03/30/22 Pilot notes (CHACHA22 RF 18)

Crew: Drew, Jeong, Robertson

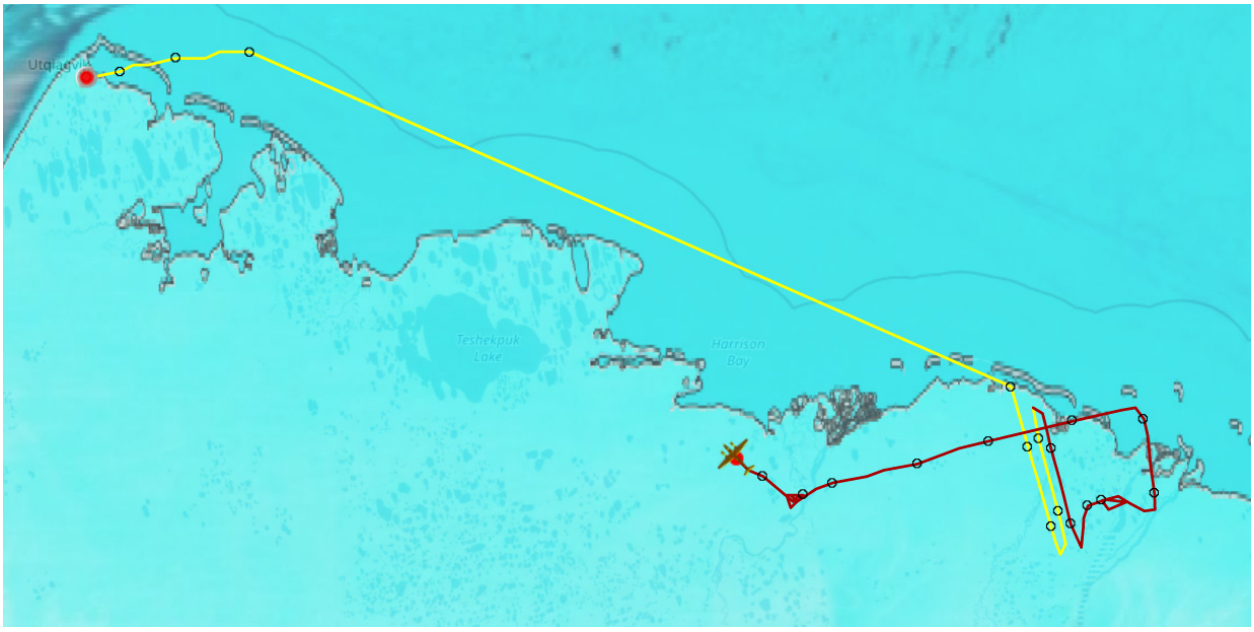
Flight Time: 3.6

Planned:
This flight includes two low approaches each at PASC, PAQT, and PABR, as well as three transects downwind and one transect upwind of the main oil field production area.

Depart PABR 30 minutes after N762JT. Ascend to 3000 ft, then descend to 300 ft. Head northeast over the Beaufort and then southeast over the Beaufort towards the PB area. Downwind of the oil production facilities, N2UW will transect three times at 300 ft for a total time of about 20 minutes. Make two low approaches at PASC. Resume 300 ft and fly the upwind leg at 300 ft.

Turn southwest toward PAQT for two low approaches. Resume 300 ft and head for PABR for two low approaches.

Actual: After departure and initial climb to 3000 ft. MSL, continued along the route at 300 ft. AGL. The wind looked good (almost perpendicular) for the transects, but decided to extend by a couple miles southeast on each. Climbed to pattern altitude and made two low approaches at PASC and continued to PATQ at 300 ft. AGL. Climbed to pattern altitude and made two low approaches at PATQ. Then continued to PABR at 300 ft. AGL. Finally, conducted another two low approaches at PABR and landed.



30 Mar 2022

RF18 System Scientist notes

Crew: Tom Drew, Anna Robertson, Daun Jeong

Objective: CIMS flight to sample over tundra and Prudhoe Bay oilfields, with missed approaches at PASC, PAQT and PABR.

Instrument notes:

RS232 issue - no pres9000, temppart, pres6140, kt1585, ktamb, palt, or wdpm

PCASP not working - sounds like this is also related to the RS232 card

PILS flow looks better today - Sara noticed a loose connection on one of the denuders so she flipped it around to try to put the crappy connection near a more stable mount

Flight notes:

2322 wheels up

2323 PCASP not communicating. Tried power cycling several times to no avail

2323 several pressure and temperature variables also not communicating

- from ground: issue with RS232 card

0041 out of first downwind plume according to CPC

0102 done with downwind legs, ascending to 1500 ft to prepare for PASC low approaches

0107 over PASC on first low approach, down to 70 ft

0111 over PASC on 2nd low approach, down to 75 ft

0114 starting upwind leg

0121 finished upwind leg

0143 over PAQT for first low approach - 70 ft

0147 over PAQT for 2nd low approach - 65 ft

0238 over PABR for first low approach - 60 ft

0244 over PABR for 2nd low approach - 65 ft

0248 wheels down

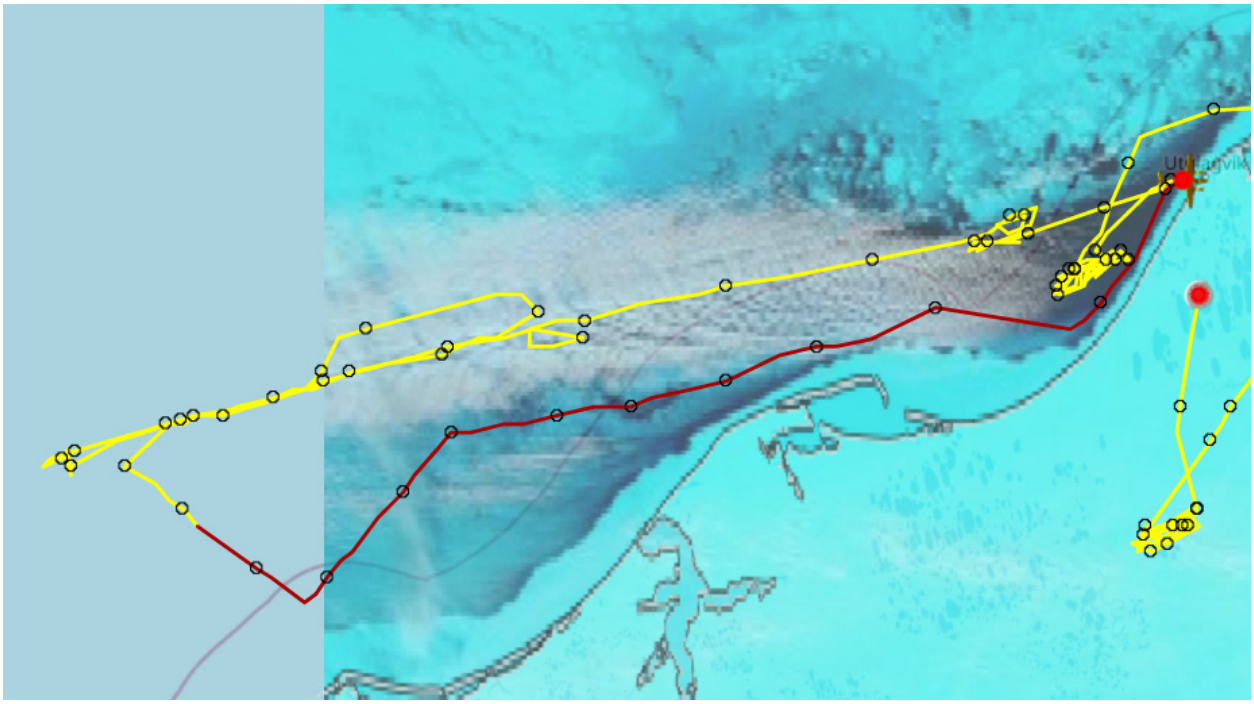
03/29/22 Pilot notes (CHACHA22 RF 17b)

Crew: Drew, Woods, Robertson

Flight Time: 3.3

Planned: Depart and climb to 3000 ft. followed by descent to 300 ft. AGL. Fly direct to the windward waypoint and spiral up to 10,000 ft. MSL. Drop a sonde then move downwind over the cloud field to second point and drop another sonde. Continue to the third waypoint and drop third sonde. If needed offset to the clear air south and spiral down to 300 ft. AGL. and identify cloud layer altitude. Return to the drop line axis (NE-SW) and fly back to second drop point at cloud level and return to third drop point. Then fly to the south to sample outside main lead cloud area. Then return on south side of lead clouds at 300 ft. AGL

Actual: Departed and climbed to 3000 ft. followed by descent to 300 ft. AGL. Flew direct to the windward waypoint and spiral up to 11,000 ft. MSL. Dropped a sonde and after orbit descended to 10,500 MSL for the transit and flew downwind (SW) over the cloud field to second point and dropped second sonde from 11,000 ft. MSL. followed by an orbit. Dropped back to 10,500 ft. MSL for the transit, and then dropped a third sonde from 12,000 ft. MSL. Spiraled down to 300 ft. AGL at the sonde location. Reversed course and flew back to the second drop point along the drop line axis (NE-SW) at cloud level after a porpoise survey. Reaching second drop point reversed course (about a four nm offset to the north) and proceeded SW again. About half-way back to third point decided to return to main axis line (four nm south.) Then flew to the south to sample outside main lead cloud area making one survey porpoise at the beginning of the leg. Then returned to edge of cloud field (of satellite image) on south side of lead clouds at 300 ft. AGL back to near shoreline. Tried to stay over open water back to Barrow, but found it difficult with a lot of floating ice in the area. Not until reaching the north half of the Barrow bay area did we encounter ice-free open water.



30 Mar 2022

RF17b System Scientist notes

Crew: Tom Drew, Anna Robertson, Sarah Woods

Objective: Cloud flight targeting the Chukchi lead with 3 dropsonde launches.

Instrument notes:

Check PCASP desiccant at end of flight

PILS flow was dropping into the negatives after spiral and reaching 10k ft. But fixed itself after a while ?

Dropsondes still not connecting while in launch tube

Ask Cory about better sealing Rogers scarf tube plate - heard whistling noise in-flight

Pyranometer lenses

Purge 2DS - 2DS windows fogged

Flight notes:

0132 wheels up

0141 reached waypoint 1, starting spiral up

0155 first dropsonde launch

0217 second sonde launched

0220 visible brownish haze layer on all sides but can't tell what altitude. Seeing some higher concentrations on PCASP and CPC (up to 600 on PCASP, up to about 250 on CPC and 200 on POPS)

0222 heading to 3rd dropsonde point

0232 in a different air mass now according to CPC/PCASP data (CPC up to 500, PCASP < 100)

0236 climbing to 12k ft for sonde launch since last 2 haven't picked up GPS until around 8800 ft

0239 launched 3rd sonde

- picked up GPS at 9800 ft

0241 started spiral down

0249 switched to CVI

- POPS flow only increased to about 6.5 cc/s so left it alone

0325 only H channel available from 2DS at this point, windows fogged up - needs to be purged

0340 Back on Rogers inlet

- POPS flow only dropped to 3 cc/s so left it

0449 wheels down

2022-03-27b KA Science Flight for CVI (From PABR)

Config: Standard for CHACHA cloud flights: CIMS off, all others operational. Rogers for takeoff/landing, CVI for cloud sampling

Crew: Tom, Anna, Sarah

Obj: Barrow lead sampling

Preflight Check Summary: No known issues. Clean CVI tip. Increasing cone & pylon deice from 8 to 30 C on setpoint. 60 min warmup for counterflow heater. Start from zero power in hangar on turn around, flows happier. Andrea & Sara tended to PILS & Drum. Daun capped CIMS.

TRF	-21 C
Zrad	4.26 ft
RH	50 %
Pa	-236 kft

Conditions: windy (from north), clear skies, some lead clouds visible from shore

On startup, 2DS element voltages low, have Cory clean windows, still kinda low though

0127 UTC Engine start

012903 am Start PILS software, Run# 88, tip temp 98

0130 UTC taxi (1730 local PBAR)

0131 PILS & DRUM pumps

No engine runups

0133 Takeoff UTC (on Rogers inlet)

0135 Drum advance after climb out

CVI, 2D-S TAS tracking

PILS tip temp 98, LFE flow 9-11

Tops 1100 ft

Transit VFR at 3kft from Barrow to approximate lat/long of nearest edge of cloud field determined by Sara Lance (P1)

0137 clipping lil seasmoke and ice fallout from puffy cu above at 300 ft, -20C, can see seasmoke almost reaching hazy scuddy bottoms of clouds out window. Sfc has ripples and ice slicks, small ice flows

At P2, spiral up from lowest altitude to 10kft, confirming cloud top & bottom heights.

0141 jog drum as begin spiral
0151 clip cloud on ascent, mixed phase 1kft, tops ~1500 ft

PILS LFE reading hovering 1 to -5. Checked traps – middle was slightly loose, but not bad.. don't see any other issues..

0155ish Drop upwind dropsonde into open water of lead, upwind of lead clouds. Had to climb to 11kft to drop since it didn't acquire lat/long in tube. Acquired lat/lon at about 8800 ft, so might need to climb a little higher next time.

0157 PILS LFE back positive as we wait on sonde

Sonde: 1kft- RH start peaking to 100% till ~500 ft, so didn't get sonde fully upwind of cloud

0159 Transit downwind along spine of cloud field at 10kft, surveying cloud & lead extent.

0216 In transit, drop downwind dropsonde through thickest part of cloud field (P3). Make a slow circle at 10kft while waiting on data to stream in. Then continue transiting at 10kft to downwind edge of cloud field. Gps acquired at 8700 ft, dropping from 1100.

Sonde: 4kft, RH starts increasing from 10%,1700 ft 90%, 1100ft, sharp peak to 100 %

Anna notes haze layer, likely above our level, visibly out front and on aerosol instrs

Continue downwind for 3rd dropsonde at far extent of cloud field

PILS LFE back up to 3-6

Anna notes hitting new air mass looking at PCASP/CPC data

0230 3rd sonde launch farthest downwind into thinning extent of cloud field near potentially other air mass from Canada

Sonde: 9811 ft gps acquired, launch from 12kft, 1900 top, 1kft bottom, RH>100 in middle?

0231 begin Spiral down from 12kft to 300 ft (or lowest pilot is comfortable, again noting cloud top & bottom heights.

Cloud looks to be slightly juicier than mid-cloud field

0250ish Turn CVI counterflow down to 2 LPM
Turn on dilution flow by opening MFC valve
Switch from Rogers to CVI inlet.
Check CVI inst flow near and < 14, have to turn dilution flow down 2 LPM to raise
Adjust pops flow not needed

0252Jog drum for in cloud sample

0253 2500 ft tops, 1700 looked juicy
0244 profile down through cloud to confirm extent, 2kft on zrad had >13um drop mode, juicy, smaller drops lower in cloud. Out bottoms around 1200 ft. thin ice below.
0256 drop back in at about 1900 ft where largest droplets were - > 13um, LWC 0.13. large ice, lil more than yesterday, more drops too though. CDP 66, CPC 50

Hear whistling sort of coming from back of plane, Anna go back to investigate.

0301 CVI pylon temp and cone temp around 25 (SP 30)
CPC 27, CDP 57
2D-S ice getting a bit smaller at times

0303 can see blue sky briefly
0303 bigger droplets before climbing out top

0304 droplet mode decreasing. Visibly getting thinner and more scattered out window.

0305 back into clouds, droplet peak ~7-9, CPC 78, CDP 79, POPS 7-25
0306 lil broader droplet distribution, LWC 0.09, CPC 56, CDP 70-90.

PILS LFE back up 7-9, tip temp 98.

Rogers flow 318

0308 in and out of cloud
Tom: tip of tail is out of clouds I think.

Droplet distribution looks variable, but still somewhat broad, peak varying between 7-13
CPC 60, CDP 90

0310ish bump CVI heater SP up to 40 since CPC wasn't keeping up quite as well with CDP. Also bump MFC flow up 1 LPM to drop CVI inst flow back under 14.
POPS flow still happy

0315 2D-S windows fogged, only CDP data here. Just mask out V-channel. H-channel still ok, somewhat noisy for a few though.

0318 bimodal drop distr briefly

0320 out of cloud briefly

0320 left turn to come back on transect, slightly offset. Try dropping slightly to catch a different altitude, not much wiggle room though, up would've put us out of cloud

0323 back on straight and level, CPC 23, CDP 50-90

0323 descend another couple hundred

Clouds are a tad bumpy, but overall fairly smooth

0326 -18C, 1590zrad, 84% RH

0327 profile up to see if clouds get juicier. Out of tops at 2 kft
0328 descend back in, but just clipping tops
0329 Drops still smaller, so head back over to original track to see if they get bigger

0331 can see surface in turn, thin ice with some patches of water

0332 back on track, drpos a bit bigger again, CPC has degraded, run back to turn up heaters to 50C (note: pylon max is 40C – does it really need to be that high, since it's more the cone that we're concerned with?)

0335 both channels of 2D-S back and good

0337 CDP broad distr. CPC 14, CDP 80-90, LWC 0.04.

0339 left turn at far waypoint

0340 Jog Drum to complete in cloud sample

Sampling potential air mass from Canadian Lead: looking to see if there are differences as it has potentially glaciated, cooled cooled and dehydrated the cloud layer that had been building off of the Barrow lead

0340ish Climb to just above clouds and hold for 5 mins
0342ish Switch to Rogers
Close MFC valve
Check CVI inst flow goes to 0
Turn counterflow up to 10
Check POPS flow – Anna says good since we won't be climbing too high
2D-S sloughing ice

0346 begin descent, hold in clouds for 5 min
Clouds are definitely lower on this side of the boundary
0347 brief pen –mixed phase, smaller droplets ~7-9um, CPC 70, CDP 100
0349 1029 ft zrad, -20C, RH 85%
0350 more ice on 2D-S

0352 descend just below cloud for 5 mins, more ice on 2D-S, 800 ft

0352 left turn at waypoint, now heading back NE

0354 descend a little to keep under clouds. 680 ft

0355 some open water amidst thin ice. See steam rising off water

0357 descend further to get below dropping bases (more ice fallout), descend a tad to keep under ragged cloud bases

0359 climb back to middle of cloud for in cloud sample for 5 mins, mixed phase, droplets 7-11um peak mode, around 900 ft. LWC 0.05, intermittent clouds since back in puffy cu field. Thin ice with patchy water below.

0402 open water patches getting larger out windows.

0402ish climb a bit to get back into cloud – CB seems to be increasing as we get nearer that more northern air mass/cloud field blowing off the Barrow lead

Over lead sampling
0405 Jog Drum for over lead sample – more open water and patchy ice out window, descend to 300 ft

0408 some 2D-S ice – pristine and rimed, -16C, 300 ft

0411 as we head back toward more East toward Wainright: see streets out right (south) window, hazy mess out left (north) – Tom says open water off left, so steaming up to clouds; lot of thin ice out right window

0414 ice is getting patchier out right window, more open water, lil thicker and lower clouds. See ice falling through our level on 2D-S

Looks like natural hot springs out the window with all the steam on some of these open water pools!

0420 still quite a bit of ice on surface.

0421 more rimed ice on 2D-S. soupy mess out right window.

0424 getting darker out window, ice getting more patchy, sky getting more soupy. Large ice fallout on 2DS

0426 looking for open water, but really thin ice, keep heading toward shore. Very dark, foreboding looking clouds above us! Clouds go all the way to and over the landfast ice, maybe even to shore!

0429 lost our open water just about, very thin ice
Tom: winds steady at 60 deg

0432.. still having trouble finding steady open water – this was all open yesterday! ..now small ice overtop of water, steady clouds above.

0434 clouds finally breaking up a bit to right. Can finally see some waves on surface, though heavily covered in ice slicks. Clouds/steam seem to meet through our level.

Tom notes: this was all open this morning, but no streaks, it just looked like the ocean.
Intermittent ice slicks on it now.

0438 sampling steam coming through our level, barely forming wispy clouds above us. Getting a bit bumpier.

0440: Tom notes this is more like what it was this mornig, less ice slicks, but still lots of seasmoke. It's quite thick, gets thicker out to left (seaward side of lead)

Seasmoke is more like smoke pillars… taller today

0441 Tom says we're near where they did morning spirals on the CIMS flight, but that was in a lot of steam too

0443 Jog Drum for climb and final descent

0446 water still looks a little more open right near Utqiagvik

0447 Gear down

0449 Landing

Turn off PILS & Drum pumps

Turn off PILS chassis

03/29/22 Pilot notes (CHACHA22 RF 17a)

Crew: Drew, Jeong, Robertson

Flight Time: 3.7

Planned: This flight includes 3 low approaches (two at Atqasuk and one at Utqiaġvik) and three parking garage/racetrack vertical profiles (one over tundra, one over sea ice, one over the lead).

N2UW will depart PABR, ascent to 3000 ft and then descend to 300 ft, heading for Atqasuk. Do two low approaches at PATQ, return to an altitude of 300 ft. [Time elapsed ~30 min.]

If PATQ is IFR, head straight from PABR to the first waypoint over the tundra.

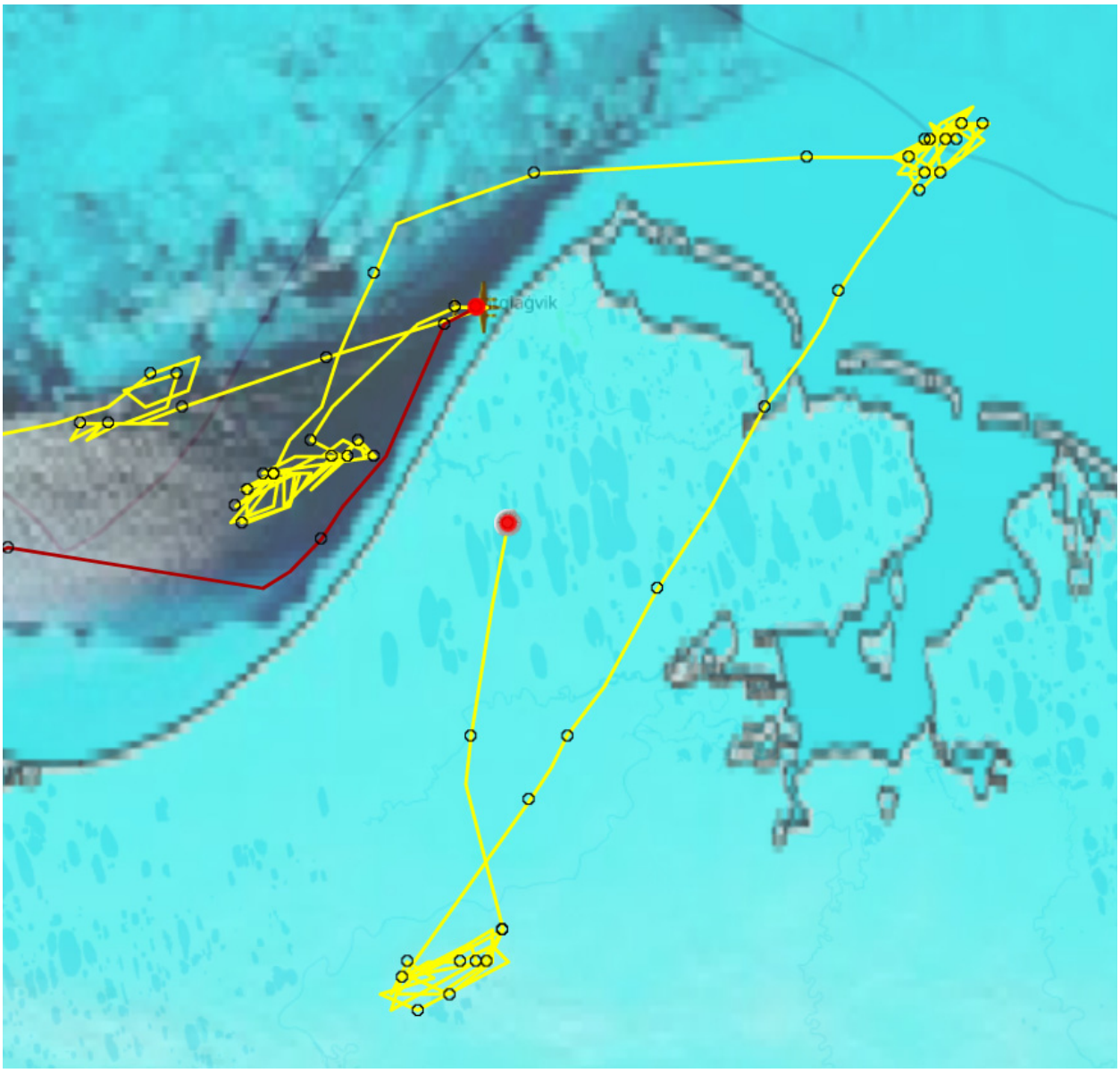
Transit at 300 ft to the waypoint of ~70˚37.15'/-157˚3.79' over the tundra. Complete a vertical profile with racetracks at the following altitudes:

- Racetrack at 300 ft for 5 min
- Ascend to 500 ft for a racetrack for 5 min
- Ascend to 700 ft for a racetrack for 5 min
- Ascend to 1000 ft for a racetrack for 5 min
- Ascend to 1500 ft for a racetrack for 5 min
- Ascend to 2500 ft for a racetrack for 5 min
- Ascend to 4000 ft for a racetrack for 5 min

Spiral down to 300 ft at ~1000 fpm.

Transit at 300 ft to the waypoint of ~71˚27.03'/-155˚31.00' over the sea ice. Complete a vertical profile with racetracks as completed for the last profile:
Transit at 300 ft to the waypoint of ~71˚7.5'/-157˚29.95' over the lead, in clear air (no clouds!).
Complete a vertical profile with racetracks as completed for the last profile:

Actual: Departed and climbed to 3000 ft. followed by descent to 300 ft. AGL. Flew to first racetrack coordinates because PATQ was still IFR. Oriented racetrack into the wind. Climb to the next level was initiated when PI announced done. After spiraling back down to 300 ft. AGL, transited over to second waypoint and completed the racetrack in the same manner. Flew well north of PABR enroute to third waypoint, to avoid traffic at Barrow. Arrived at waypoint with wispy steam rising from the open water. After the wispy steam started to seem more cloud-like at the Southwest end, we extended upwind (NE) to minimize the time in the cloud field. We were not too far from Barrow, and a King Air conducting training caused us to maneuver off the plan. During the 1500 ft. orbit we broke-off, changing altitude and maneuvering away from the waypoint due to the close proximity of the other King Air. However, we were able repeat that level back at the waypoint once that King Air returned to Barrow. After spiraling back to 300 ft. climbed to pattern altitude and returned to Barrow. Did not conduct the low approaches due to the flight time and prep-time for the second flight.


Ólafsvík

29 Mar 2022

RF17a System Scientist notes

Crew: Tom Drew, Anna Robertson, Daun Jeong

Objective: CIMS flight with racetrack vertical profiles over the tundra, Beaufort sea ice and Chukchi lead. Also 2 low approaches at PABR.

Instrument notes:

Turb red again at -0.07

PILS flow went down to 1-3 lpm at 4k ft

Flight notes:

1937 wheels up

1938 POPS flow high - may have been bumped during N2 tank swap

- adjusted to 6 cc/s

1954 start 1st s&l leg at 300 ft

1959 ascending to 500 ft

1959 starting 500 ft leg

2006 ascending to 700 ft

2007 starting 700 ft leg

2012 ascending to 1000 ft

2013 starting 1000 ft leg

2018 ascending to 1500 ft

2019 starting 1500 ft leg

- seems like we're above the BL, particle conc's lower

2024 PILS flow rate seems low, mostly 5-9 lpm

2025 ascending to 2500 ft

2027 start 2500 ft leg

2031 winds were from 050 at 300 ft, from 080 at 2500 ft

2035 ascending to 4k ft

2036 starting 4k ft leg (4k according to AALTF)

2041 PILS flow down to 1-3 LPM, nothing obvious wrong

2042 starting spiral down

- PILS flow back to normal at low alt ??

2047 heading to next waypoint

2113 starting 300 ft leg

2115 reached 2nd waypoint

- winds from 040

2118 ascending to 500 ft

2119 starting 500 ft leg

2124 ascending to 700 ft

2125 starting 700 ft leg

2131 ascending to 1000 ft

2132 starting 1000 ft leg

2137 ascending to 1500 ft

2138 starting 1500 ft leg

- wind from 070

2143 ascending to 2500 ft

2145 starting 2500 ft leg

2150 climbing to 4k ft

2152 starting 4k ft leg

- PILS flow staying around 4-6 lpm this time

2157 start spiral down

2202 done with spiral and heading to Chukchi lead waypoint

2211 north side of lead is about half open with lots of large ice chunks

- sparse clouds, more "rooted"

2222 quite foggy in this area due to "sea smoke" and some slight developing cloud above

2223 starting 300 ft leg - in a fair amount of sea smoke

2228 ascending to 500 ft

2228 starting 500 ft leg

2233 ascending to 700 ft

2234 starting 700 ft leg

- in thicker part of sea smoke/developing cloud(like) layer

2239 ascending to 1000 ft

- above developing cloud layer

2240 starting 1000 ft leg

2242 modified the racetrack to avoid developing cloud field to south

2245 ascending to 1500 ft

2250 had to hold our current pattern because there was another aircraft in the vicinity

2250 starting 1500 ft leg

2253 ascending to 2500 ft

2254 starting 2500 ft leg

2259 ascending to 4k ft

2301 starting 4k ft leg

2305 starting spiral down

2310 done with spiral, heading back to PABR

- skipping PABR low approaches since already past 3.5 hours

2318 wheels down

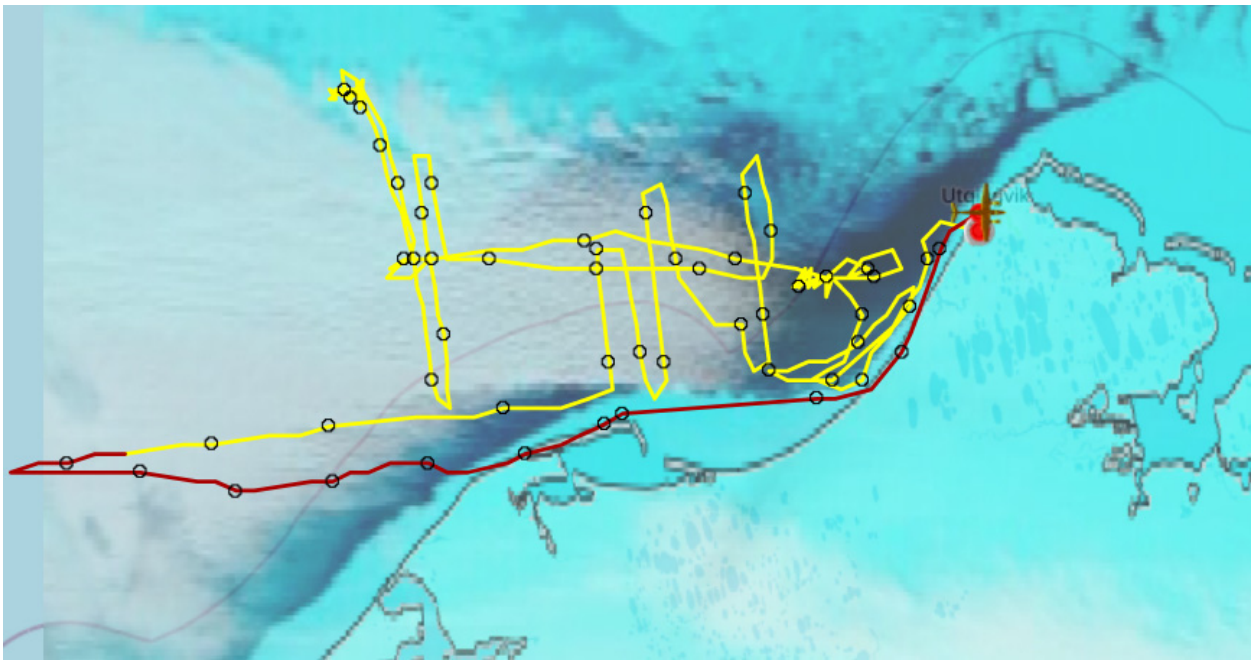
03/28/22 Pilot notes (CHACHA22 RF 16)

Crew: Drew, Woods, Robertson

Flight Time: 4.6

Planned: Depart and climb to 3000 ft. followed by descent to 300 ft. AGL. Fly to the windward waypoint following along the shore over the open water of the lead at 300 ft. Upon reaching the first point spiral up to 10,000 ft. MSL. Drop a sonde then move over the cloud field (downwind) to second point and drop another sonde. Offset to the clear air North and spiral down and identify cloud layer altitude and fly 30 minutes on the lee side. Then along dropsonde axis and then 30 minutes on windward side. Finally, fly to a point to the southwest and return along the shoreline.

Actual: Departed and climbed to 3000 ft. followed by descent to 300 ft. AGL. Fly to the windward waypoint following along the shore over the open water of the lead at 300 ft. Made three transects to get the time. Once over the waypoint on the upwind side of the lead, spiraled up to 10,000 ft. MSL. Moved about 5nm upwind for drop to ensure cloud free area. Dropped one sonde and orbited until touchdown. Enroute to second point realized we were on the north side of the cloud field so adjusted second drop point (south 10 nm) more towards the middle of the field. Then flew to the north cloud edge and spiraled down to 300 ft. AGL and climbed back up to approximate cloud level about 2000 ft. MSL. Made several course reversals NW-SE to get the time. Then followed the dropsonde axis back to first drop point. Then made several NW-SE course reversals to get the time. Then flew Southwest out to the point and did porpoise. Finally returned to Barrow upwind of the lead following the shoreline at 300 ft. AGL.



28 Mar 2022

RF16 System Scientist notes

Crew: Tom Drew, Anna Robertson, Sarah Woods

Objective: Cloud flight targeting lead clouds over Chukchi lead. 2 dropsondes planned.

Instrument notes:

Comma button stuck on 3rd seat keyboard

Both inlet tips got iced over during flight after being in-cloud for about an hour straight

Check desiccant in the PCASP

Flight notes:

2115 wheels up

Flying at 350 ft over open lead. Clouds seem much lower and shallower today.

2126 accidentally got off track, cut back toward and over open lead

2214 saw some spikes in the CPC concentration when banking to the right (went from 200 to about 400)

- tailwind at 12 knots so shouldn't have been our own exhaust: heading 280 deg, winds from 100 deg

2226 launched second sonde. Didn't see signal before launching out of tube so climbed 1000 ft to 11k first

2246 cloud tops at 2200, base at about 1700 (observed during spiral down)

2250 switched to CVI inlet, POPS flow adjusted to 4 cc/s

2257 larger droplet sizes today! CDP MVD getting up to around 13 um at times

- got up to 15 um to south of first dropsonde location

2324 starting porpoises through cloud near 2nd dropsonde point

2332 dropping out of cloud, both CVI and Rogers seem to be icing up - CPC and POPS concentrations down to less than 3, RIFLOW down to about 125 LPM

- 2335 Rogers inlet back to 330 lpm

2344 switched back to Rogers inlet, adjusted POPS flow to 4.5 cc/s

0008 switched to CVI - CPC and POPS counts still very low (less than 3) despite plenty of larger drops for CVI

0010 switching back to Rogers, POPS flow at 5 cc/s

- going to finish flight on the Rogers inlet

0017 starting 2nd set of porpoises

0045 starting porpoises near P7

0049 returning home at 400 ft

0053 lead is almost completely frozen over to the W of PAWI

0112 doing return leg over land for snow surface DRUM sample

0121 PILS chassis turned off since PILS vials done filling

- PILS flow much higher after chassis turned off (7-13 LPM)

0144 wheels down

03/26/22 Pilot notes (CHACHA22 RF 15b)

Crew: Drew, Woods, Robertson

Flight Time: 3.0

Planned: Depart and climb to 3000 ft. followed by descent to 300 ft. AGL. Fly to the windward waypoint following along the shore over the open water of the lead at 300 ft. Upon reaching the first point climbed to cloud level. Continued along approximate track of earlier flights dropsondes. Then survey the extreme lee (downwind) cloud field, then follow the cloud stream upwind. Finally zig-zag through the cloud field before returning to Barrow.

Actual: Depart and climb to 3000 ft. followed by descent to 300 ft. AGL. Fly to the windward waypoint following along the shore over the open water of the lead at 300 ft. Upon reaching the first point climbed to cloud level. Continued along approximate track of earlier flights dropsondes. Then surveyed the extreme lee (downwind) cloud field. Started to follow the cloud stream upwind, but decided to drop to 300 ft. AGL. At the beginning of the zig-zag through the cloud field did two profiles from 300 ft. AGL to 2200 MSL. before returning to Barrow.

No flight track

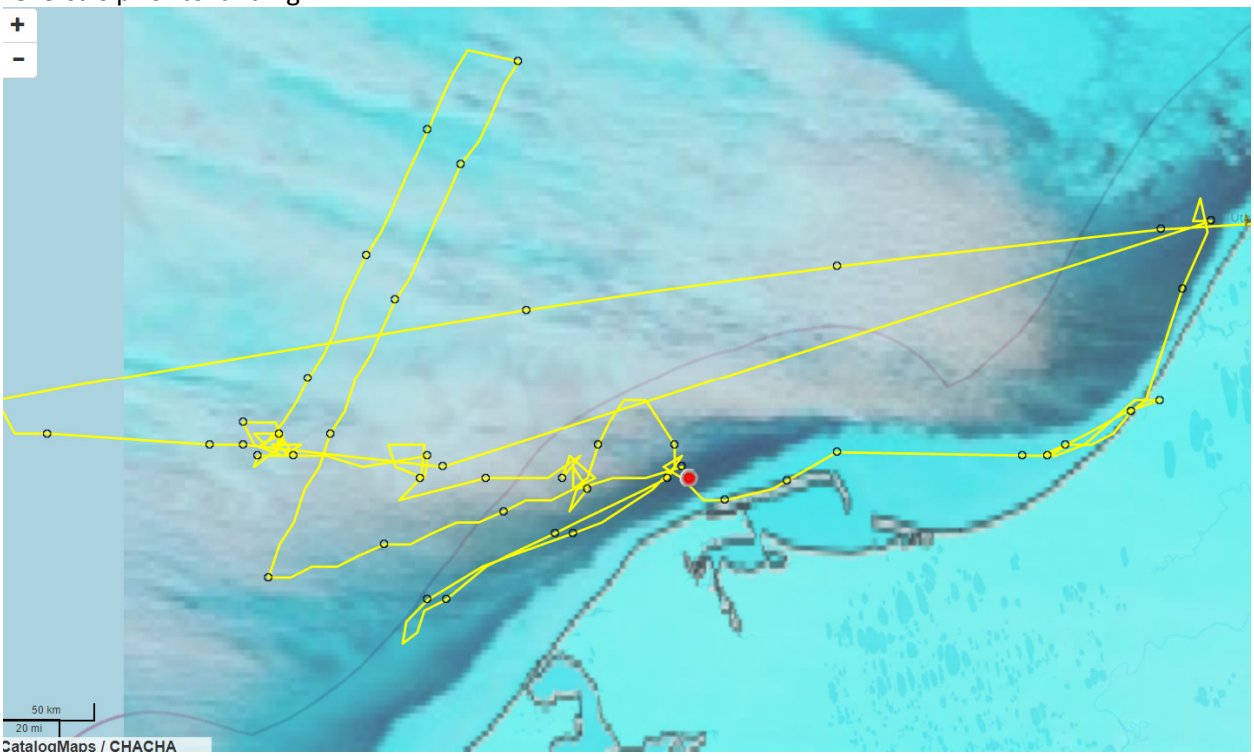
03/26/22 Pilot notes (CHACHA22 RF 15a)

Crew: Drew, Woods, Robertson

Flight Time: 4.0

Planned: Depart and climb to 3000 ft. followed by descent to 300 ft. AGL. Fly to the windward waypoint following the shore upwind of the lead at 300 ft. Upon reaching the first point spiral up to 10,000 ft. MSL. Drop a sonde then move over the cloud field (downwind) to second point and drop another sonde, and then move farther downwind to point three and drop third sonde. Finally, fly to lee side point and drop a fourth sonde. Spiral down and identify cloud layer altitude and fly 30 minutes on the lee side. Then 30 minutes in cloud, then 30 minutes on windward side.

Actual: Departed and climbed to 3000 ft. enroute to first waypoint then turned towards windward side of the lead and descended to 300 ft. AGL. Once over the waypoint on the upwind side of the lead, spiraled up to 10,000 ft. MSL. Dropped one sonde and orbited until touchdown. Then flew to the second point (scattered cu field) and dropped another sonde. Then flew to third point and dropped third sonde (broken stratus? field), flew downwind to point four to the lee side and dropped fourth sonde sonde. Then spiraled down to 300 ft. AGL and climbed back up to approximate cloud level. Turned north and flew for 15 minutes, followed by a return leg at the same altitude. Then tried to follow the the open lead to the east and then south and reversing course back to the north. Finally returned to Barrow along windward edge of ice at 300 ft. AGL. Needed a few extra minutes, so made two course reversals prior to landing.



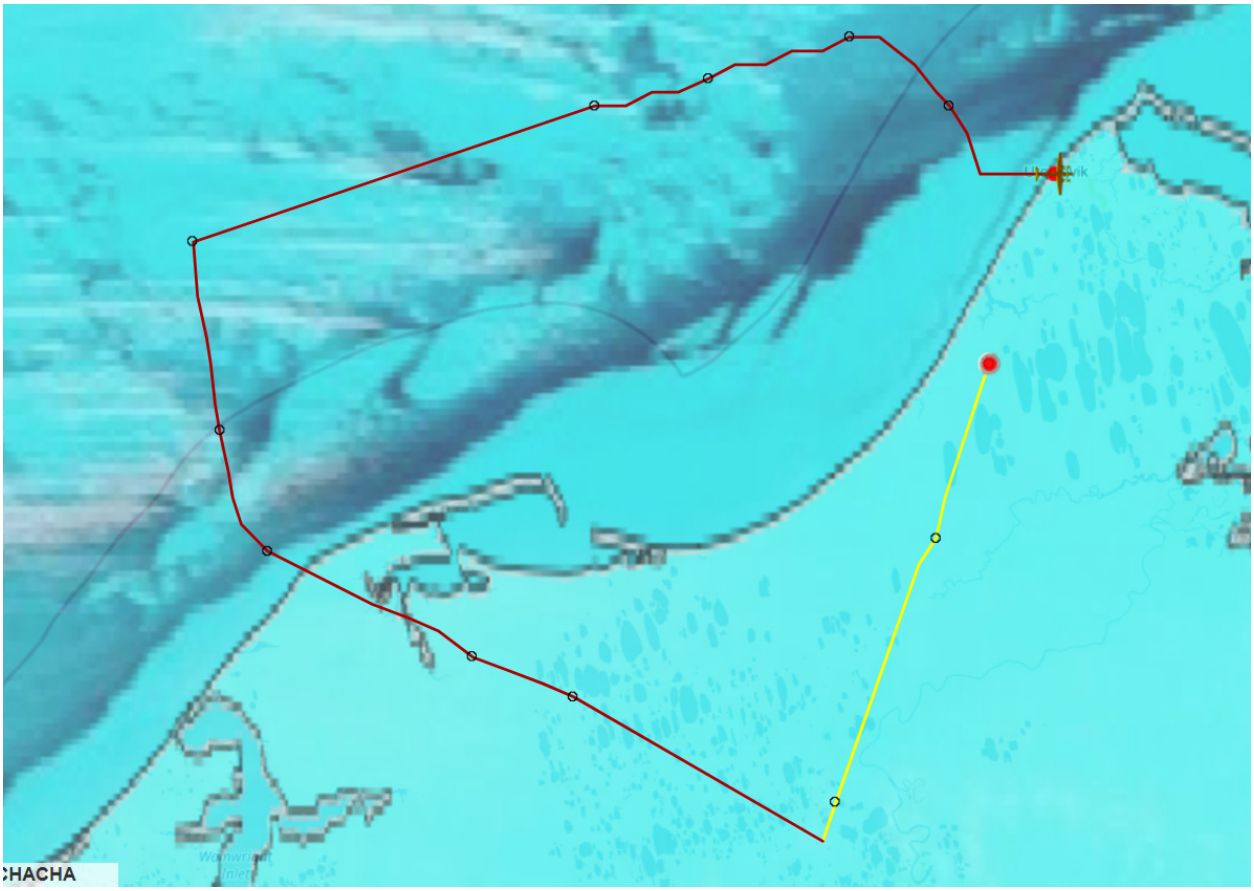
03/24/22 Pilot notes (CHACHA22 RF 14)

Crew: Drew, Jeong, Glover

Flight Time: 1.6

Planned: Due to IFR conditions at PAWI, and late start due to partial runway closure, decided to truncate original flight plan and make a single loop to PATQ and then on the lee side of the lead and return. Depart and climb to 3000 ft. then descend to 300 ft. for the rest of the flight, and make one low pass at PATQ.

Actual: Departed and climbed to 3000 ft. and descended to 300 ft. AGL. Made a single low approach over PATQ and proceeded to southern off-shore waypoints. Tracked north bound on the lee side of the lead and returned to PABR.



03/23/22 Pilot notes (CHACHA22 RF 13)

Crew: Drew, Woods, Glover

Flight Time: 3.5

Planned: Depart and climb to 3000 ft. enroute to first waypoint. Then fly to the windward waypoint at 300 ft. and upon reaching, spiral up to 10,000 ft. MSL. Drop a sonde then move over the cloud field, drop another sonde and then move to Lee side and drop a third sonde. Spiral down and identify cloud layer altitude and fly 30 minutes on the lee side. Then 30 minutes in cloud, then 30 minutes on windward side.

Actual: Departed and climbed to 3000 ft. enroute to first waypoint then turned towards windward side of the lead and descended to 300 ft. AGL. Once over the waypoint on the upwind side of the lead, spiraled up to 10,000 ft. MSL. Dropped one sound and orbited until touchdown. Then flew to the middle of the cloud field at 10,000 ft. MSL and dropped another sound. After touchdown, flew downwind to the lee side and dropped a third sonde. Then spiraled down to 300 ft. AGL and climbed back up to approximate cloud level. Turned north and flew for 15 minutes, followed by a return leg at the same altitude. Then tried to follow the wispy cloud streets to the west and returned to the east. Then tracked along the windward side of the lead back to Barrow.

No track.

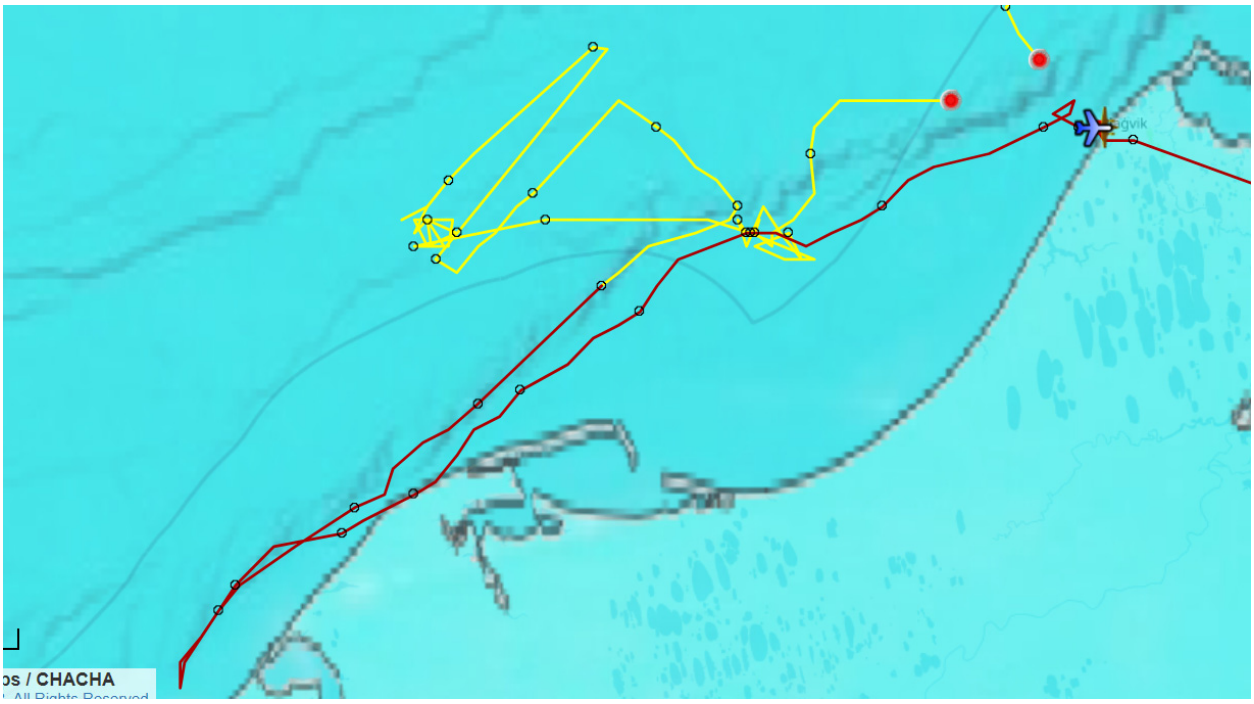
03/22/22 Pilot notes (CHACHA22 RF 12)

Crew: Drew, Woods, Glover

Flight Time: 2.7

Planned: Depart and climb to 3000 ft. enroute to waypoint N71 23.05/W158 23.92. Then fly on the windward and leeward side of the lead VFR. Drop one sonde on each side. Then pick up IFR and track down the center IFR.

Actual: Departed and climbed to 3000 ft. enroute to waypoint N71 23.05/W158 23.92. Then turned towards lead to the south and descended to 300 ft. AGL. Once on the upwind side of the lead, spiraled up to 10,000 ft. MSL. Dropped one sound and orbited until touchdown. Then flew 10 minutes downwind (using FL winds) at 10,000 ft. MSL and dropped another sound. After touchdown, spiraled down to 300 ft. AGL and made three leeward transects perpendicular to the wind (using 300 ft. winds). Then proceeded down the center of the lead to slightly past Wainwright. Turned around and tracked alongside the lead on the windward side back to Barrow.



03/21/22 Pilot notes (CHACHA22 RF 11)

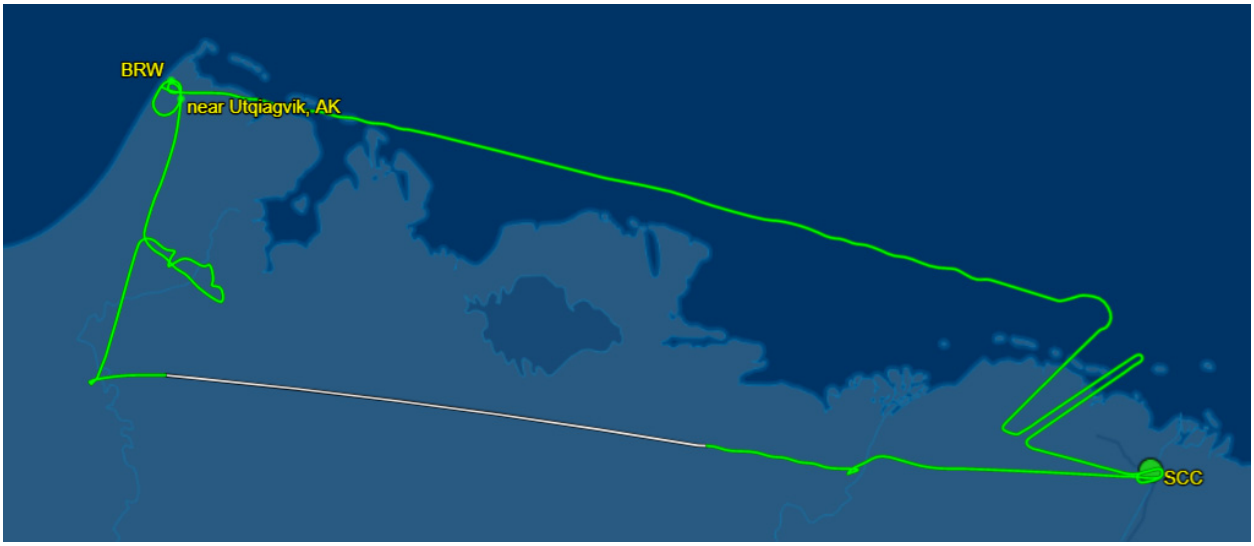
Crew: Drew, Jeong, Glover

Flight Time: 4.3

Planned: Depart PABR for Deadhorse keeping more over the Beaufort Sea on the transit to PB. After ascent to 3000 ft, descend to 300 ft and keep the altitude steady. At 70°40.44'/-149°13.84' turn south on the first leg of the N-S transect to the west of the oil production region. When finished with the transect, line up for two low approaches at PASC.
Resume an altitude of 300 ft and head west for two low approaches at PAQT. Return to 300 ft and continue west to AVELY to line up for two low approaches into PATQ. Lastly, resume flying at 300 ft and head north for SEKTY to line up for two low approaches at PABR. Return to PABR.

Actual: Departed PABR enroute to first waypoint at 300 ft. AGL. Before arriving at first waypoint for the N-S transects, ALAR relayed winds were south easterly at Deadhorse. Winds were fairly steady at 300 ft. AGL at 130@10 so we decided to turn the transect legs perpendicular to the winds, instead of flying the original 165 track. The first transect leg was set at 210 and after passing around the west side of the Kuparuk airport set the second two at 220 degrees.

Made two low approaches at PASC and continued to PATQ at 300 ft. AGL. Then continued to PAQT and conducted another two low approaches before heading to PABR at 300 ft. AGL. Elected to do the Wind Calibration Maneuvers about 30 nm south of PABR instead of at the end of the flight. Then resumed the route to PABR. Made two low approaches at PABR and landed.



03/19/22 Pilot notes (CHACHA22 RF 10)

Crew: Drew, Jeong, Glover

Flight Time: 3.7

Planned:
Narrative: This should be a VFR flight at all times. Depart PABR at 1-1:30 PM. After takeoff and ascent to 3000 ft, descend to a steady altitude of 300 ft and head for OOSIK (love that name!) to avoid restricted zone. At OOSIK, stay at 300 ft and turn more westerly to first corner (OSORE) of the downwind transect at PB. The transect, again, has three legs arranged to prevent sampling of N2UW's exhaust.
After the final leg of the downwind transect, turn southwest for two low approaches at Deadhorse (PASC). Resume altitude of 300 feet and continue toward ETFAF (line-up point for low approach into PAQT). Do two low approaches at PAQT (Nuiqsut). Resume altitude of 300 feet and continue west to AVELY to line up for two low approaches into Atqasuk (PATQ). Turn north and resume an altitude of 300 feet. Head for SEKTY to prepare for two low approaches into PABR. Return to PABR.

Actual: Departed PABR enroute to first waypoint at 300 ft. AGL. Enroute realized a discrepancy between the loaded flightplan and the flight narrative. Corrected the course to overfly Oosik, and started to check the rest of the waypoints in the flightplan, however, it was difficult to check the waypoints loaded in the GPS in Degrees.Minutes.decimal minutes (DD.MM.mm) against the decimal degrees presented in the narrative. We decided we better just fly the waypoints we had loaded (the depictions looked similar) instead of possibly missing them up. Flew the three transects from east to west noting fairly strong wind near the ground as seen by the facilities smokestacks (westerly). Made two low approaches at PASC and continued to PATQ at 300 ft. AGL. Then continued to PAQT and conducted another two low approaches before heading to PABR at 300 ft. AGL. Made two low approaches at PABR and landed.

03/18/22 Pilot notes (CHACHA22 RF 9)

Crew: Drew, Jeong, Glover

Flight Time: 3.0

Planned:
Narrative for N2UW: Depart PABR one-half hour after N762JT. Head southwest toward Wainwright. After initial 3000 ft climb, descend and fly level at 300 feet (we want to be within the boundary layer). Line up at TOPQI for two low approaches into PAWI. Resume level 300 ft altitude and turn east toward AVELY to set up two low approaches into PATQ.

After low approaches, resume 300 ft altitude and head northeast over the Beaufort Sea. The given waypoint is not firm. If visibility allows you to go further east, then it is N2UW's initiative to do so. Relay any visibility concerns or decisions to alter Beaufort waypoint to N762JT on 123.45 MHz. N2UW should just be catching up to ALAR at the Beaufort waypoint, so good communication is crucial here.
Once you have reached the eastern point over the Beaufort, prepare to release a dropsonde. Spiral up to 10,000 ft at 1000 ft/min. Level out then release the dropsonde. Continue circling until the dropsonde data has been retrieved (up to ~10 minutes). Spiral back down (1000 fpm) to 300 feet and continue west to SEKTY to line up two low approaches at PABR. Return to PABR.

Actual: Departed PABR as planned climbed to 3000 ft. MSL and descended back to 300 ft. AGL until PAWI. Made two low-approaches at PAWI and then flew to PATQ at 300 ft. AGL. Conducted two low approaches at PATQ and flew to the given coordinates off shore. Spiraled up to 10,000 ft. MSL at constant bank (no drift correction) and at 1000 ft./min. Dropped sonde, and after it landed spiraled back down at constant bank, and at 1000 ft./min. Reaching 300 ft. flew to PABR and made two low approaches before landing.

03/17/22 Pilot notes (CHACHA22 RF 8)

Crew: Drew, Jeong, Glover

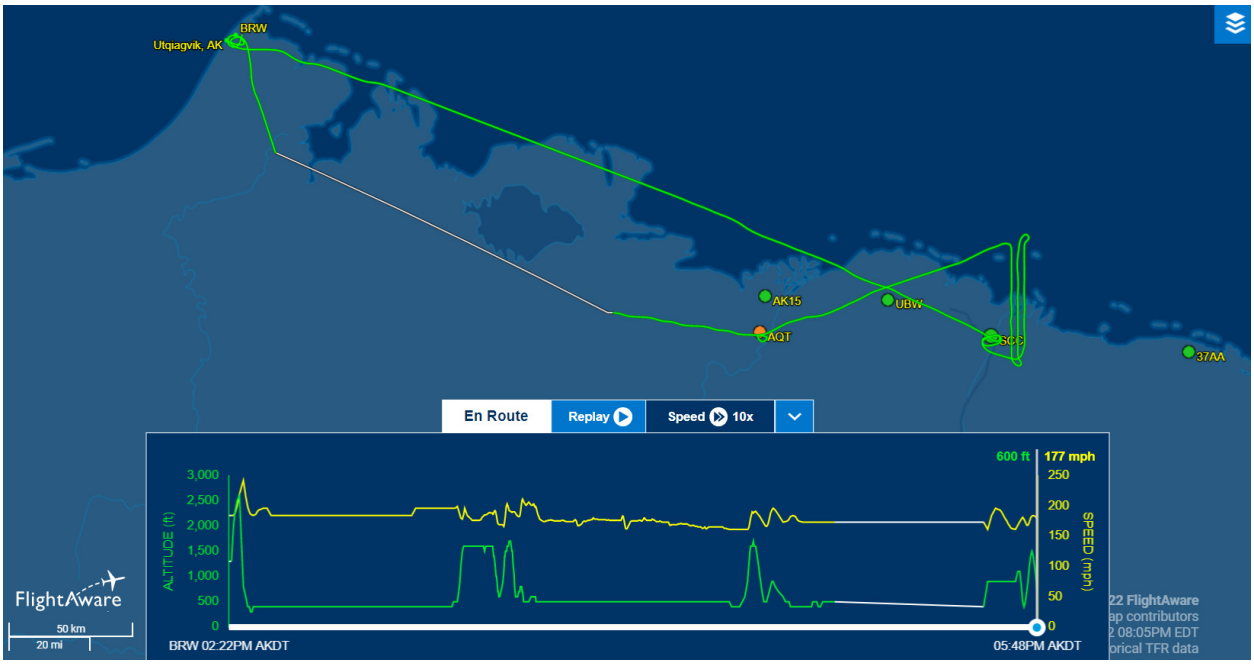
Flight Time: 3.6

Planned: Narrative: This should be a VFR flight at all times. Depart PABR at 2-2:30 PM. After takeoff and ascent to 3000 ft, descend to a steady altitude of 300 ft and head for AVELY to set up two low approaches at PATQ. Resume altitude of 300 feet and turn east toward ETFAF (line-up point for low approach into PAQT). Note that the leg to Nuiqsut (PAQT) can deviate to the north and depart from the direct path to avoid patches of low visibility if needed. Do two low approaches at PAQT, then continue east to OCOTA at 300 ft to line up two low approaches at PASC.

Return to an altitude of 300 feet. Turn southeast to the lower corner of the first of three north-south downwind transects (70.15/-148.10). From there, head due north to 70.50/-148.10. An explicit return leg (slightly to the west) has been added to emphasize that we want to stay upwind of our own exhaust.

Upon finishing the third transect (70.15/-148.24 to 70.50/-148.24), turn northwest toward SEKTY, flying at 300 ft, and line up two low approaches at PABR. Return to PABR.
Total distance: 629 miles.

Actual: Before Takeoff, ceiling at PATQ and PAQT dropped below VFR. Decided to fly just to PASC and do the low approaches and the three n-s transects and return to PABR. However, after completing the approaches and transects, checked weather at PAQT which was VFR and decided to try to get the low approaches there. After completing them the last ADS-B weather showed PATQ above IFR so decided to chance it and head to PATQ. When within range of the ASOS broadcast, it reported ceiling IFR at PATQ. Decided to return direct to PABR and complete two low approaches before landing.



03/12/2022

Pilot notes (ChaCha flight 7)

Crew: Sigel, Glover, Woods

Time: 3.0

Planned:

Take off From PABR, at 13:30. Fly the rout they gave me get a feel for how low Anchorage will let us go. Look at the lead clouds and leads to see if they have gotten larger. Do two drops one at the north end and one on the south. Come home

Actual:

Takeoff from PABR at 13:30 local. Started off on the pattern flew to the south side of the pattern to spiral up over an open leads. I filled the flight plan at the office on the field. This gave me an opportunity to load more information to ATC and I was able to file for a block alt. Leads were not really producing clouds and if anything it was low fog. Maybe 50 to 100 feet off the water. We dropped and started back to the pattern. The pattern is not a good idea and was insisted on by PI's. Sara Woods knows what she is doing and placated them as well. We need to file to a point with a 30 mile radius. Finally got sick of wasting time and followed some clouds north to see if they would rise to us. They did not but they were close. I was able to get Anchorage to get us down to 1500 MSL and they were really close. This gave me hope that as the leads expand and get bigger we will be able to get into them at higher alts. After the clouds we went back finished the pattern dropped again and went home. I didn't fall asleep so that was good.

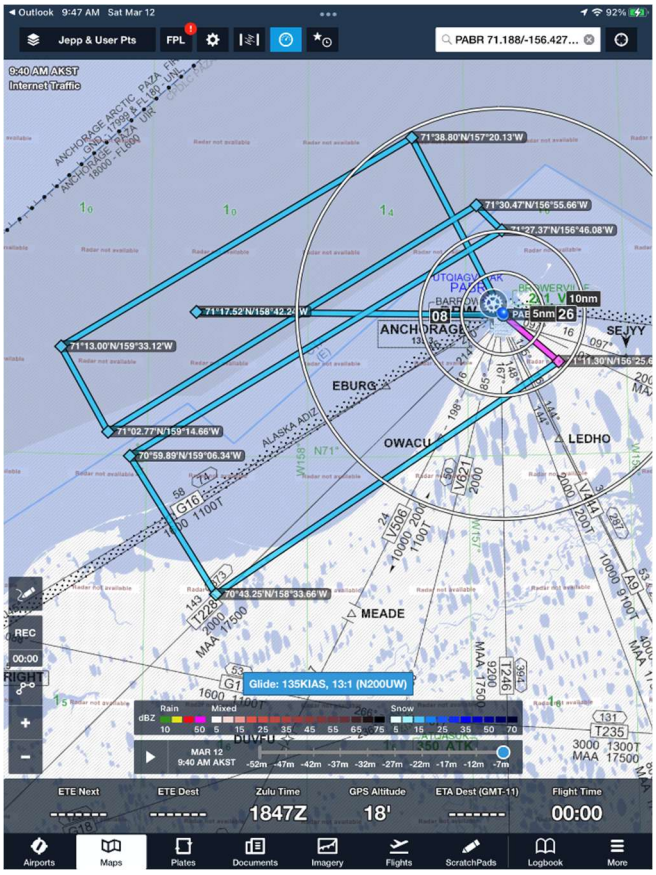
Aircraft:

The aircraft worked well. The TCAS worked well there were no problems.

Things Learned:

- **The flight plans come late every day and they over think everything.**
- **They are frustrated with me on not going low into the clouds. I do believe this will change as it warms up.**
- **I was able to talk to Anchorage on this whole pattern.**
- **I'm ready to be done**

They


Outlook 9:47 AM Sat Mar 12
92%
Jepp & User Pts
FPL
PABR 71.188/-156.427...
9:40 AM AKST
Internet Traffic
71°38.80'N/157°20.13'W
71°30.47'N/156°55.66'W
71°27.37'N/156°46.08'W
71°17.52'N/158°42.24'W
71°13.00'N/159°33.12'W
71°11.30'N/156°25.6
71°02.77'N/159°14.66'W
70°59.89'N/159°06.34'W
70°43.25'N/158°33.66'W
ANCHORAGE
EBURG
OWACU
LEDHO
MEADE
SEJYY
ALASKA ADIZ
10nm
5nm
Glide: 135KIAS, 13:1 (N200UW)
Rain
Mixed
Snow
dBZ
MAR 12
9:40 AM AKST
REC
00:00
RIGHT
ETE Next
ETE Dest
Zulu Time
1847Z
GPS Altitude
18'
ETA Dest (GMT-11)
Flight Time
00:00
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Logbook
More


Jepp & User Pts
FPL
PABR 71.188/-156.427...
:04 PM AKST
tratus, Marginal
GND - 17999
Radar not available
71°38.80'N/157°20.13'W
71°30.47'N/156°55.66'W
71°27.37'N/156°46.08'W
71°13.00'N/159°33.12'W
71°02.77'N/15
14.66'W
70°59.85'N/159°06.34'W
70°43.2
ANCHORAGE
135.3
08
26
PAB
5nm
10nm
EBURG
OWACU
LEDH
ALASKA AOZ
Glide: Altitude below 200'
Precipitation
dBZ
20
30
40
50
MEADE
MAR 12
6:04 PM AKST
-27m -25m -23m -21m -19m -15m -13m -11m -9m -7m
REC
00:00

12 March 2022

RF07 System/instrument scientist notes

Crew: Ed Siegel, Brent Glover, Sarah Woods

Object: Survey Lead Clouds SW of Barrow.

Flight notes:

CIMS off and CVI configured for flight.

24:14 PILS & Drum pumps on

Take Off 24:18

2418 Drum jog at climb out

Head @ 3kft agl SE to the first waypoint, then descend to 1kft

2420 rt turn for downwind leg

2421 Drum jog for ~25 m upwind sampling leg,
2kft is lowest for moment from ATC, will ask for lower once past traffic

POPS flow is a bit low ~2.5, needle valve might've been bumped slightly

2429 Very low/wispy lead clouds off to W over 2 small patches of open water
-14C, 1450 PALT, 42% RH, 1742 ZRAD, PCASP 40-100, CPC 40, PILS LFE 9-12
Crossing from land over to sea ice

CVI Display showing wrong values, went wonky. Run back to check – chassis all looks okay, GUI eventually recovered

2441 begin rt turn

2446 Drum jog forward at end of upwind leg

2447 Spiral up to 10kft over small open lead

2501 Release dropsonde into water off lead – small patches of open water, small lead clouds, too low/wispy to get into

2505 Brent: can see our exhaust on the CPC as we loiter waiting for the sonde to drop

2509 sonde finished, ask Ed to descend en route back north to "thicker" cloud deck from more open water nearer Barrow

2512 PILS tip temp 94, vial 25, LFE 6-10, variable

Descend to 3kft, turn NE, run above cloud recon leg at 3kft
2516 Drum jog for above cloud recon leg, 2kft

2DS & CVI TAS 92 m/s

2520 recon leg, -14C, 82m/s, 1400 ft PALT, RF47%. Small pockets of open water all over the place, low wispy clouds with roots to the leads, but no decent sized cloud banks to sample

2529 Turn on dilution MFC, switch to CVI. Bump MFC up from 17 to 18 to drop CVI inst flow below 14, lower CVI cntr flow to 2

2530 turn left to head out further to see if we can drop lower to get into cloud, current floor from ATC is 2kft
2530 Drum jog for in cloud leg

2536 ask to re-route to follow spine of clouds to get to lower IFR mins and get into clouds as they rise down wind of lead.. we're trying!

2543 approved to drop to 1500 ft.

Still can't get low enough to get into cloud and running out of cloud, so ask Ed to reverse course, and we'll do an above cloud aerosol sample on Rogers

2549 switch to Rogers and close MFC dilution flow.

2600 finish 30 min run above cloud
2600 Drum jog forward at end of ABOVE cloud leg
Begin spiral up to 10kft

~2610 Release dropsonde into lead cloud from 10kft

2616 dropsonde vert speed->0, so begin descent en route to downwind leg
dropsonde RH->100 low alt, looks like hit cloud deck

2624 Drum jog forward for downwind leg

Downwind clear air sample, PALT 1500 ft, ZRAD 1700ft, -14C, RH 45%

2638 Lft turn at S end of leg, turn back toward shore

2640 Drum jog forward

2645 Left turn to parallel shore as we RTB

2700 turn CVI counterflow back to 10 (checked inst flow goes to 0)

2702 CVI data display went wonky again

2705 Drum advance for final approach (on Rogers)

2705 Gear down

2707 Landing

03/10/2022

Pilot notes (ChaCha flight 6)

Crew: Sigel, Glover, Jeong

Time: 3.3

Planned:

Take off From PABR, at 13:30 head down to Wainwright 300 feet AGL, Two low approaches. Head to Atqasuk @300 AGL two low approaches. Then to the most southern point on the flight plan @ 300 AGL. Head to Nuiqsut @ 300 and two low approaches. Back to PABR @ 300 AGL and two low approaches.

Actual:

Takeoff from PABR at 13:30 local. The ALAR aircraft was to do the same pattern we were and left 30 minutes before we did. They would only do one low approach at each of our airports. Climbed to 3000 and descended to 500 feet and moved to 300 feet. Proceeded to Wainwright Ignored there extra points to save on time. Climbed to 1400 MSL and then low approach at 200 twice. Flew to Atqusak at 300 did the same there climbed and then the low approaches. In rout to the southern point we slowly climbed in increments of 100 feet at a time until we were at 800 feet MSL to be about 400 AGL the terrain was varied and hilly. This would not have been comfortable if there were any restriction on visibility. It only worked because you could see 2o miles and could anticipate the terrain. After turning back to the north I could see clouds obscuring the tops of hills so I climbed to 1500. Thought I could see good enough to descend again but changed my mind and climbed up again. It was clear to the north and hard to make out the clouds against the white background. Once the low lying clouds were behind us I descended back to follow the terrain again. Sometimes I was at 800 AGL and sometimes I was at 400. Visibility was unlimited the whole time. The sky was high scattered clouds maybe 20,000. We were talking to the ALAR aircraft occasionally on 123.45. This is useful to use because the Oil field uses this feq. As well. I still have no Idea where they are going but from what I understand they are going out to the north and delivering fuel and food. ALAR reported that they had an engine 'bobble" at the farthest most southern point. I could see them on the IPAD the whole time the 2s seems to work better than the 3s. We did the 2 low approaches at Nuiqsut. There is no one around and I saw no other aircraft at any airport. We proceeded back to PABR at 300 AGL and were just now closing the gap on the ALAR aircraft. We spoke to them on 123.45 and could see them on the IPAD they were at 3000 AGL. We passed under them about half way and climbed to 1400 to enter the pattern at PABR to do the low approaches. Did the first and second no problem. A Caravan was coming in and the ALAR. We were on Rwy 26 left trafic. ALAR announced that the engine was "Bobbling" again and needed to land. I flew out to the south and gave them room. The Caravan

cut in front of them and landed. ALAR got on the ground and lost the engine. They started it and lost it several times before getting to the hanger. Another Caravan was coming in so I landed quickly. The ALAR pilot went over and made friends with the Caravan pilots. He was very very upset! He was red and cussing.

Aircraft:

The aircraft worked well. The Right side co-pilots window is leaking and loud at low alt. If you turn down the pressurization it stops. The TCAS is intermittent.

Things Learned:

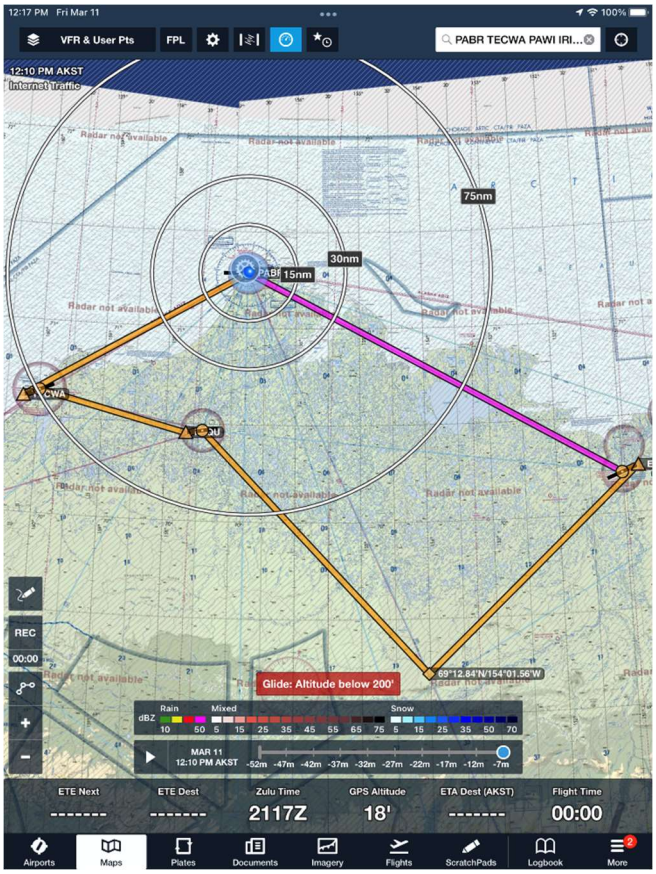
- Bob and the other pilot did not make friends

- The Caravan pilots don't do well in the sand box. They operate like kindergartens.

- They are operating with really no rules and not much curtesy.

-The flight plan was changed many times. This turned into a mess of flight plans under many emails. I ended up entering the wrong flight plan into the aircraft. Glover asked for the plan and Anna gave him one which did not look like the one I had. I was very confused. I told the PI's at the debrief what happened and requested that I have a final flight plan by 10 am. If this happens on an IFR we will definitely be not doing the flight. I explained them that I need a plan the day before to present to the FAA. If they want to make any small changes it may be possible. May being the word. I requested that I get an email that is under the words Final flight plan. I will need it by 10 am and that it not be attached to a long list of emails.

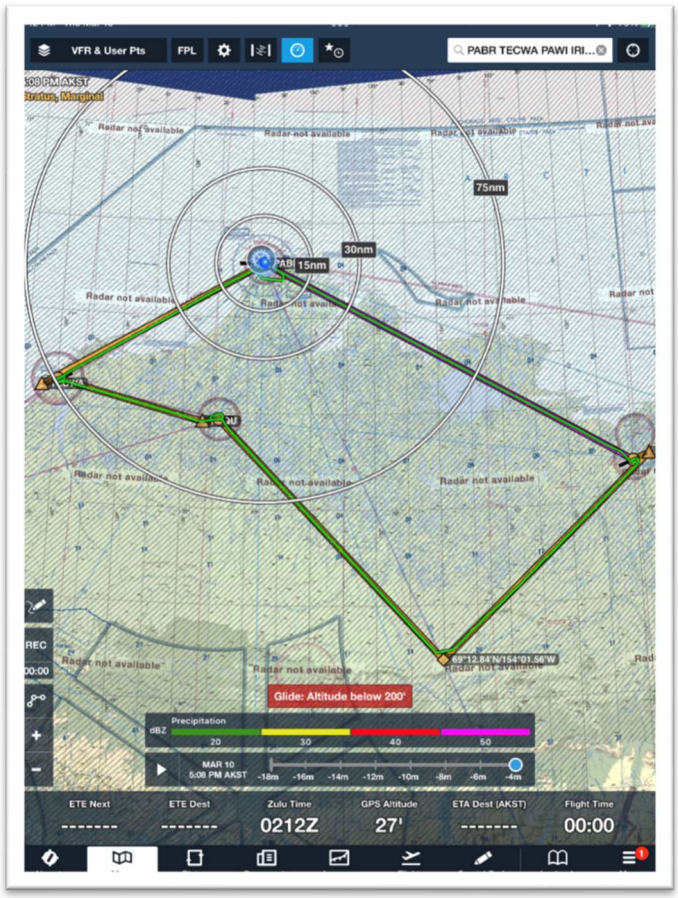
They


12:17 PM Fri Mar 11
100%
VFR & User Pts
FPL
PABR TECWA PAWI IRI...
12:10 PM AKST
Internet Traffic
75nm
30nm
15nm
Radar not available
TECWA
PAWI
REC
00:00
Glide: Altitude below 200'
69°12.84'N/154°01.56'W
Rain
Mixed
Snow
dBZ
10 50 5 15 25 35 45 55 65 75 5 15 25 35 50 70
MAR 11
12:10 PM AKST
-52m -47m -42m -37m -32m -27m -22m -17m -12m -7m
ETE Next

ETE Dest

Zulu Time
2117Z
GPS Altitude
18'
ETA Dest (AKST)

Flight Time
00:00
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Logbook
More
2


VFR & User Pts
FPL
PABR TECWA PAWI IRI...
5:08 PM AKST
Stratus, Marginal
Radar not available
75nm
30nm
15nm
PABI
Glide: Altitude below 200'
69°12.84'N/154°01.56'W
Precipitation
dBZ
20
30
40
50
MAR 10
5:08 PM AKST
-18m
-16m
-14m
-12m
-10m
-8m
-6m
-4m
REC
00:00
ETE Next
ETE Dest
Zulu Time
GPS Altitude
ETA Dest (AKST)
Flight Time
0212Z
27'
00:00

10 March 2022

RF06 System Scientist notes

Crew: Ed Sigel, Brent Glover, Daun Jeong

Objectives: Low approaches in clear air over various airports

Flight notes:

Pumps On at 22:51

Take Off at 22:54

At 3000ft 22:56

Jog1 on Drum 350ft AGL 23:00

Jog2 on Drum at 23:21

Low Level Approach 1 Wainwright at 23:22

Low Level Approach 2 Wainwright at 23:25

Jog3 on Drum at 23:25

Jog4 on Drum at 23:43

Low Level Approach 1 to Atqasuk at 23:47

Low Level Approach 2 to Atqasuk at 23:50

Jog5 at 23:51

At the Brooks Range Jog6 on the Drum at 00:31

Fog close to the ground at 00:38 climbing to 3000ft.

Descending at 00:40

Climbing at 00:43 to avoid more fog.

Backdown at 00:55

Jog7 for the Drum at 01:02

Low Approach 1 to Nuiqust at 01:04

Low Approach 2 to Nuiqust at 01:07

Jog8 on the Drum at 01:15

Jog9 on the Drum at 01:51

Low Approach 1 Barrow at 01:57

Low Approach 2 Barrow at 02:00:30

Pumps Off at 02:07

Landing at 02:07

POPS Flow was set back to 5 cc before the flight.

Water Traps on the PILS were full but no water observed in the line to the pump.

Could not get my phone to connect thru Bluetooth to the Hawkeye system.

All other KA instruments looked to worked thru ought the flight.

03/09/2022

Pilot notes (ChaCha flight 5)

Crew: Sigel, Glover, Jeong

Time: 3.9

Planned:

Take off From PABR, at 13:00 head down to Atqasuk at 300 AGL do two low approaches. Turn east and fly over to Nuiqsut. Fly two low approaches there as well. Snake your way north through the oil fields. At first Lat/Long circle up to 10,000 and drop a sond. Fly east to second Lat/Long circle up to 10,000 and drop another. Fly out to the west of PABR and then make to low approaches there as well.

Actual:

Takeoff from PABR at 13:00 local. They are improving on getting us out on time. Climbed to 3000 and descended to 500 feet and moved to 300 feet. Proceeded to Atqasuk climbed to 1400MSL to start the low approaches. We did two no problems no traffic ether. Descended back to 300 to fly over to Nuiqsut. There is nothing between these points. The ground rises and I adjusted alt. up 100 in the middle of the rout. Again ascended to 1400 to fly the low approaches over Nuiqsut airport. Started my low-level weave through the oil fields, there is another airport just north of the Nuiqsut airport that I had not seen on the map until I was just to the west of it. PALP Looks to be a private strip that has no published approaches. We then flew up north to their first lat/long circled up to 10,000 dropped a sond and then circled waiting for it to get to the ground and circled back down. We did this again on the west end of the flight. The Circling at the top of the drop requires about another 5 to 10 minutes which I did not account for on the planning.

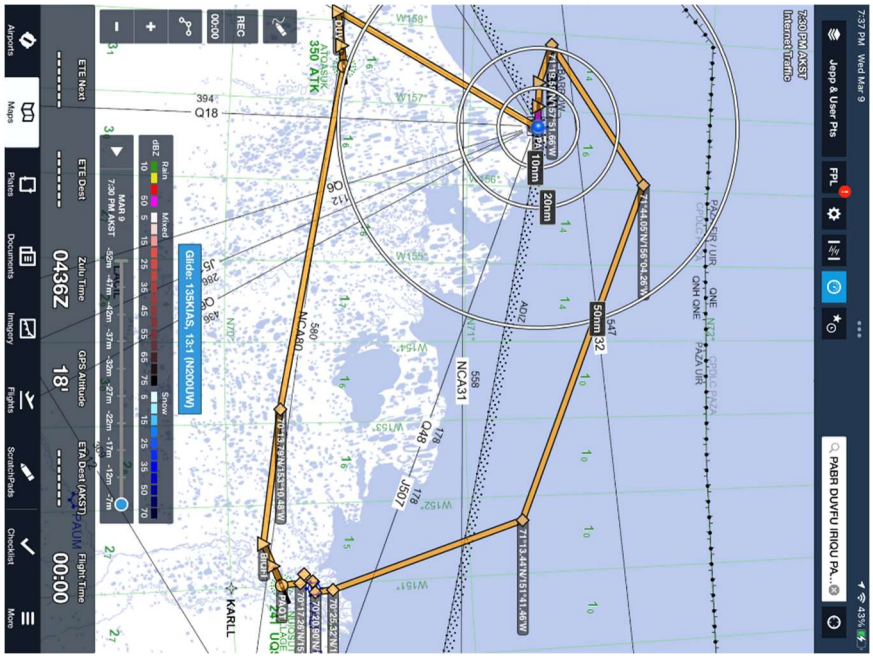
Aircraft:

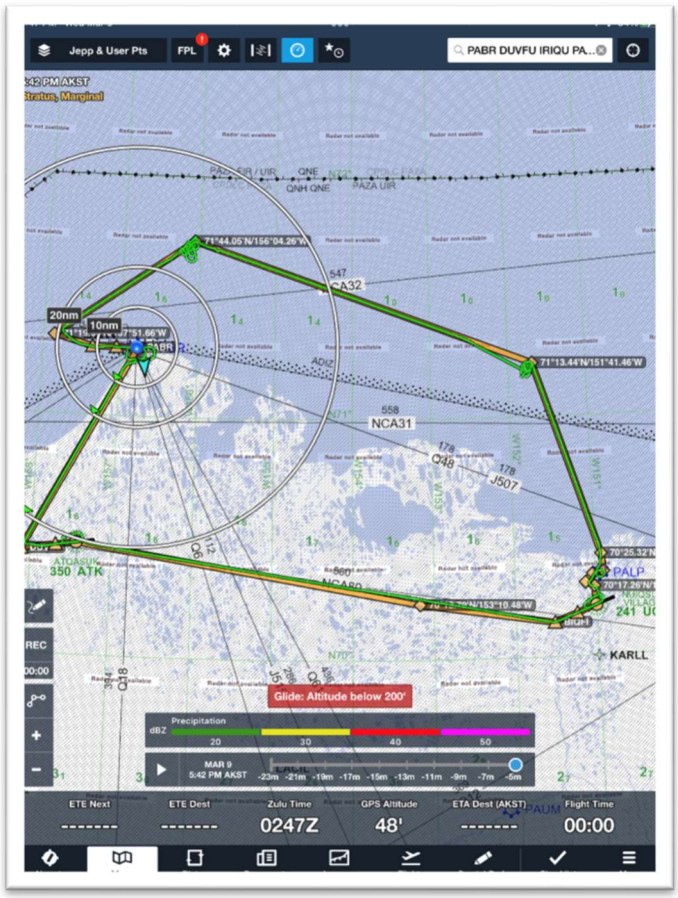
The aircraft worked well. The Right side co-pilots window is leaking and loud at low alt.

Things Learned:

- Bob the other pilot was describing a gas leak that was on the news and how to find it. Stating that there were a bunch of Antelope standing right next to the leak. Bighorn Aviation asked him if Antelope? He corrected himself and I spoke with them for a bit.

- They are caribou or muskox.


7:37 PM Wed Mar 9
Jepp & User Pts
FPL
PABR DUVFU IRIQU PA...
7:30 PM AKST
Internet Inactive
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Checklist
More
ETE Next
ETE Dest
Zulu Time
0436Z
GPS Altitude
18'
ETA Dest (AKST)
PAUM
Flight Time
00:00
REC
00:00
Glide: 135K(IAS, 13:1 (N20OUW)
MAR 9
7:30 PM AKST
dBZ
Rain
Mixed
Snow
ATQASUK
350 ATK
DUVFU
394
Q18
PABR
10nm
20nm
71°44.05'N/156°04.26'W
50nm
547
CA32
NCA480
558
NCA31
178
Q48
178
J507
70°25.32'N/153°10.48'W
70°17.26'N/153°10.48'W
241 UQI
IRIQU
KARLL
PAZA UIR
ONE
QNH QNE
71°13.44'N/151°41.46'W


Jepp & User Pts
FPL
PABR DUVFU IRIQU PA...
5:42 PM AKST
Stratus, Marginal
PAZA UIR
ONE
QNH QNE
71°44.05'N/156°04.26'W
547
CA32
20nm
10nm
71°13.44'N/151°41.46'W
558
NCA31
178
Q48
178
J507
ATQASUK
350 ATK
70°25.32'N
PALP
70°17.26'N/
241 UQ
KARLL
REC
00:00
Glide: Altitude below 200'
Precipitation
dBZ
20
30
40
50
MAR 9
5:42 PM AKST
-23m -21m -19m -17m -15m -13m -11m -9m -7m -5m
ETE Next
ETE Dest
Zulu Time
0247Z
GPS Altitude
48'
ETA Dest (AKST)
PAUM
Flight Time
00:00

9 February 2022

RF05 System Scientist notes

Clear Air Flight

Crew: Ed Sigel, Brent Glover, Daun Jeong

Objective: Clear air flight

Flight notes:

Pumps on at 22:50

Takeoff at 22:53

After climbimg out to 2000ft desended to 300ft at 22:59

Jog1 on Drum 23:00

Noticed a time jump happened at 22:14 Time Server at TFOM4

PATQ low approach 1 at 23:19

PATQ low approach 2 at 23:14

Jog3 on Drum 23:25

Jog4 on Drum 00:13

Nuiqsut low approach 1 at 00:17

Nuiqsut low approach 2 at 00:23

Jog5 on Drum 00:29

Left seat to prepare dropsondes for launch and did the 1st launch.

Daun took notes of time and we saw good telemetry.

While back there saw a wing nut from the PILS tray on the deck.

The other nuts were missing on the trey, spent time finding those and putting them back.

Prepared the other sonde for launch and launched it.

The Gate Valve hangs about a 1/3 way open. The motor is running but the valve stops moving.

Used the manual handle to get the valve moving again. This happened on both launches.

The valve shuts fine.

Daun went to check the nitrogen bottle and noticed the PILS water traps were full and flowing into the pump line.

At 02:19 we decided to shut off the PILS pump and shutdown the PILS.

Will discuss how long this PILS can run with the PI's. Sara Woods suggested taking a water bottle along to drain the water traps in flight instead of adding another water trap.

03/05/2022

Pilot notes (ChaCha flight 4)

Crew: Sigel, Robertson, Jeong

Time: 3.3

Planned:

Take off From PABR, at 11:00 local Fly at 3oo feet to Northwest of Dead horse. (See proposed flt. Plan) After the first leg climb to 10,000 release a drop sond. Fly rest of pattern to the west if there are Clouds over the leads fly on top of them on the way home. On the last leg climb to 10,000 and drop two sonds. Descend to 300 feet and fly back to PABR.

Actual:

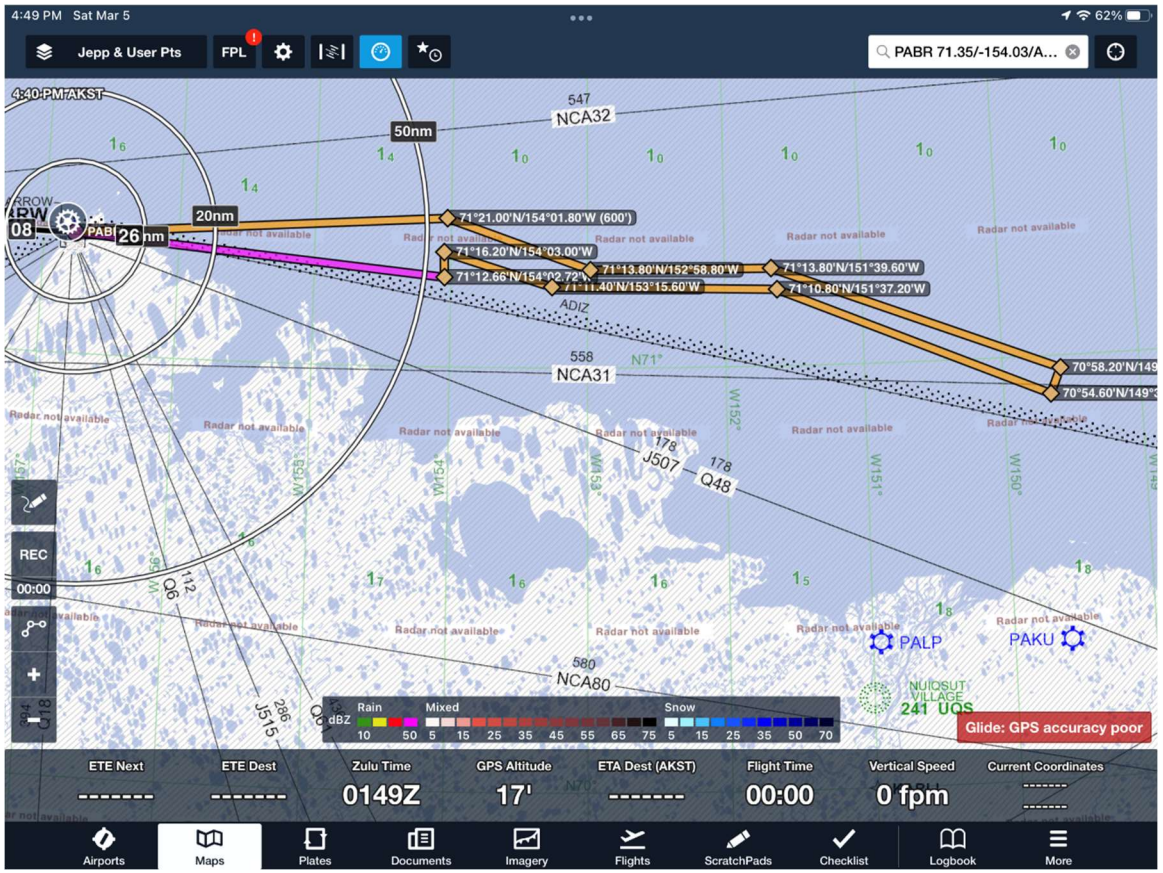
Takeoff from PABR at 11:30 local. Climbed to 3000 and descended to 500 feet and moved to 300 feet. Visibility was good out front at least 20 miles.
Flew the pattern as they asked. Circled up to 10,000 dropped the sond and circled back down to 300. Flew the pattern out to the east and climbed up to see if we could see any clouds, and there were none. Got back to 300 till the end of the patterns and circled up to 10,000 and dropped two sonds. Descended to 300 again and headed back to PABR and landed.

Aircraft:

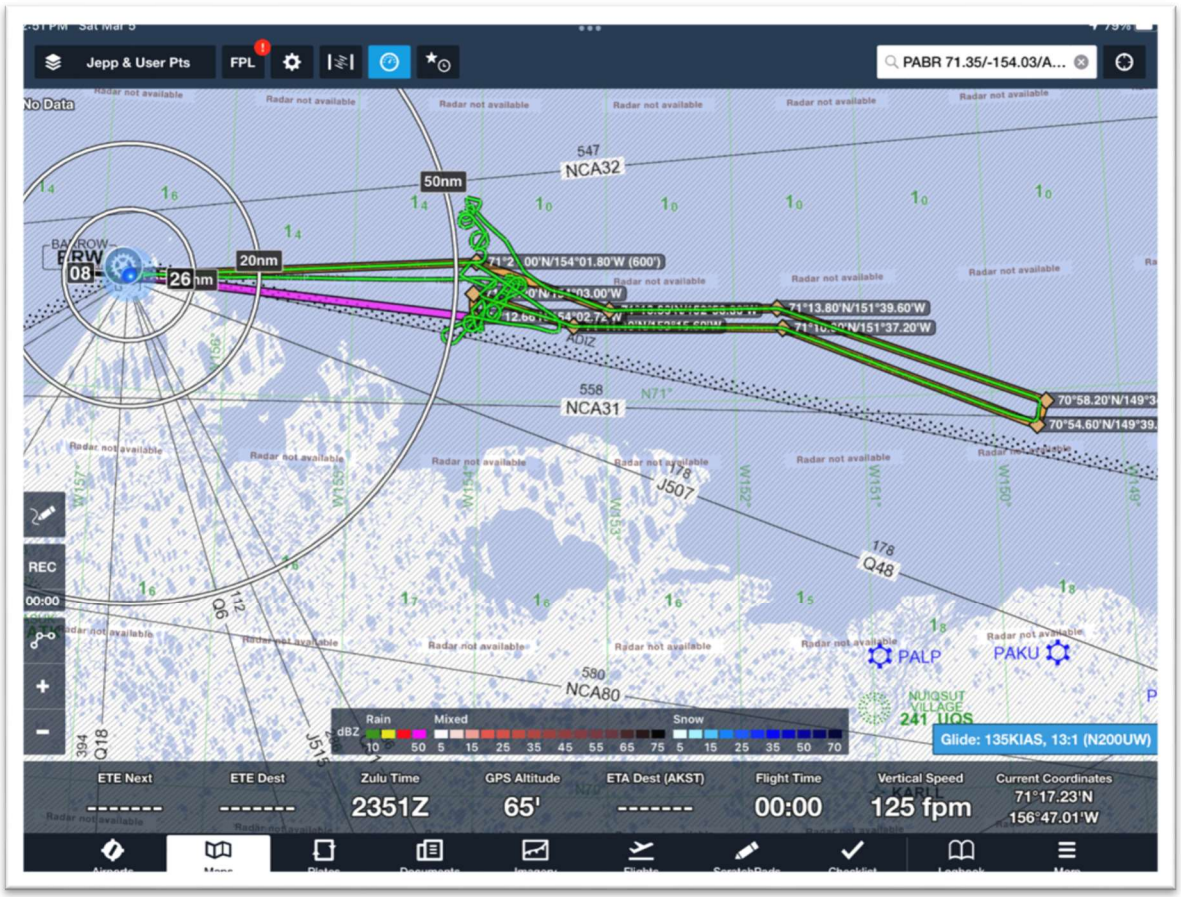
The aircraft worked well there were no other issues. No issues with the TACS.

Things Learned:

- PASC Is very helpful and will give you an update on weather when your over there you do have to be a bit higher in elevation to get them on the radio I used 123.6 and they asked me to switch to 122.60 to talk to them.
- I heard Big horn on the radio 123.45
- They use 123.45 for relaying the weather back and forth to each other.
- There were no manmade objects that could be seen on this flight.


4:49 PM Sat Mar 5
62%
Jepp & User Pts
FPL
PABR 71.35/-154.03/A...
4:40 PM AKST
50nm
20nm
26 nm
547
NCA32
558
NCA31
580
NCA80
71°21.00'N/154°01.80'W (600')
71°16.20'N/154°03.00'W
71°12.66'N/154°02.72'W
71°13.80'N/152°58.80'W
71°11.40'N/153°15.60'W
71°13.80'N/151°39.60'W
71°10.80'N/151°37.20'W
70°58.20'N/149
70°54.60'N/149°
ADIZ
J507
Q48
Q6
J515
PALP
PAKU
NUIQSUT
241 UQS
Radar not available
REC
00:00
dBZ
Rain
Mixed
Snow
Glide: GPS accuracy poor
ETE Next
ETE Dest
Zulu Time
0149Z
GPS Altitude
17'
ETA Dest (AKST)
Flight Time
00:00
Vertical Speed
0 fpm
Current Coordinates
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Checklist
Logbook
More

They


Jepp & User Pts
FPL
PABR 71.35/-154.03/A...
No Data
547
NCA32
50nm
20nm
26nm
08
BARROW
71°13.80'N/151°39.60'W
71°10.80'N/151°37.20'W
70°58.20'N/149°3
70°54.60'N/149°39.
ADIZ
558
NCA31
J507
178
Q48
580
NCA80
PALP
PAKU
NUIQSUT
VILLAGE
241 UQS
REC
00:00
Rain
Mixed
Snow
dBZ
Glide: 135KIAS, 13:1 (N200UW)
ETE Next
ETE Dest
Zulu Time
2351Z
GPS Altitude
65'
ETA Dest (AKST)
Flight Time
00:00
Vertical Speed
125 fpm
Current Coordinates
71°17.23'N
156°47.01'W

5 March 2022

RF04 System Scientist notes

Crew: Ed Sigel, Anna Robertson, Daun Jeong

Objective:

Fly over to Prudhoe Bay Oil fields

Do some racetracks downwind from the oil fields and a spiral

2 low approaches at Deadhorse

Head back upwind from the oil fields

Instrument notes:

Co-pilot window needs to be resealed

CIMS PID controller needs to be fixed

- did the same thing again where it ramped up to 130 - fixed it, turned off CIMS de-ice

Next time need to better discuss co-flying and objectives for it

TCAS failed, came back after landing

USB extender

Flight Notes:

2149 wheels up

2156 at 600 ft, bl top was around 700-750 ft (based on skew-t)

2210 reduced POPS flow from 7.5 to 5.5 cc/s

- also turned off CIMS PID controller

2221 dropped to 300 ft

2232 PCASP concentrations quite a bit lower than CPC (a lot of tiny particles?)

2250 CPC counts close to 10k!

2253 found ALAR, slowed down to 74 m/s

2255 cut north from original flight plan to fly alongside ALAR

2257 kind of wandering around trying to try to line up with ALAR

2302 slowed down to 65 m/s, flying below ALAR

2312 flying alongside ALAR (500 ft)

2320 didn't realize this was our race track, finally jogged the DRUM forward - 300 ft

2330 saw plume from offshore platform facility

2345 returning to base - 300 ft

0022 checked the cims inlet temp still says 133 degrees, metal felt very hot around inlet. Switched OFF CIMS de-ice to see if that makes a difference

- it was the de-ice switch all along

0033 climbing to get wx, 1.3k

03/03/2022

Pilot notes (ChaCha flight 3)

Crew: Sigel, Robertson, Jeong

Time: 2.3

Planned:

Take off From PABR, at 12:00 local Fly at 5oo feet to outside of Dead horse and do a race track pattern north of Dead horse twice and then to the south east of DH and fly to VFR approaches to DH make a run flying in formation with the other aircraft and return.

Actual:

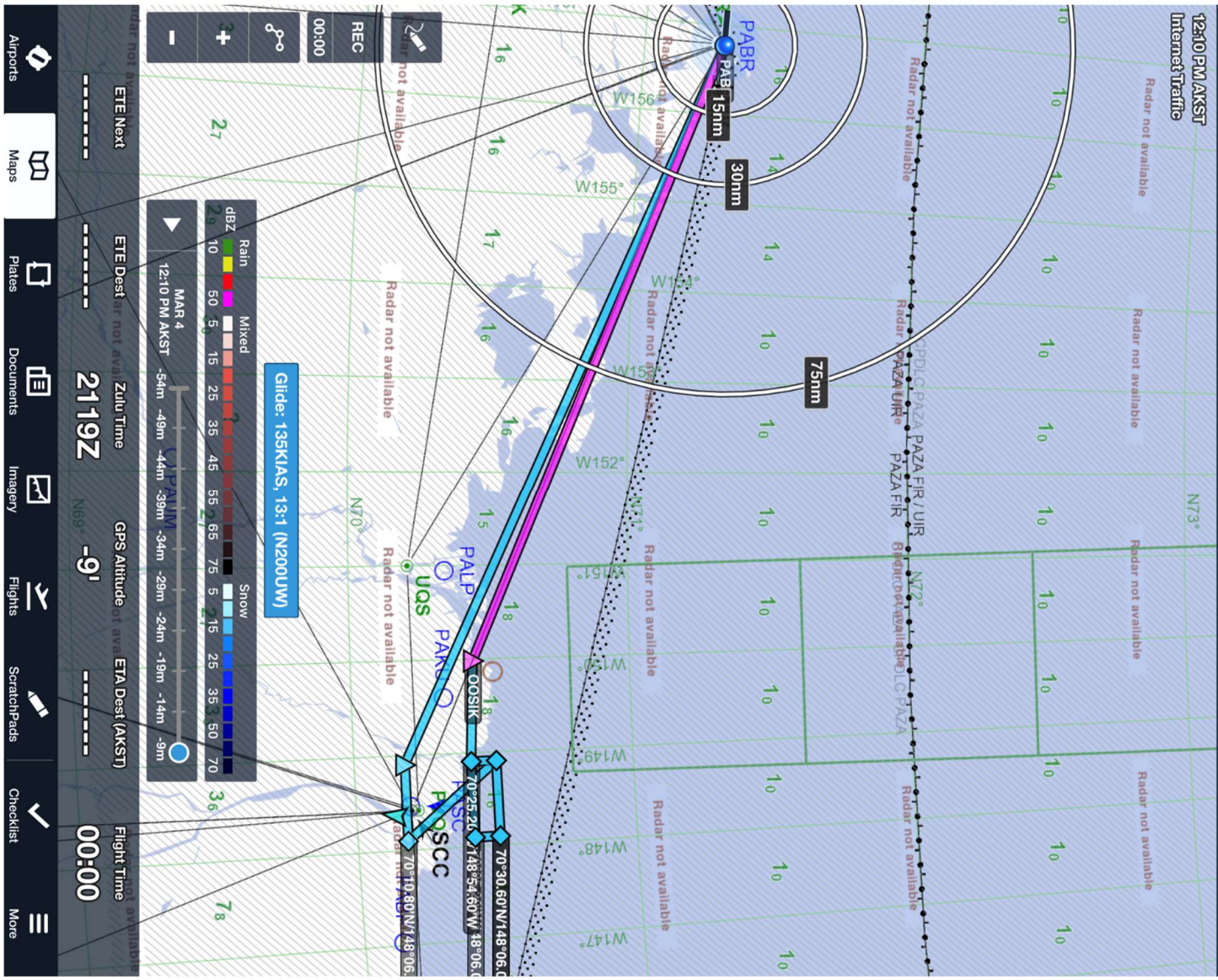
Takeoff from PABR at 12:50 local. Started off at 500 feet and moved to 300 feet. Visibility was good out front at least 6 miles as we got about 30 miles out of Barrow it was unlimited. That's when I felt comfortable to go to a lower alt. Started talking with the other aircraft about 80 miles outside of DH. The wind had changed direction and they asked to change the pattern from the east west pattern to a southwest northeast. Was not a problem there were no towers and the oil rigs are very visable and in really good VRR conditions. We did the pattern as asked.
We flew in formation the best we could I did two circles to let them catch up. I put in approach flaps and flew strait and level at about 130 knots. It wasn't a big problem but we kept passing them up. I kept them in sight and off my left side. We were about to head over to DH to do the two low approaches as asked. At this point I knew I had the minimum fuel to do this flight if PABR went down. I had 1800 pounds of fuel. This gave me two hours to get back to PABR return to PASC and have the IFR mins. I should have gotten the weather from more than one source and because it was called 600 overcast and it was actually predicted to 6000. I was heading back before the correction was made and continued back to PABR and landed.

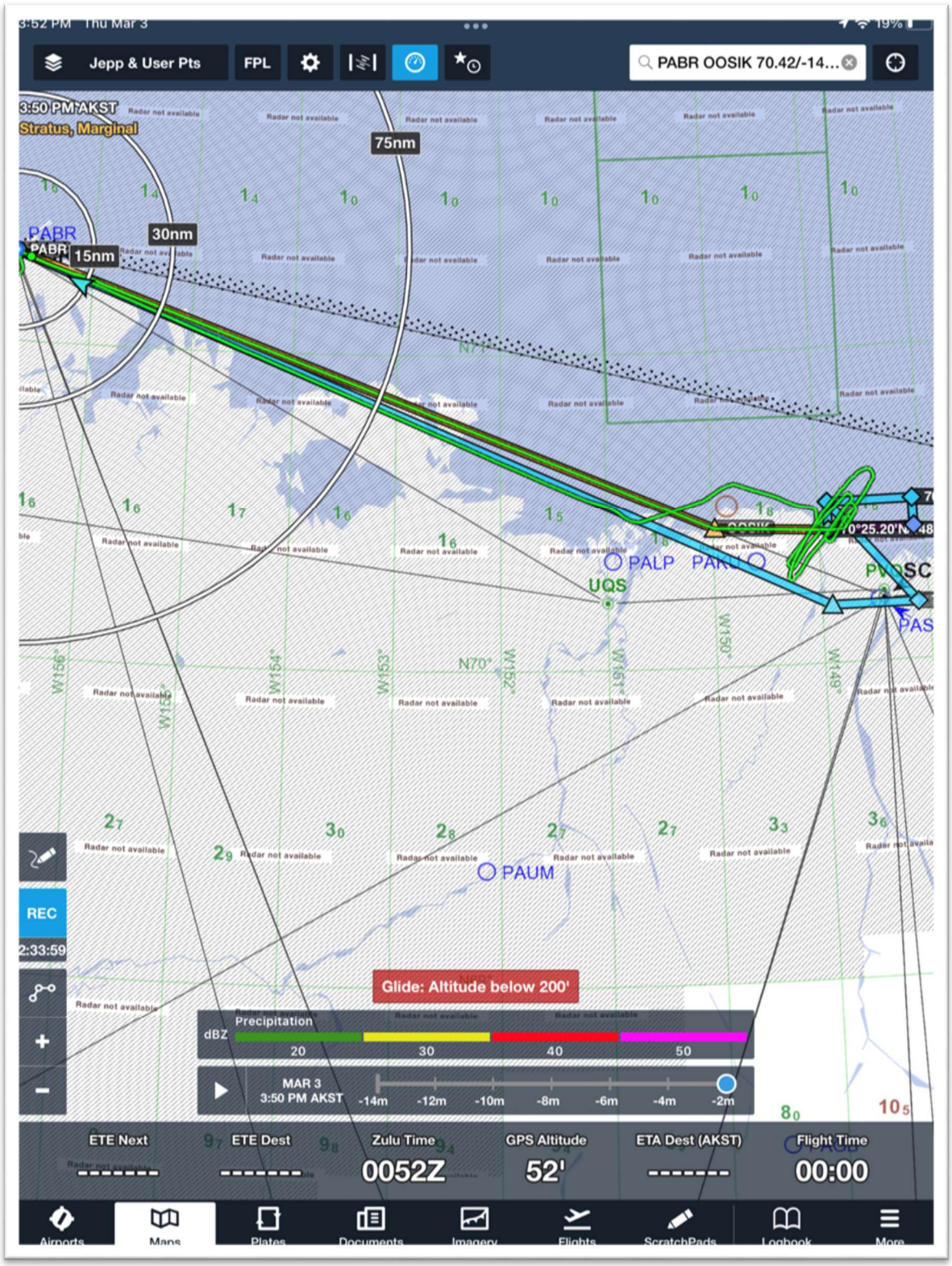
Aircraft:

The TACS failed in flight as we were heading back to PABR. This was the first time I noticed any way most of the time I was looking outside the aircraft. On return to PABR we were showing aircraft in the barrow area and it seem to be working again. I tested it on the ground taxiing in and it test normal. The aircraft worked well there were no other issues.

Things Learned:

- Anchorage ATC is happy to help us and they appreciate our communications.
- I've been adding David Chilson to the email notifications and Peter Coruso. Peter is the guy who has been answering the phone when I call in. There may be another guy I would assume. Here are their emails.
Peter.caruso@faa.gov
David.chilson@faa.gov
The Oil rigs are not noted on a map and are way out in the sea.
Peter Caruso is very helpful and offered if we had any problems with weather to get a pop up on either of these feq. 134.4 or 135.3




3:52 PM Thu Mar 3
19%
Jepp & User Pts
FPL
PABR OOSIK 70.42/-14...
3:50 PM AKST
Stratus, Marginal
75nm
30nm
15nm
PABR
PALP
UQS
PAUM
REC
2:33:59
Glide: Altitude below 200'
Precipitation
dBZ
20
30
40
50
MAR 3
3:50 PM AKST
-14m
-12m
-10m
-8m
-6m
-4m
-2m
ETE Next
ETE Dest
Zulu Time
0052Z
GPS Altitude
52'
ETA Dest (AKST)
Flight Time
00:00
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Logbook
More

`02/27/2022

Pilot notes (ChaCha flight 2)

Crew: Sigel, Robertson, Woods

Time: 2.3

Planned:

Take off From PABR, VFR@13:15 head toward Wainwright to waypoint 70.92N/158.59 at constant altitude (as low as the pilot is willing to go but no higher than 1200 feet). It does not matter If we sample over open water at this time. Return to PABR climb to 4000, for 6 mins, 7000 for 6 mins and 10,000 for 6 mins. Before making a left turn out to the northwest and open leads. Make a slow decent so as to see the clouds far west side and know that we will be able to operate in them and they were what we were looking for. Fly pattern or just cloud hunt to find clouds we can see though and punch. Sample the clouds and return to PABR.

Actual:

Takeoff from PABR at 14:00 headed towards Wainwright at a constant altitude. I picked 600 feet and held that. This put me below a very thin scattered layer of clouds at 4000. We had good visibility maybe 30 miles at a time. Flew about 4 minuets passed our planned turn around spot. This was not a problem we had good flight conditions. Started a climb at the end of the leg to 4000 and began the 180 turn. Spent 6 mins at 4000,7000 and 10000. About 20 miles out of PABR I gave them my position and told them I would be flying over and exiting to the NW. Started a slow decent down towards the clouds. The clouds looked to be in a wave shape and were scatted in a very thin layer. Flew over the triangle twice and they said they had enough information and would like to return.

Aircraft:

The third seat had no trouble communicating. Problem was a bad connection and is fixed. The aircraft worked well there were no issues.

Things Learned:

- Guy in Flight service station is not into service won't call for fuel.
- lead clouds are very thin and if you stay on top of them and just punch the higher thinner ones that you can see though you can maintain VFR
- You could see though the scattered layer of the clouds above you and below and in out front of you on this day.
- On this clear day there was good visibility and you could clearly make out the Horizon.
-There was a very small amount of ice in the clouds oat was +2c.
- You cannot move the aircraft in 2 inches of wind packed snow. It's hard to see the small drifts on the tarmac.


4:09 PM Sun Feb 27
VFR & User Pts
FPL
No Data
Internet Traffic
Radar not available
Radar not available
Radar not available
Radar not available
ANCHORAGE ARCTIC CTA/FIR PAZA
ANCHORAGE CONTINENTAL CTA/FIR PAZA
71°
71°

27 Feb 2022

RF02 System Scientist Notes

Crew: Ed Sigel, Anna Robertson, Sarah Woods

Objective: Fly straight and level to the SW from PABR at lowest possible altitude for 30 min for DRUM and PILS samples

On return, step up in altitude to test flow through Roger's inlet and make sure that leaks are fixed

After returning to PABR area, head NW over the Chukchi Sea to hunt for some lead clouds - fly through clouds for 30 min

Instrument notes:

Headphones worked great

- Keep an eye on 3rd seat headset, flashing yellow

Bluetooth keyboard working intermittently

PILS flow - PILSLFE was varying between 7-12 LPM, but all fittings seemed tight. May just be noise from small voltage range

InReach still not able to send messages

CIMSINLET temperature again shot past 40C soon after takeoff despite working fine on the ground, zane will investigate

Flight notes:

22:54 wheels up

23:01 500 ft, RIFLOW about 270-300 LPM

23:04 noticed CIMSINLET alarm at -5, temp at 106, shut it off

23:09 PILSLFE jumping around from km 6 to 13 LPM - checked water trap plugs they were fine, double-checked pitot connections and they were fine

23:32 stop 30 mon line

23:33 disconnect

23:34 DryCal measured 26.4 lpm

- Reconnect

23:36 turn and start climb to 4k

23:38 some cloud

- noticed POPS flow is at 2 cc/s :(

23:39 4.4k ft to get above cloud

23:41 disconnect

23:42 DryCal 25.6 - 26.2 lpm

23:43 reconnect

23:46 climbing to 7k, cloud tops at ~5k

- Sarah said all-liquid clouds! Still over land

23:48 7k ft

23:49 disconnect

23:50 DryCal 25.0 - 25.2 lpm

23:51 reconnect

23:53 climb to 10k

- RIFLOW still around 270 lpm

23:58 disconnect

23:59 24.4 - 24.8

00:00 reconnect

00:05 POPS flow 1.5-2

00:09 switching to CVI inlet

- POPS flow came up to 5 cc

- but counts look very weird

0015 adjusted POPS needle valve

- make sure to point out valve location to Daun and Zane

- counts still weird but also very low particle numbers (10-15 on cpc)

0023 Penetrating clouds at 0.7k ft 0.8k ft

0033 dropped back to 0.7k ft to get in cloud more

0055 finish cloud legs

0105 wheels down

2022-02-27 KA Science Flight for CVI (1st CVI flight from BAR)

Config: Standard for CHACHA cloud flights: CIMS off, all others operational. Rogers for takeoff/landing, CVI for cloud sampling

Crew: Ed, Anna, Sarah

Obj: Takeoff, climb to 3kft for ATC, Head toward Wainright, drop to <1200 ft and sample 30 mins straight and level <1200 ft for PILS/DRUM sample, turn around and step up 4, 7, 10kft for Rogers inlet testing (fixes applied morning of flight). Then head out over open water and drop down to do 30 mins of in cloud sampling

Preflight Check Summary: Rogers inlet fixes applied. Total flow on Rogers w gilli: 28-30 LPM. Gracie tended to PILS. Daun capped CIMS.

T	-18.22 C
RH	47.8 %
Pa	356 kft

Conditions: cold, slightly overcast, patches of blue sky.

PILS run # 50, tip temp 100

2249 UTC taxi (1349 local BAR)

2251 Turn on PILS & Drum pump

2252 start 2D-S

2254 Takeoff UTC (on Rogers inlet)
Few particles on 2D-S on takeoff
Funky noise on 2D-S on climbout, looks electrical, maybe check connections after flight? Recovered at altitude

_X_Check PILS sample line

CVI TAS - 93 m/s, matches 2D-S & aircraft

2301 Level at 500 ft, Drum jog for clear air 1 (in BL) – hit 2x to make sure it went..
Begin 30 min leg 500 ft, -11 C
Over thin ice, hazy clouds out window, but look to be just below our level
2205 turn off CIMS de-ice: 100/40 on panel

PILS LFE: 8.7-10.5 LPM, variable, tip temp: 98

2313 more solid ice beneath us now. Still at 500 ft (Zrad, 807 PAlt), -13C

2315 Ed: we're just coming over land now. -10.7C, 745 ft PALT

2318 clip a few particles on 2DS, thin cloud
Very small counts on cdp after 2DS

2320 Rogers flow 275-285 LPM
CPC counts on Rogers, clear-ish air: 200-400 cm3

2320, 2324 funky bio material on 2D-S

2325 few ice falling out from layer high above on 2D-S: columns, irregulars (~200-500 um), -8C, 871 PALT

Fair number of caribou (black specs) out windows

2327 slight jog to stay on straight line cause we'd been drifting

2328 lil more moderately sized ice, very low counts
Note: cloud layer above is very expansive. Few clouds about our level to the north as we approach turnaround near waneright

2332 End of 30 m straight & level <1200 ft run, Drum jog for clear air 2 (in free trop)

2334 Anna check drycal of full instr flow on Rogers while continuing on 500 ft leg: 26.4 LPM
CPC ~121 at end of leg

2336 Turn around to return toward BAR w steps checking Rogers flow: 4, 7, 10kft (free trop)

2337 small particles on 2D-S, low counts, then increasing, clipping cloud top at 4kft, have Ed climb to keep us above cloud top, ~4700 ft PALT

2340 level for 6 min, Anna run back to check drycal on Rogers again
CPC ~50 cm3
Rogers Flow 280 LPM, still variable, RH has climbed to 80%, -7C, PILS LFE still variable 8-10 LPM, PILS tip temp has dropped to 95. Still occasional ice particle on 2D-S since we're still between layers
Drycal: 25.6-26.4 LPM

2343 clipping cloud again, -7C, 4600 kft PALT, sm-moderate drops (~10-300 um)

Ed dropping slightly to 4kft to see if we can get below it while Anna in back

2345 Anna back, climb to 7kft
2345 finally break above clouds

2348 Anna run back to check drycal at 7.2kft, drycal: 25.0 LPM
CPC ~40-70 cm3, PILS LFE 7-9 LPM, tip temp 94-97
PCASP 0-40 cm3

2352 begin climb to 10kft for final Rogers alt check

2358 Anna run back to check drycal at 10.2kft PALT, drycal: 24.4-24.8 LPM
-12.8C
CPC ~95-150
PILSLFE~7.5-8.5, tip temp 93-96
PCASP ~13-119
Rogers flow 275-285 LPM

2402 5 mins from Barrow

2406 turn to NW for cloud portion and begin descent from 10kft

Turn and descend to 4kft, head toward open water to survey clouds

_x_Check PILS sample line
_x_Check POPS red ball valve behind nitrogen cylinder
Turn down CVI counter flow to 2.5 LPM
2412 Open Dilution flow, MFC set to 15LPM initial & Switch 3-way from Rogers to CVI
MFC: 15, CVI: 13.7

2411 Check CVI inst flow, adjust MFC as necessary to keep CVI flow < 14 LPM
2412 Jog Drum for cloud sample 1
Still at 4.2kft, -4.5C
PCASP~10-30
CPC~11
PILSLFE~8.5-9.5 LPM, tip temp 95

2417 descend to begin cloud sampling
2423 adjust MFC up to 17/18 LPM to drop CVI inst flow below 14.

In & out of cloud, almost all sm drops, occasional larger one. -11.8C, 1024 ft PALT

2424 turn, almost 1 mm size drop on 2DS in turn!
PCASP 10-28 cm3
CPC 100cm3
CDP 40 cm3
Rogers flow 285
PILS LFE 8-10 LPM, tip temp 97

2D-S few more occasional large drops

2428 still in cloud, -12C, all sm drops, skimming top for a minute or two
2429 back in and out, clipping tops

2431 turn to go around triangle again

2432 straight and level just above cloud tops, skimming tops
After ATC quiet, ask to drop a 100 ft or so to get into clouds a bit more

2434 back into clouds, in and out a bit, -12.5C, 73% RH

Ed: clouds higher on NW end, so we should be able to get into them more after next turn
Lil noise on 2D-S, maybe some ice shedding
2336 out of cloud, bout as low as we can go, we'll get more sampling after the turn

2337 clipping cloud again, CPC 33, CDP 200, PCASP 15-30
Mostly sm drops, but occasional larger drop still

2438 noise on 2D-S in turn, fogging?
Ed: clouds are dissipating on us, this was way thicker before hand
2440 clipping a little more cloud, just at top, -12.8C, 980 PALT
2441 back into lil thicker cloud, CPC 120, CDP 130, CDP mostly < ~15 um

2443 Drop CVI counter flow to 1.5
Occasional ice on 2D-S, -11.8C, 994 PALT
CPC 80-100, CDP 150-160
Rogers flow 260-270 LPM
2450 clouds fell below us, too low to get into, ice shedding on 2D-S
2452 still clipping very tops of clouds

2455 Finish 30 mins cloud sampling, jog drum for RTB sample, and begin climb. Shedding of ice accumulation on 2D-S.

2459 On RTB, switch 3-way from CVI to Rogers
Close Dilution flow
Turn CVI counterflow back up to 10

2500 2D-S noisy again, update mask.
2501 KA CVI display just now update to reflect my flow changes, expect couple minute delay?

2504 Turn off PILS & Drum pumps

2505 Landing

24 Feb 2022

RF01 System Scientist notes

Crew: Ed Sigel, Anna Robertson, Daun Jeong

Objective: CIMS, aerosol instr checkup flight

Need to also check total instr flow on Roger's in-flight

Instrument notes: Waited for a LONG TIME on the runway for incoming aircraft. Not good for aerosol instruments to sample this long when just sitting on the tarmac. Start waiting to turn on instrument pumps until just before takeoff.

CIMS inlet temp skyrocketed past 40 again

KA autopilot not stopping at its alt SP

Daun couldn't hear my headset most of the time

No spiral due to VFR conditions and starting to annoy the tower

Flight Notes:

2327 wheels up

Total instr flow through Roger's 21.2 - 21.4 (4k ft)

2345 turn at Atqasuk

- 2k ft lowest possible in IFR

0001 low approach 1

Total instr flow 21.2 whether on the inlet or not - 2k ft

0020 low approach 2 - lowest alt was 500 ft

0024 slightly in-cloud - tower made us climb to 5k

0027 still in cloud? - can't get ahold of tower

0037 started 7kft leg

0043 climb to 10k

0049 RIFLOW at 3 LPM ??? - can feel sucking on RI inlet when pull it off of 3-way valve

- RITIP at -6V whole flight

0050 start 10k leg

0057 start descent for approach to PABR

0113 wheels down

02/20/2022

Pilot notes (ChaCha test flight Transponder)

Crew: Sigel, West and Roberson

Time: 1.1

Planned:

File an IFR to PAWI and back at 4000 there and 3000 back. Test the transponder and some other equipment and return to PABR.

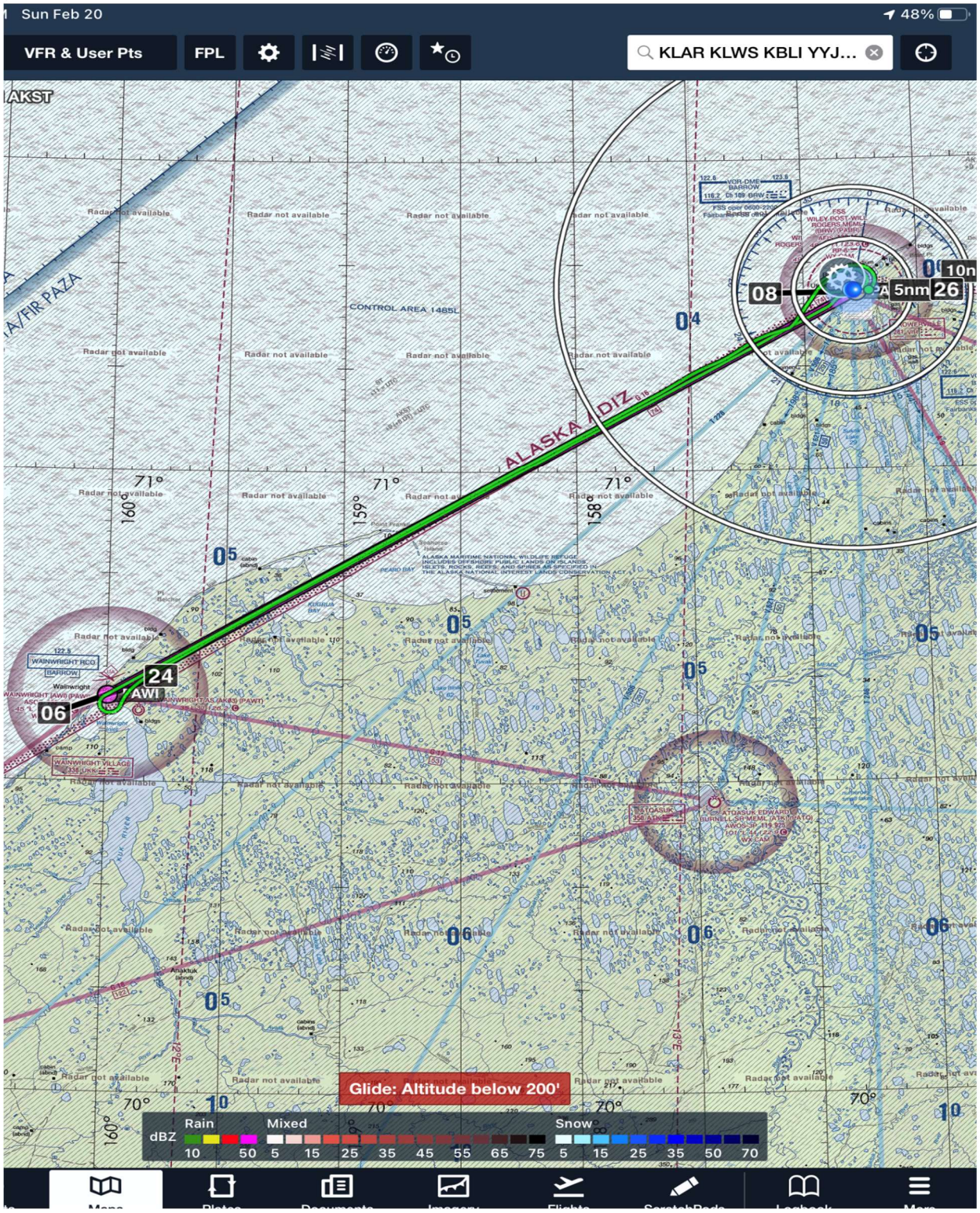
Actual:

Walked up to the Flight service station and filed a flight with Jackie. Very friendly and She gave me a full weather brief as well. Flight service station # is 907 852 2511. They like if you visit and all seem to be more than willing to help. Weather they were calling for at the moment was ¾ on the vis and 400 overcast. It looked like VFR to me. Gate code to get the lock off the fence is 5400 first person unlocks it and the last locks it up for the night.

Pulled the aircraft out and started. We had a bit of communication problem after start up. Just getting into the swing of things. Took off on Rwy 8 and then turned to the South west to proceed to PAWI. Right off we were handed to Anchorage, immediately after the level off we asked if they were picking up our transponder. They said yes. We then ask to switch transponders and see if anything changed. There was no change. Landing at PABR they were calling the weather 7 miles and 400 scattered. We saw the airport and flew overhead to enter a left downwind for Rwy 8. Turning down wind was no problem, there was good visibility. On the base leg looking back to the east with the sun at a low angle made the Runway hard to make out especially with the 400 scattered layer. We were able to make it out as we approached the end of the leg and make a normal decent.

Aircraft:

No new problems.


Sun Feb 20
48%
VFR & User Pts
FPL
KLAR KLWS KBLI YYJ...
AKST
CONTROL AREA 1485L
ALASKA MOA
Radar not available
24
AWI
06
08
26
5nm
10n
Glide: Altitude below 200'
dBZ
Rain
Mixed
Snow
10
50
5
15
25
35
45
55
65
75
5
15
25
35
50
70
Map
Plates
Documents
Imagery
Flights
ScratchPads
Logbook
More

02/09/22 Pilot notes (CHACHA22 TF 8)

Crew: Drew, Robertson, Glover

Flight Time: 1.5

Planned: Climb to 16,500 ft. and do several minutes at max speed and several at minimum speed. Repeat again. Then drop sonde. Then perform wind calibration circles. Then fly back at 9000 ft. MSL and repeat max speed and min. speed runs twice.

Actual: Climbed to 16,500 ft. and did several minutes at max speed and several at minimum speed and then repeated. Dropped sonde while heading southeast from 17,500 ft. MSL. Turned west bound for clear air to perform wind calibration circles. On the way noticed the sonde stopped transmitting. After the circles headed back towards the sonde drop point. Picked it up intermittently at 15 nm but solid at 10 nm. Descended to 9000 ft. MSL and repeat max speed and min. speed runs twice.

9 Feb 2022

TF08 System Scientist notes

Crew: Tom Drew, Anna Robertson, Brent Glover

Objective: Speed tests: At 9k and ~18k ft. Get to max speed then reduce to min comfortable. Twice at each altitude. Flaps up. For temp meast cal

Wind maneuvers. 1 360 to left, 1 to right, varying yaw. Then same, with speed reductions.

Climb to 16.5k, speed tests, drop a sonde, maneuvers, then drop to 9k on ferry back and do speed tests at lower level

Notes:

RITEMP and RIPRES showing -122 C and -102 hpa (were these from Lukens pitot setup?)

Mouse on keyboard not working (optical mouse disconnected)

CIMS inlet temp at 137.5 C (!) - turned it off

CabinP railed again - fixed after restart from Brent

Flight notes:

2109 wheels up

Magnahelic 4-5 in how, >500 lpm

Climb to 16.5k ft

- top of BL ~13K FT

2116 start max speed (TAS 140 m/s)

- magnahelic 6

2119 start slow down (85 m/s)

2122 back to max speed (128 m/s)

2124 back to min speed (82 m/s)

2137 back to normal speed

2141 launch sonde (17.5k)

- lost contact with sonde at about 20 miles away

2147 start Rodi maneuvers to L (at 16.5k ft, varying yaw)

- potentially some wave action in wwind

2150 rodi maneuver to R with varied yaw

2152 revving up to max speed

2153 start turn to L, fast to slow

2155 start speeding back up, still turning

2156 start circle to R, fast to slow

2158 start speeding back up, still turning - some turbulence

2200 switch from magnahelic to pitot

- pitot not reading anything, power connected?

- was reading -140 hpa, now back to -2 hpa

2206 heading back to drop location, started picking sonde back up intermittently about 16 miles away

- steady connection at around 10 miles (terrain may have played a part, Shirley Mts)

2209 spiraling down from 16.5k ft to 9k ft (last 2.5k ft slightly displaced to avoid terrain)

2217 start speed tests at 9k ft, max speed first (120 m/s)

2220 start slowing down to min speed (75 m/s)

2224 back to max speed (120 m/s)

2226 back to min speed (75 m/s)

2228 back to normal speed (90 m/s)

2237 wheels down

9 Feb 2022

TF07 System Scientist notes

Crew: Tom Drew, Anna Robertson, Nick Mahon

Objective: Quick flight to test Roger's inlet flow with 100 lpm ball flow meter (rotometer)

Test at different altitudes, speeds

Keep track of OAT, alt

KA data system off again

Flight notes:

(Local times)

1024 takeoff

9k ft, 160 knots, temp -2C - >100 lpm

TAS 140, still >100 lpm

Ball didn't drop until we got below 40 knots TAS on landing

1033 landing

8 Feb 2022

TF06 System Scientist notes

Crew: Tom Drew, Anna Robertson, Brett Spiker

Objective: Quick flight to test Roger's inlet flow with 100 lpm ball flow meter

Test at different altitudes, speeds

Keep track of OAT, alt

KA data system off

Headphone jack static rpm related

Flight notes:

(Local times)

0943 takeoff

9k ft, 167 kts, temp -4 - 36 lpm

9k ft, 190 kts, temp -5 - 41 lpm

9k ft, 130 kts, temp -3 - 27 lpm

9k ft, 160 kts, temp -4 - 34 lpm

0957 landed

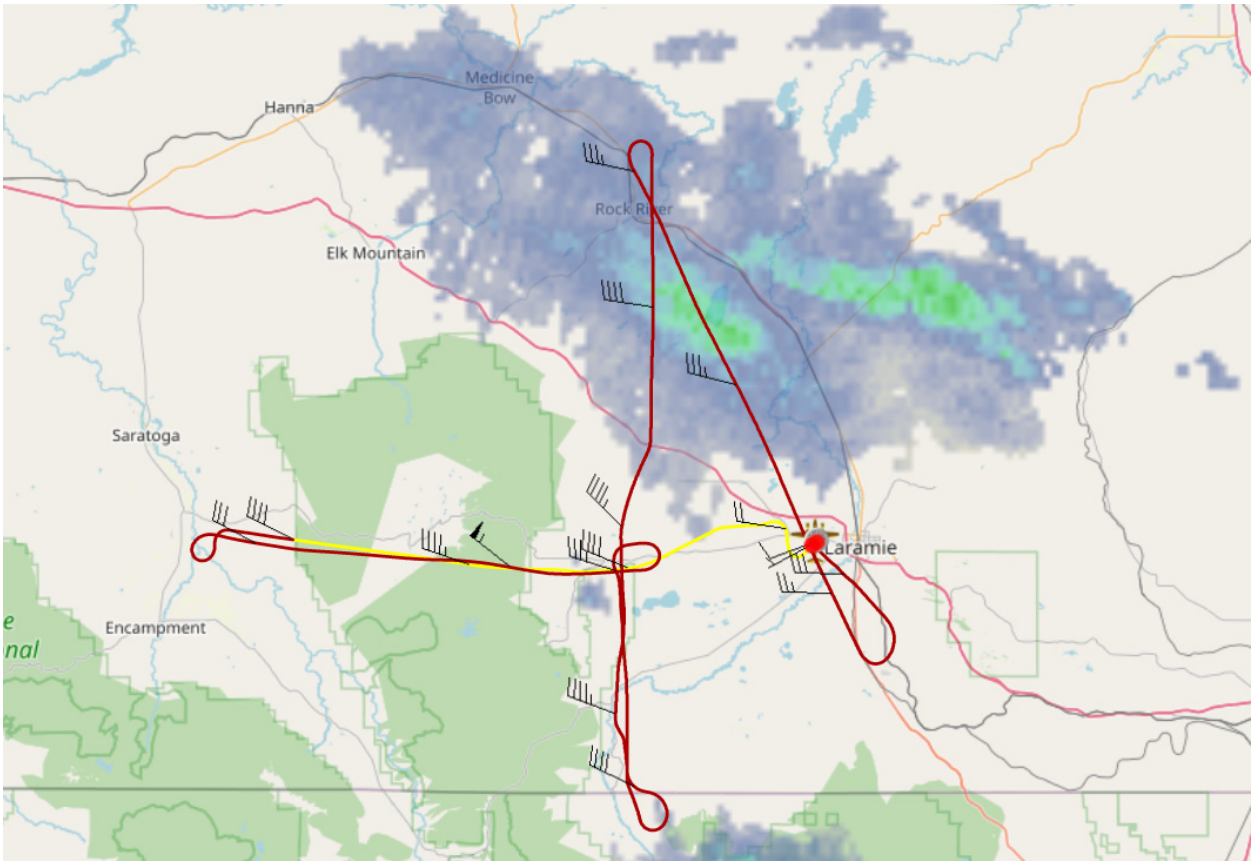
02/05/22 Pilot notes (CHACHA22 TF 5)

Crew: Drew, Robertson, Woods

Flight Time: 1.4

Planned: 1. Find Clouds as low as possible.
2. Try to stay in the clouds
3. Try to change altitude by 3000 ft. while in cloud
4. Fly down the valley low to check flows.

Actual: At the time of takeoff, all clouds in the Laramie valley were gone. Climbed to 14,000 ft. MSL and flew over the Snowy Mountains (14,000 ft. is the Minimum IFR altitude in that area). We did penetrate cloud at 14,000 ft. After exiting the cloud on the west side in the Saratoga Valley returned back to the Laramie Valley at 14,200 ft. (the clouds tops about 14,500 ft.). Noticed a pretty good standing wave cloud over Sheep Mountain and flew south/north at 14,000 ft. to stay in it. Then dropped down to about 1500 ft. AGL in the valley floor and few North for about five minutes to check flows. Then turned towards Laramie and returned for landing.



6 Feb 2022

TF05 System Scientist notes

Crew: Tom Drew, Anna Robertson, Sarah Woods

Objective: Test CVI flows, POPS flow (now using needle valve + critical orifice)

POPS flow happy thru startup and takeoff (about 2.6 cm3/s)

- dropped to 2 cm3/s at 11k
- after switching to cvi, POPS is at 3 cm3/s at 14k
- POPS flow increased to about 4 cm3/s with descent to lower alt

Cam images not recording again

Flight notes:

0013 takeoff

0019 entered cloud

0111 Pops disconnected from flow system

0126 Landed

2022-02-05 KA Test Flight for CVI (2nd CVI flight from KLAR)

Config: Standard for CHACHA cloud flights: CIMS off, all others operational. Rogers for takeoff/landing, CVI for cloud sampling

Crew: Tom, Anna, Sarah

Obj: Sniff out liquid clouds near Laramie, check flows.

Preflight Check Summary: No known issues. POPS had a MFC added, then removed because it wasn't reliable, now has needle valve, critical orifice, and ball valve after. POPS pump was also removed. Gracie tended to PILS. Daun capped CIMS.

T C
Trose -1.9 C
P mb
RH 44.7 %
Pa kft

Conditions: scattered roll/street clouds from NE to SE, drifting south over terrain. Overcast. Losing daylight rapidly.

2243 UTC on 2022-02-05 CVI pump, dry air, and flow control turned on to warm heater. Ctrl flow set to 10 LPM

0006 UTC Engine start

0011 UTC taxi (1711 local KLAR)

0012 Takeoff UTC (on Rogers inlet)

0014 Drum advance for climb out/transit

CVI TAS looks good

Heading west toward cloud

0020ish – open dilution flow and switch Rogers to CVI. Start w MFC=13, turn down to 10 to bump CVI inst flow over 11. Will leave it here for a bit since it was variable last flight and want to keep it < 14.

Hit some liquid clouds while I was in the back messing with flows – see on CDP

2D-S not working, need to restart GUI, looks good now

0024 2DS ice fallout

0025 lots of ice on 2DS, very lil liquid on CDP

0026 liquid pocket, still lot of ice, 13.8kft, -18C

0029 Drum advance for cloud 1

0029 2DS ice getting smaller, still a lot of liquid, 13.8kft, -19C

0032 turn & climb to make a pass at higher altitude
Looks like we were actually about 500 ft below tops, won't be able to go much higher

0034 repen skimming tops, mixed phase, 14kft, -19.7C

0037 lot of liquid pocket, with fewer large ice, 14kft, -19C

0041 back into cloud, less ice, more liquid – wave cloud - ** -19C, 13.9kft

0044 Drum advance for cloud 2

Turn around to get back into wave cloud, in turn Tom notes it's already dying..

0044 dropping 200 ft to get back into it.
0044 into cloud -19C, 13.8kft, lotta liquid again, lil bumpy, still some ice
Long pass, very bumpy later on, big ice

0047 lwc pocket followed by big ice, then mixed phase, -19C, 13.8kft

0048 lots of ice

0049 turn to make one more pass at this altitude. Can't go down here, and if go up get out of cloud

Tip tip for pils been 91-93

0051 lots of liquid, still some large ice, 13.8kft, -19.9C

0053 back into cloud, ice

0057 lil lwc again, and ice
0057 good lwc, some large ice, but less, bumpy ** cpc up to 400, Tom says this is the good convective one we went through earlier, 13.8kft

0100 out of cloud, descending for clear air leg

0001 fast descent, lil noise on 2D-S

0002 Drum advance for clear air leg at lower alt on CVI, 8.7kft, -6C

0002 start low alt leg in clear air, 8.7kft, -6C, occasional biomass on 2D-S
Bumpy, Tom: blowing off the snowies, always bumpy here

0008 turn to travel along same leg with pops disconnected
Still some bio material on 2D-S

0110 Anna plug/disconnect POPS, inst flow up to 17.5 during transition

Ran back to adjust MFC SP because CVI inst flow stayed high after Anna was finished

0118 cvi inst flow now steady 13, 8.7kft, -5C

0121 3-way from CVI to Rogers, close MFC dilution flow, turn CVI counterflow back to 10 (checked inst flow goes to 0), leave pops disconnected/off for remainder of flight

0223 Drum advance for final approach (on Rogers)

0125 Gear down

0126 Landing

0127 Turn off PILS & Drum pumps

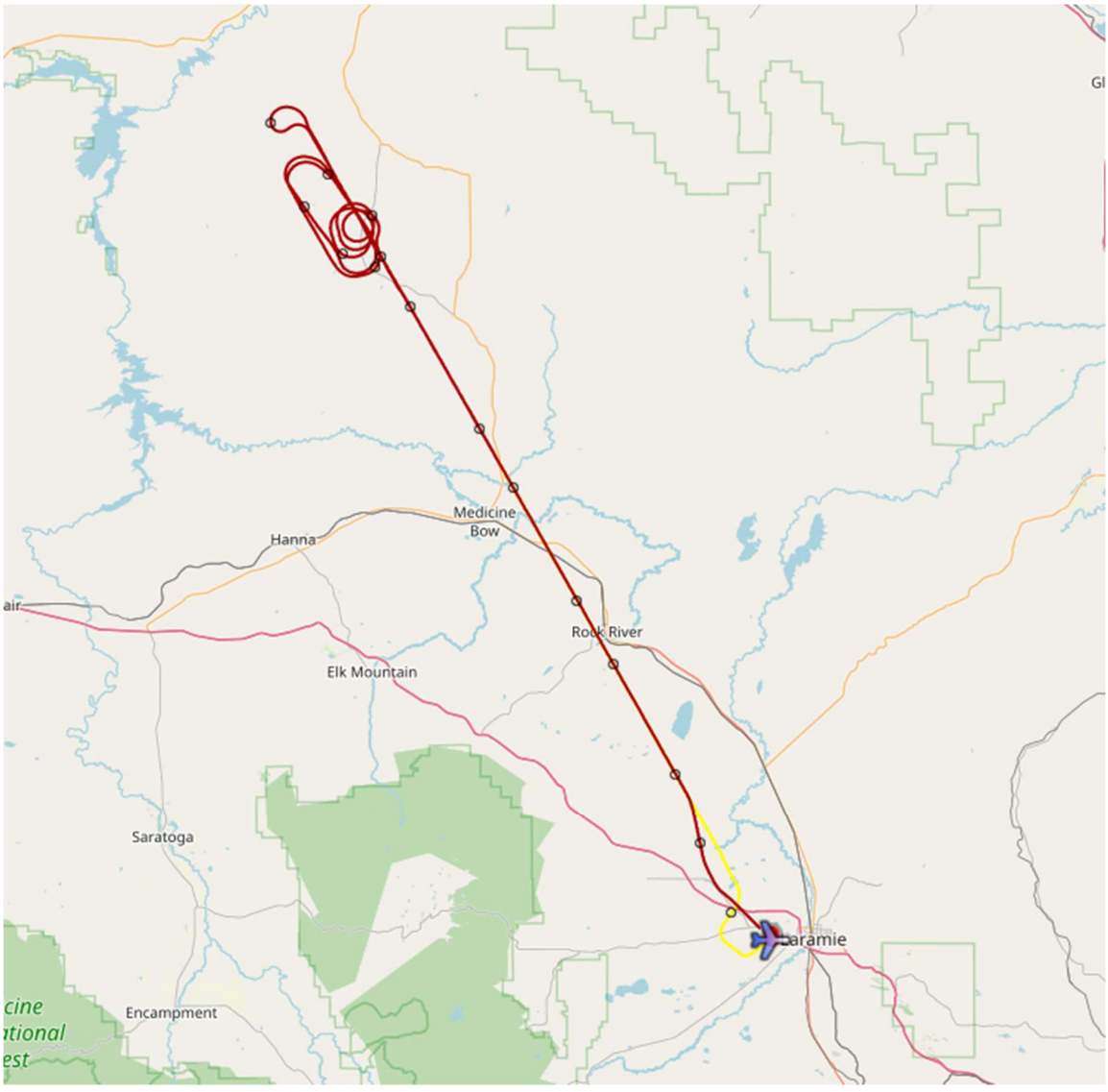
02/03/22 Pilot notes (CHACHA22 TF 3)

Crew: Drew, Robertson, Goodstein

Flight Time: 1.4

Planned: Fly to the drop location orbit, drop two sondes, then make a spiral sounding and return to Laramie.

Actual: Climbed to 16,500 ft. MSL to drop site, set up North West of point and climbed to 17,500. Dropped 1st sonde, then orbited North West and dropped second sonde. Spiraled over drop point to 1000 ft. AGL. Returned to Laramie at 2000 ft. AGL.



02/01/2022 Pilot notes (ChaCha test flight 2)

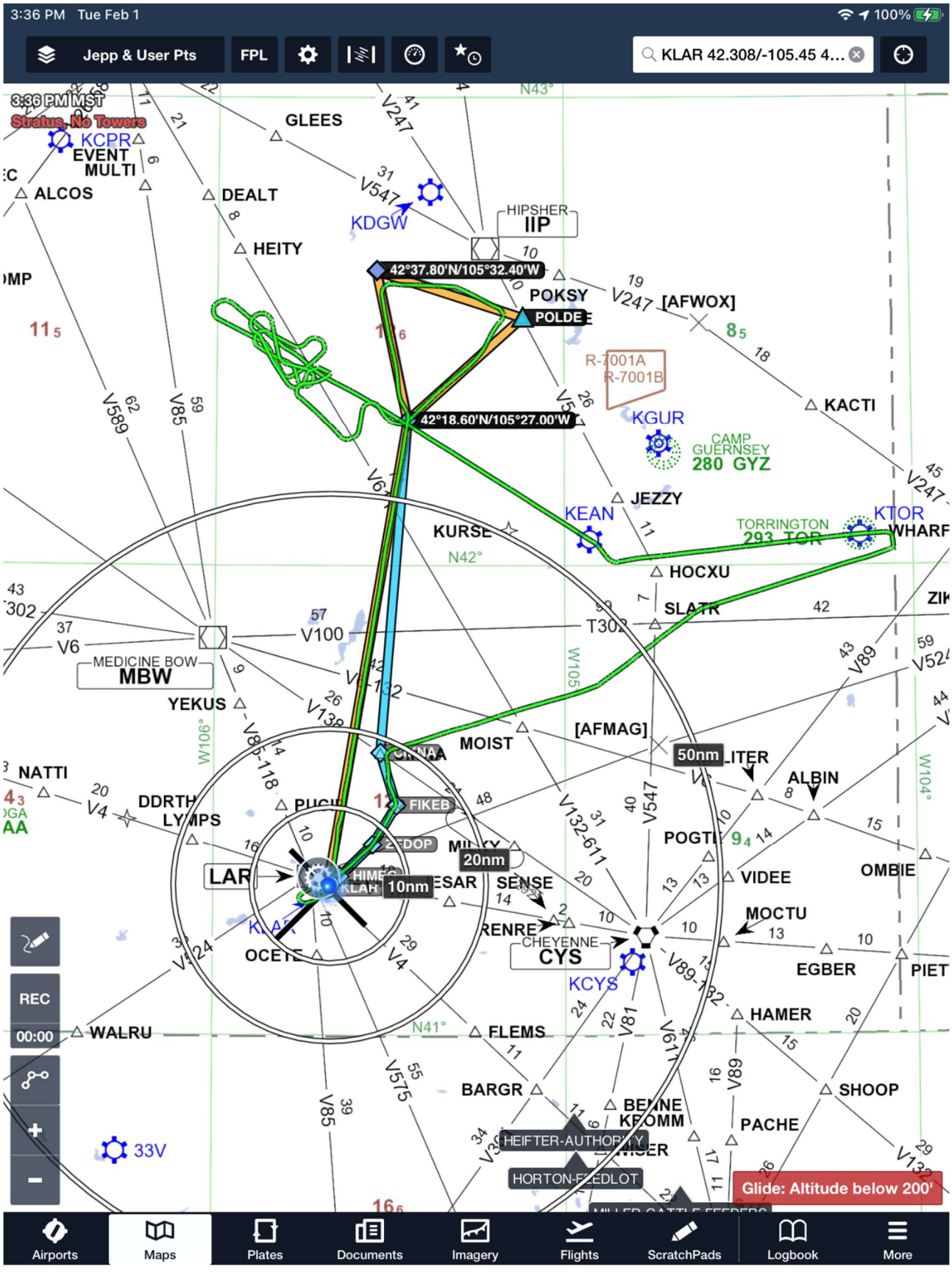
Crew: Sigel, Robertson, Wood Flight Time: 2.2

Planned: Take off KLAR, climb to 11000', direct to 42.308N/105.45W (call that waypoint A), cross waypoint A at 11,000, turning left to 42.628/105.541W (waypoint B). At B, climb to 11,500', then Direct POLDE. At POLDE, climb to 12,000' turn right to waypoint A. At A, climb to 12,500', turn right to Waypoint B. At B, climb to 13,000', then direct POLDE. At POLDE, climb to 13,500, then direct to Waypoint A. At A, climb to 14,000', direct to Waypoint B; at B, lower speed to 160kts, and maintain 14,000', direct to POLDE. At POLDE increase speed to 200 kts, direct to Waypoint A. At Waypoint A, maintain 200 kts, descend to 12000', direct KLAR for 7 minutes, then proceed as needed to KLAR.

The intent for the flight is as before. If this space doesn't work for clouds, you will have to move the triangle on the "fly"!

Actual: Departed Laramie to north east climbed to 13000. Hit first way point and we were above most of the clouds. Got to the second waypoint and still above the clouds. At POLDE we were in clouds but they were mostly ice. Passing the 1st waypoint again we went hunting clouds with more moisture. We found some a bit west of the original planed area. Made several passes through them until they started to dissipate. Through chat we were directed to EAN, TOR and SLATR. The clouds were very low and we could not safely reach them. Went back to LAR. Started the RNAV 21 and circled to land RWY 03.

Aircraft flew well J hook did not release after takeoff. Other than that there was no problems.


3:36 PM Tue Feb 1
100%
Jepp & User Pts
FPL
KLAR 42.308/-105.45 4...
3:36 PM MST
Stratus, No Towers
KCPR
EVENT
MULTI
ALCOS
DEALT
GLEES
HEITY
KDGW
HIPSHER
IIP
42°37.80'N/105°32.40'W
POKSY
POLDE
[AFWOX]
R-7001A
R-7001B
KGUR
CAMP GUERNSEY
280 GYZ
KACTI
42°18.60'N/105°27.00'W
JEZZY
KEAN
TORRINGTON
293 TOR
KTOR
WHARF
KURSE
HOCXU
SLATR
MEDICINE BOW
MBW
YEKUS
MOIST
[AFMAG]
50nm
ALBIN
NATTI
DDRTH
LYMPS
FIKEB
POGTI
VIDEE
OMBIE
LAR
20nm
10nm
SENSE
MOCTU
CHEYENNE
CYS
KCYS
EGBER
PIET
HAMER
WALRU
FLEMS
BARGR
SHOOP
PACHE
HEIFER-AUTHORITY
HORTON-FEEDLOT
33V
REC
00:00
Glide: Altitude below 200'
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Logbook
More

2022-02-01 KA Test Flight for CVI (1st CVI flight from KLAR)

Config: Standard for CHACHA cloud flights: CIMS off, all others operational. Rogers for takeoff/landing, CVI for cloud sampling

Crew: Ed, Anna, Sarah

Obj: Sniff out liquid clouds N/NE of Laramie. Note: heavy ice clouds to the South (heavy snow/upslope along CO front range)

Preflight Check Summary: No known issues. Matt just updated CVI datastream/plots up front. Larry updating to show PILS LFE. Matt also updated so CVI should be getting aircraft TAS. Gracie tended to PILS. Daun capped CIMS.

T 3 C
Trose -8.1 C
P mb
RH 21.8 %
Pa 7.3 kft

Conditions: overcast, cold, snow over CO front range

2004 UTC Engine start
CPC 1000/cc

2009 UTC taxi (1309 local KLAR)

2021 Takeoff UTC (on Rogers inlet)

2021 Drum advance for climb out

2022 ice fallout from layer above, -15C, 10.3kft

CVI TAS looks good – UI matches aircraft

2025 climbing through 13kft, -21C, thin ci above, still lil ice fallout on 2DS, snow covered below, shallower puffy cu to south

2026 Drum advance for clear air 1 since leveling near 13kft

2030 turn down counter flow to 2.5, seems to level at 7.5?

2032 approaching lower cloud deck, some puffy tops reaching toward our level, not much above. Nice wave cloud to the right. -22C, 13kft

2036 Open dilution flow, switch Rogers to CVI, inst flow a bit low (8.5), but heading into cloud, requested to stay buckled in.

2037 Drum advance for cloud 1
2037 into cloud, -23C, 12.8kft, ice on 2D-S as well as a few small drop
2038 back out of cloud
2039 skirting top of cloud, all ice, see puffier cu slightly to north, reposition.

2041 begin right turn

2044 run back to adjust MFC – drop from 12 to 10 to bump inst flow up – now reading 14.7 LPM

2045 in ice cloud layer, -23C, 12.8kft
2045 2D-S vapor grown plate

2056 Drum advance for cloud 2

2056 start getting back into some ice cloud, ask Ed to turn to hit some firmer/puffier cu tops
2056 all ice on 2D-S, -23C, 12.8kft, lost cu target in ice layer
2058 lft turn to find puffy cu, but at edge of airspace

2059 clip edge of cloud, ice, few sm drops -23.6, 12.8kft **most LWC so far for small drops

2101 continuing on to look for other clouds
2102 liquid cloud, some larger ice
2103 back into hazy mixed layer
Ed asking if we can come back through and climb to get above ice layer

2104 left, then right turn to get back in, some ice in turn

2104 more ice haze layer, -24C, 13.4kft

2106 more ice haze layer in turn

2106 into another turret, mixed phase, -25C, 13.8kft
2108 turn and look for another turret, spotted some crisper ones to the left

Note: Inst flow a lil variable, 12.9-14.6 over a few minutes

2109 into another turret, mostly sm drops, few large ice, -26C, 13.8kft

2110 into another turret, mixed phase

2112 turn around and climb to get closer to tops

2113 pen, lg ice, but some small drops, CPC 21/cc

2114 pen, lot of sm liquid drops, some large ice, -27C, 14.3kft

Note: lil icing on wing tip instruments

2116 pen, fairly smooth, but lots of liquid drops with few large ice, 42/cc on CPC, -26 C, 14.3 kft

2118 pen turret, about -27C, good lwc, 5 m/s or so up, few larger ice

2119 turn and climb to hit growing top

2119 Drum advance for cloud 3 as we climb higher

2120 pen, lil more ice, but still some liquid

2121 lil ice scud layer on 2D-S, 14.8kft, -28C

2124 pen turret, then 2nd turret, then few more, 2nd and 3rd? were mostly all liquid

Cut size still says 0 on CVI? All other flows look reasonable

2126 pen turret, good liquid, some large ice yet, -27C, 14.8kft

2128 pen turret, mixed phase, then lot of liquid, some large ice, 14.8kft, -28C

2131 transiting toward Wheatland to look for liquid clouds at lower altitudes

2132 into cloud, tad bumpy, mixed phase -27C, 14.8kft

2134 couple brief turret clips en route, mostly liquid, -27C, 14.8kft

2139 lil ice scud en route -27C, 14.8kft

2147 stuff looks pretty low and pretty scuddy (icy) ahead, not sure that we can get low enough to even get into anything.

2148 Sara suggested maybe near Chuckwater?

2149 few ice particles on 2D-S (very thin layer), -22C, 12.7kft

2150 lil more ice

2153 CVI flow was rising above 16, popped back to raise MFC from 9 to 12, then 13 to drop inst flow back down below 14.

2154 more ice scud, -16C, 9.8kft

2155 PILS tip temp was down around 91 up at 15kft, now rising back up to 93 at 9.8kft
PILS LFE 12.7 slpm – pretty steady, was 12.6

2155 advance Drum for cloud 4
2155 Arriving at Torrington, only scud ice cloud here, head to Chuckwater to look there

2159 heading to Chuckwater, still in ice layer, all large ice, some rimed columns, irregulars, occasional plate, rimed rosette, aggregates, -16C, 9.8kft

2203 still in ice layer, rimed pristine, -16.8C, 9.8kft
CPC 55-85/cc, occasional counts on CDP, but very low

2206 nada here either, call RTB, ask for 14kft to get above clouds for aerosol sampling on Rogers

Realtime airspeeds still tracking well on 2D-S & CVI

2209 CVI inst flow dropping again (from 11 to 9.5) as we climb through 11.7kft
Still in ice layer

2214 pop back to lower MFC set point to 9 to bump CVI inst flow back up to 14, level at 13.1kft, -22C

2217 3-way from CVI to Rogers

2218 close MFC dilution flow, turn CVI counterflow back to 10 (checked inst flow goes to 0)

2220 finally out of cloud layer, nearing final approach. Still thick ice layer below, some ci above. -17.8C, 11kft

2220 Drum advance for final approach (on Rogers), still some ice on 2D-S

2222 lot of ice on 2D-S again, hazy ice layer out window

2222 pocket of decent liquid water! with some ice still. On Rogers inlet though ☹

2225 still lil ice fallout from thin layer above, -14C, 9.7kft

2230 Gear down

2232 Landing

2233 Turn off PILS & Drum pumps

01/31/2022 Pilot notes (ChaCha test flight 1)

Crew: Sigel, Robertson, Jeong Flight Time: 1.8

Planned: Depart to the south east climb to 9500 to FLEMS slow decent to 6500 to cross HAMMER 6500 to WUBNO. Climb to 7500 at JENUK maintain 7500 to VIDEE. Make a low approach to CYS and back to LAR.

Actual: Departed Laramie to south east climb to 9500 to FLEMS. There was a loud cracking noise coming from Anna's headset. Very loud! It was very distracting and she was able to get it quieted down we made it to FLEMS just in time to turn to Hammer we made a slow decent to 6500 to cross HAMMER 6500 to WUBNO. Climb to 7500 at JENUK maintain 7500 to VIDEE. Made a low approach to 27 at CYS and back to LAR at 10500.

Aircraft flew well no problems other than the cracking noise. No problems.


4:42 PM Mon Jan 31
38%
VFR & User Pts
FPL
KLAR FLEMS/A095 HA...
Scottsbluff
10nm
20nm
50nm
JENUK
WUB
HEIFTER-AUTHORITY
HORTON-FEEDLOT
MILLER-CATTLE-FEEDERS
DYECREST-DAIRY
HERGER
E_BAR_M_FEEDYARD
PRODUCE_FEEDLOT
JBS_FIVE_RIVERS
FIVE_RIVERS_GILCREST
FEEDLOT12
FEEDLOT2
DAIRY11
PINNEAO_FEEDLOT
TEAGUE_ENTERPRISES
MAGNUM_FEEDLOT
T-BARW
DINKLAGE
CATTLE
TIMMERMAN-FE...NG-STERLING
MCENDAFFER-F...YARD-MERINO
REC
00:00
Boulder
Denver
Aurora
Glide: Altitude below 200'
Airports
Maps
Plates
Documents
Imagery
Flights
ScratchPads
Logbook
More

Project: CHACHA-22
31 Jan 2022

Flight: TF01

Notes:

The intent is to just get some S&L transects to examine the performance of the instruments; for the user-provided instruments, this is mostly the CIMS. We are trying to get as low as we can for these flight transects, as the typical altitude at Utqiagvik will be ~2000 - 2500agl. Take off KLAR, climb to 9500' (1000fpm is fine), direct FLEMS. Then slow descent to HAMER crossing HAMER at 6500'. Continue to WUBNO at 6500'. Then slow and steady climb to JENUK, crossing JENUK at 7500', continue to cross VIDEE at 7500', then turn to KCYS (Cheyenne). At KCYS, do a low approach over Runway 27. Depart 27 and climb as needed to head to KLAR, full stop. Instrument notes: CPC3 reading a nonsense value, even though display on front of CPC is normal. TAS does not seem to be correctly reading in to CVI. RIFLOW cutting in and out and reading 15-160 lpm. CONCP020 went red around 2239 but still reading a reasonable value (2000 cm-3, sheath 13.8, sample 0.75, histogram looks fine).

Crew: Sigel, Robinson, Jeong; LOD: Glover/Morgan.

Flight Summary:

UTC Comment

2155 takeoff

2205 FLEMS - high PCASP concentrations (25k max)

2215 HAMER - low PCASP conc's (200ish)

2231 WUBNO

2241 JENUK

2307 VIDEE

2312 approaching CYS

2314 over CYS runway (6200' AMSL) - Very high PCASP concentrations between cys and lar (50 k)

2335 landed