

# WINTERMAIL

EAA CHAPTER 25

MINNEAPOLIS / ST PAUL, MN

JANUARY 2015

## ***Lightning and Transients Research Institute***

*By Noel Allard*



During World War II, fighter and bomber aircraft were flying higher and faster than ever before. They were flying in instrument conditions for the first time. Commercial aircraft, flying in support of the military, such as the Northwest Airlines routes into the wilds of

*(Continued on p. 4)*

*Young Rod MacKay, volunteer caretaker of the B-37 lightning bolt target plane at L&T Research Institute.  
1972 picture by Noel Allard.*

## ***Chapter 25 Legacy***

*by Steve Adkins*

While flying near Stanton airport in a glider, I watched a homebuilt aircraft attempt a number of landings which eventually ended in a crash in a field to the west of the airport. I was in the midst of a 5-hour badge flight. Via a hand-held radio, I helped vector the ambulance to the crash site. I saw the all-metal, low wing, one-of-a-kind aircraft take off just before my glider was launched. Most notable, the aircraft had a flat or straight low wing ... NO dihedral! I was betting the builder did

not belong to an EAA Chapter.

The main purpose of an EAA chapter is to help members learn the skills, perform critical review project visits and ensure the test pilot has current flight skills for the homebuilt to be flown. Our legacy is what we pass on to others with lasting results. I joined Chapter 25 after being an EAA member for more than 30 years; specifically, to build an all-metal aircraft. During the next year or so, various RV builders gave presentations on the various tools and methods to work with aluminum. I attended at least one home project meeting. Dale *(Continued on page 5)*

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# Flight Lines



—from Craig Nelson,  
EAA Chapter 25 President

Welcome to 2015. I hope you had a wonderful holiday season filled with fun, family, and friends. I certainly enjoyed visiting with everyone at the Chapter Xmas party. Pat and Mary Hoyt do a wonderful job of hosting the event. On behalf of the entire Chapter, I extend a big

THANK YOU to them for their hospitality.

Flying was a little tough in December with all the murky and then cold weather. I stopped by the hangar to check on things and found the underside of the Kitfox covered with frozen condensation. Iced water drops were hanging off the back of the elevator and shining in the light from the hangar window. It was a rather beautiful sight. I wiped off the mini-icicles and left, waiting for fairer flying weather which didn't return until earlier this month.

With the New Year comes a change in Chapter 25 leadership. I am excited and honored to start my term as President. I want to thank the other members who have agreed to serve as officers; Mamie Singleton (Vice President), Kim Johnson (Secretary), and Gordon Duke (Treasurer). We are fortunate to have Kris Olson return as our Young Eagles Coordinator. She does a fabulous job of organizing our events and lining up kids to attend. Pete Gavin also returns as our award winning newsletter editor. This is a great team and I look forward to an exciting year.

The Chapter 25 Board met on January 6 to do some strategic thinking on how to improve the experience for our members and grow the chapter. There was excellent discussion and good input. We generated lots of ideas which I am now sorting through. Stay tuned for more information on these initiatives.

We start 2015 with a different twist for our January meeting. We will meet at the Minneapolis Community and Technical College in downtown Minneapolis. Peter Denny has arranged for us to get a tour of their Air Traffic Control Training Center. I suggest you hook up with another chapter member or two and carpool to the event. See the flyer that was included with this newsletter and that is posted on our website, EAA25.org for driving directions and details. Please note we will start the meeting a little early – 6:30 PM. In February we will return to the BSAEC for a presentation by Brian Huberty who is with U.S. Fish & Wildlife Service on bird flight patterns and bird strike avoidance strategies.

Finally, you should have received a 2015 membership re- *(Continued on page 7)*

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# On Final



Minneapolis/St. Paul

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# ***This Month: Wed Evening Jan 21st—MCTC Downtown***

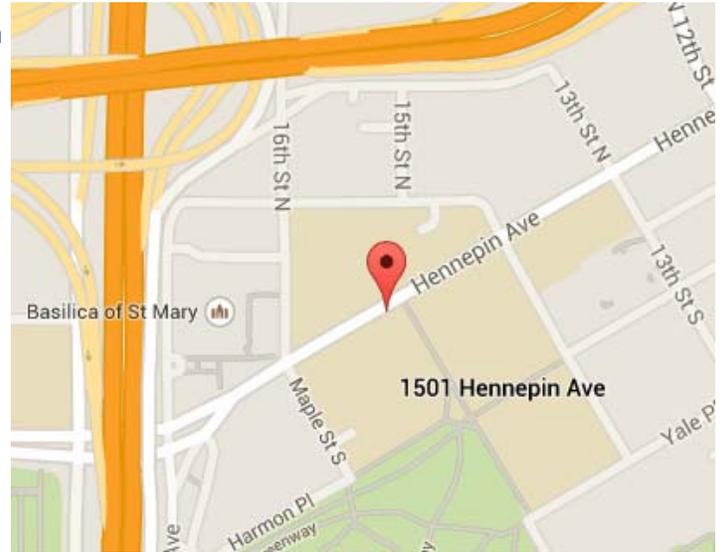
## **Carpool at 5pm at Doolittle's, Meeting at 6:30 pm**

**Program:** Our meeting this month will be a tour of the Minneapolis Community and Technical College Air Traffic Control Program training facility just south of downtown Minneapolis. See map at right and diagrams on page 8. Pat Halligan and Chris Bobka have agreed to carpool from Doolittle's Air Café at Cedar Ave and Cliff Rd in Eagan. Meet at Doolittle's at 5 p.m. if you want to carpool. Note that there will be an informal gathering at Doolittle's after the tour when carpools return.

**Directions to MCTC:** See facilities diagram and parking information on page 8. Whichever floor you park on, go to the third floor of the parking ramp. Elevators are located on the South east corner of the ramp.

Cross Hennepin Ave using the "Skyway" and enter the main campus building. This main building is the "T" building. When you enter the "T" building, you will now be on the 2nd floor, NOT the 3rd floor like the ramp.

Find the elevators in the middle of the open area ahead of you. Go to the third floor. Exit the elevator and turn left then left again and head north along the hallway. There will be a sign outside the ATC center on your right. The ATC is room T3431. Peter Denny will be roaming around rounding up lost sheep. Call him at 763-226-0473 if you are having trouble locating the training center.



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## ***EAA Chapter 25***

### ***Meeting Minutes for 19 November 2014***

***Presiding Officer, Kim Johnson, President***

***Bert Sisler Aviation Education Center at Airlake Airport, Minnesota***

The meeting was called to order by Kim Johnson, President, promptly at 7:00 pm CDT. Member and recently naturalized US citizen Peter Denny led the pledge of allegiance. A moment of silence was observed for those who have made the ultimate sacrifice for our country.

The Chapter noted that Dick Reinke is recovering from shoulder replacement surgery.

Members who contributed to the chapter newsletter were recognized. Members who helped prepare the food for the evening were recognized. Guests were welcomed. Special thanks were given to Pete Gavin for long and diligent service as the newsletter editor.

Highlights from the November meeting of the Chapter's Board was given. In summary:

***Finances:*** \$25,850 in checking and savings; Income is projected to exceed expenses by \$1,920 in 2014.

***Fund Raising:*** We netted \$2,027 from the raffle, down \$700 from 2013. We are going to explore other alternatives to selling raffle tickets. Most of us buy our own tickets so making it a straight donation would at least be tax deductible.

***Banquet:*** We were \$200 short of breaking even. It is difficult to estimate the number of attendees. The goal is to maximize involvement and fun, so the Board recommended to keep the same approach. One idea suggested was to buy an extra ticket and donate it to families with kids that would otherwise not be able to join in our night of food, fellowship and fun.

***Air Academy & Scholarships:*** Transferred one \$1,000 scholarship at UND to the Minnesota State – Mankato Aviation Dept. We now give a \$1,000 matching scholarship with the Mark Dalhberg Foundation and a \$1,000 matching scholarship with the Kevin Gruys Aircraft & Marine Ins. Agency – Kevin is also a new On Final sponsor.

The Scholarship Committee is putting together a printout we can distribute to Young Eagles and other kids about the Air Academy camps and the financial support available. This is ***(Continued on page 7)***

# Lightning Research

(From Page 1)

Alaska and Canada, encountered weather which they were never expected to fly in during peacetime.

Commercial and military aircraft were flying in conditions where high static buildup on aircraft bodies caused such things as “St. Elmo's Fire”, a form of electrical glow, resulting in rolling balls of lightning along the wings and cockpit canopies. Something had to be done to counter the effects. The situation didn't just spook the crews, but caused considerable trouble with the radios and early radar gear, knocking out navigational components and making radio communication impossible. On occasion, lightning might even punch a hole in the metal skin of an aircraft. The military began research on countering the problems and engaged several universities and private firms to study ways of dealing with static discharge in snowstorms and lightning strikes in thunderstorms.

One such private company was Lightning and Transients Research Institute. Located in an old NSP facility at the intersection of Highway 280 and Larpenteur Avenue in St. Paul, whose work up to 1946 was to study lightning's effects on power lines and transformers. Lightning and Transients Research was founded by the University of Minnesota under Dr. M.M. Neumann and John Bryant. Taking over the NSP building with its arrays of transformers and capacitors gave it the opportunity to study lightning effects on ships, aircraft and the new-fangled things called computers. Work was contracted to Boeing and Lockheed, and soon the government sought their help as well. L&T's mission was to develop federal standards for aircraft and electrical component shielding.

You perhaps remember driving past L&T before highway 280 was routed alongside, and again, after the road was built. You would immediately have noticed an old Army bomber parked between the highway and the big building. What you probably didn't notice was that the side of the building held a three-story-high sliding door. If you traveled past at night during the 1950s, you may have been shocked to see a huge fireball sail out of the open door, aimed at the airplane. The bomber was a 1942 version of the Navy PV-2 Ventura, known by the Army as an RB-37. It sported English flashes on the tail because the plane was one of a group originally lend-leased to the British, but never sent to Europe. It was outfitted as a photo-recon ship, but donated to the research facility by the Army.

Critical parts of the airplane, such as various radio components were subjected to lightning strikes of as much as 200,000 amperes, ten times the power of the average lightning strike. The plane was also the victim of 700,000 volt charges zapped at it to determine the effects of DC current



*Army B-37 bomber parked alongside the Lightning and Transient Research Institute at Highway 280 and Larpenteur Avenue in St. Paul. November 1971 picture by Jim Borden.*

generated in snowstorm clouds by static electricity. A scan of the grounds around the plane would have shown various different aircraft nose cones, armored component boxes, and other parts used in the tests. Inside the facility was quite akin to Dr. Zharkov's laboratory in the Flash Gordon movies. The three story high walls were lined with capacitors and transformer coils. In the center, riding a girder trolley was a starwars device that could be rolled out the side door to send strong lightning bolts at the aircraft. Control counsels were spread around the large open interior. I once stopped there to visit with Mr. John Robb, the director of research and some of the scientists at work, just out of curiosity. Later, when the site was dismantled and the aircraft removed, I was ashamed I didn't conduct a full-blown interview of the men.

The Air Force Museum owned the bomber and retrieved it sometime in the 1980s to the best of my recollection. It is now at Wright Patterson Museum of the Air Force. Toward the end of the Institute's tenure, work was being done for NASA, beginning with the Mercury flights right up to the time of the Shuttle.

In the pictures attached, you can see the bomber. The young man in the picture by the aircraft nose is Rod MacKay, at the time a member of the Twin City Aero Historians model airplane club. He was a volunteer caretaker of the plane and worked to clean up the yard and the inside of the plane. Rod was last known to have been working for the FAA and his whereabouts unknown.



## **Final Approach Trivia Quiz**

**Guest entry from Bert Sisler**

When is a flight against the wind faster than a flight with the wind?

*Answer on page 6*

# Chapter 25 Legacy

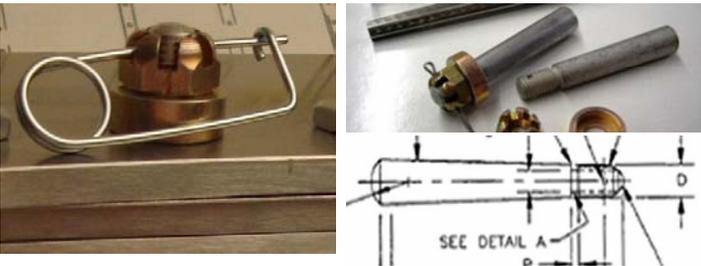
(From Page 1)

Johnson hosted a meeting in his shop with an opportunity to do some hands-on riveting. The big part of EAA is passing on to others what you have learned from your predecessors. That's our legacy.

Our chapter has an amazingly rich legacy. I am covering what has happened during the build process of an Hummel UltraCruiser. Also, I will cover a few examples of others passing on their knowledge. Here is my small contribution to our legacy ... all the result of the skilled help of other chapter members.

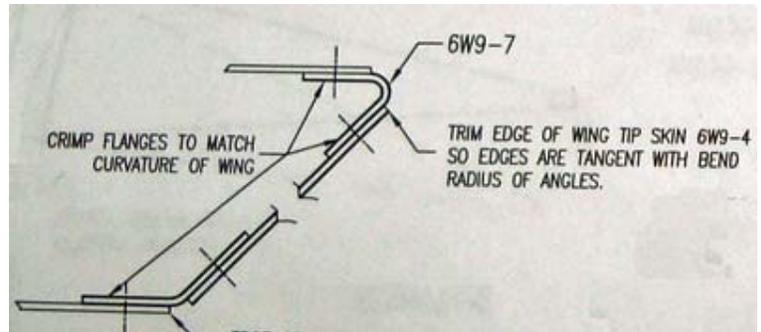
**Taper Pins:** Using taper pins in place of bolts was the first "design change" to my project. Being a glider pilot familiar with frequent wing removal, I wanted the safety associated with taper pins. Dale Johnson and Chris Bobka assured me that this was the best approach over hammering on close tolerance bolts. Chris helped me select and buy the correct taper pins and reamer. Dale gave me training on drilling and installing the taper pins. I conducted a design analysis of the spar fittings coupled with destructive testing using Dale's Junk Tensile Tester. I posted this change on the UltraCruiser Yahoo! Group. Did that ever start a wave of postings pro and con. Complaints included: the complexity; the high cost of the taper pins and reamer; etc. Bottom line? Hummel Aircraft modified the UltraCruiser plans to use taper pins.

["http://www.quid.us/hummel/taperpin.html"](http://www.quid.us/hummel/taperpin.html) ... Taper Pins



**Wing Tips:** The wing tips on the UltraCruiser are extremely difficult to build unless you are a master, free-hand tin basher. While at the Chapter 25 Christmas party at Pat and Mary's Hoyt's house, I noticed the superior wing tip design on his Zodiac. I snapped a few pictures of the wing tips; plus, snapped some pictures of the plans. Subsequently, an UltraCruiser builder, Alan, posted on the UltraCruiser Yahoo! Forum that he was restarting his project that had been languishing for over 3 years. He asked for group help with the wing tips. I posted the Zodiac wing tip photos and drawings from Hoyt's project. Surprise ... Alan used the Zodiac design. Then another builder followed suit. All because of our Christmas party.

<http://www.quid.us/hummel/zodiac-wingtip.html>



<http://cwsnder2001.blogspot.com/search/label/wingtips>

The painful process for bending over the wing tip edge to create a flange for joining the upper and lower surfaces:



**Patrick Hoyt's exhaust system:** Patrick is a very active in passing on his knowledge. Just Google "Patrick Hoyt Zodiac". You will find that Pat's project has been featured in other EAA chapter newsletters in addition to the several articles in our newsletter and a feature article in the Star Tribune, "Minnesota's wing nuts".

<http://www.zenith.aero/profile/PatrickHoyt>

Through the Zodiac forums, Pat Hoyt discovered a builder who built two right exhausts. He helped this builder by exchanging one of his left exhausts for a right exhaust. Yes, Pat built two left exhausts.

**Goof Web Pages:** Pat Hoyt and I both have "Do Over" or "Goof" web pages. Most builder web pages demonstrate how the builder built a particular part. Goof pages describe the inevitable mistakes that occur during building. Sometimes there is a recovery but most often one merely rebuilds the part ... thus the adage, "I built three sets of parts to get one aircraft". On the Yahoo! Forum, I've received good feedback from the goofs page and hopefully have prevented others from making the same goof.

(Continued on page 6)

# Chapter 25 Legacy

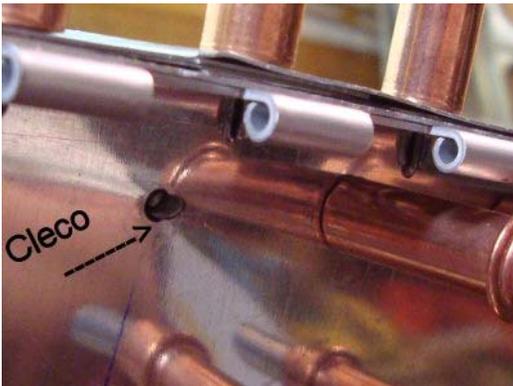
(Continued from page 5)

Goof found on the web:



My favorite goof: a buried Cleco deep inside my wing (exactly centered ... 4 feet from either end). I designed a special "long arm" Cleco removal tool. (photo below)

Cleco tip as seen from the back side of the rear spar just below the aileron hinge:



**Ron Hoyt Flutter Problem:** Ron noted a posting on the Kolb forum at Matronics.com. A fellow builder wanted to add a navigation light to the rudder but was concerned with flutter problems (some Kolb aircraft have experience growing tail oscillations when your feet are removed from the rudder pedals). This builder queried the forum, "... anybody have a solution?" Ron had successfully added a tail light by mounting it as low as possible. He shared his solution with the forum. Who knows, perhaps one or more builders may have been saved from destructive flutter.

**Pietenpols and more:** Greg Cardinal and Dale Johnson have built a beautiful Pietenpol which has been included in several Smithsonian "Air and Space" magazine articles. Just look for a blue and white Piet with straight spoked wheels. Their Pietenpol was featured at the 2009 EAA Airventure Gateway through which every attendees must pass (see below). Greg has passed on to the Piet community his elevator push/pull tube modifications. The Piet builders are noted for their crazy solutions to building a new antique aircraft with outdated plans ... ask Dale about his nose bowl. Three aircraft reside in museums which were built, in part, by Chapter 25 members (1903 Wright Flyer, Curtis JN-4H "Jenny" and Waco CG-4 Troop Glider).



## Answer to Final Approach Quiz (See page 4)

This can happen easily on a short trip because of the extra time in the pattern where you are taking off and landing against the wind and thus against your direction of flight. For example, trips from MSP to Chicago often took more time when flying with the wind.

## Chapter Credits Steve's Hummel UltraCruiser:

- Dale Johnson – Technical Advisor
- Chris Bobka - Technical advice
- Ami Sela – EAA Technical Counselor
- Peter Denny - Evenings at Washburn High School aviation magnet workshop
- Peter Denny and Ami: Project Inspection visits
- Frank Hanish – Engine advice and wing tip design





## Stuff for Sale/Wanted

For Sale: 2001 American Champion 7GCBC. IFR with Garmin 430 stack and 496 cross feed. Fully equipped, one owner airplane with 560 hours TT and no damage history and in excellent condition. 160 HP Lycoming O320. Call Jon Cumpton at 612-859-1483.

For Rent: Hangar space available at Airlake Airport, Row 34 by Chapter 25 member. Don Sektan, 2007 Diffley Rd, Eagan MN 55122 651-454-1548

## Flight Lines (From page 2)

newal form in the mail. Please supply the requested information and send it along with your dues payment to Gordon Duke. Annual dues are \$25 if you receive the On Final newsletter via email and \$30 if you prefer to get a paper copy in the US Mail.

I look forward to seeing you on Jan 21 at the MCTC.



## November Minutes (From page 3)

*the time to begin the application process.*

The next Young Eagles flights were announced to be on Saturday 20 December 2014.

It was announced that in lieu of a regular Chapter meeting in December, a Holiday Party would be held. Pat and Mary Hoyt have graciously volunteered to host at their home on Sunday 7 December 2014 from 1:00 to 5:00 pm. There will not be a Chapter meeting on December 17, 2014.

Members Greg Cardinal and Bob Poore told about their experiences flying to Brodhead and Air Venture. The evening program was a presentation by Sharon Sandberg, who spoke to the Chapter about AllStarWarbirds, Flight Expo and the Youth BuidAPlane Program.

—Submitted by Gordon Duke, Secretary



**Next Chapter Meeting: Wed, Feb 18**

**Next Young Eagles Event: Sat, Feb 21**

contact Kris Olson (see p2) if you can volunteer

## Aircraft Insurance and Hangar Insurance



Contact: Kevin Gruys at 952-890-1124  
email: [gruys@aircraft-marine.com](mailto:gruys@aircraft-marine.com)  
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12000 Elm Creek Blvd. Suite 350  
Maple Grove, MN 55369

**EAA Chapter 25 January Mtg  
Tour of Minneapolis Community &  
Technical College  
Air Traffic Control Training Center  
1501 Hennepin Avenue S,  
Minneapolis, MN 55403**

January 21 Meeting starts at 6:30 PM

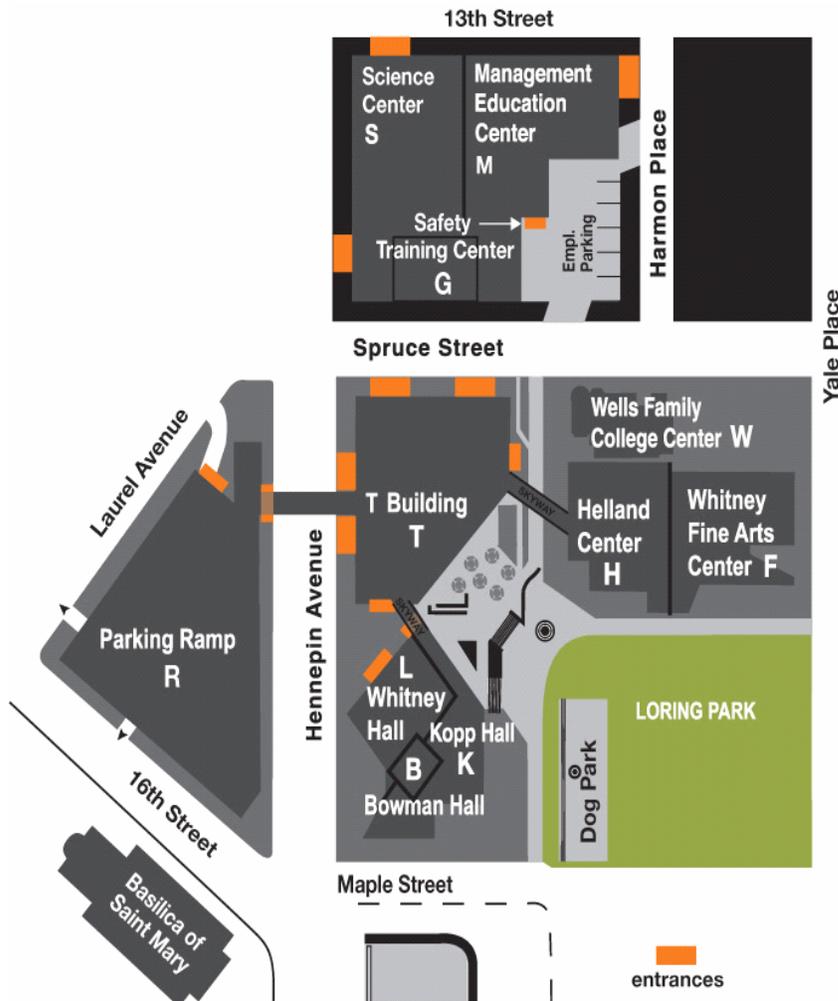
Minneapolis Community and Technical College's campus is located on the edge of downtown Minneapolis.

See map and further directions on page 3.

**Parking Ramp Instructions**

Ramp entrances are right turn only off of Hennepin Ave and right or left turn from Laurel Ave (on the north side of the building). It is illegal to make a left hand turn into the MCTC parking ramp from Hennepin Ave and the Minneapolis Police department actively enforces this restriction.

The MCTC ramp utilizes a "pay-as-you-enter" mechanical system that requires each customer to pay prior to entering the parking ramp. The parking fee is \$5



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