

Matt's Mountain Flying

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1) Matts Mountain Flying Example Routes

I think of mountains as 4 main areas, **North, Middle, South, and Far South**. We want to ensure pilots get an opportunity to fly in each of these areas, at least the North, Middle, and South. This includes as many mountain airports as possible and as many mountain passes as possible. Simply because they are all different and in practical terms, they are the routes you would actually fly to fun/goal destinations. Below are some example scenarios that work great for experiences and challenged. It is important to think about place you will actually go someday and include them in one or more of the routes. For example if "Rifle is a place I plan to go someday", then including Rifle with a middle Glenwood flight would be ideal.

- When considering a "Mountain Checkout" it is important to get experience by way of 3-4 flights across at least the North, Middle, South areas.
- The example routes below are not required to be flown exactly, they are simply common waypoints and directions.
- Deviations from a planned route become normal while:
 - o Avoiding areas of turbulence
 - o Looking for lift (updrafts)
 - o Vacating an area of down-drafts
 - o Terrain avoidance due to altitude
 - o Sightseeing specific locations

(see the map below for the 'big picture')

North Scenario: "North Area of the Mountains" (tends to be 2.5 – 3.0 hobbs)

- o Metro Airport (KBJC)
- o Rollins Pass
- o Granby Airport (KGNB)
- o Kremmling Airport (20V) (can skip if need to save time, just overfly)
- o Rabbit Ears Pass
- o Steamboat Springs Airport (KSBS)
- o Back to KBJC (return the same way, or north over Cameron Pass)
- This is a great "first mountain flight" since lower terrain, more options to navigate, least dense mountain area.
- Here is the example route: [Example of this route](#).
- Also see links to Videos of the mountain passes and airports (links below or in gallery tab)

Middle Scenario: "Middle Mountain area" (this tends to be 3.0 – 3.5 hobbs)

- o Metro Airport (KBJC)
- o Kenosha Pass
- o Mosquito Pass
- o Leadville Airport (KLXV)

- Independence Pass
- Aspen Airport (KASE)
- Glenwood Springs Airport (KGWS)
- Can include Eagle Airport (KEGE)
- Vail pass
- Loveland pass
- Back to KBJC
- Mosquito pass, the highest pass in North America.
 - If unable, south to Weston Pass or south to Trout Creek Pass (good example of options to Leadville)
- Leadville KLV, Highest airport in North America (10,000ft)
- Aspen KASE, one of the top 5 most exciting airports in North America.
- Link: [Example of this Route](#).
- Link: [Example of this Route](#). (with Glenwood and Eagle airports)
- Also see links to Videos of the mountain passes and airports (links below or in gallery tab)

South Scenario: “South area but not too far south”

- Metro Airport (KBJC)
- Kenosha Pass
- Trout Creek Pass or Weston Pass
- Can include Buena Vista (KAEJ)
- Cottonwood Pass
- Gunnison Airport (KGUC)
- Monarch Pass
- Salida Airport (KANK)
- Wilkerson Pass (or backside of Pikes Peak)
- Back to KBJC
- Spectacular mountains separate Salida side with Gunnison side.
- Link: [Example of this Route](#).
- Also see links to Videos of the mountain passes and airports (links below or in gallery tab)

Far South Scenario: “Southern and South-West Colorado”

- Airport options include:
 - Telluride
 - Telluride is the marquee airport on a plateau and considered the #1 most exciting airports in North America
 - Durango
 - Pagosa Springs
 - Mineral County
 - Cortez
 - Alamosa
- To Telluride: There are many different ways to get to Telluride, each with different values:
 - Fastest Most direct: [Link to Example Route](#)
 - Middle most interesting/value: [Link to Example Route](#)
 - South most airports (longest): [Link to Example Route](#)
- Also see links to Videos of the mountain passes and airports (links below or in gallery tab)

Videos of Mountain Airports

- Some good examples: (see all Colorado Airport videos: [Colorado-Airports](#))
 - [Telluride](#) – considered the #1 most interesting/challenging airports in North America
 - [Aspen](#) – I feel is one of the top 3 most challenging airports
 - [Glenwood Springs](#) – My opinion...the number 1 most challenging airport
 - [Crawford](#) – Ok probably the really most challenging airport

Videos of Mountain Passes

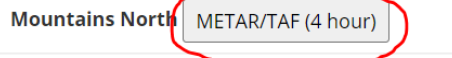
- Some good examples: (see (many) mountain pass videos: [Mountain-Passes](#))
 - [Cinnamon-Pass](#) – buried in very dense mountains down south by Telluride:
 - [Cottonwood-Pass](#) – get you into Gunnison area
 - [Independence-Pass](#) – get you into Aspen area
 - [Mosquito-Pass](#) – get you into the Leadville area. Highest pass in North America

Weather Resources

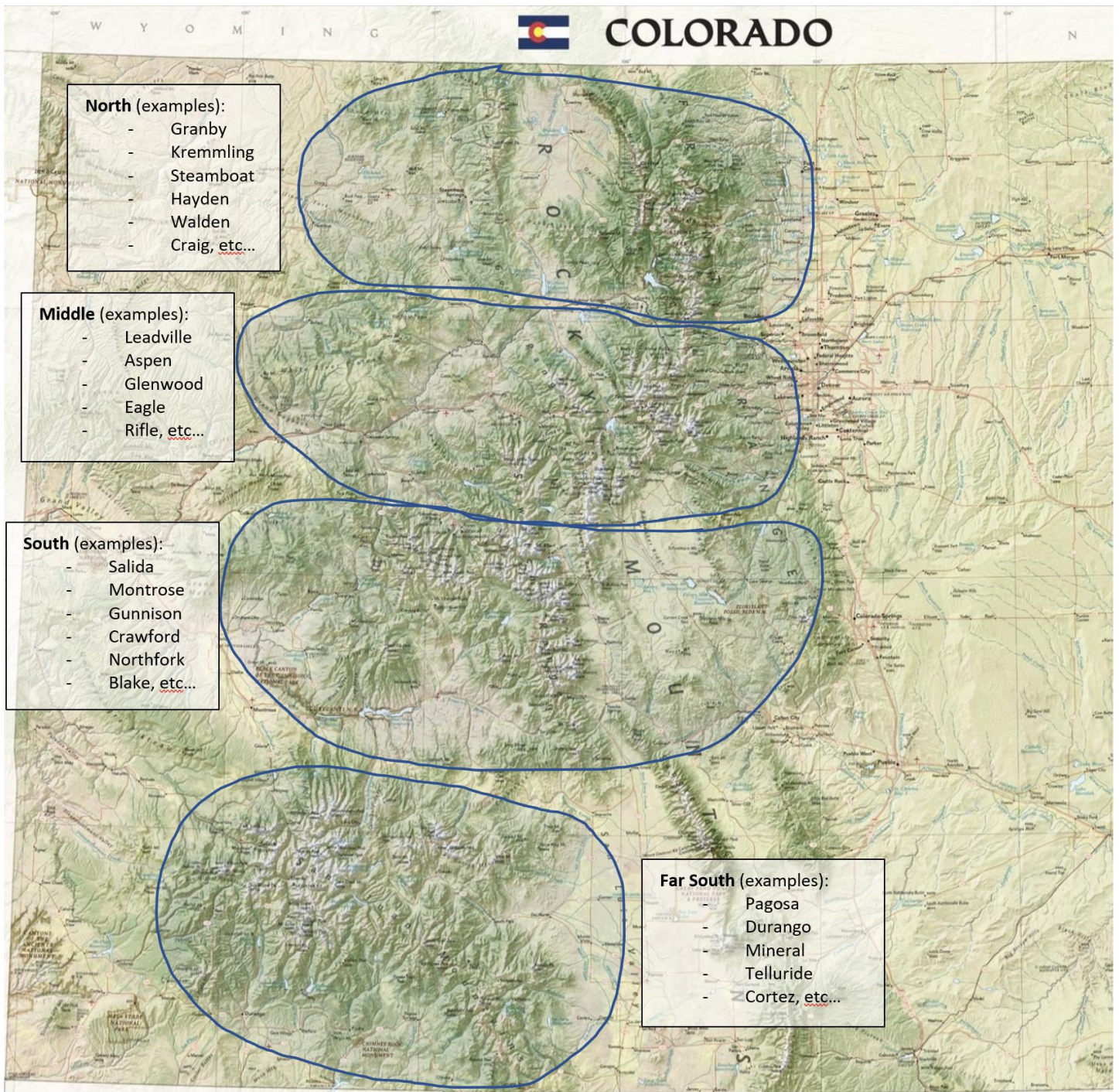
Here is a quick shortcut for links to various official and unofficial weather sources:

- <https://www.mattbeyer.com/weather/>
 - These buttons for each area are a convenient way to see it all at a glance for “past 4 hours”, “current”, and “forecast” conditions at the various airports. This is a good way to see the trend

- Example button



The Big Picture



2) Matt Mountain Flying Techniques/Notes

General

- Don't enter an area of mountains without 1000ft+ of clearance. Don't leave from Denver and enter the foothills until 10000ft as an example. Don't expect to climb "with the rising terrains"
- Oxygen requirements are pressure altitude (cabin pressure) not indicated. Can do the 1000ft per inch and on a high pressure day you can actually go higher than 12500/14000 on the altimeter etc. May want to use that extra 300ft and be at 14300 on a high pressure day. Which also means, a lower than standard pressure day means you cannot fly indicated 14000. Low pressure may prevent certain routes that require 14000.
- The rows of mountains will all blend together in your view when at a lower altitude. It may look like 1 big mountain, but be looking for the distinct rows to appear as you gain altitude. They won't look so bad. More altitude early to see the spaces between rows.
- Always have escape route to the right or left. ALWAYS
- Always have an escape route to lower terrain. Know where you would turn if needed.
- Cooler temperatures in the morning equal a lower density altitude (better).
 - o Fly in the mornings is the point.
 - o In the summer months, do not expect to fly in the afternoon warm

Airplane/Performance

- Performance: A non-turbo airplane loses 3% of horsepower for every 1000ft of altitude
 - o Example: A 4 seater Cessna 172 flies like a 2 seat Cessna 152 (when in the mountains)
 - o Example: An airplane rated at 300HP, will only have 200HP at 10,000ft.
- Radio and communication: Will be unable to pickup AWOS when blocked by a mountain or hill, can pull the squelch so that you can hear it further out (choppy but usable)
- Won't be able to create or fly a VOR based navigation flight plan.
 - o Navigation method will be pilotage and GPS, do not expect to pickup VOR's
- Weight and fuel management, keeping down gross weight can be a better advantage than the excess fuel.
- Study and know runway lengths and POH performance at Density altitude.
 - o You can usually land and get into runways that you might not be able to get out of
- Gently lean the mixture every 3000ft of climb. Enrichen on approach!
 - o Do not go full rich when landing in case you need to go around.
- Don't expect the POH to have valid performance data for these density altitudes.
 - o Expect extrapolated horrible performance, always round conservative side of POH
- Lean the engine for best power before takeoff per your POH.

Updrafts/Downdrafts

- Be watching the VSI and pay attention to lift and sink. VSI is now a critical instrument.
- Keep track of where you saw any lift or any sink, may need to go back to where you saw lift in order to climb up.
 - o Can backtrack and find a previous spot that provided lift.
 - o Be keeping a mental note of where you last saw good lift
- If area of sink, consider increased speed to get through it. 'consider'
 - o If sink persists for more than 20 seconds, alter course significantly and find the corresponding lift in the area.
 - o Make big changes in course as needed to find lift or to at least get out of the sink.
- Updrafts: Pitch for Vx when in an updraft. Ride it up like an elevator with a slower airspeed so as to stay in it longer
 - o When the updraft is over, resume Vy....its done
- If turbulence, get below maneuvering speed asap, lower the gear, reduce the power, lift the nose, slow down
- Note groundspeed changes, if it changes significantly or a big headwind, expect turbulence.
- Be a glider pilot, anticipate where the updrafts are by considering wind direction and ridges

- Alter your course to look for lift off of the ridges, go find it by changing course
- Even if this alters your planned course, deviate to find ridge lift

Mountain Passes

- Always plan to cross a pass at a 45 degree intercept angle.
 - If need to abort crossing the pass, the escape is only a 90 degree turn to get away
 - Return to lower terrain
 - Turn into the pass and cross when clearly going to make it
- Wind speed can double when it is crossing a mountain range/ridge
 - Plan for turbulence, updrafts, and significant downdrafts, watch VSI
- Always have escape route to the right or left. ALWAYS
- As always with pass flying, attain maximum altitude before approaching the pass. Do not attempt to climb while crossing (expect to sink and fly with this conservative approach)
 - Be at crossing altitude at least 5 miles before the pass
 - Give 1000ft+ of margin when crossing
- Keep a line of sight on the other side,
 - If the terrain beyond the pass starts to go away then you wont make it, you are sinking
 - If more of the other side keeps coming into view, you will clear the pass.
- Expect downdrafts that show a -1000fpm descent. Don't expect it magically gets better as you keep approaching the pass
 - Make a plan to cross at a higher altitude and tolerate the loss from the downdraft
 - Or, look for a different location to cross (different winds different terrain)

Canyon and Valley turns

- Never fly up or into any part of a mountain canyon where you cannot do a U-turn.
 - Always know how to turn back, always have the plan to turn back.
- Stay glued against one side of the valley (the side with lift). ALWAYS
 - Get close and stay close to allow more turn around space.
 - Never fly down the middle!
- The downwind side should have the updraft
- Use 45 degree steep turns and slower airspeed to reduce radius.
 - Can use up to 60 degree bank turns if allowed to descend (if you are not trying to maintain altitude).
 - Suggest 30-45degree Vy climbing turns for normal U-turn.
- Practice U-turns on flatlands with different speeds and flaps and climbs to see turn radius

Mountain Airports

- All mountain airports are short runways. AND density altitude is higher!
 - Your groundspeed is higher.
 - It is important to fly a normal approach and normal airspeeds and full flap landings. Fly the normal POH approach and landing Vspeeds
 - Any excess airspeed or being high, you wont be able to land the plane. So be very diligent with airspeed on final
- All mountain airports are to be full stop taxi back (taxi back for departure).
 - No touch and goes. Runways are short. Performance is lower.
 - Terrain may also dictate you need to go out the same way you came in (Aspen...)
- Mountain airports may not support a normal pattern, don't try to force a normal pattern!

Descending

- Add drag, flaps, gear, etc so as to allow keeping some power in (engine cooling)

- Avoid shock cooling the engine on descents.
 - o Manage a nice descent profile, close the cowl flaps, make all descents powered to maintain some engine heat.

Approach and Landing

- Do not add airspeed on approach/landing, fly the published numbers in the POH and fly indicated airspeed. Increase speeds to accommodate gust factor as usual.
- Groundspeed will be higher, you will notice it. Expect long landing and takeoff rolls
- Be aware of how high you are and make sure to descend to pattern altitude well in advance
 - o DO NOT be so high that a landing cant be made, go arounds may not exist
 - o And don't be fast on approach, its going to be a long float and maybe a go around. S turns, Slips, lower the landing gear, lower the flaps....
 - o Get down early, **Do not save the large descent for final**
- No touch and goes at mountain airports. Always taxi back and depart
- While approaching, look at the go-around AND the departure scenario.
 - o This is the last best look to see the terrain before being on the ground
- A go around at high altitude can be really tricky, watch your flaps and airspeed.

Takeoff/Departure

- Slowly adjust mixture during runup at high altitude airports, don't stall the engine.
 - o Lean for taxi
- Depart with a minimum weight.
- Treat ALL mountain airports as short field takeoff technique.
 - o DO NOT waste any inch of runway by lining up 200ft down the runway.
 - o Hold the brakes as you apply power, then release the brakes...
- Perform a mixture re-leaning procedure before takeoff so maximum performance is assured
- Do not climb slower than V_x on departure.
 - o If you are still not climbing, lifting the nose further will NOT help.
- Stay in ground effect while building airspeed. Be patient for the airspeed buildup.

Weather/Clouds:

- Avoid flight above building cumulous clouds
- VFR on top is not likely in the summer due to high bases.
- If rotors or strong winds, cross the ridge/pass over at a height that is equivalent to the height of the pass over the valley.
 - o Stay above the rotors
- Rotors tend to be at or below the ridge elevation. Their effects stop typically twice the ridge height (over the valley).

Additional Resources

- <http://www.mountainflying.com/>
- Mountain passes: http://coloradopilots.org/mtnfly_passes.asp
- How much flaps to use?
 - o Good article. Basically use as much flaps as the max aileron deflection since in theory this is the best lift/drag for that wing. So align flaps to max aileron, and use it in the mountains.
 - o http://www.mountainflying.com/Pages/mountain-flying/max_lift_flaps.html
 - o Full Flaps Good: Slowest landing speed for short runways

- Full Flaps BAD: Lots of drag...go around will suffer big time.

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