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Newsletter, April 2017

Notice of Meeting:

NOT Thursday, April 27, 2017
but on Thursday, May 4, 2017 at
7:30 PM. Topics include ...

CSeries Flight Testing:

Scott Black will present a talk on Natural Ice Flight Testing on the Bombardier CSeries aircraft.

Zodiac CH 601 HD:

Carlos Sa will present Canopy installation and customization on a Zodiac CH 601 HD.

Location:

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

This month's contributors:

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John Lawson

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

Dear Members,

Some things to be aware of...

- I draw your attention again to the fact that this month's presentation will be held at the usual time and place, but on **May 4**.
- John Dudkoff is selling a Lycoming O235-C1 engine. See details on Page 6.
- Following a very interesting presentation by Nicolas Horn of Blackshape Aircraft out of Lachute (<http://www.blackshapeaircraft.com/en/>), Nicholas offered to host our chapter members to an on-site visit of the Blackshape facilities some time in July. More news on this shortly.
- I received a request from John Lawson, President of the Montreal Aviation Museum as found below. The attachments John mentions are appended to this newsletter.

“ ...

Upcoming changes in the governance and management of the Montreal Aviation Museum (MAM) involve the creation of an Operating Committee, composed primarily of Active Volunteers, to run the day to day affairs of the Museum and the hiring of a General Manager (GM) to act as the intermediary to a newly created higher level Board of Directors whose role it is to provide strategic and financial leadership and lead the Museum into the future.

The attached job description, in English and French, outlines the duties and responsibilities of the General Manager as well and the desired qualifications.

Please send any expressions of interest or referrals of interested and qualified candidates to the undersigned. This is an important step for the Museum and your help will be appreciated.

John Lawson
President, Montreal Aviation Museum
jlawson@videotron.ca
or call (450) 424-2893
...”

Best Regards to All,

Mike Lustig
President, EAA 266

A word from our Editor**Richard Guevara**

When my wife asks me to do some repairs around the house, I now ask one question – will this help me develop or hone some skill I need for my homebuilt? Naturally, I ask and answer this question in my head. So if I get to justify buying a tool I need or try some tool I bought, I say yes – if no, I suggest she call one of the many repair guys we know. Wood repair? I'm all over it, car repair problems, ditto. Removing those large stones in the back yard, then digging down, laying gravel, tamping the gravel, then replacing the large stones – nope, not happening – call Mr. Handyman, please. As a general guide, if it's not covered by a chapter in ATA-100, I don't know how to do it.

Contact Us!

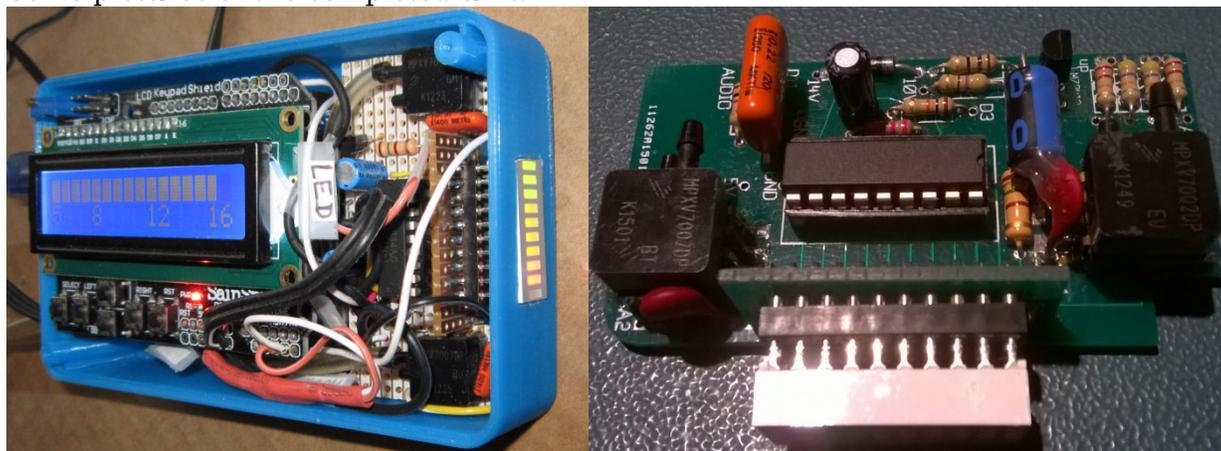
<http://eaa266.org>

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We present the fourth 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:

Some Technical Details of the AOA sensor.

Some pictures of the completed unit:



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.

A brief review of Part II:

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 personality, it requires setting some data points on the ground and some in flight. If you have flaps, you need to make some assumptions of your typical landing configuration, and if you do not have flaps, the calibration is very straightforward. It should be noted that the display and LED will not show meaningful results until the flight and stall characteristics have been properly entered into the AoA indicator.

A brief review of Part III:

The AoA Indicator will show random and meaningless results on the LED until calibration is performed. The LED will indicate errors. While stationary on the ground, the LED will show a default 10 degree AoA. This indicates the unit is ON, but no meaningful information is available for display. The permanent memory (EEPROM) on the Arduino microcontroller is used to store the flight characteristics of your aircraft. The airspeed indicator gives you quantitative information about angle of attack (except near the stall).

Some Technical Details of the AOA sensor:

Circuit Board Connections with the Arduino Uno and the aircraft:

Wiring

1. A1 – Angle of attack input from the AoA pressure sensor (on board to Uno) * Blue
2. A2 – Pitot input from Pitot pressure sensor (on board to Uno) * Yellow

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3. A3 – Flaps Down switch (from top of voltage divider on flaps-down switch to Uno)* Green
 4. A4 – Flaps Up switch (from top of voltage divider on flaps-down switch to Uno) * White
 5. D3 – LED signal from the Uno * Orange
 6. D11 – Audio signal from the Uno to the aircraft radio or intercom via board * Brown
 7. Down – Flaps down signal (from flaps-down switch to mid-point of voltage divider)**Green
 8. Up – Flaps up signal (from flaps-up switch to mid-point of voltage divider) **White
 9. Audio – Stall warning signal from board to radio or intercom **Coax
 10. Audio – Coax ground **Coax
 11. Vcc – 14 Volts from aircraft to board **Red
 12. GND – ground from aircraft to board **Black
 13. GND – ground from board to Uno * Black
 14. Vin – 10 Volts from board to Uno power input * Red
 15. 5V – 5 Volts from Uno to the board to power the pressure sensors * Pink
- * Wiring: Internal (inter-board) ** External to Aircraft wiring (4-conductor coax)
PCB wire holes require a maximum size of # 22 wire gauge

Changes to next PCB version

- Move lettering outside component area so it can be read after board assembly - DONE
- Make holes larger for wires OR use maximum gauge # 22 wire - DONE

Unit Assembly Notes

- Drill size for pressure tubing 5/32"
- Drill size for screw holes

GERBER FILE EXTENSIONS

Our site knows the default naming schemes from many PCB design packages, however if you have problems, this is a naming scheme that is known to work.

If the website doesn't understand the default naming scheme of your PCB design package, please email the zipped Gerbers and the name of your design package to support@oshpark.com.

- boardname.GTL Top Layer 11m
- boardname.GBL Bottom Layer 12m
- boardname.GTS Top Soldermask sm1
- boardname.GBS Bottom Soldermask sm2
- boardname.GTO Top Silkscreen ss1
- boardname.GBO Bottom Silkscreen -
- boardname.GKO Board Outline outline
- boardname.G2L only for four layers
- boardname.G3L only for four layers
- boardname.XLN Drills - (plated holes only) drill

"boardname" can be whatever you like. Only the extension is important.

PCBWeb.com Output Files:

- 11m = Top layer
- 12m = Bottom layer
- ss1 = Top silkscreen
- sm1 = Top solder mask
- sm2 = Bottom solder mask
- sp1 = Top solder paste
- outline = Board outline
- drill = Plated holes Excellon file
- drillnpt = Non-Plated holes Excellon file

File Locations and Gerber File Preparation Procedure:

- PCBWeb writes the Gerber file into C:\Users\Dave\My Documents\PCBWeb\boardname
- Unzip this file and change the file extension names as indicated above
- Store the files into D:\My Documents\PC Web Designer\AoA_2016-04-01.cad
- ZIP the file into C:\Users\Dave\My Documents\My WinZip Files\AoA

Design Rules (www.OSHPARK.com)

You can download our Eagle DRU file if you're using Eagle CAD, which will verify that your design meets our design rules, otherwise here are our specifications:

1. 6 mil minimum trace width
2. 6 mil minimum spacing
3. at least 15 mil clearances from traces to the edge of the board
4. 13 mil minimum drill size
5. 7 mil minimum annular ring

Thingiverse Enclosure Dimension Changes (See AoA Visio Diagram – Page “Enclosure”)

1. Openings for power and USB port should be 1/16” higher than the offset posts on the bottom of the enclosure
2. Remove the two locator pins from offset posts under pressure sensor board
3. Locate LED opening at right hand end of enclosure base (width measured at half height)

Sent to the author of the enclosure

Suggestion for modification: The bottom surface of the two openings for power and USB should be only 1/16" higher than the stand-off posts on the bottom of the case, otherwise the Arduino board doesn't lie flat at that end. The openings keep the board elevated. So far I have had to file down this area to achieve a proper fit.

Also, given the prohibitive cost of SolidWorks for the hobbyist, never mind the learning curve, would it be possible to ask for an enhancement to the geometry? I have to cut out the right hand end to accommodate a 10-segment LED as you can see in the "MADE" section of this website; the unit dated August 3, 2015. A punch-out opening would make life much easier (and neat), since I plan to make several of these devices using this 3D-printed enclosure.

In anticipation of a positive response, the knock-out opening is located at approximately midpoint of the right-hand end of the box. The opening is 10.4 mm high by 25.6 mm wide. Vertical location is 5.3 mm below the top and 9.0 mm above the bottom of the box. Horizontal location is 23.3 mm from the front and 25.6 mm from the rear, measured at approximately mid height of the trapezoidal end of the box.

Thanks!

davidjohncyr@gmail.com

Construction Comments

- Air hose holes 5/32” diameter
- Enclosure top screw holes 5/64”
- Hole placement: top = Pitot, middle = Static, bottom = AoA probe
- ALTERNATE PRESSURE SENSORS: Rather than the +/- differential pressure sensors that are only useful for half their range, exchange these for zero-to-max-range sensors MP3V5004DP and MPXV5010DP.
- AoA with manual flaps: Use full down switch, full up switch and neither of these contacted means half flaps. Could split the difference or record stall at mid point and store that observation. Use cubic spline interpolation (C++ source code).

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**

For Sale: Lycoming O235-C1 with logs, 2160 SMO, 1427 STO (PenYann) with starter and generator. Suitable for certified aircraft. \$3900.00 John 514-428-1233

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.



Graham Batty
 Air Prestige Flight Training Inc.
 President & Chief Flight Instructor
 AERIAL PHOTOGRAPHER & FERRY PILOT

École de Pilotage Air Prestige Inc.
 Président & Chef Instructeur de Vol
 PHOTOGRAPHE AÉRIEN ET PILOTE DE CONVOYAGE
graham@flyairprestige.com

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

POSTING

JOB DESCRIPTION – GENERAL MANAGER

Upcoming changes in the governance and management of MAM involve the creation of an Operating Committee, composed primarily of Active Volunteers, to run the day to day affairs of the Museum and the hiring of a General Manager (GM) to act as the intermediary to a newly created higher level Board of Directors whose role it is to provide strategic and financial leadership and lead the Museum into the future.

The attached job description outlines the duties and responsibilities of the General Manager as well and the desired qualifications.

The position is open to both internal and external candidates. The intent is to hire the individual as soon as possible so that the new GM can be integrated into the organization and begin to function.

Please read the Job Description and forward any recommendations for candidates to John Lawson at jlawson@videotron.ca or 450 424 2893.

MONTREAL AVIATION MUSEUM

GENERAL MANAGER - JOB DESCRIPTION

Position of General Manager

The museum seeks a qualified bilingual executive to act as General Manager (GM) to work in partnership with the Board of Directors to provide leadership and management to advance the mission, vision, values and strategic direction of the museum.

The General Manager is responsible for the day to day operation of the museum overseeing projects, financial and administrative duties, managing staff and volunteers while working with the Board of Directors to implement a progressive program for the Museum's fundraising, exhibitions, collection management, educational activities, public relations and community outreach.

The GM will be assisted in his tasks by an Operations Chief, an Operations Committee of volunteers, and various sub committees focussed on specific tasks such as fund raising, display management, youth education, building management, etc.

Summary of Roles and Responsibilities

- Work in conjunction with the Board to develop the strategic direction and establish initiatives to fulfill the mission of the Museum and increase the MAM's prominence within the city of Montreal and the Province in general.
- Plan, coordinate and direct the operations of the MAM including development, educational and public programming, finance, and external communications.

- Lead and participate in fund raising and development activities, including grant writing and developing relations with funding entities, foundations, corporations and individuals donors.
- Serves as a spokesperson and chief advocate for MAM, establishing partnerships in the community that enhance the Museum's public image to expand interest and support.
- Manage and lead employees and volunteers within a cooperative and congenial atmosphere that reflects the MAM's Code of Conduct and Ethics.
- Manage and maintain the property, facilities and its security, as well as the collections held in public trust.
- Organize Board meetings including status reports on operations and budgets, including visitor attendance and satisfaction surveys.
- Be responsible for the health and safety of volunteers and visitors
- Organize the preparation and production of Planetalk and other interim communications.
- Represent MAM on the CAPA Board and other professional museum organizations if required.
- Develop strategies for attracting, motivating and retaining volunteers and the general membership.
- Maintain a strong customer focus and to work toward increasing

Qualifications

Required

- A passion for aviation and history and a commitment to preserve Canada's aviation heritage and to pass it on to future generations.
- Proven ability to work cooperatively, diplomatically, and effectively with Boards, volunteers and in relations with the community and the media.
- Background in civil or military aviation at a supervisory or managerial level.

- Evidence of success in developing, managing and growing an annual operating budget.
- Demonstrated excellence in writing and public speaking in both official languages.

Desirable

- Prior experience as an Executive Director or senior administrator in a museum environment
- Demonstrated knowledge of best practices for museums, non-profit or similar organizations
- Demonstrated success in fund raising and outreach to the community, government and corporations.
- Prior experience as a board member or in working with a board.

Personal Attributes

- Excellent communications, interpersonal skills, organizational and time management skills.
- Respectful, inclusive and effective leader and developer of staff and teams.
- A self-starter able to work alone and with others, a collaborator.

Salary

This position will appeal to an already retired person seeking a challenging and rewarding part time position. There is a modest stipend associated with the position that will be tailored to the qualifications of the selected applicant.