

THE RITE FLYER

MARTIN AIRFIELD

HOW'S YOUR TURN?

BETTER FLYING IS IN THE DETAILS *By LeRoy Cook*

Coming Up ...

Meeting :

December 11, 2023, 6:00 p.m. at Martin Field. Holiday Dinner

Program: Annual Awards recognition

Board of Directors

None in December

Next Meeting:

January 8, 2024, 7:00 p.m. at Martin Field.

Chapter Website:

chapters.eaa.org/ea604

2023 Officers

- President
Jim Edwards
skypilot150@gmail.com
- Vice President
Susan Chlarson
tdstogether@gmail.com
- Young Eagle Coordinator
Susan Chlarson
tdstogether@gmail.com
509 607-1257
- Treasurer
Tim Anderson
fuzzet@hotmail.com
- Secretary/Newsletter
Don Gibbard
gibbdo@pocketinet.com
509-525-9497

Airplanes must eventually turn if they are to be used to get anywhere, a fact of logic that the Wright brothers realized early on.

Rather than build a flying machine that rode the waves like a ship, solid and imperturbable, the brothers worked on making the aircraft steerable, so its pilot could bring it about and cope with changes in the air. One of early aviation's greatest achievements was Wilbur Wright's completion of the first circular flight on September 20, 1904.



Photography by Chris Rose

As one of the four fundamental modes of flight—along with straight-and-level, climbs, and glides—turns are often given short shift after being introduced in the first hour of flying lessons. And yet, as a part of the foundation of everything we do with an airplane, they deserve more study and diligent practice. I tell every student to make every turn as perfectly as they can, so they'll get better and better, until a good turn becomes second nature. Sloppy turns result from inattention to small details, a basic flaw that transfers to other maneuvers.

For instance, do you finish a turn 50 feet higher than when you began? Or do you pay attention to altitude deviations at all? Do you roll out 10 degrees past your intended heading, then wobble your way back to it? Does your bank angle wander as the airplane comes about, and does the slip ball habitually ride partway out of its cage? These aren't big items, but they distract us from what could be perfection. Lest I be accused of being engaged in

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Calendar Items to share

Fridays	10:00 a.m. Coffee Club, Martin Field Pilot's Lounge,
Dec 11	Chapter 604 Holiday Dinner, 6:00 p.m. Martin Field
Winter is a time of fewer opportunities to fly so look for other social events with pilots or visit a hangar!	



HOW'S YOUR TURN? *continued*

over-obsession, I realize there are times when we have better things to do than correct minor blemishes in a medium-bank turn. But if we don't work on improvement as time permits, we're doomed to accept second-rate performance.

How does it work?

The details of what makes an airplane turn can be confusing, but if I bank the wings, something called the *horizontal component of lift* will push the airplane around in a circle. No bank, no turn; more bank, more turn—that's the way it works. Oh, I know it's possible to perform a flat turn by holding aileron against firmly applied rudder, thereby skidding our way through a curved path. As a practical matter, though, airplanes and passengers much prefer coordinated flight, with bank as the primary ingredient and rudder used to maintain coordinated flight.

The act of rolling into a bank requires a bit of persuasion, because the airplane is designed to maintain straight flight. Its tail acts like the feather of an arrow, resisting minor disturbances, and the displacement of the ailerons at the wing tips creates a yaw input that's opposite to the desired direction of the turn, called adverse yaw. Modern aileron designs and slow control movements may allow us to ignore compensating for this resistance, if we choose to do that, but the turn's entry—and subsequent recovery—will be a sloppy procedure.

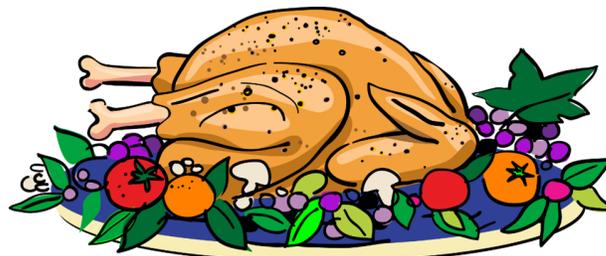
It's far better to tap some rudder pedal as the turn begins, along with aileron, which brings in a little pre-turn yaw to offset the adverse yaw of aileron movement and breaks the airplane out of its insistence on straight flight. Airplanes of many years ago needed lots of rudder to initiate turns. In our case, modern differential ailerons only require a little coordinated rudder to produce a smooth roll-in and rollout. We have but to watch the slip ball to get a grade; it should remain essentially unmoved as we go in and out of turns. Passengers will likewise remain undisturbed in their seats.

In level flight, our wings primarily produce vertical lift. Once the turn is underway that lift vector changes, and we produce both vertical and horizontal lift. Because we are now making less than the necessary amount of vertical lift to overcome our weight, our altitude will begin to drop unless we add a little more, obtained only by increasing angle of attack by pulling back on the stick or yoke or speeding up. Thus, every turn entry and recovery require the use of three controls: ailerons, rudder, and elevator. Unlike an automobile, the wheel or stick is returned to neutral after the turn is begun, along with the rudder pedals; only the eleva-

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Holiday Dinner December 11

Christmas Dinner, Dec. 11 6:00 p.m.



EAA Chapter 604 will hold the annual Christmas Dinner this year in the Pilot Lounge at Martin Field. Turkey will be the main dish. We will need the rest of us to fill in the menu with our favorite holiday dish. We will also need a few hands to help set up and decorate the room. This dinner is open to all members and friends and your families. A sign-up sheet will be at our November meeting for you to pick your side dish. If you will not be at the meeting but still plan to attend or help with setup, just email me what you would like to bring and I will add it to the list (gibbdo@pocketinet.com).

Election of Officers

Every two years we hold elections for Chapter Officers. Officer nomination were made at are last meeting. They are as follows:

President: Susan Chlarson
 Vice President: Jim Edwards
 Secretary: Sharlaine Ortiz
 Treasurer: Blaise Szallasi

Elections will be held at our December Meeting.

DUES ARE NOW DUE!

Tim Anderson will be available at the Christmas Party to receive your dues. Our dues are \$30 per person or \$45 for a family. These dues are used to pay our Chapter renewal and insurance with EAA, so please be sure to support our local EAA Chapter.

Minutes November 13, 2023

President Jim Edwards called the meeting to order at 7:05. Jim welcomed our guest, Eric Green. Eric participated in our first Eagle Flight and is now taking lessons. Congratulation Eric!

We started with **projects** to catch up with everyone. Jim **Edwards** is still working on his landing gear lock system and is making progress with the help of several of our Chapter members. **Joe and Blaise** have taken on a new engine for the Cessna 120. They discovered that the crank was cracked and the engine is past TBO. They found a complete engine in the Mid-West and Joe made a quick trip there and back to retrieve it (Ask to see pictures). **Boyd** finished his Cub and after passing certification he was able to sell it. **Charlie Miller** is still working on wiring but winter limits his time in the cold shop.

The Holiday Dinner is next month during our regular meeting. The Chapter will pay for the turkey and Susan and Travis will cook it with dressing and gravy. The rest of the members who will be attend, will bring side dishes. A sign-up sheet was passed round to get a head count and menu selections. Decorating will be Saturday at 10:00 a.m.

Scholarship Report: Elsie wrote an essay and applied for a LightSpeed headset which is available to Ray Scholars. Her essay and application were accepted and Travis presented her with new Zulu-3 headsets from LightSpeed.

Eagle Flight Report: The event was held Oct. 28 with seven people attending. All had an introduction flight and they seemed very interested in aviation. As of our meeting, three had started training and a fourth is planning to start. We also did the "Learn to Fly" portion on Saturday.

Student Report: Klint passed his knowledge test and has finished his cross-county requirements. He is getting close to scheduling a check ride. Elsie is studying for her knowledge test and working on cross-country planning.

The fund raising flyer has been designed by Dr. Ortiz. We will be getting those printed and out to the community. Jeni talked about the February "Love of Flying" fundraiser. Susan suggested that we apply for another full scholarship award from EAA for 2024. We agreed and she will start the process.

We had nominations for Officers. The follower names were placed in nomination:

President—Susan Chlarson
Vice President—Jim Edwards
Secretary—Sharlaine Ortiz
Treasurer—Blaise Szallasi

In addition to the Officers, the board consist of the immediate

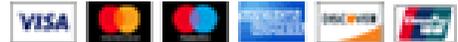
Past President and At-large members which includes the Young Eagle and Eagle Coordinator, the Technical and Flight advisors.

There was no other business. Our program was given by Elsie Mann and she share with us some of the lessons she has received as part of her flight training. Refreshments followed.

Respectfully Submitted
Don Gibbard, Secretary

Please support our Scholarship Fund by donating today. EAA 604 is a 501c(3) and all gifts are tax deductible. Click the link below to be directed to our Donation Page

Donate



2023 REFRESHMENTS

JANUARY	Ray Bankes
FEBRUARY	The Chlarsons
MARCH	Matt Haris
APRIL	Jim Edwards
MAY	Andrea Moore
JUNE	Larry Moore
JULY	
AUGUST	Bill Herrington
SEPTEMBER	Don Gibbard
OCTOBER	Kris Kuykendall
NOVEMBER	Blaise Szallasi
DECEMBER	CHRISTMAS PARTY

HOW'S YOUR TURN? *continued*

tor pressure is maintained throughout. The elevator is “lifting” the airplane around the turn.

It is important to hold a steady bank angle during the turn if you want to maintain a constant altitude or, in the case of climbing and gliding turns, the correct airspeed. Allowing the bank angle to shallow produces a climb and letting it steepen tends to create a descent, in the absence of changing elevator pressure. If you want the turn to remain level, keep the bank immobile.

Turns, great and small

The typical bank angle chosen for “medium turns” is about 30 degrees, mild enough to avoid challenges to skill but effective enough to bring the airplane around quickly. Once medium-bank turns are mastered, we will proceed to steeper turns as a skill-building maneuver. At 45 degrees of bank, the pilot is required to add considerable up-elevator to keep altitude steady, nudging in a bit of throttle to keep a fixed-pitch propeller’s rpm from dragging down and airspeed from deteriorating. Steep turns begin to manifest an overbanking tendency; rather than holding at a stable bank angle, the bank would really like to increase itself. A small increment of “outside” aileron pressure may be required to keep the bank steady.

Don’t fixate on the panel’s attitude indicator for a perfect turn. Instead, use the natural attitude indication of the horizon in the windshield. Learn where the nose of the aircraft is pointed in relation to the horizon during a left or right turn and keep it fixed in that attitude. Use the altitude and bank indications only as confirmation that your basic outside references are correct. After all, outside is where the other airplanes are, which is why you’re clearing the airspace you’re going to occupy before you begin a turn. Even while practicing, have your eyes outside 80 percent of the time.

Instrument pilots, brooding introverts that they are, avoid trouble in the clouds by doing only “standard rate” turns that move the heading at a sedate 3 degrees per second. Most training airplanes achieve this rate of turn at about 15 degrees of bank; faster airplanes will need 20 or 25 degrees of bank. But we generally limit instrument turns to 30-degree maximum bank angles, regardless of speed. VFR pilots will use these benign bank turns during climbs, to allow most of the engine’s power to go into producing climb, and in slow flight turns, where there’s a stall lurking a few knots away.

As a general rule, coordinated level turns in slow flight can be made at bank angles up to 30 degrees without worry about the stall speed increase from added G-load. If you inadvertently let the bank get too steep at slow speed, just drop the nose and unload the wing while rolling out. Trading a little altitude for speed is better than stalling during the turn.

Gliding turns, like climbing turns, require attention to airspeed control, rather than maintaining altitude. To hold a steady best-glide speed, back-pressure is added to the elevator control after the turn is begun, proportionate to the amount of bank used, and released as you roll out of the turn.

Rolling out of the turn requires a little anticipation as the heading indicator moves through the numbers. We don’t want to snap the passengers’ necks by instantly banging into straight flight, so let’s begin the rollout about 5 degrees prior to our chosen heading, remembering to squeeze in a little rudder with the aileron. Be careful, now that you know what the rudder is for; your legs are at least twice as powerful as your arms, so use small displacements. Don’t forget to release the back-pressure you’re holding as the wings become level, lest the airplane jump 25 feet during the rollout.

Make every turn the best you ever did. It won’t take long to see them become smoother and more precise without even trying. Your future passengers may not ever notice, but you will.

LeRoy Cook is an airline transport pilot, instructor, and frequent contributor to AOPA publications.