POSITION REPORT

Contents:

Chairman's Letter

The Alaskan Aviation Safety Foundation's primary mission is to "improve aviation safety in Alaska." Many of our members have decades of flight experience in multiple airplanes and, I suspect, many safety lessons learned or re-learned over the years. Why not share them with your fellow pilots. Do you have a story with a lesson that you are willing to share? Our monthly Safety Spot provides a perfect forum to share experiences. No need to be embarrassed if you *may have* made a mistake that created the teachable moment. At your request we will attribute the story to an "AASF Member." Sharing your aviation-life experiences may save another member from an incident, accident or simple embarrassment. Remember, we need to learn from the mistakes of others because we won't live long enough to make them all ourselves.

If you would like to share a story with a lesson, send an email to aasfonline@gmail.com . Put **Lessons Learned** in the subject line. Provide a summary of the incident/lesson in the body of the email. Please provide your contact information--email, phone, and text, in case we need to

obtain additional information or make editorial changes for clarity. In any event, we will send you the final version before it's published and ask you to verify its accuracy and consent to publication.

Another flying season is upon us. We survived the winter and now we're ready to make up for lost time. As we prepare to join the eagles and hurl ourselves through footless halls of space, let's take a moment to pause and make sure our aerospace flying machines are just as ready as we are. Are all the inspections current? Did you identify any "small" mechanical issues before you put your trusty steed to bed for the winter? Have you gotten them fixed? Have you inspected and inventoried your survival gear recently? Is it all serviceable? Maybe your electronic survival gear needs some new batteries. Speaking of inspections—how are you doing? Have you given the appropriate medical practitioners a visit lately? After all, it isn't just our airplanes that need to be inspected, detected and corrected. Lastly, are your flight skills up to speed? We need to block and tackle before we play in the big game! If you've had a long layoff, it may be wise to use a flight or two for basic air work and traffic patterns. If you find you are having trouble with something, take a flight with your favorite CFI.

I look forward to seeing you all at our Fall Seminar. Until then, Fly Safe!
Rocky Capozzi

Editor's Introduction – Board Member John Mahany has stepped up to take on the Editor's job on an interim basis

To Turnback or Not to Turnback—That is the Question!

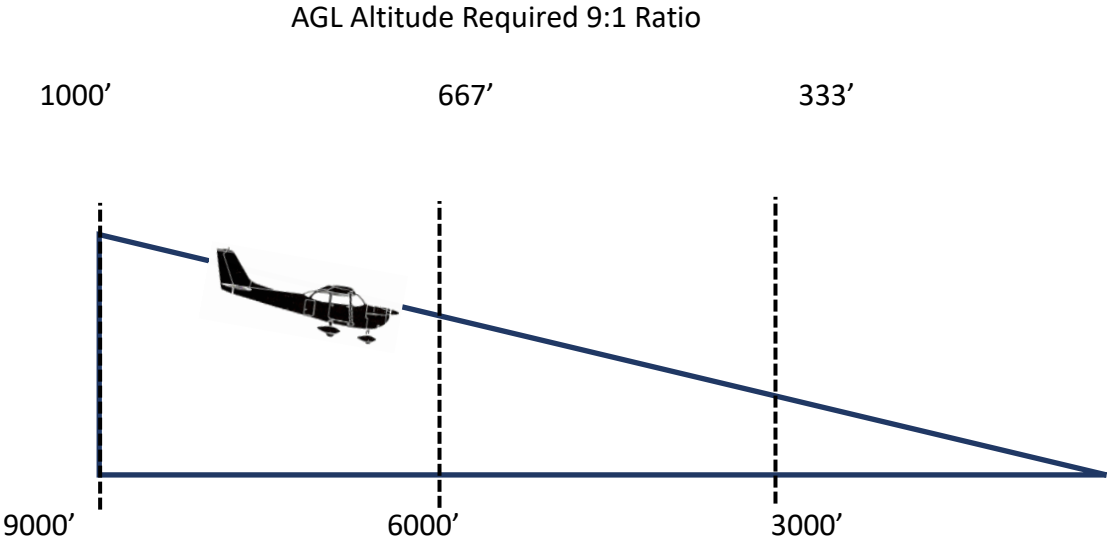
by Rocky Capozzi, Alaskan Aviation Safety Foundation

This article provides an analysis of the variables that affect whether a turnback maneuver is likely to be successful and offers a suggestion of how a pilot, faced with an engine failure shortly after takeoff, might quickly make an informed decision to continue straight ahead or turnback. To clarify my use of the term "shortly after takeoff," I mean within 1.5 miles of the end of the runway -- roughly between the time a pilot break's ground and reaches pattern altitude or slightly higher. In this regime, the pilot has only seconds to decide to whether a turnback is feasible. Any hesitation precludes the turnback option. We may hope we never face this situation and simply ignore the possibility, or we can mentally prepare ourselves to make an informed decision in the few seconds we have available.
Numerous articles have been written about the turnback over decades. AOPA has written about it several times and produced a video. EAA formed a team to explore the subject Enhancing GA Safety Through Turn-Back Study (eaa.org). Chapter 18 of the Airplane Flying Handbook (FAA-H-8083-3C) has a section on Engine Failure After Takeoff (Single Engine). A scholarly article supported by simulator and flight tests shed light on optimum bank angles and

airspeeds for the turnback maneuver in 1982 jett.DVI (nar-associates.com). All authors agree that if there is a suitable landing area in front of the airplane, that is the best option. The pilot must decide on a course of action within a few seconds. There is no time to trouble shoot the problem. Preventing a stall and choosing a landing option require exclusive focus. AOPA found the turnback maneuver to be, "viable for some pilots, in some aircraft, under some circumstances." Intuitively, we know this to be true, but it is not particularly helpful in preparing for the eventuality of an engine failure after takeoff.

Assumptions, Assumptions: Many investigations of the return problem begin with an assumption that the engine fails at a certain altitude during the climb out. The investigation proceeds with consideration of reaction time, altitude lost in the turnback, the airplane's turn radius, the best glide speed, wind, etcetera. My problem with this approach is that I have no reason to believe my engine will fail at 700 feet AGL, or 1000 feet AGL or any other fixed altitude. Nor do I have reason to believe it will fail at a fixed time after brake release. It seems to me the fixed altitude or fixed time analysis suffers because you are unlikely to be at that specific point in space when you have an actual engine failure.
It may be more useful to consider when it is not possible to get back to the runway. If the engine fails on takeoff leg and there is no suitable place to land ahead, it would be good to know if you have enough altitude to turnback with a reasonable chance of success. Three maneuvers are required to return: turn around, glide, and final alignment. So, we need to know three things: how far are we from the end of the runway when the engine quits, how much altitude will we lose turning, how much altitude do we need to successfully glide back to the end of the departure runway. A combination of POH data, pilot practice, and prior planning is required to answer these questions.

Know Your Numbers: Most POH's provide a best glide airspeed *at maximum gross weight* and a chart showing altitude lost versus distance traveled across the ground. Using the POH best glide ratio you can easily compute the minimum altitude required to glide back, *if you were pointed at the end of the runway*. We will address the turn back later. I will use the C172S as an exemplar. The POH identifies 68KIAS as the best glide speed resulting in a glide ratio of 9:1. One nautical mile equals 6076 feet. From one nautical mile, the C172S requires 675 feet to glide to the end of the runway.



Horizontal Distance from the End of the Runway

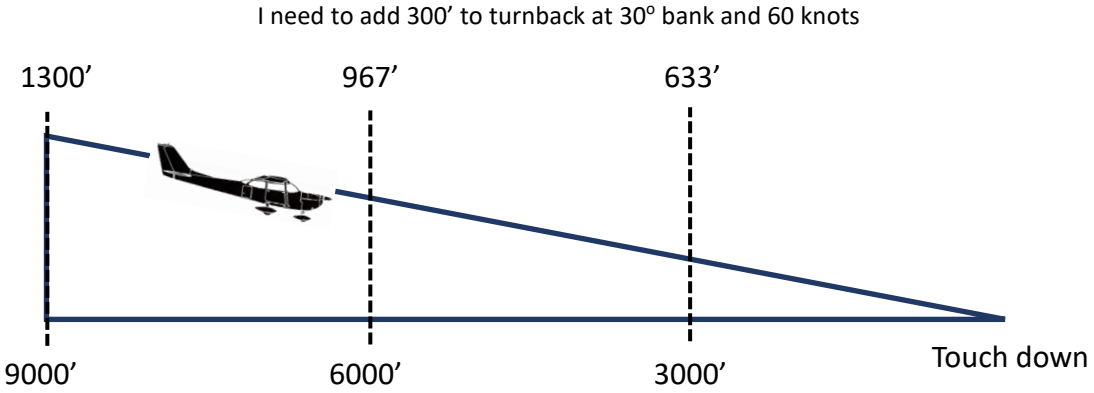
Let’s take a closer look at the relationship between glide speed and best glide ratio. Best glide is premised on maintaining the angle of attack (AoA) that corresponds to maximum Lift/Drag (L/D_{max}). The optimum angle of attack doesn’t change with aircraft weight, but the airspeed required to obtain L/D_{max} AoA does. The POH typically quotes the best glide speed for maximum gross weight. At lighter weights, the airspeed corresponding to L/D_{max} is less. How much less? The correct airspeed is equal to the square root of the actual weight divided by the max weight times the best glide airspeed for max weight; $\sqrt{\left(\frac{w}{w_{max}}\right)}$x V_{BG} where V_{BG} is best glide at max gross weight. For example, the best glide speed for C-172S at maximum gross weight of 2550 pounds is 68 knots. A typical takeoff weight for a solo pilot with about half internal fuel is 2000 lbs. (2000/2550) = .784. The square root of .784 = .886. Best glide equals .886 x 68 knots or 60 knots.

Is Close Good Enough: You may wonder how much difference it makes if the airspeed is off a few knots. I wondered, too. I flew two test flights in my C172D on two different days in stable air and found that flying 5 knots slower or faster than optimum airspeed increased my descent rate by about 100 feet/minute. That means for every minute I glide 5 knots off optimum, I reduce my horizontal distance travelled by 900 feet. Ouch! Results in your own airplane will vary, but this suggests it is worth computing your best glide airspeed for your actual operating weight. It’s a good idea to do this ahead of time as most pilot’s math skills deteriorate somewhat after engine start—just kidding. The deterioration is massive. Keep the number in a place for quick reference and brief yourself prior to takeoff.

Just knowing how much altitude is required to glide back to the end of the runway doesn’t help much if we aren’t pointed at it. So, we need to know how much altitude it will take to turn around. The three biggest variables bearing on this problem are reaction time, bank angle and airspeed. It’s essential to react immediately to a catastrophic engine failure or massive

loss of power during initial climb out. Whether we land straight ahead or attempt a turn back, the first order of business is preventing a stall. If you haven't done it in a while, establish climb speed and attitude at a safe altitude. Chop your power and see how quickly the airspeed bleeds off. I typically climb at V_y for the first 1000 feet and transition to a cruise climb thereafter. The rate of airspeed loss from the V_y climb attitude is dramatic but I still have a few seconds to react. The V_x climb attitude requires an immediate unload.

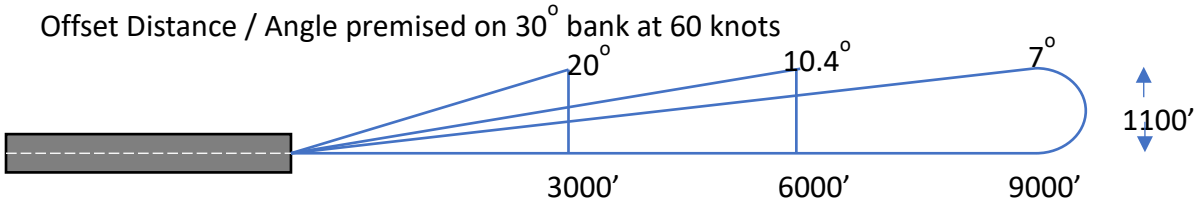
The angle of bank used in the turnback has a big impact on altitude loss. Going back to basic aerodynamics, the steeper the bank angle the higher the turn rate. A higher turn rate means a quicker turn. Airspeed is also important. Going slower reduces the turn radius.



Horizontal Distance from the End of the Runway

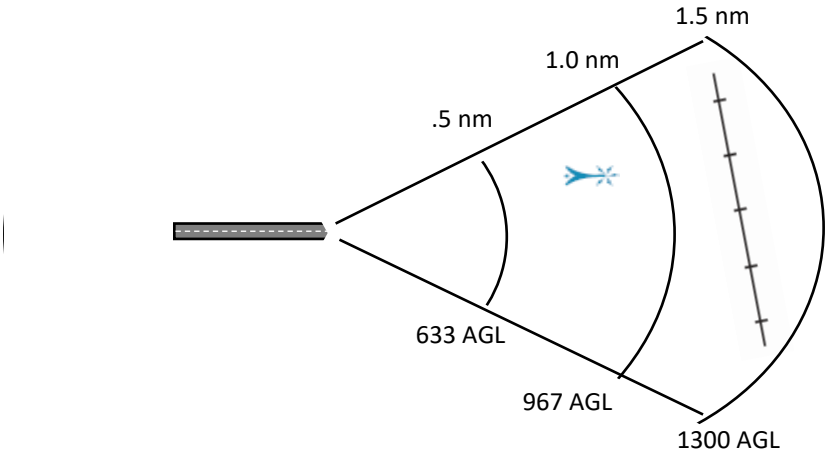
Bank Angle Matters: It has been shown mathematically that altitude loss is minimized using 45° of bank and an airspeed just above the stall. I tried that and couldn't quite get there. I found bank angles of 40° or more at an airspeed approaching Vs_1 to be very uncomfortable. Turning through 210° using 30° of bank I found I lost only 50 feet more than I did using 40°of bank. Best glide for my weight was 65 knots so I used 60 knots for the turn. I expect to lose 300 feet in a 210° turn from a V_y climb in *my airplane*. Your numbers will be different. Repeat the maneuver until you get consistent results using a bank angle and airspeed you believe you will be able to handle under stress.

You may wonder why I used 210 ° of turn. It is somewhat arbitrary but reasonable. An airplane flying at 60 knots using a 30° bank angle has a turn radius of about 550 feet. Total displacement from centerline at the 180° point is 1100 feet. As depicted in the diagram, the angles off the runway centerline at 3000 ft, 6000 ft and 9000 ft are 20°, 10.4°, and 7°. In all cases beyond 3000 feet (.5 nm), 210° of turn is enough to get back to the end of the runway. Turning into a crosswind will minimize displacement from the centerline and the degrees of turn required for the turnback.



See figures 5-57 and 5-59 in the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) to compute your turn radius using the bank angle and airspeed you found repeatable when you practiced this maneuver. The same information can be found in graphical form in Figure 2.29, in Aerodynamics for Naval Aviators .

Where Am I: The question I have yet to address is how to determine how far you are from the end of the runway. If you are flying from your home airport, you may already know how far significant features are from the end of the runway. For example, you might know that a road crosses your flight path at 3000 feet or there's a large clearing 4000 feet off the end of the runway. Make note of easily identifiable features the next time you climb out on centerline and use Google Earth to get a good estimate how far you are from the end of the runway when you observe that feature. Record this information and pair it with the minimum altitude you require to turnback and glide to the end of the runway. The decision whether to turn around must be made in a few seconds, so memorize 2 or 3 distance altitude pairs but also write them down. Keep them in a place you can conveniently reference when you are doing your takeoff briefing. You do one, right? Be sure to add the airfield elevation to your AGL turnback numbers. Everyone who flies with a GPS (that's almost everyone) has a viable option for any airfield – home or away. Enter the coordinates of the runway end as your GPS waypoint. You'll know your distance at a glance. Every tenth of a mile is 600 feet.



Consider This: Always use full runway length and takeoff into the wind. If you only require 1000 feet to get off the ground and you are operating from a 3000 or 4000-foot runway, you may be several hundred feet AGL by the end of the runway. A headwind will improve your

climb angle relative to the ground and keep you closer to the runway, but it will also increase your ground speed at touchdown. Turning into a crosswind minimizes displacement from the runway centerline, shortening your return path. Constant speed props are designed to fail to the flat pitch/high RPM position in single-engine pistons. Most require oil pressure to drive them to low pitch. If your engine has failed, go ahead, and select high pitch/low RPM. Maybe it will work depending on the failure mode. While investigating glides in my airplane at idle power, I found my descent rate improved by about 100-150 FPM with the prop set to high pitch. Your airplane-engine combination may give a different result, but the rate of descent should decrease.

Wrap Up: Knowing your aircraft "numbers" and identifying key distance and altitude combinations along your departure path can vastly improve your chances of making the right decision should you experience an engine failure shortly after takeoff. You need to practice your turnback maneuver using your normal departure airspeed and attitude and using bank angles and airspeeds you believe you can confidently handle in an emergency. Don't be lulled into a false sense of security about your glide potential from practicing idle power glides. Chances are you will do much better than the POH glide ratio. When practicing idle-power glides in my C172D, I found my descent rate was 200-300 FPM less than it should have been with a 9:1 glide ratio. Since the glides were accomplished at the appropriate speed (AoA) for my actual weight, this is evidence that an engine at idle still provides measurable thrust. That thrust that won't be there with a catastrophic engine failure.

Hopefully, none of us have an engine failure shortly after takeoff. If we do, the simple act of working through the "what ifs", practicing the turnback maneuver, and computing a few key airspeeds and distance-altitude combinations may make the difference between tragedy and flying another day. Minimizing injuries to the passengers and pilot is the prime objective. Saving the airframe is a secondary consideration. If there's a suitable landing area ahead of you, that's the best option. To be successful, the turnback decision must be made quickly and correctly. The time and effort put into thinking through the problem and practicing the necessary maneuvers puts us in the best position to make the correct decision.

Great Alaska Aviation Gathering – AASF Participation

AASF Hosts at Safety Seminars

AASF supported the well-attended Alaska Airmen's Association Great Alaska Aviation Gathering at Palmer on May 7-8, 2022, by providing organizational coordination along with the Seaplane Pilots Association as well as moderator hosts for Safety Seminars in Hoskins Hall at the Fairgrounds. Around 100 participants gained Wings Pilot Proficiency Credits for attending seminars on a wide variety of subjects which included: Flying Clubs, Aeronautical Decision Making, Insurance, Improving Remote Airstrips, the Seaplane Community, Seaplane corrosion,

and Mountain Pass Charting to name some. Winning nice door prizes including caps, jackets, a transceiver and a carbon monoxide detector added to the fun. AOPA had a Town Hall Meeting with their President Mark Baker. Adam White of the Airmen updated everyone on current advocacy issues. AASF looks forward to continuing efforts to return to in-person Safety Seminar events.

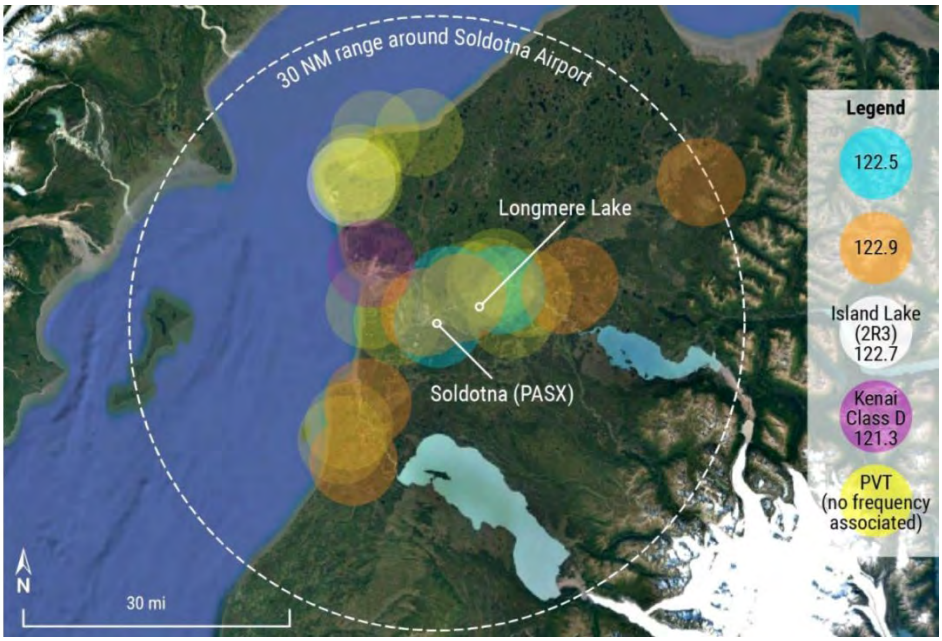
NTSB Makes CTAF Recommendations for Alaska – From NTSB Press Release

Aviation Investigation Report: Require Common Traffic Advisory Frequency Areas in Alaska

The NTSB released an Aviation Investigation Report (AIR-22-03) urging the Federal Aviation Administration (FAA) to address safety issues relating to common traffic advisory frequencies (CTAF) in Alaska. The report and resulting recommendations were derived from our investigation into a midair collision involving a de Havilland DHC-2 airplane and a Piper PA-12 airplane that occurred on July 31, 2020, near Soldotna, Alaska. The pilot and five passengers on the DHC-2 were fatally injured, as was the pilot on the PA-12.

What You Should Know
The PA-12's departure location did not have an air traffic control tower. As a result, communication among aircraft departing Soldotna Airport (SXQ) and aircraft transitioning the area was accomplished via the CTAF of 122.5 MHz, which was published on the visual flight rules sectional chart and FAA chart supplement for the area. Because both airplanes were operating in uncontrolled airspace, it was the responsibility of both pilots to visually acquire aircraft flying in their vicinity and maintain separation from them. (This concept is referred to as "see-and-avoid.")
We concluded that, without a requirement that pilots report their positions on the designated CTAF frequency when operating in CTAF areas, pilots may remain unaware of the presence of other airplanes even though a method of communications exists; thus, the benefits of establishing CTAF areas are not fully recognized.

The NTSB recommended that the FAA require all pilots to monitor and communicate their positions on the designated CTAF when entering and exiting dedicated CTAF areas throughout Alaska, as well as near established reporting points and airport traffic patterns within the CTAF area, unless already communicating with air traffic control. We also asked the FAA to establish additional CTAF areas in locations throughout Alaska at high risk of midair collisions, designate one frequency that is associated with all non-towered airports within the geographical boundaries of these CTAF areas, and define mandatory position reporting locations and reporting requirements within these areas.



We encourage all pilots and operators to read this AIR and other aviation safety resources on our website. The prevention of midair collisions, especially in Alaska, has been a focus for the NTSB and the aviation industry for many years. During the period from 2005 to 2020, 14 midair collisions have occurred in Alaska, 12 of which occurred in uncontrolled airspace. These midair collisions resulted in 35 fatalities and 15 serious injuries.

Dear AASF Members and Former Members,

The Board of Directors has voted to extend two years of membership for the price of one. Individuals who join or renew at the current rate of $35 will have membership benefits for calendar year 2022 and 2023. Members that have already renewed for 2022 will also be extended through 2023. If your membership lapsed in the last few years, now would be a great time to rejoin. You can join, renew or donate on-line at our website (https://www.aasfonline.org) . Click on the blue button on the home page.

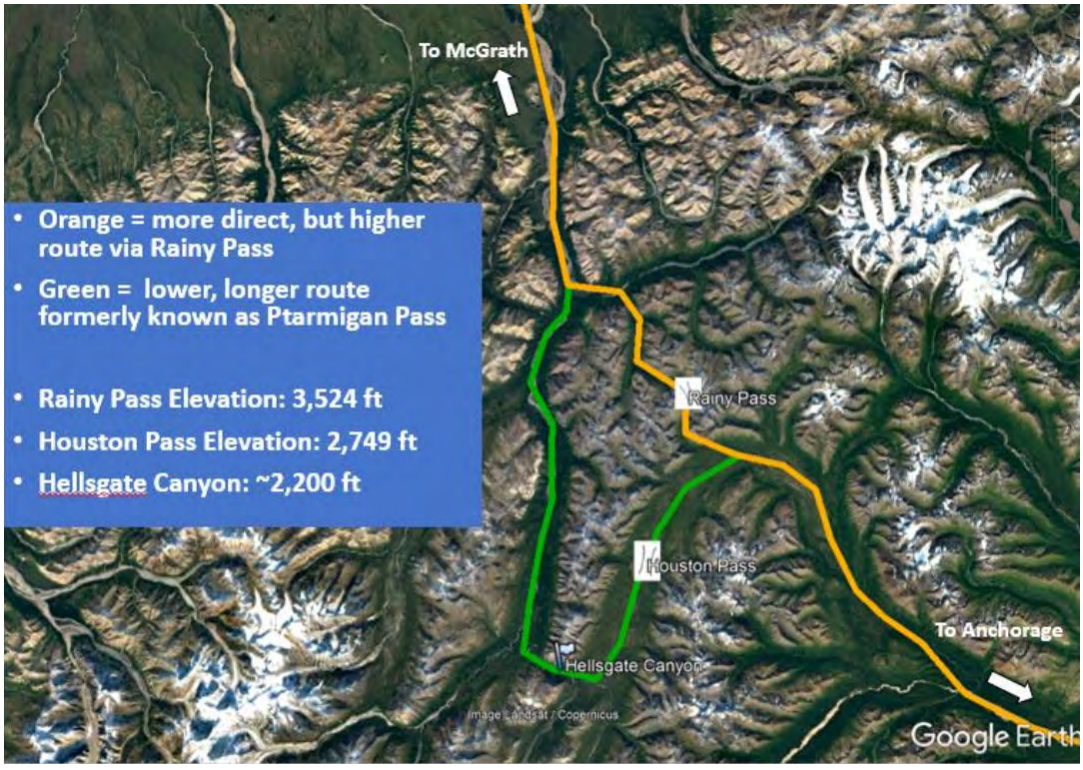
Why are we doing this? We recognize that the cancellation of our live fall and spring seminars represented a substantial loss of benefit to our members. There is no substitute for in-person seminars to learn from and question the experts, earn wings credit, and renew old acquaintances. Our financial objective for the immediate future is to maintain a healthy posture so we can resume and improve our seminar activities when the public health situation allows. We are a volunteer organization with a single part-time administrative assistant. Nevertheless, we have minor overhead and administrative expenses we must meet. We continued, and will continue, to offer aviation scholarships despite our present inability to host live seminars.

We miss you. We're still here and trying to work our way through COVID restrictions. We don't want to lose you as a member. I encourage you to join, renew, or donate any amount.

Thank you,
Rocky Capozzi
Chairman, Alaskan Aviation Safety Foundation

Ptarmigan Pass RIP – AASF Video On New Mountain Pass Naming

Tom George writes: A popular mountain pass through the Alaska Range connecting Anchorage and McGrath just got a "facelift." The flight route that has for many years been known as **Ptarmigan Pass** is the longer, lower, and more open pathway through the Alaska Range. It provides an alternative to **Rainy Pass**, which is at a higher elevation along a more confined route. As the FAA's Aeronautical Information Services is reviewing Alaska mountain passes, discrepancies are being corrected. During this process, two issues were discovered regarding the route formerly associated with Ptarmigan Pass, which are resulting in significant changes to features on the McGrath Sectional,
including renaming and relocating Ptarmigan to **Houston Pass.**
https://www.aasfonline.org/hangar-flying/
For Tom George's full article click here:
https://www.aopa.org/news-and-media/all-news/2022/march/10/mountain-pass-charting-changes-coming



Heads Up – AASF 2023 Pick Click Give Opportunity

After a hiatus, the AASF will once again participate in the Pick.Click.Give program for 2023.

Pick.Click.Give allows Alaskans to donate a portion of their Permanent Fund Dividend to causes they care about statewide.

While applying for their PFD online, Alaskans can choose to Pick.Click.Give in increments of $25. All donations are tax deductible and donors will receive tax documentation from the State once their donations have been processed. Permanent Fund Dividend applications are available from January 1 to March 31, 2023, though Alaskans may choose to add or adjust their pledges online through August 31, 2023.
The program is run by The Alaskan Community Foundation in partnership with the Rasmuson Foundation, The Foracker Group, and the State of Alaska Permanent Fund Dividend Division.

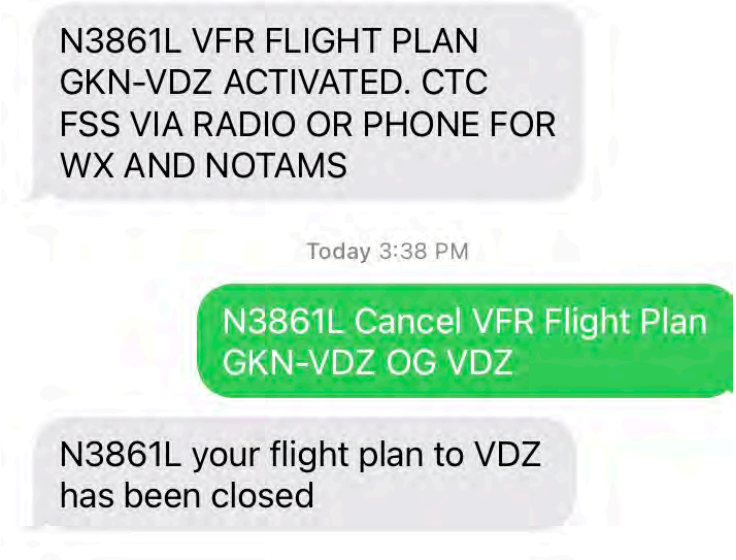
Keeping in mind the two years for one membership fee, please consider a Pick.Click.Give donation ($25?) in 2023 to help support Alaskan Aviation Safety Foundation activities.

New FAA Comm Capability For FSS: Two Way Texting

After enrollment, pilots with updated Master Flight Plans and using certain devices may now communicate their flight plan activations, closures and amendments for filed flight plans with Alaska Flight Service Stations. There is also SOS/Emergency/SAR communication capability. At present FAA advises that cellular devices can be used, and that Satellite Based Texting Devices are presently limited to Spot X, with ongoing efforts to include other satellite devices.

To enroll, contact Flight Service and file or update a Master Flight Plan.

https://www.faa.gov/sites/faa.gov/files/2022-03/Master_Flight_Plan_Worksheet_Revised_March_2022.pdf



Aviation Scholarships Available!

The Alaska Aviation Safety Foundation provides scholarships to individuals who want to develop their aviation careers. Scholarships are available for up to $2000 each in memory of Alaskan aviators and safety advocates:

The Tom Wardleigh Memorial Scholarship
The Virginia Hyatt Memorial Scholarship
The Ellen Paneok Memorial Scholarship

These AASF scholarships are established with funds received from families and friends of Alaskan aviators who have gone to new horizons.

The 2022 application deadline is July 31st, 2022

Applicants must:

- Be participating in an aviation-related program with a qualified instructor or at an accredited college, university, trade school, or training center
- Intend to make aviation their career
- Have spent at least 2 of the past 3 years in continuous official residency in Alaska
- Have completed at least two semesters or 30% of the work toward their professional goal

Complete the application online at:
www.aasfonline.org/scholarship2/

NOTAM TUNE-UP: Notices to Air Missions are generally defined per FAA as "...information regarding unanticipated or temporary changes to services, components of, or hazards in, the National Airspace System (NAS). The NOTAM System does not advertise published or charted data and information."
So, when you see that a NOTAM is no longer provided, does that mean that the condition is no longer in effect? In many cases that is true, however if the information is "published" the condition may still be valid.

For example, and as an awareness item, consider that the NOTAM information prohibiting touch and go landings at Merrill Field during certain hours was recently published. It looks like this in the Chart Supplement Alaska:

NOISE: Noise Abatement: tgl and pat ops NA 0700–1500Z‡

A good clue that this was going to be long term were the NOTAMs D for the runways such as the following one utilizing the contraction PERM (permanent):

!MRI 06/027 PAMR RWY 07/25 CLSD TO TOUCH AND GO OPS DLY 0600-1400 202106120600-PERM

If you are self-briefing, and looking at current NOTAMS, the information might be transparent since there is no longer a NOTAM, but an entry in the Chart Supplement Alaska as a published condition currently in effect. If you are going into an airport, especially one you have not recently operated at, study up to stay safe and maybe let the neighbors sleep sounder.

Candidate for Lesson to Learn/Relearn: Stay current on NOTAMS and current publications/charts including the Chart Supplement Alaska.

HELP US STAY

ON TRACK

WITH THE

44TH ANNUAL

GENERAL AVIATION AND PART 135 ACTIVITY SURVEY

Receiving responses to the GA survey from all aircraft is essential to assess the need for aviation infrastructure and evaluate the impact of safety and aviation initiatives.

**Survey invitations were sent to a select group of aircraft owners/operators.*

Understanding Flight Hours and Safety Metrics

Reporting your flight hours is critical because of the direct linkage to computing accurate accident rates.

- **Not Reporting Your Hours = Higher Calculated Accident Rate**
- **Reporting Your Hours = Lower Calculated Accident Rate**

More Accurate

QUESTIONS? CALL 800-826-1797 OR EMAIL INFOAVIATIONSURVEY@TETRATECH.COM

Editor: John Mahany email: johnmahanycfi@gmail.com

Alaskan Aviation Safety Foundation
C/O Aviation Technology Division UAA
2811 Merrill Field Drive • Anchorage, AK 99501
Phone: 907-243-7237 • Email: aasfonline@gmail.com