

# RACEPAC Flight #1 – Polar 6 – 140428

Report by Stephan Borrmann

All times are local times, very approximate “wrist watch times” only, and may differ from more precise aircraft data system times. The same holds for the altitudes specified here. The reported observations are based on visual sightings and may also be inaccurate due to the limited angle of view and the limited horizontal viewing distances. Photographs are available for many of the flight segments.

General situation: During all flight NO clouds at middle and high altitudes in the atmosphere.

Take off time: 12:09 LT

(1.) Approach field of scattered clouds around 12:50 LT at 4000 ft altitude. At 13:07 LT occasional penetration of patchy clouds. Not stratus, more cumulus humilis and mediocris with thicknesses between 300 and 400 ft.

(2.) **Experiment 1:** 13:15 LT clouds turn into thicker stratus deck with clear sky openings. We fly in a “**chasing mode**”, i.e. along the planned flight track albeit with altitude varying such that we spend as much as possible time inside clouds.

(3.) **Experiment 2:** At roughly 13:35 LT we arrive at the turning point past C2, and the Polar 6 turns towards Point C1. We drop down below the cloud deck and start “**staircase experiment**”. For this the vertical and horizontal dimensions of the cloud deck seemed sufficient. Cloud deck thickness about 200 to 300 meters.

\* 1300 ft, about 5 minutes below cloud to sample the existing precipitation. Bumpy flight.

\* 2000 ft, about 2-3 minutes inside cloud.

\* 2600 ft, about 2-3 minutes inside cloud

\* 3200 ft, some time. We are at cloud top, sample patches, but for me we are too high above the deck already. Thus drop down to

\* 2900 ft, for some more time. Here cumuliform cloud top sampled as well as clear air pockets.

(4.) **Experiment 3:** At 14:05 LT on our way to Point C1 the clouds get thinner and patchier. We descend to where the cloud seems thicker and switch to “**chasing mode**”. Again thin patchy broken cumuli (mediocris and humilis, not bigger). The aircraft goes in and out on its way to C1.

(5.) **Experiment 4: Gas phase and aerosol profile experiment:** Around 14:15 LT we ascend from about 4000 ft to 7000 ft for at least 5 minutes and later to 10000 ft in the vicinity of C3. The directions of the Polar 6 vary, only the altitudes are kept constant. After about 5 minutes at 10000 ft we turn towards Inuvik for return.

## Polar 6 UserEvents 28. April 2014

0	2014-04-28 18:06:28.941	Lat= 68° 18,321' N Lon=133° 30,004' W Taxi
1	2014-04-28 18:08:29.779	Lat= 68° 18,186' N Lon=133° 30,245' W rolling
2	2014-04-28 18:10:15.494	Lat= 68° 18,218' N Lon=133° 29,355' W take off
3	2014-04-28 18:11:41.932	Lat= 68° 19,345' N Lon=133° 24,895' W bmet deicing on
4	2014-04-28 18:15:29.640	Lat= 68° 25,035' N Lon=133° 41,211' W aerosol auf
5	2014-04-28 18:16:06.593	Lat= 68° 26,026' N Lon=133° 43,413' W Nerzeroff on heater on
6	2014-04-28 18:16:57.871	Lat= 68° 27,438' N Lon=133° 46,694' W roller door Kt off
7	2014-04-28 18:19:38.917	Lat= 68° 32,475' N Lon=133° 56,788' W Cr2 on
8	2014-04-28 18:32:45.174	Lat= 68° 55,852' N Lon=134° 40,916' W Netzerov kalibriert
9	2014-04-28 18:54:51.875	Lat= 69° 31,096' N Lon=136° 10,692' W Netzerov balanciert
10	2014-04-28 19:03:07.794	Lat= 69° 36,059' N Lon=137° 1,021' W Netzerov balanciert
11	2014-04-28 19:04:48.477	Lat= 69° 37,045' N Lon=137° 12,217' W up to 1700 ft
12	2014-04-28 19:35:49.415	Lat= 69° 53,759' N Lon=140° 37,806' W wp C2 plus 20 Meileen
13	2014-04-28 19:46:30.327	Lat= 69° 49,943' N Lon=139° 44,952' W up to 1600 ft
14	2014-04-28 19:47:42.379	Lat= 69° 49,455' N Lon=139° 38,659' W up to 200 ft
15	2014-04-28 19:48:50.806	Lat= 69° 49,040' N Lon=139° 32,360' W No text
16	2014-04-28 19:50:24.926	Lat= 69° 48,342' N Lon=139° 23,150' W climp 300 ft
17	2014-04-28 19:51:18.173	Lat= 69° 47,981' N Lon=139° 17,798' W level 2300 ft
18	2014-04-28 19:52:37.234	Lat= 69° 47,199' N Lon=139° 10,191' W ScreenDump_DMS- OPERATOR1_Header_2014_04_28_19_52_37.jpg
19	2014-04-28 19:52:43.046	Lat= 69° 47,138' N Lon=139° 9,728' W climb up to 2600
20	2014-04-28 19:55:01.446	Lat= 69° 46,044' N Lon=138° 56,232' W climb up to 2900
21	2014-04-28 20:02:04.943	Lat= 69° 42,350' N Lon=138° 11,471' W down to 2600
22	2014-04-28 20:13:27.418	Lat= 69° 35,762' N Lon=137° 8,213' W wp c3
23	2014-04-28 20:14:53.632	Lat= 69° 36,855' N Lon=137° 13,790' W climb to 7000
24	2014-04-28 20:16:45.332	Lat= 69° 37,733' N Lon=137° 24,611' W 7000 ft
25	2014-04-28 20:18:22.252	Lat= 69° 38,782' N Lon=137° 34,860' W Nevzorovsonde balanciert
26	2014-04-28 20:19:44.358	Lat= 69° 38,932' N Lon=137° 43,861' W Nevzorovsonde untere anzeige nicht auf null. autoknopf hakt
27	2014-04-28 20:21:13.917	Lat= 69° 36,090' N Lon=137° 41,342' W climb up to 10000 ft
28	2014-04-28 20:23:03.381	Lat= 69° 33,344' N Lon=137° 29,445' W level @ 10000ft
29	2014-04-28 20:28:27.802	Lat= 69° 22,192' N Lon=136° 49,476' W einlaß wechsel spurengas
30	2014-04-28 20:28:54.911	Lat= 69° 21,217' N Lon=136° 46,134' W nezerovsonde balanciert
31	2014-04-28 20:38:40.178	Lat= 69° 0,353' N Lon=135° 34,053' W down to the way back
32	2014-04-28 20:50:12.243	Lat= 68° 36,423' N Lon=134° 23,203' W down to the way back
33	2014-04-28 20:50:14.665	Lat= 68° 36,334' N Lon=134° 22,890' W cr 2 off
34	2014-04-28 20:51:41.129	Lat= 68° 33,660' N Lon=134° 15,150' W roller zu kt 90 einlaß zu
35	2014-04-28 21:03:06.052	Lat= 68° 18,211' N Lon=133° 29,601' W Touchdown
36	2014-04-28 21:05:07.484	Lat= 68° 18,283' N Lon=133° 29,286' W Bmet deiceing off
37	2014-04-28 21:08:56.444	Lat= 68° 18,321' N Lon=133° 30,005' W Parkposion

## Polar 5 - 28. April 2014

2035 UTC Clear Sky above, low cloud underneath

2038 UTC the same

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2046-2 UTC 2x2-Binning, no clouds above, clouds below

2050 UTC evtl. Eiskante

2051 UTC C1

2100 UTC evtl. Eiskante, keine Wolken ueber uns, wolkendecke unter uns

2105 UTC Wolke ueber uns. Messung stop, Daten kopieren

2104 UTC eigentlich 2109 UTC doppelte Wolkenschicht

2111 UTC noch leichte doppelschicht unter uns, nichtS ueber uns

2115 UTC keine Doppelschicht mehr, aber variable einfache Schicht, nichts ueber uns

2120 UTC keine Wolke ueber uns, geschlossene einfache Wolkendecke unter uns. Wahrscheinlich ueber

Eis

2122 UTC C2

2127 UTC keine Wolke ueber uns, hoeher gerutschte geschlossene Wolkendecke unter uns

2132 UTC Dropsonde

2137 UTC Doppelschicht unter uns. Nichts ueber uns

2145 UTC the same

2151 UTC the same. Ueber Wasser. Einzelne Wolkenschicht

2155 UTC Wolkenschicht niedriger. Ueber Wasser. Duenner zweiter Wolkenstreifen eventuell. Flug parrallel zum Eisstreifen. Links im Eaglebild Eis, rechts Wasser. Seeeehr gut

## **P5 Tim ... Flug-Nr.: 28.04.2014**

Datum: 28.04.2014, Zeiten sind LT

Take-off: 12:16

Messbeginn SMART: 12:23

keine Wolken zu sehen

12:35: roll am Begrenzer kurz weil Linkskurve

Flug nach NW Richtung C1

12:45: einzelne offene Stellen im Eis → Meerwasser

12:50: Linkskurve

rechts ist jetzt offenes Meer zu sehen

C1 erreicht (deshalb Kurve)

12:52: Höhe: ca. 2795m, Flugzeug bremst, Laser wird angemacht

12:55: Laser ist an

12:58: Eisgrenze, jetzt über Wasser

13:01: unter uns auf rechter Seite vor allem: tiefe Wolken

13:22: nahezu geschlossene Wolkendecke unter uns

es ist immer mal wieder Eis unter den Wolken

13:36: C2 passiert → Linkskurve (69,88°N, 140,66°W)

→ 2 Kreise um P6 vorzulassen

noch immer kein Cirrus zu sehen

zwischen C2 und C3: Nase sehr hoch, deshalb Pitch-Korrektur immer mal wieder am Anschlag

13:45: Dropsonde #1

14:02: keine Cirren, tiefe Wolken unter uns (teilweise aufgebrochen)

14:06: Dropsonde #2

14:11: tiefe Wolken brechen komplett auf, nur noch vereinzelt

14:12: Linkskurve (P6 hat Horizontalflug durch Wolke beendet)

14:14: über Wasser (NIR geht runter)

14:17: Strahlungsviereck (ca. 3min-Legs)

ca. 14:17:40-14:20:45: Start direkt Richtung Sonne

ca. 14:23:10-14:26:05: 90° nach links

ca. 14:28:20-14:31:20: 90° nach links

ca. 14:33:15-14:36:45: 90° nach links

→ immer mal wieder über Eis gewesen, Eis+Wasser wechseln sich ab,

Höhe: ca. 2800m

ca. 14:38:55-14:41:55: nochmal 90° nach links wieder direkt in Sonne

14:42: Kurs Inuvik, Rückflug, Aufstieg auf ca. 3120m (11000ft)

14:44: unter uns quasi geschlossene Eisdecke, kein Cirrus

14:50: Laser bereits aus

15:03: Start Sinkflug

15:05: Stop der Messungen, Landeanflug

15:15: Landung Inuvik, Flugdauer: 3h

Eis auf Dome oben

## Polar 5 UserEvents 28. April 2014

0	2014-04-28 18:14:18.451	Lat= 68° 18,340' N Lon=133° 30,014' W taxi
1	2014-04-28 18:16:48.395	Lat= 68° 18,217' N Lon=133° 29,378' W Takeoff
2	2014-04-28 18:19:33.185	Lat= 68° 21,071' N Lon=133° 30,960' W Rollerdoors open
3	2014-04-28 18:20:03.228	Lat= 68° 21,720' N Lon=133° 33,059' W Camera start
4	2014-04-28 18:23:17.031	Lat= 68° 27,223' N Lon=133° 44,486' W Start Photometer
5	2014-04-28 18:27:32.958	Lat= 68° 36,126' N Lon=133° 59,777' W Upper Video start (SD card was broken)
6	2014-04-28 18:28:21.377	Lat= 68° 37,896' N Lon=134° 3,780' W Albedometer on
7	2014-04-28 18:44:10.814	Lat= 69° 15,003' N Lon=135° 17,980' W Slewable Camera on
8	2014-04-28 18:51:27.440	Lat= 69° 29,515' N Lon=135° 54,552' W WP C1
9	2014-04-28 18:54:53.040	Lat= 69° 31,755' N Lon=136° 17,437' W AMALI Laser on
10	2014-04-28 19:10:52.347	Lat= 69° 40,917' N Lon=137° 55,353' W Dome of Slewable Camera iced
11	2014-04-28 19:36:18.048	Lat= 69° 54,135' N Lon=140° 43,795' W WP C2 extened
12	2014-04-28 19:45:08.170	Lat= 69° 51,505' N Lon=140° 3,427' W Drop Sonde Launched
13	2014-04-28 20:05:25.485	Lat= 69° 41,916' N Lon=138° 5,904' W Drop Sonde 2 Launched
14	2014-04-28 20:16:47.957	Lat= 69° 45,832' N Lon=137° 5,286' W S1
15	2014-04-28 20:17:08.832	Lat= 69° 46,332' N Lon=137° 3,505' W turn towards the sun, start raditation box
16	2014-04-28 20:17:53.377	Lat= 69° 45,474' N Lon=136° 59,892' W S1
17	2014-04-28 20:20:53.614	Lat= 69° 39,107' N Lon=136° 48,445' W E1
18	2014-04-28 20:23:13.237	Lat= 69° 36,882' N Lon=136° 35,443' W S2
19	2014-04-28 20:26:06.439	Lat= 69° 38,609' N Lon=136° 15,229' W E2
20	2014-04-28 20:28:24.208	Lat= 69° 42,066' N Lon=136° 7,887' W S3
21	2014-04-28 20:31:27.009	Lat= 69° 47,520' N Lon=136° 12,318' W E3
22	2014-04-28 20:33:20.574	Lat= 69° 48,874' N Lon=136° 19,357' W S4
23	2014-04-28 20:36:51.174	Lat= 69° 44,894' N Lon=136° 34,962' W E3
24	2014-04-28 20:42:03.233	Lat= 69° 34,125' N Lon=136° 26,476' W E5 last lag towards the sun
25	2014-04-28 20:42:25.718	Lat= 69° 33,290' N Lon=136° 25,299' W fligh back to Inuvik
26	2014-04-28 20:49:44.284	Lat= 69° 13,787' N Lon=135° 41,309' W AMALI Laser off
27	2014-04-28 21:05:31.598	Lat= 68° 31,613' N Lon=133° 58,349' W Rollerdoors closed, Camera off, Albedometer off
28	2014-04-28 21:10:12.538	Lat= 68° 21,602' N Lon=133° 41,865' W Video stop
29	2014-04-28 21:14:15.840	Lat= 68° 18,200' N Lon=133° 30,028' W Touchdown
30	2014-04-28 21:18:27.709	Lat= 68° 18,340' N Lon=133° 30,016' W Park Position