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# News!

## February 2021

On the Web: [www.EAA80.org](http://www.EAA80.org)

Facebook: [www.facebook.com/eaa80](https://www.facebook.com/eaa80)

Twitter: [https://twitter.com/eaa\\_80](https://twitter.com/eaa_80)

## Notes from the President

By Bruce Mundie



I'm ready to get the year started! Our first meeting is set for 8 February at Oracle Aviation at Millard Airport. We will be awarding our scholarship to Graham Geyer and get the opportunity to listen to the regional representative from Garmin. Additionally, EAA 80 sent out our very

first "News Blast" to all national EAA members in the Omaha / Council Bluffs area inviting them to our meeting. I hope to see many new faces at the meeting, all prospective EAA 80 members and all with a passion for building and flying airplanes.

Also, during our meeting, we will set and publish our 2021 schedule. It is looking to be a year packed with dozens of events to include Young Eagle events at Millard, Plattsmouth, Fremont, and maybe even Tekamah. Will the Ford Tri-motor make an appearance in Omaha? Will EAA 80 flyout to Hastings and help the 99's with their compass rose? We will keep you posted. Finally, we should have numerous weekend flyouts, and our chapter cookout during Plattsmouth's Harvest Days and Millard's STEM Day.

The Winter Gathering was a success and we had nearly thirty members, friends and family in attendance. Even with the threat of a winter storm and COVID-19, everyone had a great

time and a fantastic Anthony's Prime Rib dinner.

We will find out very soon if EAA 80 was selected to award a Ray Scholar in 2021. If we are selected, we will have the ability to award up to \$10,000 scholarship to a deserving private pilot student in the local area.

See you at our meeting on February 8!

Bruce

## **EAA Chapter 80 Meeting Minutes**

### **January 2021**

The Christmas party was held in lieu of the regular business meeting; therefore, here are no January meeting minutes.

## **Flight Advisor**

### **Wake turbulence on the ground, or how close is too close**

Mike Howard

I learned many years ago that taxiing behind a large airplane with its engines running could be a big mistake. I was visiting my son in Seattle and had just landed at Boeing Field. This is not the airline airport SeaTac but the field on the south side of Seattle where Boeing finish paints a number of their airliners. I had just switched over to ground control when they gave me instructions to taxi behind an Air Force C17 and I could see that its engines were running.

I told the controller that I would not do that due to potential jet blast. He said it would be OK that he was waiting at that location. I declined again so the controller sent me to a nearby safe spot (penalty box). Soon after I got stopped the C17 began to taxi. I saw significant dust and debris kick up from behind the C17. Glad I wasn't there. Might have gotten blown into Puget Sound.

There is no direct correlation between jet engine thrust and exhaust velocity. You can make a general statement that the bigger the

engine the high exhaust velocity will extend further behind the source. Here is some data that I was able to collect for a range of airliners.

#### CRJ-200 (older regional jet)

544 mph and 440°F at 25 feet

#### Boeing 747-400

Idle thrust 35 mph at 70 feet

Begin moving (break away thrust)

35 mph at 580 feet

Normal taxi thrust

35 mph at 150 feet

Take off thrust

100 mph at 500 feet

I could find no FAA rules about how far behind a jet for a light aircraft to taxi, however the general consensus is that one should stay at least 500 feet away from the back end of any airliner. That's a 1/10 of a mile or 4 airliner lengths.

Flight Advisor Mike Howard

## **Technical Advisor**

### **Koehler's Korner**



As many of you know, I have officially moved to Spruce Creek Fly-In Community near Daytona, Florida. Spruce Creek is the largest fly-in community in the world, and the

busiest private airport in the world, so I still get to see a lot of airplanes. Behind my house is my hangar where I keep the trusty Mooney, and I rent a space to a Grumman Tiger.

As I was walking across the ramp the other day, I noticed what looked like a long screw laying in a crack in the new pavers. I had some work done on the hangar too, so I assumed the screw had been dropped by a construction worker. I bent over and picked it up and noted it was not a screw, but a metal rod with a ball on one end. I quickly recognized this as the radiating part of a DME

or Transponder antenna, either of which usually live on the belly of our planes. I first checked the Mooney, and it had all its protuberances, so I next looked at the Tiger. Sure enough, the “rod-and-ball” antenna for the transponder was missing.

A close-up view of the broken end of the antenna stem showed a hollowed-out center, with a very clean and smooth break. This type of break is indicative of a vibration induced fatigue failure.



The obvious solution was to replace the antenna. A quick call to Aircraft Spruce produced the replacement item. After that, just getting access to the area and disconnecting the BNC connector to the coaxial cable stood in the way of replacing the antenna. Finished product looked and worked well.



So, why did I know right off that it was a transponder or DME antenna? I knew by its length, of course. Let's spend a few moments at this point in the ethereal realm of antenna theory. There is a basic law of physics that says that for any form of radiation, the frequency times the wavelength equals the speed of light, or  $f \times \lambda = c$ . I can never remember the exact speed of light; it is something like three times 10 to the something power meters per second. What I

do remember is that at a frequency of 300-megahertz (MHz) (or 300 million cycles per second), the wavelength is one (1) meter. Transponders and DMEs operate near 1000 MHz, so the wavelength of their signal is 0.3 meters or 30 centimeters, or since a meter is 39.37", about 11.8". Remember, the wavelength is the distance between the peaks of the vibrating wave signal.

So, the rod and ball were more like three inches long. How does that compare to the 11.8" we just calculated? Well, diving a bit further into theory, one can use calculus to show that an ideal radiating antenna would be a dipole, or two metal “rods” aligned opposite each other and each being one forth of the wavelength long. So, we were really looking for an antenna that is  $11.8"/4$ , or 2.95" long. For the application on the airplane, the other dipole piece is the metal skin of the aircraft. This is often called the ground plane, and it must be there, or the antenna will not work. The shape of the metal plane is also important in shaping the radiating pattern of the antenna. One other thing, antennas have identical transmitting and receiving patterns. Personally, I find the theory easier to understand when considering transmitting, but if it has a bad transmitting pattern, it will have a similarly bad receiving pattern.

By the way, the middle of our VHF communication frequency range is about 128 MHz, for a wavelength of 2.34 meters, or a quarter wave antenna length of about 23 inches. Similarly, for the VOR system, the middle frequency is about 113 MHz, for a wavelength of 2.65 meters, and antenna dipole lengths of about 26 inches.

One last piece of the puzzle is the antenna location. The transponder and DME system usually talk to facilities on the ground, so they should be on the belly of the plane. Also, our RG-58 and RG-400 type coaxial cable we use for transmission lines are not real good at a thousand megahertz, so they should be as short as practicable, usually directly below the radio stack. Some ADS-B installations limit the RG-400 cable to a bit over eight feet! Antennas can interfere with each other so, as a general rule they should be separated by at least their combined length. Farther is better.

One last note: GPS antennas are usually not dipoles, and they usually have an active preamplifier built into them, powered by five volts DC sent up the cable line. Be sure to mount them as high as possible, with as much of a clear view all the way to the horizons as possible, since the best satellites for position information are near the horizon. More on this in another KK, but avoid mounting a GPS antenna under structure, such as a cowling.

I hope this antenna discussion helps you understand what is really happening with your avionics, and knowledge you may have gained will help you fly safer in the future.

Keep building, flying and maintaining.

Dick 1/2021

Re-published with permission of Dick Koehler, EAA 186

## **EAA 80 Calendar of Events**

February 8

Presenter: Jim Laster, Garmin aviation regional sales manager

March 8

Presenter: Dave Greer, Omega Aerial Refueling Services

*EAA Chapter 80 is classified as a Non-Profit Charitable Organization per section 501(c)3 of the Internal Revenue Code. As a result, we are eligible to receive tax-deductible contributions in accordance with Code section 170.*



*Your contributions will go towards such things as:*

- ✓ *Aviation scholarships*
- ✓ *Scholarships to send kids to EAA's Air Academy in Oshkosh, Wisconsin*
- ✓ *Helping promote Young Eagles events and rallies for the community*
- ✓ *Many other events that promote aviation in the Eastern Nebraska and Western Iowa region.*

*EAA 80 is a 100% volunteer organization, there are no paid members to the staff. Our only funding comes from chapter dues and occasional fund raising.*

*Please visit our website [eaa80.org](http://eaa80.org) or contact an office to inquire about making a tax free donation.*



## Photos

President Bruce addressing the group at the Christmas party.



## For Sale

Former member Doug Humble is moving has a couple wall hangings for sale. Contact him at (402) 250-9075 for more information.



Radial Engine

32" x 47"

Photo printed on the backside of glass  
\$100 OBO

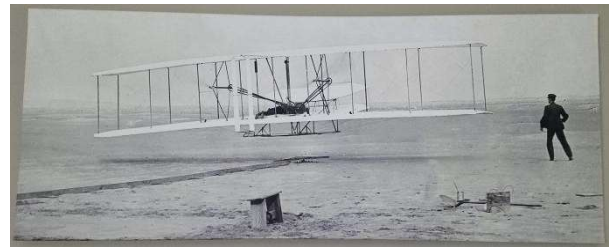
## Monthly Funny



An amazing historical photo...this early image showing the early test flights of the F-14 "Tomcat" during the American Civil War.

Some question the authenticity of this photograph, as it is widely known that the 6 pounder 1841 Model Gun, the workhorse of Mexican War, was considered obsolete by Civil War.

You be the judge...



Wrights

29" x 70"

Cloth printed photo of the first homebuilt airplane.  
\$50 OBO

# Upcoming Webinars

## [Corsair: The Story of the EAA Aviation Museum's F4U Corsair](#)

MUSEUM WEBINAR SERIES

2/9/21, 7 p.m. CST

Chris Henry

## [ATC and You: How to Make the Most of Flying VFR](#)

Qualifies for FAA WINGS credit.

2/10/21, 7 p.m. CST

Richard Kennington and Bob Obma

## [Flying Procedures into Canada](#)

Qualifies for FAA WINGS credit.

2/16/21, 7 p.m. CST

Luke Penner

## [ATC and You: Balancing IFR Flying and the Efficiency of Controlled Airspace](#)

Qualifies for FAA WINGS credit.

2/17/21, 7 p.m. CST

Richard Kennington and Bob Obma

## [Owner in Command: Things I Wish I Knew Before I Knew Them](#)

Qualifies for FAA WINGS and AMT credit.

2/24/21, 7 p.m. CST

Sebastien Seykora

## [Panthers and Beyond](#)

HOMEBUILDERS WEBINAR SERIES

3/2/21, 7 p.m. CST

Dan and Rachel Weseman

## [How Mags Fail](#)

Qualifies for FAA WINGS and AMT credit.

3/3/21, 7 p.m. CST

Mike Busch

## [Bong: America's Ace of Aces](#)

MUSEUM WEBINAR SERIES

3/9/21, 7 p.m. CST

Chris Henry

## [Pushing Past TBO - Running your Rotax Engine "On Condition"](#)

Qualifies for FAA WINGS and AMT credit

3/10/21, 7 p.m. CST

Prof. H. Paul Shuch

## [Rolling Fear Upside Down with Aerobatics](#)

Qualifies for FAA WINGS credit

3/16/21, 7 p.m. CDT

Cecilia Aragon

## [Sling Aircraft Kits](#)

3/17/21, 7 p.m. CDT

Mike Blyth

## [SNAGGED! Dealing with Defects Safely and Legally](#)

Qualifies for FAA WINGS and AMT credit.

3/24/21, 7 p.m. CDT

Sebastien Seykora

## [Engine Care Items Every Pilot Should Know](#)

Qualifies for FAA WINGS and AMT credit.

3/31/21, 7 p.m. CDT

Bill Ross

## [Wittman Tailwind & Buttercup](#)

HOMEBUILDERS WEBINAR SERIES

4/6/21, 7 p.m. CDT

Earl Luce

## [The E-1 and the Pursuit of a Record](#)

MUSEUM WEBINAR SERIES

4/13/21, 7 p.m. CDT

Eileen Bjorkman

## [The History of Air Racing](#)

MUSEUM WEBINAR SERIES

5/11/21, 7 p.m. CDT

Connor Madison

## [Spirit of St. Louis](#)

MUSEUM WEBINAR SERIES

6/8/21, 7 p.m. CDT

Chris Henry and Ben Page

These are the current webinars listed on [eaa.org](http://eaa.org).

Please check the site at:

[www.eaa.org/en/eaanews-and-publications/eaawebinars](http://www.eaa.org/en/eaanews-and-publications/eaawebinars) to see if there are other webinars available.

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KMLE 12916 Millard Airport Plaza Omaha, NE 402.934.5300 www.oracleaviation.com

### EAA 80 MONTHLY TREASURER REPORT

Feb-21

#### Checking

Acct. 310

Opening Balance \$10,858.67

#### Receipts

12/28/2020 EAA AHC Borscpe Reimb \$64.50  
 1/5/2021 EAA AHC YE 2019 Reimbt \$878.35  
 Dues Cash  
 1/19/2021 Dues Chks \$100.00

#### Expenses

Y.E. Expnse  
 Refresh Mundie  
 Y.E. Exp Prdie  
 UNO Scholarship

Ending Balance \$11,901.52

#### Asset Accounting

Date	Item	Value	Date	Item	Value
6/17/2020	T-Shirts	\$125.00	5/22/2020	Zenith 750 Proj.	TBD
7/13/2020		\$100.00			
8/10/2020		\$25.00			
Total to Date		\$250.00			\$0.00

AS INFO FEB 2020 \$14,335.08

# CENTRAL CYLINDER SERVICE

## AIRCRAFT ENGINE REBUILDERS

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 Bellevue, NE 68005

## EAA CHAPTER 80

### 2021 APPLICATION FORM

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CONTACT INFORMATION			
NAME		EAA NUMBER	
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CITY, ST, ZIP			
SPOUSE NAME			
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E-MAIL ADDRESS			
PROFESSION		RETIRED	

MEMBERSHIP PROFILE										
OWNED ACFT						N-NUMBER				
ACFT BUILDER		TYPE:					COMPLETE %			
PILOT LICENSE										
AIRPORT BASE			HANGAR #							
EMAIL GROUPS	FLY-OUT		BUILDERS				YOUNG EAGLES			
PUBLISH INFORMATION IN CHAPTER DIRECTORY				HAVE A NAME TAG			YEAR JOINED CHAPTER 80			
YOUNG EAGLE VOLUNTEER			YOUTH PROTECTION TRAINING CURRENT							

OFFICE USE: (DUES \$25 PER YEAR)									
2021		2022		2023		2024		2025	
PAYMENT	TYPE				AMOUNT			DATE	

Last updated: 1/3/2020