Test flights to collect eddy covariance measurements using a CO2/CH4 Picarro analyzer
University of Wyoming King Air Research

Summary

A set of flights based in Laramie to collect eddy covariance measurements over the Pawnee National Grassland in Colorado, using a 10 Hz CO2/CH4 Picarro gas analyzer.

Links

- Weather briefing information and real-time chat instructions
-  UWKA flight planning and tracking tools
- Convert Google Earth points to way points

Date	Flight # (*.kml)	Status	Times (UTC)	Hours	Crew/Notes
23 Sep 2020	RF02	Measurements collected along the N-S track at 300', 500', and 700' AGL, and the E-W track at 300', 400', and 500' AGL, with a vertical profile before, between the two, and after.	1757-2114	3.2	E Sigel D Caulton D Plummer
		Measurements collected during three sets of passes at 300', 500', and 700' AGL, with a			

Order FLUX Data

- King Air 1 Hz files
- King Air high rate 10 Hz files
- King Air high rate 25 Hz files

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18 Sep 2020	RF01	vertical profile before and after. **Note:** Systems testing for this project was incorporated into DILBERT-20 RF02, Picarro and other test data may be accessed under that project.	1906-2108	2.2	B Wadsworth D Caulton D Plummer
Flight Hours		As of Sep 23, 2020, 5.4 out of 6 research hours were flown, 0.6 remain.		Test and Ferry: 0.0	

Facility Instruments

- In Situ
- Wyoming Cloud Radar
- Wyoming Cloud Lidar

Contact

Mailing Address:

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Facility Manager:
Jeff French

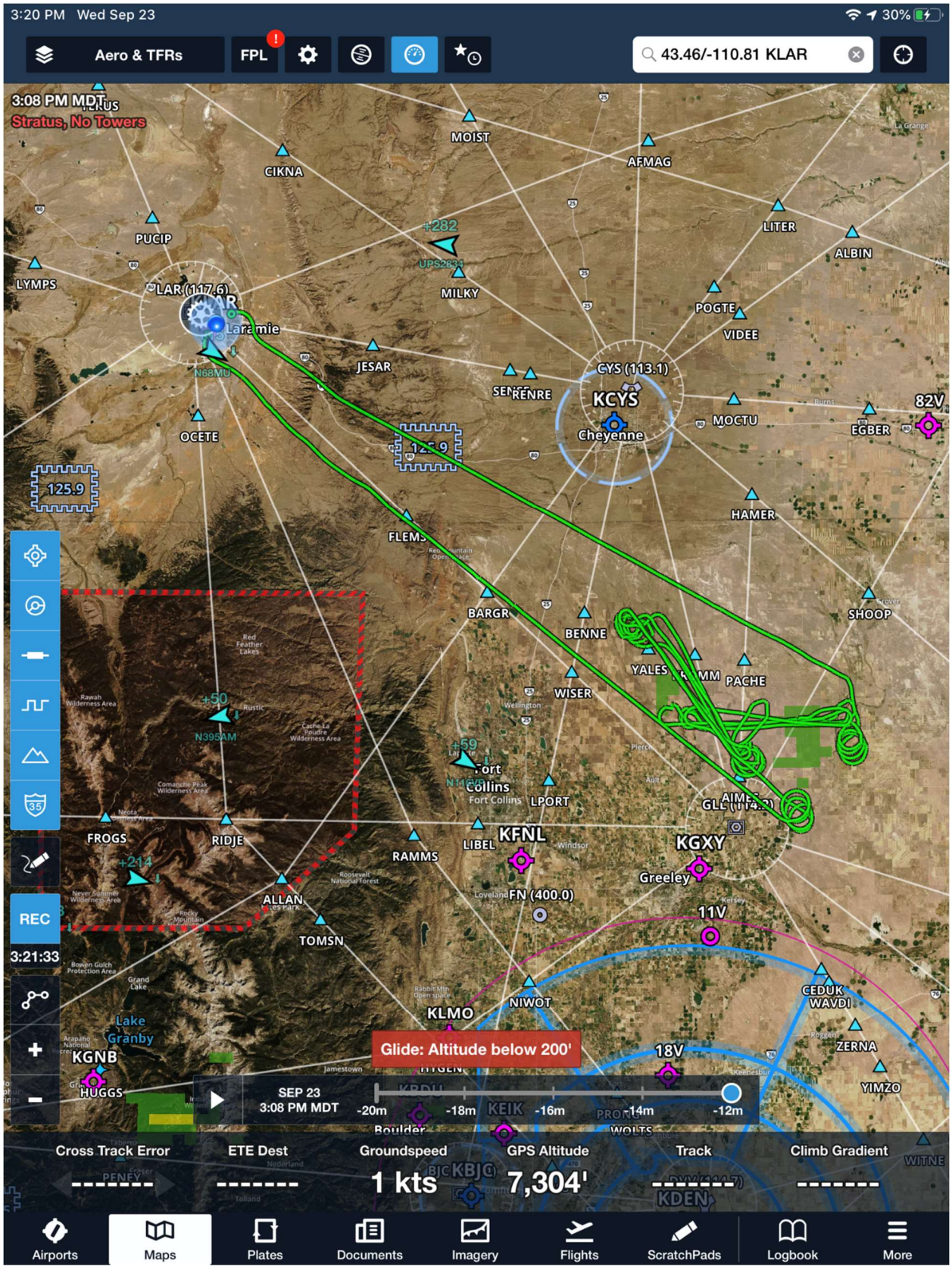
9/23/20 FLUX-20 Pilot notes (Research Flight 2)

Crew: Sigel, Caulton, Plummer

Flight Time: 3.2

Planned: Track 1. Depart LAR Fly to FLX 2 Spiral descent from 15'500 MSL down to 1000' AGL. First track at 1000' AGL to look for obstacles, then 700', then 500', then 300'. Track back and forth between Flx1 and Flx2. Spiral up on last leg of over Flx2. Start Legs between FLX3 and FLX4 at 1000' AGL and then spiral up on FLX4 to 10,000 AGL. Head home.

Actual: Picked up VFR Flight Following to FLX2 planned to fly at 15,500' MSL but stopped at 13,500 because of clouds. Visibility was pretty good there was a bit of smoke. Reaching FLX2 we spiraled down and canceled our Flight Following. At 1000'AGL we started between FLX2 and FLX1 we stepped down to 700 AGL and the 500, 300. We made two passes at each attitude. I did do a bit of maneuvering to keep distance from houses and barns. Mostly at the end of each leg. After reaching the end of a leg at 300' FLx1 we spiraled up. Dana was looking for 15,000' but we could not get there do to a broken layer above. She settled for 14,500 MSL. We proceeded to FLX3 and spiraled down to 1000' AGL and continued our legs between FLX3 and FLX4 with step downs. 1000', 500', 400' and 300'. At the end of a 400' leg we spiraled up to 15,500. We were able to do this, due to a large break in the broken layer. I descended down to 12,500 and picked up VFR Flight Following and returned to Laramie. There were a few cows and bird nothing seemed bothered. The aircraft worked well.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30%
Aero & TFRs
FPL
43.46/-110.81 KLAR
3:08 PM MDT
Stratus, No Towers
MOIST
CIKNA
AFMAG
PUCIP
LITER
ALBIN
LYMPS
MILKY
POGTE
VIDEE
LAR (117.6)
Laramie
JESAR
CYS (113.1)
KCYS
Cheyenne
RENRE
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OCETE
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BENNE
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YALES
PACHE
WISER
FROGS
RIDJE
RAMMS
LIBEL
KFNL
KGXY
Greeley
LPORT
Fort Collins
ALLAN
TOMSN
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KGNB
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18V
YIMZO
Glide: Altitude below 200'
SEP 23
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-18m
-16m
-14m
-12m
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Groundspeed
GPS Altitude
Track
Climb Gradient
1 kts
7,304'
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Project: FLUX-20
23 September 2020

Flight: RF02

Notes:

Second and final flight for this project. Research measurements along both the N-S and E-W flight tracks, with three vertical profiles interspersed. Altitudes of 700'-500'-300' AGL were selected again for the N-S track, with 500'-400'-300' AGL for the E-W track.

Crew: Wadsworth, Caulton, Plummer; LOD: West

Flight Summary:

UTC Comment

1807 Wheels up.

1816 Initial climb planned to 15.5 kft, but descended to 13.5 kft to keep under clouds developing at top of BL.

1828 Begin descending vertical profile at S end of N-S track

1840 At S end of track, doing overpass to assess track and obstacles. Much better visibility compared to RF01.

Begin first set of research legs on N-S track

1848 Begin first pass heading north to south, 700' AGL.

1855 Second pass, 500' AGL.

1903 Third pass, 300' AGL.

Second set along N-S track. Maneuvering off track before lining up.

1914 First pass, heading south to north at 300' AGL.

1923 Second pass at 500' AGL.

1930 Final pass at 700' AGL.

Vertical profiles between tracks.

1935 Begin ascent at N end of N-S track, targeting 14.5 kft to stay VFR. Head to west end of E-W track.

1948 Descending profile to ~1 kft AGL at west end of E-W track.

1956 Overflight of E-W track. Less obstacles noted compared to N-S track.

First set of research legs on E-W track.

2004 First pass, heading west to east at 500' AGL.

2011 Second pass, 400' AGL.

2017 Third pass, 300' AGL.

Second set of research legs on E-W track.

2023 First pass, heading east to west at 300' AGL.

2030 Second pass at 400' AGL.

2036 Final pass, 500' AGL.

2041 Ascend for final vertical profile, then head home.

2114 On the ground.

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Jeff French

9/18/20 FLUX-20 Pilot notes (Research Flight 1)

Crew: Wadsworth, Caulton, Plummer

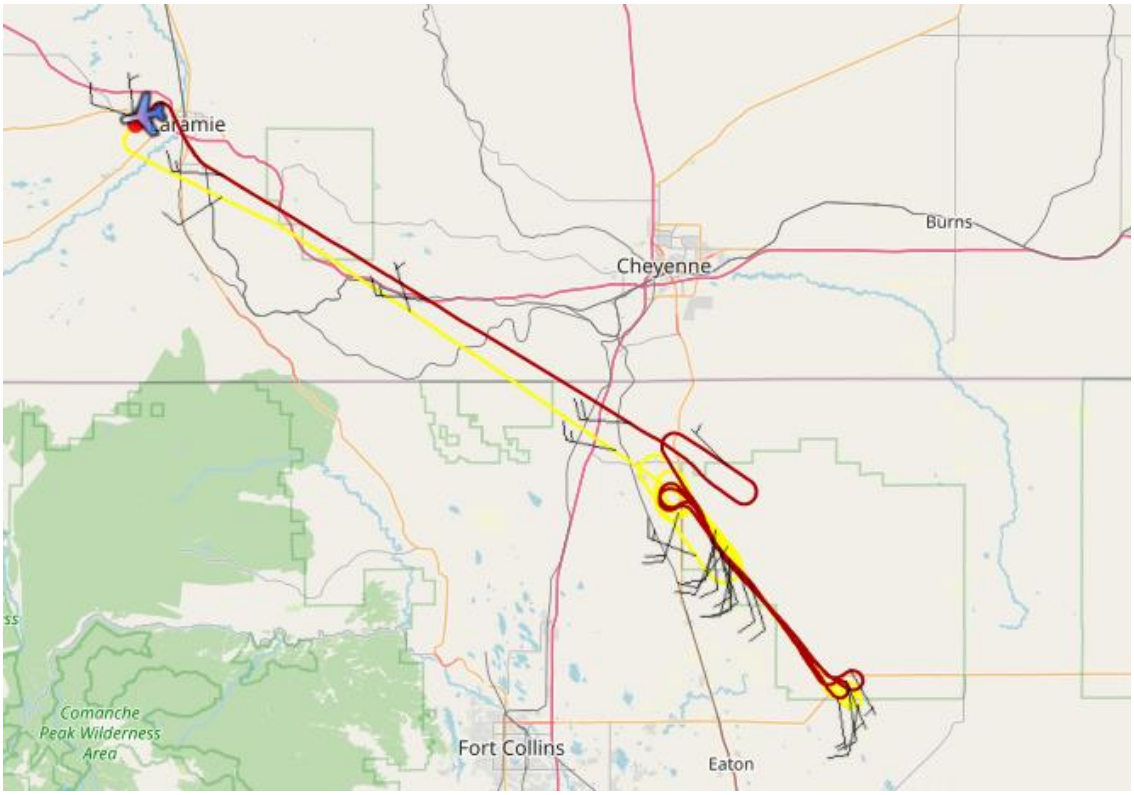
Flight Time: 2.2

Planned: Track 1. Spiral descent over the NW point from 10k' AGL down to 1000' AGL, do first trip on track at 1000' AGL to look for obstacles, then 700', then 500', then 300', then to do something else. Possibly track 3. Spiral ascent for a sounding, then go hom.e

Actual:
Filed a VFR flight plan up to 16,500' MSL. Not great visibility in smoke & haze. Got over the NW end of track 1 & did a spiral descent to 1000'AGL. Center had passed me off to Approach. Could generally talk to Approach at 1000', but when below that I missed a number of calls from them. Enough to piss them off and he sent me on my way with service terminated.

Two towers just nort of the north end of the track. One tower SW of the south end of the track. Some cattle along the route in fairly small groups. Only two groups of buildings to avoid along the track. A few more south of the south point. There was initially an airborne aircraft just below 1000' AGL about 5 miles south of the south point, but it eventually went elsewhere. Otherwise only saw a bird airborne.

Along the track, the request was to maintain roughly constant AGL altitude on each leg. Flew at 1000, 700, 500, 300, then 700 x2, 500, & 300. Climbed back up for a sounding to 15,500 , picked up flight following from Denver & came home.



Project: FLUX-20
18 September 2020

Flight: RF01

Notes:

First research flight for the project, focusing on the N-S flight tracks. Will do vertical profile descending from transit altitude, then repeated passes at 700'-500'-300' AGL, then prfile back to altitude. **Note:**The test flight for the project (flown 17 Sept) was funded under the DILBERT request, as it also focused on making LWC-301 calibration measurements.

Crew: Wadsworth, Caulton, Plummer; LOD: Glover/West

Flight Summary:

UTC Comment

1906 Wheels up.

1922 At north end of tracks, ~10 kft AGL (16 kft). ~15 minute transit time. Starting descent for initial vertical profile.

1932 Starting overpass of planned track at ~1 kft AGL. Poor visibility today due to wildfire smoke. Visually identified towers to 3-400 feet at north and south ends.

Begin first set of research legs. More terrain change on this track compared to E-W track, so will do 700'-500'-300' AGL.

1940 South to north at 700' AGL.

1947 Second pass at 500' AGL.

1956 Third pass at 300' AGL.

2001 Ascending temporarily per ATC request.

Second set of research legs.

2004 First pass, north to south at 300' AGL.

2011 Second pass at 500' AGL.

2019 Third pass at 700' AGL.

Final set of research legs.

2026 First pass, south to north at 700' AGL.

2033 Second pass at 500' AGL.

2040 Final pass at 300' AGL.

2046 Begin vertical profile at north end, then head home.

2108 On the ground.