Welcome to the Chapter 770 newsletter. Please share your news and updates from the chapter, upcoming flying events, info and more. If you have flying stories, photos etc to include feel free to send them to etf6911@gmail.com.

UPCOMING EVENTS

Chapter Meeting: ,January 19, 2023

UPCOMING EAA WEBINARS

System Awareness (WINGS)	JAN 4, 7:00pm
The Ford Tri-Motor and EAA's "Tin Goose"	JAN 10, 7:00pm
LODA -Letter of Deviation Authority for Flight Instruction	JAN 11, 7:00pm
Engine Dehydration: Cheaper Than an Overhaul (WINGS)	JAN 18, 7:00pm
Obsessed with EGT (WINGS)	Feb 1, 7:00pm
Sonex High Wing Aircraft Update	Feb 7 7:00pm

Register for upcoming webinars at:
www.eaa.org/eaa/news-and-publications/eaa-webinars

John Salz and Chris Bildilli took local radio host Greg Bishop on a round trip to Litchfield in late October for the local pumpkin drop. Below is video of the flight down and some precision pumpkin dropping.....

Flying from Springfield To Litchfield For a Pumpkin Drop Fundraiser

Below is the collection of toys from this year's Toys For Tots drive by the chapter

THANKS TO ALL WHO DONATED!

Homebuilders Week – Online Event Starts January 23: An online opportunity to learn about all aspects of building your own aircraft

By Charlie Becker, EAA Homebuilt Community Manager

EAA will be hosting our third annual Homebuilders Week online learning event for aircraft builders (www.EAA.org/HomebuildersWeek). It will be five straight days of educational forums covering a broad spectrum of aircraft building topics. It will start on Monday, January 23, 2023, and run until Friday, January 27, 2023. The live online presentations will be open to everyone interested in building their own aircraft. Sessions will start at 11:30 a.m. CST and run until 8:30 p.m. CST daily.

This event is an opportunity for a new person to jump in with both feet and learn a lot about the wonderful world of homebuilding. We will cover areas like getting started successfully and techniques when building with sheet metal, composites, steel, and wood. But it won't be just for the newbie; we are offering in-depth talks on panel planning, engine selection, FAA certification, flight testing, and selling a homebuilt aircraft. There will be something for every builder, whether you are just starting out, knee deep in a project, or just received your airworthiness certificate — it is going to be a great learning opportunity.

EAA is working with industry experts, kit manufacturers, and other subject matter experts to provide top-notch material for builders. The sessions will be live and allow time for attendee questions. Recordings will be archived and available to EAA members for review.

EAA Homebuilders Week coincides with the 70th anniversary of the founding of the Experimental Aircraft Association in 1953. Those founding members of EAA lit the fuse on the homebuilt movement that provides affordable access to aircraft ownership and today has spread worldwide.

EAA Homebuilders Week is possible through the generous sponsorships of Aircraft Spruce & Specialty Co., Dynon, Scheme Designers, Inc., and Van's Aircraft, Inc.

Visit EAA.org/HomebuildersWeek to review the schedule and sign up for a session.

The Flight Tracker Age

by Eric Fromm

I'm sure most of you are aware of one of the many flight trackers that are out there. They are a great tool to see the traffic that is flying above, keeping track of friends and family as they fly commercially or in their GA aircraft, and of course looking at the egg shaped pattern your flying buddy flew and using it as fodder to heckle them after they land.

There are several flight trackers out there. Probably the most well known is Flightaware. There is also Flightradar24. I also use ADS-B exchange regularly. Each tracker has its own strong points and I thought this would be a good group to explain to, how I use them and what each of them is best for.

I remember when Flightaware became available in about 2006. I couldn't believe it, I could actually watch air traffic on the screen! I used it exclusively for years as the other flight trackers available at the time were more generic and didn't offer as much information. Flightradar24 came along maybe 10 years ago and I slowly migrated to that as the tracker I use most regularly. ADS-B exchange came along several years back. It can be thought of as the Linux of flight trackers as it's data comes from people who have ADS-B receivers all over the world and contribute their data.

As it stands now, I've noticed Flightaware is best for past flights and general aviation not currently flying. If you want to see VFR traffic that is not currently airborne, it can easily be found in the "arrivals" or "departures" section. Flightradar24 doesn't show VFR traffic after it has landed, however its moving map gives a great view of any VFR traffic (as long as it has an ADS-B transponder) that is currently airborne.

Flightaware and Flightradar24 both show IFR traffic and both do show some historic info if the aircraft has landed although you can access flights further back in time on Flightaware. Flightradar24 however, displays a tail number to IFR flights under a callsign or airline flight number. This can be helpful if you are booked on a flight several hours from now and want to know where your aircraft is. You can easily track that aircraft to where it is currently and see if it is running on time. Of course this is only if dispatch doesn't swap aircraft, so don't take it as gospel, but flightradar24 is pretty good about getting

updated information from the legacy airlines so usually the aircraft is up to date.

Flightaware has a neat display on the main page for an airport. When you enter an airport in the search box , the airport page has a map with the airport in the center. It will show all inbound and outbound traffic for that airport on the map. This shows IFR and VFR flights so the airliners that are 3 states away, the corporate jet just taking off from the east coast enroute, and all of us flying to and from for the $100 burger or hanging out in the pattern. It's a neat display of all of the current activity for that airport. Below the map is "Arrivals" and Departures" which are both aircraft that have landed or taken off from that airport already. Below those are the "scheduled arrivals" and "scheduled departures" which are upcoming flights for that airport. Most are IFR traffic, although I have seen some filed VFR flight plans show up there on occasion. You can also get the METAR and TAF for that airport on this page.

As mentioned above, Flightradar24 has become my go to. The reason is because of the active map. The phone app includes airline and corporate logos for each aircraft, GA aircraft usually take the form of a Cessna 172 or a generic twin. Turboprops appear as an ATR or Dash 8, and every once in a while you'll see what looks like a Eurofighter which is usually a fighter or trainer. Sometimes military T-38s appear like this, but typically they are warbirds like T-33s, Dornier Alphajets etc. P-51s do show up as the Eurofighter too for some reason.

I'm usually just nerding out when using flightradar24 so when I see a Eurofighter the curiosity is too much and I have to check and see what it is. The turboprops can be interesting too, although the ones I seen haven't been Basler conversions, DC-3s typically appear as a turboprop. Recently I've often needed to check on airline flights so flightradar24 gives really good info location and arrival times. I can also use it to determine where an aircraft I am waiting on is flying prior to my flight which gives me an idea of what kind of delay the flight might have.

I mentioned ADS-B earlier. This shows some aircraft that are blocked by the other two. I'm not sure how I feel about that because if you don't want to be seen, I think you should have the choice not to. What I do like about ADS-B exchange though is , there is a military only option. Again, I guess there is part of me that thinks these type flights probably shouldn't be seen by avgeeks like myself, but it is neat to see, and I'd assume they have the capability to shut the ADS-B transponder when it needs to be. By hitting the box at the top of the screen labeled "U", it will remove all aircraft from the map except for military flights. I have seen B-52's, U-2's, P-3's, E-3's and many other interesting aircraft. I have seen an F-16 with the callsign "Thunderbird 1 (assuming the other 5 are in formation) meeting up with a KC-135 for refueling.

All three give altitude and speed information. What is neat about ADS-B exchange is each aircraft is a different color based on altitude. Orange and yellow are low, green and blue are mid level, 6000ft-ish to mid teens, then darker blue and purple up into the flight levels and red for high altitude (the U-2 and the USAF drones often appear red). Clicking on an aircraft will give you a picture of the aircraft and info about altitude and speed, transponder code and more.

Flightradar24 displays altitude similarly, when you click on a specific aircraft it's entire flight route is indicated with a multicolor line which shows the altitude it was at at that particular point on the map. So the common airliner flight will show yellows and greens as it departs. Then the line turns to blue and purple for cruise and comes back to green and yellow as it approaches and lands.

Flightaware shows more of an ATC type display for an aircraft, giving callsign, type, altitude and speed much like an ATC radar. Flightaware is also handy as it has available approach plates and airport diagrams for the airport you are looking at and also gives FBO information.

As you can see each flight tracker has its own qualities. I've found each offers something to use so I use all 3. I spend way too much time on them just watching the traffic. It's kind of amazing to see how much is out there. To make them more interesting, visit liveatc.net and find an approach or tower frequency to listen to at a particular airport and watch one of the traffic maps (probably flightradar24 as its moving map stays the most current) for the same airport. It's fun to watch and can be a good learning tool as a pilot to get a picture of how the air traffic system works!

An update from Ray Scholar and Lincoln Land Community College's Aviation program student Ayden Miller. He is currently finishing up his private pilot certificate and working towards his A&P.

Right now, I am studying to become an A&P mechanic at Lincoln Land. I have recently finished the general section of the course and moving into airframe. The course is divided into three sections: general, airframe, and powerplant.

The general section is a foundation for everything that you need to know for the more advanced classes. A few topics covered in general are forms and records, basic electricity, materials and process, and math and physics.This first semester was more than enough to convince me that working as an A&P mechanic is going to be a satisfying career.

Earlier in the semester, Lincoln Land had a job expo which allowed our class to meet some possible employers. I was able to speak with West Star, Flight Star, and Standard Aero. I felt that it was very easy to approach these companies since they were all very interested in recruiting new mechanics. The recruiters from West Star particularly stood out the most to me though.

One of them had traveled all the way from near St.Louis to go to our job expo in his free time. Typically when most people think of a recruiter, it’s someone that just needs to make a quota and get more manpower, but instead, it was someone who would actually go that far out of their way to help their company. I am still astounded by his performance in his role. Somehow my image of this industry is only getting better and better.

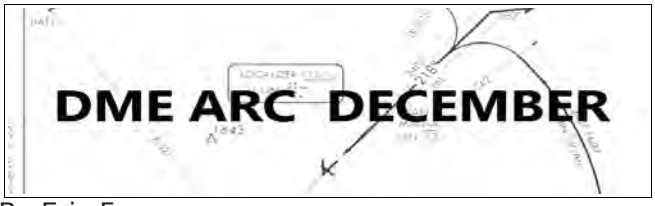
I see a lot of promise in this career and I will recommend it to anyone with an interest. Even becoming an A&P can be beneficial as a pilot. For example, when I first started my ground school, weight and balance was very confusing, but after we covered it in class, it was extremely easy. After I had been through a couple classes, I feel like I see planes in a different way than I did before.

The classes are also very dynamic. Every day is always something different and there are always things going on. We got to help the fire department do a mock crash by playing as actors. We were given makeup and a few conditions that could range from being delirious to life threatening.

I “lost” my fingers on my right hand and my left leg was broken. They had scattered some debris from a plane across the field we were in, so I hid my leg under a detached wing. Once we were recovered, we got to ride in an ambulance back to the school.

In class, the teachers all support hands-on learning. A few of them work in some of the nearby hangars, so depending on who we are with, we might be able to see some real work that is being done. Towards the beginning of general, we went to a nearby hangar and learned about bladder fuel tanks and sealing them. We also were able to use a borescope to see inside the inspection panel and what was wrong with the wing.

Taking classes to become an A&P is definitely one of the best decisions I’ve ever made. I fully recommend looking into becoming an A&P if you are interested.



By Eric Fromm

Keeping with last month's alliteration theme, i hereby proclaim this as DME Arc December. We'll talk a little bit about the mystery behind flying a miles wide constant circle around a DME fix.

Before learning more about them, One of the weirdest concepts of instrument flying to me was the DME Arc. Sure flying inbound or outbound on a straight VOR, NDB, or GPS course seems logical but how can you fly in a constant "turn" and why would you need to?

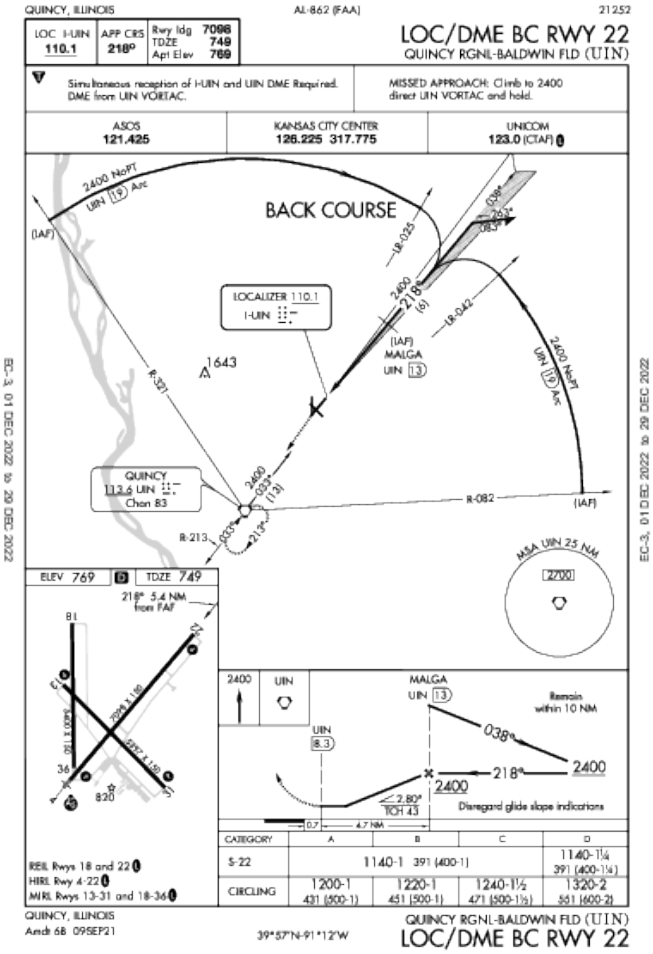
The DME arc is typically used in association with an instrument approach instead of a procedure turn (usually a teardrop or hold that allows you to get established on the inbound final approach course). In the case of the approach at UIN in the upcoming example, it might be designed in because the VOR is located so far away from the field that it would add significant time to fly all the way to the VOR from the East or West and then fly outbound over the field and then perform the procedure turn to get established on the inbound course that they added the arc to give you an "onramp" to the approach that would get you there quicker.

Sometimes they are used to keep you a certain distance to provide an efficient way to get you to an approach fix but keep you a certain distance away from terrain, obstacles or restricted areas. Either way, It is an arc that extends a certain distance from a NAVAID that has DME. Nowdays many aircraft use GPS distance info to fly one these days in lieu of traditional DME.

On an approach plate they appear as a bold black arc that includes an initial radial to enter it, and a lead radial that leads you to the localizer or VOR approach course you are flying and of course the DME distance the arc is relative to the DME station.

To fly one, depending on your groundspeed , you fly towards the NAVAID the arc is based on. In aircraft like the 172 and Warrior Archer 90kts is typically the approach category airspeed (indicated) used to fly an approach therefore after some math and geometry ,a 90* turn into the arc at about 1/2 mile outside of it will get you almost perfectly on the arc when you level off.

From there , since you are flying mostly perpendicular from the fix you will need to have some kind of guidance. This is where you'll use the VOR radials. You will pass through the various radials from the VOR as you traverse the arc. Although you could fly in a 1 or 2* bank (dependent on groundspeed and wind conditions) constantly from entering the arc to the end of it, it's much more practical to fly small straight and level segments between radials to maintain the proper distance.



While there are several methods of doing this, one common and effective way is "turn 10 twist 10". As an example, let's assume we're flying the DME ARC on the LOC/DME to the Backcourse (another fun instrument challenge in and of itself!) to Runway 22 at Quincy. We're flying in from Springfield to go grab a sandwich at the restaurant over there. The approach plate is oriented like other charts, with North at the top. So we would tune the UIN VOR however we wouldn't fly directly to it. We will need to get

established on the 082* radial from, which is the lighter shaded line marked R-082 (which means we'd be on a 262* heading to the station.

As you can see along the arc there is an encircled 19, this means this is the 19DME arc or a 19 mile arc around the VOR. Since we're sitting pretty lined up perfectly on the 082 radial, we'll begin a 90* right turn to 352* when our DME is at 19.5nm which gives us a .5nm lead to complete the turn and end up on the arc.

When we are wings level, we then twist the OBS (omni bearing selector) on the VOR tuned to the VOR to the 072* radial which I s ahead of us still. When the needle is centered on the 072* we will turn 10* left to 342* and then twist the OBS to the 062* radial. In a no wind situation this will keep us right on the arc. We could essentially fly a complete 19NM circle around the VOR if we so wished by continuing to turn 10 twist 10. So in reality we're not flying a constant circle, but small straight segments with small turns that keep us within the DME distance.

Notice on the plate towards the end of this segment of the arc you'll see an “LR-042”. This is the “lead radial”. When our VOR shows we're on the 042* radial from the VOR we will then perform another 90* (ish depending on wind) turn to the left and intercept the inbound course, in this case the localizer backcourse, and with that, for this discussion, we have just completed a DME arc. Simple!

I have learned there's no easy way to describe or be described how to fly a DME arc that makes it easy to see or understand, and I'm sure this description is no exception. One flight with a good instructor though and the myth was quickly lifted. They're simple, and it is fun to try and keep that DME within a point or two of the distance required.

Of course wind is always a factor. So if the wind is coming from your left or the station, it is going to blow you further away from the 19NM DME. As with anything else , you’ll incorporate a wind correction angle with a left correction or nose “towards” the station. . It is all an experiment , but all you need to do is watch the DME, if it is losing distance , say it now says 18.7, you know there is too much correction so you can get rid of half of the correction and see what it gets you. Likewise if the wind is coming from your right and pushing you towards the station you’ll fly a right wind correction “away” from the station and use the same experimentation with the DME.

As we've seen, this and many other DME arcs are associated with instrument approaches. That doesn't mean you have to fly an instrument approach to fly a DME arc nor be an instrument pilot to try one out.

The next time you're out flying, or actually before you go flying next, look at a VOR or instrument chart and find a good old fashion VOR that has DME. Find an area that is out of airspace and away from obstacles. Use a plotter to measure distance to a point, maybe 20NM, this will give you a nice shallow arc that is easy to manage but gives you the idea of how they work. Plot another point also 20nm maybe 40* from the first one. Then take a protractor and draw the arc between those two points. Then, hop in (after a thorough preflight of course) and go try it! All you're really looking for is the DME stays the same distance (within a 10th mile or so, and you end at the intersection you plotted (ie the radial from and selected DME distance). They're fun, a little challenging but much easier than the text books and this amateur description makes them out to be!

Are you a sim pilot at home? Here's a fun one to try. Martin State VOR RWY 15 is an approach that is entirely a DME Arc. It is a VOR approach but there is no VOR course to fly, only the arc. This basically has you flying the arc down to the numbers. Throw in some heavy wind and some low ceilings to add to the challenge.