



## EAA Chapter 100

### May 2015 Newsletter

<http://eaa100.org>

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EAA Chapter 100 is a nonprofit association involved in the promotion of aviation through adult and youth education, hands-on training, building and maintenance of experimental aircraft, and through community awareness programs.

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Reader submissions and comments are strongly encouraged.

#### Notes from the April 10 - 2015 EAA Chapter 100 general meeting.

- It was mentioned that the Business Meeting was held March 31st, and would occur every other month.
- Plans for the Pancake Breakfast were discussed with the consensus that “the usual people would do the usual things“. We will firm-up the tasks and personnel as we get closer. Derwin Hammond will contact the C.A.P. about their involvement. Tom Hall will contact Mayo 1 and the Dodge Center Fire Dept. about having a firetruck present.
- Our Chapter is in need of a Young Eagles Coordinator. Spread the word or volunteer yourself.
- There is a photo album on the table in the A D building. We are looking for photos relating to our Chapter; aircraft, Pancake Breakfast shots etc.
- Starting with the May meeting, we will meet on Saturday mornings, with the idea of hosting flying related activities. This is open to all pilots, not just chapter 100 members.
- Meeting was adjourned by 8:00 PM.
- Sonny Martin had a great photo presentation of his and Barb’s visit to Edwards A F B and the S A C museum.
- Respectfully submitted: Tom Hall, Secretary / Treasurer

**June 11<sup>th</sup> Static Displays:** I got some clarification on this Thursday. It is a Rotary Club meeting to show and introduce the airport to about 100 Rotary Club members. Tim Argo will give a short presentation on why GA is important to businesses and the advantages to businesses using GA. They are asking EAA, the SEMN Flying Club and other GA pilots to display their airplanes. Gary Black of Cirrus is bring a brand new SR22 Turbo Premier for static display. Static display times are about 1100-1400 with Rotary members being there between 1130 and 1300. **I need to know by May 11<sup>th</sup>** if you would like to display your airplane **and** get a box lunch, It should be a fun time and it would really be great to get some Chapter 100 airplanes to show off.

**June 20<sup>th</sup> Static Displays?:** We received an email from Janet Brauckman asking if during the May EAA Fly-in if she could share with us information about both a “fund rising” KRST Hangar Dance and their museum effort. We said yes. I think they will want static displays of EAA airplanes in conjunction with their event, but I’m not sure. We should find out at our May 10<sup>th</sup> fly-in.

In conjunction with the dance, the Minnesota Wing of the Commemorative Air Force is planning to bring in four planes that day. They are scheduled to arrive at 9:00 a.m. and will be available for rides all day.

#### June 28<sup>th</sup> EAA Chapter 100 Flight Breakfast at Dodge Center

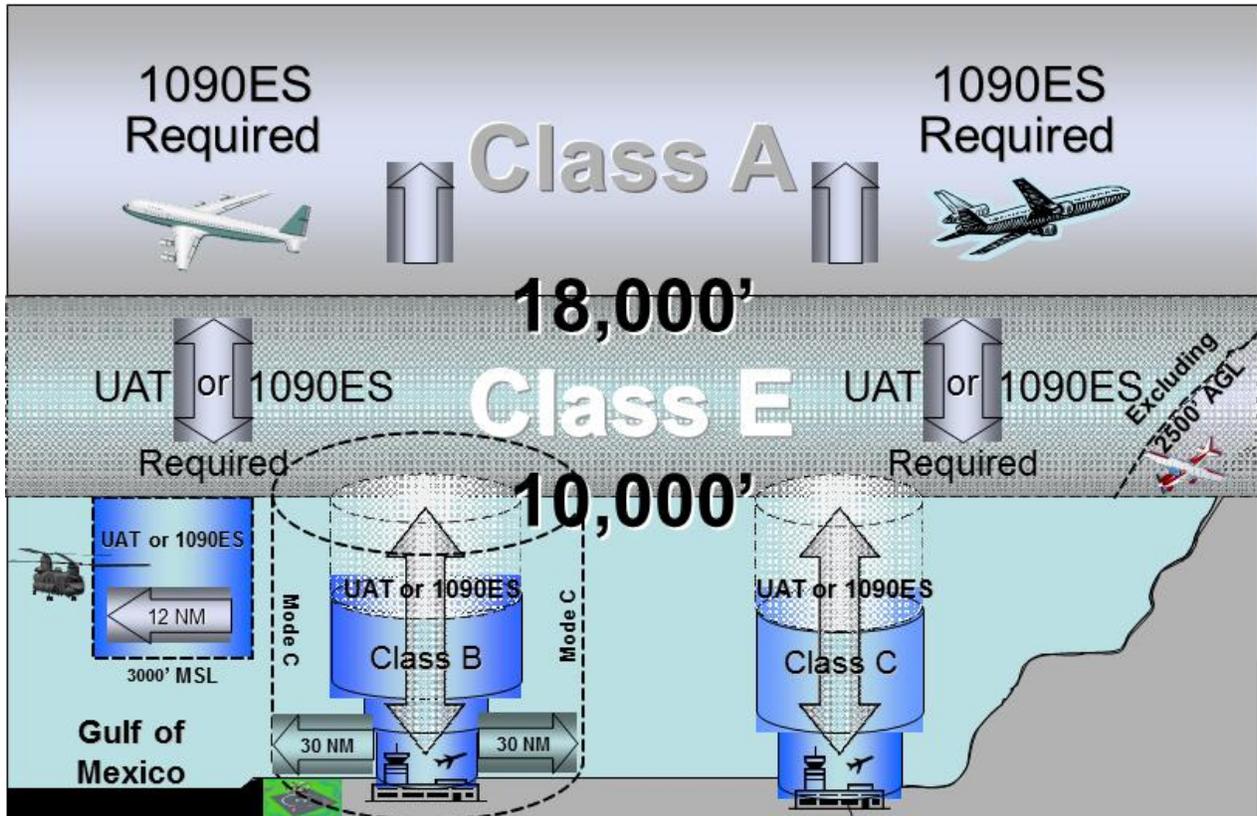
**July 9<sup>th</sup>-12<sup>th</sup>** (maybe) We might be helping the SEMN Flying Club with the EAA Tri-Motor event at KRST along with other aviation festivities. More information on this as we get it.

**Member Directory:** No firm decision has been made on what items should be on this directory. This will be an agenda item at the June 2<sup>nd</sup>

requesting a member directory but we don't want to publish a member's Business Meeting. As I wrote in the last newsletter: Many members are We are still discussing the items printed on the paper copy. It should have: name, phone number, and email, but what about address and mug shot? Should it list only current members or include almost everyone who has ever shown an interest in the chapter? Should the paper copy only be distributed to current members? Current meaning paid their dues for the current year. i.e. a copy will cost you \$10/year. Please send you comments to [Newsletter@EAA100.org](mailto:Newsletter@EAA100.org).

### Who Really Needs ADS-B Out?

| Airspace | Altitude   |
|----------|--|
| A        | All  |
| B        | From the ground up within the Mode C ring        |
| C        | From the ground up                               |
| E        | Above 10,000 ft MSL but not below 2,500 feet AGL |



- Short Answer – if you stay more than 30 miles from Minneapolis (or other Class B, Don't go into or above Class C, and stay below 10,000' MSL you are good without ADS-B Out.
- Long Answer:  
ADS-B Out will be required in the following airspace:
  - Class A, B, and C airspace
  - Class E airspace areas at or above 10,000 ft MSL over the 48 states and DC, excluding airspace at and below 2,500 ft AGL
  - Airspace within 30 nautical miles (nm) at certain busy airports from the surface up to 10,000 feet MSL; airports listed in appendix D to part 91.
  - Above the ceiling and within the lateral boundaries of a Class B or Class C airspace area up to 10,000 feet MSL
  - Class E airspace over the Gulf of Mexico at and above 3,000 feet MSL within 12 nm of the coastline of the United States
  - i.e. If you fly in the airspace listed below, you must be equipped with ADS-B

**Member Bios** New biographies are published in the newsletters and all are on our [website](#). I'm hoping all members will submit their bios.

Last month's Autobiography of Gordy Westphal was improved by adding pictures of the actual airplanes Gordy has owned. This updated bio is on the [website](#).

This month we have Sonny Martin's Bio.

Oliver G. (Sonny) Martin Jr.

Grew up in Metairie La. (suburb of New Orleans). Places I have lived: Baton Rouge, La; Austin, Tx; Shreveport, La; Greencastle, IN; Mechanicsburg, PA; Poughkeepsie, NY; Rochester, MN.

High School Metairie HS; College LSU and LSU Shreveport Associate degree computer science.

Married; wife Barbara Sorochak (pilot with Instrument rating): children Son; Scott. Daughter; Patricia Grecni.

Pipefitter in shipyard (NOLA), Roughneck in oilfield (LA), Carman ICRR (NOLA), Customer Engineer IBM (Baton Rouge), Product Support Engineer IBM (Austin TX), Field Manager IBM (Shreveport LA), Staff Systems Analyst IBM (Greencastle IN), EOL Staff Analyst IBM (Mechanicsburg PA), EOL Program Manager (Poughkeepsie NY), Avionics Tech at Clark Aviation (New Cumberland PA). Avionics Shop Manager R C Avionics (Rochester MN).

My Manager in Mechanicsburg was a pilot and I expressed a desire to learn to fly. HE set me up for lessons with Clark Aviation at Capital City Airport (CXY). 1987. I was 51 years old. Went wild with the training, had my commercial multi instrument within the first 2 years. Bought my first airplane in 1989 a Cessna 172G model N4684L. I bought my next in 1993 a Cessna 182P model N21402. Completed my Van's RV12 in 2012. Great airplane.

Just lucky I guess I have never had any situations that were anything other but routine flying.

Served 3 Years Regular Army Security Agency. Basic at Fort Chafee AR; MOS training at Fort Devens MA; Advanced Training at NSA Fort Meade MD. Spent 2 Years at Torii Station Okinawa.

Mustered out at Oakland Army Terminal 1961.

[Editor's note: Sonny is not one to embellish his accomplishments or skills, but believe me, he is a wealth of information – as are many in the chapter. If you have an airplane question (especially avionics) he is always ready to help and usually has the answer on how to do it, or how to do it better.]

**Dear fellow aviation enthusiast,**



I am delighted to inform you that I am the new representative of Skylark Aircraft Dova-1 in the U.S. After a long absence from the U.S. market, the Dova Company is back with a strong commitment to help the aviation community to achieve its goals and fulfill its dreams. My company is selling the certified Skylark Light Sport Aircraft and a fast-build kit. The fast-build kit version gives the builder the opportunity to choose from various engines (e.g. Viking, D-motor, Rotax) and avionics to obtain the desired performance.

I am representing the Dova Company with great pride in order to serve and fulfill the needs of our customers. My goal is to fully satisfy Skylark's buyers with an outstanding product.

Skylark USA, located in Sacramento, California, is the Skylark's exclusive distributor for the U.S. and Canada. For more information about Skylark aircraft and ordering details please visit our website ([www.skylarkusa.com](http://www.skylarkusa.com)) or e-mail us at [office@skylarkusa.com](mailto:office@skylarkusa.com).

Sincerely, Nick Suci, Skylark USA, CEO.



## Good Links:

Airplane Misrigging: Lessons Learned From a Close Call

[https://www.youtube.com/watch?v=AsPA3u7JSFQ&feature=player\\_embedded](https://www.youtube.com/watch?v=AsPA3u7JSFQ&feature=player_embedded)

[NTSB Safety Alert for Pilots](#)

[NTSB Safety Alert for Mechanics](#)

Discover Aviation Days, May 30 & 31 2015 at the Blaine Airport

[www.youtube.com/watch?v=CqQvwkOqxho&feature=youtu.be](http://www.youtube.com/watch?v=CqQvwkOqxho&feature=youtu.be)

X-47B (UAV/Drone) Completes First UAS Aerial Refueling

<http://www.avweb.com/avwebflash/news/X-47B-Completes-First-UAS-Aerial-Refueling-223958-1.html>

May 1 Issue of Vectors for Safety <http://genebenson.com/newsletter/index.htm>

## Climb Considerations

By Dave Higdon

Long ago, an instructor explained to me that knowing the various options for using the airplane, the different ways to make it do what's needed, and the savvy to use those different models as appropriate; differentiated aviating from rote piloting. In the case of using climb abilities to your benefit, the best preparation begins with knowing and understanding all available options, knowing the plane and practice.

How we chose to perform our climbs should be tailored specifically to the time of day, the weather, the surrounding terrain and/or the traffic. We can chose to maximize the trip's average groundspeed, minimize fuel use or get as high as we can as fast as we can, fuel efficiency be damned.

Born of Imbalance

You, of course, remember the four forces acting on all aircraft in flight: thrust, its counterpart drag, lift and its polar opposite, gravity. In stable, level flight, the two force pairs cancel out each other; thrust and drag balance shown by the aircraft holding a steady speed; and lift balances gravity as evidenced by the aircraft's constant altitude. Alter that balance between any one of the four and other things also will change as the balance of forces is destabilized.

Climb results from lift exceeding gravity—a change of state produced by the use of power in excess of that needed to sustain stable, level flight at any given pitch setting.

At any given airspeed, any increase in applied power initially accelerates the airplane as it seeks to return to its previous trim attitude—and thus its previous airspeed. That excess speed first turns into altitude gained on an initial climb until the airplane, left alone, stabilizes itself at the old airspeed—but at a steady climb proportional to and consistent with the amount of power added.

Similarly, an aircraft at cruise gradually trimmed to a lower airspeed will, leaving all else alone, gradually begin to climb because the power used exceeds that needed to sustain level flight at the lower airspeed. But that's not all that's going on in a climb.

According to the FAA's Airplane Flying Handbook (AFH), FAA-H-8083-3A, "In a climb, weight no longer acts in a direction perpendicular to the flightpath. It acts in a rearward direction. This causes an increase in total drag requiring an increase in thrust (power) to balance the forces. An airplane can only sustain a climb angle when there is sufficient thrust to offset increased drag; therefore, climb is limited by the thrust available." In other words, we must have sufficient power, in excess of that required for straight and level flight, before we can climb.

So it stands, the more power we have in excess of that needed for level flight, the greater the climb rate—at least, as long as the engine makes power enough to sustain that climb.

At some point, the change in altitude results in reduced power or an arrival of indicated airspeed at the stall point on the airspeed indicator—and all rules are off. If the aircraft reaches a point at which it can fly but not climb, it's at its absolute ceiling. At that point and all things begin equal, the aircraft is unstable, bordering on uncontrolled. But at least you've plenty of air beneath you, giving you time to correct your situation and restore your control over the aircraft.

The Forces in Climbs

For all practical purposes, the wing's lift in a normal, steady-state climb is the same as it is in a steady level flight at the same airspeed. Although the aircraft's flight path changed when the climb was established, the wing's angle of attack (AoA) with respect to the inclined flight path reverts to practically the same values, as does the lift.

Initially, there is a momentary lift increase: “Raising the aircraft’s nose increases the AOA and momentarily increases the lift. Lift at this moment is now greater than weight and starts the aircraft climbing. After the flightpath is stabilized on the upward incline, the AOA and lift again revert to about the level flight values,” according to the FAA’s Pilot’s Handbook of Aeronautical Knowledge (PHAK), FAA-H-8083-25A. This is depicted in Figure 1, above.

### Rate or Angle?

Most pilots’ formal climb training involves some short-field work, perhaps along with exercises focused on maintaining a specific attitude or airspeed. When training to become a multi-engine pilot, we spend a lot of time seemingly trying to balance a large, underpowered airplane on the head of a pin, where any failure to maintain the correct pitch and bank angles is immediately noticed on the vertical speed indicator.

Other than that, we’re usually taught there are two speeds to fly when climbing, one for a best-rate climb and another for the best angle. The best rate of climb speed, VY, is the one delivering the maximum gain in altitude per unit of time. It’s usually higher than the best angle of climb speed, VX, which provides the greatest altitude gain over a given distance. It’s the one you aimed for when doing those aforementioned short-field exercises. A third speed, VYSE, best single-engine rate of climb, is published for multi-engine airplanes. Interestingly, it’s also the only best-climb speed marked on an airspeed indicator.

Reams have been written about which kind of climb is best. Best-rate climbs may get you to altitude quickest, but you’ll likely see the lowest average airspeed across the route. If ATC says “expedite climb” to your final altitude, there’s no question: Use VY. If your departure route takes you toward terrain higher than your departure point, consider VX. More important is remembering to determine the distance to the obstacle and whether climbing at any speed will keep you clear of it.

The other thing to keep in mind about VY and VX is they’re published for an airplane at sea level and change as we climb. Since we very rarely depart a sea-level airport, and since the act of climbing means we’re rather quickly higher than zero feet, we need to adjust our best-climb speeds as altitude increases. The chart on the right, Figure 2, details how these speeds change with altitude—VY decreases while VX increases, slightly—all the way to either the airplane’s service ceiling or its absolute altitude.

### Cruise Climbs

After best-rate and best-angle climbs, a third type also is worthy of discussion: the cruise climb. In general, cruise climbs raise the average speed for the trip, a bit, and lower overall fuel use—particularly when the pilot practices progressive leaning. Adjusting fuel flow downward every turn of the thousand-foot needle of the altimeter saves gas and comes closer to optimizing power. If balancing groundspeed against rate of climb is what you need, a cruise climb is the way to go.

Cruise climbs, of course, lack a definitive V-speed, which makes some sense: It’s a lot more variable than VX or VX—despite the need to modify these two speeds for altitude—and depends more on operational requirements and individual choice than anything else.

A cruise climb is one conducted at an airspeed higher than the best-rate or best-angle climb speeds and produces a lower climb-rate number used to trade off gain for cross-country progress. Cruise climbs not only speed you more quickly toward your destination, they also save fuel, help the engine run cooler and improve the view from most airplanes. In fact, it wouldn’t be hyperbolic to say that most airplanes gain altitude in a cruise-climb configuration rather than one adhering to published speeds. More on cruise climbs in a moment.

### Setting Up for Climbs

Every climb requires proper airplane configuration. Factors to consider, in addition to obstacles or climb rate, include engine cooling, out-the-cockpit visibility, minimizing drag, setting power and weather.

For maximum-performance climbs, that means open cowl flaps, if so equipped. With cooling-air flows reduced by the higher angles and lower airspeeds at VY and VX, the cowl flaps will be needed to increase the flow of cooling air coming through the cylinder fins and oil cooler. If opening the cowl flaps isn’t enough, or your airplane doesn’t have that option, excess fuel can be used to keep things cool under the cowling. Enriching the mixture to, say, 150-200 deg. F rich of peak EGT and consistent with altitude has little-to-no effect on a piston engine’s power production.

Unless needed to sustain a special rate or angle, flaps and gear should be up as quickly as practicable. If speed, however, underpins your climb decision, remember to close those cowl flaps as soon as safe—shortly after trimming to your cruise-climb setting.

And that trim knob, crank or wheel, is seldom more your friend than when setting up the aircraft for a sustained climb. How better to assure a stable, consistent ride up the atmospheric stepladder than by trimming the aircraft for the exact speed you need to hit for cruise climb, obstacle climb or best-rate climb.

#### When Normal Won't Work

Some call it a “zoom” climb—others may have their own name—but this type of climb results from letting speed build and then hauling back on the pitch control to convert velocity into altitude. For some airport and aircraft combinations, a zoom climb may be the only way out.

This is a recommendation to think seriously about the necessity of the flight or the wisdom of the plan if you have to factor into your departure plans for anything like a zoom climb.

Abnormal climbs may also be appropriate for departing a short field in soft conditions—or a short field, period. Don't let a focus on minimizing takeoff distance and maximizing immediate climb become the enemy of remembering to maintain a comfortable margin above stall speed—in particular if the winds are at all variable.

It's no fun being close to the ground, at a high pitch angle and higher AOA—only to have strong winds suddenly subside or, worse, reverse direction. And low-level stalls hurt the worst.

Meanwhile, anything that adds drag to an airplane will handicap its performance. A climbing turn, despite how necessary it may be under some circumstances, qualifies.

Absent some reserve power, putting your climbing airplane into a turn will diminish the climb's rate and, possibly, its angle. If you're trying to climb out of a box canyon or skyscraper-studded neighborhood, you need more leeway if a turn has to be part of the departure.

#### Planning Your Climb

Consider this scenario: 500 nm to go and the need to fly at 7500 feet msl after taking off from sea level. What's the most efficient way to get to your cruising altitude?

My long-time traveling machine boasted a full-throttle, best-rate climb of about 950 fpm at 82 KCAS at sea level. Its best-angle climb produced 750 fpm at 65 KCAS. Using those numbers, which admittedly are based on sea-level performance, means I'll need just under eight minutes to reach my target altitude at maximum-rate climb. In that time, I'll cover 12 nm. If cruising at 135 knots groundspeed for the rest of the trip, I'd need 3.65 hours for a total of 3.75 hours—three hours, 45 minutes—to arrive at my destination.

If I chose the airplane's best-angle climb speed, I'll need 10 minutes to climb to 7500. I'd cover the same 12 miles or so, but spend two more minutes doing it. All else being equal, I'll spend about three minutes longer en route when climbing at best angle instead of best rate.

But if I used a faster speed after clearing any obstacles, the numbers change again. Trimmed to 115 KIAS for the climb, experience tells me a 500-fpm rate was available. Yes, it took longer to get to 7500 feet, but I would be at nearly 29 nm from my departure point, or more than twice the distance toward my destination.

My total time en route is about 3.4 hours, meaning I can arrive about seven minutes earlier and burn three to four fewer gallons of fuel than the other two options.

Once clear of obstacles and with enough air underneath to lengthen the time available for emergencies, climbing at a faster airspeed pays off for me. It will for you, too.

This article originally appeared in the April 2013 issue of Aviation Safety magazine.

For more great content like this, subscribe to Aviation Safety.

#### 2015 Airshows:

- [Thunderbirds](#)
- [Blue Angels](#)
- [May 9-10: Davenport, IA](#) (Blue Angels)
- [June 27-28: Mankato, Minn.](#) (Thunderbirds) (also our flight breakfast setup and feed dates)
- [July 4-5: Eau Claire, WI](#) (Blue Angels)
- [July 25-26: Fargo, ND](#) (Blue Angels)
- [August 8-9: La Crosse, WI](#) (Thunderbirds)

Please send questions and comments about this newsletter to [newsletter@EAA100.org](mailto:newsletter@EAA100.org).