



# The Denton Flyer

Newsletter of EAA Chapter 661, Denton, TX

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## Next Meeting: – Wait! Really!?

By now, you realize that this edition of “The Denton Flyer” is late in coming. Moreover, there was not a meeting at KDTO in June. I apologize to anyone who was confused by that – or who showed up for the meeting only to find there were no tacos and no meeting. Recall, El Presidente Janet reminded us all of that fact at the last meeting. Still, this missive is late, and that is my fault.

So, why no meeting, you ask? Our regularly scheduled June meeting has been replaced by the Poker Run. Instead of making your way to the meeting room on the second floor, you can use the month of June to zoom around to five local airports to collect what you need for your winning poker hand.

## Poker Run:

You may know how a “poker run” works. You and a few dozen of your closest friends fly around and stop at five designated airports. At each stop, someone is there to give you a playing card. After collecting five cards, you fly back to the base aerodrome and play a round of poker with the cards in your hand. It’s a thinly veiled excuse to fly around and party with your friends. Like we need an excuse, right?

However, this is Texas – and it’s June, and most of us are limited to aviating only on those blessed days when visual meteorological conditions (VMC) prevail. To alleviate the risk that some or most of us could not participate, some people who are smarter than me (Janet, Kim, and Shelly) revised the rules a bit. You still need to travel to five local airports. However, you have the rest of the month of June to

get it done. Moreover, you can travel to each airport by whatever conveyance you have at your disposal. Snap a selfie in front of the designated landmark at each airport. (See attached flyer below.) Your selfies must show the date of the blessed event. The designated spots are as follows:

The Black Hawk Building at Waco Regional – ACT  
The Line Shack at Ardmore Municipal – ADM  
The statue (or FBO doors) at Grand Prairie Municipal - GPM  
The terminal building at Mineral Wells Regional – MWL  
The Red Barn Café at Sulfur Springs Municipal - SLR

The photos in the circles on the attached flyer show what you are looking for.



But first, you must register. Point your phone at the magic square and follow the instructions. The money will go to a good cause. It’s ‘cause the chapter needs to put money in the bank so we can keep doing fun stuff. (Just a note: No matter how

long you stare at the magic square, it does NOT reveal a 3D dinosaur.) So, charge up your Segway, gas up your Vespa, or roll out that aeroplane and start collecting those selfies. Then, show up for the regularly scheduled meeting on 1 July at 1200 to collect your cards and test your fortune. For what it's worth, if you don't get to all five airports, you don't get your money back. We're playing poker, after all. However, show up and play the game anyway. More than one hand has been won with three very good cards. Who knows. Maybe Lady Luck was riding in your right seat. I understand through a very reliable source that there will be prizes to be awarded to the winning hand (or hands). We will meet at our usual meeting place at US Aviation, 4850 Spartan Drive, on the field at KDTO, on the second floor in Classroom Bravo.

## Supplemental Oxygen:

By Russell Erb

*Editor's note: This is the second installment of a three-part treatise on supplemental oxygen and why you may want to use it at lower altitudes than required by regulation. It is reprinted here from The Trailing Edge with the author's permission. For more, go to "The Trailing Edge" (<http://erbman.org/trailingedge>).*

## Portable Oxygen Systems

If your airplane doesn't come with a pre-installed oxygen system then you are probably going to want a portable oxygen system. Having a portable oxygen system is also useful in your car, if you happen to be driving up Pikes Peak or have someone with asthma or otherwise compromised breathing in your family. I bought my portable oxygen system, an Aerox 4M system, from the nice man in the Aerox booth at Oshkosh 2009 (<https://www.aerox.com>). (If you bring your Aerox oxygen cylinder to the Aerox booth at Oshkosh, they will refill it for you right there. This is always my first order of business on Monday morning when at Oshkosh.) There are other brands available, such as Sky-Ox, but Aerox acquired Sky-Ox in 2022, so it is now just one company. They continue to support the Sky-Ox brand. Why did I choose Aerox? Probably because that is what my flying buddy had. Since I am familiar with Aerox, that is the style I will be talking about here.

When you order a portable oxygen system, it will come with all of the bits and bobs that I will talk about. The one difference you may have to choose is what type of cannula or mask you want.

## Cannula

Cannula is a funny word that reminds me of canoe, but actually comes from the word "cane" like a reed. Strictly speaking, a cannula is some sort of tube. In this case, it is a tube that introduces oxygen into your nose. In its simplest form, an oxygen cannula is a tube with two small tubes to stick in your nostrils.

This cannula may remind you of what a patient in a hospital would use, because that is exactly what it is. The children's cannula is the same except the nostril tubes are smaller and closer together.

These cannulae are actually rather wasteful of oxygen. To address this, Aerox offers their OxySaver cannulae.



Standard cannula



Child's cannula



“Mustache” oxysaver cannula

With the standard cannula, the flow rate of oxygen must be high enough that sufficient oxygen is drawn in during inhalation. During exhalation, the oxygen that is flowing is just blown into the atmosphere with the exhaled gases.

With the oxysaver cannula, oxygen flows at a much lower rate, about half to a third of the rate with the standard cannula. When inhaling, some of the oxygenated air enters the nose but never reaches the lungs, being caught in the trachea and nasal passages. When exhaling, this oxygen rich air is the first air to come back out of the nose. In the oxysaver cannula, this oxygen rich air inflates an 18 ml bladder in the “mustache” or pendant. During the remainder of exhalation, the exhaled air passes around the cannula, while new oxygen from the bottle is added to the air trapped in the bladder. On the next inhalation, this super-oxygenated air is the first air to be inhaled, meaning it is then drawn into the deep parts of the lungs. Oxygen from the tank continues to flow and is drawn in with the rest of the inhaled gases. Thus, all of the oxygen from the tank makes it into the lungs instead of part of it being wasted with the exhaled gases. In the pendant style oxysaver cannula, the bladder is on your chest instead of in a stylish mustache. *(Editors note: With some creativity and a black marker, you can draw a handlebar mustache on the little bladder under your nose.)*

A recently introduced variation on the cannula is the “boomula”, which is mounted to your headset instead of running tubes around your head. The fat

part connected to the headset contains the oxysaver bladder.



For hopefully obvious health reasons, any person using your oxygen system should have their own personal cannula, and should not use one used by someone else. *(Editors note: Drawing a moustache on your cannula makes more sense now, doesn't it?)* Having a personal cannula is not really a big deal, since the cost of the cannula is under \$40. The remainder of the system can be used by multiple people without problems.



According to Reference 7 from the FAA, “Nasal cannulas. These are continuous-flow devices and offer the advantage of personal comfort. They are restricted by federal aviation regulations to 18,000 feet service altitude because of the risk of reducing blood oxygen saturation levels if one breathes through the mouth or talks too much.” For higher use, up to 25,000 feet, you can buy an Oral-nasal re-breather mask.





Again, from Reference 7, “it has an external plastic rebreather bag that inflates every time you exhale. The purpose of the rebreather bag is to store exhaled air, so that it may be mixed with 100% oxygen from the system. These masks supply adequate oxygen to keep the user physiologically safe up to 25,000 feet.”

The downside of the masks is that they require a higher oxygen flow rate, so the supply does not last as long. Part of this high flow rate is caused by the higher altitude, and part of it is from a less efficient use of the oxygen.

For cabin altitudes higher than 25,000 feet, a completely different type of oxygen system from the one being discussed here will be required. Then again, if you have an airplane capable of flying above 25,000 feet, it’s probably pressurized and none of this matters.

## Flowmeter

In the oxygen tube from the bottle to the cannula you will find a flowmeter. This device is used to measure the proper oxygen flow rate.

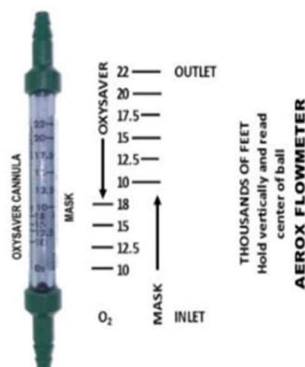
### ATTENTION!

The **Aerox Flowmeter Label** is shown at the right. Note that there are **two** scales, a **lower** and an **upper**.

Read the lower scale when using the Oxsaver® Cannula.

Read the upper scale when using the Mask.

*Failure to use appropriate scale will result in incorrect oxygen consumption.*



On the bottom of my flowmeter there is a needle valve that when turned one way stops the flow of oxygen. Turning it the other way slowly increases the flow of oxygen. Other systems may have a

separate needle valve. The flowmeter contains a simple ball-in-cone flow rate sensor, and must be held vertically to set the flow rate. The lower (and thus slower) scale is used for oxysaver cannulae. The upper scale is used for standard cannulae or the mask.

My flowmeters glow in the dark, which I assume helps with using them at night.

For using oxygen at altitudes below 10,000 feet, I set the flow rate to the 10,000 feet line, which is about the minimal reasonable flow rate.

## Regulator

The oxygen in the bottle may be at a pressure of 2000 psi or slightly more. In the plastic hose running to your cannula, the pressure needs to be just barely above atmospheric pressure. This pressure drop is accomplished by the regulator.



This regulator is screwed to the top of the oxygen bottle. Aerox sells this regulator with one, two, four, or six outlets. My oxygen system is labeled a “4M” system. The “4” specifies the number of outlets, and the “M” specifies the size of the bottle. The number of outlets determines how many people can simultaneously use the system.

## Bottle

Of course, there needs to be a bottle to store the oxygen in. We are covering high-pressure bottles, storing oxygen at 1800-2200 psi.



A

C

D

E

M

My recommendation on bottle size is to get the biggest one you can fit into your airplane. For me, the “M” size bottle fills the space under the rear seat very nicely. Where ever you choose to place the oxygen bottle, I highly recommend that the ON-OFF valve be accessible in flight. It doesn’t help much to be airborne with oxygen on board and decide you want to use it, but you can only open the valve on the ground. In my Bearhawk, I can reach the ON-OFF valve of the oxygen bottle while strapped in the pilot seat.

Oxygen bottles can be made from aluminum or steel. There is conflicting information on the Interwebs about testing and service life, so I can’t remember which is correct. I will restrict my comments to aluminum bottles, as that is what I have. Aluminum bottles, by law, are required to be hydro-tested every five years. Hydro-testing is simply pressure testing to a pressure well above the service pressure to check for bottle integrity. It is called hydro-testing because the bottle is filled with pressurized water for the test. If pressurized air was used and the bottle fractured, the result would be a low-yield bomb (it would still cause a lot of damage) as the air expanded. Since water is incompressible, if the bottle fractured, the water would simply spray out of the crack but would not send shrapnel all around the shop. Of course, after the test, the water must be drained out and the bottle dried, which is apparently done by heating the bottle or blowing hot air into it for a while. Of course, when you get the bottle back, it will need to be refilled with oxygen. The sooner the better to keep moisture from getting into the bottle.

Hydro-testing is required for all gas cylinders, so the service is usually readily available. I have mine done at Fire Ace in Lancaster CA. Their normal stock-in-trade is fire extinguishers, but that test equipment works just as well for oxygen bottles. They don’t even flinch when I take it in, as it is a normal service for them.

Besides the ON-OFF valve, the bottle comes with a pressure gauge. The pressure decreases pretty linearly with use. Pressures below 500 psi are marked in red, hinting that if your pressure is below 500 psi you should really consider getting it refilled.

Reference:

7. FAA, Oxygen Equipment: Use in General Aviation Operations,  
[https://www.faa.gov/pilots/safety/pilotsafetybrochures/media/oxygen\\_equipment.pdf](https://www.faa.gov/pilots/safety/pilotsafetybrochures/media/oxygen_equipment.pdf)

*Editors note: Stay tuned for the third and final installment of Russ’s article in next month’s newsletter.*

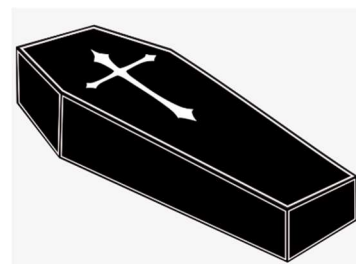


## Coffin Races

The E-Racer project is going downhill. “Of course,” you say, “That is what it is supposed to do.” Your design team has been at work calculating coefficients of drag and measuring perturbations in the gravitational constant. We have been analyzing the effects of Coriolis acceleration on linear motion on a spheroidal surface.

However, the website for the grand event went from “Click here to register for 2022” to “The 2023 race is sold out,” seemingly overnight. It’s sort of like making a

reservation for a dorm room at AirVenture. No one can get into the website until the reservations are full. We may continue the development in hopes that we might be able to obtain a slot as an alternate. The possibility remains that we may have another year to develop our entry into the Great Graviton Gathering of vehicles powered by the curves in the time-space continuum caused by the celestial mass of our planet.





# EAA Poker Run

WIN  
PRIZES

\$20 PER HAND  
\*NO LIMIT

July 1st at Noon Denton Airport  
US Aviation Bravo Room  
Trade your selfies for poker hands.



Fly or drive to each location within  
the month of June.  
\*Selfie must show date



ACT - Black Hawk Building  
ADM - The Line Shack  
GPM - Statue or FBO Doors  
MWL - Mineral Wells Terminal  
SLR - Red Barn Cafe



Take a selfie with our chosen  
airport identifier at each of  
the five destinations listed.

REGISTER



[chapters.eaa.org/ea661](http://chapters.eaa.org/ea661)

