CALGARY ULTRALIGHT FLYING CLUB

Skywriter

COPA

Monthly newsletter of the Calgary Ultralight Flying Club - COPA Flight 114

December 2008

This special guest showed up at the Sundre fly-in last weekend...
An L-39 Albatross

Picture by Brian Vasseur

From The Cockpit

By Pat Cunningham

Well I thought winter was on it's way last month but November actually turned out some pretty nice flying days, one of which was last Saturday, November 29th. I flew out to Sundre with a number of fellow club members as well as numerous other pilots to help them celebrate their new GPS overlay approach being approved by Transport Canada. At one point I counted 15 planes on the ground, another good showing by southern Alberta pilots! Of coarse any day of flying wouldn't be complete without a stop in Linden for pie and coffee.

The results are in for the proposed club name change and your choices will be as follows, in no particular order:

- **CALGARY RECREATIONAL FLYING CLUB**
- **CALGARY RECREATIONAL AVIATORS**
- **CALGARY ULTRALIGHT AND RECREATIONAL FLYING CLUB**
- **CALGARY ULTRALIGHT FLYING CLUB**

Now is your chance to sit back and think about what you would like your club to be called. We will be having a vote on this issue at the January 8th meeting. If you wish your vote to be counted and will not be in attendance at the meeting, please e-mail me with your choice and I will make sure it is counted. You can also contact me by phone if you wish.

Your membership dues are due January 1st, 2009. There will be a small increase of $5.00 to a total of $30.00 per year. Please see Carl Forman or one of the executive as soon as possible to pay.

The annual banquet is once again being looked after by Dave Procyshen and will be held in February, more details will upcoming as well as our annual raffle taking place early next year.

Elections will be taking place at the December meeting. If you are interested in either the Vice President or the Secretary positions, please see Dave Procyshen and let him know, it's still not too late to throw your name into the hat. It takes volunteers just like YOU to keep this club in the great shape it's in right now.

I would like to thank Troy Branch for his presentation of his ongoing RV10 project. It's going to be one beautiful plane in the near future and it's easy to see why Troy remains one of our favorite speakers. As I will be unable to attend the December meeting, I would like to wish you and your families a very Merry Christmas and a Happy New Year!

See you soon!

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Calgary Ultralight Flying Club

COPA Flight 114

Meetings are held on the second Thursday of every month, except July and August, starting 7:00 PM at the Northeast Armory, 1227 – 38 Avenue NE, Calgary.

President:
Pat Cunningham
(403)276-2617
patcunningham@shaw.ca

Vice-President: Ted Beck
(403)203-3282
fusion@platinum.ca

Secretary: Ed D'Antoni
(403)247-6621
dantoni@telusplanet.net

Treasurer: Carl Forman
(403)283-3855
forman.c@shaw.ca

Director: Andy Gustafsson
(403)247-3245
gustafsa@shaw.ca

Past President:
Garrett Komm
(403)257-3127
kommair@telusplanet.com

Web site:
www.cufc.ca

Skywriter

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Editor: Ken Beanlands
(403)295-2079
kbeanlan@telus.net

Moving Up

By Brian Vasseur

A few years ago I started on my commercial license so I'd have something to fall back on once I got to the point where I couldn't handle a corporate job anymore. I have a good job which pays well and I get to play with toys all day but I also have to talk to other people from time to time; that I could do without.

It was getting expensive to build hours renting airplanes. I liked having a new C172 to fly with all the latest equipment but at $175/hr it was costing a lot of money with little to show for it. I figured that I could buy my own plane, burn off the hours and then sell it. Even at a loss it was no worse then renting and I'd be able to fly when I wanted to.

I ended up purchasing a Zenair CH 250 with an O-320 from Salmon Arm. I've gone from crusing at 65 mph to 140 mph which creates many new possibilities. Having an airplane to fly when I want is a lot more enjoyable.

Just about the time I found an airplane I also realized my daughter was a teenager. They're high maintenance. I didn't do a lot of flying for a few years. Now that I can focus on flying again I'm trying to get in about 15 hours a month. That's become a lot easier now that I have 4 hours endurance and can cruise at 140. I can stay in the air and I can actually go someplace interesting. One of the struggles I had with the RANS was that going to places more than an hour away meant I had to be able to buy fuel on the way home. Now I can go pretty much wherever I want without having to worry about being able to get home.

Something else i've enjoyed about moving from an ultralight to a fast homebuilt is that I'm able to cruise at any altitude I want to. Using the NavCanada ASEP products I'm able to find an altitude that gets me the best winds for my trip. On my last flight home from Edmonton I climbed to 9500 and ended up with a 20 kt tailwind.

I haven't forgotten my ultralight roots though and I still like to go places as a group. This weekend we went to Nanton and landed in a wheat field. That's not something you can do in a rented club plane but it's a lot of fun. I'm looking forward to a lot more flying like this.

When I have more time I'll write about some of the stuff you can see when you can fly more than 60 miles away from home.. ✈

Calling For Nominations

By Dave Procvshen

Secretary and Vice President Positions

So I know that many of you have asked yourself "How can I help out the club?" Well here is your chance to get involved and lend a hand.

We have two openings in the club and here is your opportunity to get involved and see what goes on behind the scenes. We will need to elect a new Vice-President as Ted Beck has fulfilled the obligations of this position. Now if you ask Ted what he did he will probably tell you that he felt like he didn't do much but I can tell you that he stepped in when needed to run a meeting, get a guest speaker or whatever needed to be done.

Now with Ted done his term we need someone that can help out Pat Cunningham and the rest of the executive.

This position is a good place to get your "feet wet" and see what new ideas you can bring to the club. If you have ever sat around and wished that our club was more exciting... here is your chance. Now if you know of someone that might fit this profile let me know. I know that it is easier to sit around and let everyone else do the work but remember "many hands make for less work". If no one steps up nothing will ever get done. We also have the position of secretary that has come to the end of its term.

Now having said that Ed D'antoni has offered to let his name stand for this position for another term, but if you have an interest in this position please let me know so that we can have someone that can be in training for this position or else we will be scrambling for someone next time. I would like to thank Ed for all the hard work that he has done for our club. Thanks Ed.

Now that I have asked all of you for your help in this matter

I would like to remind you all that this is in the interest of getting new blood and new ideas into the club. This will also keep us coming back for more good times on the second Thursday of the month.

I can tell you that after being in 3 different positions on the executive it has been a great learning experience.Thanks for your time and I look forward to seeing who steps up to the plate. ✈

CARB HEAT ON WITH CRUISE POWER !

By Al Botting

One of the greatest dangers of aircraft operation is ice. Its effect on the operation of the power plant is perhaps far more insidious than on the aircraft. Carburetor or induction ice is not visible to the pilot. The first indication of icing is a loss of power with the loss increasing at a rapid rate. It is possible to have the power seriously affected in less than a minute after the ice accumulation has started. The engine may cut out completely a short time after this unless corrective steps are taken immediately. Carburetor icing under certain conditions may occur when the atmospheric temperature is as high as 80°F (27C), although generally it is encountered only between 20°F (-7C), and 65°F (18C), when accompanied with a high relative humidity (approx. 50% or greater), rain or overcast. Below 20°F (-7C), the danger of ice formations are less because the quantity of water vapor in the air is slight.

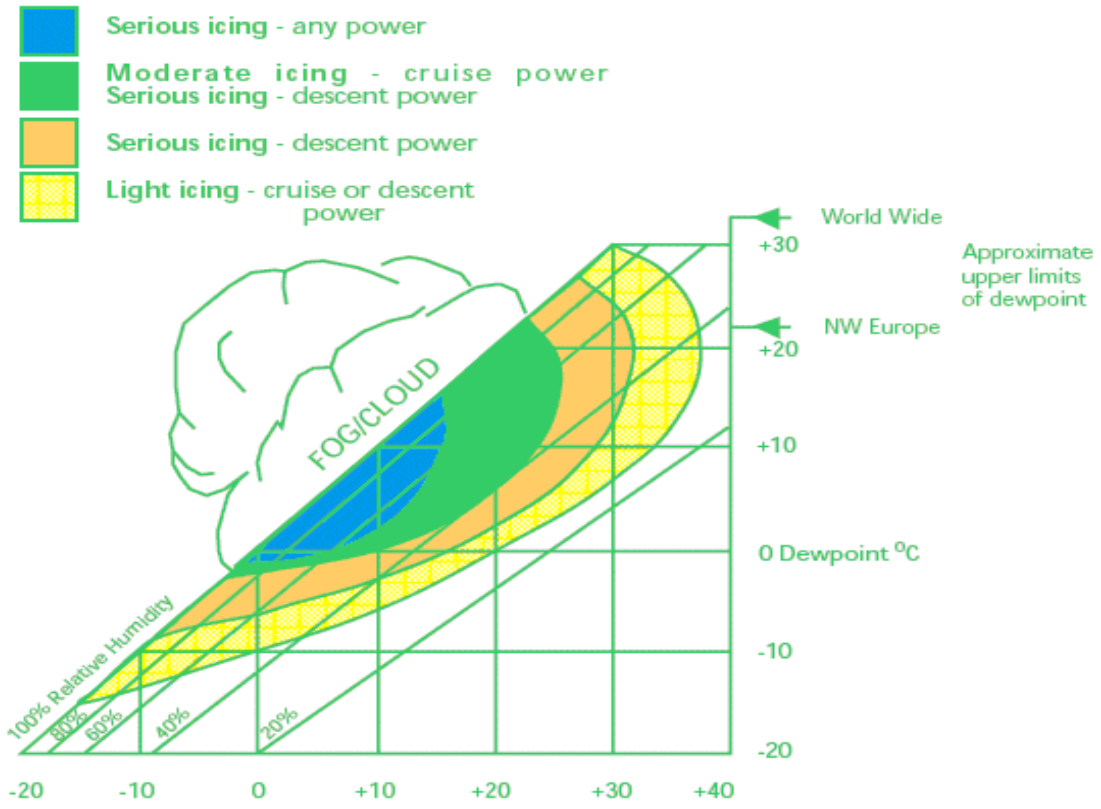
How can we predict when we should be cautious of icing? A Relative humidity of more than 50% is the single best indicator of this hazard. We are not provided relative humidity in our METAR or ATIS reports but we are given Temperature and Dew point. Consult the data given and apply to the Carb Icing Charts, as below, and judge your risk more accurately. Will we be carrying this icing chart while flying? Probably not, therefore we have to learn to interpret the data reported. The recommendation of this presentation is to apply caution if the temperature is less than 70°F. (21C) AND you determine the relative humidity probably exceeds 50%. Be "Ice conscious"!

The element of surprise that is attendant on carburetor icing makes it essential that the pilot be conversant with icing symptoms. He must be able to judge and be aware of the weather conditions within which carburetor icing is possible so that he can properly adjust his carburetor heat controls in order to prevent icing. He must be able to recognize the symptoms of icing so that corrective steps can be taken as soon as the first signs of icing have appeared. The ice formation should not be allowed to start, but in the event that it does it must be checked and eliminated in its early stages. After a severe loss in power it is almost impossible to check further formation or eliminate the ice unless the aircraft is equipped with de-icing mediums other than heat.

<u>CAUSE OF ICINGS:</u>

Carburetor icing is not a mysterious occurrence but is the result or aftermath of the changes taking place within the carburetor during the course of its intended operation. The carburetor in performing its function of metering fuel and air under various engine operating conditions induces the following changes in the fuel and intake air which contribute to the refrigeration of the mixture:

(a) Vaporization of the liquid fuel,



CARB ICING CHART

(b) Changes in intake air and mixture velocity and consequently pressure,

(c) Evaporation of moisture or water entrained in the intake air.

Of all these factors the vaporization of fuel contributes the greatest by far to the refrigeration of the mixture and is always present regardless of atmospheric conditions with respect to moisture, water, etc. The vaporization of the liquid fuel requires heat and this heat is drawn from the intake air. The temperature drop due to vaporization of the fuel may be as much as 40°F. The total drop to all of the three influencing factors may be as much as 60°F. Under these possible temperature reduction conditions, it can be readily appreciated that even during summer operations the temperature in the carburetor at the throat, throttle or the adapter can be at 32°F (0C) or lower and, if at the same time the atmosphere has a relatively high humidity and/or when flying through clouds or rain, an ice formation will occur.

The temperature drop due to velocity and pressure changes is in most cases small and generally does not exceed 6°F or 7°F. However, when this drop is combined with the refrigeration effect of fuel vaporization, it may mean the difference between an icing or non-icing condition.

The cooling induced by the evaporating of moisture or water entrained in the air is not as significant as that due to fuel vaporization but under some atmospheric conditions may be an important contributing factor to icing.

Air is capable of retaining a certain amount of moisture in the form of water vapor and the maximum amount it can retain varies directly with the temperature -- the higher the temperature the greater the vapor retaining ability. The maximum amount of moisture that the air can retain at any given temperature is referred to as 100% relative humidity. Air at 60°F.(15C) and 100% relative humidity contains 11.2 lbs. of water vapor per 1000 lbs. of dry air; at 32°F. and 100% relative humidity this is decreased to 3.8 lbs. of water vapor per 1000 lbs. of air. If air at 60°F (15C) and 100% humidity is cooled to 32°F (0C) then the moisture in excess of 3.8 lbs. per 1000 lbs. of air is condensed out as free water, and at that temperature it will freeze.

A 75 H.P. engine at cruising R.P.M. consumes approximately 500 lbs. of air per hour and, under the conditions outlined above, there would be 4 lbs. of free water per hour passing through the carburetor. This is equivalent to 1.84 cubic inches of water per minute. A portion of this condensed moisture will be deposited on the venturi, butterfly, etc., and with the venturi air temperature at 32°F or lower, ice will be formed. The ice deposited results in a reduction of the venturi opening, blanketing of the carburetor fuel jet and a possible jamming of the throttle. More than one or all of these conditions may occur simultaneously. Any one is sufficient to cause a serious loss in power and result in complete failure if not corrected immediately.

The rate of ice formation at the throttle is increased with a decrease in throttle setting because of:

(a) the greater expansion effect and consequent pressure drop in the region of the throttle.

(b) the increased rate of fuel evaporation in the region of the throttle.

For this reason serious icing can occur when maneuvering at low or closed throttle settings. Prolonged glides, simulated landings at part throttle, closed throttle spins, etc., are dangerous under icing conditions and should be avoided.

<u>ICE PREVENTION:</u>

It is well to remember that it takes a considerably greater intake air temperature rise to eliminate an ice formation within a reasonable time interval than it does to prevent the formation. Therefore, the icing problem should be attacked from a preventive point of view rather than an attempted cure after the formation has started.

The most common means of preventing and removing ice formation is heat. No ice can form in the carburetor providing the mixture temperature is held above 32°F. and preferably in the region of 35°F.(2C) to avoid making the temperature condition too critical. In engine installations equipped with mixture temperature indicators the pilot can be guided by temperature and R.P.M. or manifold pressure. Some installations have the temperature indicated in the intake air duct before the carburetor; in those cases the intake air temperature should be maintained at approximately 75°F (24C) or at a temperature sufficient to maintain 35°F mixture. The intake air temperature required to prevent icing varies somewhat with the type of engine and the installation. It is advisable to obtain non-icing temperature data from the manufacturer where this type of installation is employed. No matter where the temperature indicator is located, it is essential that either the manifold pressure gauge or the R.P.M. be watched when the outside air temperature is at 70°F (21C) or lower and the Relative Humidity exceeds 50%. If a decrease in power or any other icing symptoms are noted, treat it as icing regardless of the mixture or intake air temperature. The temperature indicator may

be sufficiently off calibration to falsely indicate a non-icing temperature condition.

Where no temperature indicators are installed, as is the case with most low-powered airplanes, it is then advisable to operate with carburetor heat "full on" when the atmospheric temperature is 70°F. (21C) or lower and the Relative Humidity exceeds 50%. It is permissible to take off with carburetor heat at "full cold" in order to develop the maximum take-off power, but during warm-up and idling and immediately after safe flying speed has been reached, the heat should be applied. Higher inlet air temperature will richen the mixture, but you are already monitoring the mixture control.

When no mixture or intake air temperature indicators are installed, it is essential that the heat control valve be placed at "full on" and not in any intermediate position, as the pilot has no means of determining at what point adequate heat is being applied. Normally in low-powered aircraft very little heat is added to the intake air until the control is almost at its maximum heat position.

In event that an ice formation and accompanying loss of power does occur because sufficient heat was not applied, then it is advisable to apply all heat available until it is ascertained that all the ice has been eliminated. A check on this can be made by returning the heat to "full cold" for a short period to see whether or not the original power has been regained. After eliminating the ice, the intake heat can be reduced (providing the aircraft is equipped with inlet temperature indicators) to a point where it is sufficient to prevent further ice formations.
If adequate heat is not applied at the early stages of icing, there may be a great enough loss of power so that the available exhaust heat will be insufficient to remove or prevent further formations of ice.

OPERATING RULES:

Carburetor icing can be avoided providing the heating system is adequate, carefully serviced and maintained, and properly used by the pilot. Just a few common sense rules need be followed in order to stay clear of engine icing:

(a) Be "Ice conscious" whenever the temperature is 70°F. (21C) or below and the Relative Humidity exceeds 50% or when visible moisture is present.

(b) Make certain that the intake air preheater is in proper working condition. Check the preheater for cracks and burning through due to heat erosion. Make certain that when the heat control is at "full hot" the valve completely cuts off the entrance of cold air into the induction system.

(c) Keep the heat control at "full on" when you are "ice conscious", or maintain a mixture temperature at not less than 35°F, or maintain intake air temperature at 75°F (provided the manufacturer advises that this is sufficient to maintain a 35°F mixture.) Always use full heat on all low-power aircraft not equipped with mixture or intake air temperature indicators except during take-off.

(d) With some engine installations, the available intake air heat may be far greater than that necessary to prevent icing. The continuous use of excessive heat may result in a serious loss in power, engine overheating, detonation and possibly damage to the (high compression) engine. Under these conditions be guided by the temperature indicator in the application of heat.

(e) Remember that loss of power means loss in heat available for de-icing and ice prevention. The effect is cumulative. The reduction in heat available may be great enough to make it impossible to remove the ice formed or prevent any further formations and, therefore, result in complete power loss.

(f) From the icing standpoint it is inadvisable to operate at reduced throttle settings over prolonged periods when icing conditions exist.

References:

This article has been heavily plagiarized from an old 1942 R.C.A.F. pamphlet AFP 14 ICING OF AIRCRAFT, CARBURETTOR ICING AND PREVENTION.
Many other good references were used and available on the internet. Recommend:

1. http://www.avweb.com/other/gasco-icing.html

2. For Rotax and 2 cycle icing information:
http://microlighters.co.za/viewtopic.php?f=13&t=8488&sid=7a32b96f0a9f8e876e86c7cf8fe29616&p=85246

3. FROM THE GROUND UP publication pages 61 thru 64.

4. Relative Humidity Calculator:
http://www.hpc.ncep.noaa.gov/html/dewrh.shtml

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