EXPERIMENTAL AIRCRAFT ASSOCIATION 245 OTTAWA

NEWSLETTER

Carb Heat

Hot Air and Flying Rumours

Published by EAA Chapter 245 (Ottawa) P.O. Box 8412 Main Terminal, Ottawa, Ontario, Canada, K1G 3H8

Next Meeting

Thursday April 18 , 1991

7.30 p.m.

McNabb Community Centre, 180 Percy Street.

Community Room, Lower Level

Featured Topic
VIDEO Night.!
Selection of films on aircraft construction,aerobatics orEAA will be available

Read at your own risk !

The information contained herein may be filled with innaccuracies, halftruths, misinformation and down right fibbing.

President's Corner

Activity out at the hangar at Carp is following the daily temperature trend ... upwards. I had occasion to spend a couple of days out there and was pleasantly surprised at the number of members dropping in to fuss with their aircraft or just to socialize. It was kind of like being an airport kid all over again as I was even invited to go for a flight around the patch. (Thanks, Andy!)

The ground is still very wet out there, so it will be at least another month before we can drive up to the hangars. The aircraft don't seem to do much damage to the grass; probably because the tires exert less ground pressure and don't impart tractive forces to the soil. 'Talk about rolling resistance, though. I watched George Elliott use all 150 of the horses in the Zenith pulling into his tie-down spot. Andy and I are still nursing hernias from muscling C-GIKK around.

One thing that is noticeable at Carp is that we've got some sprucing up to do out there. The Spring Clean-Up is slated to begin at 0900 on Saturday, 20 April with a rain date of 27 April. If you have any light-coloured paint at home, bring it out along with brushes and rollers. A lot of the doors and our detached sanitary facilities are crying for some paint. Other needed items will be the usual window cleaning stuff, vacuum cleaners, mops, etc.

The last meeting was a definite success. ELTs can be a dry subject, but Bob Merrick from Transport Canada did an excellent job in livening it up. In the usual cordial style of the Chapter, lots of questions were asked at the end; so many, in fact, that I had to call "Time Out" for coffee and donuts. Thanks, everybody!

I would also like to officially thank Ted Chambers for the beautiful colour 11"x14" photograph of his Zenith CH 300 in flight over the Carp countryside. Rest assured that it will be displayed in a place of honour in the lounge to inspire those of us who are still in the building or dreaming stage. Thanks, Ted!

Our paid up membership this year stands at only 42. That's a quite a bit down from our normal paid membership of 70. For those who haven't yet paid your 1991 dues, this will be the last newsletter that you will receive unless you renew before the end of April.

If you scan through the latest COPA CGAN "On the Horizon" columns, you'll see lots of opportunities for fly-ins and airshows this season. Here are some that you should consider attending either by flying or driving in:

Apr 28 - Camp Borden Safety Seminar
May 26 - Embrun Aero Club Breakfast
Jun 1-2 - London Airshow
Jun 15-16 - Hamilton Airshow
Jun 16 - Embrun-Russell Breakfast
Jun 23 - Pembroke Breakfast
Jun 29-30 - National Capital Airshow
Jul 1 - National Aviation Museum
Jul 26-Aug 1 - Oshkosh EAA Convention
Aug 17-18 - St. Thomas Fly-In
Sep 7-8 - Zenair Open House
Sep 15 - Chapter 245 Breakfast

In addition, there will also be the Ottawa Flying Club Fly-Day and probably breakfasts at St. Lazarre, Kingston, Cornwall, Smith Falls, Brockville and Cobden which are all very popular.

Special thanks to Luc Martin for the very entertaining article in last month's newsletter describing his pre-cover inspection experience. It's great how we can look back on something like that and see the funny side of it rather than to dote on the terrifying aspects of it. Well done, Luc!

Well, that's about it for this month. Don't miss the April meeting. It will be very informal with lots of aviation videos and Henri's always popular coffee and donuts. 'See ya there!

— Lars

Minutes of Mar. 21 Meeting Held at MacNabb Community Centre

Pres. Lars established order at 7:50, cordially welcomed our guests, and quickly handled business matters before CO_2 buildup in the tiny classroom forced a coffee break.

For Your Information

Our **next meeting** will be back at the **McNabb Community Centre** on **April 18.** We will show a variety of videos.

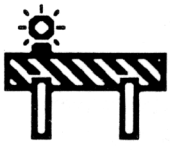
The **May** meeting—at **Carp International**—will be a joint effort with the **Ninety-Nines**. Bring your significant other, but not your children.





Work Party: on the morning of **April 20** to clean up the facilities before our May meeting. Bring brooms, mops, rags, windex, white paint, etc., and lots of gumption and elbow grease.

Hon. Sec. Luc Martin is looking for help in evaluating repairs needed at Carp. He also noted that he is closer than ever to pinning down the ever elusive builders' badges.



Ops. Manager Dick Moore remarked that the **Florida swamp land (alias taxiway)** in front of the main hangar is **OFF LIMITS to motor vehicles.** Remember also that **June 31** is the **deadline** for paying the second installment of tie down fees to Dick.

Tool Tabulator Andy Douma is taking up the hanging business and looking for volunteers—to hang the tool crib doors, that is.

Andy also displayed **Chapter Photographer John Perrins'** excellent enlargements of **Ted Chamber's Tri-Zenith.** Ted generously donated one to the chapter archives.

FEATURE: Bob Merrick of Transport Canada on ELTs

While sometimes regarded as inept and expensive bureaucratic meddling, ELTs do perform valuable services by offering help at survivable crashes, by extending search capabilities, and by reducing the cost of searches. These tasks must also be performed within certain constraints: 1) ELTs must be automatically activated 2) they must survive survivable crashes 3) general aviation must be able to afford them.

ELTs became mandatory in 1974. They became infamous in 1978 when lithium sulphur dioxide batteries had to be withdrawn because of their propensity to explode and to produce weak sulphuric acid—neither of which endeared them to pilots! A happier milestone was the 1982 launching of a satellite with a SAR package on board. Only 9 days later, the satellite was instrumental in a Canadian rescue and has helped with over 1500 since then.

It became increasingly clear, however, that better standards were needed to reduce both the number of false alarms (upwards of 90%) and the 40% of crashes where ELTs did not activate. (In fairness, 1/3 of these instances are attributable to a) no ELT

on board b) ELT not armed c) poor maintenance). As a result, in 1983 a new specification, TSO-91A, appeared. In 1986, DND turned to TCAG for help. Obviously, any new ELT would need to be thoroughly field tested. Also, preliminary research was needed on the feasibility of upgrading older ELTs to the newer standards (too expensive, it turned out), and on whether a low-cost Crash Position Indicator could be developed (also not feasible).

Decisions were also necessary concerning frequency. While satellites allow operation on 121.5, they are primarily intended for the international distress beacon frequency of 406 MHz. Both frequencies have advantages and disadvantages, thus further complicating an already difficult choice. For example, 406 provides global coverage, 121.5 is only light-of-sight. Localization with 406 needs only one satellite pass; 121.5 needs two—a matter of vital interest to pilots who fly around hungry polar bears. The homing capabilities of 406, however, are not yet well established; 121.5, by contrast, has a good record here. On 406, 70 different stations can be distinguished; 121.5 reaches saturation around 10. Strong signals on 406 don't mask weaker ones; this is not so on 121.5. Whereas positive individual identification is available on 406, it is not on 121.5. One possible solution to these competing frequencies would be to use 406 for the initial alerting and 121.5 for the subsequent homing. With this combination, SAR would quickly know both the general area and precise identification of a downed aircraft. Any such decision is still a long way off, however.

Before the new ELTs could be field tested, however, avionics shops required manuals. In the year or so it took to produce these manuals, the new ELTs sat patiently waiting in climate controlled government basements. Unfortunately, routine checks on these units revealed horrifying battery corrosion problems. Thus, only when this corrosion problem is solved to everyone's satisfaction will the actual 2-year field trial begin. In the meantime, we must make do with what we have.

How can you help? Make sure that your ELT is properly maintained. Don't leave home without it. Check that the unit is **armed in the plane** and **disarmed during shipping, installing, or other possibly rough handling**. Follow the manufacturer's instructions concerning battery type and replacement interval. (Given that your life may depend on it, the inspection and battery replacement are inexpensive life insurance. Also, many shops provide a free check up if you purchase your batteries there). Examine the ELT antenna periodically and watch for signs of corrosion, particularly on the case. Every month, briefly test the ELT (see SAR 3.8 for details). Monitor 121.5 after each flight—some landings are less "controlled crashes" than others. In a 6-week period in the fall of 1990, there was only 1 false alarm. In the last 5 weeks, there have only been 3. Let's keep up the good work.

Your faithful scribe,

Roger Fowler

AUTO FUEL

by Dick Moore

En route to the airport, Andy and I stopped at a gas station to purchase fuel for the Zenith. The station's three grades of gas at various prices prompted the obvious question: Which one do you buy? Well, if you're a real tightwad, the problem is fairly easy: you buy whatever is cheapest. However, if you're concerned about what goes into your aircraft engine, you might like to know a little more about the fuel.

At this point, I thought that I would inquire about the octane ratings of the fuel selection. I approached the person inside and asked for this meagre bit of info. All I got, however, was a blank stare: "What's an octane?" She didn't know but assured me that if I returned the next day, I would probably find out. I thanked her anyway—I just like to be polite—because she had little desire to help me and told her that I had other means to get the requested information. I did some research and this is what I found out:

COMPANY	OCTANE	RVP (in kPA)
Petro Canada		
Maximum	87	
Maximum Plus	89	70-107
Maximum Supreme	92	
Shell		
Bronze	87-88	
Silver	89	45-99
Gold	91	
Esso		
Regular	87-88	
Mid-grade	89-89.5	72-103
Supreme	91-91.5	
Texaco (see Esso)		
Sunoco		
Regular	87	
Plus	89.5	72-107
Supreme	92	
Gold	93.5	

The low RVP value starts in May and ends in Sept.

The March issue of the COPA Newsletter announced that DOT has made it legal for most private aircraft owners to use Canadian-made auto fuel in place of 80-87. Some of

us lucky Cessna 150 owners can even use auto fuel without an STC.

After learning about the different grades of fuel, I was curious about what auto fuel DOT meant us to use. I called **Dave Austin at DOT** and was assured that they used the old regular, or what is now the mid-grade fuel or 89 octane. However, he said that homebuilts can use the 87 octane and that he would appreciate knowing how well they performed. **Dave can be reached at 952-4332.**

Now I know I can use Canadian auto fuel and I also know which one, but why 89 when the engine is designed for 80/87? In 1982, the FAA issued the EAA an STC permitting unleaded mogas of 87 octane or higher for C-150's with Continental 0-200-A engines. As it turns out, there are four methods of determining octane:

(1) Research method—ASTM spec D908-47T
(2) Motor method—ASTM spec D357-47
(3) Aviation method—ASTM spec D614-47T
(4) Supercharge method—ASTM spec D909-47T

To obtain auto fuel octane, they determine the octane by methods (1) and (2) and then average the two. For aviation fuel, both numbers are given, but 100 is the maximum inasmuch as you can't have more than 100% of something. There are numbers above 100 but these are AN performance numbers and are non-linear above 100. Fuel octane values are minimums and there is a degree of variability and therefore it is quite possible that 87 fuel could be satisfactory for an 80 engine. The problem is: How do you know? Well, the best way is with an EGT gauge. When pre-detonation occurs, the EGT falls instantly and drastically. The EGT can also be used to detect vapor lock. Boiling fuel in the lines and carburetor has the effect of leaning the mixture. To counteract this, simply enrich the mixture and reduce the throttle setting. Descending would also be helpful.

I did find out one difference between Shell and the rest: Shell uses potassium as an anti-knock ingredient in equal quantities in all their grades of fuel. The potassium also acts as a lubricant that they claim is as good as lead.

Some other interesting things about auto fuel. For one, there is pressure—excuse the pun—to reduce the RVP because the higher the RVP the more air pollution since more raw gas is liberated into the atmosphere. Second, mogas is slightly heavier than avgas. Depending upon composition, this weight difference may be between 5% and 10%. This means more calories per litre (BTU's per gallon for the old guys) resulting in lower fuel consumption.

Whatever fuel you buy, just be sure that you get it from one of the four mentioned suppliers and not from a cut-rate supplier. Fuel from these suppliers may be mixed in the tank truck with alcohol, ethanol, or methanol, because these substitutes are cheaper. Your car may not care, but your aircraft sure will. These substitutes swell rubber seals, and attack aluminum, zinc, and other metals. The most serious problem is phase separation where, at low temperatures, or in the presence of water, these substitutes tend to separate out of a gasoline mixture and fall to the bottom. If the alcohol concentration rises too high, the engine will quit.

One final note. To avoid the possibility of vapor lock on take off, one would be well advised to do a full power run-up prior to rolling down the runway. If small bubbles have begun to form in the fuel line and are restricting the flow, they might not be noticed until take-off when there is maximum flow demand.

I should mention that none of the dealers endorse the use of auto fuel in aircraft

and would never knowingly sell it for that purpose.

Aviation fuel is specifically blended and purity-controlled as well as being tested for water when delivered.

Remember that if you are going to use auto fuel, you should reset the idle RPM to no less than 700. However, just because you choose to use 100LL is no reason not to worry. Rubber components in aircraft fuel systems may be adversely affected by some blending agents in a few brands of 100 octane low lead aviation gasoline. The use of 100LL has resulted in accelerated aging of some rubber parts, particularly around sumps and fuel line connectors. In the wake of several reported leakage incidents where 100LL is suspected, FAA and the aviation industry are currently testing the long-range effects of 100LL on fuel system components.

References:

COPA Flight Safety Bulletin Mar. 1991
John Frank, "Plane Talk," *CGAN* Feb./Mar. 1991
The Recreational Flyer Jan./Feb., 1991
Cessna 150-150 Hints 'N' Tips

CLASSIFIED SECTION

AIRCRAFT FOR SALE:

Two-Place Lazair. KFM engines, less than 10 hours TT. $3900 negotiable. Contact owner through George Reid 749-0792.

PROJECTS AND PLANS FOR SALE:

Everyone interested in Group Building or Group Ownership of Amateur-Built Aircraft, please contact Peter Patton at 731-2269.

Zenith CH701 Project. Plans, wing fittings, spars and ribs cut. Some sheet metal, rivets and tools. Asking $1000. Peter Plaunt, Carp, Ont. (613)839-2283. SOLD

KR-2 restoration project. No time to finish. Revmaster 2100 cc. New wings and canopy. Valued at $11,000. Will sell for HALF or reasonable offer. Contact Mike Proulx (819) 827-1930.

Baby Great Lakes Project: Fuselage 90% complete; all ribs and spars; Continental C-85; MacCauley metal prop; all instruments. $6500. James Oliff 724-6123.

Zenith CH 250, 75% complete, trike gear. Signed off by DOT, ready to finish closing. Wings and tail nearly complete. Includes gear, cowling and fairings. **Reduced to $5500!** Will consider trade for CH 701. Call Jim Robinson at 830-4317.

Davis D2A plans. Call Russ Robinson. 831-2485.

PARTS FOR SALE

Contact Mike Sacoutis at 729-3774 for the following parts:
Propellers - 0 time constant speed
- Wood pusher prop.
- Zenair wood 68x46

Hanlon Wilson mufflers, Mooney Parts: Complete retract gear with 6.00x6 main wheels, 5.00x5 nose wheel. Also seats, fuel tanks, gauges, gyros, and control surface pushrods.

Airpath magnetic compass, 0 SOH 1987, base mount. $100. Alex Fulton, 234-6753.

Brakes and wheels, Rosenhan. Suitable for Vari-Eze, Davis, etc. Offers welcome. Eric Taada 749-4264.

Vari-Eze landing gear legs. New. Contact Peter Plaunt, Carp, Ont. (613)839-2283.

Classified Editor: Lars Eif 837-6680.

Carb Heat April 1991.