

Air Mail

Volume 3 Number 1

Utah Back Country Pilots Inc.

Winter 2004

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Flight Plan (Upcoming Events)

- March 20, 2004 Fry Canyon Work Party**
Check the UBCP message service for info: (801) 583-0342.
Watch for an email message from UBCP
- March 27-28, 2004 UBCP Spring Fly In @ Fry Canyon**
Camp on the strip or make reservations at the lodge: (435) 259-5334. Visit the website: www.frycanyon.com. Check out the Southwest Aviator article on Fry Canyon by Fletcher Anderson: www.swaviator.com/html/issuejf02/FryJF02.html
- April TBA Ibex Hard Pan Fly In**
More information in the Spring Newsletter.
- July 9-11, 2004 BTF/UBCP Smiley Creek Fly In**
More information in the Spring Newsletter.
- October 16, 2004 Mineral Canyon Work Party**
More information in the Summer Newsletter.
- October 23-24, 2004 Mineral Canyon Fly In**
More information in the Summer Newsletter

UBCP CFI Listing

We have fielded multiple requests for referrals to certificated flight instructors within the UBCP group who are willing and able to offer flight instruction with an emphasis on back country and mountain flying operations. The following are UBCP flight instructors:

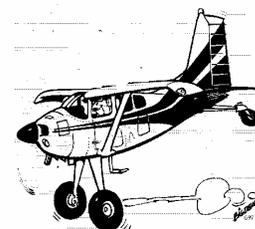
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Larry Newby	KCNY/KPUC	(435) 637-1108
Chris Tuckfield	KBTF/KSLC	(801) 576-9926
LaVar Wells	KHVE/KCNY	(435) 542-3248

If you are a flight instructor and would like to be added to the list, please contact Matt Haag (squawk1200@earthlink.net) to be included in the next newsletter.

From UBCP

Steve Durtschi, UBCP President

As we begin the New Year, it seems appropriate to first consider a new year's resolution: We resolve to get a newsletter out EVERY QUARTER. We have been remiss in this duty in the past and will do better. Our enthusiasm for the Utah back country has not dimmed and I have a million excuses why we have let our newsletter slip, but all of them combined aren't worth a darn.



What a great year it has been. From a safety standpoint, there were only two accidents on Utah back country landing strips, and only one involved minor injuries. Although no accidents would have been better, considering the accident history of much of the west, we are doing pretty well. We had a great safety seminar with Sparky Imeson. I came away with several ideas to improve my flying safety.

In a larger sense, 2003 saw some struggles played out that may have far-reaching effects for pilots. Early this year, word leaked out that the Superintendent at Death Valley National Park had asked his subordinates to research any and all ways to close the only recreational landing strip in the park, "Chicken Strip". All of the facts concerning this early decision making process will probably never be known, but the pilot community responded promptly with letters, e-mails and calls to park headquarters. The Park Superintendent was tactfully reminded that no landing strip on public lands could be arbitrarily closed, thanks to a letter of understanding from the highest levels of the Department of the Interior in Washington DC. The public's message was heard, and although the future of the strip is not known at this time, it has remained open unrestricted to the public. Any further action that bears on its future security will only take place with the public in attendance.

The second major policy unveiling last year was the decision by the Forest Service to essentially close four landing strips in the Big Creek Drainage inside the Frank Church River of No Return Wilderness. Many had thought this impossible due to public law forbidding the Forest Service from closing any landing strip without the State of Idaho's permission. (The Idaho Division of Aeronautics made it clear very early on that they were not in favor of closing the landing strips). The Forest Service countered with classic double-speak; the landing strips would not be "closed", but will be re-identified as "Emergency Only" – meaning that the public no longer has un-restricted access to them. This policy decision seems unbelievable. But if this alternative eventually makes it into the books (and the Forest Service has announced their intention to do just that) then these four strips will be closed to everyone forever. The Idaho Aviation Association has pledged to fight this decision to the highest level, but they are up against quite a monster. The UBCP pledges its full support to aid Idaho in this issue. (See the UBCP public comment letter on page 2.)

On the brighter side, we had a great fly-in at Ibex in April, Smiley Creek in July and at Mineral Canyon in October. We hope the weather treats us as well during 2004.

UBCP is poised to make a real difference with respect to Utah's back country issues. We have a great relationship with the BLM and the Utah School and Institutional Trust Lands Administration. Together these two groups control about half of the land in Utah and virtually all of the land with back country airstrips. The Title 5 Rights of Way we assisted in obtaining for Mineral Canyon, Hidden Splendor, and Fry Canyon are accumulating a successful track record. Our state lease at Happy Canyon is moving into its fourth year. State land managers have indicated that they would like to lower the payment if they can create a lower "fee classification" for our particular case. UBCP land leases are currently at the lowest fee per acre possible. We have a great leader in Pat Morley at the Utah Division of Aeronautics. Notice that there are some 12 Utah remote recreational landing strips now on the State Aviation Chart. We hope to work closely with Pat for a long time.

What does UBCP need? It needs YOU. We have vacancies in the Board and constantly require newsletter material. There is much to do. As I said earlier, I have never seen a time in the four or five years that we have been championing the Utah back country that has allowed more opportunity. We are poised to assist setting policy for Utah's remote recreational landing strips for a long time to come. UBCP needs your help. Come on out and get involved. We encourage you to attend our monthly meetings. They are usually the last Wednesday of the month at 7pm at Skypark Airport (KBTF). There is plenty to do for people that are out-of-state too. Feel free to call any board member for more information.

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Pictures and 1000 Words

Matt Haag, Editor

Thanks to all those who contributed articles and photos to the newsletters this past year. However, as Steve mentioned above, we are perpetually in need of material for the newsletter. Any subject matter relating to flying in the back country of Utah is fair game; be it an experience you'd like to share, a report on conditions and nuances of operating in and out of a particular strip, or coverage of a UBCP event.

A good quality photo makes a fantastic supplement to a well-written article. Whether you write or not, we welcome all photos you have taken at UBCP events, people and airplanes at airstrips you visit, and aerial photos of the back country we fly. Jim Wark has submitted an excellent piece for this newsletter detailing some pointers for novice photographers (and wannabes like me). For newsletter purposes, digital versions of pictures are required. Modern digital cameras take adequate pictures in most cases, as long as lighting & focus are kept in mind. The shooter must also have a steady hand!

Unfortunately, this issue does not feature as many new photographs from recent events as we would like. So when you pack your gear for the back country, be sure to stow that camera and snap a few photos for the rest of us to enjoy. Help make this newsletter a means for others to live vicariously through you! Please contact me via email at squawk1200@earthlink.net to submit articles and pictures, or if you have questions!

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UBCP Public Comment

The following letter was drafted by Karl Spielman, UBCP Resource Access Officer, and sent to Mr. Ken Wotring, Wilderness Coordinator for the Salmon-Challis National Forest in central Idaho. It expresses our concerns regarding closure of several airstrips in the Idaho back country. Although this is not a Utah issue per say, these strips are enjoyed by many of our members.

The UBCP would like to comment in an official capacity and on behalf of our 200+ members, regarding the FC-RONR WMP FEIS. UBCP disagrees with the Forest Service's Preferred Alternative "D" which would result in the closure of four airstrips in the Big Creek drainage to public recreational use. UBCP holds the position that these four airstrips, Dewey Moore, Mile-Hi, Simonds and Vines, were constructed and in public use prior to the 1980 FC-RONR Wilderness and the Central Idaho Wilderness Act (CIWA), and were specifically protected by those documents. To wit: PL 96-312 SEC. 7 (a) (3) "...the Secretary shall not permanently close or render unserviceable, any aircraft landing strip in regular use on National Forest lands on the date of enactment of this Act....". Prohibiting maintenance to allow them to 're-vegetate' is tantamount to closure.

Since construction, public aviators who seek a remote fly-in camping experience have regularly used these airstrips. They are frequently visited, yet, due to their circumstances, require above average proficiency to visit and therefore are not in danger of overuse. They have had no adverse impact on their surrounding environment, and have not precipitated any liabilities to the Forest Service. They provide ready access for recreation, emergencies and forest management and have not cost the taxpayers of the United States anything in maintenance so far.

The UBCP would like to urge the Forest Supervisors of the Salmon-Challis NF, to adopt ALTERNATIVE 'E' in their Record of Decision for this EIS, to manage Dewey Moore, Mile-Hi, Simonds, and Vines as public use recreational airstrips.

Because all pilots capable of visiting these four airstrips desire a primitive fly-in camping experience, a large amount of money need not be spent in their upkeep. UBCP suggests that citizen and pilots groups be allowed to "Adopt" these airstrips through a Memorandum of Understanding or a Cooperative Management Agreement. These agreements would be similar to trail maintenance agreements with other user groups like horsemen and hikers, and would allow non-motorized maintenance at little or no cost to the Forest Service. These partnerships have proven useful in past experience, sample documents have already been created, and there would be many citizens willing to sign up for such activities. Also, setting priorities for landing strip maintenance is an administrative action and does not require analysis under NEPA.

UBCP believes that ALTERNATIVE 'E' is a winning compromise for all parties and is in keeping with the spirit of Secretary of Agriculture Ann Veneman's policy agreement with Congress of July 2001. She said, in part, "We agree that it is appropriate to maintain airstrips that provide critical air access to rural, backcountry or wilderness areas; that contribute to pilot safety; or that support aerial fire-fighting efforts".

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Candid Aerial Photography

Jim Wark

Let's begin with the proposition that you are using a reasonably good 35mm film camera. A good camera is defined as one with interchangeable lenses, be they zoom or fixed focus. I prefer a camera that is designed for manual exposure setting and manual focusing. Auto-exposure, however, works well in most lighting, and is a good choice for most folks, but auto focus may create problems. If you have manual focus lenses keep them set (mine are taped) to the infinity stop. If you are stuck with using auto-focus lenses, keep them in the auto mode. Auto focus lenses do not have a reliable infinity stop.

If you are using negative (print) film try to stick with either Kodak or Fuji ASA 100 film. Faster films will compromise sharpness, and more importantly, color saturation. With strong daylight a 100 film will allow you to shoot at 1/1000 & f5.6. If the air is reasonably smooth you can get sharp work down to 1/250

shutter speeds. The sharpness will be improved if your lens can be set at one or two stops above the maximum aperture, i.e. if you are working with an f2.8 lens the best results will be at f4.0 or f5.6. The difference here, however, is slight so do not hesitate to use full aperture if needed. When using negative film there is a good margin of exposure latitude (as much as two full stops) that will produce good photos. Most folks do not take slide photos, but if you are, the only film I can recommend is Fuji; ASA 50 is the best, but ASA 100 is good. With slide film there is no exposure latitude for optimum shots. An in-camera spot light meter here is important.

For most shots the heights that work best are 1000 to 1500 feet AGL. Maintain the slowest safe airspeed, both to smooth the ride and to slow the relative motion. Keep in mind the wind direction to minimize the latter. If you have a great subject take lots of shots. Film is cheap compared to the cost of getting to the location. Often my best shot turns out to be the last of many taken. Lighting is the most critical factor in most photos – this includes sunlight direction and time of day (sun height). The two hours of first and last light are the most dramatic, and the lower light intensity is usually accompanied by calmer air allowing the use of slower shutter speeds. Strong frontlight (the sun being directly behind you) seldom produces good aerial photos and should be avoided. The best lighting is usually from the side, however backlight (into the sun) can produce some nice effects, especially with water shots. Good aerial photos need at least moderate shadows.

The second critical factor is perspective, which is determined by both aircraft position and lens focal length (normal or telephoto). The optimum here is only achieved by your judgment and experience. It may seem too obvious to mention, but be aware of your aircraft position! Getting too wrapped up in shooting can get you all wrapped up in aluminum. Sometimes, however, there are calculated risks to be taken in getting great shots. In tight spots plan and practice the approach without shooting. Then take one shot only on each run. Above all, know the air current potential and what your aircraft is capable of – then mentally double the former, and halve the latter. Nothing made this point clearer to me than the death a few years ago of one of the world's top aerobatic performers who flew into a low hill while shooting his house.

I use seven fixed focus lenses (28mm to 180mm). The 180mm requires a slight back-off from infinity if shooting below 1000'. You just have to estimate this. If I had to choose only two lenses they would be 28mm and 90mm. So if choosing a zoom this should be the range. With 28mm to 50mm I almost always use a circular polarizer to bring up the sky and cut the haze. It makes a big improvement, especially with side lighting. The polarizer, however, really soaks up the light. This usually requires two full stops of exposure. It has little to no effect in low light.



*Los Alamos, NM Water Treatment Plant
Use of patterns and juxtaposition is evident...*
Jim Wark Photo

Afterthoughts: If you are going to shoot a specific subject, think about it beforehand. I once rose early in the morning and flew to a distant location for a waterfall assignment only to find that it would be deep in the shadows until much later in the day. A quick reference to the topography of the area would have made that apparent. I do not recommend shooting through the window. But if you must, hold the camera as close as possible without letting it touch



Copper River Delta, AK. Ahhh... Serendipity!
Jim Wark Photo

the glass. If shooting in the relative wind get a good pair of photographer's gloves. They will help you hold on to the camera, and if the temperature is below 50F you'll be glad to have them. My experience with commercial photo labs is that they tend to print aerials too light. If you are taking a lot of aerials stick with one lab and educate them. If you are shooting over the National Parks, et al, please honor the 2000' AGL request. In choosing your shots, look for patterns and juxtaposition, and hope for serendipity.

Jim Wark's website of over 4000 aerial photos of North and Central America can be seen at www.airphotona.com. His latest book, "Colorado, An Aerial Geography of the Highest State", is available in major bookstores or on line.

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Smiley Creek Fly-In 2003

JaNae Kinikin

Smiley Creek, Idaho sounded like a wonderful place to go, especially in an airplane. I was up at 5:15 am in anticipation of the flight, stopped for a breakfast of milk and donuts, and headed to the airport. My clothes were packed, along with my tent, sleeping bag, etc., and I was ready for another adventure. At the airport I found Dale already loading the plane. I added my stash and we were off. It was a beautiful morning to fly, the air was calm and we were ready for a smooth, scenic flight. This was my third backcountry experience, but I was still in awe that you could land a plane on an isolated strip in the backcountry of Idaho.

We passed over Craters of the Moon National Monument and pointed the nose northwest and we were soon passing just north of Ketchum, conveniently avoiding the congestion around the Hailey/Sun Valley jetport. Heading up the valley following the river, we slipped over Galena Pass and dropped into the valley below to land at Smiley Creek. We checked over the airstrip with a high pass and landed to the south. The runway is a beautiful long grass strip of 4900 feet at an elevation of 7160 feet. The scenery is spectacular with the Sawtooth mountain range rising to the West and the valley opening to the north towards Stanley, a perfect spot for a backcountry runway. The facilities for pilots included clean restrooms with showers, a courtesy car, and a wonderful cafe just across the highway from the strip.



Dale Gardener and JaNae Kinikin camp with N4053D

As we set up camp, I watched the sky to the southwest in anticipation of my parents arriving from Wyoming. We had expected them about 10 am at the latest, and now it was after 11 am. Alas, a small blue and white plane was overhead. Was it them? No, it was a Kitfox from Logan. Then we spotted another blue and white plane flying down from the pass. Could it be them? Yes! They landed, found the parking spot next to us, and were happy to be on the ground after 4 hours of flying. Their delay had been an unscheduled fuel stop at Picabo.

We counted over 30 airplanes lined up on the runway at Smiley Creek, and that was just on Friday. We met pilots from Washington, Utah, Idaho and even a couple from Nebraska. It was fun looking at the planes and visiting with different people who shared a common interest in backcountry flying.



UBCP members Monte & Sheila Orr from Hay Springs, NE

Saturday morning dawned beautiful, but cool. We huddled around the tiny stove and drank hot chocolate. This morning Dale was taking my dad to Thomas Creek, down the Middle Fork drainage, with a second stop at the Big Creek Lodge for breakfast. My dad was really looking forward to seeing some of the backcountry strips. I had had my first introduction to the Idaho backcountry just the week before and knew this day would be a real treat for him. Idaho has some spectacular airstrips for pilots, plus a number of lodges that serve meals.



Kyle & Jill Garrett roll out as the applause subsides...

Meanwhile, back at the Smiley Creek Lodge, Mom and I had breakfast and planned our day. We were ready for adventure and decided Red Fish Lake would be a great place to see. We rounded up

Melinda, Cathy, Sheila, KC, Stephanie, and off we went. The lake was beautiful and clear. We rented a motorboat and with our guide had an enjoyable loop trip to the end of Red Fish Lake and back. After snacks and a trip to the gift shop we headed back to the airport.

As expected my dad's trip was more than he had even anticipated. He couldn't quit raving about how beautiful the backcountry was, but also about the required pilot skills and airplanes needed to fly into these areas. He is currently working to finish his "Bearhawk" project with the intention of coming back.

Saturday night we enjoyed a barbecue pork dinner with beans, cornbread, salad, and peach cobbler at the Smiley Creek Lodge. Before dinner, several speakers entertained us. They described the origins of the "Friends of Sky Park Airport" fly-in at Smiley Creek, and the beginnings of the Utah Back Country Pilots Association. Both before and after dinner a number of door prizes were awarded. Our table won big with backcountry t-shirts, an air mattress, tent tie downs, and a tablecloth. After more socializing and meeting new people, we were off to bed.



"There we were..." Lies, propaganda, and fish stories abound!

Morning came early, as many pilots wanted to be off the ground while it was cool. It was another beautiful day to fly and I was happy to be along for the ride. We arrived in Logan mid-morning to an unusually calm and quiet airport. As we unloaded the airplane, I reflected on the flight, the people, and incredible memories that were made during the 2003 Smiley Creek Fly-in.

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Back Country Tidbits

Rob Hunter

The new Utah Aeronautical Chart is out! Pat Morley, the Director of the Utah Division of Aeronautics, and UBCP wish to thank everyone who sent pictures to be considered for the cover of the new chart. We presented all of them to Mr. Morley,



who had to make a difficult decision. He chose one taken by June Steely that features Steve Durtschi's Ce185 flying above Mexican Mountain. Those familiar with the area might be able to spot the eastern edge of the airstrip on the lower right hand side of the photo.

The front cover showing Mexican Mountain looks great, but the inside that features several of our back country airstrips looks even better! UBCP offers a big thank you to Pat Morley and every one at the Utah Division of Aeronautics for making such a fine chart and including some of our back country airstrips. We hope to have even more of our airstrips included in the next edition. You can pick up a chart at the division's office or call and have one sent to you.

Utah Division of Aeronautics Phone: (801)715-2260
135 North 2400 West Fax: (801) 715-2276
Salt Lake City, Utah 84116

NTSB Summary

For 2003 the NTSB database reports 40 aircraft accidents in Utah resulting in 22 deaths. Only one occurred at a backcountry airstrip, Mexican Mountain. The NTSB report follows:

On June 18, 2003, at approximately 19:05 MDT, a Piper PA28-180 (Cherokee), was substantially damaged when it impacted high vegetation at Mexican Mountain, a private airstrip northwest of Green River, Utah. The private pilot and his three passengers received minor injuries. VMC prevailed. No flight plan had been filed for the cross-country flight being conducted under Title 14 CFR Part 91. The flight was originating at the time of the accident, bound for Richfield, Utah. According to the pilot, the airplane was departing to the west. The pilot stated that he had "failed to leave enough [room] to get proper airspeed" to clear the brush at the west end of the runway. The airplane impacted the brush. During the impact, the right wing was separated from the airplane.

I inspected the crash site after the airplane had been removed. Other than a few broken tamarisk bushes and a few paint chips (which I picked up) there was no evidence of the crash.



Back Country Operations Clinic *Fletcher Anderson*

Takeoff Requirements from an Unconventional Airport

This article is inspired by last summer's crash of a Piper Cherokee 180 on takeoff from a popular backcountry dirt strip. This flight was doomed from the beginning. The performance charts for that airplane, regardless of load, indicate that a takeoff could not have been successful in that distance on pavement on a normal day. This airplane was heavy, and hot temperatures made it worse. A soft and bumpy runway probably increased the degree of impossibility (if that is an abuse of the English language, I apologize) by another 20%. Naturally, after the fact, we can all easily see what someone else did wrong. What are the factors we should consider to assure that the rest of us don't do the same thing in the future?

The fact that there are so few accidents at all the very demanding remote backcountry strips in the area suggests that just about everyone using those strips is either incredibly lucky or understands what they are doing. This is intended as a review to see if we are all on the same page.

It is very likely that everyone reading this has determined from personal and sometimes very embarrassing experience that whatever the aircraft owner's manual contains regarding takeoff distances was not computed in the middle of the Utah desert on a hot afternoon in July. Probe just a little way into that portion of your memory that you don't usually discuss with other people and you can probably find a time when you could not get airborne at all.

For me that embarrassing moment came twice in 1996. The first time was mid July, late afternoon with three people and a few heavy bags at Needles Outpost. The temperature was about 110 degrees, the runway was a little softer than usual, the wind calm. Various rudimentary calculations suggested a takeoff roll more than double the sea level value on a standard temperature day. (Something I have never done, by the way. Days are never standard when I am at

sea level.) But with a mile long runway, I should still be airborne with three thousand extra feet to go. This simply was not the case. By the imaginary thousand foot mark, I was at close to 70% of my take off speed, but that proved to be about as fast as the plane was going to go for the next four fifths of a mile of very soft dirt in front of me. Trying again in the opposite direction produced no better result. Think of all the secret tricks you know. I tried them. Get going really fast with no flaps and then dump them in? No. Jerk the yoke forwards and backwards to try and induce a slight bouncing? Nope. Saw side to side on the yoke to wrest one wheel free? Vary the pitch attitude until it is precisely right? In a small plane on that long a runway, you have plenty of time to try out all sorts of new ideas. The air that day was just thin enough, the load heavy enough, the tires small enough, and the wind calm enough that when plowing through soft dirt, terminal speed was still just barely below flying speed. I got out in the early evening, not so much because it was cooler, but because by then a gentle five knot wind was blowing straight down the runway and I could get airborne by bouncing off the biggest bump I could find. Once unstuck from the very soft sandy soil, I could climb out just fine.

Late December that same year found me at Sand Wash with calm winds, but temperatures down in the teens, alone, no baggage, and half tanks. For those conditions I would predict getting airborne in less than 1,000 feet. Wrong again. Because I seriously misjudged the snow depth, full power produced a speed along the ground about equal to a casual walk. After six passes of the runway using the plane as a kind of inefficient snow cat, I had a track packed out that allowed me to get moving fast enough to actually fly. It might have been even easier if I had made the track straight instead of including a little dogleg in the middle. It is not necessary for anyone to reflect on the stupidity that put me in that position. I have already done so many, many times.

Presuming that while all of us like to visit remote backcountry landing strips, we don't necessarily plan to permanently move there on each visit, how can we be relatively confident of being able to leave again? The place to start answering that question is the aircraft operator's manual. Specifically it is the take off distance tables. Except with certain turbocharged engines, by the time field elevation gets to be over 4,000 MSL, take off distance always exceeds landing distance. You can land beautifully in all sorts of interesting places you can never take off from.

Correct for Altitude

Using the operator's manual, read the takeoff distance from the tables. In our part of the world, the first necessary correction you are always going to have to apply is for altitude and temperature. The tables are going to provide a reasonable way to allow for that, or at least a starting place to interpolate from. Even with an older aircraft (is there some other kind?), the take off distance tables give a pretty accurate result for a perfectly flat paved runway. Typically on a 60 degree day at 5000 feet elevation, your take off roll is double the sea level figure, and this is compounded by the fact that your climb rate is halved. This figure alone explains why most of the backcountry airstrips in Utah have to be twice as long as some of the sea level strips in Alaska.

As a rough estimate, up to around 7,000 or 8,000 feet of elevation, each 1,000 feet more elevation is going to increase your take off roll by 10%. Above those altitudes, 20% increased takeoff distance per thousand feet of elevation is a better figure. These takeoff distances above 10,000 feet elevation are important because if you want to visit me at my field altitude of over 9,000 feet in the summer, your take off distance will be triple sea level, but equally important to know if you fly anywhere around Utah or Colorado on a hot day. Hot air is thinner. Hot days have higher density altitudes. The effects are more than many people realize.

Correct for Temperature

Somewhere on the wall of the FBO, or in the textbook you didn't bring with you is a chart for calculating density altitudes. There is one on the back of the state of Utah aeronautical chart across from the picture of Governor Leavitt. There is a temperature correction factor in the take off distance tables. Read these numbers!

Needles Outpost, with a field elevation of only 4950 feet MSL has a density elevation of something like 9500 feet on a really hot summer day. There are quite a few low powered small planes that cannot take off at all from pavement with a full load at an elevation of 9500 feet. At that altitude, your engine is getting only about 70% of its sea level rated horsepower and you will reach your indicated airspeed needed to takeoff at a true speed through the soft dirt something like 20% faster than what is indicated. No wonder I had trouble. On a soft surface, the lower power available simply could not produce the higher ground speed required to fly.

Without density altitude tables in front of you, you can still estimate density altitude by adding 600 feet elevation for every 10 degrees higher than standard temperature. Standard temperatures are roughly: 50 degrees at 4000 feet, 42 degrees at 5,000 feet, and 35 degrees at 7,000 feet. Another way of looking at this is that we only see standard temperature days in winter. On any summer day, you always have a density altitude problem.

Here's another rough calculation to get the same result: Add 15 to 20% extra takeoff distance for each 10 degrees higher temperature. Be cautious about using this figure though, because at the extreme ends of the temperature scale, the effect is magnified and in the desert you do see the extremes.

Fudge for the Ground Surface Conditions of the Runway

Here you are on very unsure ground. (Get it- ground, runway....) This calculation is not just airplane specific. It is also runway specific. The slower your airplane needs to be going to get airborne, the less significant the problem. A very light plane with a very big wing and fat tires might suffer less than a heavy plane with small tires and a high takeoff speed, but you have no way of calculating how much. Some soft dirt is softer than other soft dirt, but how much softer? The rule of thumb here is therefore pretty inaccurate, and the same runway will produce dramatically different results on different days:

- *Smooth, hard dirt (any surface other than pavement):* Add 10% to your take off distance.
- *Bumpy or rocky hard dirt:* Add another 10% to 15%
- *Very tall grass:* Add maybe 20% to 30%
- *Very soft, deep dust or sand:* What does soft mean? This can range anywhere from 25% longer takeoff distance on up to infinity. At Needles Outpost on that particular 110 degree day, I could not have left the ground at all, no matter how long the runway.
- *Snow or mud:* Planning a 50% longer takeoff roll is a good starting point, although we all know that you can find both mud and snow through which you cannot move at all. Was your car ever stuck last winter? Was the airport ever closed for snow removal? How deep the mud or water or snow can be before you cannot takeoff at all depends on the consistency of the mud and snow, your available power, and how well the tires float on soft surfaces. If you really guessed wrong, you can pack out the snow and try again, or you can wait hours or days or even weeks until the mud dries out.
- *Combined conditions:* Add together a dirt surface (10%), recent rains to make it muddy (another 30%?), ruts because the rain made it soft (10% more?), grass that grew up during the wet spring (25% on top of that?), and the calculation loses validity, although the figure has to be very high. Come back a week later when the grass has died, the runway dried out and is hard as a rock, and volunteers shoveled in all the ruts.

Allow for Gradient

Small amounts of up or down gradient significantly change takeoff distance. The runway here in Telluride looks pretty flat, but it

isn't. Takeoff either way, and you have a 1.9% down slope to a runway center 87 feet lower than both ends. That almost unnoticeable slope reduces takeoff roll by around 10%. A 4% downgrade reduces takeoff roll by close to 20%. A 6% slope, which looks very steep indeed, reduces takeoff roll 28%. Conversely, trying to takeoff uphill increases takeoff distances half again as much as downhill decreases them.

Finally, the Effect of Headwinds

Sitting at home trying to decide whether or not you can use a runway, you have to assume the worst likely conditions, which is a hotter day that you really expect, and calm winds. Standing on the runway getting ready to go, you can factor in the wind. For the types of small planes flown in the back country:

- 10 knots headwind decreases takeoff roll 27%
- 15 knots headwind decreases takeoff roll 39%
- 20 knots headwind cuts takeoff distance in half!
- 25 knots headwind can... are you sure you want to takeoff in a 25 knot wind in the bottom of a narrow canyon or a top a high mesa surrounded by cliffs?

Conversely, because nearby terrain may dictate a downwind take off, you should anticipate noticeably greater increases in takeoff roll caused by tailwinds than decreases caused by the same headwind. I would hesitate to use any figure even for calculation purposes because the result is highly dependent on the speed the airplane accelerates, and the numbers are very different for different aircraft. The operator's manual may or may not offer you some help here.

This leads to the question of when is the wind strong enough to make it preferable to takeoff uphill? Leaving aside various possible calculations, it can generally be said that a plane taking off at the speeds of most small Pipers and Cessnas, you would be well advised to takeoff downhill even with a 10 to 15 knot tailwind rather than takeoff uphill. Regardless of wind direction, the downhill takeoff is typically towards lower terrain, while the uphill takeoff is into higher, rising terrain.

The Plane and the Pilot

How many of you flying single engine Cessnas have not added or contemplated adding a STOL kit? Who has not at least contemplated the STC that trades your 90 horsepower Super Cub engine for a 150, 160, or 180 horsepower engine? Your 145 horsepower Cessna 170 engine or 150 horsepower Cessna 172 engine for 180 (or more) horsepower? The 230 horsepower engine in your Cessna 180 or 182 for 260 or 300 fuel injected horsepower? Who has a non-standard propeller? Has everyone visited the Wing X STOL wing extensions web site? How many of you have replaced the stock 600x6 tires with 800x6 or even larger tires? Obviously, your plane's performance is no longer going to be what the manual says it is.

By far the biggest improvement you can make to reduce takeoff distance of any airplane is simply to lighten your payload. Fly at no more than 80% or 90% of gross weight and you have a whole new plane. Consider ferrying half your load from a longer, nearby field and coming back for the rest on a second trip.



Departing Happy Canyon, UT...

I think it is pretty safe to guess that at all of the members of this particular organization fly or wish they were flying airplanes that takeoff in much shorter distances that the operator's manual claims. My best guess made by looking at markers along the side of the

runway is that my Cessna 172 trainer with a bigger engine and a STOL kit has a nearly 25% shorter takeoff roll than the standard airplane it once was. Really radical modifications can produce a better result than that.

Knowing that certainly makes my knuckles nearly 25% less white and my palms 25% more dry as I turn downhill to depart my neighbor, Todd Wilson's, steep 1200 foot strip. But since I can't say with absolute confidence just how much shorter the takeoff will really be, I still use the book figures for calculation purposes. (In fact, my charter certificate requires me to calculate it that way.) Ideally, I would not want to takeoff from a runway less than twice my calculated takeoff distance. Let's just add that to the very long list of things in life that I really wish were true. It isn't always going to happen. Perhaps I might settle for 1,000 feet of extra distance beyond the calculated takeoff distance? Add that one to the wish list as well.

To actually achieve the maximum improvement that STOL modifications can produce, you might have to change the takeoff technique from what the manual specifies. In its stock configuration, the manual says my plane achieves its shortest takeoff roll with no flaps (but also says that with 10 degrees flaps for a soft field takeoff, the ground roll is shortened by 10% while obstacle clearance is worse. Take your pick.) Experimenting on a long runway has shown that with the bigger engine and STOL kit, the shortest takeoff distance and the best obstacle clearance are both achieved with 15 degrees flap with a heavy load and perhaps 20 degrees flaps with a light load. Anyone with a modified plane would do well to experiment cautiously some day on a long runway to see whether or not different procedures work better.

Pilot skill is a huge factor in actually achieving the takeoff distances all these admittedly inaccurate calculations suggest are possible. Nearly 2000 hours, that is to say almost half, of my flying time has been in Cessna 172's. All else being equal, my takeoff roll on a paved runway will be a good 10% shorter than the best effort of the student pilot sitting beside me in the same airplane. Both these distances would be pretty close to the book figures if it were a stock airplane. The difference when flying a turbo Bonanza would be less, in part because I have only a couple of hundred hours experience in those, and with twice the horsepower, they pretty well get airborne when they are ready, regardless of the pilot.

On soft, bumpy dirt, my best effort in a Cessna could well produce a takeoff roll only 2/3rds that of one of my low time student pilots, and on occasion I am inclined to say it could even be half their distance. Why is that? I have a pretty good feel for that particular make and model plane, so I have a pretty good sense for how much back pressure on the yoke will unstick the nose wheel, and precisely what attitude will keep the nose wheel just out of the dirt without having the angle of attack too high to accelerate efficiently. With a couple of thousand hours experience in type, it is much easier for me to precisely hold the pressures and attitudes I know I need. Lest anyone think I am just admiring my own skill here, let me say that without question, in a Super Cub, a plane in which I have very little experience, the owner could achieve a substantially shorter takeoff distance than I could, and do so with far less drama.

Be honest with yourself. If you have done quite a few takeoffs from soft surfaces in your plane and they feel pretty consistent, then you very likely will achieve something like the calculated figures predict. If you just bought the plane and are transitioning into it from something different, then add on some extra distance until you are confident of the numbers.

Landing distance is also very much a factor of pilot ability. Without even considering such heroics as dragging it in behind the power curve with a lot throttle holding you in the air, a very short landing distance over an obstacle can be achieved by just getting the air speed on short final exactly where it needs to be and not 1%

faster. A very soft touch down on a very rough surface can be accomplished if the pilot applies just a touch of power at just the right instant, but not enough to increase the floating distance. The key here is how much of a touch "just a touch" is. A pilot very experienced in that particular airplane probably intuitively knows the answer.

The Actual Takeoff

Assuming flawless pilot technique (which we all no doubt demonstrate) we are still faced with the fact that our takeoff distance calculations are based on some unsure and probably faulty assumptions. How soft is that dirt again? How steep is the downhill gradient? What did we guess the wind speed was? Will the wind change during the takeoff roll? (Yes, it always will...) How much does that last backpack weigh? What does that last passenger weigh?

Admitting ahead of time that you don't really know just what the takeoff roll will be means that you have to have it in your mind that you might have to abort the takeoff. One simple way to help with this on a short strip is to note precisely where the middle of the runway is, or even place a little marker there before you try to take off. On a longer strip, you might place this mark at about the point where you are going to have to start applying the brakes if you are not airborne.

Depending on who you ask and the type of plane, you should have reached between 60% and 70% of takeoff speed by your midfield marker. If you have not reached that speed, abort the takeoff and try again. Note that this is actual takeoff speed, which you know from previous experience; not just the rotation speed (V_r) you read from the manual. (Actual takeoff speed is probably a little faster than V_r unless your plane has STOL modifications.)

If you takeoff towards a row of trees or some other obstruction, you are going to have to move your decision point some distance further back based on what you calculate your climb angle is going to be. Remember, those same factors that doubled your takeoff distance will approximately cut your climb rate in half and slightly increase your ground speed. The obstructions can come up pretty quickly.

Two Step Summary

The first step happens when you are planning the trip and involves a series of calculations that determine whether or not the strip is long enough to land and takeoff with your plane on the day you intend to be there. These are not precise calculations and should not be treated as though they were. Therefore to the maximum calculated takeoff distance, you should add a safety factor. Some people suggest another 20%. Some suggest 50%. I would be very happy to have double. Some add a specific distance like 500 feet or even 1,000 feet more runway. Your previous experience with your airplane is going to tell you which of these is best for you.

The second step is reminding yourself that if the takeoff is not going the way you anticipated, you have to be ready to abort before you run out of room.

In both steps, being too conservative is never wrong. Being too optimistic might be. If you make a couple of takeoff attempts and have to abort, it is not time to give it one more try. It is time to formulate an alternative plan. That might be as simple as waiting for evening and cooler temperatures. It might be as difficult as flying out your load in more than one trip. In the very worst imaginable case, it might involve driving to the plane with a big flatbed truck and hauling it out. Even that is far preferable to almost - but not quite - getting airborne with no more runway in front of you.

Despite the obvious dangers, backcountry flying has a very admirable safety record. Part of that safety comes from sharing information with each other. Let's keep the dialog going.

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Air Mail to Master Pilot:

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The internet address for the UBCP's web site is www.UtahBackCountryPilots.org. The searchable database of Utah's back country airstrips is now fully functional. If you have corrections, additions, photos, or additional comments on the airstrips, please e-mail them to Margarite Hargrave hargrave@halcyon.com. She will add them to the database.

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