



The ThunderWord

Thunderbird Field EAA Chapter 1217

March 2021

Scottsdale, Arizona

PRESIDENT'S CORNER

Greetings from my corner of the hangar. Finally it looks like there is a light at the end of the tunnel that has been this pandemic. People I haven't seen in a year are stopping out at the airport and working on their planes. The big news is that we will be back to in person Chapter meetings in May. If you know someone that wants to be our featured speaker when we restart drop me a note. We also are planning our May Day BBQ on May first so put that on your schedule.

It looks like some of the major aviation events are going to happen this year. Sun-n-Fun in Florida is happening in mid-April and Oshkosh AirVenture is a go for now. Locally the Cactus Fly-In was held as well as the monthly Coolidge Breakfast Fly-In on the first Saturday of the month.

Stay healthy and keep a positive outlook. See you around the hangar!

Curtis

CHAPTER MEETINGS

START ON MAY 20

Finally a plan has emerged from the haze of this pandemic. Your officers have a unanimous decision to get things rolling in May. Starting on May first we will have our annual May Day-May Day BBQ at Jack Pollacks hangar at Deer Valley, followed on May 20th with our first in person meeting in over a year.

So send up the smoke signals! After 23 years are back to having monthly meetings!

CACTUS FLY-IN

The 63rd annual Cactus Fly-In took place earlier this month. It was a much different

event than years past with the City of Casa Grande restricting it to a private affair geared towards aircraft owners, pilots and aficionados. The Airport Manager was very accommodating in letting the event be held as long as people used common sense and physically distanced themselves.

Friday's attendance was very light and it was a great way to catch up with old friends and make a few new ones. Two of the really unique planes were a yellow Clipwing Monocoupe with 185 horsepower. The other unique stand out was Steve Dillon's Huey gunship helicopter. It attracted tons of admiring people telling stories of their adventures in Southeast Asia.

Friday evening had a happy hour hosted by Fred Borns at his hangar. On Saturday night there was a free BBQ and drinks for attendees. The biggest surprise of the evening was that your Chapter President received Peoples Choice and Grand Champion for his Wickham B! It may be a homebuilt but it is also an antique.

FAA Oks J&J VACCINE

FOR AVIATION

Following the Food and Drug Administration's emergency use authorization of the Johnson & Johnson COVID-19 vaccine, the Federal Aviation Administration has approved use of the vaccine by pilots and air traffic controllers. After taking the vaccine, which requires only one dose, aviation professionals must wait 48 hours before flying or controlling air traffic. The FAA previously approved the Pfizer/BioNTech and Moderna COVID-19 vaccines for pilots and air traffic controllers as well.



**Wickham B at the 2021 Cactus Fly In
It was awarded Grand Champion and People's Choice**

HOMEBUILTS IN MEXICO

AOPA and the Experimental Aircraft Association have asked the civil aviation authorities in Mexico to **reverse a recent policy change** that prevents operation of U.S.-registered amateur-built aircraft in their country. AOPA and EAA have asked the civil aviation authorities in Mexico to allow operation of U.S.-registered amateur-built aircraft in Mexico

In a February 15 letter to the Directorate General of Civil Aeronautics (DGAC), AOPA and EAA noted that “operation of such aircraft has been common practice for several decades, but a recent change in policy by the DGAC has led to a halt in operations. Many of our members are concerned about this change and we seek an expedient solution to this problem.”

Under U.S. regulations, aircraft that are issued special airworthiness certificates, including experimental aircraft, bear a limitation that the aircraft does not meet the airworthiness standards of Annex 8 to the Convention on International Civil Aviation. Such aircraft may only fly over a foreign country with that country's permission and carry a document to that effect. The document must be made

available on request “to an FAA inspector or the applicable foreign authority in the country of operation.”

“Both The Bahamas and Canada use ‘blanket’ authorizations that allow any FAA-registered Amateur-Built aircraft that follows certain conditions to enter those countries without additional authorizations. The operator simply prints out the authorization and carries it aboard his or her aircraft, in accordance with the above operating limitation,” the letter said, urging Mexico to adopt a similar approach.

The letter also noted that under FAA regulations, the 21,000 experimental amateur-built aircraft operating in the United States “are only allowed to be flown for non-commercial purposes.”

AOPA and EAA included a prior authorization issued by the DGAC to an amateur-built aircraft from the United States in the letter as an example of past practice—also noting that “the Directorate may consider a similar means of granting the required permission.”

ELECTRIC AIR RACING

Air Race E, a hopeful electric air race promotor, has announced it is launching two

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**Wickham B hanging in Museum of Flight in Seattle
Before the restoration started it was destined to be recycled into beer cans.**



Wickham B prep for Transport to Arizona for Restoration



New Electric Air Racing class of Airplanes

new distinct race classes: one for airplane and the other for VTOL.

The new airplane formula will be named the Performance Class and will be based on a standard electric powertrain, which will focus on optimization, efficiency and extracting the maximum potential out of a powertrain. Air Race E is developing this new race plane under its own roof with the help of leading manufacturers in the industry.

Some modifications and enhancements will be allowed in the Performance Class to continue Air Race E's mission of accelerating technological innovation and showcasing new technologies in the aerospace electrification industry.

Air Race E's existing race airplane formula will be re-named the Open Class referring to the fact that any and all manufacturers can produce their own unique powertrain configurations up to 150kW power. Both airplane classes will be raced according to the same rules but with differences governing the powertrains.

The new electric VTOL class will be named the V-Class. VTOLs - often called flying cars - are a different category of aircraft altogether and at the forefront of electric technology in aerospace. Air Race E is positioning this class as "The World's First Vertical Motorsport."

The race format and rules will be somewhat different than the other two race classes and will be revealed soon.

Jeff Zaltman, CEO of Air Race E, said: "The launch of the new Performance Class and V-Class will allow us to include more stakeholders in our project and greatly increase our ability to meet the needs of the industry while organizing a thrilling motorsport.

"The Performance Class will provide deeper insights on power management and best practices and will steer more dedication to the sub-systems such as cooling, battery management systems, power electronics and aerodynamics.

"The V-Class demonstrates a major step-change in air racing. Air Race E will be working directly with the top pioneering organizations in the e-VTOL world to shape the event to be at the vanguard of both technology and entertainment in this next generation of motorsport."

FMI: <https://airracee.com/>

DISPLAY YOUR PLANE AT RENO AIR RACES

The National Aviation Heritage Invitational (NAHI) launches its 20th Annual vintage aircraft competition, at the Reno Air Races, by formally opening the application process for

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Rare RV-3 from Hemet California at the Cactus Fly-In



Steve Dillon's Huey gunship and T-34 at the Cactus Fly-In

restored aircraft to compete for the acclaimed NEIL A. ARMSTRONG AVIATION HERITAGE TROPHY. The prestigious event is hosted by the Reno National Championship Air Races. Sept 15-19, 2021.

“The vintage aircraft competition, which was founded in 1998, has two primary goals; to encourage the preservation of our rich aviation history by encouraging the restoration of vintage aircraft to airworthy condition and to help inspire our nation’s youth to pursue careers within the aviation and aerospace

industry”, said Ken Perich, Chairman and Executive Director of NAHI.

To enter, aircraft must be restored to airworthy condition and be manufactured at least 45 years ago. For the 2021 competition, all aircraft must be manufactured in 1976 or in prior years. The Reno Air Racing Association and the National Aviation Heritage Invitational are committed to keeping our rich aviation history alive and we invite aircraft owners and restorers to participate in this prestigious event. Since 1999 a panel of judges reviews participating aircraft against standards in line with those of the Smithsonian Institution’s National Air and Space Museum. This includes; authenticity, quality of workmanship, attention to detail and technical merit.

- Aircraft can be entered to compete in one of the FIVE judging categories: Antique, Classic, Contemporary, Military and Large Aircraft.
- Antique – includes all eligible civil aircraft manufactured in 1945 and earlier. The winning aircraft will be awarded the Orville and Wilber Wright trophy;
- Classic – includes all eligible civil aircraft manufactured in years 1946 to 1956. The

winning aircraft will be awarded the Paul E. Garber trophy.

- Contemporary – includes all eligible civil aircraft manufactured in years 1956 to 1976. The winning aircraft will be awarded the Steven F. Udvar-Hazy Trophy.
- Military – includes all eligible military aircraft manufactured in 1976 and before. The winning aircraft will be awarded the Henry “Hap” Arnold trophy.
- Large Aircraft -includes all eligible aircraft, both civil and military, manufactured in 1976 and before with wingspans of 45 feet or more. The winning aircraft will be awarded the Herb Kelleher trophy.

The overall winning aircraft is awarded the Grand Champion Neil A. Armstrong Aviation Heritage Trophy. The trophy resides at the Smithsonian Institution’s National Air and Space Museum’s Steven F. Udvar-Hazy Center at Washington Dulles Airport in Virginia. The winning aircraft owner’s name and the name of the restoration facility is engraved on a plaque placed on the perpetual trophy. The overall winner and each of the category winners are presented with a keeper trophy.

Six foot tall Grand Champion Trophy which sits at the National Air and Space Museum - Steven-F. Udvar Hazy Center when not at the National Aviation Heritage Invitational.

In addition, the People’s Choice trophy, sponsored by Air & Space Smithsonian magazine, is awarded to the owner of the aircraft receiving the largest number of votes cast by the event attendees.

For details on eligibility, judging criteria and to complete the entry application for the NATIONAL AVIATION HERITAGE INVITATIONAL please visit www.heritagetrophy.com Applications for entry in the 20th annual Invitational must be submitted online no later than August 15th, 2021. Each aircraft may only be entered in one category, which must be declared on the application form.

For further information please visit www.heritagetrophy.com or contact:

June Powers, Director – Participants National Aviation Heritage Invitational Tel: 503-851-4337 Email: cjpowers7005@yahoo.com

Colin Powers, Chief Judge National Aviation Heritage Invitational Tel: 503-851-4338 Email: cjpowers7005@yahoo.com

Connie May, Director – Communications National Aviation Heritage Invitational Tel: 775-530-2297 Email: cpardew@att.net

MAGNETIC VS TRUE

A Canadian group has completed a study that might have world wide aviation impact. The group titled NAV CANADA is leading industry efforts to move away from magnetic north to true north, improving safety and saving millions of dollars annually.

Magnetic variation has always posed a problem for the design and operation of instrument procedures for Canadians from the enroute through to terminal and approach phases of flight.

The problem has continued into the digital age even though aviation doesn’t need the original magnetic reference anymore.

Alaska’s Anchorage International Airport highlights the issue. In 2012, the Federal Aviation Administration (FAA) updated the magnetic variation of the airport. Because aircraft operators couldn’t all follow suit immediately, there was a mismatch between the magnetic variation used in various aircraft systems and the navigation database in the flight management system.

Getting airlines to update their systems regularly is known to be a challenge. A Canadian study estimated some were 10-15 years out of date. Already, the National Oceanic and Atmospheric Administration (NOAA) has recommended a mid-cycle update to the World Magnetic Model 2015 as the forecast is deemed no longer valid out to 2020.

As Anthony MacKay, Assistant Overlord Vice President of NAV Canada, explains, issues

with magnetic variation persist largely because “that’s the way we have always done it”.

The background

The use of magnetic north dates back to the earliest days of flight. As soon as aircraft were developed, a heading reference system was required. And the fragile nature of the early aircraft meant that the system needed to be small, lightweight and simple. “Nothing is more simple than a magnetic compass,” says MacKay. “It doesn’t need any power and it always works.”

As navigation systems developed, a heading instrument or directional gyro was used to account for small errors in the magnetic compass caused by dips in the Earth’s magnetic field. Periodically, the pilot would reset the heading instrument to align with the magnetic compass.

In the jet age, the heading instrument was tied to a magnetic sense system eliminating that one step of the pilot reading the magnetic compass and then setting the heading instrument.

“Unless you were flying north or south of 70 degrees latitude, the difference between the moving magnetic poles and the true north and south poles that form the anchors between the latitude and longitude lines around earth were easily handled,” MacKay explains. “Small directional errors in an analogue system were not that critical and the analogue human in the middle could easily adjust and compensate.”

But as aircraft systems became more tightly integrated and digital systems developed, those small errors have become more than a mere distraction, driving a mismatch between the various navigation systems as the Anchorage case illustrates. As MacKay puts it: “If a computer is expecting to see a one and instead it is given a zero, it doesn’t like it very much.”

Today, all modern aircraft with Inertial Reference Systems or Attitude Reference Systems that use cost-effective Inertial

technology actually function in true north (TRUE).

“All the systems, all the math under the hood is done in TRUE,” says MacKay. “Then the aircraft systems convert it to magnetic north to show it to the pilot. Today, instrument procedures are built in TRUE and then converted to magnetic prior to publication. Our surveillance systems use latitude and longitude in TRUE and then adjust to magnetic prior to showing the tracks/targets to controllers.”

Advantages

There are many advantages in moving to TRUE, including simplifying technical processes.

Because Magnetic North is always moving, all the procedures and systems built upon magnetic north need to be constantly updated and amended. Switching to TRUE will therefore remove the cost involved for airlines in updating magnetic variation in Inertial Reference Units (usually two or three per aircraft), flight management systems and, if installed, Synthetic Vision Systems.

“Basically, while using magnetic north, every computer system on the aircraft requires updates to maintain the current magnetic value,” he says. “And they all have to match – which sometimes they don’t, depending on the model and the implementation.”

Similarly, for ANSPs, switching to TRUE removes the time devoted to updating IFR approach and in route procedures with the latest magnetic values. The system would be frozen on TRUE.

Airports, meanwhile, would never need to change runway numbering again. Given the documentation involved in that process, it would be a significant gain. “Essentially, switching to TRUE removes a large and costly time and money burden for all segments of modern aviation,” MacKay insists.

Select the switch

Perhaps the biggest advantage to TRUE is that it can be implemented by simply stopping

a process – the conversion to magnetic north. As noted, Inertial Reference Systems on modern aircraft already function in TRUE. Most aircraft have a Mag/True switch that would just need to be selected.

Of course, this solution works for the larger aircraft used in scheduled commercial aviation. General aviation planes that still only have and can only have a magnetic compass or sense system on board would need to either manually do a small plus/minus conversion on what was read off of the magnetic compass prior to setting the directional gyro or use a device that would convert from magnetic to TRUE for them. But these systems for light aircraft are much cheaper than those required to go from TRUE to magnetic on a large aircraft fleet.

Most importantly, however, there needs to be a desire to change. The next step, therefore, is working with ICAO to accept the change and help the industry move towards TRUE. Those meetings have started. There will be

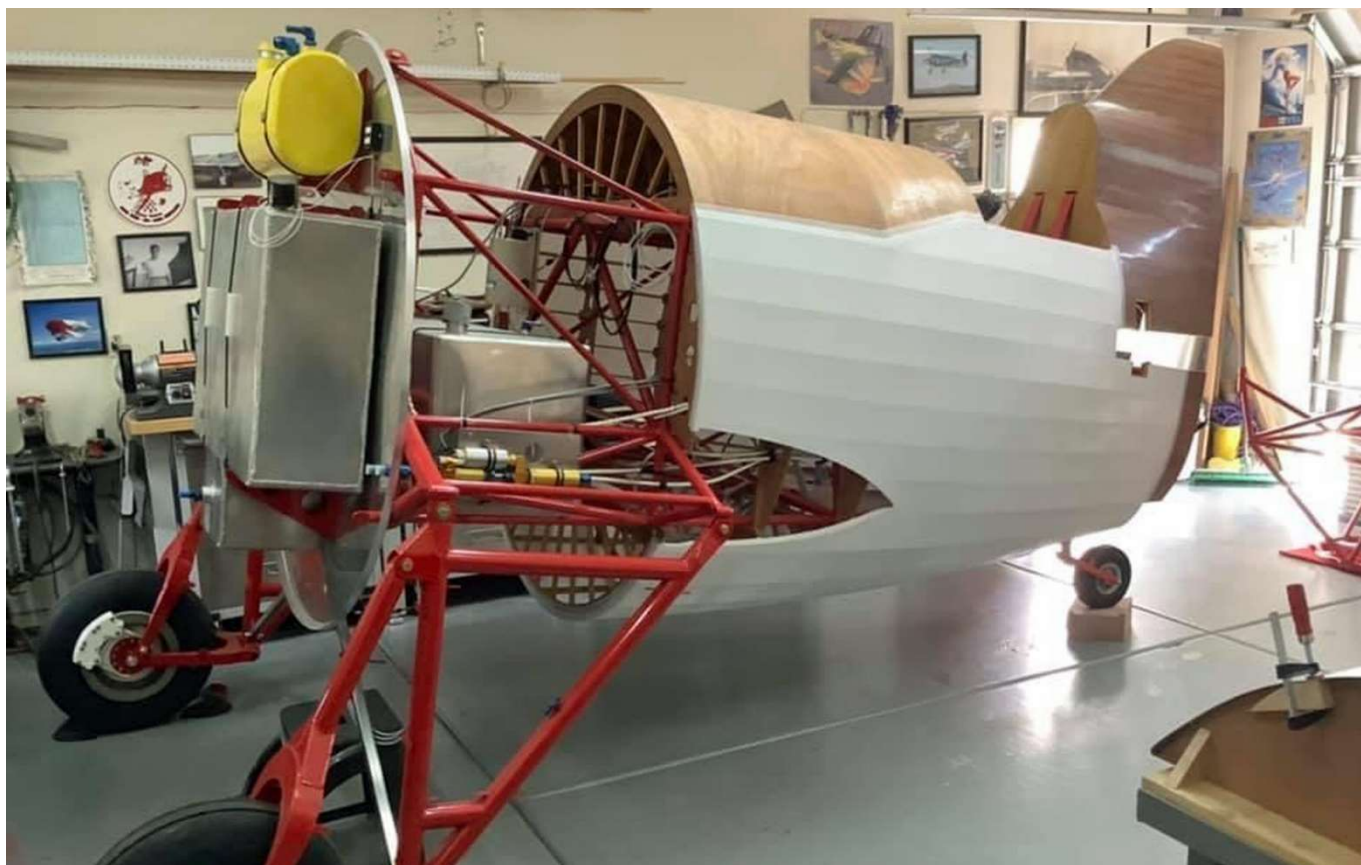
objections from small aircraft operators, but NAV CANADA anticipates a lead time to enact the change of 10 or more years.

“It would be more than manageable,” concludes MacKay. “There are millions of dollars lying on the table for the aviation industry to save.”

TRUE in performance-based navigation

Canada’s working paper to ICAO suggests that a true north heading reference in a performance-based navigation (PBN) operation would simplify charting and aircraft operation and reduce costs going forward. In Canada alone, it costs roughly \$500,000 per year to manage magnetic variation in various publications. Another \$300,000 per year is spent rotating VORs and flight checking modified instrument procedures for magnetic variation changes. Other magnetic variation costs stated by the working paper include:

- Airport signage and runway renumbering
- RADAR alignments
- Aircraft magnetic variation table updates



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LONGEZ AND SONEX

Tom Partin has decided to stop flying and has two airplanes for sale at Thunder Ridge air park (AZ28), a 180hp LongEz and a 120hp Sonex. Contact Bertha Partin at bmartin@gmail.com

THATCHER CX-4 PLANS & BUILDERS MANUAL

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