EAA 266

**Experimental Aircraft Association Chapter 266, Montreal Canada**

EAA The Leader In Recreational Aviation

# Newsletter, February 2017

## In this Issue:



**This month's contributors:**

**David Cyr**

**Notice of Meeting:**
**Thursday, February 23, 2017 at 7:30 PM**

**Topics:**
***How aerobatics can improve your flying skills*** will be presented by Francois Vrana, Aerobatic Instructor Class I (Chief Instructor/Owner Lachute Aviation) and Luc Martineau, Aerobatic Instructor Class II - Judge and Aerobatic Competitor (Airline Pilot A320).

***Canopy installation and customization on a CH601-HD*** will be presented by Carlos Sa.


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**Check out our website at: http://eaa266.org**

## A word from our Chapter President... Mike Lustig

Dear Members,

Just a quick note to let everyone know that I have now moved to Saint-Lazare! Still in the thick of moving boxes, SO, not too much time to chat this month.

Got my aircraft insurance renewal request this week, first sign of Spring! So exciting, after all this snow, cold and freezing rain…

In case you have not heard, Mo's Fly-In, originally scheduled for February 25, 2017 has been cancelled. On the bright side, here is a handy list of AIRIC's Airshow Schedule, covering Airshows, Fly-In's and aviation events in the Great Lakes Region as well as a few select events across North America: http://www.airic.ca/html/airshowschedule.html
(Thanks to Eric Dumigan for this)

Best Regards to All,

Mike Lustig

President

## A word from our Editor Richard Guevara

Events of the past few weeks have again underlined the simple truth that the way we document aircraft maintenance instructions is sensible, robust and uniform. Questions were asked about who could do what, who should do what about maintenance instructions needed for an avionics box. The fundamental questions that were asked directed us to where we needed to go – which in itself is not an unusual thing. What was unusual was that we were working in a robust framework that allows us to provide effective maintenance information that, over the years, remains effective. The granddaddy of maintenance document specifications is ATA-100 which first came out in 1956. Today, long after it was superseded, it remains incredible pertinent and effective because the original authors of this specification simply got it right the first time. Some of the chapter definitions were updated over the years to reflect the rise of the use of electronics in aircraft. ATA-100 was superseded by ATA iSPEC 2200, which is still in wide use today – you see it every time you open an Aircraft Maintenance Manual or a Wiring Manual. I have worked in many non-aerospace industries that hands-down have nowhere near the quality of maintenance documentation that I expect and use every day. When form follows function amazing things can happen.

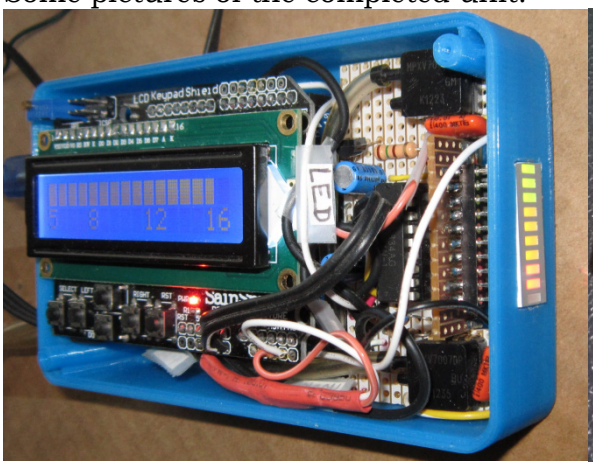
## Angle of Attack Sensor, Part II by David Cyr

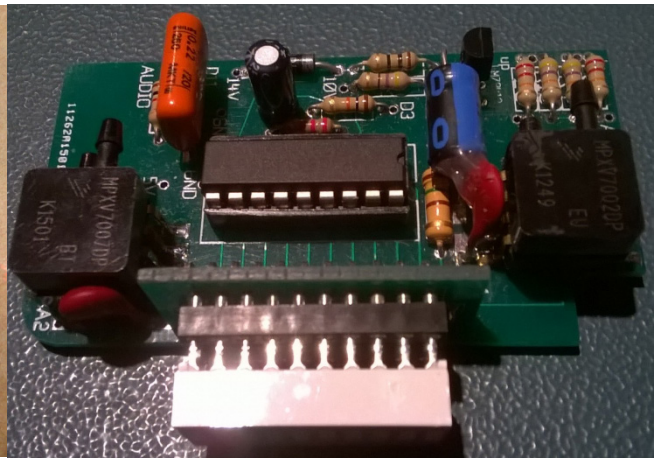
We present the second part of a five part series on a novel AOA Sensor that was presented at the October 2016 EAA 266 meeting. This month we cover:
**Calibration of the AoA sensor.**

**A brief review of Part I:**
This Angle of Attack indicator was designed for use on a Lancair 360 that has a Dynon heated Pitot probe. The probe also has an angle of attack port to allow display of AoA; but only with a Dynon EFIS. The Grand Rapids EFIS on the Lancair panel does not support this Pitot/AoA probe,

so a standalone indicator was designed using the Dynon probe. However, it will function with any other similar Pitot/AoA probe.

Some pictures of the completed unit:




The AoA indicator needs to be calibrated to properly respond to an approaching stall as well as show the current angle of attack on the LED display.

In order to make it configurable for any aircraft, it requires setting some data points on the ground and in flight. Calibration will require pressing a button on the LCD "keyboard" for each of the following:

1. Setting the "zero" point for the pressure sensors while stationary on the ground and with no wind (press the left most button once).

2. Establish the cruise AoA which will become the low end of the AoA scale: Setting the cruise AoA is really a waste of the AoA indicator scale and it is desirable to start the angle of attack readout at a lower speed than cruise so that the LED will cover more of the critical range, say from 10 degrees AoA to 16 degrees AoA or stall, rather than 4 to 16 degrees (press the second button from left once you are at the desired speed).

3. Setting the clean-stall point that will become the high end of the AoA display: The upper button should be pushed and released once while in cruise. Start with the airplane at least 3000' above the surface. Slow the airplane until the aircraft is at the maximum AoA, just before a complete stall, or allow the aircraft to enter a full stall if you are comfortable stalling the aircraft. Resume cruise flight and press the upper button a second time. This will store the highest angle of attack attained during the stall. Note: Calibration must be repeated if the configuration of the Pitot probe changes in any way; e.g. if the probe mounting is adjusted or the Pitot probe is moved to a different position.

   IMPORTANT NOTE: If there are no flaps on the aircraft or you do not wish to make a distinction between the angle of attack for a clean stall and flaps-down stall, NEVER press the next two buttons. If you do press either of the following two buttons, then you will have to set the flaps-down stall angle of attack, even if it is the same as the clean stall angle of attack. Otherwise the stall AoA indication may be false.

IMPORTANT NOTE: If you have manual flaps with no electric motor then you can only sense flap position if you add switches in the up and down positions that will sense the full up or full down flap positions. The presence of 12 Volts at these switches will indicate full up or full down. No attempt is made to calculate stall angle in between the full up and full down with this AoA indicator.

4. The flaps-down-stall angle of attack with flaps fully extended will become the high end of the AoA display assuming there is an input available from the aircraft indicating flaps down. The flaps-down AoA is set by pressing the bottom button while in cruise. Use the same procedure as described above for setting the clean-stall AoA.

   NOTE: If you wish to have the stall warning activate at a lower angle of attack than it will following calibration, then you can redo the stall calibration(s). In order to have the full scale show a lower angle of attack, you can reset the stall angle by approaching the stall, but returning to cruise before entering a stall.

5. In order to set the time of travel to lower the flaps, the right button should be pushed. Pressing the right button at the same time as you start to lower the flaps. Electric flaps should be extended with one continuous action from the flaps-up position to the full down position. N.B. It is important to:
   1) Move the flaps in one continuous motion, and
   2) to release the flaps-down switch as soon as the flaps stop moving down, otherwise the recording of the extension time will be incorrect and the flaps-down AoA will not indicate correctly, and
   3) if the flaps-down stall AoA does not change linearly with flap extension, then you should note where the stall AoA does not further reduce the stall angle with continued extension. For example, if the maximum stall AoA reduction has been reached with 75% flap extension, then you should set the flap extension time to 75% of the total travel time. This will ensure the correct indication of AoA relative to the actual stall angle.

6. For manual flaps with position sensing switches, make the travel time minimal (less than 1 second) so the AoA indicator will reflect the correct stall angle as soon as the flaps are fully down. For a progressive sensing of the flap position, a different AoA indicator model is required, and a rheostat installed on the manual flaps/flap handle to sense flap position.

7. The system can be reset and restarted with the right-most button. This does not alter the settings established in steps 1 to 5 above.

It should be noted that the display and LED will not show meaningful results until the flight and stall characteristics have been set up by pressing each of the buttons at the appropriate times.

Next month (March) we will cover troubleshooting.

## TCCA Airmanship Notes

I remember seeing a long version of this in a TCCA publication and thought it was worth a repeat here. I do not remember the Author's Name.

The three fundamental principles of airmanship are:
- Skill
- Proficiency
- Discipline.

When all three are applied together, one becomes a safer and more efficient pilot.

Skills come in four levels (Tony Kern):
- Level one is safety (good enough to be safe)
- Level two is effectiveness (being able to handle the local and cross-country environment that you wish to operate in on your own);
- Level three is efficiency
- Level four is precision and continuous improvement.

The average general aviation pilot will usually reach level two in their lifetime. Only with additional training will they be able to move up to level three.

## EAA 266 Library — Ed Hannaford

The EAA 266 library contains a collection of books and DVDs that cover aircraft in general, homebuilding construction techniques, local events, history and Technical Manuals.

**To order books - Call Ed Hannaford**
**613-347-1201 e-mail Skyranch33@gmail.com**
**Cost to borrow these items is $2.00 for a one month period**

## The Unclassified Classified — Free Ads for Paid-Up Members

**Seeking:** Looking for partner (or partners) to purchase a small (2-4 place) airplane. Would consider factory or home-built, tricycle or tail wheel. Robert Hope, roberthope530@gmail.com

**For Sale:** Hangar doors (sliding) complete with rails for 40-foot hangar. Door height is 11'5½" all metal. As removed from hangar at Cornwall. $1200.00. Ed Hannaford. skyranch33@sympatico.ca

**For Sale:** 1 ea. H-Type shoulder harness 2 inch, black with metal to metal fittings. New never used, from Aircraft Spruce, no lap belts, $100.00. skyranch33@sympatico.ca

**For donation:** Vari-Viggen Rutan, designed by Burt Rutan inspired by the SAAB 37 Viggen. It is 60% complete with almost everything you need to complete except the engine and the propeller. Located at the airport of Louiseville, QC CSJ4. Gaston Girard (438) 495-5253

**Seeking:** Active aircraft builder looking for old projects or materials. Specialized in old wood aircraft and restoration. Ron Gosselin (514) 808-1808 - ronny@total.net

**For Sale:** Landing lights, 50W, 24V, 20$ each, Frank Grayer (613) 874-2837.


Please note: Graham's email has changed to graham@flyairprestige.com.