



CHAPTER 81

SKY WRITER

April 2011 Newsletter

Notice!

**Regular Chapter Meeting at Ryan Field
Administration Building
Saturday, 16 April 2011, at 10 AM**

2011 EAA 81 Dues Payment Status

Annual dues are \$20, now due for 2011. As of 09 Apr, 67 of 106 regular members are paid-up. Checks should be made payable to: EAA Chapter 81 and sent to Mick Myal, 2900 E. Weymouth, Tucson, AZ 85716, or brought to a chapter meeting.

EAA Chapter 81 Meeting Minutes Thursday, March 24, 2011

Meeting was called to order by President Duane Boyd at 1900 at the Pima Community College Aviation Program campus near Tucson International Airport.

Treasurer's report: Mick Myal reports that we have \$12,413.03 in the bank as of 2/22/11.

	Calendar of Events (Please send event info to the editor)
Apr-16	EAA81 Meeting at Ryan Field, 10AM
May-21	EAA81 Meeting at Ryan Field, 10AM
Jun-18	EAA81 Special Meeting (TBD)
Jul-09	EAA81 Meeting at Ryan Field, 10AM (Note early date in the month)
Jul-25 to Jul-31	EAA AirVenture 2011
Aug-20	EAA81 Meeting at Ryan Field, 10AM
Sep-17	EAA81 Special Meeting (TBD)
Oct-15	EAA81 Meeting at Ryan Field, 10AM
Nov-19	EAA81 Meeting at Ryan Field, 10AM
Dec-17	EAA81 Holiday Party (date TBD)

Secretary's report: Bob Miller reports that the February meeting minutes were published in Sky Writer and on the website.

Newsletter Editor's report: Erik Fjerstad reports for Webmaster about the revised chapter web pages (www.eaa81.org) with a calendar of events and pages for contact info, aviation links, newsletter & minute archives, and coming soon a page for classifieds. If there is interest, a "chapter blog" could be set up as well. Also, for warbird buffs, the Collings Foundation will be at the Marana Regional Airport April 15-18 at the SE ramp, bringing their Boeing B-17 Flying Fortress Nine O Nine, their Consolidated B-24 Liberator Witchcraft (previously The Dragon and Its Tail), and the

only remaining flying 2-seater North American TP-51C Mustang Betty Jane. At Airventure Oshkosh this year, the only flying Boeing B-29 Superfortress Fifi will make an appearance.

At 1910, Tom Hinman, Pima Community College's newest Program Manager, began his presentation. PCC is a community-oriented school which offers three aviation career programs: Avionics, Structures, and A&P (Airframe and Powerplant, not the Great Atlantic and Pacific Tea Company, for those of you old enough to remember the supermarket chain). There is also a ground school for pilot certificates. The A&P program costs from \$6K to 10K, about half of the typical cost of A&P schools. The course is rigorous, 7AM to 3PM five days per week, costing \$60-80 per credit, and the graduates are ready to test at the end of the 19 month program. There is a vast market for aircraft maintenance mechanics and graduates are placed without difficulty, even internationally. Tom is very proud of the PCC aviation programs, citing them as in the top 10 nationally, and teaching real craftsmanship and pride in workmanship. He showed us a film on the programs and took us on a tour of the very large hangar housing the tools of the aviation construction and maintenance trade, including an entire retired airliner (one of several on campus), multiple light aircraft, and quite a variety of aircraft engines from modern turbines to antique radials. We are planning on making an endowment to each of the three Aviation Programs and sharing our enthusiasm for Experimental Aircraft with the PCC students via joint programs in the future.

The next meeting will be held at the Ryan Field Meeting Room on Saturday April 16 at 1000.

Respectfully Submitted by
Secretary Bob Miller

Interesting or Useful Aviation Information

FAA suspends its expunction policy

In April's AOPA PILOT Magazine, AOPA's General Counsel John Yodice discusses the recent suspension by the FAA of the "expunction" policy, whereby certain violation history would be removed from pilot records after a period of time. *"At first blush this may not seem significant to pilots who have never been in trouble with the FAA. That's most of us. But, it is significant to all of us. From long experience, I can tell you that most of the pilots who have faced FAA enforcement have been law-abiding and safety-conscious pilots. They are pilots who have been involved in an inadvertent, first-time violation that did not seriously compromise safety. They stumble because the FAA regulations are so numerous and so pervasive that any pilot with*

significant experience can get caught. It is by mere chance (or the limitation of FAA resources or the many reasonable FAA inspectors) that most are not."

This action was taken as a result of recent issues where deleted history of airline pilot applicants involved a history of poor airmanship, etc.. For the full article, click here:

<http://www.aopa.org/members/files/pilot/2011/april/counsel.html>

Magnetic North Pole Shifting

Charles Spence in General Aviation News discusses how the North Pole is shifting, and its effects on aviation. *"... magnetic north is shifting its position at a rate of about 40 miles a year. At the beginning of the last century, the shift was only about nine miles a year. The shift is moving the magnetic pole northwest, from its early location from down in Northern Canada towards Siberia. It is now over the Arctic Ocean, according to the National Oceanic and Atmospheric Administration (NOAA). The magnetic pole also is about 15% weaker now than it was in 1831 when discovered by a British explorer.*

Airport runway numbers are evaluated every five years, The current shift of about 40 miles a year creates a 1° difference in compass direction every five years. Over the years, that means you could wind up one or several degrees off — which translates to a few or even hundreds of miles — depending on the length of flight. That gives pilots an additional — and important — reason for using up-to-date charts and making sure equipment is properly calibrated." For the full article, click here: <http://www.generalaviationnews.com/2011/02/24/how-the-shift-in-magnetic-north-affects-your-flying/>

Aviation Enlightenment

"There's a big difference between a pilot and an aviator. One is a technician; the other is an artist in love with flight." - E. B. Jeppesen

My thanks to Chapter 81 member David Schiffman for his contributed articles on expunction, the North Pole, and on being an aviator. - ed

Mick Myal sent me a link to some great aviation videos. Click on <http://www.sleepingdogtv.com/>

There are four videos to watch, the main one in the large window, plus three more to the right.

I'm A Big Fan - (Contributed by Bob Miller)

No, I'm not talking about sports. I'm your propeller, and, I'm tired of being neglected. Unless you're flying turbojets, you need me to pull (or push) your airplane (glider pilots, stop looking so smug; who got you up there in the first place?). My obvious purpose is to cool the pilot (you can actually see him sweat when I stop), but beyond that, what I do is convert power into thrust. Sir Isaac Newton (the apple guy, not the fig one) told us in his third law that "for every action, there is an equal and opposite reaction." In ground vehicles, thrust is applied to the ground via tires. The ground goes backwards and the vehicle goes forward, but because the ground is a bit more massive than the vehicle, its backward movement is imperceptible. But, when the tires leave the ground, that method becomes noticeably less effective. So, if you can't push against the ground, what do you push against? Air has mass too, and if you push enough air mass backward, you will go forward. That's where I come in. I have the ability to push enough air mass backward that you and your airplane go forward. Divert some of that thrust downward with a wing, and you get lift too.

So, what am I? The most critical airfoil on your aircraft, that's what. Try these stats on for size, sports fans. I routinely cruise at over 500 MPH, all the while spinning, pulling, and flexing. While undergoing this unbelievable stress, I am constantly being eroded by sand, rain, even gravel, yet, nearly always provide reliable service. And, what thanks do I get? Do you even know my parts? Do you think that the face of the propeller faces forward? If you did, you'd be wrong. The face faces backward and pushes the air. The leading edge and the face take most of the abuse, but do you ever look at the face during your pre-flight? My other parts are like those of other airfoils: chord, length (span), and thickness. Rather than using the term "angle of incidence," we props have our own term: "pitch." This is based on the concept that a propeller is an air screw. The pitch of a screw is the distance between adjacent threads, and the pitch of a prop is the theoretical distance it would travel through air in one revolution if there were no slip, like a screw going through wood. Of course, there is slip, but you get the idea. Pitch is measured at the point $\frac{3}{4}$ of the way between the hub and the tip. Every prop is made up of a number of blades, each with its own designation. Even a fixed-pitch prop has blades #1 and #2, and each must be of the same pitch and length, and balanced against the other. So, now that you know the basic anatomy of a propeller, here is an example of a designation that explains the above: the common Sensenich 74DM6-0-60. Its diameter is 74", D is the blade

design (chord, airfoil), M6 denotes the hub configuration (how many bolts, etc.), -0- refers to the fact that zero inches have been cut off the diameter, and 60 is the pitch in inches, measured at $\frac{3}{4}$ radius station.

Maintenance - That's only for those complex constant-speed props, right? Wrong. Yes, even the humble fixed-pitch prop needs maintenance. Before we go into this, let's review the differences in pitch-control types. All prop blades flex, in both twist and in the forward-backward plane. What about those rigid, metal fixed-pitch props? Yes, they flex too. Some fixed-pitch props are designed to flex in twist so that the pitch effectively changes according to load. The pitch goes finer under load (takeoff and climb), then becomes coarser when load is reduced under cruise. There have been certificated props that use centrifugal force and springs to deliberately change pitch according to load. Then there are pilot-controllable variable-pitch props that twist the blades to control the pitch. And finally (and most complex and maintenance-intensive) is the constant-speed prop, which has its pitch adjusted by a speed governor to maintain constant RPM. Having a variable-pitch prop is like having a transmission in a car; a gear for each purpose. You start a car in low gear (more engine RPM at lower speed for more power), then shift to higher gears to let the engine slow down as you go faster. The variable-pitch prop starts up in fine-pitch (low gear) for takeoff and climb, then is moved to coarser pitch at cruise to slow the engine. A fixed-pitch prop is like a car with only one gear. Its initial acceleration is slower or its top speed is limited, depending on what gear you pick. A "climb" prop is like being stuck in 2nd gear, whereas a "cruise" prop is always in top gear. So why don't we all have variable-pitch props? Well, there are a few negatives, such as weight, increased mechanical complexity (and more failure modes), increased operational complexity (and more opportunity for pilot error), increased maintenance, and, mainly, expense.

Basic propeller maintenance should start with the pre-flight checklist. On a basic metal (aluminum) prop, check for dings and nicks from rock strikes. This defect in the leading edge or the face can have great adverse effects on performance and efficiency. Even more important, they can create stress-risers: places where the crystal structure of the aluminum propagates cracks that can cause loss of a tip. This causes a huge imbalance which can tear the engine from the airframe, and I'll bet your weight-and-balance calculations did not take losing the engine into account! On a certificated plane, repairing prop damage is not legal preventative maintenance, unless supervised by a licensed mechanic. On an

amateur-built, you can do what you need to do, but you'd better know what you are doing. Dressing out a ding is not as simple as one might think: the rule of thumb is to dress out the ding to 10 times the depth. This means that if the ding is 1/8" deep, you must dress out the repair 5/8" to either side of the center of the ding, or a total width of an inch and a quarter. Of course, this can affect balance, so the prop must be rebalanced as part of the repair. Hydraulically-controlled constant-speed props require not only this basic maintenance, but also have seals and controlling mechanisms best left to the trained mechanic. One thing that the owner can do, however, is to insure that the hydraulic medium, engine oil, is regularly changed to keep sludge and moisture out of the mechanism. So, how about simple wooden props; fool-proof, right? Wooden props have their own maintenance needs. They need to be inspected regularly for delamination and their varnish coat must be maintained for moisture protection. The compressible nature of wood, and the fact that moisture in the wood allows for expansion and contraction, mean that prop bolts must be checked and re-torqued at regular intervals. They are more prone to rain-damage as well. Some modern polymers and composites share the advantages of wood (light-weight and lack of crystal structure, so cracks don't propagate) and have the advantage of not holding moisture, but they are still softer than metal and more easily damaged.

Now, on to propeller overhauls. Of course, constant-speed props, being complicated mechanisms, have TBO (time before overhaul), just as engines do, and time, as well as hours, counts. Neglect can cause corrosion in the prop hub, rendering a prop unairworthy without a single hour of operation. Most should be overhauled not only every 1000 hours, but every 5 years, whichever comes first. But, did you know that those sturdy metal fixed-pitch props require overhaul too? Fixed-pitch McCauley props should be overhauled at 2000 hours or 7 years, while Sensenich recommends a 2000 hour TBO. Overhaul involves disassembly, cleaning, and inspection for cracks and excessive wear. This can involve dye-penetrant methods which can find otherwise invisible flaws. The blades are then dimensionally checked and the pitch is checked at every station along its length. Necessary repairs are made, and the prop is repainted. That's a lot of work so no wonder it isn't cheap, but how much is your life worth?

So, stop taking me for granted, wouldja? You should listen to me; after all, I'm your greatest fan!

B-17 Flights!

The Collings Foundation will be at Marana, 4/15 - 4/18, with their B-17, B-24 & P-51.

If you are interested in a ride in one of these classics, click here:



http://www.collingsfoundation.org/cf_schedule-wof.htm
If you are just interested in how to fly the B-17, here are two training films that should get you started!

B-17 Part 1 <http://www.youtube.com/watch?v=nZQStAxnr0&feature=related>

B-17 Part 2 <http://www.youtube.com/watch?v=Fdc8MJHB0Cc&feature=relmfu>

Please send items of interest, classifieds, etc to Erik Fjerstad – Newsletter Editor
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or to Erik's address on front page.

Check out the Chapter Website at
<http://WWW.EAA81.ORG/>

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