



Volume 61

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No. 5

Priest & pilot: Reflecting on two amazing gifts from God

By Fr. Miles Barrett

How creative can God be in bringing His priests to evangelize, share the Gospel of Christ and renew hope in God? And fly? A God who gives His gift of the art of flying to evangelize? Who calls a man to be ordained a priest but also gifts him with a Federal Aviation Administration certificate to pilot a plane as well?

As a priest/pilot, ordained 43 years for the Diocese of Sioux City, Iowa, a pilot for 46 years, and an FAA flight instructor, let me share just a few memories where God was in a very creative mood on and above *terra firma*.

Medical flight and evangelization

Back in Spencer, Iowa, while serving at Sacred Heart Parish, a Catholic doctor called me to come to the hospital as soon as possible. A baby needed an emergency baptism and parents asked for a priest. I arrived to find the baby girl with spinal meningitis and underweight. She needed a larger hospital like one in Sioux City almost two hours away on winter roads. After baptizing the child, I heard the seriousness of the case, the issue of time and complexity of a helicopter from Sioux City coming and going at great expense. Doc and parents were very quick to accept my humble offer of a rented plane at the local airport. Timewise it was much more efficient and at a low cost for me to rent.

It took a simple call to the flightline to have the plane



Fr. Miles Barrett at cruise altitude in the Piper Turbo Arrow III that he owned in 2017. It was a nice step up from the rental he describes in this story.

pulled out and ready for the flight. We arrived at the airport with the baby in Mom's arms and Dad looking anxious. We took off from Spencer (KSPW) and landed at Sioux City (KSUX) in less than 40 minutes. That was quicker than a helicopter could have arrived at the hospital from Sioux City. God had blessed us with a clear, cold day

in Iowa. And the plane had a good heater. Mom nursed the baby to sleep in back and Dad got back in touch with God's love. I had called my parents, Ambrose and Mary Barrett, who lived in Sioux City. Eager to help, Mom and Dad met us at the Sioux City airport within the hour of the baptism.

The old Barrett family station wagon was warmed up and waiting at the general aviation gate, close to where the plane was tied down. Within minutes, we were at St. Vincent Hospital. To say the baby's parents were grateful would be an understatement. The baby's fever broke after midnight, thanks to God and natal ICU care.

The baby's parents were not practicing Catholics. And Dad was afraid of flying! But God's love conquered all.

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I flew Dad back to pick up items for his wife and baby, so he could drive back an hour and 45 minutes or more to the hospital. During the flight back, I heard the rest of his struggle with the Church, and how he wanted to get back to the faith he was raised in as a Catholic.

Evangelization? More often than one can imagine. The baby's Dad and Mom returned to the Church and became active in their faith. They were grateful to God for the priest pilot who happened to be available to help. How creative God was that wintry day supplying good weather, a rental plane and brave parents to be able to serve up His creative love.

Sowing seeds of faith at the airport

Recently as a flight instructor I had a student pilot who was raised Catholic and married his high school sweetheart who was also raised Catholic. Out of high school, their marriage was performed by a justice of the peace, and they were not practicing their faith in a long while. It didn't take long before he brought his wife to Mass and returned to the Church. He said it was because I was there at the airport, approachable and invited him to my weekend Mass. His Q&A sessions on faith issues and Catholic traditions were done while he learned to fly. And he was not alone asking questions.

Folks who would never darken the doorway of a rectory would have good questions and discussions of faith in Jesus Christ in the Catholic tradition while at the airport. Protestants even attended Mass, I think at times because they were invited.

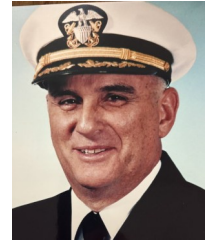
Protestants and Catholics asked questions about my being a Catholic, a priest and retired Navy Chaplain. They were amazed with stories of military flights logged during my 26 years serving the Navy, Marines and Coast Guard, with one year in Iraq serving the Army and Air Force. Because we both shared a common interest as pilots, there was already an established relationship to build on. The Holy Spirit does the rest.

What a gift to bring the Christ in self to engage the Christ in others. Mutually we come closer to God's mystery and majesty while soaring like an eagle. As Isaiah 40:31 put it: *"Those who hope in the LORD will renew their strength. They will **SOAR on WINGS like EAGLES**; they will run and not grow weary; they will walk and not be faint."* All pilots need faith, hope and trust, don't you think?

Remembering a hero priest pilot

My hero is a priest pilot, retired fellow Navy Chaplain and friend. Fr. Jim Kelley flew for more than 12 years

in Alaska. In a week of flying with Fr. Jim, we set down on riverbed landing strips and walked up to fishing villages where he had sacramental prep and Mass. As a pilot, he covered his parish from Dillingham to the length of the Aleutian Islands. His parish would stretch from Denver to Boston in the Lower 48. Fr. Jim Kelley was a heroic NAPP member.



Fr. Jim Kelley

May God bless us with more young men today **who need your encouragement** to answer the call to serve as a priest. And let them know God will use every gift He has given them, even the gift to pilot a plane. Even experience as John Gillespie Magee Jr. put it in his poem ***HIGH FLIGHT***: *"Oh, I have slipped the surly bonds of earth... Put out my hand and touched the face of God!"*

Pax Christi, carpe diem!

Editor's note: A version of this article is being submitted for publication in "Salute" magazine, published by the Archdiocese for the Military Services USA. The effort is being coordinated by Fr. Edward Moran to encourage military chaplain priests and seminarians to join NAPP.

For more about Fr. Jim Kelley, the pilot who died in Alaska, see the archive article on Page 3.

2025 NAPP Dues – U.S. \$30.00

Fiscal year began July 1, 2024

Use this form or use PayPal (go to priestpilots.org and click **Pay Now**).

NAME: _____

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Make check payable to NAPP and mail to: Tom Enwright, Treasurer, 419 Chestnut St., Sauk City, WI 53583

In addition to the \$30 annual dues, we encourage members to make a separate donation to the **NAPP Missionary Gift Fund**, which will be used to support the organization's charitable grants. Donations can be sent to the same address or you can use PayPal. Go to priestpilots.org and click on the **Donate** button.

Donate



From the NAPP archives ... 23 years ago | April 2002

Fr. Jim Kelley, Alaskan pilot who died in crash, is remembered by NAPP friends

Editor's note: Fr. Ev Hemann, NAPP president in 2002, wrote this tribute to [Fr. Jim Kelley](#) in the [April 2002](#) newsletter. Ev's brother, Fr. Mel, who was editor of the newsletter, wrote extensively about the plane crash that killed Fr. Jim. You can page through the edition with the link above, but I call your attention to Mel's message at the end of this archive article.

On Sunday, March 24, I made a memorial flight in honor of (Fr.) Jim Kelley. It is a tradition I started about 15 years ago. When a pilot I know dies in an aviation accident, I fly a "memorial" flight in his honor. It is my way of remembering the deceased, a personal variation of the traditional flyby. Fortunately, I have made very few of these.

On Good Friday, 1954, my grandfather died. It is the first death that I can remember dealing with in my life. On the vigil of Palm Sunday, 2002, Jim Kelley died en route to celebrate with one of his parishes. Two significant deaths in my life. Temporal bookends, the first and the last. Both in Holy Week when we solemnly celebrate the Paschal Mystery of Jesus Christ, our Passover.

I remember meeting Jim at one of my first NAPP conventions, perhaps in 1971. He impressed me as a professional pilot and priest. I was a young, newly ordained priest. Here was a man who loved serving as a priest and did a marvelous job at it. It was evident in the casual discussions which we have at our conventions. He was also a professional flight instructor in his free time.

It seemed to me that Jim was one of the members we all looked forward to seeing annually. Talking with him always left me feeling good about being a priest and pilot. But, at least with me, I was almost always challenged by some question, insight or discussion. Despite all of his experiences, he always inquired about what I was doing, in ministry and in flying. Some of the NAPP officers were talking about giving him a special honor at our convention this summer for his commitment to flying the bush for 11 years and his dedication to NAPP.

I know that you have said a prayer for Jim. Go take a memorial flight to honor him.

Everett Hemann



Fr. Ev Hemann

Excerpt from Mel Hemann's comments in the [April 2002](#) newsletter:

Jim Kelley is the last name on our list (of recent member deaths). On Saturday, March 23, 2002, the Cherokee 235 Jim was piloting met a mountain head on near Manokotak, Alaska, en route to Palm Sunday services in Togiak and King Salmon. Because of bad weather, rescuers were not able to reach the crash site until Monday morning.

Jim and I are three months apart in age. As his elder, he always introduced me as his "mentor." I always felt there was something special between the two of us. In the past week, the many I've talked to in Alaska and many other States have shared that same thought with me.

Isn't it wonderful when you discover that specialness you felt you shared with a person is exactly the same feeling others experienced?

Thank you, Jim, for being such a special friend, model and inspiration to all of us. Thank you for allowing ME to be YOUR mentor!

A video of Fr. Jim ministering in Alaska was produced in 1994. A copy is at this [YouTube link](#).

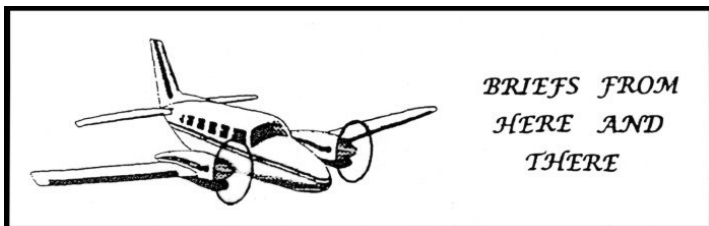


Fr. Mel Hemann



Fr. Scott Garrett (left) and Fr. Jim Kelley in Alaska. Fr. Scott currently is pastor in Dillingham and uses a Piper Warrior II to reach remote areas of his large parish.

Fr. Scott is featured in a video produced by Chicago Catholic. [Here is the link](#). Fr. Scott is pastor of [Holy Rosary Parish](#), where his motto is "Flying the Gospel to the ends of the Earth."



Jubilee recognition: Any NAPP member priest or deacon celebrating a jubilee in 2025 is invited to send a note to be recognized in a future issue of the newsletter. Email: napp.editor@gmail.com.

Grateful for donations: Special thanks to **Fr. Jim Falsey** in Alaska for his recent \$500 contribution to NAPP's Missionary Gift Fund, which helps support our annual charitable grants. This is one of the largest gifts received this fiscal year, but we truly appreciate the generosity of all our members who donate beyond their \$30 annual dues. So far this fiscal year, NAPP has received \$1,530 in donations.

Associate member Nick Chapman, a seminarian for the Archdiocese of Hartford, shared an update from Rome:

"I'm in the spring semester of my second year at the North American College in Rome. Learning Italian has been a rewarding challenge, and the chance to travel to European countries during semester breaks a real highlight. My FAA pilot's license doesn't count in Europe, so I've picked up a new hobby: pickleball!"

"I've really enjoyed getting to know other seminarians from all over the United States living at the NAC and look forward to being ordained a deacon at St. Peter's Basilica in 2026."



Nick participated in NAC's Thanksgiving Turkey Trot 5K run around Vatican City.

Fr. Mike Kerin sent this note along with his dues:

"I was on a 30-day retreat in February and started moving into my new assignment in March. Glenmary reassigned me from southwest Georgia to middle Tennessee. There is a small mission church here in Celina. And I will be working with a Glenmary Commissioner who is starting a church from scratch. We are hoping to start Masses on Sunday in April; we are just waiting for the final approval from the Chancery. We will be using the Methodist church to get started."



"God willing, I am hoping to make a contact with a CFI this coming week and schedule a checkout. The airport is an hour away."

Medical resources from AOPA: Fr. Miles Barrett has some useful resources for older priest pilots, courtesy of the Aircraft Owners and Pilots Association. He writes: "Just had a great phone call with AOPA and helped my student keep flying to finish his instrument ticket. His 'deferred medical' with BasicMed will let him fly and add up the hours needed as PIC."

Three PDF files are available:

- BasicMed Pilot & Physician Guide
- AOPA BasicMed Physician Directory Consent Form
- CACI – Prediabetes Worksheet (CACI is an acronym for Conditions AMEs Can Issue.)

If you're interested in copies, contact Fr. Miles or the newsletter editor at napp.editor@gmail.com

Reminder to pay your dues: Thanks to the 66 members who have paid their dues for fiscal 2025 or beyond. If you haven't paid, please send in your \$30 to remain a member in good standing. Additional donations are appreciated. Fiscal 2025 began July 1, 2024. **See the dues form on Page 2.**

Additional ways to support NAPP: Please remember NAPP in your retirement and estate plans. Those who need to take a required minimum distribution from their Individual Retirement Account can designate NAPP for a qualified charitable distribution. Also, please remember NAPP in your will. Email: napp.editor@gmail.com.

Obituary planning: Members who are making advance funeral arrangements are encouraged to include NAPP in the list to be notified by the family or funeral director. Email: napp.editor@gmail.com.

Hotel reservations open for NAPP Convention in Mason City July 15-18

Hotel reservations are now open for the 2025 NAPP Convention in Mason City, Iowa. Arrivals will be on Tuesday, July 15; convention activities will take place Wednesday and Thursday; and departures will be on Friday, July 18.

(Note that this is the week before EAA AirVenture in Oshkosh, Wisconsin, July 21-27.)

The convention hotel is the [Best Western Holiday Lodge](#) in Clear Lake. The hotel features complimentary full breakfast and an airport courtesy shuttle. Mason City Municipal Airport (KMCW) is two miles from the hotel.

Reserve your room by June 15: Call the hotel directly at: 641-357-5253. To receive the special group rate, identify yourself as being with the “National Association of Priest Pilots Group Block” at the time the reservation is made. NAPP room rates are \$119 per night (plus tax) for either one queen bed or two double beds. Twenty rooms are being held until June 15.

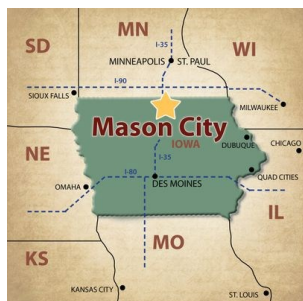
[North Iowa Air Service](#) is the FBO at [KMCW](#). United Express has flights between Mason City and Chicago O’Hare.

Our convention hosts are Fr. Nick Radloff and Mike Makelbust. They’re working on a schedule of activities, but one of the highlights will be joining the [Third-Thursday Burger Burn](#) at KMCW.

The NAPP annual meeting and Mass will be at [St. Patrick’s Church](#) in Clear Lake.

If you’re planning to attend, please send in (or email) the RSVP form on this page. Watch for more details to come.

Learn more about the Mason City area: visitmasoncityiowa.com.



2025 NAPP Convention **Mason City, Iowa**
Arrive: Tuesday, July 15 **Depart: Friday, July 18**
Our hosts: Fr. Nick Radloff and Mike Makelbust

[Best Western Holiday Lodge](#)

2023 7th Ave. N., Clear Lake, Iowa 50428

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Reservation deadline: 20 rooms are being held until June 15.

In addition to making your own hotel reservation, please send this RSVP form to: Tom Enwright, 419 Chestnut St., Sauk City, WI 53583
You can copy and paste into an email: napp.editor@gmail.com

NAME _____

CELLPHONE _____

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How are you arriving?

☐ **Private plane at Mason City Municipal Airport (KMCW)**

N _____ Arrival time: _____

FBO information: [North Iowa Air Service](#); phone: 641-424-9366; email: info@northiowaair.com

☐ **Airline at Mason City Municipal Airport**

United Express has flights to/from Chicago O’Hare

Flight number _____ Arrival time: _____

☐ **Arriving by car**

Other convention costs: In addition to paying for your own hotel, members can expect a convention fee to cover other NAPP expenses, including hospitality room, activities and tours. Details to come.

No more Comanche flying, then ...

By Fr. Bill Menzel

Some of you may have been aware that March 17, 2024, through March 17, 2025, was the last year that the broker for N6442P was able to get coverage for me as a named insured on the Comanche's policy. As March 17, 2025, drew nearer, I scheduled some "last flights" with some of the young pilots I had mentored over the years. They love the Comanche, and so do I. If I wasn't going to be able to fly it anymore, let's go out in style!

I was fully prepared to begin a new phase of my aviation life, where I no longer would be able to fly as PIC, but still would have a lot to contribute to our EAA Chapter 706, NAPP, and aviation in general in other ways. No more flying as PIC to NAPP gatherings, no more Young Eagles flights, but I still could be the chapter Ray Aviation Scholarship Coordinator, a position I have held for several years, as our chapter has successfully "hatched" three new private pilots through that program.

As kind of a last-ditch effort to hold onto what has been, I took a closer look at what a non-owner's/rental policy (they're the same thing) would involve. I wasn't too hopeful. I purchased a non-owner's policy a couple of years ago so I could fly a friend's Archer. The policy satisfied the Archer's owner, but I was concerned because the agent with whom I dealt seemed really clueless. He insisted that I had to have so many hours in make and model and did not seem to understand that all PA28s were essentially the same. We did work it out, but I don't think that agent really understood what he was selling.

Fast forward to March 13, 2025. After trying to contact the agent who sold me the current policy and finding no way to do so via the company's website, I decided to contact a company that is well-known in the aviation community. What a difference! I explained to the agent that I would be 84 in May and could no longer be a named insured on my friend's policy. He asked, "Well, what do you need?" I told him the liability limitations that Mike had on the Comanche's poli-

cy. He said, "Give me a minute while I look those up."

When he got back to me, he told me that we could do that, but he said he could only do up to \$150,000 on hull coverage. I told him Mike had that set at \$90,000 on his owner's policy, so that would be great. The agent said he couldn't do that, as their hull coverage breaks were \$80,000 and \$100,000. Would \$100,000 be okay? Then he quoted me the price.

The happy ending is that I now have a non-owner's policy that is a little bit better than Mike's owner policy, and ... get this ... it is costing me less than what I was paying to be a named insured on the Comanche's policy! I can fly any airplane that has one piston engine, less than 450 horsepower and less than seven seats, as long as I have the owner's permission.

Yes. I have a new lease on life for flying the Comanche. Now I'll have to take back those "last flights" I flew with my friends ...



Fr. Bill Menzel (left) and Fr. John Swing with Comanche N6442P in Wisconsin Rapids after flying back from the NAPP Convention in Texas last September.



The National Association of Priest Pilots newsletter is published online six times per year (August, October, December, February, April, June). Fiscal year begins July 1. Website: priestpilots.org

Articles, news notes and photos can be sent to Tom Enwright, napp.editor@gmail.com. Deadline for the June edition is May 30.

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Fr. Mike Gould, longtime missionary priest pilot, dies at 97

Fr. Mike Gould, who joined the National Association of Priest Pilots in 2021, died January 25, 2025, in the Skilled Nursing Unit at Maryknoll, New York. He was 97 years old and a Maryknoll priest for 70 years.



Michael Augustine Gould was born on August 13, 1927, in Merna, Illinois, one of 10 children of Eugene and Angela Kinsella Gould.

According to his [Maryknoll obituary](#), following ordination in 1954, Fr. Mike was assigned to the Maryknoll Mission in Peru, but before finishing the language course in Cochabamba, he was transferred to the Maryknoll Mission Region in Bolivia where he served for over 60 years.

In 1965, Father Mike was appointed pastor of the mission in the Okinawa II colony, located in the eastern lowlands of Bolivia, an area experiencing rapid development due to new roads and the arrival of internal migrants and Japanese settlers. Fr. Mike helped organize agricultural cooperatives and credit unions, and helped the parishioners build 30 churches in the mission stations, plus a small hospital, dispensaries and schools in various communities.



For 24 years, Fr. Mike flew a Piper Cub to attend the extensive area; the parishioners helped set up 13 landing strips within the parish.

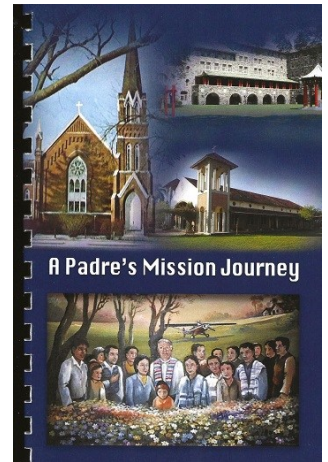
Fr. Mike retired from the rural parish in 2011 and returned to the United States in 2017. He assisted in parish work in the Diocese of El Paso, Texas, until 2019, then moved into the Maryknoll Residence in Los Altos, California.

In May 2024, Fr. Mike returned to reside at the Society Center in Maryknoll, New York. In June 2024, he celebrated his 70th jubilee as a Maryknoll priest.

A Mass of Christian Burial was celebrated on February 4 at the Maryknoll Society Center. Burial followed in the Maryknoll Society Cemetery.

According to the [Diocese of Peoria](#), a memorial Mass will be celebrated at 10 a.m. Saturday, May 31, at St. Patrick Church of Merna in Bloomington.

Fr. Mike's time in Bolivia was highlighted in an article in the [June 2021](#) NAPP newsletter. He joined NAPP at the suggestion of the late Fr. George Remm. Fr. Mike wrote an autobiography, "A Padre's Mission Journey," which was published as a 198-page spiral-bound book.



Fr. John Swing, who lives in Nekoosa, Wisconsin, was a missionary in Bolivia from 1975 to 1981. "Yes, I knew (Fr. Mike) and he would stop in at Santa Cruz from time to time. He is part of the 'old guard.' There was a fantastic group of Maryknoll priests in Bolivia during the years I was there."

Fr. John had his own missionary story published in the NAPP newsletter in [December 2022](#).



"It is with paternal satisfaction that the Holy Father views the efforts of the members of the National Association of Priest Pilots to encourage the use of air transportation to obtain ever more abundant spiritual fruits from their sacerdotal ministry and missionary apostolate."

The Vatican, September 29, 1964

Purpose:

1. To promote the use of private aircraft as a practical, safe, and efficient tool of the apostolic work of a priest.
2. To cooperate with other aviation and ecclesiastical groups wherever possible in order to promote aviation in the cause of the Church.
3. To insist on the safe and proficient use of the airplane by its members.
4. To encourage the use of private aircraft as worthy of the talents and dignity of priests.
5. To further the use of aircraft in the missions.

So, what's the angle?

A flight instructor's review of angle of attack

By Jim Knights, ATP, CFII

The purpose of this article is to get back not just to the basics, but to the real foundation of flight: Angle of attack. Understanding the concept of angle of attack is the key to fully comprehending almost everything else about the behavior of airplanes.

As is generally taught to student pilots, angle of attack is the angle between the wing's chord line — the imaginary line drawn between the wing's leading and trailing edges — and the relative wind (see Figure 1).

Put another way, the commonly held view is that angle of attack is the angle between the wing and the air through which it is moving. At constant airspeeds, lift will be increased if the wing is inclined to a greater degree, thus increasing the angle of attack. If the

wing's angle of attack continues to increase, lift will continue to increase until the air can no longer move smoothly over the upper surface of the wing and begins to "burbles," or separate from the wing. This is the point at which lift decreases dramatically and the wing stalls.

The issue here is the often-oversimplified statement that angle of attack is the angle between wing and the air striking it. Before we discuss that, let's look at another aspect of conventional instruction.

It's taught that lift generated by the wing is perpendicular to the relative wind, but that the induced drag created as the result of the generation of lift (separate from parasite drag) acts rearward parallel to the relative wind. Put simply, as the wing moves forward, lift is "straight up," and the resultant induced drag is "straight back" (or rearward).

However, as a result of induced drag acting rearward, the effective lift is not "straight up," but is itself in-

clined slightly rearward (see Figure 1). Since lift is not acting "straight up" from the wing, it's effectively reduced (as it would be if the airplane were in a bank). That much is true — but why?

The problem is that the definition of induced drag — and how it's responsible for this rearward inclination of lift — can easily be misunderstood by new pilots. Consider the concept of "relative wind." What does that mean? Yes, lift is generated perpendicular to the relative wind, but at what angle is the relative wind

meeting the wing? This is the crux of the issue: What is the true angle at which the oncoming air meets the wing?

Here's the answer: In subsonic flight (the rules change in the realm of trans- and supersonic flight) the angle at which the oncoming

air molecules approach the wing changes. It decreases just prior to contacting the wing.

The angle of attack *decreases* as the air begins flowing around the wing.

Here's why: As the wing moves through the air, low pressure exists above the wing as a result of the venturi effect while high pressure exists below due to the deflection of air off the bottom of the wing. Since nature abhors an imbalance (remember high school science class?), she tries to correct it by forcing air from the area of high pressure to the area of low pressure, i.e., from the bottom of the wing to the top. This happens at the wingtips, the leading edge and the wing root. Since this occurs while the wing is moving through the air, the net effect is the creation of small horizontal vortices trailing behind the wingtips and — to a lesser extent — rearward from along

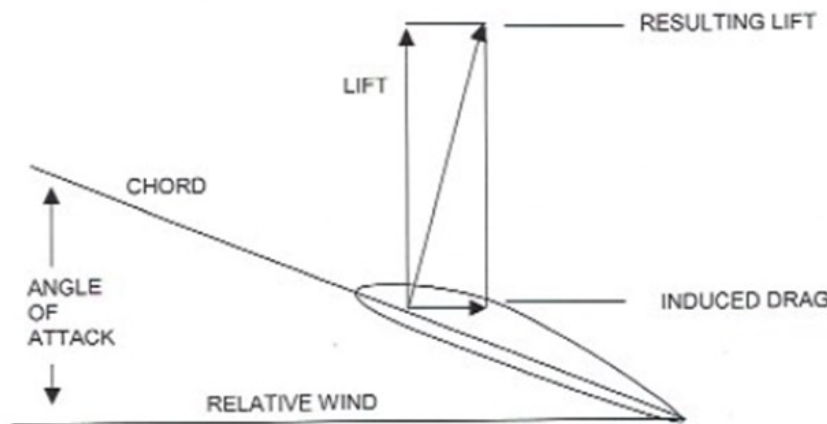


Figure 1

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the leading edge and root of the wing (see Figure 2).

This, as we all know, is why we avoid flying in the wake of a heavy aircraft.

Now this next part is important: *These wingtip, leading edge and wing-root vortices alter the airflow around the wing in such manner as to decrease the angle at which the air molecules strike the moving wing.*

The difference between the apparent angle of attack — what it looks like it “should” be — and the effective, or actual, angle of attack resulting from the vortices’ alteration of the airflow around the wing and consequent loss of lift, is the induced drag. Hence, *the vortices are the source of induced drag.*

As can be seen in Figure 3, lift *is* generated perpendicular to the relative wind, but the angle between the relative wind and the wing has been *decreased* by the action of the vortices, resulting in a *reduced* angle of attack. The result is a reduction in lift. Remember earlier when we said that the traditional definition of angle of attack didn’t explain how the induced drag managed to incline a wing’s lift rearward, thus resulting in reduced lift? That rearward inclination of lift is actually lift being generated at a right angle, or perpendicular, to the relative wind *after* its flow around the wing has been altered by the vortices.

In a nutshell, induced drag is the decrease in lift that results from the reduction of the effective angle of attack caused by the wing’s vortices. This is how induced drag is a product of lift.

OK, so what? What good does knowing all this do for us? Well, consider this for a moment: Those pesky vortices are making the wing less efficient, right? They’re preventing the wing from generating as much lift as it could, aren’t they? What if we

could somehow eliminate or reduce the vortices and, hence, the induced drag, and allow the wing to develop more lift at the same inclination, or the same amount of lift at a decreased inclination? Well, this happens each time an airplane lands. It’s called

“ground effect” and, coincidentally, is sometimes still not fully and clearly understood by new pilots since to understand ground effect one must first have a thorough understanding of angle of attack.

As the airplane approaches within one wingspan of the runway, the runway surface

begins to block the vortices. The closer the airplane gets to the runway, the more completely the vortices are blocked, thus progressively reducing the effect the vortices have on altering the airflow around the wing. This results in a reduction of induced drag. From the discussion above, it can easily

be seen that with the weakening of the vortices, the effective angle of attack is being increased, and, necessarily, so is lift. This is why an airplane may tend to float during the flair, especially if the approach speed is too high. As the airplane nears the runway, induced drag is being reduced, the effective angle of attack is in-

creasing, and the wings can produce more lift. This is also why many high-performance airplanes are equipped with vertical winglets at the wingtips. The winglets help provide more lift by blocking the wingtip vortices that cause induced drag.

Ground effect is *not*, as it is so often repeated, the “cushioning effect” of the air being compressed beneath the wings as the airplane nears the runway.

How else does angle of attack influence an airplane’s flight? The answer is: Adverse yaw.

Student pilots are still often taught that adverse yaw is the result of the “drag” of the downward deflected aileron forcing the upward moving wing rearward.

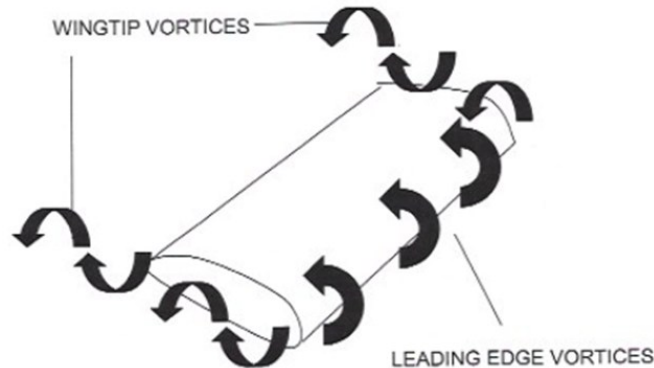


Figure 2

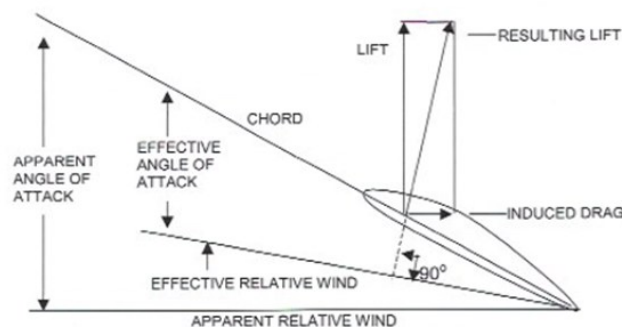


Figure 3

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The discussion is often left there because it's considered a sufficient explanation for the student's purposes, but it's not correct, or not fully correct. Yes, "drag" is responsible, but what type of drag — parasite or induced — and how?

The answer is induced drag. The parasite drag created by an upwardly deflected aileron has the least to do with adverse yaw.

Remember that the wing is moving forward and is subject to induced drag. Then, with one aileron deflected downward and the other upward, it effectively becomes a *different* wing and it's rotating in one direction or the other while still moving forward, consequently the angle of attack at both ends of the wing will be altered differently from one another.

Instead of going into the math and complex diagrams, both of which are beyond my skill level, we can look at Figure 4 representing a wing entering a banked turn to the right.

Remember that an aileron is simply a device for increasing angle of attack. The lowered left aileron increases the lift by increasing the angle of attack and the wing begins to rotate upward. As a result of increased lift, *induced drag* also increases resulting in a *more rearward* lift vector, pulling the wing opposite the intended right turn.

More interestingly, as the raised right aileron decreases lift and that wing moves downward, the changing angle of attack has the opposite effect: Induced drag is reduced and the new angle of attack results in the wing's lift vector tilting *forward*, pulling the wing against the turn. (Remember also that the upwardly deflected aileron does extend into the airstream as much as the downwardly deflected aileron.)

This is important to know because as the angle of attack on the upward rotating wing increases, it gets closer to the stalling angle. As we all should know, when practicing stalls and a wingtip drops, you must *never* correct with aileron (you must always correct with rudder). The wing is already close to the stalling angle of attack to begin with. Lowering the aileron

will almost certainly push the wingtip past the stalling angle of attack and over the top you will go into an unexpected spin. If you happen to be on base to final, your chances of recovering before impact are nil.

Instructors have a responsibility to provide their students with a complete understanding of the forces acting on an aircraft without trying to turn them into aerodynamicists. Yet, in attempting to keep the technical side of flying

digestible, there is a real possibility of failing to give students the tools they need to operate the airplane safely. As has been said many times, if you want the airplane to go up, pull back the yoke. If you want it to go down, pull back the yoke some more. Also, sadly, base-to-final stall-spin accidents continue to claim lives. *It's all about angle of attack.*

We have been flying airplanes for 122 years, yet it seems many of us still don't understand angle of attack in all its nuances. Stall-spin fatalities still occur with lethal regularity. According to AOPA, they account for 28% of fatal general aviation accidents. The NTSB and FAA have enough to do. Be considerate and don't add to their workload.

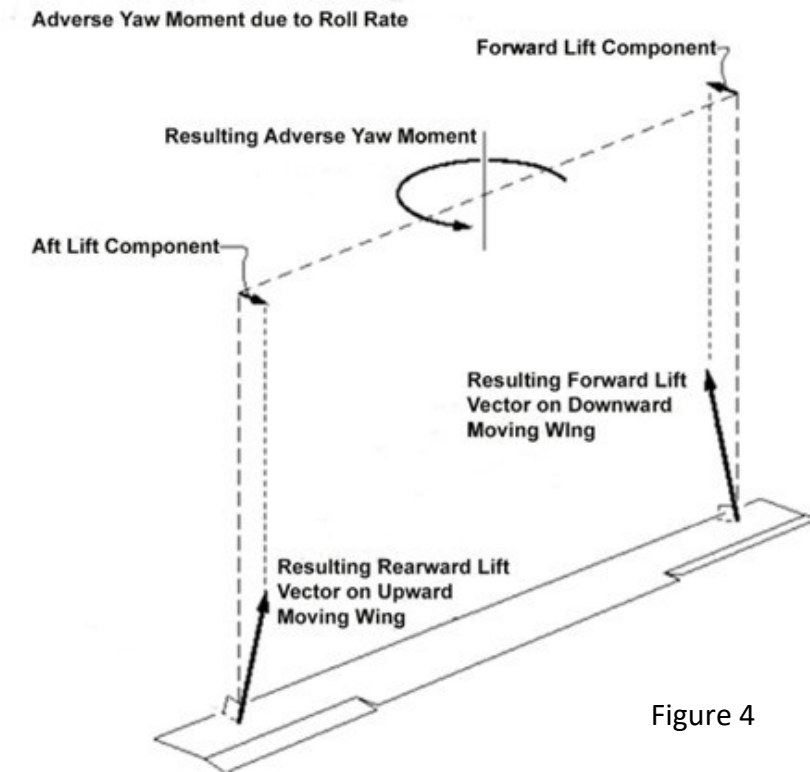


Figure 4

