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This month's contributors:

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Newsletter, February 2003

Notice of Meeting: Thursday, February 27 at 7:30pm

Speaker: Garth Wallace

Topic: Why women don't fly

Speaker: Frank Hofmann

Topic: Flight Testing

Location:

**Room 204
Penfield Building
John Abbott College
Ste. Anne de Bellevue**

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A word from the Chapter President...

The late January visit to the PARTENAIR plant was an enlightening experience. Thirty-eight people showed up for the tour – twenty were Chapter members along with 18 new faces - and they were all warmly received by the team of Saleem Saleh, Mario Schiller, Bruce Gillies and Stephane Marcoux. One of the kit builders invited Messrs. Dudkoff and Michaleski to join him at the plant one evening, whereupon he would show them how he's going about his Mystere project. For that matter, Bruce Gillies has invited anyone of us to participate with Saleem in the building of the 4 Mysteres at the plant. The day laid on for such visits is Monday (1900 to 2300 h) with prior notice afforded by phoning 514 990 9438, faxing 450 655 9590, or wiring info@partenairdesign.com. Furthermore, demo-flights are available to all our members. Five kits have been sold, four here and one in Italy. Watch for PARTENAIR on the covers of KITPLANES March 2003, RECREATIONAL FLYER(RAA) May 2003 and further featuring by CUSTOM PLANES and AVWEB in the next 12 months. They will also be at Sun N' Fun, Oshawa, and Oshkosh this year. Good luck, then, to this all Canadian venture.

Garth Wallace, our February guest speaker has flown commercially and came to that career stage after many years as a Flight Instructor. He is also a writer and the author of several books on flying, which books are laced with a clever sense of humour and a fervent imagination, which serve to bring his characters right into your living room. In matters aviation he knows whereof he writes and was doing so for COPA these last few years. He'll be talking to us about women pilots on the 27th.

Wally Robinson is still recovering from surgery and can only take on light-duty functions, which leaves us without a refreshment feature at our meetings. As Directorships go, the catering one is a once-a-month effort, and fair to say, probably the most appreciated. Should the person taking this one on be out of town or otherwise handicapped on a meeting night, assurance is offered that there shall always be a back-up – it's not as onerous as first appears. **Would someone out there, then, please step up to the plate.**

Two school boards have expressed an interest in the Young Eagles Program namely; Sir Wilfred Laurier (read John F. Kennedy School, Laval) and the Lester B. Pearson one which serves 28,000 pupils from Dorval to the Ontario border. We shall be involved and in need of pilots presently, so, expect to hear from the Chapter's Coordinator for the program.

Mike Lehman is unable to continue as the Young Eagle Coordinator because of unforeseen impositions to his personal calendar. On behalf of the Chapter, I would like to thank him for his dedication and professionalism in orchestrating past YE events – he did it admirably. Because of the imminent YE Day we need someone to take his place now. **Any volunteers?**

The Centre of Educational Excellence(CEE) of the Lester B. Pearson School Board(LBPSB) is planning 2 field days in support of Space Day 2003. The Space Day Foundation was established in Washington D.C. with a grant from Lockheed Martin to support Space Day 2003 (see www.spaceday.com). CEE shall also be working in concert with NASA and the Canadian Space Agency. There follows CEE's objective: "The Centre of Educational Excellence, along with our Aviation and Space partners would like to celebrate Space Day 2003, which commemorates 100 years of Aviation history in North America and The Future of Flight. The Centre of Educational Excellence recognizes the importance of linking our business and community partners in the education of our teachers and students to raise awareness of

aviation and space technology. It is important that our children are aware how flight has changed over this past 100 years, and that there would be no space or aerospace technology as we know it today if there had been no aviation. It is our goal at the CEE to have our students understand Canada's contribution to Space technology."

The reference to aviation is where the CEE has asked our Chapter to play a role, a role that your executive has endorsed. Frank Hofmann shall be giving a presentation pertinent to changes in aviation over the years. As well, I have agreed to organize a station of aircraft tended by the owners to familiarize children with the aircraft, which familiarization would be manifested by a walk-around and with an opportunity to sit in a cockpit. I will be appealing to many of you to help with this commitment. This station (flight line), among others with different themes, shall be maintained for 2 consecutive Field Days during the week of June 9-13, this, at Laurentide's Cedars Airport. Our Chapter may also be asked to provide resource persons in other aviation disciplines.

Participants at the February CEE committee meeting came from several schools, a robotics company, Rolls-Royce, Skyservice, LBPSB, John Abbott College, Canadian Aviation Heritage Centre, Laurentide Aviation and, there may be more reps present from other industries at the March meeting. So, if the companies you work for or own outright wish to participate, please let me know.

Cheers,
Eddy.

Garth Wallace - Aviator / Author / Publisher / Speaker

Garth Wallace is from St. Catharines, Ontario, where he learned to fly in a Fleet Canuck in 1966. Garth studied Aerospace Engineering at Ryerson in Toronto long enough to know he should never fly anything that he helped design or build.

In 1971, Garth started a career in general aviation as a flying instructor with the St. Catharines Flying Club.

For the next 19 years and 12,000 flying hours Garth worked as an instructor, bush pilot, charter pilot, flying school owner and corporate pilot at various locations in Canada.

Garth's writing career began with flying school newsletters. In 1974, he started a long association with *Canadian Aviation* magazine as a contributing writer. In 1990, he switched to full-time journalism at MacLean-Hunter as assistant editor of *Aviation & Aerospace* magazine.

It was during his flying years that Garth met the characters and survived the experiences that are the basis for his seven books: **"Fly Yellow Side Up", "Pie In The Sky", "Derry Air", "Blue Collar Pilots", "Don't Call Me a Legend", "The Flying Circus", "Cockpit Follies"**.

From 1994 to 2002, Garth was publisher of *Canadian Flight*, the aviation newspaper produced for the 16,000-member Canadian Owners and Pilots Association.

Garth now lives in Merrickville, Ontario (near Ottawa) with his wife, Liz. He maintains a Commercial Pilot Licence and flies a two-place American Trainer for pleasure.

Pilot License Currency Seminars for the Québec Aviation Community "Survival in Sparsely Settled Areas"

<u>Date</u>	<u>Place</u>	<u>Room</u>	<u>Time</u>
Friday 21-03-2003	Les Cèdres	Laurentide Aviation 514-875-6669	19H00

Michel Leduc, System Safety/Sécurité du système (NAB), Transports Canada - Québec
514-633-3484 <http://www.tc.gc.ca/quebec/fr/securiteaerienne>, email: leducmi@tc.gc.ca

Frigid Flying

Most regions of Canada face winter operating conditions that require pilots to go beyond simply starting an aircraft and flying it away. The same can be said about much of the northern US, yet many light aircraft manufacturers don't comprehensively address this issue in their various operating manuals. For example, some operating handbooks do not give a temperature below which preheating of the engine is necessary, and others do not state that an aircraft is untested below a specified temperature. In fact, the Federal Aviation Regulations under which light aircraft are certified do not require some aircraft to meet specific standards for cold weather operations. Considering that a single cold start can cause wear equivalent to 500 hours of normal operation, and an even colder start can cause serious damage immediately, perhaps cold weather operating deserves more attention. In my own experience a few years ago as an operator of a maintenance organization in Whitehorse, Yukon, I found that most local owners and operators knew about cold weather operations as a matter of course. New arrivals and those passing through, however, sometimes got themselves into trouble. In one instance, a brand new Cessna 207 was being ferried to an operator in Alaska via Whitehorse. On the morning of departure the temperature was about -30 °C and the pilot elected to try and start the aircraft cold without preheating it. I don't know how the pilot got the thing started in the first place, but start it did. After a bit of a warm-up, the forty-hour-old engine began to make unusual clunking sounds and the oil pressure began fluctuating madly. The pilot shut down the shiny new airplane and we towed it to the hangar where we removed the oil screen and found it full of various types of metal. When the engine was later torn down at the factory it was discovered that the clearances around the crankshaft had tightened so much at this low temperature that it was easier for the front bearing to break loose of its locating dowel and spin in the crankcase than it was for the crankshaft to turn inside the bearing.

Engines

So what can pilots and AME's do to prevent similar cold weather disasters from occurring? When starting a piston engine one of the most important things to know is what temperature the engine should not be operated at. Find out what the cut-off temperature is for the aircraft in question and at what temperature ranges it is wise to preheat. Engine manufacturers offer some information in their service letters, but these can be somewhat ambiguous at times. A good rule of thumb is, to preheat (a piston aircraft) anytime the outside air temperature (OAT) is below 0°C and definitely when it is below -10°C. In the old days when there was no electricity available near a parked aircraft, a pilot would drain the oil from his engine as soon as it was shut down. The container of oil was placed near a stove overnight making it good and hot to pour back into the engine in the morning. This may have worked in old engines where clearances and tolerances were fairly loose, but in modern power plants this is not entirely sufficient, nor realistic. Modern engines often have minuscule tolerances and as temperatures change dramatically so too do the clearances between parts especially those made of dissimilar metals. For instance, aluminum expands more when hot, and shrinks more than steel does when cold. An aircraft engine with a steel crankshaft supported by an aluminum alloy crankcase, such as the Continental 10-520, has a minimum crankshaft clearance of 0.0018 at room temperature. In a new engine built to this tolerance, that clearance becomes zero somewhere around -25°C. Even at slightly warmer temperatures, clearances can become so small that there is no room for oil to be pumped in where needed. This causes bearings and crankshaft to be scuffed from lack of lubrication. Likewise, pistons are generally made of aluminum working inside steel cylinders. When cold, the clearances actually increase so you may think, "No problem." Well, on initial start-up you would be right, but the piston is instantly heated by combustion and is not exposed to the same blast of cold air that the cylinder is, and aluminum heats up and expands much faster than steel. What happens shortly after starting is that the piston expands faster than the cylinder causing scuffing, particularly at the top end of the cylinder. There are a few approved engine preheat systems that can be installed to prevent this from happening though.

Some, such as Tanis heaters, involve installation of an electrically heated pad fixed to the bottom of the oil pan or crankcase, with a heating element inside each cylinder head. Other systems use a heated band around the cylinder base, and recently a heated rocker cover gasket has been developed. Combined with an insulated engine cover installed over the cowling, you can simply plug the airplane in overnight, and in the morning the engine is warm

and ready to start. Some people attempt to achieve the same results with a strategically placed car heater, but keep in mind this is an uncertified part inside the engine cowling with no guarantees. There is always the potential of the heater shaking itself to bits and pieces jamming a control or severing an oil or fuel line. In any case, it is unknown how even the heat distribution is with this system. Regardless, if you do a lot of winter flying, installation of a proper preheat system makes good dollars and sense. Hot air preheating is another way to go, or to be used in conjunction with electrical heating systems. There are several brands of fuel-fired and electric forced air heaters. These duct hot air into the bottom of the cowl and can be routed into the aircraft cabin. The trick with these units is knowing when things are warm and evenly heated enough. If the top surfaces of the crankcase and cylinders are warm to touch it is safe to say the engine is warm enough to start. How long it takes to get the engine to the point where it is safely ready to start will vary with the degree of heat output of the heater and the coldness of the day. In any event, don't be in a rush and jump the gun too soon; the results can be expensive. If you do start the engine prematurely it may spin over freely, fire, then quit. After this no amount of cranking will bring the power plant back to life, because when the engine fired moisture was created and when it quit this moisture froze on the spark plug electrodes prohibiting any spark. All you can do now is either move the aircraft into a warm hangar for some time, or remove the plugs and warm them up until the ice melts and they are dry.

Then there is the type of engine oil to consider for your aircraft. There are plenty of arguments for and against modern multi-grade lubricants as an all-season oil, but most experts seem to agree that these are the better oils to use in winter. It is thinner when cold and will get to the important parts sooner than a single grade lubricant. Winter kits are offered for some models of aircraft. These generally are pieces of sheet metal that block part of the cooling air intakes in the front of the cowling, and another piece to block some of the oil cooler air. The manufacturer will state the maximum temperature for operation with this kit installed. A word of warning though. Some people have attempted to make their own cold weather kits by blocking the front of the cowl with duct tape. Engines have been overheated and damaged or even failed during the first flight. Manufacturers test airflow over the engine with their kits, and measure temperatures at various points around the engine when the kit is installed. This cannot be done with the duct tape version. Now, you may think that many of your problems are eliminated if you keep the airplane inside a warm hangar. Certainly many of the starting issues are solved, but there can be other problems worth bearing in mind. For example, if an aircraft is rolled out of a warm hangar when it is snowing, the flakes can melt on the warm wings. As the wings cool the melted water can freeze becoming lumps of ice impinging controls and adhering to critical surfaces with all the unwanted results both situations entail.

Batteries

Another major cold weather concern is your electrical power supply. Batteries lose power in frigid weather, so they must be kept warm if they are expected to start the engine. An automotive battery blanket is a safe, effective way to achieve this. Some heat in the cockpit doesn't hurt either as instrument gyros can suffer when they attempt to spin up cold.

Wheels

Grease used in wheel bearings and retractable landing gears should also remain viscous in extreme cold. It has been known for a tire to spin on its rim and blow when an aircraft is landed. The wheel bearing grease simply would not allow the wheel to spin up quickly.

Props

Another item that can be affected by cold weather operation is the constant speed propeller. While cruising in level flight in smooth air there is no need for the prop to change pitch. As such, the oil in the hub is exposed to a blast of icy air and can congeal there so that when it comes time to change propeller pitch it is possible nothing may happen. This can be particularly serious in a twin if feathering a prop becomes necessary. To prevent this from happening,

the easiest remedy is for the pilot to cycle the propeller pitch at regular intervals perhaps every twenty minutes or so just to get some warm oil circulating into the hub.

Critical Surfaces

Airframes are not exempt from cold weather hazards either. The first concern, naturally, is frost, ice and wet snow on the wing and tail surfaces. If significant contamination remains on your wings after take off you instantly become a test pilot, so in cold weather it goes without saying you should always conduct a careful inspection of the aircraft's critical surfaces. When it's cold out, though, we can be easily tempted to do a less than thorough pre-flight, but this is when things must be checked even more carefully. So bundle up and have a good look. Are the fuel vents free of ice and snow? Has blowing snow gone into any openings to add weight where it is not wanted or is it blocking full movement of the controls? Are the oleos sitting at full height or has some air leaked out of them? What about wheel assemblies? Is there pink hydraulic fluid on the snow? Finally, what about your fuel drains? Has ice blocked them (A good way to prevent moisture in the fuel tanks is to top up immediately after landing to leave less room for condensation.)

Now, at what temperature do you say, "Enough is enough," and leave the airplane on the ground? Well, there is no exact answer, but it is somewhere around minus forty. If you are inexperienced in cold weather operations, a warmer temperature should be the cutoff. Also keep your parka on while flying. Heaters have been known to fail. Know where your survival gear is, and have a plan to keep warm if you should have to set down. It is easy to be complacent when looking down at a winter wonderland while the heater is pumping out BTUs. However, things can go wrong quickly, and survival in these conditions is unlikely without proper preparation. With proper preparation and a knowledge of the limits, cold weather operations can be quite safe, and indeed a joy.

This article first published in Aviator magazine. Jan. 2003. Story by Ian Cook.

FREQUENCY CRUNCH GETS HELP... From AVweb

Last Wednesday, the FAA gave \$16 million to ITT Industries of Fort Wayne, Ind., and \$21 million to Harris Corp., of Melbourne, Fla., to come up with prototype designs for NEXCOM, the Next Generation Air/Ground Communications System. System. NEXCOM will integrate data link with digital voice, to make more-efficient use of the available frequency spectrum. The new technology is considered crucial to support continued industry growth -- without NEXCOM, today's 50-year-old communications system would reach its saturation point by 2010.

103 YEARS -- A LIFETIME AND AN ERA IN FLIGHT From AVweb

Ralph Charles, one of the country's oldest pilots, died Feb. 2 at age 103, in Somerset, Ohio. In his youth he worked with the Wright brothers as a welder. He later ran his own airport, and in the 1930s he flew Stinsons and Ford Tri-Motors for TWA and other airlines. During World War II, Charles flew as a test pilot for Curtiss-Wright. After the war, he gave up flying for many years, but never lost his passion for it. "Sometimes when I would mow, I would imagine my tractor was a plane and I was rising up into the sky," he told the Associated Press in a 1999 interview. He took up flying again in 1995, and owned an Aeronca Defender. He last flew in the summer of 2001

Reported to have been seen at AVweb's local GA airport, which features the following sign in the men's room: "Pilots with a short pitot tube and low manifold pressure are advised to taxi up close..."

Unclassifieds

- For sale:** (1) firewall forward kit for installation of Subaru E-81 Stratus engine, on Avid aircraft. Kit includes cowling, engine mount, radiator, all fittings, hoses, and drawings
(2) 14 gallon (US) wing fuel tank for Avid of Kitfox
(3) Set of drawings for Acro Sport II biplane -see **Ron Hills**, or call him at 514-684-6581

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Note: Rem Walker's EAA Canadian Council newsletter will be provided to email recipients of this newsletter in hard copy at the next Chapter meeting on February 27. It is a typewriter created document that is unavailable to us in electronic format.