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RECREATIONAL RELYER

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THE CENTENNIAL SILVER DART REPLICA PROJECT

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

From The President's Desk

Gary Wolf RAA 7379

UAV in your Future?
Closer than You Think.

Do a word / text search of the CADORs for the words UAV or drone and you will see 39 reports since January 1st. Here are typical occurrences:

A privately operated Cessna 340 (C-XXXX) was enroute from Fort McMurray, AB (CYMM) to Ponoka, AB (CEH3). The aircraft was at 8000 feet in the vicinity of north east Edmonton when the pilot made visual contact with traffic approaching at the same altitude. A black unmanned aerial vehicle (UAV) was passed approximately 300 feet off the right wing at the same altitude. No evasive manoeuvres were carried out. The UAV was described as a quadcopter 18 to 24 inches in diameter.

Multiple aircraft on short final to Toronto, ON (CYYZ) runway 24R reported seeing a drone operating at approximately 2 miles final and half mile left of centreline. Changed operation to land runway 23 only. Toronto Police advised and dispatched officers.

The privately operated de Havilland DHC-2 Mk1 Beaver floatplane, C-XXXX, was en route from the Vancouver Harbour to Squamish when it came close to an Unmanned Aerial Vehicle (UAV), at 1200 feet. The floatplane was travelling northbound, north of Point Grey, when the UAV was reported just missing one of the DHC-2's wings. The Royal Canadian Mounted Police (RCMP) was advised.

Do you recall the early eighties when the ultralight boom took off? Transport slept through the early days and it took some twenty years to play catchup, get them registered, and the pilots licensed. The same is happening now with drones and Transport is missing the boat.

Now anyone with a few hundred dollars can buy one and they are being sold at every hobby shop to anyone who walks in

Since about 2007 Transport has been regulating the use of drones, but only for commercial operations. They have taken a hands-off approach regarding non commercial use and have treated them like radio controlled model aircraft. That approach worked when a drone cost the price of a car but now anyone with a few hundred dollars can buy one and they are being sold at every hobby shop to anyone who walks in.

Transport Canada's website now has a page to explain the legalities of operating a non commercial drone, but there is little chance that any buyer knows that Transport has a policy, let alone that Transport has any authority over the toy they just bought.

In brief, a drone must stay at least five miles from an aerodrome, at an altitude no higher than 300 ft AGL. It must stay more than 100 ft from buildings, vehicles, structures, and people. Operations must be day VFR and line of sight– smartphones and onboard cameras may not be used for navigation – only firsthand visual line of sight qualifies.

Now reread the three reports above and ask yourself if the requirements are being met. Clearly the operators either have no idea of what the rules are or they do not care. Christmas is

continued on page 35

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features

columns

George Gregory

A Cessna 140, Delta Air Paark, 2014
On the cover: The Silver Dart Replica

Just Another Day on Tow

Heidi Bekker

THERE'S A LINE UP of gliders along the right side of runway 25 at CYHE. These "ships" have already have had their daily inspection and are eagerly awaiting a chance to explore the elements, in hopes of catching a wave. The gliding season is in full bloom and the glider pilots have the glow of childish delight, as they impatiently wait their turn. The tow plane has now had its run up and is ready for the fun to begin. The wind has shifted to favour runway 25, as it often does by the time late morning comes around.

The 10 o'clock briefing has occurred in the Vancouver Soaring Association's clubhouse, and we have assessed that the weather will cooperate with our plans for today. A tow card gets handed to me and reads, "3000 feet at Hope Mountain." I watch through the window of the tow plane as a glider pilot prepares for his first adventure of the day. The pilot secures his parachute and gracefully slides into the low seat of the ship. The timekeeper observes, and then assists by attaching the tow rope to the glider and closing the canopy. He looks around the field to ensure there are no aircraft in the vicinity, and once confirmed all is safe, he walks over to the left wing. The wing gets lifted to balance the glider, and the timekeeper begins to swing his arm from left to right; this is the signal for the tow plane to pick up slack in the rope. As I slowly inch the tail dragger forward, I keep a close eye on the rear-view mirror to watch the signals of the timekeeper, and to visually confirm the slack of the rope. The radio is tuned to 123.3 and a transmission check has been completed. "Hope traffic, F-A-U-J rolling 25 Right, glider in tow for Hope Mountain."

The timekeeper has now changed the signal to a circular arm movement, which means that the tow rope is now tight; it is time to commence the takeoff. I apply full power to the 230 horsepower machine and begin to roll, keeping the aircraft centred down the runway. I gradually raise the tail, and as rotation speed hits, the main wheels lift off the grass surface. I watch as the airspeed indicator increases to 70MPH. This is an easy airspeed to remember, as I will be spending the majority of the day flying at this speed. As the aircraft reaches the operational speed, I make a gentle turn to the right towards the Fraser River, to abide by the local noise abatement procedures. The throttle gets pulled back to 25 inches of manifold pressure, and I then begin to lean the mixture. I make a wide gentle turn to the left to accomplish my goal of being approximately 1000 feet over the Husky gas station – this is to ensure that if there are any issues, the glider can release and join the circuit pattern. I look in the mirror and see the glider bouncing happily behind me with the rope attached; onward to Hope Mountain.

I make my way to the south of the field toward the "knoll", taking into consideration the winds and the sink with the current conditions, as I want to avoid getting pulled in toward the mountain. I concentrate on maintaining airspeed, despite the turbulence, and carefully position myself within one wing span from the trees along the hillside. It seems like the knoll is "working" today as I feel the lift and watch as my vertical speed indicator climb to 750 feet per minute. No communication was made from the glider pilot, so I will continue eastbound for Hope Mountain, as originally planned.

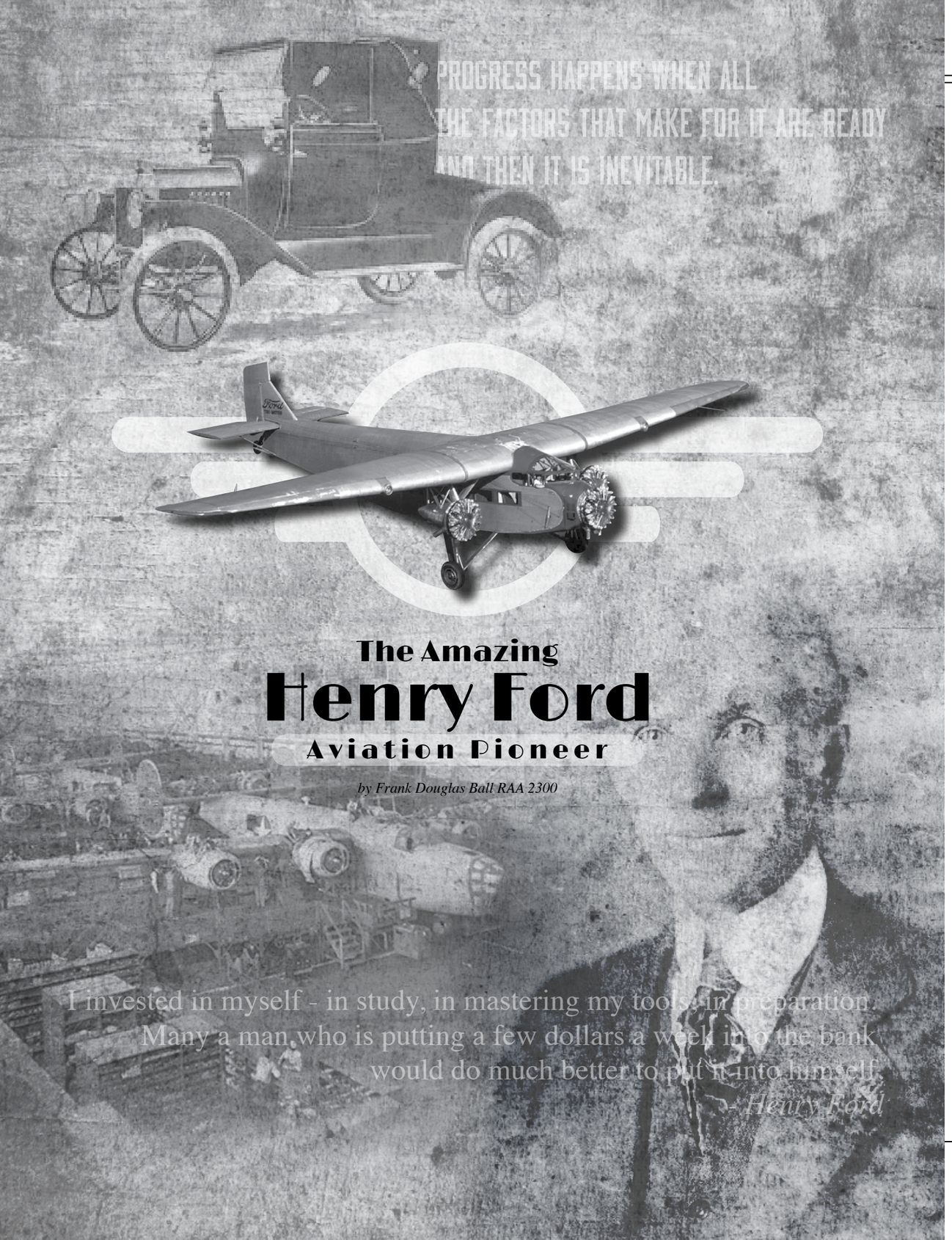
As I look ahead, I can see a rock face on Hope Mountain; this is called the "chimney." The strategy of this game is that I need to be at the chimney by 2000 feet. Between the knoll and Hope Mountain, I begin to battle moderate turbulence. Turbulence is already a challenge to deal with, but it becomes intensified when towing another aircraft that is experiencing turbulence as well. I carefully assess the distance between myself and the chimney and commence a gentle turn to the left, toward the city of Hope. This is where I try to make a point of looking down the valley for a split second to enjoy the view, and to appreciate what a beautiful place we live in, and how lucky we are to be here. I then start a wide and gentle 360 degree turn so I can get the glider back to the chimney at 3000 feet above ground level. When towing a glider, it is important to make sure that the

The gliding season is in full bloom and the glider pilots have the glow of childish delight

turns are not abrupt. With the ever-changing conditions in Hope, considering the variable lift and sink, there is no exact formula as to when and where to turn in order to end up at the desired drop off point for the glider, and at the requested altitude. One is constantly assessing the conditions and the trends throughout each day, and making the appropriate decisions accordingly. As 3128 feet approaches on my altimeter, I have the glider behind me at the chimney, with Hope Mountain to my right. I can feel the glider release and then hear the call on the radio, "Thanks for the tow!" I reply, "Have a nice flight!"

Immediately after the release, I turn the tow plane to the left, as the glider turns to the right. This procedure provides traffic separation. After the turn, my first job is to find the glider, as I want to ensure I am not travelling into his flight path. It is also important to be aware of other gliders and aircraft in the vicinity. I reduce my airspeed slightly and apply 60 degrees of flaps. I slowly close my throttle in steps to avoid shock cooling the engine, and commence my descent. I cross mid-field and join downwind, while making the appropriate calls for an uncontrolled airport. I make a tight base turn to final for runway 25 Left, as I have sufficient drag to get me down quickly – and after all, time is money! I battle the gusty, unpredictable crosswinds of Hope and reunite my plane with the grass field it knows so well. I call when clear of the active rwwunway and see that a gliding student is in the middle of a pre-flight briefing with his instructor. As they are not quite ready to go, I shut down the engine. At that point, I jump out of the L19, an aircraft which is twice my size, and I sit on the grass in the sun to reflect on another great flight.

Heidi Bekker *is currently a tow pilot for the Vancouver Soaring Association, and is also the Secretary for the Recreational Aircraft Association (Chapter 85) at Delta Airpark. She has enjoyed sharing her passion for flying with youth in previous roles, while volunteering as a civilian pilot for the Air Cadets, and working as an Ultralight Instructor at King George Airpark. Heidi presently holds a Commercial Pilot Licence, Multi-IFR, and an Ultralight Instructor Rating, with 730 hours total time. Her goal is to take her flying to the next level and advance her career with a local outfit in the Lower Mainland.*



WITHOUT FEAR of exaggeration, I would say almost everyone knows that Henry Ford, of Dearborn Michigan was the key participant in the evolution of the automobile. He did this through his inventive genius and his visionary focus on manufacturing methods that allowed him to make quality cars so cheaply that millions could afford to buy them. From the time he sold his first automobile for $200 in 1896, after driving it for 1,000 miles, to May 31, 1921 when his factory shipped car number 5,000,000, his name became known all over the world for his enterprise and success. While this was going on, however, Henry Ford was building another lesser-known legacy through his entry into the world of aviation.

During World War 1 the Ford automobile factory also mass-produced Liberty aircraft engines, in addition to the 40 hp. De Palme engine for the Kettering Bug aerial torpedo. This device was simply an unmanned flying bomb. It had a range of 75 miles at a speed of 50 mph. When it ran out of fuel, the wings fell off and the bomb dropped out of the sky. The aerial torpedo sounds a lot like the ram-jet powered V-1 flying bombs the Germans sent over England during WW 2.

By 1917 the British people were on the brink of starvation because of the success of German submarines in sinking merchant ships taking food to them by sea. In addition, the British would now have to feed the American troops when they arrived. To save themselves, the British realized they had to do something very drastic. Their plan was to plough up and seed all of the arable land available in the country and not already in production. This meant ploughing up all of the lawns in private estates and all of the golf courses. At that time most ploughing was done with horses. The few tractors available were very heavy and steam-powered; not at all suitable for the job ahead. The Ford company was one of several asked to bid on tractors of alternative designs. They put together a new demonstration model using parts already available and won the bid on both price and delivery. They built a new factory to produce their Fordson tractor, which up until then didn't exist, and went on to build 5,000 of them in 3 months from order receipt, at a price of $700 each, with the first one delivered just 60 days from receiving the order.

In 1923, Henry Ford and his son Edsel who, by now, was President of the company, were introduced to William Stout, an inventor and designer of all-metal aircraft. They bought into the company, along with other investors. With this new capital Stout built 2 commercial all-metal luxury aircraft, each with 2-Liberty engines. Ford purchased one of them for his new Ford Airlines, flying parts, material and personnel between his factories. As it was reported in the New York Times on April 12, 1925, "Com-

Ford wanted to put the Flivver into production even though Charles Lindbergh called it the worst machine he had ever flown. The project was cancelled after the prototype crashed, killing his friend and chief test pilot Harry Brooks.

mercial aviation on a regular schedule began in America today". By the end of the second year, Ford Airlines had delivered millions of pounds of freight and flown more than 500,000 miles, including delivering mail on their domestic airmail flights, the first in North America.

Ford built, at Detroit, the first modern airport complete with concrete runways, a dirigible mast, a restaurant and a hotel.

In 1925 Ford, to promote public confidence in aviation, sponsored what was to be an annual Ford Reliability Tour for non-military aircraft. The first tour took off from Ford Airport with 16 planes flying a 1,900 mile route with stops in 10 cities. A week later 11 planes had completed the tour, led by the Dutch manufacturer Anthony Fokker who had put together a new aircraft designed specifically for the tour.

The metal aircraft were made of 3-layer sections of duralumin covered on each side by a layer of pure aluminum, on all surfaces of the wings, fuselage and control surfaces. They were also corrugated for added strength and noise abatement. Stout went through several design options, starting with a single engine, then 2-engines and then, at the insistence of Ford, with 3-engines. Ford was unhappy with many decisions Stout was making so quickly bought control of the company, retaining Stout as a consultant. In the next few years the planes, now affectionately called "the Tin Goose", went through several size increases and engine increases. At first equipped with 2-Wright 200 hp. Whirlwind radials, which gave enough safety and reliability for Ford to call them the "Superplane", the next generation was built with 3- Pratt & Whitney 420 hp. Wasp radials. These aircraft could carry 17 passengers, 1 flight attendant and 2-pilots. Before long the Ford Trimotor, which had set new standards of both airframe and engine reliability was flying in about a dozen small airlines that had now sprung up. Ford built a total of 199 Trimotor aircraft. One of them he gave to Commander Byrd for his expedition to Antarctica. With it, Byrd and his crew flew over the South Pole in late 1929.

Ford also built a small single-seat, open cockpit low-wing monoplane that weighed only 370 lbs. Called the Ford Flivver and powered by a 3-cylinder Anzani 36 hp engine, it cruised at 100 mph. Charles Lindbergh had an opportunity to fly it

Ford built... the first modern airport complete with concrete runways, a dirigible mast, a restaurant and a hotel.

once and didn't hesitate saying it was the worst machine he had ever flown. Although Ford was planning to put it into mass-production, the project was cancelled when the prototype crashed and killed his Chief Test Pilot and good friend, Harry Brooks.

The last Tin Goose was built in the depression of 1932, just as other new metal planes like the Douglas DC-2 and the Boeing 247 appeared on the market. Many of Ford's planes kept flying for many years, however, providing reliable air travel in countries around the world. But Ford's contribution to aviation was not finished yet.

In 1941 the demand for aircraft skyrocketed when the U.S. entered the war. In addition to other military contracts already in motion, Ford was contracted to start making the 4-engine B-24 Liberator bombers. He did this in his own unique way. Following his own well-published philosophy, that it is best to make only one major item in any factory, he designed and built a new factory at "Willow Run" dedicated to making the B-24's. Instead of working with the thousands of parts he needed to make an automobile, Ford now had to handle 1,250,000 parts for each B-24. The first aircraft was finished on September 10, 1942.

The manufacturing floor at Willow Run was 1-mile long. Runways and taxiways were also built to allow the finished aircraft to be tested and flown away. Operations continued there until June 28, 1945 when the last B-24 was completed. In the 3-years it was in operation, the Willow Run factory built 8,700 B-24's, which worked out to completing an average of 8 planes per working day.

I look upon Henry Ford as the ultimate "home-building genius", who also was lucky enough to be an exceptionally astute and successful business man. Those of us interested in building a small plane would do well to remember what Ford preached in his factories – cut the weight at every opportunity because excess weight always meant excess cost and poorer performance, whether it was in an "A" model car, or in an aircraft.

Some years ago, in the midst of the North American craze to try to catch up to the Japanese level of quality in their automobiles, one of the Japanese key engineers was asked how they did it. "It was very easy," he replied, "we just followed to the letter all the ideas Mister Henry Ford told us about in his books."

Frank Ball *is a member of the RAA-Toronto Rotorcraft chapter and the RAA-Flamborough chapter, and produces the newsletter for the latter.*

The Willow Run factory produced 1,587 B-24 Liberator Bombes for the Allied war effort.

Making a Scimitar Prop Template

by Mike Shave

TONY BINGELIS HAS BEEN an inspiration to many home builders, myself included. In the early '90's he replied to a letter I had sent and wrote in his reply suggestions and answers to my questions. I still have that letter and I still have questions.

Every new project is a venture into the unknown. It involves asking questions of those who have done it before. It involves finding obscure sources of information. It involves an element of risk and perhaps failure. Anyone who has made a project knows these things and all of us have failed. But failure doesn't stop us from trying again.

With home built aeroplanes there is an elevated (no pun intended) element of risk if there is a failure, but the reward of success is unmatched. Confidence in starting a new project comes from your own history of success. Every season Leaf fans hope this will be "it" based on a successful season almost 50 years ago.

Finding the history of the scimitar prop has been a challenge. As early as the late 1800's engineer mathematicians have been experimenting and writing reports comparing water props and the first air props. At the end of this article is a short list of more recent articles that mention the scimitar shape. A scimitar shape is said to flex under load during take-off to reduce prop pitch allowing the engine to spin faster generating more horse power making the take-off run shorter and improving climb rate. A heavier aeroplane with a direct drive VW could benefit from such a thing. Props can have a significant affect on the performance of any aeroplane. A builder may have an idea of the first prop he can try on his plane based on what others of the same design are using on theirs and be happy with the result. Sometimes the result isn't to his satisfaction. When I first found out that the scimitar shape may allow me to have my cake and eat it too, in that both the climb and cruise could improve, I had to try it. The nose bowl on the front of my GY201 Minicab could fit an 0-200 behind it turning a 72" prop. The area at the front with that size of prop isn't as much an issue as having a much smaller 56" prop powered by a VW and in an attempt at having more blade beyond the cowl my first prop was a 62 x 40. VW engines need to turn 3000 RPM to be able to produce enough power for a reasonable take-off. With the 62 x 40 cut to 60" the engine could turn 2800 RPM but the take-off was less than stellar.

There are two ways to get power from a VW and they both involve increasing the RPM. One is a small prop allowing the engine to run at a higher RPM without the tip speed going beyond 800 ft/sec or installing a re-drive on top of the VW turning a larger prop. At some point I would like to try installing such a re-drive to see if there is a performance gain but the scimitar prop, if it works, would involve no changes to the current engine installation. To make the prop using a duplicator a template is required so the first thing is deciding what diameter and pitch followed by creating a suitable scimitar profile shape. There are programs on the net that can help find a good place to start knowing the Hp of your engine and the cruise speed of your plane. In my case the 2276cc VW direct drive I have on the front may be producing 80 hp at take-off. That number is debatable. The next optimistic figure is the cruise speed and I'll be happy if it can do 100mph at 3000 rpm

Nomographs can be used along with Prop programs to zero in on the best prop design for your plane. The following formula devised by Eric Clutton on page 10 in his "Propeller Making for the Amateur" is another method.

$$\text{Prop dia} = 118 \sqrt[4]{\frac{HP/100}{(V/100)\,(RPM/1000)^2}}$$

Prop Pitch = AirSpeed/RPM+12% Slip

The actual blank for the prop will be made from an assembly of white ash strips 3/16" x 1-1/4" x 60" long glued into an "S" shape using a 2x10 form to squeeze the 16 strips required for each layer into a lamination after planing 1" thick a little less than 60" long. The two laminations are glued together with 2 more 1/2 x 5-1/2 x approx 36" long boards top and bottom.

Figure 1 shows my method for

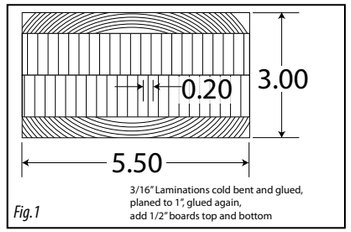


Fig.1

Above, figure one shows how the wood is glued together to make a block a template can be made from. Right, figure 2 shows the outline profile and thickness taper. Centre right, figure 3 shows how to find the angle for the 1 airfoils, and at the bottom, figure 4

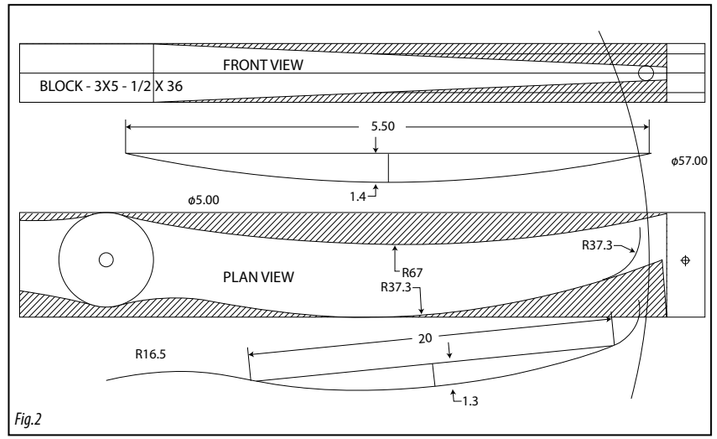


Fig.2

making a propeller template to use in a duplicating machine. The local builders supply had some nice 1 x 6 (5-1/2) spruce relatively straight grained with a few small knots. I bought a 12ft length cut it into 4 pieces 36" long glued them together make a block of wood a prop template can be carved from.

The full size drawing on paper (Figure 2) shows the outline profile and thickness taper. These shapes are transferred to the 3 x 6 x 36 block and then the block is sawn to a crude prop shape. Next drill a 1/2" prop hub centre hole and a 1/4" hole the tip as an index hole. If this hole is located carefully on the props centre line the blank will be able to be inverted to allow more accuracy on the duplicator table.

The airfoil used is the venerable Clark Y. It's 11.7% thickness will provide enough thickness to give the prop strength. I use an old version of AcadLT to create the airfoil drawings from a dxf file that can be downloaded from the site noted the end of the article. You can also download the

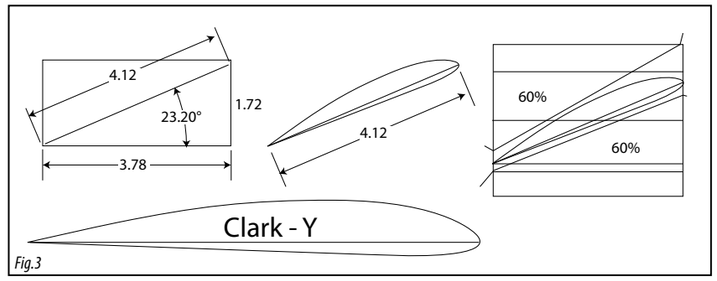


Fig.3

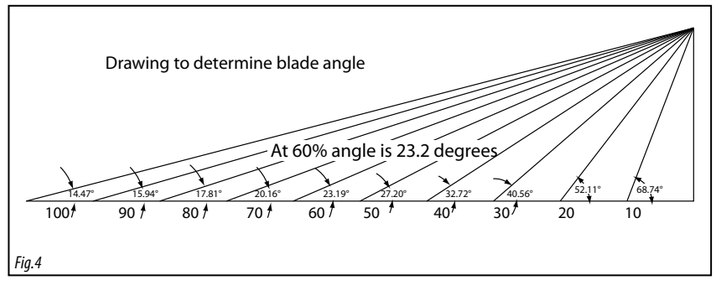


Fig.4

pdf version and size the image using Open Office. Size or scale the airfoil to match the chord at each 10% interval noting the chord is longer when rotated to the angle required.

To find the angle for the 10 airfoils at each section (figure 3) along the span a full scale drawing can be made using Cad or a paper drawing at 1/10 scale or download the Excel

r/R (%) 10.0	Pitch Distribution (%) of nom. pitch root-affected	Pitch Angle	Adjusted Angle	Chord/R (%) root-affected	Estimated Chord as % of 28.5"	Thickness/ chord (%) root-affected	Calculated Thickness	Drawn Chord
20.0	61	52	32	13.9	3.96	40	2.39	5.96
30.0	73	40.6	31.6	15.1	4.3	37.1	1.86	5
40.0	91	32.7	29.75	16.8	4.7	19.12	.89	4.65
50.0	97	27.2	26.4	17.8	5.0	14.99	.66	4.38
60.0	100	23.2	23.2	17.7	5.0	13.6	0.56	4.11
70.0	101	20.16	20.36	16.4	4.67	13	0.49	3.79
80.0	101	17.8	17.98	14.0	4.0	12.41	0.42	3.4
90.0	101	16	16.16	11.5	3.27	11.9	0.35	2.9
100	100	14.4	14.4	8.2	2.337	10.5	0.27	2.58

Figure 5, above: use this table to ensure the propeller is thick enough to be strong. Figure 6, make hand saw cuts across the block to serve as a guide during band sawing. Figure 7, These cut out airfoil sections will be used as templates to check progress during the carving stage. Figure 8, a 1/8"x 1" strip of pine and 1" finishing nails will help hold it in place for marking. After sawing off the bulk of the wood I use a chainsaw disk that fits onto a 4" angle grinder. Figure 9: with the scimitar shape try to keep the airfoil templates perpendicular to the longitudinal axis that the centre hole and index hole are on

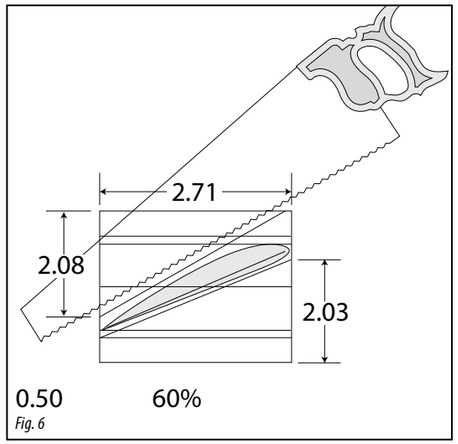


Fig. 6

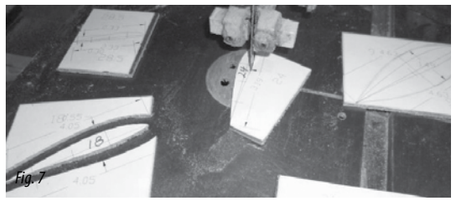


Fig. 7


Fig. 8

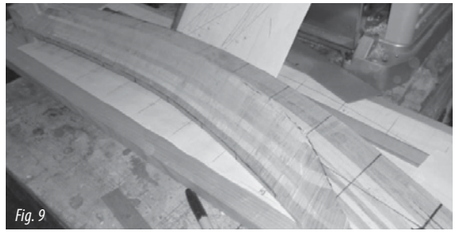


Fig. 9

calculations sheet from the "nmine.com" site. A 57" prop has a 179" circumference. Draw a line 17.9" long, at the end draw a vertical line 4.6" up. This distance represents the pitch. Go back to the horizontal line and divide it into 10. From each of the tick marks at 1.79" intervals along the horizontal line, draw lines to the top of the vertical line made. If you have done it right the angle at the tip will be 14 degrees and at the 50% point or 14-1/4" out from the hub (half the radius of the prop) the angle is 27 degrees. (figure 4, previous page)

Label the airfoils and print. Cut them out and glue them with spray contact cement to 1/8" x3x6 ply. Saw each of them in half on the airfoil centerline and then remove the airfoil shape top and bottom. It should be noted the cross sections near the hub from 30% out back to the hub will be distorted to allow enough thickness to make the prop strong.

Follow the thickness to chord ratio chart to ensure the prop has sufficient thickness to be strong. These cut out airfoil sections will be used as templates to check progress during the carving stage but first we can use them to estimate where to do the roughing cuts to remove most of the wood that isn't the prop. The actual tip of the prop will be about 2" in from the end of the 36" block and the hub center hole in this case 30-1/2" from the end of the block of wood.

By drawing lines on the top and back of the block I am able to make hand saw cuts across the block that are a guide during band sawing. The same is done to the bottom and soon there is a curved chunk of wood that looks a little less crude. To estimate the location of these lines I print 2 sets of drawings, one to cut out and the other to finish by hand. I draw horizontal and vertical lines tangent to the edge of each airfoil that have been oriented to their pitch angle forming a rectangular box. Centerlines are drawn through the boxes will be used as datums. For this prop the thickness taper will be symetrical above and below the centerline. (see front view dwg) The vertical thickness of the block at the hub will be 3" and the vertical thickness before carving at the tip is 3/4" . (note: this is not the thickness of the airfoil) The wood for the prop will be 2 lamination layers 1" thick with an additional layer 1/2" thick top and bottom, therefore the centerline will be at the middle gluing line on the block . The rectangular boxes containing the airfoils are placed onto the centeline of the block at their % location along the span and tick marks marked into the wood top and bottom. Connect the tick marks with a curved line.

A 1/8"x 1" strip of pine and 1" finishing nails will help hold it in place for marking. After sawing off the bulk of the wood I use a chainsaw disk that fits onto a 4" angle grinder. It's great for removing wood quickly but be careful not to take off too much. If gouges are made they can later be filled with bondo. A set of wood rasps is used to finalize the rough shaping. From time to time check the angle and profile of the airfoil at each section. Use a pencil or felt tip pen to mark the stations along the length of the blade to match the number of airfoil outlines.

With the scimitar shape try to keep the airfoil templates perpendicular to the longitudinal axis that the center hole and index hole are on. During the layout it is possible to leave an extra 1/4" of thickness to make template stronger out towards the tip. The prop template will end up being 3-1/4" thick for a prop 3" thick. During the shaping check the thickness of the airfoil to ensure it stays within safe minimums. As the template nears the desired shape switch to files and then sandpaper to make a smooth finish. Leave the area near the hub till last and fair the cylindrical shape of the hub into the airfoil shape of the prop between the 0 to 20% sections. Finishing the sanded template will make it look nice but usually I'm in a hurry to try it out. Don't forget to mark the design identifier ie: 57 x 46 Scimitar. Its ready for the duplicator so the next step is aligning the template with the prop blank and using a 1/4" router bit to make cuts every 3" along the prop blank top and bottom leaving about 1/2" material on the blank for finishing with a 1/2" ball end router bit. (note: the 1/4" cuts are the same as the saw cuts made into the template and are the guides used for roughing out in the bandsaw) Once the bulk of wood is removed with the bandsaw return the prop blank to the duplicator and finish the prop to within 1/16 leaving material to hand finish.

Balancing is next. Then glassing, more balancing and finally testing.

Reference articles:
http://www.verein.rc-network.de/fraes-daten/2010/Profile/CLARKY.DXF ;Clark Y Airfoil

http://forums.matronics.com/download.php?id=29381 ; Clark Y pdf for scaling in Open Office Calc

http://www.nmine.com/propeller.htm ; Excel program to calculate airfoil angles

http://wood-carver.com/articles.html ; to download the articles below

Appreciating the propeller – Bob Whittier – EAA Experimenter Aug 97
Why the "S" curve in Propellers – May 1960 Sport Aviation
Perennial Prop Maker - Article and Photos: Dick Cavin -Sport Aviation, June 1985
Design and build your own propeller – Fred A. Weick – December 1960 Sport Aviation (from an article that first appeared in the Mechanical Package magazine in 1925.

BING 54 NEEDLE JET

RAA

The venerable Bing 54 carb. Left to right, the keeper, the needle with its circlip, and the slide. Assemble in the order in this photo.

THE BING 54 is the carburetor that is almost universally used on 2 stroke aircraft engines. It is a simple device that does an adequate job of using Bernoulli's principle to meter the air to fuel ratio.

One problem common to all carburetors is that engines want the fuel to air ratio to be metered by mass, while carburetors supply fuel to air by volume. When the air density changes due to altitude or seasonal temperature changes it is sometimes necessary to change the jetting.

Full throttle jetting is adjusted by changing the main jet to one with a higher or lower number to create a richer or leaner full throttle mixture respectively. That one is simple, and not part of this article.

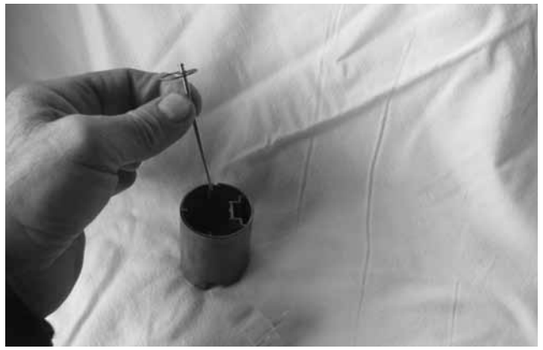
Mid range jetting from half to 7/8 throttle is controlled by a tapered needle that is fitted into the cylindrical throttle slide, and this is where the complications begin The lower pointed end of the needle sticks into a fuel jet, and this needle has several circlip grooves at its top end. The circlip may be repositioned to change the relationship between air and fuel. The slide controls airflow through the carb throat and the tapered needle rises and falls with it to admit more or less fuel as the slide is actuated by the throttle cable.

The problem arises when the inexperienced pilot, who is attempting to change the mid range mixture, reassembles the needle into the carb slide after having repositioned the clip on the needle. The needle is meant to be dropped into the slide first, followed by a white plastic keeper that has a projection to prevent the throttle cable from becoming inadvertently detached from the slide.

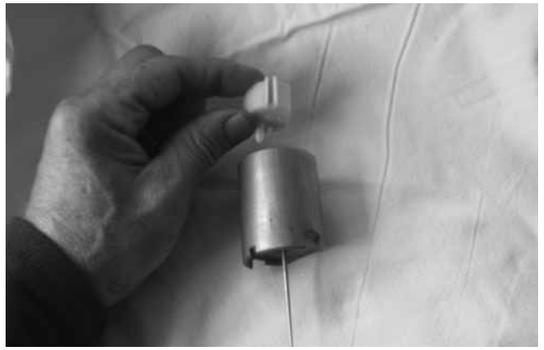
Every Spring and Fall when pilots reposition their needle circlips, some install the white plastic keeper first, and then the needle afterwards. This results in the tapered needle being lifted much higher, creating a very rich midrange mixture. The full throttle mixture will usually be OK but in the midrange the engine will end up missing beats, producing less power, and consuming a lot of fuel.

The solution is to put the needle in first, followed by the white plastic keeper. If your engine has more than one carburetor it is a good idea to dismantle only one at a time. That way the other may be used as reference if necessary when reassembling. An exploded view of the 54 carb is available on the Bing website www.bingcarburetor.com , very handy when performing any work on a Bing carb. R

DO NOT assemble in the order in this photo



Drop the needle into the centre hole of the slide...



Follow with the keeper.

Note the slot in the slide. There is a pin in the carb that clocks its position.

Needle and circlip

U2 Progress Report

Ryan Derot

The aircraft was moved to King George Airpark, registration is complete. To move the aircraft involved us having to have a crane come and lift the aircraft over our house and onto a flat deck trailer.

We decided to permanently join the wings instead of the folding wing mechanism. The aircraft was covered with Superflite system, painted in 2 blue and gray with chrome trim tape, the aircraft will have a Rotax 377 engine installed with an electric starter. We are also using a Powerfin Carbon Fiber 3 blade prop.

The U-2 has the following instrumentation installed: airspeed indicator, vertical speed indicator, altimeter, tachometer, EGT, CHT, ammeter, Hobbs and a transponder. The antenna for the transponder is state of the art and is installed internally preventing unnecessary drilling or mounting outside the aircraft. For additional visibility in flight we have installed strobe lights, beacon, wig wag, and landing lights. We also have an auxillary charging system installed in the cockpit that allows in flight recharging of any electronics or the plugging in of any other devices. There is also a solar powered charger installed at the hangar to keep trickle charging the battery keeping it fully charged.

We should be ready for taxi tests in November with the first flight planned for the New Year. Future plans include building lots of airtime, getting it on static display and possibly flying at Boundary Bay Airshow, Chilliwack Airshow as well as static display at Abbotsford Airshow. I'm also planning on building a web site to log the entire build process as well as a business involving my aircraft selling merchandise and assisting people who may be interested in building a U2 or currently building one and needing help. It is a very challenging aircraft to build due to the lack of info and not always clear in instruction. If I can help with the obstacles I faced and conquered give me a call or drop a line!

Top down: a crane was needed to get the U-2 out of Ryan's back yard; and some shots of the aircraft now residing at King George AirPark. Power is by Rotax 377 with an electric start and a Powerfin 3-bladed propeller.

George Gregory

Flying in the Rocky Mountains

Barry Meek

IT WAS A FINE, sunny August afternoon as I touched down at a small Alberta airport in the foothills of the Rockies. The temperature was typically hot but a cool breeze came in from the west, the same breeze that was my tailwind across the mountains rising sharply just a few miles back. Departure from Kamloops, B.C. had been under similar conditions earlier in the morning. A big high-pressure system over Western Canada was stable, offering good flying weather that pilots could not ignore. Final destination that day was Edmonton.

Outside the flying club facility, a couple of local pilots sat, enjoying the early afternoon heat. Normal greetings were exchanged, and they asked where I had flown in from. The conversation suddenly got interesting to them when Kamloops was mentioned.

"We don't go in there as a rule" one stated, referring to the mountains. These fellows were purely flatland flyers, not unlike many others I've met on the prairies.

There are pilots who avoid congested Class C airspace, and those that avoid mountains. They seem to attach a certain mystery to mountain flying. And with good reason! There are uncounted wrecks and plenty of aluminum sitting on the rocks of the Rockies, unfortunate results of inexperience, bad weather, bad decisions, and pilots getting lost. Living in close proximity to them, undoubtedly the stories are talked about a lot around the airports

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Down... But Not Out

by Dan Oldridge

The Seabee came down just short of a water landing. Above, right, SARtechs work on stabilizing Henry's back, which was broken in the crash. Below, after a helicopter evacuation, a Canadian Forces Hercules took the two men to a hospital in Saskatoon where he spent 12 days before heading home to start the recovery process for the SeaBee.

DR. HENRY CHAPESKIE is an aviation medical examiner and maintains a regular medical practice at the Thorndale Lion's Medical Centre. He has privileges at St. Joseph Hospital in London and acts as an adjunct Professor at Western. Henry has been an active pilot since 1979 and holds an IFR Seaplane rating. Henry's plane is a Republic Seabee CF-GAD, originally owned by his father. In 2006 the plane was rebuilt as an Amateur aircraft and its Lycoming was replaced by a factory-new crate Chevrolet engine.

Henry and his son-in-law Ricky had originally planned on heading east into Labrador, but long range forecasts predicted continuing bad weather for that region, so the two of them decided to make the trip west to the Yukon instead. Setting out from his father's strip in Barry's Bay, they began the trip west stopping in Sudbury, Wawa, Thunder Bay and Kenora to enjoy the local sights and take photos beside the iconic landmarks like the Big Nickel and the Wawa Goose.

Crossing Lake Winnipeg and Northern Manitoba, they made their way to northern Saskatchewan where they stopped at Reindeer Lake. They enjoyed an excellent sunset around 11pm and had a good night's sleep before heading west again in the morning. When they departed that morning they joked about the great 40 mph tailwind they were experiencing and that the Seabee had never flown so fast. Less than one hour into the flight they heard a high pitched whizzing noise at which point the alternator light came on and the engine temperatures began to rapidly increase. Within a very short time the temps were soaring above 300 degrees and the engine was shut down to avoid permanent engine damage. They began to look for a place to make an emergency landing.

Northern Saskatchewan is covered with lakes so Henry figured it would be no problem setting down on one of them, drifting to shore and repairing whatever had broken before continuing on their way. They spotted a long narrow lake just below them and decided it was likely best just to turn base and final into the lake below rather than press their luck to find something else ahead of them. Unfortunately, the 40 mph wind that assisted them in making time earlier was about to deal them an unexpected blow. As the Seabee turned into the wind, their ground speed dropped by 80 mph and Henry soon realized as the Seabee quickly lost speed and altitude that they would not make the lake.

Crashing into the thin bush a few hundred feet short, they skidded and bounced across basketball sized rocks hidden by muskeg and shrubs from above. When the plane came to rest, they appeared to both be uninjured, but when he attempted to exit the plane it quickly became apparent that Henry had broken his lower back. The 121.5 Mhz ELT beacon went off but as these are not monitored anymore he shut it off and instead Henry used 126.7 Mhz to make a call to another plane in the vicinity and requested help, giving them his GPS co-ordinates.

One photo *(see page 3)* shows how close they actually came to making the lake. The plane came from the top of this photo, but spun around when it hit the trees. So close… yet so far!

Meanwhile elsewhere in the cockpit, Henry's Spider Tracks unit was doing its thing and reported via satellite his situation and co-ordinates by sending a text message to his daughters and his wife. Henry made a point of letting us know not to set a cell phone near the Spider Tracks unit, as it may send out a false distress call. Henry said his wife was assuming this had happened again and was less concerned about the distress messages than his daughters were.

By the time the message got from the overhead pilots to SAR in Trenton, they had already received a call from Henry's daughter giving the co-ordinates of his downed aircraft. A Hercules was quickly dispatched from Winnipeg and within hours, 3 parachutes were descending from above the crash site. They attended to Henry and used Henry's swede saw and axe to clear a large patch of brush for the rescue helicopter to land. Upon arrival a short time later, the paramedics got Henry aboard the Canadian Forces Griffon Helicopter, which had come from CFB Cold Lake, Alberta and headed to Points North

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BUILDING A REPLICA OF CANADA'S FIRST AEROPLANE

On December 17th 2003 in Kitty Hawk, North Carolina the USA celebrated the Wright brothers' first successful flight of a powered, controllable, heavier than air aircraft. In attendance at that event were fourteen aviation enthusiasts from the Niagara region in Ontario. This celebration served to kickstart an idea to celebrate Canada's own first flight, that of Alexander Graham Bell's Silver Dart on February 23rd 1909 at Baddeck, Nova Scotia.

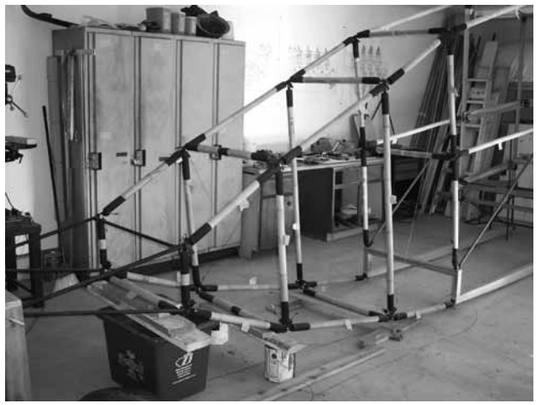
By Doug Jermyn

On December 17th, 2003 in Kitty Hawk, North Carolina the USA celebrated the Wright brothers' first successful flight of a powered, controllable, heavier than air aircraft. In attendance at that event were fourteen aviation enthusiasts from the Niagara region in Ontario. This celebration served to kick start an idea to celebrate Canada's own first flight—that of Alexander Graham Bell's Silver Dart on February 23rd 1909 at Baddeck Nova Scotia.

An initial association called the Aerial Experiment Association 2 was soon formed (after Bell's original AEA group) and construction of a Silver Dart replica was begun in the early spring of 2004—in a back yard garage in Welland, Ontario. As a reference, some rudimentary three view drawings and photographs were obtained from the A. G. Bell museum in Baddeck, the Cape Breton University archives and the Canadian Aviation and Space museum in Ottawa.

The AEA2 goal was to create a "2 in 1" Silver Dart replica—and airplane that could initially fly safely (to DOT. ultra light regulations) and would recreate the first powered / controllable flight in Canada and the British Empire. Once the aircraft had accomplished this task it would then be reconfigured to a highly accurate, museum standard representation of the original 1909 Silver Dart.

Above: a number of flights were performed on February 22nd (the celebrations were held a day early due to an unfavourable forecast on the 23rd) - the last being almost 3000 feet long with a shallow S turn thrown in. Photo by Marian Whitcomb.



Right, By the end of summer 2004 the rear fuselage truck and wing support assembly had been completed. Above, To make the fuselage structure rigid, each horizontal and vertical bay was cross braced with 1/16th inch diameter cables—tested to a tensile strength of 800 lbs. The final result was an amazingly rigid structure.

By the end of summer 2004 the rear fuselage truck and wing support assembly had been completed --using the same ash and Sitka spruce materials as in the original Dart. Initially the funding for the project came out of the volunteer's pockets or with personal loans or materials donations. Construction of the forward bamboo fuselage then got underway and took us well into 2005 to complete. A total of 43 bamboo struts and crossbars had to be fashioned along with many dozens of original style turnbuckle and cable assemblies. The turnbuckles were made from steel straps and shortened and bent motor cycle spokes. To make the fuselage structure rigid, each horizontal and vertical bay was cross braced with 1/16th inch diameter cables—tested to a tensile strength of 800 lbs. The end result was an amazingly rigid structure.

During this construction period we took the opportunity to formally incorporate our association as a non-profit, limited company—The AEA2005. This was to add some legitimacy to our project for fund raising purposes. As the project gained publicity and momentum the following major companies and/or associations donated cash or materials and guaranteed the success of the program:

Pratt & Whitney Canada
Leavens Aviation
Ontario Trillium Foundation
Bombardier
Air Force Association of Canada wings
Air Canada Pilots Association
Silver Dart Centennial Association

With the fuselage complete and set aside at the end of 2005 we then began working on the wings and control surfaces. The two canard elevator panels, four ailerons and rudder frames were all constructed from old growth Douglas fir. The completed frames were then sent out to a shop in Vienna Ontario to be covered in Ceconite and silver doped. It is interesting to note here that while picking up the finished elevator panels we noticed a set of Pitts Special wings being covered in the shop---and were told they belonged to Canadian astronaut Bjarni Tryggvason. An invitation was sent to him to visit our project and two weeks later he flew to Welland in a Harvard and was given a tour of our shop. His interest was to have students in his Flight Dynamics course at the University of Western Ontario analyze the flight characteristics of the Silver Dart. During his visit we casually asked him if he would like to be our test pilot and to our surprise his answer was an enthusiastic "yes".

Fabrication of the biplane wing structural spars, ribs and vertical struts occupied the best part of 2006 and into early 2007. This was the most tedious part of the whole construction process.

All the spars and struts were assembled, the leading edge down on the hangar floor and then all the turnbuckle/cable assemblies were installed and tensioned. The bare wing structure was then attached to the fuselage for final adjustments. Above right, the Silver Dart Replica in its present home at the A.G Bell Historic Complex.

34 horizontal spars and 18 vertical struts were sawn and hand planed from Sitka spruce planks.

45 wooden wing ribs were fashioned by laminating two half inch wide by one eighth inch thick strips of spruce between two similar strips of ash –as was done a hundred years ago on the original Silver Dart!

14 steel ribs with end caps to insert the horizontal wing spars were made and welded in a jig.

48 end caps were welded for the vertical struts and aileron bay spars.

By the early Spring of 2007 we had out grown our small fabrication shop—we could not put the fuselage on its wheels for lack of ceiling height and could not assemble the four 23 foot long wings. Fortunately we received an invitation to move our project into the Russell Aviation Group hangar in South Niagara Falls. Sharing this hangar with a Harvard, a Spitfire, a Hurricane and an Me109E was an amazing boost to our productivity.

As the end of 2007 neared we had:

-Fabricated the temporary engine mount for our borrowed 64 year old Lycoming 0-145B engine which had been inspected, retimed and tested by Leavens Aviation
-Received our "flight" propeller from Ed Sterba in Florida
-Created a minimal instrument panel-(housed in an IKEA cake tin) with a master switch, twin mag switches, a tach, air speed indicator and oil pressure and temperature gauges.
-Installed a temporary "cockpit" floor to mount a set of rudder /toe brake pedals and installed a set of brake calipers on the rear wheels

It should be pointed out here that we had two other projects on the go throughout the program. The first was an out reach program to teach students, cadets, service clubs etc. about Alexander Graham Bell and the Silver Dart history. The second program was to prepare for the post centennial flight time when we planned to convert the airplane into its museum configuration. We had very talented volunteer craftsmen build amazingly accurate replicas of the Curtiss V8 engine, the torpedo shaped fuel/oil tank, the large copper tube radiator and the 8 foot diameter propeller. These four components are the only surviving items from the original Silver Dart. The engine and propeller are on display in the Canadian Aviation and Space Museum in Ottawa and the fuel tank and radiator are displayed in the A. G. Bell museum in Baddeck. Each of these items was meticulously measured and photographed to ensure the accuracy of our replicas.

Thoughout 2008 we continued to

make progress building up the wing structure and installing the rudder support framework. Initially all the spars and struts were assembled, leading edge down on the hangar floor (to ensure a straight wing) and then all the turnbuckle/cable assemblies were installed and tensioned. The bare wing structure was then attached to the fuselage for final adjustments (Photo#3). Finally, the wing structures were broken down to have the silver fabric panels installed. Late in the year the upper right inboard wing panel was temporarily removed and sent to the University of Western Ontario to be tested in their wind tunnel. No sign of trailing edge flutter or performance problems were encountered. Bjarni Tryggvason had also built scale models of the wing and elevator assemblies and tested them in the tunnel previously.

Top: Some volunteers admire the Dart.
Centre: engine run-ups were done in January. What could be more Canadian than that?
Left, the Silver Dart replica was rolled out in May 2010 for public viewing in more congenial weather.

The resulting data gave us good confidence that we could safely fly!

Although our target was to have the aircraft finished by September 2008 we did not actually finish until the first week of January 2009 (photo #4). With the February 23 Centennial of Flight date rapidly approaching, the pressure was mounting! On January 11 2009 the aircraft was rolled out on the coldest day of the winter for engine start up tests (photo #5).

With a bit of coaxing and some ether starting fluid the engine soon fired up and ran well.

Construction Technical Information

The bamboo we used to fabricate the fuselage and rudder support struts was about ¼ inch in diameter larger than on the original Silver Dart. Although it was a bit heavier than the original we felt the extra strength was worth the penalty. The steel end fittings were fixed into the struts with epoxy glue and steel pins and then the strut ends were fiberglass wrapped to prevent splitting of the bamboo. Finally the strut ends were wrapped with "hockey" tape so they looked just like the originals.

The interior frames of the rudder and elevator panels were cross braced with 5/32 inch diameter carbon fiber rods—instead of drag wiring as on the original aircraft. Once covered and doped---who would know!

The wing covering fabric was a white nylon upholstery fabric that was painted silver with ordinary Tremclad paint. This worked beautifully and was a lot cheaper (albeit heavier) than silver rip stop sailcloth

It was an amazing feeling watching our Silver Dart replica duplicating the original Silver Dart's flights 100 years earlier.

at $24 per yard. One of our volunteer builder's wives who was a talented seamstress sewed the 13 panels and 14 steel rib sleeves. To reinforce the panel and sleeve edges to accommodate the inter panel lacing; over 1800 grommets were set by hand.

All the turnbuckles for the wing and fuselage cables were fabricated from steel straps and modified motor cycle spokes. The smaller elevator turnbuckles used bicycle spokes. Modern turnbuckles were only used in high stressed areas like the wing roots. Sample cable/turnbuckle assemblies were tested in tension machines to ensure they met the cable breakage specs. (ie. 800 lbs for the 1/16th inch cable and 1200 lbs. for the 3/32 inch diameter cable).

Although our flight engine was rated at 65 SHP at 2200 rpm we were never able to get much more that 2000 rpm out of the engine—probably since our Sterba propeller was mismatched.

As mentioned previously, for pilot safety reasons we temporarily added rudder pedals, brakes, an instrument panel and a crash worthy pilot's seat with a safety harness. In addition we re-rigged the ailerons to connect with the "steering wheel" rather than a shoulder yoke as was on the original Silver Dart. This would be a much more intuitive and sensible control system for a modern pilot.

Because of the extra equipment and heavier wing fabric, our replica was about 280 lbs heavier than the

On February 8, just weeks before the official celebrations, a series of short flights were conducted of increasing distance. Test Pilot Tryggvason commented it was (no surprise) "like flying a 100 year old airplane".

original Silver Dart. This meant that we would need about 30 extra lbs. of lift out of the elevator. To achieve this we added a temporary 4 inch curved leading edge extension to the flat plate elevator panels. This probably gave us an extra 9 or 10 degrees of elevator pitch before the onset of detrimental stalling.

The airplane conformed to DOT ultra light regulations and was given the C-IIGY registration letters—although we were exempted from painting these letters on the wings and fuselage---it just wouldn't look right!!

Our replica was often described by the media as "rickety" but in fact it was a very rigid structure. Lifting one wing tip one inch would cause the other tip—49 feet away-- to go down an inch.

For the initial flight tests we installed a smaller diameter nose wheel to effectively lower the pitch of the main wings and hopefully prevent them lifting before the elevator was ready to fly.

Above: The replica with some of its more recently designed siblings: a CF-18 Hornet, CF-86 and the Canadian designed Tutor.

Hamilton Flight Tests

Our Silver Dart replica arrived in Hamilton the first week of February 2009 as a guest of the Canadian Warplane Heritage Museum (photo #6). It was quickly reassembled and carefully inspected for its first taxi and flight tests. Museum attendance and media attention continued to grow each day. On February 6, after a few taxi circles around the museum ramp and with the co-operation of the Hamilton International airport tower crew we conducted six successful test flights of increasing length. The first flight was just a "bunny hop" and the last was 90 seconds long and went the full 5000 feet of the runway. Lift off was consistent at 42 kmh. and cruising speed was 48 to 50 kmh. Videos of these flights can be seen by searching YouTube for Silver Dart Centennial Replica. Following the last flight, our pilot Bjarni Tryggvason was asked what it was like flying the replica Silver Dart—his answer was" like flying a 100 year old airplane"!

The Baddeck Experience

Following the test flights the airplane was disassembled and loaded on to two 53 ft. semi trailers bound for Baddeck Nova Scotia. They arrived of Feb 16 and the aircraft sub assemblies were hand carried down to a large tent that had been erected on the shore of Baddeck Bay-- which, by the way, was frozen over for the first time in about 10 years! By February 21st the airplane had been reassembled amid much anticipation, fanfare and national media attention. The next day dawned clear and cold with little wind so the decision was made to go out on the plowed ice runway and get in some "practice" flights. Word had gotten around however and as we emerged from the assembly tent we were met with many hundreds of people already out on the ice.

The first attempt was just a taxi run to feel out the ice runway surface but upon turning the airplane around we broke the small nose wheel due to a quality control problem—ie. loose hub spoke to rim bolts. It was back in the tent then to install our original 22 inch diameter nose wheel. Two hours later the Silver Dart was back out on the ice and Bjarni Tryggvason was able to get in five successful flights—the last being almost 3000 feet long with a shallow S turn thrown in. These flights can also be seen on YouTube videos. It was an amazing feeling watching our Silver

As an added bonus on our last flight, the Vintage Wings Hawk 1 Sabre jet piloted by astronaut Chris Hadfield and the Airforce Centennial CF18 thundered over head.

Dart replica duplicating the original Silver Dart's flights 100 years earlier. As an added bonus on our last flight, the Vintage Wings Hawk 1 Sabre jet piloted by astronaut Chris Hadfield and the Airforce Centennial CF18 thundered over head. It was a sight that probably won't be duplicated for a very long time –if ever!

We were not able to fly on the actual February 23rd anniversary date since the weather had badly deteriorated and we did not want to risk having an accident as happened with the RCAF 50th anniversary Silver Dart replica. We were in fact quite happy to have closed out the first century of flight in Canada on February 22nd.

Post Centennial Activity

Following the Baddeck flights the airplane was disassembled and shipped to Greenwood Nova Scotia airforce base where it went on display for two events in April and May. This was rapidly followed by air shows in Niagara Falls, Toronto, Bagotville Quebec (photo #10), North Bay, Brampton and finally and fittingly in A. G. Bell's home town of Brantford, Ontario. After this final showing in September of 2009 it was back to the RAG hangar in Niagara Falls.

Though the winter of 2009 / 2010 the Silver Dart replica was stripped of all its "non original" Silver Dart

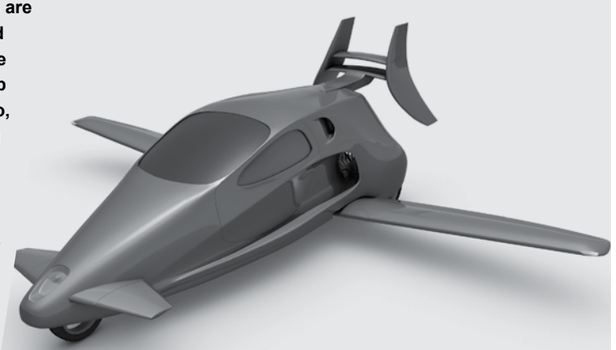
hardware and the previously mentioned replica Curtiss V8 engine, propeller, fuel tank and copper radiator were installed. It was during this time that we also discovered an old photo that solved a long standing question of where the engine batteries and ignition coil were located on the aircraft---they had been strapped to the "plank" seat just behind J. A. D. McCurdy the original Silver Dart pilot.

The newly configured Silver Dart Centennial Replica was rolled out for a local viewing in May of 2010 (photos #10 and #11) and shortly after it was sent to the Canadian Air and Space Museum in Downsview Park, Toronto. It was on display there until September 2011. We had to remove the aircraft at this point since the museum was forced to vacate its premises by Parks Canada. The Silver Dart Centennial Committee in Baddeck reacted quickly and purchased two semi trailers and brought the airplane back to Baddeck for safe storage. In February of 2013 Parks Canada decided to display the aircraft in the existing A. G. Bell Historic Museum complex along side Bell's DH4 Hydrofoil. In May of that year a large hole was cut in the side of the museum and the still disassembled Silver Dart was inserted piece by piece through the hole and lowered 9 feet to the museum floor. Three days later it was reassembled for the last time and perched 10 feet high on an aluminum tripod. The following evening at a gala event in the museum the AEA2005 officially sold the aircraft to the Silver Dart Centennial Committee for the princely sum of "one shiny loonie". Our nine year project had come to successful and fitting end!

As a final word the AEA2005 would like to encourage all aviation enthusiasts in Canada to someday make the "pilgrimage" to Baddeck , the Birth Place of Aviation in Canada—and tell them at the A.G. Bell Museum that we sent you!

Doug Jermyn *is the president of AEA2005. He can be contacted at deejay27@cogeco.ca*

Switchblade Roadable Aircraft Update



Sam Bousfield writes: The biggest news is that our right wing skins are finished and ready for assembly. Now all we need are the spars and ribs, and we will be assembling the wings! The wing hinge parts are about half completed at a CNC (computerized milling machine) shop in Wisconsin. The balance should be done over the next week or so, and then they will go to the anodizing shop to put a durable coating on them. The hinges are an exterior piece, and they will be made more durable by a coating designed to protect aluminum in that environment.

Work was completed on our electrical layout, and wiring schematic. In the avionics industry, flight instrument equipment is frequently changing and advancing in their capabilities and function. We are moving to keep track of those changes and opportunities to advance along with them, and to provide a more robust and simple avionics solution. Our goal is to make the Switchblade's equipment simple, intuitive, and easy to use.

Also in our mind is the future requirement for ADS-B, which is the part of the Next Generation air traffic control system that the FAA has mandated be in each aircraft by 2020. ADS-B (Automatic Dependant Surveillance – Broadcast) is a piece of equipment that sends out a signal that is then re-broadcast to all aircraft in the vicinity which will let each aircraft 'see' the others in their region, and allow more effective routing of aircraft. This will make it much easier to see and avoid other aircraft, which will make the skies even safer than they are now. We have several ways of handling this requirement, and while not a current requirement, we are working to provide the solution now rather than give that problem to purchasers in just a few years. Our equipment choice will allow Switchblades to exceed the required standards, and be capable of upgrading further.

Rotax Bing Carburettor Floats Safety Bulletin

RAA

ROTAX HAS JUST ANNOUNCED a Mandatory Service Bulletin for the Bing carburetors of their 912 and 914 series engines, both certified and Ultralight. A batch of carb floats does not meet the spec and these can absorb fuel, lessening their buoyancy. This results in a higher than specified fuel level in the float bowl, causing a richer mixture, and at the limit it could mean overflow of fuel through the float bowl vent. The richness imparted by a high fuel level might not be noticeable at high power settings but it can result in a very rich idle mixture that might make idle impossible. There is also the safety consideration of having fuel spilling over in the engine compartment

There are two procedures to check this problem. Without removing the carb the procedure is to remove the cold start enrichener mechanism. The owner then uses a syringe available from Rotax to inject a measured amount of fuel to see if how much it takes to overflow the carb, to indicate whether the fuel level is too high. A new gasket is required at each reassembly.

Alternatively the carb may be removed, and the floats must be weighed as a pair on a scale with a resolution of 0.1 grams. Together the two floats must weigh no more than the weight specified in the service bulletin. Heavy floats indicate absorption of fuel, and these must be replaced in pairs.

The floats in question are part # 861 184 which were produced beginning approximately June 2012.The full procedure is given at the Rotax service website www.rotax-owner.com . The service bulletins are SB-912-065, SB-914-046, SB-912UL-065, SB-914UL-046. Serial numbers of the affected engines and carbs are given in the bulletin. *www.rotax-owner.com* is where you start.

The same series Bing carb is used on both HKS and some Jabiru engines. Owners of these engines should contact their dealers to see how they are handling the situation.

A call to Rotax brought forth the further information that the same floats are used in the Bing carbs used on the two stroke engines. These carbs have a different cold start mechanism so the Rotax-supplied syringe cannot be used. The weighing procedure is the only means of determining if the two stroke carb floats are defective.

Van's RV-10 Service Bulletin

RAA

THE NOSEGEAR OF THE RV-10 is a third class lever that compresses an elastomeric shock absorber against a socket that is part of the engine mount. In some examples the socket has experienced cracking and Vans has issued SB14-8-29, details of which are available on the www.vansaircraft.com website.

The procedure is to take the load off the nosegear by tying the tail down so that the shock absorber unit may be removed. A careful inspection of the socket of the engine mount is to be carried out, and for this the powder coat paint may have to be removed either by abrasion or by the use of a chemical paint stripper. In some cases there will be cracks emanating from the centre hole that accepts the top end of the shock absorber unit. To date this has happened only to aircraft that have had rough field operations.

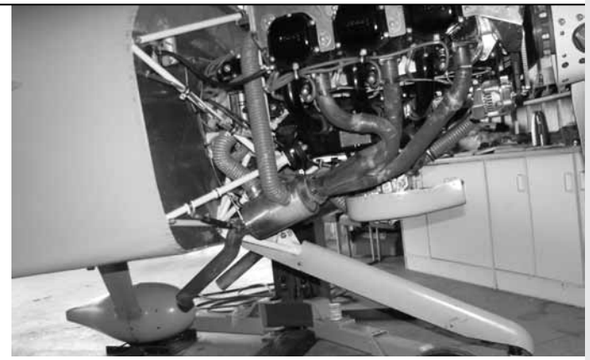
If there are no cracks the procedure is to slip the Vans-supplied doubler plate over the top of the shock absorber unit and reinstall everything. The plate is thick enough to spread the bump loads to the edges of the socket in the engine mount.

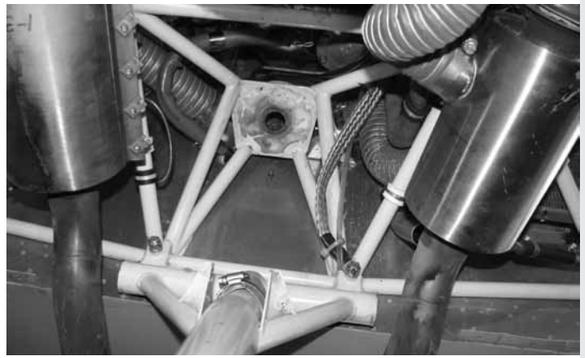
There is a second check to be done at this point. With the shock installed the owner must check for vertical play that can occur as a result of wear on the elastomeric donuts of the shock assembly. If more than 3 washers are required to remove the play the donuts must be replaced with new. The whole procedure should take only half a day.

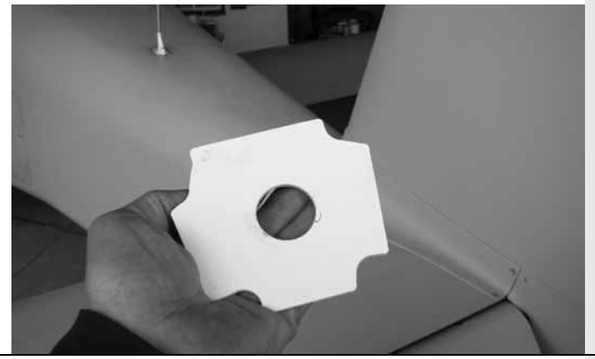
If there are cracks the engine and mount must be removed to have Vans-supplied reinforcement pieces welded in place to reinforce the socket. For most owners this will mean that the mount must be removed from the engine to be sent out for "precision welding".

Although Vans does not specify the method it would be foolish to use a wire feed welder, either with or without argon gas. Vans specifies that ER70 S-2 filler rod must be used. This is the rod commonly used when TIG or oxyacetylene welding, and every welding supply will stock it.

As before, when installing the shock no more than 3 washers may be used to eliminate play, or the elastomeric donuts must be replaced with new. **R**







From top down: 1) The nosegear hinges to the engine mount at the base of the firewall; 2) The socket area on this plane has had the powder coat removed to inspect for cracks. 3) The steel reinforcement plate must be painted... 4) ...and dropped on top of the shock before reinstalling it to the engine mount

Best duct tape story **ever**

During a private "fly-in" fishing excursion in the Alaskan wilderness, the chartered pilot and fishermen left a cooler and bait in the plane. And a bear smelled it. This is what he did to the plane.
The pilot used his radio and had another pilot bring him 2 new tires, 3 cases of duct tape, and a supply of sheet plastic. He patched the plane together, and *flew it home !*
Duct Tape ? Never Leave Home Without It!

Mountains / continued from page 19

and flying clubs of the foothills.

I'd have to say my own mountain-flying experience is quite extensive. I learned from some of the best while working as a tow pilot launching sailplanes. At my age, it's probably been good decision making (fear) rather than great skill that's kept me out of trouble. There have been times when it would have been a whole lot safer to be on the ground than caught in some of the bad weather I've been in.

Several times, pilots have asked what the best way through the Rockies would be if flying from Alberta over into British Columbia. I always say you can't go wrong with the route westbound from Jasper to Valemount, then south following the Thompson River through the towns of Blue River, Clearwater, then Kamloops. When I was in my teens, I lived in the Alberta town of Hinton, located on the Yellowhead Highway between Edmonton and Jasper. Just 15 miles from the first range in the Rocky Mountains and about 40 miles from Jasper town site, the highway through there was familiar to me. That was before becoming a pilot, and one reason the road existed right through to British Columbia was because it was a natural corridor. No point on that highway between Kamloops and Edmonton is higher than 3,500 ft. ASL. And oddly enough, that point is well outside the mountains, almost 40 miles east at a site called Obed Lake. The land surrounding Obed is relatively low foothills. Through the mountains, the average elevation of the highway is between 1,200 and 1,700 ft. ASL.

Years later when I obtained a private pilot license in B.C., I never though twice about flying off to Edmonton or any other Alberta destination. It just seemed natural to take a C-150 or 172 through that route. You don't need to be higher than 4,000 ft, which is usually below most weather in there.

Only once was I caught by the weather, and that was at Blue River, where the valley narrows down and a lot of cloud can plug things up. It was late in the afternoon when I left Edson, Alberta for Kamloops, B.C. with a planned fuel stop in Valemount. After departing Valemount, it was suddenly darker than expected, mainly because the overcast was thickening and getting lower at the same time. Soon it was pelting rain, and I almost had to turn back with just five miles left to get to Blue River. However, flying just above the highway and because the area was quite familiar, I was able to fly straight in to Blue River. Relieved and happy to be on the ground, I stayed the night.

The downside of that route is the unreliable weather forecasting. The mountains throw off a lot of localized wind and cloud that just doesn't register with FSS predictions. Calling ahead to a helicopter operator in Valemount gave me some good information one time. Just getting a reliable report from someone on the ground was helpful in a go or no-go decision. There is fuel available at Valemount, but none in Blue River unless you have a jerry can, can burn mogas and don't mind a one-mile walk into town. If you're east bound, the next fuel can be bought at the Hinton-Entrance strip, but call ahead and someone from the flying club will meet you. Edson has fuel as well.

There are several other routes which VFR pilots can take to get across the rocks. From Kamloops to points such as Red Deer means flying much higher in spots, through Revelstoke, over the Rogers Pass and into Golden. Most of the route is over the Trans Canada Highway. But at Golden, you can leave the highway and fly north through the valley of the Blackberry River. That little departure from the security of a highway below, is a short hop of only about 30 miles, and will bring the VFR pilot to the Jasper-Banff highway at Saskatchewan River Crossing. The valley is steep and quite narrow, but the floor is only around 2,000 to 3,000 feet ASL most of the way through. Several peaks and glaciers rise to near 11,000 feet on both sides of that valley.

Once through there, you're in Alberta, and eventually you will exit the mountains near Rocky Mountain House. For any mountain flying, it is best in the early morning hours. Plan to get through before the mid-day turbulence kicks up and usually you're fine.

There are instructors who can offer specialized training for mountain flying. It's a good idea to be briefed on the basics of the unique situations you can find yourself in when flying to unfamiliar territory. Personally, I stay close to the VFR routes, best over highways, and wait for good-weather days.ww Maybe there were higher risks than I understood when I started flying in the mountains. Most problems you will run in to involve wind and weather. A good briefing and good judgment will help to keep you out of trouble. The rewards include the fantastic scenery viewed by very few privileged pilots and their passengers. R

Most problems you will run in to involve wind and weather. A good briefing and good judgment will help to keep you out of trouble

The iconic Lake Louise looks surprisingly small from the air. George Gregory photo.

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

President's Message / cont'd from page 2

coming and there will soon be a lot more inexperienced operators filling the airspace with drones.

It is nice that Transport Canada has a webpage about how to operate a drone but they have to do more than just post it and feel that they have done their job on the matter. They should be contacting hobby shops and retailers and they should do a media blitz to let people know the responsibilities that go with flying a drone. It just made the news that the FAA has announced that they will prosecute operators who fly near stadiums, likely using their homeland security law. Meanwhile Transport Canada has their nice quiet webpage.

What can you do as a pilot? You could google "transport canada uav" to read the webpage. You could then print off some copies and take them to your local hobby shop, and ask that they let the purchasers know the rules. Do not wait for Transport Canada to do this for you. Few of those people ever leave the ivory tower on Sparks Street in Ottawa and even fewer are ever PIC.

AIR CADETS

Do you happen to have a spare Lycoming or Continental engine that you do not need? The Air Cadets at Waterloo Airport are now setting up a training course to get young people jumpstarted on becoming AME's. The engines do not have to run but they should be complete enough to be used for teaching purposes. The cadets have charitable status so you could even get a tax receipt. Give me a call at the 800-387-1028 number. R

RAA Chapters and Meetings Across Canada

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

ATLANTIC REGION

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

QUEBEC REGION

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

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

MONTREAL (LONGUEUIL): Chapter 415, Meeting in French second Wednesday at 8 pm, at CEGEP Edouard Montpetit 5555 Place de la Savane, St. Hubert, PQ. Contact president Normand Rioux at NRIOUX@lapresse.ca

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

ASSOC DES CONSTRUCTUERS D'AVIONS EXPERIMENTAUX DE QUEBEC (QUEBEC): Third Monday 7:30 pm at Les Ailes Quebecoises, Quebec City Airport.

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

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

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

ONTARIO

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

COBDEN: Third Thursday of the month at the Cobden airfield clubhouse 20:00 hrs. President - Grantley Este 613 432 0797 este@compmore.net

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. George Elliott gaelliott@sympatico.ca 705-445-7054

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 Pres. Karl Wettlaufer 905 876-2551 or lazykfarm@sympatico.ca

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

KITCHENER-WATERLOO: Kitchener-Waterloo: New Meeting Time. We now meet the Second Monday of each month at 7:30pm in the upstairs meeting room of the Air 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 p.m. At the Air Force Association building at the London Airport. Contact President Phil Hicks p.hicks@tvdsb.on.ca 519-452-0986

MIDLAND/HURONIA

Meeting: First Tuesday, 7:30 pm at Midland/Huronia airport (CYEE) terminal building. Contacts: President Ian Reed – 705-549-0572, Secretary Ray McNally – 705-533-4998, E-mail – raa.midland@gmail.com .

NIAGARA REGION: Second Monday at 5:30 pm in the orange hangar at Niagara Central Airport June to September. Contact Pres. Elizabeth Murphy at murphage@cogeco.ca , www.raaniagara.ca

OSHAWA DISTRICT: Last Monday at 7:30 PM at the Oshawa Airport, South side, 420 Wing RCAF Assoc. Contact President: Jim Morrison ,905 434 5638 jamesmorrison190@msn.com

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

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

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

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

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

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

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

MANITOBA

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

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

SASKATCHEWAN

Chapter 4901 North Saskatchewan. Meetings: Second Tuesday of the month 7:30pm Prairie Partners Aero Club Martensville, Sk. info at www.raa4901.com. Brian Caithcart is the chapter president. Contact email: president@raa4901.com.

ALBERTA

CALGARY chapter meets every 4th Monday each month with exception of holiday Mondays and July & August. Meetings from 19:00-22:00 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 Bob White 403-472-1035 pittsflyer111b@gmail.com

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

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

BRITISH COLUMBIA

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 Mekong Restaurant.1030 Harvey Ave. Dinner at 6:00pm, meeting at 7:30pm Contact President, Cameron Bottrill 250-558-5551 moneypit@uniserve.net

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

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

CHAPTER 85 RAA (DELTA): First Tuesday 7:30pm, Delta Heritage Airpark RAA Clubhouse. 4103-104th Street, Delta. Contact President President: John Macready jmacready@shaw.ca. Website www.raa85.ca.

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

THOMPSON VALLEY SPORT AIRCRAFT CLUB: Second Thursday of the month 7:30 pm Knutsford Club, contact President Wally Walcer 250-578-7343

ALASKA HIGHWAY: meetings held every third Thursday of every month (except July & August) at the Taylor Fire Hall at 7:30 p.m. For more information call Gerry at 250-782-4707 or Heath at 250-785-4758.

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

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

Classified Ads

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

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

Deadline for submissions *is the first of the month preceding date of issue.*
Artwork: Rates apply to camera ready artwork. Digital files are preferred and should be sent as email and in .txt format, PDF, JPEG, MS WORD, Photoshop or other common file types. Advertising is payable prior to printing of magazine unless other arrangements have been made. Payment is in Canadian funds. 10% Discount applies to one year (6 issues) insertion paid in advance. Commercial Classified ad rates 1/8 page minimum.
Advertising Policy: *The Recreational Flyer Publisher reserves the right to refuse any or all advertising for any reason stated or unstated.*
The Recreational Aircraft Association Canada does not assume responsibility for advertisements, but does exercise care to restrict advertising to responsible, reliable individuals.
Please note: Ads running more than 3 issues must be renewed to guarantee continued display in the magazine.

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

Recreational Flyer Magazine

Registration Mail Publication No. 09869

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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

WANTED: CONTINENTAL A65 PARTS: Pistons, cylinders, carb, magnetos, rocker covers, spyder, cams, etc. Also interested in complete engines up to C90. Email Chris at cphorsten@yahoo.ca or call 416-918-6569.

HANGAR FOR RENT at YKF (Kitchener-Waterloo) Available immediately 40 x 40 feet, concrete floor, Bi-fold door, unheated, with hydro for engine pre-heating and extra lighting. Good access to taxiway, close to RWY 32 The hangar is large enough to accommodate two small aircraft. Rent is $400.- per month plus HST For more info contact Rudy Hane at 519 648-3006 519 648-3006 FREE

Hangar For Sale at Sundridge Ontario, beside CPE6 airpark. Hangar is a wood framed building with steel siding, roof, and doors, with a gravel floor. 40x40x10 on 7.5 acres. Taxes last year were $352. Asking $50,000. Phone 705-386-9080. Email whiteheadbj@msn.com

RV6 for sale $72,000, 410 hrs TT, Lycoming A1A 180 hp, Sensenich Fixed Pitch Propeller, JPI Fuel Flow Gauge, Dynon D10A and autopilot servos, Dynon Heated Pitot, Kannad 406 ELT, GPS Garmin Aera 560, Transponder KT76A, Odessey Battery, Bell Tailwheel Yoke, Stereo Intercom PM3000, Garmin SL30, ADF KR87, Certified for IFR, Call George at 647 588 8544
CNC3 BRAMPTON, HANGAR SPACE FOR RENT. Suitable for high wing. Heating, electricity and bi-fold door. $335 monthly. 905-861-9535 Paul Horsten.

FOR SALE MINI MAX. TTSN220 TSEO40. In wing tank. New ICOM radio. Always hangared. Aluminum skis. 447 Rotax.
Very good condition. $8900.00 OBO. Contact by phone only at 780-460-6841 (Alberta)
Sump for O-360, complete and in good shape, includes heater and rear mounted carb. This was removed from a Sundowner. Asking $500 OBO. Located at my hangar in Hanover Ontario, will ship, postage or UPS extra. Please call 519-881-6019 between 9 am and 8 pm EST or email to fleetair@wightman.com

4 Pietenpol lift struts for sale.They are brand new and are made from 4130 streamline tubing bought from Aircraft Spruce Part # 03-00192. Wall thickness 0.065. major axis 2.697", minor axis 1.143"
These have been epoxy primed and painted black -price: $1500. pjb@ornithopter-pilot.com Ontario

1946 Luscombe 8E, 2755TT 90 Cont. 1108 S.M.O.H., Alternator, Val Radio, Skis, Paint and interior good, $24000. firm.
Also a Benson Gyro with McCutcheon Blades. Also a partially Pietenpol project. Best offer.
306-645-4320. Rocanville, Sask.

0-290-D Lycoming Engine with newly overhauled carb, 6 Bolt prop extension
Newly reconditioned 80 amp light weight alternator. Starter. 80 amp gel-cell battery. Cooling plenum. Log book and maintenance manual Asking $8,000 OBO ontact Norm at graham110@rogers.com

VW engine parts – several cranks $25 each. A pair of single port heads with valves, springs, retainers, includes rockers shafts and arms - $75 each, $125 the pair. Camshaft $25, rods $20/set.. Full set of1600 cylinders with pistons but no rings -$100. Updraft intake system for single port $50. garywolf@rogers.com

Czech aluminum 1150 floats with mounts for Savannah / 701.$6500. al.hayduk@shaw.ca

Engine sump for Lycoming 150/160 hp with intake tubes and oil pickup tube. Removed from Grumman Traveller. $250 OBO. 519-925-3712 flybobbriggs@bell.net

1947 Stinson 108-2 Voyager w/float fittings, no floats, restoration started by retired AME. Sandblasted and zinc chromate, all new bearings, pulleys, cables etc. All logs and tags included. $7,500 / OBO. 705-653-4525. davidcarlaw@prototyperesearch.com

Corvair Engine For Sale. 1965 Corvair engine ser #T0131RH, 164 cid. Conversion completed in 2006 and installed on Pietenpol by previous owner. $2500. Price includes the engine, the engine mount [for Pietenpol] and the propellor [wood, 66" length and 30 pitch]. Located in Orangeville, Ontario. 519-925-3639. Patricia Jones-Bowman.

Dakota Hawk (Fisher Flying Products) Amateur Built, with Cont C-85 (711.3TTSN) with Warpdrive ground adjustable prop.¬† Full VFR panel including Icom IC-A200 comm, Garmin GTX327 xpdr, AVMap EKP-V GPS.¬† Based in Brampton.¬† Was factory demo plane for Fisher Flying Products.¬†$32,000 OBO For more info paulried@rogers.com or call 416-358-6941 and ask for Paul

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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

Down But Not Out / cont'd from page 21

Landing 18 miles away, where the C-130 Hercules had landed. The two men were transferred to the Hercules and then flown to Saskatoon where Henry spent 12 days, recovering enough to take an airline flight back to London.

Henry arranged for TransWest Airlines of LaRonge, Saskatchewan to use one of their Bell 205 helicopters to lift the SeaBee out of the bush, which was a mere 18 miles from the crash site. Two weeks later Henry and 3 other men went back to Points North, where they spent 2 days dismantling the SeaBee and loading it onto a trailer supplied by XU Aviation in London, who specializes in aircraft recovery. After enjoying the hospitality at the Points North supply depot, they finally made their way home.

Henry showed us the fan belt that shredded and when the alternator bearings failed, throwing the serpentine belt that also runs the water pump. The engine then overheated quickly.

At this point Henry figures it will be about two years before the Seabee will be back in the air, but thankfully his own injuries are healing well. We wish Henry well with his rebuild and thank him for sharing his story and photos with us.

Across Canada *RAA Chapters in Action*

RAA London-St. Thomas

Dave Hertner showed the radiator that he is installing on his RV10. Denny Knott reported that they are working on the tail if the Karatoo project. Mike Stoddard reported the now that other priorities from his move into the local environment have been accomplished a workshop is being established. The workbench can now be seen Bob Buchanan reported that now he has his Spezio Two Holer up to his standard he has it for sale foe $10 000. Roland Knening reported that he is involved in a flight test of his Rebel.

Roland Kreining showed "film" of flights of his Viking powered Murphy rebel. He repoted that the engine is operating flawlessly and he is able to concentrate on flying. With the camera mounted on the vertical tail it was possible to appreciate the flying qualities of the aircraft. Then, with the camera behind the pilots' seats one could see them and the view they had through the windscreen. The presentation finished with a viewing of Roland's first tail-dragger landing.

Roland then took the meeting on a tour of the Smithsonian Museum's aircraft collection with "snapshots" of the many historical aircraft including "Hawks" of the 1030s and The Spirit of St. Louis suspended from the ceiling..

Phil Hicks recounted his adventure of ascending Mount Kilomanjaro. His pictures showed that it is not "climbing" the mountain, but an uphill hike. There were guides to carry supplies and to prepare meals and sleeping accommodation at the camps along the way. What starts out as an easy saunter becomes a one-foot-after-the other struggle as the higher altitudes with the deceased oxygen ar reached. Phil had a picture of looking up at cloud, walking through cloud and looking down at cloud. And the triumphant picture at the 19,540 foot peak.

In the November meeting, Chapter member Dr. Henry Chapeskie presented pictures of his adventure to Northern Saskatchewan with his son-in-law Rikie. His presentation included the force landingmisadventure with his Republic Seabee and the subsequent return of it to its home base. Dr. Chapeskie climaxed his presentation with a lateral CT scan of his vertebral column showing the result of a compression injury.

RAA Scarborough/Markham

The summer BBQs in July and August continue to be a feature of the Chapter. Our return to Markham Airport after many good years at the home of Anne and Dave Austin seems to be working well. Our people (Jack, Bill, Bob, etc.) have found a nice site on the airport to set up operations. Turnouts have been good, approaching 20 people or so. Ed Weeks and some out-of-town visitors showed up in August. The BBQs continue to be a success!

We were lucky to have a beautiful day for the Hawke Field Fly-In at Orono on Sunday, 7 September. Quite a number of Chapter members put in an appearance. It was very nice to see Ross Ferguson. We certainly wish him well with the rejuvenation (!) of his Spitfire after a forced landing. Ross seemed to think he had managed to choose the roughest piece of ground for miles around. There were some weird and wonderful aircraft on display. If you have not attended this annual fly-in in the past, make a point of doing so next year.

Most unfortunately, the kind offer By Nick and Karen Schwertfeger to host a Corn Roast/Boil at their cottage on Lake Simcoe on Saturday, 13 September had to be cancelled at the last minute because of bad weather.

Chapter 85 Vancouver

It's apparent when summer comes to an end. The sun goes behind the perpetual clouds and the rains come and so it is the WET coast again. Calgary got 20 cm of snow today. How about that! Despite the rain we did have a couple of days of nice weather.

Chapter 85 held their Annual Election in October. Our Vice President Peter Whittaker graciously stepped up to replace yours truly as President. Peter has some good ideas to keep the chapter active and one plan is to actually build a chapter airplane. We will keep you posted. Peter has some great homebuilding experience, (see Recreational Flyer Sept-Oct 2013) and a long time association with aviation. Bruce Prior, a chapter stalwart volunteered to take on the Secretary position and Gerard van Dijk accepted an offer to be Vice President. John de Visser and Shawn Connelly are the two new directors for 2015-17. Eric Munzer will serve the remaining two years of Gerard's directorship since Gerard will be Vice President next year. Alex Routh will complete his three year term as director in December. We thank him for his service. The other executive members are the same as last year. I am happy that we have another strong executive this year.

Our attempts to secure a club airplane hit a snag again. We had identified a Piper Tri-Pacer at the field as a suitable candidate. But on close inspection and due to the expert work by our aircraft chairman, Cyril Henderson and a fellow tenant Dave Browning, a number of concerns were identified which would require some repair work. We aren't in the market

Top honour for the Best Kit Built aircraft at the 2014 British LAA Rally at Sywell airfield is the RAA [Canada] trophy and this year it went to Richard Parris of Leighton Buzzard for his immaculately built RV-7, G-RVRP This aircraft made its maiden flight in November 2012 from Turweston, the HQ of LAA. Romeo Papa is powered by a 180 HP Superior XP-IO-360 engine and flew to the rally from its base at Holmbeck Farm in Buckinghamshire." Picture credit Nigel Hitchman courtesy Light Aviation magazine. Above,Left to Right Back Row: Tim Novak, Heidi Bekker, Hugo Regier, Gerard Van Dijk, John Macready, John de Visser, Peter Whittaker, David Marsden. Front Row: Cyril Henderson, Tom Boulanger. Missing: Peter Lenger, Alex Routh, Tim Nicholas, George Gregory.

Belite Unveils Amphibious Ultralight

The Belite Sealite amphibious ultralight flew off the water recently. Even with difficult conditions for a seaplane -- light winds, 90+ temps, 3800 ft density altitude -- it performed really well. The Sealite took around 20 seconds to get airborne off the water. Of course, land takeoff times are significantly faster.

The Belite Sealite is powered with a F23 Hirth 50HP powerplant, coupled with a solid carbon fiber three blade propeller.

The plane is reported to be solid on the water, in light chop and in smooth water, and broke out of the calm water by lifting a float first. Belite will post video of the experience soon.

In amphibious (land/sea) configuration, the Sealite is priced at $60,000; in straight float configuration (no wheels, just floats), the Sealite is priced at $50,000.

The Belite Sealite is a variant of the Belite Ultracub. The amphibious version incorporates carbon fiber floats, coupled with trailing link retractable landing gear. The straight float version uses the same carbon fiber floats in a water only (no wheels) version.

For more information: www.beliteaircraft.com info@beliteaircraft.com

for a repair project so we gave the Tri Pacer a pass. The chapter will look for another airplane, specifically an amateur built aircraft at a reasonable price.

The other significant issue this year will be the negotiations for the renewal of the Licence Agreement for Delta Heritage Air Park, which Chapter 85 holds. We will enter into negotiations with Metro Parks in the spring, forming a team to identify and resolve some concerns we have. Trevor Skillen, RAA member and DapCom chair will lead the renewal process but our executive will play a significant part.

Chapter 85 was invited by Metro Parks to participate in the 100th anniversary of Cammidge House in September. Several chapter members contributed to the exhibit. See the pictures attached.

At the September monthly meeting, Peter Whittaker presented a talk on Jabiru engines, the power plant he selected for his Zenith 601D. Peter likes the engine and thinks it is well suited for homebuilt aircraft.

Dave Marsden is continuing with his work on his Dova Skylark. He has received a new engine, a Rotax 912, and he is now also ready to paint his components. Once the aircraft is painted he will assemble the parts. It's looking good and very impressive.

Our chapter has committed to renew its pledge to the BCIT Foundation to fund 750 dollars for the Don Souter Memorial Bursary. We contribute to this award yearly to the delight of BCIT aviation students.

Chapter members are reminded that we do not accept old books or magazines or furniture at the clubhouse as we do not have room in the clubhouse to store these items.

Chapter 85 will participate in the November 11 ceremony at Delta Heritage Air Park. Volunteers are welcome!

The next pancake Breakfast will be held on Sunday November 9 and the next one hosted by RAA will be held on Sunday January 11, 2015. Helpers are welcome!

We have posted a list of member's clubhouse maintenance responsibilities. Please read and consider participating in the maintenance of our facility.

Top: young Taylor May Chubb, a prospective member for 2030, checks out Chapter 85's kiddy trainer. Above, chapter members at the Cammidge House 100th Anniversary event held on September 21. Cammidge House is a historical site maintained by Vancouver Regional Parks. We were invited to attend on behalf of Delta Heritage Air Park as part of the Vancouver Regional Parks System. The picture of the Group includes, left to right, Greg Lukin, Scouts Canada, Tom Boulanger's daughter, Helen, Cyril Henderson, Tom and Wife Annie Boulanger and Bruce Prior. Missing in Photo: John Macready

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