Cockpit Clutter

EAA Chapter 45 web site http://45.eaachapter.org

Chapter 45 Newsletter **Experimental Aircraft Association** **JANUARY 2017**

Happy New Year

January 20th General Membership Meeting

Friday January 20th, 7:30 PM

This year we will be having our normal group membership meetings but plan to do at least one technical, airplane related Show and Tell session, called **Builder's Corner** at each meeting. We will also have a Builder's Corner section of the newsletter each month.

Featured this month is Steve Glaeser talking about his use of Drill Jigs in drilling the spars of his Acrosport.

The feature for this meeting is a showing of the Oshkosh AirVenture 2016 highlight video.

Also, member Travis Hall will give an overview of a meeting scheduled soon by the glider club that is open to our members.

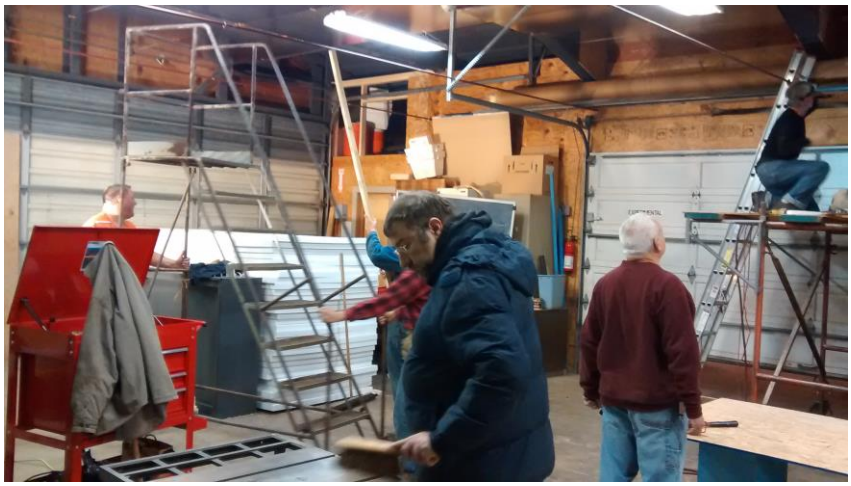
And he will also give a few tips he has learned in owner-assisted certified annual aircraft inspections.

Finally, COME TO THE MEETING to see the new EAA hangar insulated ceiling just installed in the last month. It was a challenge to add a ceiling to a complicated structure, but it is finished and looks great! The following are a few pictures of the crew doing some work during one of the Monday evening workshop sessions.

At left: Paul Jencka and Jake McClelland installing panels carefully around the area of the 16' garage door that connects the hangar to the meeting room.

Below left: Hank Szewczyk and Ken McClelland prepping a ceiling light to reinstall below the new ceiling.

Below: Rob Rossi installs hangers for installing the light.



At left: John Handis does clean up duty while John Warren waits for the next measurement to cut either a panel or a framing piece.

Below: Richard Seman and Jake McClelland trim fit an odd piece around the hangar roof supports while Paul Jencka, using his head most efficiently, holds up the large panel while they do their adjustments.

Cockpit Clutter / Builder's Corner

Shop Tip #67 Masking Tape Roller by Jack Dernorsek

When I was painting the black and white checkerboard scheme on the rudder of the Teenie Two, I wanted to be sure that the paint did not seep under the edges of the masking tape. This was also a concern on the accent stripes on the bottom tail cone area. I realized that sticking the tape down by hand pressure was not enough and some kind of roller would be needed to be sure the edges of the tape were firmly attached.

What I came up with was a small roller and handle, made from a piece of broom stick, a ¼" bolt and a wood wheel from the hobby/craft store. It worked very well and I was pleased with the result.

Here is a copy of an article from Sport Aviation, December 1966
A good one to post in your shop for reference or a copy with your torque wrench.

From the Designee File, by Jack Denison,
Designee No.115 *[the old name for EAA Tech Counselors]* Sport Aviation, Dec.1966 page 6.

WHY TORQUE? Without limits on the torque applied to important structural threaded parts, either the parts would not be tightened enough to provide rigid joints, or the application of too much torques would overstress the parts.

The fatigue life of a part depends on the percentage of load change encountered during operation. The lower the percentage the longer the fatigue life.

Will all the bolts holding the part get the same pull if each nut is tightened the same amount? Only when conditions that resist the nut from turning are equal; thread cleanness, condition of the threads, condition of the mating surfaces, and other factors. It is important to keep these conditions as uniform as possible by giving close attention to the physical condition of the mating parts and abiding by recommended assembly procedures. The torque method has it drawbacks, but it is much better than guesswork and the best method generally available. While using this method, keep in mind that it is pre-load of the stud or bolt that we are after.

The application of torque given in Column 2 of the table will develop about 40,000 psi in the bolt. Column 3 is simply 60% of the values given in Column 2 and will develop about 24,000 psi in the bolt. These torque values are intended for bolts loaded primarily in shear *["in shear" meaning the fastener is extended through two parts and the parts typically show a side force on the fastener, ie the parts in use are trying to shear the fastener off. This is opposed to being 'in tension' where the fastener in use is being pulled along its length – Most fasteners have both a shear and a tension applied although usually there is one of those forces by design that is the greater load - ed.]*

Columns 4 & 5 list maximum allowable tightening torques. These torques are intended for bolts loaded primarily in tension. Column 4 values develop 90,000 psi in the bolt; Column 5 values develop 90,000 psi in the bolt; Column 5 values develop about 54,000 psi.

Obviously, the torque limits given in Columns 2 through 5 are all within the static strength of the 120,000 psi minimum ultimate strength *[of an]* AN bolt.

To summarize, a loose joint is more detrimental than an overtorqued fastener. When tightening castellated nuts on bolts it is recommended a nut be overtightened just enough to line up the nearest slot with the cotter pin hole so long as the limits in Columns 1 and 5 are not exceeded.

Editor's note: the values at right are in 'inch-pounds'

TORQUE TABLE

These torque values are derived from oil-free cadmium plated threads.

Top Size	Tension Type Nuts AN 365 AN 310	Shear Type Nuts AN 364 AN 320	90,000 PSI Bolts AN 365 AN 310	(60% of Col. 4) AN 364 AN 320 Nuts
8-32	12-15	7-9	20	12
10-24	20-25	12-15	35	21
10-32	20-25	12-15	40	25
¼-20	40-50	25-30	75	45
¼-28	50-70	30-40	100	60
5/16-24	100-140	60-85	225	140
⅜-24	160-190	95-110	390	240
7/16-20	450-500	270-300	840	500
½-20	480-690	290-410	1100	660
9/16-18	800-1000	480-600	1600	960

TENTATIVE CALENDAR OF EVENTS 2017

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Planning and setting of dates are typically done by your board of directors at the beginning of the year and sometimes change. Unless noted, meetings are held at the chapter hangar at Rostraver Airport. Hangar is C1

January 13th -7:30 PM Directors and Board Meeting at Rostraver. All are welcome to attend our business meeting.

January 20th 7:30 PM General Membership meeting, a FREE dinner

February 10th - Board meeting

February 17th – General meeting

February XX – unsure of date; soaring / glider meeting and a simulator at the chapter hangar.

Monday night workshop / build nights are EVERY Monday night, unless winter weather is bad.

check out the meeting web site for updates
http://imapilot55.wix.com/ch45