Todd Donahue, Homestead Helicopter, Inc.

By Gary Matson

Todd Donahue, pilot and owner of Missoula’s Homestead Helicopters, was introduced to Montana during the 1980’s while he was a Massachusetts college student. His then girlfriend and now wife’s brother lived here and they came out for a visit. As has happened to so many of us he was smitten with the Treasure State, became sold on the idea of living of living here, and even bought some land near Polebridge.

After his graduation from college and acceptance into law school Todd looked ahead to a bright future… but something about it didn’t mesh with what he expected from life. Something was missing. A passing Coast Guard helicopter lured his attention skyward. Just as thousands of pilots before him had found inspiration from their eyes on the sky he saw greater promise in the challenge, adventure, and joy of flying. Instead of entering law school, he entered flight training.

A helicopter pilot with a college degree was unusual at the time and these dual assets helped direct Todd towards a unique opportunity that arose while he was working as a pilot in Connecticut. It ultimately led to his indelible commitment to flying safety. During the early 1990’s the unusually large number of accidents with Robinson R22 helicopters...See Homestead (Continued on page 2)

ADS-B Update: A Missoula GA Pilot’s Observations

By Bryan Douglass

Missoula general aviation pilot Bryan Douglass flies extensively for both business and pleasure in the RV-10 aircraft he built himself. The plane is equipped for ADS-B -In and –Out. He has two Electronic Flight Information System (EFIS) units, an Advanced Flight Systems 5600 and 5500. They provide graphic displays for engine, aircraft, and GPS location. His ADS-B unit displays air traffic (TIS-B = Traffic Information Services – Broadcast), and weather (FIS-B = graphical National Weather Service products).

Bryan began flying his RV at a time when ADS-B services were just becoming available. Here are his notes about how the service is working now:

1. The traffic and weather within 30-50 miles of Missoula (altitude dependent) is pretty reliable and consistent now. I get traffic immediately after takeoff and Nexrad weather loads a few minutes later.

2. There are ground stations in Polson, Missoula and Kalispell that are consistently active now. I can usually get at least one of them if I’m over 10,000 feet as far east sometimes as Seeley? East of that I get nada until eastern MT.

3. I flew across MT to eastern ND several times this year. Once I’m out of range of our ground stations, the next stations are in the Sidney/Williston area, and they appear to only be providing weather. However, it then occurred to

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Homestead (Continued from page 1)

led to a demand for an investigation by the National Transportation Safety Board (NTSB). To supply data for the investigation, the newly certificated 21-yr-old pilot accepted the challenge of analyzing every accident in every make and model helicopter from 1980-1994. For a full year, he spent 4-5 hours nightly going through accident records. His work culminated in a report to the NTSB and became a key reference in the agency’s efforts to improve helicopter safety. His research had given him broad expertise in understanding the causes of helicopter accidents and he received an appointment as FAA Accident Prevention Counselor for the New England Region. In this role, he spoke both domestically and internationally on the cause and prevention of helicopter accidents.

The move to Montana came in 1996. Todd and his college girlfriend married and moved to Missoula bringing along his Robinson R22 helicopter. He found a friend in Northstar’s Ron Hendrickson who gave him hangar space and support for his venture in flight instruction. Homestead Helicopters, Inc. was born. Flying in the mountains brought more demanding conditions as Todd soon recognized. The capability of performing autorotation (landing without engine power) is an essential element of helicopter flight training. Performing autorotation in the R-22 required a far higher skill level than was appropriate for flight instruction, so Todd moved up to the more capable R-44.

The R-44 could perform well at higher altitudes and this brought opportunities for Homestead’s growth. Todd was successful in winning contracts for the USDA Natural Resources Conservation Service snow surveys. The way the survey was done at the time involved high risk. During the period February-April the pilot would land the helicopter at high altitude on snow of unknown stability with the possibility of an aircraft roll-over being ever present. After 4 years, Todd found the risk unacceptable and ended this role for Homestead. Although some surveys today are still done by landing on the snow, the safer procedure is to hover while a passenger exits and does the measurement.

Growth continued with FAA Air Carrier Certification in March of 1998, (Part 135 On-Demand Air Service, FAR Part 133 External Load Operations Certificate, and FAR Part 137 Agriculture Application Certification), acquisition of a Bell 206B3 Jet Ranger in 1999 and a new ability to win firefighting contracts. Two pilots were the entire personnel of Homestead’s first firefighting operation. The USFS limited piloting days to 12. Todd would fly for 12 days and then drive the fuel truck for 12 days while his pilot partner flew. After 12 more days they would reverse roles.

By 2002, Homestead had 3 helicopters, the R-44, the Jet Ranger, and a Bell 206L4 Long Ranger purchased just after “9-11.” These aircraft gave the company great versatility and the ability to conduct both utility and firefighting operations. However, with its growing success Homestead also outgrew the space available at Northstar. Todd needed his own facility and sold two of the helicopters to finance a new building, completed in 2005. The immaculately clean hangar and with comfortable adjacent offices is directly southeast of the Neptune hangar.

Since moving into its own facility, Homestead has resumed its growth and now operates one Bell 206 BIII Jet Ranger, 2 Bell 206L4 Long Rangers, and a Cessna 206 Airplane. A new facility will be constructed in the spring of 2014 doubling their footprint at MSO. Todd is Director of Operations, Jason Oren Director of Maintenance, and Kevin Wyant Chief Pilot. Total staff typically includes 5 pilots, 2 Mechanics, several Fuel Service Vehicle Drivers, and Administrative Personnel. During the fire season, the staff may include as many as 14.

Todd’s overriding commitment to safety harkens back to his earliest days as a helicopter pilot and has motivated him to establish unique and well-recognized training programs. Homestead does not offer basic flight instruction but specializes in high-level, standardized training in vertical reference (hauling loads under a helicopter), mountain flying and firefighting. The company’s comprehensive web site lists the instructional programs and other services offered, including sightseeing, photography, and electronic news gathering: http://www.homesteadhelicopters.com/ . A feature of special interest on the web site is the article in the Vertical Magazine.

Homestead’s inconspicuous location out of sight behind other buildings at Missoula International Airport belies its robust, dynamic presence. Todd and his growing company are playing an increasing role at MSO. It’s fitting that the company’s namesake is the Homestead Act of 1862, signed by Abraham Lincoln, which brought adventuresome pioneers westward to carve their niche in history.
me that I might not be getting traffic out there because there isn't radar that picks up the transponders.

4. I have, on one or two occasions when I was out of contact with any ground station in MT, picked up someone with ADS-B out on my EFIS. I can tell when that happens because their N-number is displayed. In one instance it was the RV-10 owned by the guy who makes my EFIS, passing south of Missoula on his way home to Oregon from OSH!

5. It seems like every time I fly very far from Missoula there are more ground stations that are active. If you fly west, you get good traffic and weather by Spokane/Coeur d’Alene, all the way to the coast. If you go south, you lose it until you get well into Nevada. I flew into Las Vegas this summer and got a ton of traffic, including some of the commercial planes that apparently have ADS-B out because I saw their N numbers. There remains a large hole in the middle of the country that is slowly filling in. I did see some new ground stations in the Rapid City area in late summer. Once you get to eastern ND, you get pretty consistent coverage all the way south to the gulf coast, but that is approximately the line of expansion, so it does come and go a bit in KS and OK. East of that line it is pretty consistent, south of Arkansas it seems pretty consistent. We were in south Alabama and flew down to New Orleans for the day and got constant traffic and weather. Very nice.

6. The weather takes several minutes to load, maybe 10 minutes once you are in touch with a ground station, so it is important not to rely on it too soon. And, of course, the usual warning about delay times for Nexrad weather. On the other hand, when my system shows a traffic target, it's always right where I eventually see it.

7. I fly to Grand Forks, ND a lot and they have a huge flight school with over 100 planes, all of which have ADS-B in/out. So it isn't unusual for me to have 15-30 traffic targets on the screen when in and around GFK. Pretty cool.

So...it is definitely growing and getting more robust and filling in the blank spots. The accompanying map is not quite current, as it doesn't show the new ground stations near Rapid City, but it's pretty close. The good news is that most of the blank areas are pretty flat, so a few ground stations should cover a large area and fill in fairly quickly. We really could use a station in Billings. The real benefit will be when everyone has ADS-B out and we can see each other air-to-air.

*Photos (right) courtesy of Bryan Douglass.*

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**ADS-B (Continued from page 1)**

Screen shot of Bryan’s Advanced 5600 ADS-B traffic display. The yellow ball indicates nearby traffic.

Screen shot of ADS-B traffic display. The larger yellow ball indicates the traffic is closer.

Screen shot of ADS-B traffic display. The yellow airplane symbol represents Bryan’s airplane. The three dark rectangles at the bottom represent traffic. Symbols and numbers in the rectangles indicate the direction of traffic and whether it is higher or lower, climbing or descending.
Our runways are designated according to their compass direction. Because of changes in Earth’s magnetic field all MSO runway designations will be changed. Runways 11 and 29 will become 12 and 30; 7 and 25 will become 8 and 26. The Airport is expecting to have the change completed by the summer of 2015. There will be lots of new work for runway painters, makers of signs, charts, electronic softwares, etc. and giving lots of transient and resident pilots an exercise in discarding the old.

**East General Aviation Apron Expansion/Rehabilitation**

The construction on the East General Aviation Apron Expansion/Rehabilitation near Northstar is not going to be finished this fall as hoped. The B-1 taxiway and the expansion of the north side of the ramp are mostly complete. There is unfinished work to be done on the ramp expansion to the south and east; work has been stopped and will resume in the spring. The late start (August 5th) and some unforeseen construction difficulties caused the project to fall behind schedule. Taxiways A-3, D, and C1 have been closed but will re-open until construction resumes in the spring.

**Remodeling of the old control tower**

Remodeling of the old control tower at the terminal has been underway for some time. The control cab will serve as a communications center for the Airport, providing good visibility for coordinating the control of incidents and airfield operations such as snow removal. It will also serve as a backup facility for air traffic controllers in the unlikely event that the control tower becomes unusable. The 5th floor, formerly the controllers’ break room and the 4th, formerly the Supervising Controller’s office, are being remodeled for possible uses as yet undefined. The remodeled 3rd floor will serve as storage space and the 2nd floor will have a break room and conference center.

**Note from Steve Powell:** “The airport remains committed to GA. There are three Airport Commissioners who are pilots, as is Cris, and we are always appreciative of suggestions from the GA community about how to improve the services on the Airport for the flying community.” The new gates by Northstar and by the Runway 25 hangars are great examples of improved services to these areas. They are used extensively and greatly appreciated!

**Opposite Direction Procedures Rwy 29/11**

Missoula air traffic control supervisor Henry Barsotti invited Missoula pilots to a 1 October 2013 meeting and explained the effect of FAA procedure changes for opposite direction traffic on Runway 29/11. Runway 11 ILS practice will no longer be permitted when there is inbound traffic for 29 except under certain circumstances. For details, contact your CFII.

**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.
General Aviation Barbeque

The “GA BBQ” has become a much-anticipated annual tradition at MSO. This year’s August 10th event was held at the “Runway 25 Hangars” on the east side of the Airport. Members of the Garden City Rods and Customs Car Club came with their dazzling and unique cars of all descriptions. The Museum of Mountain Flying brought over the TBM. The fun mix of custom cars and aircraft on display provided a uniquely enjoyable atmosphere! Cris Jensen and Brian Ellestad served up their usual highest caliber outdoor brat/burger cuisine, which was greatly enjoyed by the hundred or so lucky participants. We even had Big Dipper ice cream! Ideas abound for making next year’s event even better!
Unfolding the TBM wing
Neptune Aviation Anniversary

Neptune Aviation invited Missoula to share in its 20th Anniversary celebration on Saturday, October 12, 2013. The nearby field set aside for parking was large but almost not enough for the hundreds who attended! Music, food, and friendliness gave the event a festive atmosphere. The Museum of Mountain Flying displayed the TBM and Travel Air. Other special use aircraft were there to see as well. Families peered inside the cockpits of tankers, kids sported balloons, and a good time was had by all. The day featured water drops by both the newer generation BAe-146 jet tanker and the tried-and-true Lockheed P2V Neptune. All Missoulians have marveled at these aircraft seen so often in our sky during fire season. Those of us who have been directly helped by their firefighting in our backyards shared the day with perhaps a bit more zeal.
Lance and Andrew

The whole family loves the Travel Air

Dick and the deputies

Eric and the DC3

The old and the new
Friday, June 28, 2013: The pilot of the Bell 206 helicopter had just left off the U.S. Forest Service examiner on the bank of the Clark Fork River and was about to demonstrate his proficiency in water bucket operations for firefighting. Although highly experienced, he was required to do an annual recertification with an examiner present.

As the solo pilot began to have difficulty gaining altitude, he was so close to the water that the rotor downwash was circulating up, inward, and downward back through the rotor. In her KFBB story, reporter Jackie Coffin quoted Forrest Gue: "The helicopter starts settling in its own downwash. The more you pull in power the more power you ask out of the ship the faster it sinks, so the pilot was attempting to get clean air." With lift steadily being degraded by the water in the recirculating downwash, the helicopter dropped into the river in about four feet of water. The pilot was uninjured, but there was damage to the aircraft.

Minuteman was called to the scene and Mark Mamuzich piloted the helicopter that was able to lift the downed aircraft from the river using a cable attached to its rotor mast. Water poured out as the helicopter emerged from the river and some outflow continued all the way to Missoula International Airport where it caught the attention of air traffic controllers. The damaged helicopter was safely deposited at Minuteman’s maintenance facility for repairs.

An Even More Dramatic Rescue

While visiting with Forrest Gue about the helicopter in the river, the News learned about an even more dramatic rescue involving a Minuteman helicopter. A man and his son were cutting wood in the Bitterroot when a falling tree caught the man underneath. He was pinned there and helpless. His learning-disabled son mustered his resources and was able to call 9-1-1 and direct Search and Rescue to the scene. Life Flight arrived, but after evaluating the circumstances concluded that there was no way the man could be freed. He was trapped under the tree’s huge root ball with no apparent method of moving it. Life Flight departed for Missoula to transport a surgeon to the scene so the leg could be amputated sparing the man’s life.

Meanwhile, someone thought of Minuteman and gave them a call. Could one of their helicopters possibly lift the massive root ball off the man’s legs? They would try. The helicopter chosen was the remodeled Vietnam-era Huey UH-1H, N109MA. Minuteman had rebuilt the helicopter, installing new and more powerful engine and tail rotor. At the accident scene, chokers were put around the root ball and attached to a cable from the helicopter. The Huey had just enough muscle to lift the root ball about a foot and the man was freed. He recovered completely and has full use of both legs.

Thanks to Forrest Gue, Supervisor of Operations, Minuteman Aviation, for help with this article.
The National Museum of Forest Service History recently unveiled a 10 foot tall wooden statue of a Forest Service Ranger. This icon of the West was hand-carved by volunteers. The forest ranger symbolizes America’s commitment to conserving our forests and grasslands. Now on display in the Missoula International Airport terminal, the Ranger and the interpretive sign introduce travelers to the legacy of the people and partners of the Forest Service, and to the Museum’s work to share this rich history.

The Museum has a large campus adjacent to the Airport and in the vicinity of the smokejumper base. Its grounds are open to the public and feature a number of displays, a restored Bungalow Ranger Station Cabin, and a Fire Lookout. Described on the Museum’s web site, “The Grove of Champion Trees planted on the grounds share the DNA of the nation’s greatest trees—groves like these are planted at selected sites throughout the nation to protect them from loss to fire, insects, drought and the acts of man.”

The Museum’s inconspicuous physical profile in the Airport neighborhood belies its ambitious ongoing interpretive programs. For example, the Museum produced a dynamic, comprehensive traveling exhibit about the benefits of minerals derived from our National Forest lands. The exhibit was provided to 4 co-hosts in different parts of the U.S. during 2013. Displays and virtual galleries connect mining operations on our National Forest System lands with our use of minerals in everything from satellites that orbit the earth to the shoes on our feet. The exhibit’s reach is broadened by state-of-the-art features such as codes on the displays that will enable visitors with smart phones to experience diverse virtual galleries.

Construction of the National Conservation Legacy and Education Center building on the Museum’s Missoula campus is an ambitious project that is still millions of dollars away from being realized. Fundraising continues with support sought from private sources. Aviators hope to someday be able to land at MSO and taxi their aircraft to a parking and camping area close to the Museum. The Museum’s informative website: http://www.nmfs-history.net/index.html

Will’s first flight in Grandfather Ray Aten’s Zenith Zodiac Experimental

Ray’s note: “Will is a sixth grader at Missoula International School and told me my Spanish pronunciation needs lots of work. He just turned twelve and has an older and a younger sister. He has a copy of flight simulator on his home computer and has flown all kinds of aircraft. Landing Trikes on 747 wings is one of his claims to fame. He is the second of six grandchildren to fly with me in my Zenith Zodiac 601XLB. This was not his first flight. He and Joseph Sanella have flown with Joe in his Maule.”

Left: Will with his grandfather Ray Aten, the aircraft builder and pilot.

Photo courtesy of Will.
Aviation Fuel Contamination
By Sherry Knight Rossiter

Every year there are many accidents resulting from fuel contamination. Insuring that clean, dry fuel is delivered into the aircraft fuel system is the responsibility of the pilot-in-command and is one of the prime factors that contributes to flight safety. New fuels and fueling systems are continually being developed and improved, but the possibility of human error can never be completely eliminated, only minimized through careful design of fueling facilities and equipment, good operating procedures, and adequate education of pilots and personnel responsible for refueling of aircraft.

The FAA requires that a colored ring stating octane be placed around each fuel filler cap of a piston-powered aircraft (AC 20-116, 1982). This requirement is in place to prevent accidents resulting from jet fuel being delivered into non-turbine aircraft.

Some piston-powered, turbocharged aircraft have the word TURBO written on the fuselage. This practice is being discontinued because some flightline personnel think this means “turbine” and they are filling the tanks with jet fuel. This even happened to Bob Hoover once in his Aero Commander.

So, what causes fuel contamination? Fuel is contaminated when any material is introduced into it that isn’t called for in its technical specification. The more common forms of aviation fuel contaminants are solids, water, surfactants, micro-organisms, and other miscellaneous things including the intermixing of grades and types of fuel.

Solid Contamination

The most common forms of solid contamination are iron, rust, scale, sand, dirt, metal particles, dust, lint, particles of filter media, rubber, and sludge produced by bacterial action. Solid contaminants are usually visible to the eye and can, in most cases, be controlled by insuring the following: (a) that rusty pipelines, tanks, or containers are no utilized; (b) that covers and caps on fuel storage containers are kept tightly closed; (c) that fuel is filtered through an extremely fine filter installed as close as possible to the dispensing nozzle of the refueling equipment.

Because solid contaminants appear in relatively small numbers and sizes in relation to the volume of fuel, their detection is sometimes difficult. Aviation gasoline is basically considered clean if a one quart sample is clear of any sediment when viewed in a clean and dry glass container. It may be helpful to swirl the container so that a vortex is created; if any solid contaminants are present, they will tend to collect at the bottom beneath the vortex.

It takes approximately four times as long for solids and free water to settle out of aviation turbine fuels as it does to settle out of avgas. Therefore, if the fuel truck just picked up a load of fuel from the tank farm prior to refueling your aircraft, it probably won’t do much good to take a fuel sample because not enough time has elapsed for contaminants to settle out.

Water Contamination

Water occurs in aviation fuel in two forms: dissolved water and free water. All aviation fuels will dissolve water in various amounts depending on the composition of the fuel and the temperature, and any water in excess of that which will dissolve is called free water. Lowering of the temperature will cause dissolved water to come out of the solution as free water, somewhat similar to fog formed by condensation. That’s why it’s a good idea to fill up your fuel tanks at night when putting the aircraft back in the hangar.

Free water can cause catastrophic problems depending on the amount and can appear in the form of water slugs or entrained water. A water slug is a relatively large amount of water in one body or layer. Entrained water is suspended in tiny droplets in the fuel and may or may not be visible to the eye, but will give the fuel a hazy or cloudy appearance depending upon the size and quantity. Entrained water often results when a water slug and fuel are violently agitated, such as when passing through a pump, and will usually settle out with time. Entrained water may result by lowering of the temperature of the fuel that is saturated with dissolved water.

Aircraft engines can generally tolerate dissolved water. However, slugs of free water can cause an engine to quit. Additionally, ice from slugs of water or entrained water can severely restrict fuel flow by plugging engine fuel filters and high-precision equipment such as carburetors and fuel controls.

A simple method of detecting free water in fuel can be made by using the same clean and dry clear glass bottle test used to detect solids. If the fuel is acceptably dry, it will appear bright with a fluorescent appearance, and will not be cloudy or hazy. This test is well known in the petroleum industry as the “clean and bright” test. The fuel is clean when it is clear and bright when it is dry. To assist in the determination of whether any free water is contained in a given fuel sample, a few drops of a liquid vegetable dye can sometimes be helpful to outline the free water in the sample.

A test for determining if jet fuel has been mixed with
avgas is to take a paper towel and place an eyedropper full of fuel on the paper. If jet fuel is present, it will stay on top of the paper, whereas gasoline will be absorbed. It should be mentioned that aviation turbine fuels must, of necessity, be several orders of magnitude cleaner than aviation gasoline to be acceptable. While visual fuel sample checks may be adequate for avgas and operational checks on turbine fuel, additional equipment and checks are necessary to insure that the operational efficiency and cleanliness level of turbine fuel is maintained.

In summary, it is the pilot’s responsibility to monitor the aircraft fuel system and fuel source. Use only the recommended grade of fuel. Filter all fuel entering the aircraft fuel tank. Don’t use any fuel additives that aren’t FAA-approved. Drain fuel sumps regularly. Keep fuel tanks as full as possible when the airplane is on the ground. Periodically inspect and clean the fuel strainer screen. The bottom line is that protection against fuel contamination begins on the ground.

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Cavanaugh Bay, Idaho
From notes by MSO pilot Ray Aten

The airfield Cavanaugh Bay (66S) was suggested by Ray’s pilot friend Joe Sannella as an excellent fly-in camping destination. It is on the southwestern side of Priest Lake on a course directly down the Clark Fork River towards Sandpoint with a quick hop over the ridge west of Sandpoint. http://www.airnav.com/airport/66S Ray’s notes:

- CTAF:122.9, Runway 15/33, 3100 x 120 turf with trees on both sides of runway, no line of sight between runway ends
- As I was approaching a pilot responded to my request for the active by indicating that most pilots approach with right traffic to runway 15 and over the bay with an eye, or two, out for seaplane operations in the bay
- Landing is slightly uphill with a definite rise as the southern end.
- There are camping sites with tables in the woods beside the runway and in a grassy area beside the runway; a bath-house with flush toilets, showers, and a reading area; running water for cooking and dish washing and a refrigerator by the bathhouse/cooking area
- At the Bay end of the runway is a restaurant/bar and a marina with a swimming area
- My departure was northbound on 33 after taxing uphill; kind of exciting to see trees rushing by you on both sides.
- I’ll be back with my tent and sleeping bag!
MSO GA News thanks Ray Aten, MSO Private Pilot; Todd Donahue, Homestead Helicopter; Bryan Douglass, MSO Private Pilot; Forrest Gue, Minuteman Aviation; Cris Jensen, MSO Airport Director; Dick Komberec, MSO Private Pilot, Steve Powell, MSO Private Pilot and Chair, Missoula County Airport Authority Board; Sherry Knight Rossiter, Missoula educator and EAA Chapter 517 President; Roger Shaw, MSO Private Pilot; Dave Stack, National Museum of Forest Service History for contributing to this newsletter! 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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