicks or damage. SAE 1 $500.00 . Super Cub 8:00 X 4 wheels, tires, brakes and reservoirs. $500.00 for set. C85 starter and NAS3 carb. $200.00 each, or will trade one for C85 generator. 780- 460- 6841 Oct 08

O235C LYCOMING ENGINE, Ground crank nitroed new bearings, seals, rings, seats, and guides. Can be seen running PA12 exhaust. metal prop. $4,800 Maxwell Say 519-941-9698 Oct 08

Christavia IV fuel tank for left wing, per Ron Mason drawing. 14 Imp gals [63 litres] all fittings in place. Peter James 416 282-2186 Oct 08

FOR SALE DUE TO HEALTH -aircraft engines and an Aeronca Champ project. The three engines are zero-timed: two 0-235, one 0-0-290DQ. Some mags might be missing,

but the prices will be very low... The project is a Champ awaiting the MOT final approval. For details, contact George ASAP at 250-768-3585. Oct 08

FOR SALE: Aeronca Champ wing hardware [except drag wires], rudder horn, 3 pc tail wheel spring, parking brake handle unit and nose fuel tank all for 7 AC/ Peter James 416 282-2186 Oct 08

Lycoming O-320 H engine, $6000 certified with logs, and pickled. This engine is near 2000 hours but it recently had new a new case and most internal components replaced. The previous owner bought the plane and immediately repowered it with a new 180 hp for float flying. With not much more than a top overhaul this would be nearly a zero time engine. kinger@bmts.com Dec08

For sale, new RV9A parts; conical engine mount, 3 L/G legs, mounting brackets, nose wheel, fairings. All the parts I didn't use when I converted to tailwheel. Contact Terry Elgood for list at TMB_Elgood@shaw.ca or 604-279-2062 Mar 09

SIDEWINDER: All metal; seats two. Equipped with Lycoming 0-290D (110 hrs STOH), engine log, 3-blade ground adjustable Wrap Drive Prop. Bendix/King KY 97A radio, Icom portable standby radio; intercom, transponder/c. Full cockpit and panel lighting, strobes, L/L, and nav lights. Ready for MDRA final pre-flight inspection. All drawings and building manuals are included. Selling for material cost only ($20,000 cdn.) Call Norm at 519-745-7971 or email at ldservice@rogers.com. Apr09

Project Assistance 15 years of aircraft sheet-metal/fabric/ composite construction/ mechanical. can help your project. Have helped on RV projects.and other home-build aircraft. 1-519-777-7084 ask for Robert April09

ZODIAC - CH601 - 8 years - Rotax 912 – 80 HP with warp drive prop. 800 hrs TTAE. Bendix King Radio – 2 headsets. Excellent Condition – asking $ 40,000 – negotiable. Call after 7:00pm - 519-986-2343 April 09

FOR SALE: Teenie Two homebuilt, first flew 2002, total air time 28 hours, flies beautifully, TC time flown off. All paperwork up to date. Has brand new VW factory 1600cc longblock to be installed, all engine assessories ready to install, rebuilt Vertex mag, ground adjustable IVO prop, all parts to repair slight landing gear hard landing, hydraulic brakes, new tires. Nothing to buy. Bargain at $4500.00. One of the nicest built and flying T2 anywhere. 519-426-8583. Near London ON. jdonaldson@kwic.com Jun09

FOR SALE: Bushcaddy R120 kit, tail section done, cabin 85% completed. Comes with everything needed to complete the plane. Rotax 912S, Warp Drive 3 blade propellor, instruments, etc. Price:$49,500.00. Rexton N.B. W 506-523-9056, H 506-523-9614
e-mail: ahudson@nbnet.nb.ca Jun09

FOR SALE: Cuby project at precover stage, on gear with controls, seats, engine mount, struts, wood wings. $3500 gpeees@hotmail.com 519-831-5350 Jun09

1969 c-172,2800 TTAF,590 SMOH,original paint,Mk12D with glideslope,Mk12,loran March annual, Transponder with encoder.$60M Ted Strange 1-250-762-4924 ted.strange@gmail.com Aug09

FOR SALE: Zenith Zodiac 601 C-FZOF. Subaru powered, warp drive propeller, A22 ICom portable, flightcom intercom. Flight authority valid to Aug 11/09. 13 hrs total time on airframe. Presently located at St. Catharines airport. Asking $25.000. 905 295 4906 Jun09

RAA DONATION FOR SALE: 6 cylinder Continental IO 470 J engine as a core for rebuilding, condition unknown. This engine was in a Debonair that had a wheels up landing. Best offer but be resonable as the proceeds go to RAA. I can email photos to you if required. garywolf@rogers.com Jun09

FOR SALE: 1969 Stitts Playboy.135hp. Lycoming. Fuselage & tail surfaces covered with ceconite in 2006. Gross 1450 lbs. Net weight 945 lbs. $12,500. Call 1-519-294-6118. E-mail mtlarkin@sympatico.ca. Jun09

McCauley prop from a 150 hp 172, CTM 7553. Removed July 06 for inspection/overhaul. Asking $700 flyadler@golden.net 519-648-3886 Aug09

Falconar "F11A" project, Fuselage complete, wing 90% complete, empenage complete, 1st inspection done, EA 81 Subaru with re-drive included. $3000. (905) 649-1376Aug09

FOR SALE: ZENITH CH-300 on floats First flight, Sept 1983, total hours 575 (300 on floats

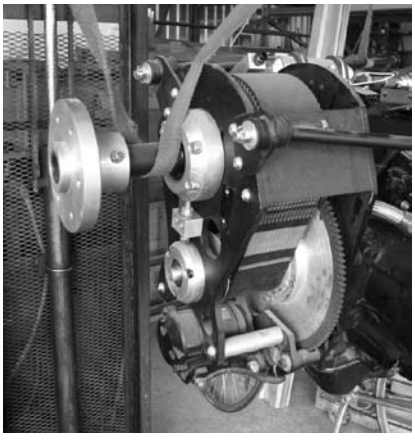
since July 1993). Engine O-320-C2A zero timed in 1999 now with 170 hours. panel, no radio. Prop McAuly 1A175/GM8241 new in 1993 Floats, Zenair 1850. Location Lake Muskoka. $45,000 George 705 445 7054 CollingwoodAug09

Four Subaru EA81s and one EA82. one partly converted. Will not be undersold. FOB my shop. Bill Weir 519-461-0593 Jun09

FOR SALE _ Zenair 601HD tricycle gear built from plans. Wings and empennage finished. Fuselage 90% done. Electric elevator trim operational. Control cables finished. Hydraulic brakes operational. Fuel tank installed. Radio antenna and cable installed. Logs up to date. Also included; plexi for canopy, radio, extra aluminum sheeting and some tools. Asking $8000. ALSO FOR SALE_ Corvair Monaza 6 cylinder 110 Hp engine. Prop hub, ring gear and starter installed. Needs carburation, ignition, and exhaust. Logs complete. Asking $4000. Both items for $10000. ph; 403-665-2482 Hanna, AB. e-mail; mcdonell@netago.ca Jun09

I have too many RV projects on the go…
1. RV-4 project well on the way with the tail feathers finished, wingspars finished and all ribs drilled, primed and numbered in the box. Flaps and ailerons finished. Fuselage on the jig. All primed. Good workmanship. $9500 OBO . Call for more details or e-mail for pictures. (519) 461-1464 or ed@solaire-canada.com
2. RV-8 project, tail feathers finished, spars done, flaps,ailerons, D-tube and tanks finished. Predrilled ribs and skins. All parts in boxes ready to go. Excellent workmanship. $9500 OBO Call for more details or e-mail for pictures. (519) 461-1464 or ed@solaire-canada.com Jun09

FOR SALE: Lycoming engine-Model IO-360-B1B--Last annual 5-8-73 at 646.0 hrs since top O/H--in storage since removal from Beechcraft--C/W Hartzel C/S prop. Dynafocal mount , Exhaust,--Logbook--Located in Edmonton,Ab. $8500 OBO forestind@mmipro.com Cell 780-499-1724 Res: 780-460-7420 Jun09



Brand new Crossflow redrive for Subaru EA 81 with flywheel and starter. RAA is handling the sale of this redrive for the estate of the late Mike Davy. $1200. This is a complete bolt-on unit. Please contact garywolf@rogers.com or call 519-648-3030 Jun09

1969 Stitts Playboy.135hp. Lycoming. Fuselage & tail surfaces covered with ceconite in 2006. Gross 1450 lbs. Net weight 945 lbs. $12,500. Call 1-519-294-6118. E-mail mtlarkin@sympatico.ca. jun09

Tri Pacer fuselage with main gear. $300. Must be picked up, cannot ship. garywolf@rogers.com 519-648-3030 Jun09

(1) 1967 C-172, 3155 TT, Cont. 0-300, 1005 SMOH, new windshield, new battery in 2007, new paint in 2005, a working DME, two 720 com. radios, a ELT, current annual until Nov.09. $41,000. (2) 40' X 30' Calhoun structure hangar at Earlton,CYXR, 5' high steel walls, 10' high doors, fabrene roof, put up in Nov. 2004, will hold a C-172. $12,000. Phone 705-544-8743 or whiteheadbj@msn.com Aug09

Van's RV-4, 105 TT, O320 1787 SMOH runs well, Prince carbon prop, Garmin SL-40 VHF, Bendix/King KT76A Xpdr, digital and analog flight instruments, engine monitor, always hangared, NDH, white with red/black trim, $49,900. 519-829-2374, retaborek@gmail.comAug09

Wanted

Would you like to fly a Zenith 601HD from Hanover Ontario to Calgary Alberta? This plane has been sold, and the purchaser is looking for someone to ferry it out. If interested please call the new owner at 403-285-3564.Aug09

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

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

Looking for a port side wing for a 1989 Avid Flyer H.H. STOL. if any one has one they can email me @ wcsorell@northwestel.net or phone Wade Sorell 250-500-3775 Fort Nelson B.C. or is there anyone out there who rebuilds AULA

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: classified@raa.ca and place "RAA ad" in the subject line.

Send us Photos of your completed projects

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

RAA Chapters and Meetings Across Canada

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

ATLANTIC REGION

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

QUEBEC REGION

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

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

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

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

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

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

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

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

ONTARIO

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

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

COLLINGWOOD AND DISTRICT; The Collingwood and District RAA, Chapter 4904, meets every first Thursday of every. month, at 7:30 PM except July and August, at the Collingwood Airport or at off-site locations as projects dictate. The January meeting is a club banquet held at a local establishment. For more information contact Pres. Keith Weston at 705-444-1422 or e-mail at ckweston2@sympatico.ca

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

FLAMBOROUGH: Second Thursday 8:00 pm at Flamborough Airpark. Contact Editor Frank Ball

fdnmeball@teksavvy.com 905 822-5371

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WIARTON: Bruce Peninsula Chapter #51 breakfast meetings start at 8:30am on the second Saturday of each month in the Gallery of Early CanadianFlight/Roof Top Cafe at Wiarton-Keppel Airport. As there are sometime changes, contact Brian Reis at 519-534-4090 or earlycanflight@symptico.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. Kevin Drinkwater 306-955-1361 lauraprd@shaw.ca

ALBERTA

CALGARY chapter meets every 4th Monday each month with exception of holiday Mondays and July & August. Meetings from 19:00-22:00 are held at the Southern Alberta Institute of Technologies (SAIT) Training Hangar at the Calgary Airport. Join us for builder discussions, site visits, tech. tips, fly out weekends and more. Contact president President Gene Lukan at 403 932-4238

EDMONTON HOMEBUILT AIRCRAFT ASSOC: First Tuesday 7:30 pm EAHS boardroom. Contact President Bill Boyes 780-485-7088

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

MEDICINE HAT: Last Thursday of the month, 7:00PM, RAAC clubrooms, airport. Contact Boyne Lewis at (403) 527-9571or E mail balewis@shaw.ca

BRITISH COLUMBIA

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

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

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

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

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

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

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

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

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

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

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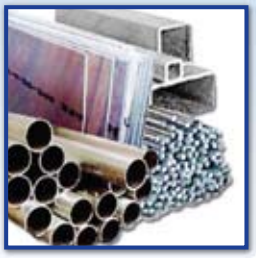
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