

## Abstract

Test water vapor retrieval using GPS signal occultation.

-  [UWKA flight planning and tracking tools](#)
- [Convert Google Earth points to way points](#)

Date	Flight # (*.kml)	Status	Times (UTC)	Hours	Crew/Notes
24 Feb 2020	RF06	Round trip from Laramie past Winner, SD. Diverted off path on return leg by ATC. V channel on 2D-S often unusable.	2300-0251	3.9	<b>T Drew</b> M Vergalla D Plummer C West
23 Feb 2020	RF05	Round trip from Laramie to Winner, SD	2231-0144	3.3	<b>B Wadsworth</b> P Tarantino D Plummer M Vergalla
23 Feb 2020	RF04	Cody, West Yellowstone, Laramie	1707-2026	3.4	<b>B Wadsworth</b> P Tarantino D Plummer M Vergalla
22 Feb 2020	RF03	Round trip from Laramie to Kimball, SD	2339-0317	3.7	<b>E Sigel</b> Bryan Chan L Oolman

## Order MONARK Data

- Flight Notes
- King Air 1 Hz netCDF files
- King Air 1 Hz ICARTT files
- King Air high rate 10 Hz netCDF files

## User Information

- Planning Chart
- EOL Facilities
- Software Repository
- Projects & Data Requests
- Planning and tracking tools

					P Tarantino
22 Feb 2020	RF02	Round trip from Laramie to Kimball, SD	1728-2038	3.3	<b>E Sigel</b> M Vergalla L Oolman P Tarantino
21 Feb 2020	RF01	Round trip from Laramie to Winner, SD. No PCASP measurements. Licor flow meter switch initially turned off.	2326-0211	2.8	<b>B Wadsworth</b> M Vergalla D Plummer B Chan
20 Feb 2020	TF01	CRL alignment and wind calibration circles	2041-2214	1.7	B Wadsworth M Vergalla D Plummer B Chan
Flight Hours		As of Feb 24, 2020, 22.1 out of 24 hours were flown, 1.9 remain.			

 Facility User's Guide

## Facility Instruments

-  In Situ
-  Wyoming Cloud Radar
-  Wyoming Cloud Lidar

## Contact

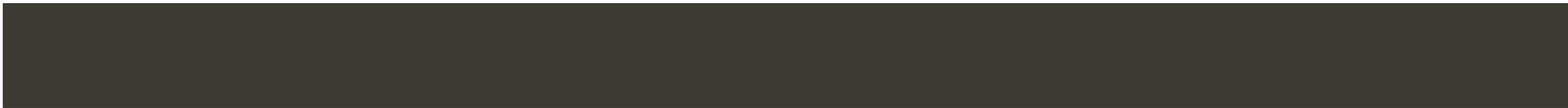
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Facility Manager:

**Jeff French**





2/24/2020 Pilot notes (RF6)

**Crew:** Drew, Plummer, Vergalla

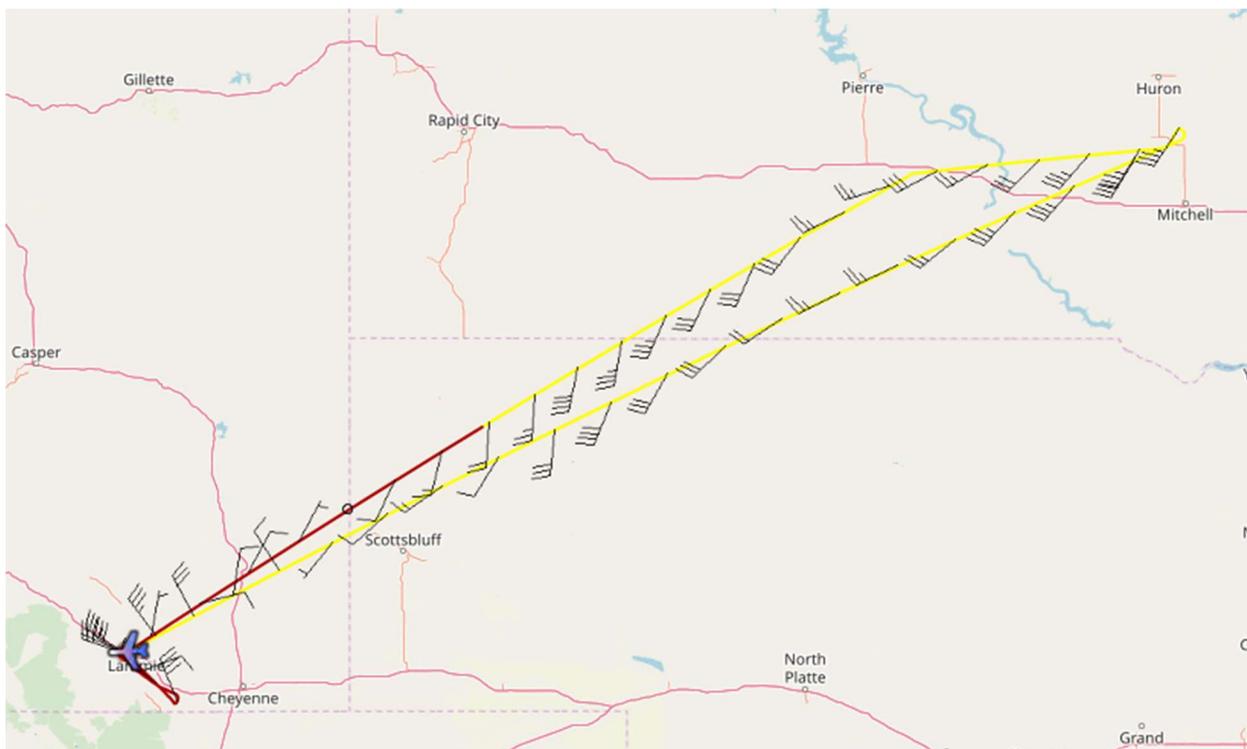
**Flight Time:** 3.9

**Planned:**

Fly from Laramie (KLAR) to Winner VOR (ISD) at FL 270. Turn around and fly back to Laramie.

**Actual:**

Flew to Winner VOR and then 80 nm past. During the turnaround, Minneapolis Center sent us around the north side of the MOA, then direct KLAR. Stayed at FL 270 until crossing KLAR then descended enroute to ICEDU for the RNAV 30 approach.



## 2/23/20 Pilot notes (RF5)

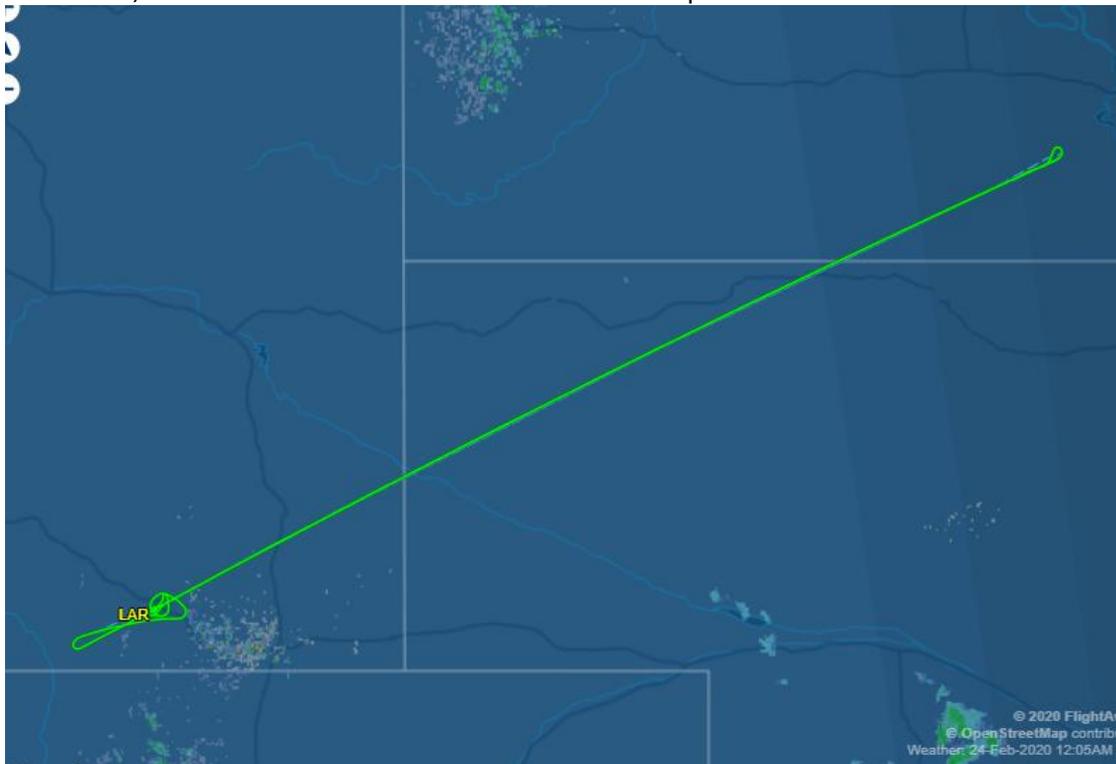
Crew: Wadsworth, Tarantino, Plummer, Vergalla

Flight Time: 3.3

Planned: Fly direct KLAR-ISD return. FL270.

Actual:

Fueled the aircraft to mains + 65/ side. Had plenty of fuel for the flight. Weather was great. Just prior to reaching ISD, the PI asked to extend past it. We were still under Denver control but 20 miles into Minneapolis airspace. I did not want to screw with the arrangement already made between the controllers, so I told him it was too late and we turned as planned.



Coming back to Laramie, we needed to extend a bit to the SW at FL270 to capture the last couple of ROs. Denver gave us FL270, all quadrants around LAR. Then when complete, coordinated a descent back toward KLAR, all quadrants for maneuver to below 18000. Weather was great so took the visual to RWY 21.

Easy day.

## 2/23/20 Pilot notes (RF4)

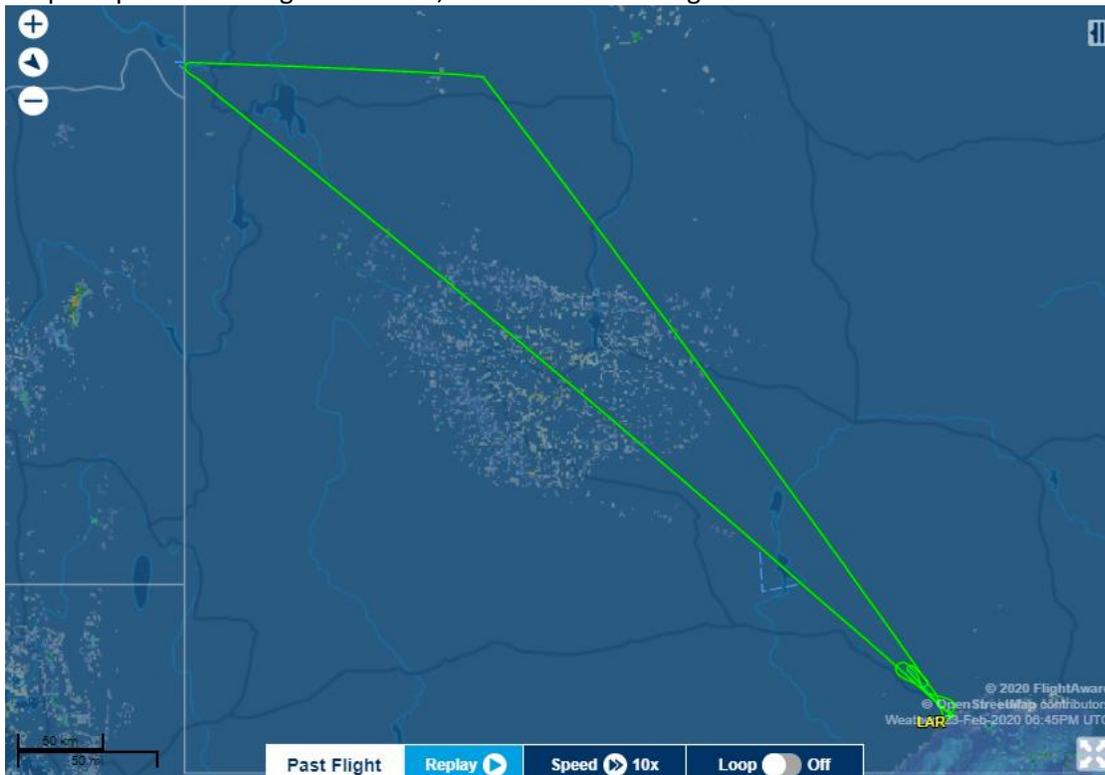
Crew: Wadsworth, Tarantino, Plummer, Vergalla

Flight Time: 3.3

Planned: Fly direct KLAR-COD-KWYS-KLAR at FL270.

Actual:

Fueled the aircraft to mains + 65/ side. Had plenty of fuel for the flight. Weather was great. Pressurization was a little better in the aircraft today. Cabin altitude topped out at 8500. Again had to keep the power a bit high in descent, but was more manageable



Along with maintaining a constant altitude (270 the wrong way to KWYS), they commented that they want to minimize speed changes. At FL270, you can't get to 160 kias with the vanes out, so I have been maintaining 150 kias which you can do with vanes in or out.

Easy flight. Great scenery.

2/22/2020 Pilot notes (RF3)

Crew: Sigel, Oolman, Chan and Tarantino

Flight Time

Planned to fly direct from Laramie (LAR to Winner VOR (ISD) at Flt Level 270 Make a 180 degree turn and fly back to Laramie we may slow down on the way out or back and we make extend the flight a bit over ISD.

Actual

I took the same fuel load. Mains topped and 65 aside in the AUX.

Standard climb out this time the last 2 thousand feet took a long time. We averaged about 100 feet per minute.

Flew to Winner and then past for a few miles and made a 180 degree turn to the left.

Encountered very small clouds enroute.

VFR at Laramie made a visual approach to 03 put the gear and flaps down on a normal schedule. Pressurization is really leaking and it's preventing the pilot from pulling much of the throttle. No wright ups on the aircraft.

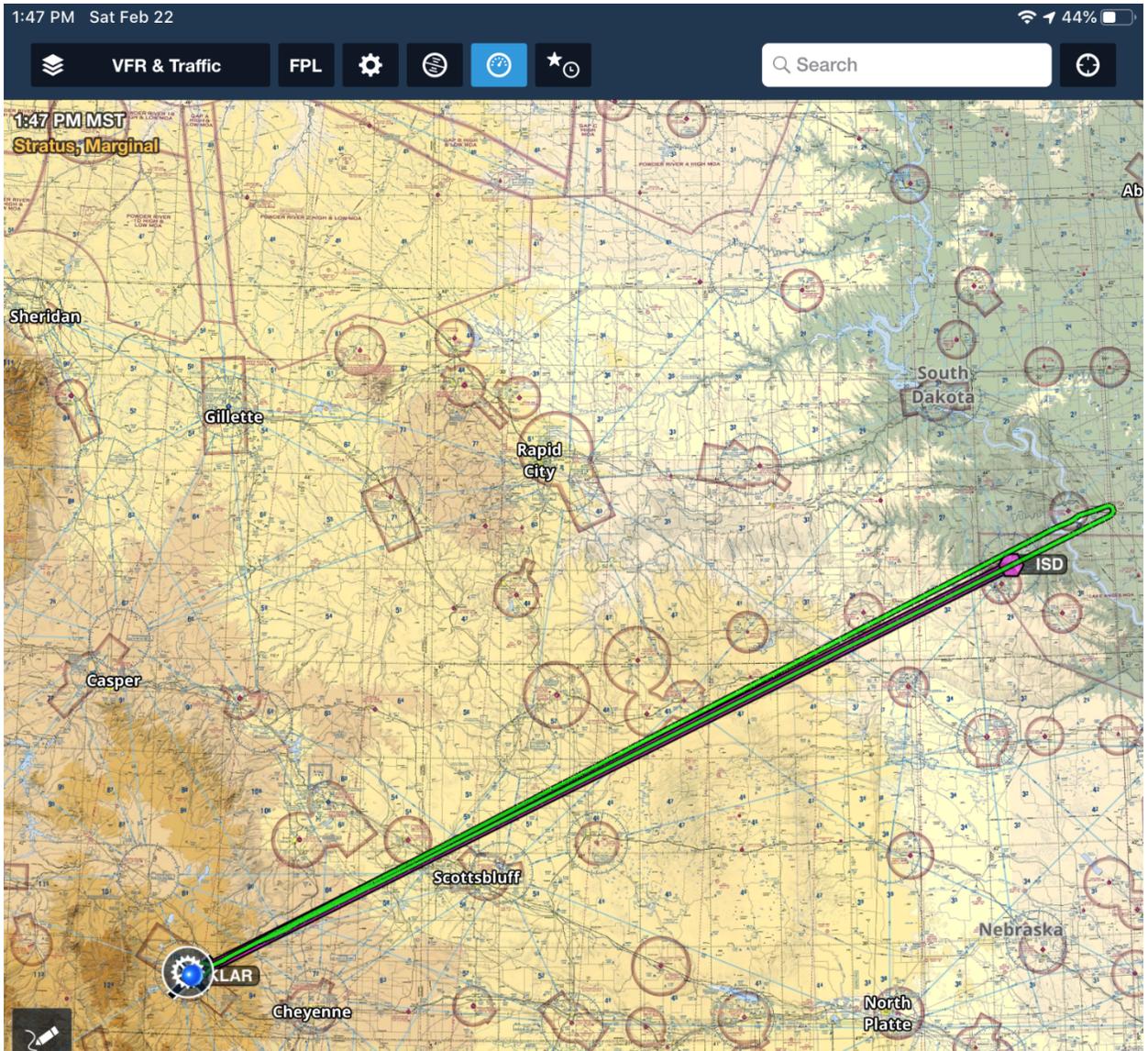


Figure 1 RF02

2/22/2020 Pilot notes (RF2)

Crew: Sigel, Oolman, Vergalla and Tarantino

Flight Time

Planned Fly direct from Laramie (LAR) to Winner VOR (ISD) at Flt Level 270, make a 180 degree turn and fly back to Laramie.

Actual

Just to be on the conservative side I put on a bunch of fuel. We had cool weather and wind provide good performance so I fueled Mains Pulse 65 aside in aux.

No trouble climbing out. Not the best performance but not exceptionally bad. There were almost no clouds in the sky and it was not turbulent.

Flew to Winner and then past for a few miles and made a 180 degree turn to the left.

Pressurization held up well one small problem. If I had pulled back the throttles above 180 the pressurization started to climb rapidly. I never saw it climb over 8000 feet. Coming in to Laramie we started down late and needed to get down. Over Laramie I dropped the flaps at 160 feet and the gear at 140. Made a midfield cross wind and was on glide over the gas stations. Aircraft ran well.

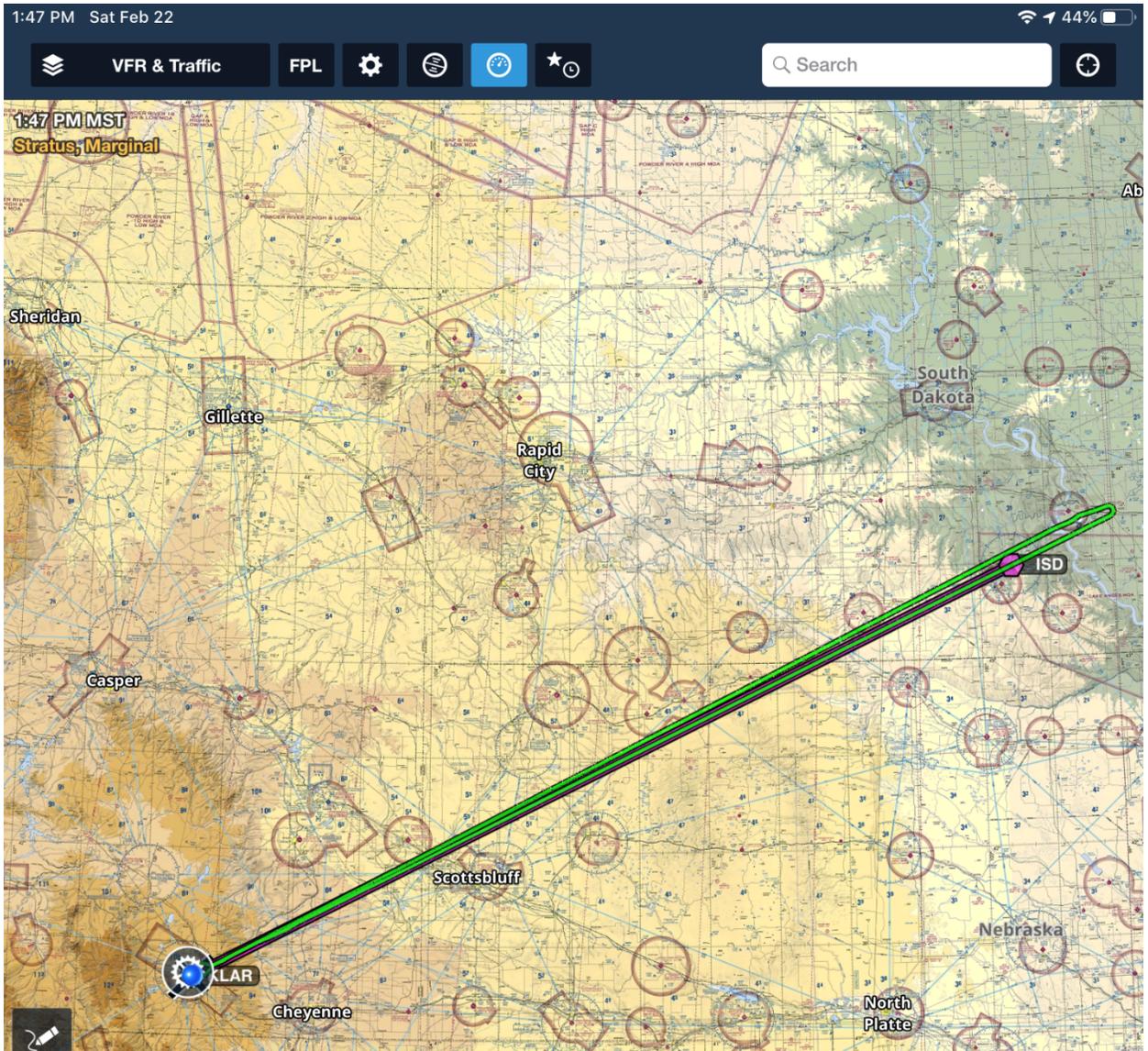


Figure 1 RF02

## 2/21/20 Pilot notes (RF1)

Crew: Wadsworth, Vergalla, Plummer, Wang

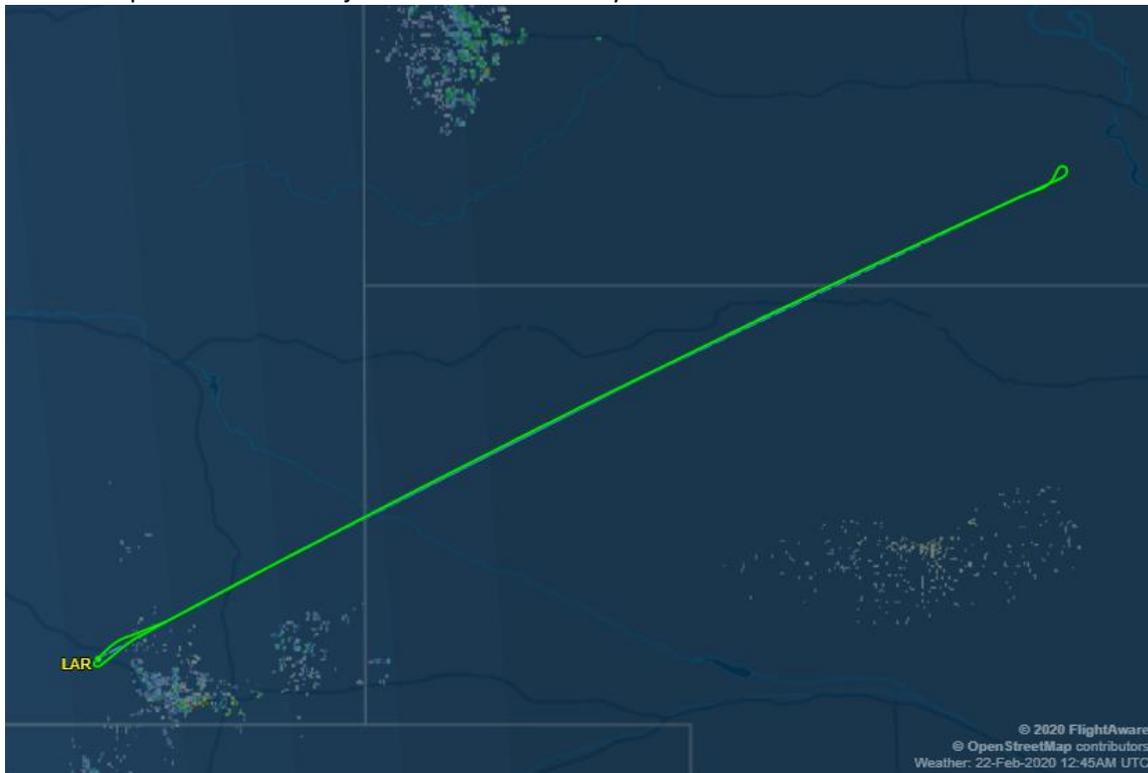
Flight Time: 2.8

Planned: Fly direct from KLAR to ISD (Winner VOR) at FL270, reverse & return to Laramie.

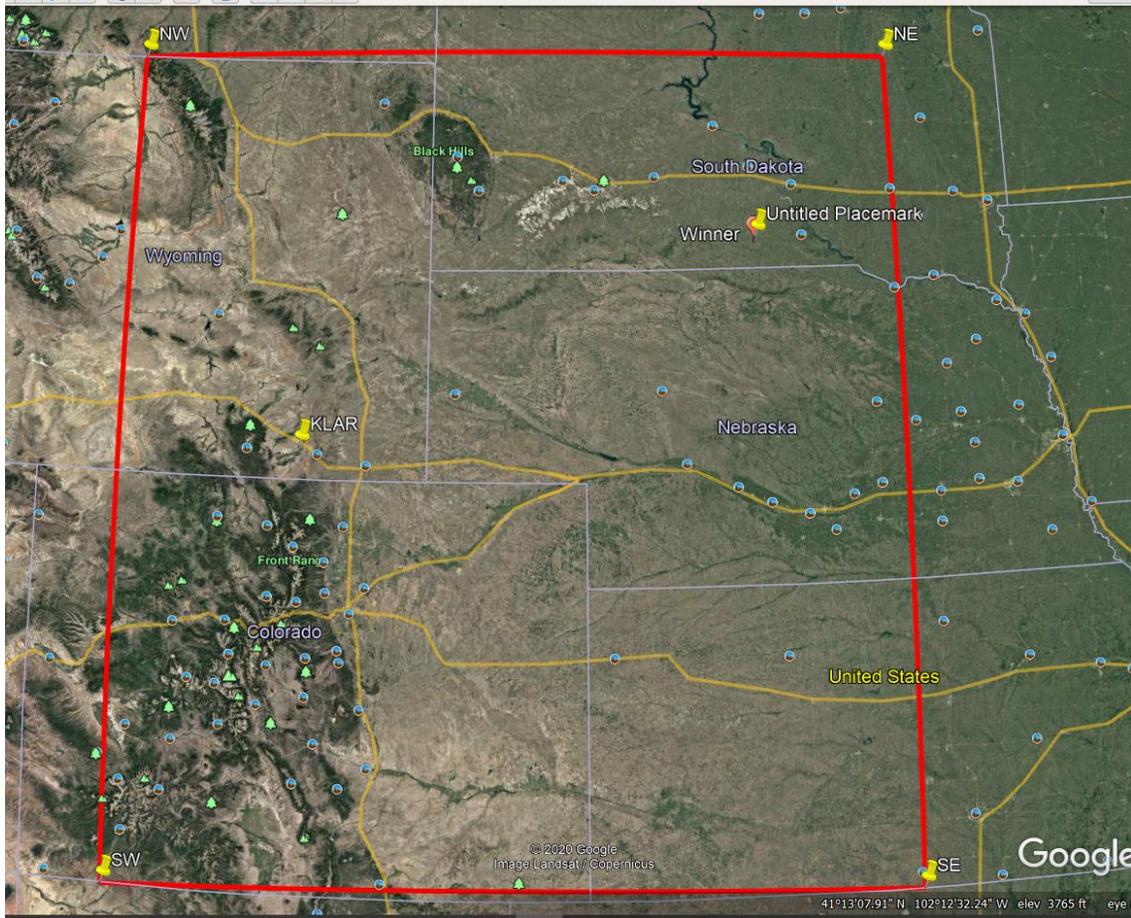
Actual:

Fueled the aircraft to mains + 65/ side. Had plenty of fuel for the flight. May consider reducing the fuel load to help get to altitude easier. Climb rate around 600 – 700 fpm for the last 3000-4000 feet. Weather was good. Only one thin band of clouds encountered early in flight along eastern Wyoming. Denver Center kept control and didn't pass us off to Minneapolis Center as we only went into their airspace about 25 miles.

Pressurization was a little better in the aircraft today while the power remained high. But, at FL270 with power reduced even a bit to slow to 140 KIAS, the cabin would climb. For the descent, had to keep the power around 1300 lbs/side to minimize pressure loss. Cabin eventually got to 10,500 feet before had descended enough so the pressurization started to improve. I had laid the oxygen mask in my lap and took a couple shots of 100% just to be sure. No way to run a railroad.



The airspace limit for the LIDAR box with with pins at LAR & ISD on Google Earth below.



Some suggestion that they may want to spend an extra hour airborne in some of the upcoming flights.. Possible to extend the track about 80nm further past Winner on about the same path. A direct route from KLAR to HON (Huron VOR) will stay in the LIDAR box and extend the length out to 370 nm (one-way). An alternative is to fly the aircraft at 140 KIAS instead of 160. The PI's are good with that.