MSO GA NEWS

Missoula MONTANA AIRPORT

Spring 2023

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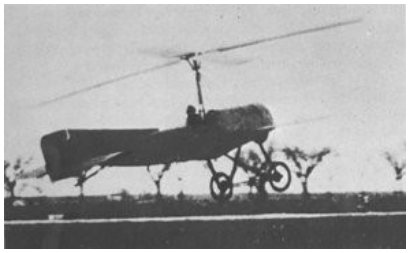
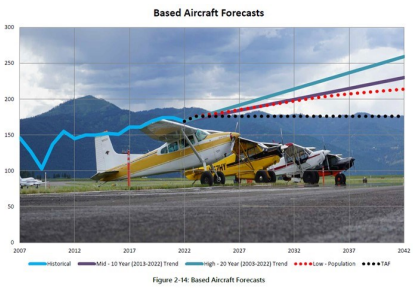
The next phase of terminal construction starts with a hole in the ground. *Read more*

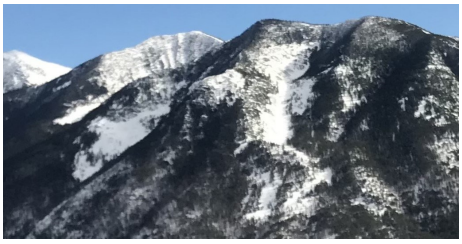


Dan Neuman celebrates words, and gyrocopters? *Read more*



The 20-yr airport master plan process is underway at MSO. *Read more*

How to crash your plane, learn from it, and start over. *Read more*



There are stories on the ground below/ beside us when we’re airborne. *Read more*

The Museum of Mountain Flying creates adventures year-round. *Read more*

Missoula Pilot Art Dykstra is featured in AOPA Pilot magazine. *Read more*

Missoula Smokejumpers continue making history at MSO. *Read more*

EAA sponsors programs of exceptional interest. *Read more*

Airport news – lots going on at MSO. *Read more*

Ace Aviation adds staff. *Read more*

Missoula CAP cadets are rocket scientists! *Read more*

General aviation contributions to MSO. *Read more*

Traffic Procedures at MSO

By Peter Graf, CFI

A small group Runway Safety Action Team of Air Traffic Control Manager Christel Terrel, FAASTeam Program Manager Jeff Vercoe, and CFIs Kurt Kleiner and Peter Graf met on March 28, 2023 in preparation for the upcoming RSAT large group meeting to be held in Missoula May 15, 2023.

Missoula pilots and CFIs, if you don't ever read anything else in this newsletter read this article. We are all safer and more efficient when we're all on the same page for MSO traffic procedures. Author Pete Graf is retired Air Force, retired Delta Airlines, recipient of the FAA's Wright Brothers Master Pilot Award, and a Lt Col with the Montana CAP Wing -Ed

Topics covered at the March 28th Runway Safety Action Team meeting:

Primary No-Wind Runway: Rwy 30 is the primary no-wind runway as long as a tailwind does not exceed 5 Kts.

Standard pattern altitude for light aircraft at MSO is 4200' MSL.

Initial call to Ground or Tower: Call Ground or Tower, hesitate momentarily, and then continue to say what you want. Do not just say "Missoula Tower, N1234P" and wait till Tower returns the call. They are prepared to answer your complete call the **first** time.

Initial Ground Call: If you have a specific request, state it early on initial call-up. For example, if you desire to taxi from Minuteman to Rwy 30 and takeoff from Txy G request that in your initial call. Otherwise, you will probably be instructed to taxi via A to A3 or the end. Also, if you want Flight Following, include that and the destination in your initial call. Maintenance flights will more than likely always be given full length.

Recommended phraseology: Missoula Ground, Cessna 1234 at (location, e.g. NorthStar or Minuteman), taxi, information (alpha, bravo, etc.), departing direction (e.g. west, south). **Readback clearance.** If unclear, transmit "say again for Cessna 1234" or "Cessna 1234 requests progressive taxi."

Initial Call at Minuteman Aviation: If at Minuteman Aviation FBO, it is best to call when ready to taxi away from the ramp instead of taxiing up to the non-movement area line **(- - - -)**.

This gives the controller more advanced warning to manage other taxiing traffic so that you don't inadvertently block the taxiway access for someone else who may have already been cleared to taxi **to** Minuteman via Golf.

Takeoff clearance, recommended phraseology: Missoula Tower, Cessna 1234 ready for departure (location e.g. Runway 30 at Alpha 3). **Readback clearance. If told to hold short, read back hold short instruction with your call sign.**

Wake Turbulence Hold: *An instruction to hold short for Wake Turbulence (for 3 minutes) can be waived.* Simply tell the Tower controller you want to waive the wake turbulence instruction. *Understand your takeoff will be at your own risk.* In one case from A3 behind a fairly small twin, I asked to waive wake turbulence and to back taxi 500 feet to provide additional wake turbulence avoidance. The Tower controller promptly approved my request.

Immediate Takeoff: If you are completely ready for takeoff and can expedite safely, advise the Tower that you are "Ready for an Immediate Takeoff". Once cleared for such, the Tower expects you to promptly begin your takeoff roll.

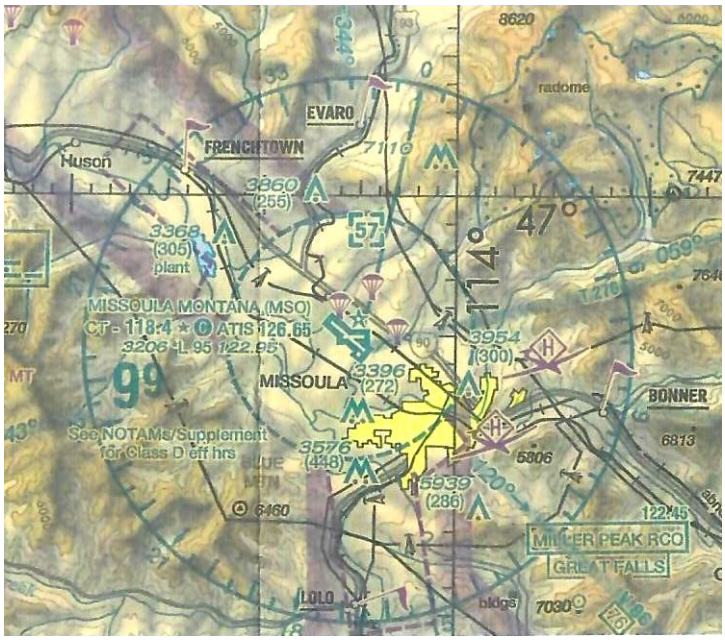
(See "Procedures" continued on page 3)

Back to Page 1

("Procedures" continued from page 2)

Cleared for Takeoff: When we are cleared for takeoff, the controller expects us to pull out and depart **without** delay so as not to adversely impact the flow of other inbound aircraft. Takeoff briefings and final checks of flaps, trim, etc. should be completed well before asking for a takeoff clearance. When practicing or teaching short-field takeoffs, for example, PICs or CFIs need to be sure they can smoothly but very efficiently line up, apply brakes, power up, and release brakes quickly to begin takeoff roll. Better yet, save the short-field takeoff practice for times when no one else is close in the patten, or practice/teach that technique at a non-towered airport. Another option is to request short delay on runway prior to brake release, such as "ready for takeoff, request 10 second delay on runway before takeoff". The delay is yours, once approved.

Early Turnouts: On a normal departure, the controllers expect you to climb straight ahead to 700 AGL (300 feet below pattern altitude per Airplane Flying Handbook) as standard before you make your first turn. If you make an immediate turn out low and early, you may be disrupting the flow of traffic that has already been cleared on the downwind. If you want an early turn-out immediately after takeoff, make that request to the controller when you are ready for takeoff. They may or may not be able to accommodate your request. Don't just fly an unannounced/unapproved early turnout and surprise them. Conversely, if the controller asks you to fly an early turnout, you can accept it **if and when** you feel it is safe, or you can say "unable" and they will give you a different instruction. The altitude and airspeed at which a Tower-requested early turnout is flown is up to the PIC but if you accept, the Tower expects it to be soon. Remember, an early, low-altitude, low-airspeed turnout has a reduced safety margin. The PIC is fully responsible if such a turnout is initiated.



Pilots inbound for Missoula have four easily recognizable call-in points marked on the sectional chart.

Inbound, Initial Call-in points: There are FOUR Initial Call-in points for inbound traffic that are labeled with a magenta flag on the Sectional chart. Use them.

North – EVARO

East – BONNER

South – LOLO

West – FRENCHTOWN

Recommended phraseology: Missoula Tower, Cessna 1234 over (location, e.g. Evaro) inbound for (landing, or option) information (alpha, bravo, etc.).

NOTES:

Landing Request: Advise the Tower early on entry call what you desire at KMSO. VFR transition, landing, or option.

Use "Option" for multiples patterns. "Landing" tells the Tower controller you want a Full Stop.

(See "Procedures" continued on page 4)

Back to Page 1

("Procedures" continued from page 3)

Option: Cleared for the "Option" means that you can do anything you want on the runway such as touch and go, stop and go, low approach, full stop, etc. However, for situational awareness if you plan to land on your next pattern, it is helpful to advise the controller of "Full Stop" when cleared for your next pattern. If Tower controllers sense a need, they may restrict clearance to "touch and go only" because of traffic spacing. That voids the "Option" and you can only fly a touch and go.

It is best to give complete information on the initial call-up (**instead of** calling the tower, waiting for their reply, and then transmitting your intentions), just like initial call to ground control.

You may also give your relative position to Missoula, as in "Bonner, 9 miles east."

Sometimes radio transmissions are difficult to receive, mostly by Bonner and Evaro Hill, mainly if the aircraft is too low for line-of-sight radio transmissions. You may have to call closer or at a higher altitude.

Downwind Call: Unlike some other towered airports, there is no standard requirement or controller expectation for you to announce you are "midfield downwind" on every trip around the pattern unless the controller specifically instructs to report that position. They will normally give you a clearance to land, the option, or tell you to extend your downwind, etc., by the time you reach the point "abeam the numbers." *If the controller has not called you by that point, you can ask if you are cleared to land (or cleared for what you intend to do)*. If remaining in the pattern, the controller should say, "make left/right closed traffic" when they clear you for the option. If they don't tell you a traffic direction, fly the same direction as the pattern you entered or just ask. Once you are in a closed traffic pattern, continue to make turns in the same direction as last pattern unless instructed to switch. In other words, you won't be told to remain in left or right closed traffic when cleared for the option on every single landing, but be ready to switch.

Entering the Pattern: When entering from Evaro Hill to right downwind Rwy 30 you will most likely be instructed to enter right downwind and call midfield downwind. You can fly a direct entry to the downwind without the 45 degree-to-downwind entry. If you are entering from Lolo to left downwind Rwy 30 expect to enter and report a left downwind for Rwy 30. Remain well to the south (i.e., over the Bitterroot River), proceed to the NW, and then turn right and make a normal 45 degree entry at pattern altitude to a left downwind for Rwy 30. Fly a ground track just as you would for a non-towered airport pattern entry on a 45-to-the-downwind leg. Your inbound heading for a 45 entry to the left downwind for 30 should be about 075 degrees aimed for a point no farther than the one third to one half (mid-field) point of the runway. Report downwind or entering downwind as instructed by the Tower controller.

Runway Spacing: Three Thousand feet (3,000 ft) of spacing is all that's required between two light singles. Spacing requirements are greater for larger, faster aircraft.

Spacing in the Pattern: The Tower controller may extend your downwind or upwind to facilitate traffic spacing. Go patiently with that instruction. If instructed to extend downwind and you feel the controller forgot about you, don't turn base, call Tower first and then follow the instructions from there. There is no standard speed in the pattern**.** If your plane typically flies faster than another aircraft, the Tower controller may assign you to the traffic pattern opposite the slower aircraft. It is always appropriate to modify your speed to not overtake another aircraft in the same pattern.

Landing Long or Short Approaches: *When landing, you are expected to exit the runway at the first available taxiway that it is safe to turn on.* If you want to land long, request it, including the exit taxiway. Don't assume it's automatically allowed; get approval first. The controller may need you to be clear of the runway promptly due to other traffic waiting to depart from Golf or Alpha 3, or due to other aircraft or on final. Same with a short approach, request approval. If you wish to practice a "Power-off 180" or a short approach, ASK first. If approved, the Controller expects that you will not extend your downwind much past "abeam the numbers." If cleared for a short approach, expedite and make it a true short approach so it does not adversely affect spacing with other inbound traffic. The best practice is to be situationally aware of the other traffic in or entering the pattern. Don't expect to be approved for a special request if it will clog up the traffic pattern.

"UNABLE": Any time you are issued a instruction by an air traffic controller that you cannot comply with for whatever reason, simply use the term "UNABLE". No other long reply is required. However, you may be asked to explain your decision later.

Runway 8-26: CLOSED PERMANENTLY. The airport and FAA cannot afford to keep the runway open and the crosswinds are not sufficient enough to warrant keeping it open. Missoula airport is deciding how to decommission the runway and turn it into a taxiway. We, small aircraft pilots, will have to practice up on our crosswind takeoffs and landings for Rwy 12/30.

(See "Procedures" continued on page 5)

Back to Page 1

General aviation contributions to MSO

Gary Matson

The Missoula Airport enjoys great popularity among Missoula area residents and the value of its commercial side is well understood. As the process of planning for the future goes ahead, it's easy to perceive needs such as passenger terminal expansion that will accompany the predicted steady increase in airline travel. What about general aviation? Does it play an important role at MSO? The public has little exposure to GA. Monthly meetings of the Airport Authority Board of Commissioners focus on the activity, growth and value of commercial aviation.

Major aviation contributions at MSO come from its two "fixed base operators" (FBOs) Northstar Jet and Minuteman aviation. Both serve aircraft based here as well as transient aircraft, providing fuel, maintenance, hangar space, reception areas, crew cars, and rental car reservations. Minuteman's fleet of helicopters provides wildfire firefighting services all over the U.S. Neptune's air tankers operate nationally as well, providing robust aviation firefighting. Other GA facilities at the airport are those of the Washington Corp., Museum of Mountain Flying, U.S. Forest Service aviation and Smokejumpers, Homestead Helicopters, Heli-1 Helicopters, and FedEx. All are busy participants in MSO general aviation.

The Neptune hangar is always busy keeping its 9 BAE-146 in top shape. The facility modifies the aircraft, building retardant tanks and installing pumps and controls. *Ed Lovrien photo* ,

The intrepid Northstar team of (L to R) Jessie Peek, Todd Franicevich, and Logan Heindle helped park over 300 planes at the 2018 AOPA fly-in. *MSO GA News photo*.

Our FBOs contribute in unheralded ways to aviation at Missoula. Northstar was the primary venue for the 2018 AOPA

(See "Contributions" continued on page 6)

("Procedures" continued from page 4)

Paragliders: Be aware of paragliders east of the airport. Information should be broadcast on the ATIS to say where they are. Flights depart from Mt. Sentinel and the tower at the top of a peak just south of Mt. Sentinel and can fly up to 12,000 Ft MSL across the valley over to Blue Mountain. (Blue Mountain landing is rare but does happen and the Tower will do its best to keep everyone aware).

Smokejumpers: When Smokejumpers are doing their operations over areas such as Razor Ridge, Tower avoids a 5-mile radius North of Rwy 12/30 for those operations usually at or below 7,500 ft MSL. If outbound to the North expect to go to the Wye before turning North or West or to fly closer to Mt. Sentinel before beginning turning North. If inbound from the North expect to go to the Wye then enter a left downwind or make a straight-in, or to Mt. Sentinel with a right downwind or a straight-in.

VICTO ONE (RNAV) Departure: Beginning about August of this year there will be a new Rwy 12 departure. This RNAV departure will have an altitude restriction of 10,400 feet 21 miles southeast on the 159-degree radial of Missoula VOR. It will require approximately 343 Ft/NM climb. That should be easily doable for most light aircraft at lower altitude but may be tough to achieve as you climb closer to 10,400 ft. The MZULA FIVE departure should still be available and doesn't require such a high initial climb. The first restriction is at IPPUG and only at 7800 ft MSL. Standby for news on these departure procedures.

Transitioning near Delta airspace: If transitioning overhead, or near the edge of the Class D, or anywhere within 7 or 8 miles of the airport, it is helpful to call the Tower and let the controller know who you are, where you are, and what your intentions are, and that you have the current ATIS information so they don't feel obliged to give you the current altimeter. Although a call-up is technically not "required" if you are remaining outside of Delta airspace, it is very helpful for the controllers. At the very least, that allows them to give traffic advisories to you and to other aircraft that may be inbound or outbound.

New Runway: A new runway is on the 20-year plan for Missoula south of and parallel to the existing runway. The length is not yet determined but may be just a little shorter than Rwy 12-30. The spacing south of the existing runway is still being considered. The new runway is expected to have an RNAV approach. More information should be presented at the next RSAT meeting.

Next RSAT Meeting: The next RSAT meeting is 15 May at 1500 in the Johnson-Bell Conference Room in the passenger terminal. Key players for the Missoula airport will be there to make presentations and answer questions. A review of that meeting will be presented at the EAA meeting in East LZ Hangar #4 at 1900 on the same day.

Questions or comments? Contact Peter Graf 406-370-3066

Back to Page 1

("Contributions" continued from page 5)

Fly-in, contributing place and people power. When the Montana Aviation Conference is held in Missoula, attendees come to the Northstar hangar for displays, as well as refreshments provided by Montana Pilot Association.

Each Christmas season a Minuteman helicopter puts Santa Claus in the air over Missoula. *Photo courtesy of Jillian Mamuzich.*

Minuteman has for years made Santa airborne during an evening just before Christmas. It also provides the Airport with an extra parking option during peak holiday seasons. It works with Missoula organizations and Military to provide space for benefits, reunions, and other events to help benefit our community.

What's GA's value to the airport in terms of dollars? Although commercial aviation is the financial backbone of the airport GA's contribution is, as my mother used to say, "nothing to sneeze at." The figures were provided to the *News* by MSO Financial Manager Will Parnell.

GA payments to MSO for fiscal 2022

Non-Based Landing Fees	81,584.67
FBO Rentals	256,274.70
Fuel Flowage Fees ($0.05/gallon)	33,167.10
Fuel Farm Leases	4,176.36
Aeronautical Ground Rent	100,889.00
Total payments	$576,091.83

More important than the cash flow are the immeasurable benefits of general aviation. Northstar and Minuteman employ 23 pilots, 23 technicians, 32 ground personnel, and 14 administrative and support staff. The two FBOs are bases for 26 of their own aircraft and more than 57 non-owned. They provide maintenance services for the airlines, charter services, government-owned aircraft including the USFS, and privately owned personal and business aircraft. They have 8 certified flight instructors and annually train more than 40 flight students.

Neptune Aviation has 169 employees: 41 pilots, 100 technicians, and 28 administrative personnel. It offers nondestructive testing services and has a full-service machine shop. Also in the GA mix are two helicopter services. Homestead Helicopters has 4 aircraft and employs 6 pilots, 5 mechanics, 4 service truck drivers, and several administrative staff. Heli-1 adds 8 aircraft to the mix, not all of which are permanently based at MSO. The Washington Corporations have 7 aircraft based here and employ pilots, mechanics, and support staff. Not counted in this brief summary are FedEx and USFS aviation, which add measurably to employment and operations.

The current master plan forecast for year 2027 expects a "low" estimate of approximately 30,000 general aviation operations in the total of approximately 48,000 operations of all aircraft. Plainly, we GA pilots help keep this place busy! Altogether, GA tenants and aircraft contribute substantially to Missoula Airport dynamics and financial health. We pilots love our airport, greatly appreciate the support of airport administration and staff, and look forward to good years ahead.

Fly the Big Sky license plates *are now available through regular county motor vehicle licensing departments. For each license purchased, EAA Chapter 517 receives $20 to further its activities promoting aviation. The additional cost for the specialty plate with standard numbers is about $30, and for the personalized plate about $60. Plates can be ordered at any time without affecting the renewal cycle. Standard renewal rates apply, with the specialty plate cost being added.*

Back to Page 1

Missoula Airport Master Plan 2023

Gary Matson

It's hard to imagine any public facility that's as dynamic as an airport. Change is constant and its predictability is limited. Periodically, MSO administration, staff, and airport authority board collaborate with engineers to do the best possible job at planning for the future. The last airport master plan was conducted during 2008 and completed in early 2009. Many of its concepts have been realized, including for example the general aviation growth on the east side of the airport. The current master plan effort has engaged the technical support of Morrison -Maierle Engineers. Missoula-based engineer Shaun Shea has extensive experience at MSO. His fellow engineer Scott Bell, based in Bozeman, specializes in airport planning.

The planning process started last fall and is expected to conclude sometime in early 2024. Worth special note is that the "plan" is only "best guess" ideas about how and what will grow at the airport based on current trends and forecast information. The finished plan won't be "carved in stone" but will simply suggest possible directions for growth. Here are the steps in the planning process:

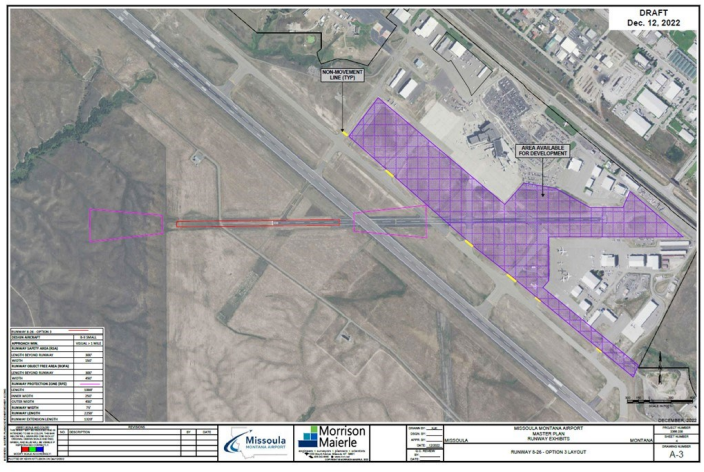
1. Inventory – What are current facilities?

2. Forecast – What growth do we expect?

3. Facility requirements – What do we need to meet demand?

4. Alternatives – What needs to be added or changed to meet demand?

5. Concept and financial plan – How do we pay for these changes?



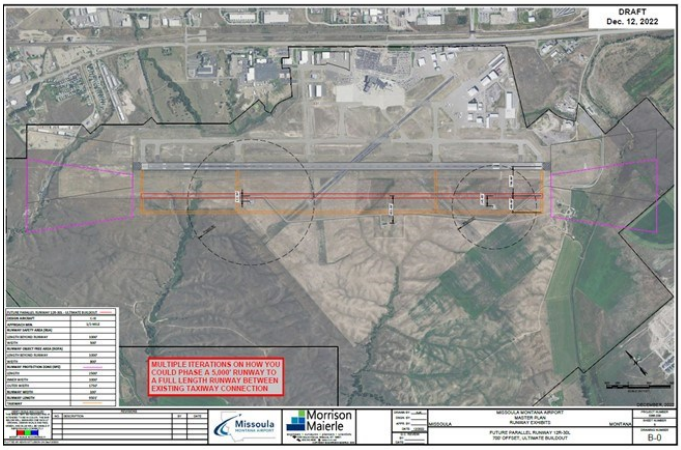
This early concept shows an increased amount of developable land, shown in purple, with the deactivation of Runway 8/26. The shortened 2250' runway, outlined in red, is not considered feasible. *From Morrison-Maierle Airport Master Plan Draft December 12, 2022.*

6. Airport Layout Plan – What do these changes look like?

The first meetings included not only airport personnel and planning engineers but also aviation specialists and stakeholders: FBOs, air traffic control, Museum of Mountain Flying, Forest Service, and general aviation pilots. A first agenda item was Runway 8/26. The two relevant considerations:

1) Wind conditions at MSO do not justify the runway. That is, the crosswind component on Runway 12/30 is less than 10.5 knots 97.46% of the time. The FAA considers that degree of safety high, and disqualifies Rwy 8/26 from funding as a "crosswind runway." The runway's convenience, though appreciated by local pilots, is not justification for FAA funding.

2) The second consideration is that releasing the large amount of land required for Rwy 8/26 and its safety area creates a new asset for expanding airport facilities and services. Because of these considerations the first consensus decision of the airport planning "working group" was to deactivate Rwy 8/26. That process is underway, and the runway is expected to remain closed from now on.



The planning process conceptualizes various lengths, widths, and locations of a future parallel runway at MSO. This one envisions a 9500' length, 100' width, and 700' offset from the current Rwy 12/30. *From Morrison-Maierle Airport Master Plan Draft December 12, 2022.*

Another runway topic discussed at planning meetings was the fabled parallel runway, long expected to be built alongside the existing Runway 12/30. A number of concepts for runway orientation, width, length and location were looked at. Though none will happen very soon it remains important to conserve the space for a future need.

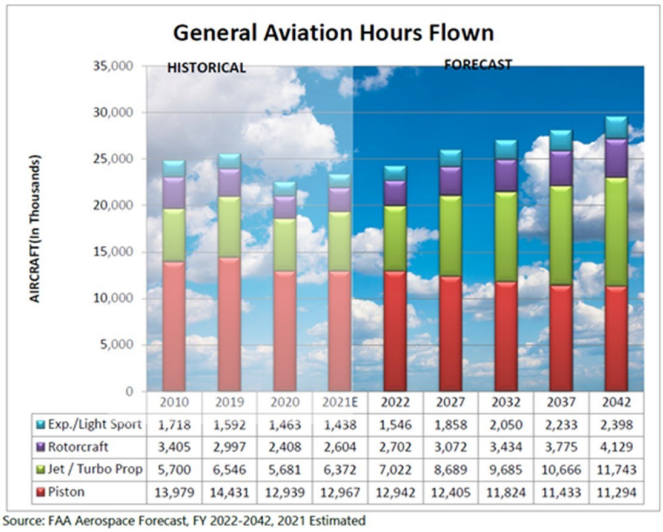
The land that's now available after the deactivation of Rwy 8/26 offers sites for more general aviation hangars as well as space to expand the airport terminal and parking space for travelers.

(See "Plan" continued on page 8)

Back to Page 1

("Plan" continued from page 7)

Forecasting future growth is an integral part of the airport planning process. Nationwide, general aviation (GA) is expected to experience marginal growth in hours flown with the biggest share coming from an increase in jet and turbine aircraft. Single engine piston aircraft hours flown are expected to decrease slightly.



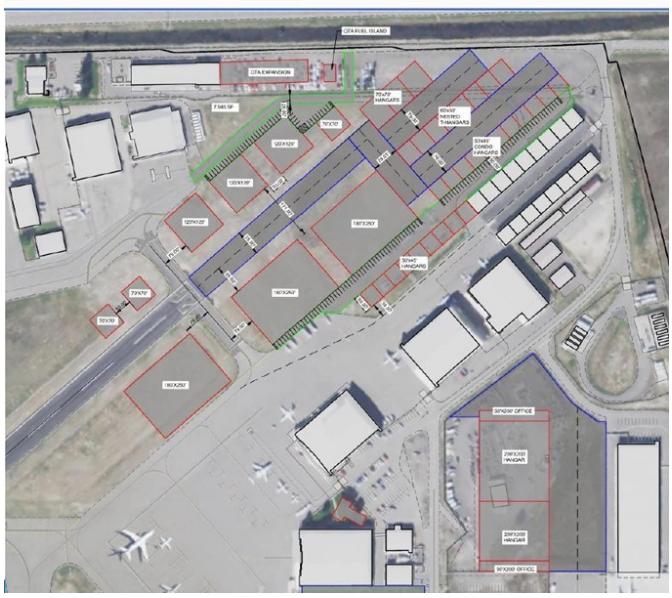
	2010	2019	2020	2021E	2022	2027	2032	2037	2042
Exp./Light Sport	1,718	1,592	1,463	1,438	1,546	1,858	2,050	2,233	2,398
Rotorcraft	3,405	2,997	2,408	2,604	2,702	3,072	3,434	3,775	4,129
Jet / Turbo Prop	5,700	6,546	5,681	6,372	7,022	8,689	9,685	10,666	11,743
Piston	13,979	14,431	12,939	12,967	12,942	12,405	11,824	11,433	11,294

Source: FAA Aerospace Forecast, FY 2022-2042, 2021 Estimated

Figure 2-4 U.S. General Aviation Hours Flown

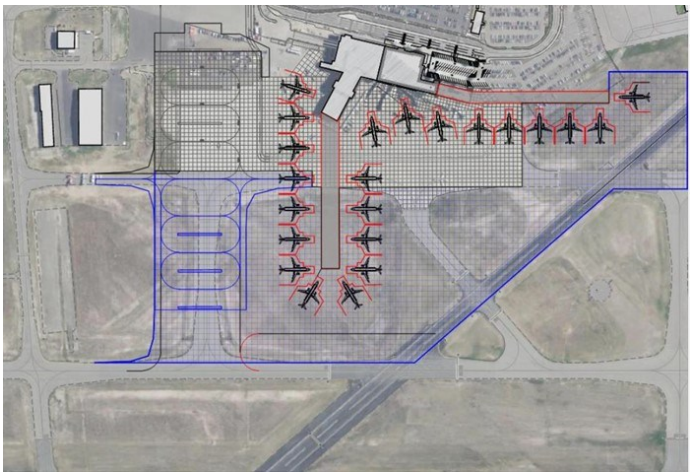
Forecast aviation growth at MSO. *From Morrison-Maierle Airport Master Plan update 3/28/23*

The number of GA aircraft based at MSO is expected to undergo modest growth. Depending upon how it's calculated, based aircraft growth could increase from a current 169 aircraft to a high of 259 or a low of 176. With this growth in mind, MSO planners envision a mix of GA hangar types that could be located in the area that's presently the approach path for Runway 26.



The land area at the current approach end of Runway 26 is envisioned as the possible location for new GA hangars, shown as outlined in red. Existing buildings are in white. *From Morrison-Maierle Airport Master Plan update 2/28/23*

In contrast to GA, commercial aviation at the Missoula Airport is expected to grow by more than 20% during the next 20 years. Accordingly, growth will be needed in the number of passenger terminal gates, parking space for travelers' vehicles, and rental car availability. These three factors are driving the planning for the commercial side of aviation at MSO.



Various options for passenger terminal development are visualized. This one has 22 gates and is accompanied by an expanded deice area. *From Morrison-Maierle Airport Master Plan update 2/28/23*

Already, parking is being added just south of Minuteman Maintenance in the area newly available because of the deactivation of Runway 8/26. Parking for travelers' vehicles is the toughest nut to crack at MSO and is eating up lots of ground area. A parking garage is an obvious solution and planners are seriously considering optional locations. The expense of garage construction has kept it off the planning table until now but eventually it will be a key to providing adequate parking.

Other aspects of the MSO Airport Master Plan include things not often thought of. They include designs for roadways, facilities for the fuel farm, airport rescue and firefighting, and the airport operations that house maintenance vehicles.

What about a grass runway?

What's been left out of the planning conversation? One topic of interest to some of our pilots is a grass runway. The *News* visited with the airport directors of Bozeman and Helena. Both places have grass runways maintained by the airport. Helena's receives frequent use. HLN Airport Director Jeff Wadekamper observes that a grass runway provides pilots with an opportunity to experience conditions like those of our region's numerous backcountry airstrips. Missoula's CFI Aaron Foster offers these advantages for consideration:

Safety

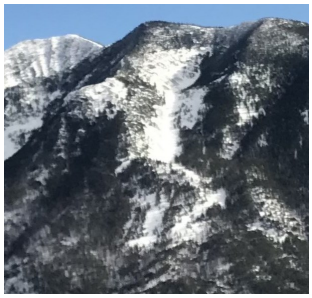
Light, high wing, tube and fabric tail wheel aircraft are very susceptible to wake turbulence and a properly placed (predominant upwind) grass strip would provide reduced risk option.

(See "Plan" continued on page 9)

Back to Page 1

Stories on the Ground

Gary Matson



The Dancing Boy. *MSO GA News photo*

Flying a small airplane just a few thousand feet above the ground can reveal stories that are harder to perceive from the ground. An exception is The Dancing Boy, an iconic, story-telling landmark. It's plainly visible both from the air and on the ground from your vehicle headed south from Arlee on Hwy 93. Reporter Kim Briggeman wrote in the June 18, 2019 Missoulian:

> "You might pass the Dancing Boy a hundred times without seeing him.
>
> "Maybe a Séliš-Qlispé elder, say, Stephen Smallsalmon, finally points out the oh-so-obvious figure, half a mountain tall, on the south end of the Jocko Valley.
>
> "Some say he's just a talus slope formed by fire or avalanche, but don't believe it.
>
> "The Dancing Boy, in his regalia of bells and bustles, moccasins and beaded headband, is alive as you and me. He's clearly a fancy dancer, which means high energy, intensity, butterfly-like joy."

Flying at about 6,000 feet over Camas Prairie, south of Hot Springs, there are spectacular signs of a geological story.

Ripple marks from the draining of Glacial Lake Missoula, seen at Camas Prairie from 6000 feet. The dots at the upper left are farm buildings. *MSO GA News photo*

Repeated formations of ice dams 15,000 years ago near what is now Sandpoint, Idaho, backed up water to form "Glacial Lake Missoula" that submerged much of western Montana. Periodically the ice dams would break and suddenly release immense quantities of water. The flow was so great and so fast in its westward course that it created giant ripple marks that are now spectacularly evident at Camas Prairie, south of Hot Springs. According to the Flathead Land Trust[1] the ripples are as much as 45 feet high and thousands

(See "Stories" continued on page 10)

("Plan" continued from page 8)

Tailwheel airplanes are easier to land on grass as it's less grabby than asphalt.

Tailwheel planes generally take more time on the runway for t/o and landing, (particularly for students) a grass option could reduce congestion at busy times and prevent mishaps resulting from rushed operations.

Wear and tear:

Many Tailwheel aircraft run soft and VERY expensive tires, a grass option would greatly reduce maintenance expenses for these pilots.

Emergency

Grass strip might also be a preference for retractable pilots executing an emergency gear up landing.

How about it, readers? Do you see a grass runway as an important consideration for the future at MSO? Let us know and we'll bring it up at a future airport master plan meeting.

The visioning process continues, and ultimately engages all airport stakeholders. It's about halfway to completion. Before it's finalized there will be opportunities for the public to view the master plan and its accompanying Airport Layout Plan. To be clear, this planning process looks as much as 20 years into the future. Actual development will be guided by the visions in the plan but will change along with changing need. Stay tuned!

Back to Page 1

New Terminal Construction Progress

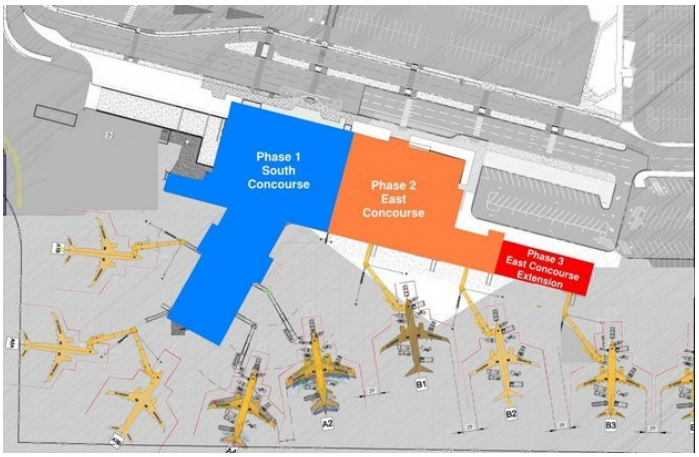
By Tim Damrow, MSO Deputy Director

With an unseasonably long winter wrapping up we are quickly approaching Montana's unofficial favorite season, "construction", or in our case terminal construction. Despite multiple weather challenges over the prior months, work has continued for the second phase of the terminal expansion project. The scope of work for this phase will focus on adding baggage claim, bringing rental cars back into the building and adding 2 additional jet bridge boarding gates. As we look forward to 2023, a year that promises to be a record-breaking one in terms of passenger enplanements, this addition will be well overdue when it's complete in early 2025.

In addition to the work on the terminal there will also be several other projects underway at MSO in the coming months. Most notable is the expansion of the commercial de-ice apron which will increase the space available for de-icing operations and provide a much needed second means of access to Minuteman Aviation on the west side of the airport.

At the same time, we will also be expanding to the east of the terminal to create additional construction laydown space and parking areas as we contend with a strong growth in demand for passenger parking. Toward the end of the summer, our taxiways and ramps will receive some much-needed TLC as we perform pavement maintenance. This work will focus on crack repair, seal coating and some nice fresh paint.

Finally, a big thank you to all of those who have participated in our Airport Master Plan meetings over the preceding 6 months. We still have quite a bit of time until we finish the plan but continue to make good progress on helping to define what the next 20 years looks like at MSO!



Phase 1 of the new terminal, the South Concourse, is complete. Construction of Phases 2 and 3, the East Concourse and its extension is expected to be complete by the spring of 2025 and will add baggage claim, rental car offices, and passenger holdrooms. The East Concourse cost is expected to be $44M. *Graphic courtesy of Tim Damrow*.

Basement excavation and foundation; placement of first footings and foundation walls for Phase 2. *Photo courtesy of Tim Damrow.*

("Stories" continued from page 9)

of feet long.

Another symbolic landmark can be best seen from aloft near the National Bison Range. The Salish and Kootenai people see the shape of a bison formed by the forest on the east side of the range.

1. https://www.flatheadlandtrust.org/places-we-protect/feature-projects/giant-ripple-marks-of-glacial-lake-missoula-floods-preserved/

The author guesses that this is the bison formed by the forest on the east side of the National Bison Range. *MSO GA News photo*

Back to Page 1

Missoula Airport News

MSO GA News

Missoula Airport Finance Manager Teri Norcross retires after 25 years

Retiring Financial Officer Teri Norcross. *MSO GA News*

Teri's growing up years were in San Jose, California. Her dad was an aviator, first as a mechanic in the military then continuing his career in commercial aviation. He worked his way up to Flight Engineer, flying the Lockheed Constellation for TWA. Teri fondly remembers their family outings that also gave her dad a break from aviation routines. Sadly, her dad passed away at age 42, when Teri was just 15 years old.

Teri attended college in San Jose then came to UM for her CPA master's degree, graduating in 1994. She worked as a public accountant for a couple of years, beginning her position at MSO on September 28, 1998. Teri's initiation on her first day on the job was a visit by auditors. She managed to come up with the needed records and master the task. After her 25-year career, she will officially retire on September 28, 2023. Meanwhile, she's mentoring the airport's "new" Financial Officer, Will Parnell. There will be a lot to learn with the airport's multi-million-dollar budget, the multiple incoming and outgoing accounts, tracking grant expenditures, and the multiple reporting requirements by the FAA and other entities.

Teri has loved her job and partnering with so many good administrative teammates in keeping the airport finances functioning smoothly. It hasn't all been roses, though, as evidenced by her discovery of misallocated funds. Her diligence in making that discovery led to the conviction in July, 2005 of then-Airport Director John Seymour for the embezzlement of $645,000 for his personal use.

Memorable times at MSO for Teri included the "Y2K' scare when the arrival of the year 2000 was predicted to be a time of universal disruption of computer function. The airport had gone to great lengths to be ready with workable alternatives but luckily the predictions were groundless.

A real scare during Teri's tenure was 9/11. First there was the shock of realizing the tragedy that had just happened. Then there was the shocking silence at the airport brought on by no airplanes flying. The following days brought insecurity symbolized by new barriers placed in front of the terminal and new restrictions of access to the commercial aviation ramp. By now, we've all become accustomed to the strict security procedures that didn't exist before 9/11 but it surely changed the airport environment.

One of Teri's fondest airport memories was her ride in the B -25 Maid in the Shade when the Commemorative Air Force brought it to Missoula. She shared the observations of all the aircraft's visitors that the interior of the aircraft was designed for battle and not comfort. Teri very much enjoyed her ride around the Missoula area and at the same time was reminded of the service and sacrifices of so many crew members who flew the WWII era planes.

Teri's expertise and her sense of fun and good spirit will be missed. Her monthly financial reports to the board were made more appealing by the cartoons she included. She rounded up entertainment at the terminal during holiday times. Teri herself will miss the airport's places and people, but she will enjoy having more time for favorites like gardening, sewing, and cooking. Travels are on her list. She and her husband will be keeping their camper busy. Best of luck in the times ahead, Teri!

A changing of the guard – Missoula Airport Finance Manager

Missoula Airport Financial Officer Will Parnell. *MSO GA News photo*

Will Parnell joined the airport administration as Finance Manager on January 25th of this year. Will had for seven years provided the airport with financial auditing services as an accountant with the firm Anderson ZurMuehlen. He had come to know and enjoy working with the people in airport administration. When the Finance Manager position opened, Will jumped at the chance. He was enthusiastic about the challenging and unique opportunity of serving as an airport financial manager. His general knowledge of the airport's finances has been helpful but there has also been much to learn, and that process continues. Luckily, the former finance manager, Teri Norcross, has been his skilled and experienced mentor.

Will grew up in New Jersey. His Dad was from Judith Gap, Montana and the family came back every year to enjoy fishing as well as our state's other special offerings. When Will was in high school the family moved to Helena. Hockey was a family tradition and he played on the high school team. After Helena, the family moved to Mukilteo, Washington, a city near Seattle. There, Will played more hockey and wound up on a AAA hockey team, the highest level of youth hockey in the United States.

The University of Montana was Will's next stop. After his bachelor's degree he earned his Master's in accounting and went to work for Anderson ZurMuehlen. Will's family lives in Missoula's South Hills. His youngest son, age 6, attends Chief Charlo Elementary School; his eldest, age 11, C.S. Porter Middle School. And, you guessed it, both play hockey! One is in the Peewee League and the other's a Termite. Will and his family are so appreciative of the Missoula community's support for

(See "News" continued on page 12)

Back to Page 1

("News" continued from page 11)

hockey.

Will is looking forward to becoming more familiar with all the activities it takes to make an airport work as well as Missoula's does. He'd welcome a chance to help out with tasks like baggage handling just to learn what it's all about. He's even interested in learning what goes into becoming a private pilot. Welcome aboard, Will, glad to have you among us!

More Airport News

Missoula is now the second busiest airport in the state. Bozeman is first, Glacier Park International third, and Billings fourth.

MSO becomes 4th airport in the U.S. to be certified as "sensory inclusive." MSO staff have been trained to assist travelers with hidden disabilities and sensory sensitivities in order to make their travel experiences as pleasant as possible.

Four MSO Public Safety firefighters joined thousands of others on March 12th for the *32nd annual Firefighter Stairclimb* to the top of Seattle's tallest building. Competing for the best time participants climbed 70 floors in full turnout gear. The MSO firefighters did very well at this benefit event for the Leukemia and Lymphoma Society.

Nate Cole, Airport Operations Manager. *MSO GA News photo*

MSO Airport Operations Manager Nate Cole achieved certification in the American Association of Airport Executives certification program. The certification involves rigorous study followed by an exam requirement. It signifies a diverse knowledge of the primary functions of how an airport operates.

The airport has purchased a Lektro electric aircraft tug, which is much easier to use than the diesel tug it replaced. It's more maneuverable, easier to control, easier for training, highly efficient, and requires infrequent recharging. The Lektro can handle regional aircraft up to the Embraer E190. It is currently used for all American Eagle operations at MSO. Three electric belt loaders were also purchased, replacing three 90s era diesel belt loaders. Funding for the four electric vehicles was provided by a Montana Department of Environmental Quality grant utilizing Montana's $12.6M share of the Volkswagen settlement for the automaker's false emissions claims. MSO's Andrew Bailey, Ground Handling Manager, and Dan Neuman, Business Development Manager were the successful grant applicants.

MSO Ground Handling Manager Andrew Bailey (R) shows the Lektro tug to Airport Board member Winton Kemmis (L). *MSO GA News photo.*

Back to Page 1

Got Boost Pump?

By James “Cal” Geyman

When life was good. Cal taxis his newly completed RV-9, preparing for test flights, one of which ended in the crash. *Photo courtesy of Cal Geyman*

They say confession is good for the soul. I crashed my newly built kit plane, a Vans RV-9, during hour six of engine break-in. Besides ruining a perfectly good aircraft, it hurt my identity as a competent and proficient pilot. I did suffer lots of broken bones and other injuries, but the really sad thing is that it was all preventable.

I had a 20-year history of flying only high wing Cessna aircraft, with a “both” fuel selector and lack of an auxiliary boost pump in the early carbureted models. When I began flying the “experimental” kit planes, it was a Vans RV-12, which has a liquid cooled Rotax engine, and the auxiliary fuel pump was always on by design. When I started flying a Vans RV-9 with a basic Lycoming O-320 carbureted engine, I used the auxiliary fuel pump when changing tanks from Right to Left, and vice versa. My transition training flight instructor advised me to use the aux fuel pump for takeoff, landing, and when changing tanks – but there was no explanation of WHY.

After 400 hours of diligently using the aux fuel pump as instructed, I found that it actually added little, and all fuel tank switches worked well without any deviation in fuel flow or fuel line pressure, so I stopped this extra step. I then read that the engine fuel pump is generally very reliable, and decided to use the boost pump when needed i.e. it got relegated to my “engine failure” checklist.

They say a lot of flying rules are written in blood. I would agree. It turns out that when your engine quits you might not have the time or altitude to switch on such a simple thing as the boost pump.

My engine quit when trying to land at KMSO on June 27, 2022. I was entering the pattern at a 45-degree angle when my engine surged, and then fully quit. I reached down to switch tanks, thinking I had run a tank dry, then focused on figuring out if I could make a runway and not crash onto the Neptune tankers or the newly built terminal. I overshot a normal pattern entry during the ten seconds it took to realize my engine really was stopping, and that now I had a very heavy glider. I was hopeful that switching tanks would solve the problem, but no, it did not. Sixty long seconds later I was unable to line up on the runway and stalled it 50 feet short. It was a near-fatal stall/spin. The classic behavior we are taught NOT to do.

It turns out I had run the left tank dry, due to the high fuel burn when running rich and hard on the new engine. There was an “unporting” of the left tank, when air was able to get in the system. This air got trapped in my engine fuel pump and “locked up” the fuel line. Without reaching over to turn on the boost pump, there never was enough pressure head to clear the air out of the line. During the NTSB investigation, the flight recorder showed fuel flow spikes to 30 gph during this time, when air bubbles flew past the red cube impeller, giving telltale erroneous signals. On engine tear-down, there was nothing else found to explain engine stoppage.

What I learned is that the aux boost pump is like your safety belt, at least in a low wing aircraft. It may be too late to turn it on when you really need it. I was all eyeballs outside when my engine stopped, and didn’t have the “blindfold” muscle memory to flip on the boost pump without looking down and finding the switch among a row of switches.

Now my five mile out GUMPS check is “Switches” on for the S, this includes the aux boost pump and the wig wag landing lights. Better to turn it on when at 2,000 feet AGL or higher, than to worry about it in a pinch. Most of the time switching tanks will remedy the problem, but if you are unlucky and enough air gets into your fuel line, the engine fuel pump may stop working Only the boost pump will solve this life-threatening problem.

For more information, you can watch the slideshow presentation I did for my local EAA Chapter 517 group. This is at: https://docs.google.com/presentation/d/1hBMikFdqinAP9IPx25YXEJbTahC_AxD8b9fyFrgK2iQ/edit?usp=sharing

James (Cal) Geyman, KMSO, EAA Chapter 517, is currently building a second RV-9a (and licking his wounds)

Cal happily at work building another RV-9 aircraft. *MSO GA News photo.*

Back to Page 1

EAA brings exceptional programs to Chapter meetings

MSO GA News

Neptune

Chapter 517 members have been treated to a series of fine programs of monthly programs over the winter, thanks to the efforts of program coordinator Orson Jordan. Perhaps the most memorable was Cal Geyman's first-person account of crashing his RV-9 and what he learned from the experience (see his story in this newsletter). Much less dramatic but also of great interest were a Neptune Aviation Maintenance hangar tour, a consideration of backcountry first aid, and a presentation of how 3-D printing helped with an RV-10 aircraft building project.

During a chapter-sponsored tour of Neptune's maintenance hangar, Kellen gets a feel for what it might be like to fly the BAE -146 tanker. *Ed Lovrien photo*.

Chapter member Mark Nystrom led a personally narrated tour of Neptune's maintenance hangar. A hundred technicians keep Neptune's 9 BAE-146 aircraft airworthy for their demanding role delivering fire retardant.

Neptune manufactures and installs the retardant tanks for the BAE-146. *Ed Lovrien photo*

The aircraft's 3,000-gallon tanks are made in Missoula and installed here as well along with the pumps and controls. Retardant can be delivered using selected methods, either all at one time or in increments. Maintenance can be urgent during the fire season when it is essential to keep the planes in the air as much as possible. In one case, a tanker operating in another state experienced a tail strike and had to return home for repairs, keeping technicians working around the clock.

Neptune's maintenance needs will increase when its plans to acquire 4 lead planes are consummated. The lead plane puts down a stream of smoke that's followed by the tanker on its retardant drop.

Backcountry medicine

"What if"… you're moseying about at a backcountry airstrip and encounter a fellow visitor who is experiencing a sudden occurrence of a serious health issue. Allergy to a bee sting? Chest pain and shortness of breath? A fall resulting in a broken bone? You're at an airstrip like Schafer Meadows or Moose Creek. In some situations, a call for outside help will be important. One such calling tool is the Garmin inReach GPS communicator. Garmin describes how it works when accompanied by a satellite subscription: "Pressing the SOS button sends a message to the Garmin Response team, and they notify the appropriate emergency responders of your situation. You can communicate with the Garmin Response team during your emergency while you wait for help to arrive." The inReach is less expensive than a cell phone, about $350 or in some cases less. The satellite subscription is about $20/yr.

The Garmin inReach is a tool for communicating via satellite. *Photo from Garmin website*

Christian Dean specializes in wilderness medicine. *Photo courtesy of Christian Dean*

Wilderness medicine specialist Christian Dean gave a presentation at an EAA Chapter 517 monthly meeting. He described the Garmin inReach and shared his recommendations for a backcountry first aid kit.

For survival, here are things that can be carried on a small plane and will have multiple uses.

Tarp, flares, garbage bags, bear spray, sleeping bags, energy bars, lighter, rope, saw, oil

Download 'off-line' maps on programs such as onX or Gaia.

For first aid, the kit can be as big or small as you want, but some common recommended things are:

- BSI- body substance isolation- gloves, cpr mask, hand sanitizer
- Bandages, pressure bandages, and tourniquet
- Analgesia- oral acetaminophen/ibuprofen

(Continued on page 15)

Back to Page 1

Aviation license plates

Montanans are greatly blessed to have two special license plates that boost general aviation. The Montana Pilot Association plate raises funds to establish an effective "endowment" which will fund at least two flight training or mechanic scholarships of $4000 every year. MPA President Mike Vivion notes just how important scholarships are, given the increasing need for pilots and aviation mechanics. Mike says, “We have a LOT of very generous folks in Montana. This is just a very painless way for someone to make a difference year after year without even having to think about it.”

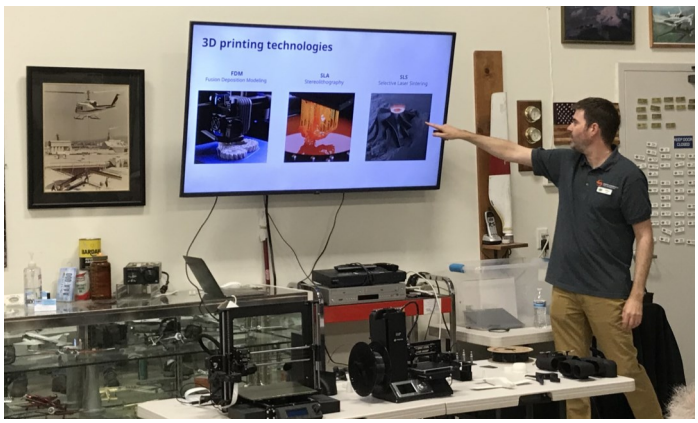
Missoula’s EAA Chapter 517 also has a specialty plate. Funds provide aviation scholarships and pay the expenses needed to keep the Chapter’s hangar viable as a place to promote general aviation. The chapter sponsors Young Eagles events at its monthly breakfast. Young people interested in aviation can go for a ride with one of the chapter’s pilots and also can sharpen their piloting skills in the hangar’s flight simulator.

(Continued from page 14)

- GI- anti-nausea (prescription), electrolyte solution, water purification tabs/filter/UV light
- Allergy response- epinephrine/epi-pen, benadryl/ diphenhydramine, famotidine/ranitidine, aspirin
- Athletic tape, kerlix, cravatte/triangular bandage/bandana
- Splint- SAM splint
- Skin- antibiotic ointment, sunscreen, petroleum jelly, hydrocortisone, burn gel, non-stick bandages

All these supplies don't help if you don't know how to use them. Christian’s company, MyDocInTow, LLC, teaches wilderness first aid courses, such as the 16 hour wilderness first aid certification course, with or without CPR. He can tailor the course to scenarios/equipment that you would have on a weekend trip in your small plane. He can also prescribe medicines to build out other custom first aid kits. To contact Christian, see Instagram @MyDocInTow.

3-D Printing

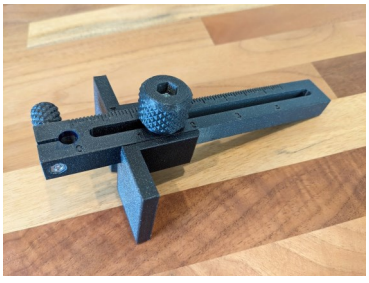


Chapter member Allan Glen describes how he’s used 3-D printing in building his RV-10. *Gary Matson photo*

Chapter member Allan Glen is building an RV-10 aircraft. He presented at a chapter meeting a detailed and fascinating description of the s seven categories that he used to organize the different ways even ways he used 3-D printing in building his plane:

- Jigs
- Fixtures
- Tools
- Prototypes
- Surrogates
- Molds
- Non-structural parts

Most of us are pretty much in the dark about this newer technology. Allan described the process in great detail then passed around some of the items he had made. Specifications including dimensions and shape are first created on a computer then communicated to the connected printer. The computer utilizes “computer aided drafting” to make the design that creates the piece made by the printer. Awesome technology, especially in Allan’s capable hands!



Allan brought this tool to show as an example of what he made with his 3-D printer. It’s an offset-marking gauge for marking a line at a distance from an edge, often needed during aircraft construction. The world of Internet exchange includes designs for 3-D printing that are shared by users around the world. The tool that Allan printed was designed by Andres Zorko, of Buenos Aires. *Allan Glen photo*. https://www.thingiverse.com/thing:2851783

Back to Page 1

Museum of Mountain Flying

MSO GA News

The Museum has been richly blessed with volunteers that have made possible the seemingly impossible. The volunteer tradition continues, as exemplified by Kaye Ebelt and her exceptional newsletter "Backcountry Flyer" with its attractive and comprehensive reporting of Museum activities. As reported in the fall edition of MSO GA News, Kaye's a private pilot as well as the Museum's "Newsletter and Community Outreach" specialist. The second, winter 2023 edition of the Flyer was published just recently. Kaye taught at Missoula's Target Range School. She's received several awards in recognition of her science and math teaching. Kaye now teaches k-2 engineering, 5th math & science and 6th-8th aeronautics at The Greene School in West Palm Beach, Florida. She spends summers in Missoula where she is active in aviation education and activities for both youngsters and adults.

Excerpts from the winter Backcountry Flyer, reprinted with permission.

Left to Right: 1. Art and Ryan provide rotor power for Santa. From the story "Red Sleighs Over Montana" by John Haines. Photo by John Haines. 2. From the article about the Museum's Flying and Fishing Camp, attended by Missoula area youth and organized by Kaye Ebelt and Cheryl Hughes. Youth were introduced to fly fishing and also given rides in airplanes.3. A U.S. Air Force jets in the fabric of this quilt for some lucky child. From the story "Red Sleighs Quilters" by Barbara Jo Komberec. Photo by Barbara Jo. 4. From the story "Memories of Bill & Margaret Yaggy and Johnson Flying Service Days," by Bill Yaggy, Jr.

Join the Museum of Mountain Flying and keep up with its news!

Annual membership dues:
Singe $35
Family $59
Lifetime $1500

Mail Membership Renewal/Application to
Museum of Mountain Flying
Missoula International Airport
PO Box 16601
Missoula MT 59808-6601

2023 Membership Renewal / Application

Join our growing Museum of Mountain Flying "Family." If you are already a member, please pass this on to a friend who might be interested in supporting the preservation of aviation history in the Rocky Mountain West.

Yes, I would like to support the Museum of Mountain Flying.

I have enclosed a check in the amount of $_____made payable to the Museum of Mountain Flying.

Name_____Interested in joining our volunteer team? Y N

Address_____ _Prefer an emailed copy of the newsletter? Y N

City_____

State_____Zip_____Phone_____

Email_____

Airport weather and conditions by phone and radio

- ATIS by phone 406-549-2989, when you're away from a radio during hours of tower operation
- ASOS (Automated Surface Observing System). 406-728-3743. MSO weather 24/7.
- After the tower closes, ASOS weather is available by radio at 126.65.
- Talk to a real person. 406-329-4840. The staff at our local National Weather Service office is always glad to visit with pilots about weather and can often clarify uncertainties in a forecast.

Back to Page 1

Art Dykstra, Backcountry Flight Instructor – And More

By Ken Fielding

This article first appeared in AOPA Pilot magazine, February 2023. It's been reformatted but otherwise unchanged. AOPA responded to MSO GA News request to reprint: "Permission has been granted, all rights reserved, copyright from AOPA Pilot".

Art Dykstra has had an amazing career filled with interesting and generous people, unique aircraft, and challenging missions.

But first and foremost, he is a flight instructor. His aviation career began with a bad flight training experience. His first instructor had "one foot out the door," on his way to the airlines. Dykstra vowed to be better: "To be the instructor I wish I'd had."

After obtaining his initial ratings in the Los Angeles area, Dykstra moved his family to western Montana where he grew up. An FBO at Missoula had a flight school that was in the doldrums. Dykstra convinced the owner he could revive it. "If you can fit into a Cessna 152, you've got the job," he was told. At 6 feet, 4 inches tall, he made it work.

He set about building a client base through primary instruction and flight reviews. His friendly, "let's have some fun with this" style, dedication, and professionalism created an excellent reputation in the aviation community.

I learned that instructing was a gateway; those relationships that I developed led to fantastic opportunities."

After completing a flight review in a Cessna 210 with Dykstra, the client mentioned the need to get current in his taildragger. "I can help you with that," Dykstra said. The aircraft was a classic Stearman biplane, a type he had flown before in LA. Over time he became the go-to guy for training with radial engines and tailwheels.

Once, a local businessman came in for a flight review, liked the way things went, and asked if Dykstra would like to teach his son to fly. The son was a good student. The company is Bretz RV & Marine, with father Frank Bretz, and son Mark. Bretz and Dykstra developed a long-term relationship that started with the training in a Cessna 172, progressed through several piston twins, and ultimately to Cessna Citation jets and turbine helicopters.

While instructing has been Dykstra's core focus, part-time work for multiple operators as a contract pilot has led to unique opportunities. A Missoula company that provides aircraft and pilots to the U.S. Forest Service for firefighting asked him to teach a ground school. That led to one of his favorite flying jobs: backcountry flights dropping smoke jumpers from a de Havilland DHC–6 Twin Otter.

Perhaps the crown jewel of his career happened in June 2019. Dykstra was co-captain on Miss Montana, the DC–3 that flew across the Atlantic with a crew that included four of his former students. The airplane was part of the Daks Over Normandy flight commemorating the seventy-fifth anniversary of the D-Day invasion of France. That adventure is best described by Bryan Douglass in his book *Every Reason to Fail.*

"How do you get to fly all this cool stuff?" a young CFI asked him. "Oh, you wouldn't believe how easy it is," Dykstra said. "You work for six or seven years, six days a week with Wednesdays off, and when the phone rings you say yes! That's the formula."

Logbook

- Hours/ More than 12,000, with over 5,000 hours dual instruction given
- Certificates and ratings / Airline transport pilot, airplane single- and multiengine land; commercial, airplane single-engine sea; rotorcraft-helicopter; CFII
- Favorite aircraft / "Part of why I'm drawn to the DC–3, the Stearman, the Beavers, is because you have to work at it. It's not FADEC where the computer figures it out for you."
- Extra / On his love of flying smoke jumpers in the backcountry: "Every day is different. It's mission driven. It's correlation at the highest level. You never know where you're going, what the conditions are going to be; everything has to be assessed and processed on scene."

Note from Kaye Ebelt in Museum newsletter Backcountry Flyer, Winter, 2023: Thank you to Ken Fielding for recognizing Art's amazing career. For all the Top Gun Maverick fans, Ken Fielding was who Tom Cruise came to for flight instruction to earn his instrument, commercial and multi-engine ratings. We are very proud of these extraordinary Montana pilots and flight instructors!!

Left: : Art and the Miss Montana to Normandy crew. L to R Randy Schonemann, Crystal Schonemann, Eric Komberec, Art, Bryan Douglass. Photographer unknown.

Right: Art and his son, Ryan, riding high on Miss Montana. Art was CFI for Ryan, who now flies aircraft with wings as well as others with rotors. *Elias Snyders photo*

Back to Page 1

From Dan's Desk

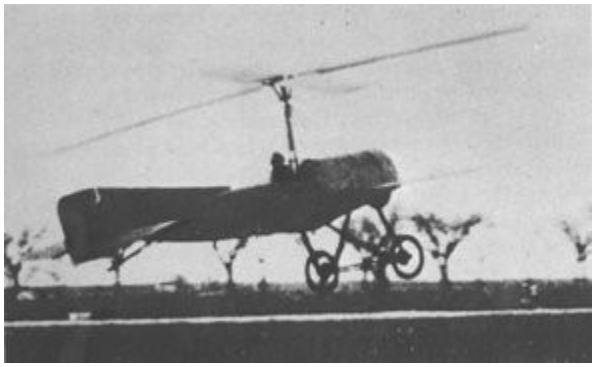
By Dan Neuman, MSO Business Development Mgr.

Well, Gary once again has displayed his unquenchable thirst for being assaulted by my reckless abuse of the English language by asking me to pen yet another monumental communication about things that strike my fancy. One would think that after these many years, his poor ears would tire of the relentless haranguing I tend to create. Which leads me to the topic of this Dan's Desk… namely, that of using too many words.

Have you ever noticed how politicians and government officials like to throw out superlatives and magnifications like they are being paid by the vowel? It never ceases to amaze me how they can turn a single sentence into a virtual fruit salad of prolific renderings mixed with the scantiest morsels of substance. This thought quickly led me to the internet where I disappeared down the rabbit hole of obscure terms for political speech.

For instance, I learned that a "*Gish Gallop*" is a rhetorical technique in which a person in a debate attempts to overwhelm their opponent by providing an excessive number of arguments with no regard for the accuracy or strength of those arguments.

"*Bloviation*" is a style of empty, pompous, political speech that originated in Ohio and was used by US President Warren G. Harding, who described it as "the art of speaking for as long as the occasion warrants, and saying nothing."



The Cierva C.4 aircraft made its first flight in Spain, during the administration of President Warren G. Harding. It was the first stable flight by any form of rotary wing aircraft.

"*Verbosity*" is speech or writing that uses more words than necessary. "Waffling, Beating Around the Bush, Pontificating, Posturing, Fogging and Talking in Circles" all get honorable mentions as well which led me finally to the immortal words of Mark Twain. "Politicians and diapers must be changed often, and for the same reason."

News From Ace Aviation MSO

By Nicole Cannavaro

A lot of new changes have been coming down the pike at the East LZ Hangars. Ace Aviation MSO, run by A&P IA and machine wizard Joe Featherly, has brought on Nicole Cannavaro, A&P, as Head of Maintenance. Nicole also has established AthenAir Batteries, a repair lab for all types of lead-acid, NiCad, and avionics batteries, and runs it out of the Ace hangar. For more about what Nicole can do for your batteries: https://www.athenairbatteries.com/

Ace Aviation MSO offers inspections and maintenance on all light aircraft, from sport to small twin engine models. They are establishing a strong business model focused on customer commitment, priority, integrity and passion. From start to finish, they will ensure that when your sky chariot is in their hands, it will be a positive experience, and you will have a safe, airworthy machine by the time it leaves their facility.

Ace Aviation MSO also is delving into the business of creating new talent. Nathan Cross is their newest technician currently building apprenticeship hours towards his A&P. They will also be establishing aviation youth outreach programs in the next year as well.

Ace Aviation MSO plans to expand their operations with new hangar space to be built near our existing hangar sometime in the next year. Joe and Nicole are also teaming up with Troy Ault and David Stickler to launch a flight club: Flight Club MSO. It is in the early stages of development, and the club plans to launch with a fleet of aircraft that will cater to the various needs of local pilots.

Ace Aviation is in East LZ Hangar No. 3. (406) 541-2665

https://www.aceaviationmso.com/
aceaviationmso@hotmail.com

The Ace Aviation Crew, L to R Nathan Cross, Nicole Cannavaro, Joe Featherly. *Photo courtesy of Ace Aviation.*

Back to Page 1

Civil Air Patrol Cadets Participate in Rocket Contest

By Lynn Sainsbury, Deputy Commander for Cadets.

Photos courtesy of Lynn and Lt Col Bill Bowden, CAP

The Missoula CAP squadron participated in The American Rocketry Challenge (TARC), held in Butte on April 2nd. Cadets Marcus Klemp (camo jacket) and Chase Goodman (knit cap) place their rocket on its launcher, watched by CAP External Aerospace Educator Steve Shannon (green jacket).

Cadets in the Missoula Composite Squadron again competed in the America Rocketry Challenge (TARC), which is open to kids in middle and high school. This is the third year the squadron has fielded a team over the last 6 years. There are approximately 800 teams from across the country and only 100 teams make it to the national finals. Competition is tough.

The difficulty of competing from Montana is that it is impossible to locally source the parts required to build the TARC rockets and rocket engines are considered a hazardous material so shipping is slow and pricey. The real issue is that qualification flight scores have to be submitted by early April, and it's nearly impossible to have good-weather launch days from November through March. Teams only get three chances to fly their rocket for official qualification scores, with the sum of the top two scores deciding which teams make to finals. A National Association of Rocketry (NAR) member needs to witness the launches and submit the scores, and there aren't many Montana NAR members. So the few warm spring days cadets and an official are available may see 15-knot winds which really throw off the scores.

The challenge is to design and build, from scratch, a model rocket at least 26 inches in length but weighing less than 650 grams that lifts an egg to 850 feet – and lands it undamaged – in 42 to 45 seconds from lift off to touch down. At the national competition the altitude requirement moves up or down 25 feet with a concurrent time change. A perfect score is zero. For every foot above or below the target altitude a point is gained, and every second below 42 or above 45 adds on 4 points. In 2021, only teams with summed scores for two qualification flights around 15 made it to finals.

Every year there are constants with the challenge related to safety. The rocket can never weigh more than 650 grams nor use engines creating more than 80 Newton-seconds of thrust; must be capable of being launched with a 1-inch slotted launch rod; and every part has to return to the ground using a recovery system that slows the descent to a safe speed. For accuracy's sake only three models of altimeters can be used. Students always have the freedom to choose body tube diameter, fin and nose cone shape and size.

However, each year TARC rules change slightly with the target altitude varying up to 100 feet, and the time a few seconds. And the design requirements can change dramatically! Sometimes the body tube sections can be one diameter. Or they need to vary, either the top or bottom half being larger. Sometimes the rocket needs to lift one egg, other times more, or the eggs need to be placed vertically or horizontally. For the 50th anniversary of the NASA mission landing on the moon, TARC basically required building a model of the Apollo 11, with the landing module carrying three eggs and using two parachutes, and a separate prize was given to the rocket that looked the most like the real deal. This year's rules call for using one egg in any orientation, same or different sized body tubes. The difficult engineering constraint in 2023 is that the rocket must completely separate, and each half needs to come down with its own parachute. The time is scored for the half containing the egg and altimeter.

Launching TARC rockets can be expensive (a single engine capable of getting the rocket to 800+ feet costs around $12 and parts to build a single rocket runs about $75) and risky (parachutes can deploy too soon or too late and "zipper" the body tube tearing it in half, or may not deploy at all leading to a catastrophic crash; or fins can tear loose upon launch or break upon landing on a rock, etc. all resulting in having to rebuild). So students begin the process using a rocket simulation program called RockSim. The program was developed by a former NASA engineer turned model rocket business owner, and it allows students to play with any and all design parameters, using known weights and dimensions of thousands of parts and engines. Once the design is complete, the launch can be simulated using various conditions such as temperature/launch altitude (density altitude) and wind – which has a huge effect on the time a rocket returns to Earth. At first the students get a big kick out of creating crazy fins and multiple tube sizes, putting in the largest engine they possibly can just to see how high it will go, and using materials they'll never be able to, but after a while they settle into the challenge the contest requirements call for.

Once the simulated design results in the correct altitude and time, rocket construction begins. Building an excellent rocket that performs the same way every time it's launched is a major undertaking. Fins need to be oriented the correct way, so they don't break and sanded and painted precisely to lessen the drag. Body tubes have to be cut precisely so they fit properly; fins must fit snugly and be placed perpendicular, so the rocket doesn't spin. Parachutes need to be sewn and shroud lines need to be exactly the same length. The egg payload, parachutes and altimeter need to be placed in exactly the right place as shown in the simulated design. So, building techniques are practiced on smaller rockets before the TARC build begins. Once it's launched in real life the design may need to be tweaked, and often there are only certain engines available out of the hundreds

(See "Rocket" continued on page 20)

Back to Page 1

("Rocket" continued from page 19)

to choose from, so a major redesign and build may be required. So all in all, TARC really is an engineering challenge!

This year's qualification launch was in Butte on April 2nd, the last possible day to get the flights done. As every Montanan knows, this year's winter busted our chops, and even April 2nd was on the wintery side. Winds were brisk and the temperature hovered around 30 degrees. Three Civil Air Patrol squadrons were represented this year, from Billings, Butte and Missoula. The Billings squadron also used the opportunity for their cadets to work on their rocketry badge, so they flew many smaller rockets.

Marcus and Chase putting together an engine reload as Lynn Sainsbury reads the directions. If done improperly the flight will fail.

Lert: Marcus and Chase connecting ignition wires to their rocket.

Right: Marcus firing the rocket

Rocket motors come in different versions: White Lightning, Mohave Green, Redline, Blue Thunder and Black Jack. The chemical formulations aren't just for looks. Some burn hotter or faster, so the rocket accelerates quicker or has a longer burn time, all of which affects the flight. Missoula's first flight was stellar! The rocket came off the launch rod perfectly and zoomed straight up leaving a bright white smoke trail. Just after apogee the parachutes deployed, and the two halves drifted downwind. We all stared at our stopwatches and when the payload half landed, we were amazed to see a time just a few hundredths of a second shy of 45. Perfect time! The cadets retrieved the parts and opened the altimeter bay to find it had soared to 856'! Just 6' above the target – about as good as you can get. The egg was still intact. There was lots of high-fiving.

Unfortunately, that was the only good flight they had. For the second flight neither parachute deployed and the rocket crash landed in one of the few snow-free spots. The impact caused enough internal pressure that it blew the rocket to shreds, leaving only the fin section and nose cone intact, covered in scrambled egg. The third flight, using the back-up rocket, saw a very nice climb and good separation, but only the front chute deployed, disqualifying the flight. Billings squadron had not been able to find motors capable of getting their rocket high enough, but Butte fired some nice shots. They had two qualifying flights, but the wind really messed with their altitudes. One of theirs came off the rail, arched steeply and plowed into the snow several hundred feet away, once again reminding us all that model rocketry is still a work in progress!

A failure occurred during a flight when the rocket didn't separate and exploded from the internal air pressure when it hit the ground!

Back to Page 1

MORE CAP NEWS!

CAP Provides Orientation Flights to Air Force Junior ROTC Cadets

News release by Major Steven Heffel, CAP Director of Aerospace Education, Billings

Billings, MT— While the 2023 Montana Aviation Conference was in progress in Billings; Civil Air Patrol (CAP) aircraft and pilots, from CAP's Montana Wing HQ, and 14 Air Force Junior ROTC (AFJROTC) cadets from the new AFJROTC program at Lockwood High School converged at the Billings Airport to participate in CAP's cadet orientation flight program. This program is an extension of CAP's aviation education curriculum which has been a central feature of CAP's Cadet Program since its inception, in October 1942.

CAP pilots *Lt Col Peter Graf of Missoula,* Captain Greg Brainerd of Livingston, and Captain Jacob Ramirez of Billings conducted the orientation flights for the AFJROTC cadets at Edwards Jet Center, which hosted this aviation education activity on March 3-4. Each cadet orientation flight lasted about one hour and were conducted using two Cessna 182 and one Cessna 206 aircraft. The cadet orientation flight program follows the curriculum outlined in CAP's orientation flight syllabus, which covers topics including ground handling and preflight of aircraft; normal flight maneuvers; advanced flight maneuvers; interpretation of aircraft instruments; and aviation meteorology. These orientation flights add real world experience to CAP's aviation education curriculum for both CAP cadets and AFJROTC cadets, which are sister programs.

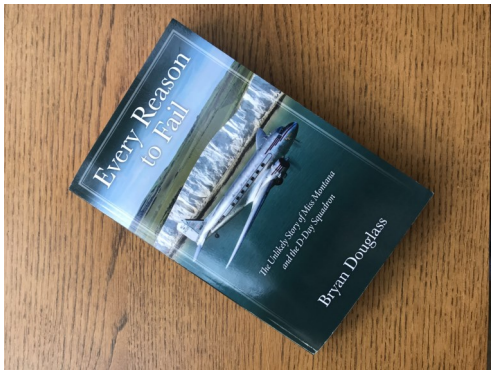
High school AFJROTC and college AFROTC cadets are allowed to participate in CAP's cadet orientation flight program thanks to a Memorandum of Understanding (MoU) between the AFJROTC/AFROTC HQ and CAP's National HQ. CAP's orientation flight syllabus offers orientation flight curriculum in hot-air-balloons, glider aircraft, and powered aircraft. However, currently, Montana Wing HQ is only capable of providing its orientation flight program in powered aircraft. But eventually, Montana Wing HQ hopes to be able to offer orientation flights in glider aircraft, as well. In the future, the Montana Wing of CAP plans to conduct cadet orientation flights for the AFJROTC programs in Billings and Great Falls and for the college AFROTC program at MSU-Bozeman. CAP's cadet orientation flight program is funded by the Department of the Air Force. Please, visit https://www.gocivilairpatrol.com for more program information.

Major Heffel also sent the link to a General Aviation News report that Embry-Riddle Aeronautical University has received a $485,000 FAA grant to tackle the shortage of employees in the aviation industry by providing free training to high school students hoping to become pilots, drone operators, and aerospace engineers.

https://generalaviationnews.com/2023/04/10/tackling-the-pilot-shortage/?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter

Every Reason to Fail

Bryan Douglass' book about the epic adventure of Miss Montana to Normandy is absolutely a "must read" for aviators, especially those of us sharing a base with the historic DC-3. Bryan's story creates in the reader a deep appreciation for a number of things: The success of a near-impossible effort to make the aircraft flyable in less than a year's time and starting with zero resources; the rarely seen volunteer energy that showed up again and again to do the work; the rich relationships among the Miss Montana crew that flourished because of their sharing of an epic adventure; the physical and performance challenges involved in participating with many DC-3s never before together as a group and called upon to skillfully execute a "one-shot-only" D-Day Seventy Fifth Anniversary performance. The historical accounts included in the book, Mann Gulch, WWII, the Berlin Airlift, give added value. ***Every Reason to Fail*** can be purchased on Amazon. Bryan will sell an autographed copy for $20. Contact him at bryan@everyreasontofail.com



Back to Page 1

Greetings from the Aerial Fire Depot!

An update by Smokejumper Scott Jones

Located north-west of Taxiway Golf and marked on many KMSO maps simply as NWS (National Weather Service) the depot is focused on far more than weather predictions. The U.S. Forest Service has been a long-time user of Johnson-Bell Field and maintains this multi-service base to facilitate government wildland fire operations throughout the region and nation.

The Aerial Fire Depot (AFD) opened in 1954, with President Dwight Eisenhower and an estimated 30,000 people attending the commemoration celebration. The large ramp area of the AFD is lined with a fixed-wing air tanker base, interagency fire support cache, smokejumper center (whose parachute loft tower is easily recognizable) and the, NWS. There is also an aircraft hangar providing facilities for the Forest Service's fleet of agency owned aircraft. During a busy fire season, the AFD is a hive of activity with the ramp area crowded with a wide variety of utility and cargo aircraft. Missoula Helitack rotor wing ships also use the AFD as a base of operations, utilizing landing pads directly south of the retardant area. In addition, a fire sciences laboratory, firefighting technology development center and a children's daycare are also a part of the depot campus. Lastly, but foremost in this long list of AFD facilities, the Northern Rockies Coordination Center (NRCC) provides interagency mobilization oversite and predictive services for wildland fire and other all-hazard incidents throughout the Northern Rockies Area.

The Missoula Smokejumper program has been delivering firefighters by air since 1940, and currently has 70+ personnel available for initial attack response to wildfires. Annual parachute refresher training begins in the spring and from April through October it is typical to see jump ships flying the skies near the airport. The Short C-23 Sherpa, de Havilland DHC-6 Twin Otter, Dornier 228 and CASA C-212 Aviocar are the aircraft generally utilized for smokejumper missions.

From Memorial Day thru Labor Day, tours of the smokejumper base are available to the public. Please stop by the visitor center and museum located west of the base or call 406-329-4934 for further information regarding hours of operation and tour scheduling. We look forward to seeing you!

The Short C-23 Sherpa aircraft is a common site at and above MSO. *Dylan Phelps photo.*

Back to Page 1

MSO GA News thanks **AOPA Pilot magazine; Nicole Cannavaro, Ace Aviation; Kevin Condit, Neptune Marketing Manager; Tim Damrow, Missoula Montana Airport Deputy Director; Kaye Ebelt, Newsletter and Community Outreach, Museum of Mountain Flying; Cal Geyman, Missoula pilot and plane builder; Allan Glen, Missoula Pilot and plane builder; Pete Graf, Missoula CAP; Josh Johnson, Minuteman Director of Ground Operations; Major Steven Heffel, Montana CAP; Scott Jones, Missoula Smokejumpers; Robyn Jurinski, Assistant General Manager, Northstar Jet; Ed Lovrien, President, EAA Chapter 517; Jillian Mamuzich, Minuteman Aviation; Dan Neuman, MSO Business Development Manager; Lynn Sainsbury, Missoula CAP; Christel Terrell, MSO Air Traffic Manager** *for their contributions to this "newsletter" (news magazine!).*

If you have something interesting to write about we'd like to put it in the newsletter and share it with the Missoula aviation community! Long (about 500 words), short, funny, serious, whatever. The News is published intermittently. Interested in contributing? Contact the editor (see below).

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MISSOULA AVIATION WEB SITES

Ace Aviation: **https://www.aceaviationmso.com/**
Aerotronics: **http://www.aerotronics.com/**
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Heli-1: **https://heli-1.com/**
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