

- October 2015 -



**Bright red “Aerial One” and airport crash truck “Red One” shared the spotlight at Sudbury Airport on Saturday, September 5, 2015. Aerial One was a really big hit with the guys at the Fire Hall at CYSB.**

## President’s Message

Believe it or not, I have had about 80 hours of flight time in C-FDEP this year and expect to have around 100 hours by the time the snow flies. Considering that the longest trip was to Sudbury one weekend to visit my son who works at CYSB, that’s a lot of short trips and flights that make up the rest of this time.

I’ve had the pleasure of taking about 20 different people up flying this year to experience the joy of flight and do a bit of sightseeing. Some of those were our own chapter members who joined me in a flight, giving them an opportunity to see how my plane flies compared to their own and vice versa. I also wanted to pay it forward to a few builders, as was done for me by Lee, Sandy, Rudy and Gary while I was (re)building my own plane. My belated thanks to those members!

I managed to get to all of the local RAA fly-ins plus one London RAA fly-in this season as well

as a couple of COPA fly-ins, the UPAC convention and a fly-in on the last weekend in September at Bush Creek Farm near Straffordville, Ontario.

For anyone still building, I just want to let you know that there will be no shortage of places to go, people to fly with, and people to meet and talk aircraft building stories with once your plane is finished.

We really are lucky to have such a great hobby available to us in Canada and organizations like RAA Canada and COPA are critical in maintaining this great privilege we share.

**I’m already looking forward to the 2016 fly-in season!**

- Dan

*Be sure to check out the great article by Lee Coulman regarding ELT’s in this month’s issue.*

## How to Destroy an ELT without even Crashing.

Emergency Locator Transmitters (ELT) are required on our amateur and certified airplanes. These are supposed to show the location of a crashed airplane but they don't always work. G-switches are supposed to trigger, antennae are supposed to transmit, and batteries power transmitters, on the emergency frequencies of 121.5, 243.0 and the new digital 406 MHz.

The newer 406MHz are just newer but aren't necessarily any more reliable. Here is a COPA opinion of the mandating of these devices.

***“COPA’s long-standing position remains that we are not opposed to 406 ELTs but they should not be mandated. 406 ELTs are great when they work but they provide absolutely no information until they are activated and since they are prone to exactly the same failures as older ELTs (antenna breakage, inverted wreckage masking signals, crushed or consumed by fire or submerged) it is likely that if aircraft are equipped with only an ELT, there will be no indication of where you may be or where you have been. Newer ELTs are more expensive than their predecessors and so are many of the tracking services. It is unreasonable to expect the non-commercial sector of aviation to equip with both so that is why COPA advocates for a compromise requirement that provides the maximum benefit at minimum cost.”***

- Kevin Psutka, COPA

Well the government is at it again, and it looks like it will mandate the 406 MHz beacons regardless of COPA's well-constructed criticisms. You might as well get ready to make the plunge, but don't expect just to swap one for the other.



It is time to re-evaluate your installation as there is a hidden killer of ELTs, just waiting to destroy it. I've seen a few installations that are ready to fail before they can do the job. Treat this as an "opportunity".

So you've heard of the Velcro strap that isn't tight enough to hold the ELT in its' cradle. That isn't it, but keep it tight and check it regularly. You've heard of batteries failing or corroding. That could be true but the newer LiOn batteries are more reliable and rated for 5 years. (except for the ELT battery that almost destroyed a 787 Dreamliner last year). Better have them checked yearly. Another is the coaxial line from the ELT to the antenna. These lines do deteriorate and corrode. They also can break easily when the ELT is in one part of a broken fuselage and the antenna in another part.

These are all good reasons but there's a more insidious killer of ELTs. The answer lays a hidden fault in almost every 121.5 VHF ELT ... or more likely a weakness, that's part of a design to reduce the complexity and cost.

To increase survivability, the transmitter circuits are very simple. They do not have protection against incoming VHF power. I know because I've destroyed 2 ELTs in my airplane.

Is this the fault of the ELT manufacturer or just the aircraft owner's or technician's failure to recognize this as a potential issue? Either way, you really need to take the time to assess the ELT installation on your aircraft.



Picture your VHF radio transmitter antenna right beside your ELT antenna. Often that can mean 5 or 10 Watts of transmit power radiating in all directions from the antenna. That power

## The Leading Edge

does its job to communicate to ATC but is also absorbed by the ELT antenna. Not a problem most of the time. My dilemma didn't show up until I changed airports. "Every" year after that, my ELT re-certification would come back with a bad transmitter. It must have been a fault of the ELT manufacturer! The ELT installation had worked in that aircraft for 6 years without a squawk. Not so fast.

The simple fact was that the new airport ground frequency was 121.8 MHz which is very close to the ELT 121.5 MHz. Just how far was my ELT antenna from my VHF? Oh, it was about a 20". That was OK for most dual VHF transceivers, but that was not OK for the poor unpowered ELT. Remember it is only powered on when it's turned on in a crash. The circuitry is very simple and without battery power it doesn't have any active protection. The VHF transceivers are much more robust and have the necessary protection. So just where should the ELT antenna be located?

The answer to antenna location question became apparent when, in frustration, I bought a Kannad 406 MHz ELT. The newer equipment must be better. I put the new improved equipment into its robust dock, right behind me on the strongest structure. Adapted the remote control for my panel and hooked up the antenna. Wait, that was RG58 coaxial feeding the antenna. Better read the instructions closer about antenna requirements. Besides upgrading the RG400, I was stunned when I read "... 2 metres minimum separation is required to the VHF transmitter antenna". I think it was about this time I realized what had been happening over the last 2 years. Hindsight really is 20/20.

This was an embarrassment. I had worked for Leigh Instruments as a student some (many) years ago in the Crash Position Indicator (CPI) department. These novel devices were ejected off of aircraft during a crash. G-switches located in the aircraft nose and wings would activate a solenoid/spring to shoot the self-contained transmitter, battery and antenna to relative safety. You could find these on military aircraft of the day. Well they also transmitted the same signals as our current ELT. In the 1970s this expensive solution was

compromised into the automatic fixed ELT.



Somehow I had forgotten about all of these design limitations and it wasn't limited to just the antenna separation.

Where can I move this ELT antenna? Put it on the nose? No, that would likely be destroyed in a crash. Put it in the tail? Ok, but in a flip-over, which is likely in most airplanes, it would be obliterated. The answer became very obvious on my airplane. Put it on the rear



fuselage between the propeller and the tail empennage. My favourite mounting location is on a hatch, or near a hatch. I found some of my trusty CTC aluminum patch and made as big of a ground plane as I could (one antenna radius, if you can). The Searey has a boom tube fuselage, which makes a perfect, protected antenna run from the ELT transmitter. I checked that the antenna wasn't too blown around by having a propeller a short distance away. The beacon was registered, so I did a test transmission. I got an email that night that my beacon was working!

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Today, I know the VHF part of the beacon works but the JRC doesn't send out confirmations of tests anymore. But that is

another topic to discuss at another time as to where DND is putting the \$6M savings from mandating 406 MHz ELTs.

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We need to do a few things to keep our ELTs working and look out for others:

- *Don't forget to monitor 121.5 MHz when you shut down. This is not just to check your ELT is off but to listen for other ELTs and possibly save a life.*
- *Don't forget to register your 406 MHz information on-line using the unique identifier for your airplane. Keep the information up-to-date for the JRC (Trenton) to find you or your contacts.*
- *Have another personal beacon like SPOT or Spider Tracks. These devices are probably more survivable as they are with you in the cockpit. They should be sending out your position during your flight and can send emergency messages when you need to. Don't forget that CEL phone or better yet, SAT phone.*

Safe flying,

Lee



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## See you at the October meeting at 7:30 on the 5<sup>th</sup>!

Gunter Malich will be doing a presentation about his test flights in the RV8, and Lee Coulman and I will be doing a presentation about a week-long Georgian Bay adventure we had.

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**Please note:** The RAA Christmas party date has been confirmed on **Friday, November 27, 2015**. We are back at Ariss Valley Golf and Country Club (Room seats 125 people) **Get it in your calendar now!** More details to follow at the October meeting. Price is confirmed now at \$35 per person.

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### Upcoming Events in 2015: (Highlighted lines are KWRAA Events) **Note the changes in RED**

<b>October 5</b>	-	October Meeting at 7:30 in the Cadet building at CYKF
November 9	-	November Meeting at 7:30 in the Cadet building at CYKF
<b>November 27</b>	-	KWRAA Christmas Party in lieu of a December meeting

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### Classifieds:

**Mustang II** plans and parts for sale plus some aluminum sheet metal – Call John at (519) 745-6463