

Science Flight Report

Operation Ice Bridge Fall 2009



Antarctic Flight No 20
Mission Plan: Peninsula 5 (PEN 5)

Aircraft	DC-8 (N817NA)
Flight Number	DC8-100128
Flight Request Number	108002
Flight Hours	10.4
Date	Monday, Nov 16 2009, Day of Year 320
Purpose of Flight	Operation Ice Bridge Peninsula 5
Aircraft Status	Airworthy, after a minor delay of 1 hour and 10 minutes.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	<ul style="list-style-type: none"> • Low level survey over Larsen C Ice Shelf and glaciers (1500 ft AGL). • Completed all of the planned survey lines. • ATM, DLH, DACOM, gravimeter, MCoRDS, Ku-band radar, snow radar, DMS, AVOCET, and POS/AV operational throughout target areas. • WAS and LVIS were not operated on this mission. • Conducted one pass over runway at Punta Arenas airport for ATM instrument calibration.
Planned Events	<ul style="list-style-type: none"> • Complete the remaining missions based on weather and crew hours.

Mission Log (Michael Studinger, Mission Scientist)

Today's mission is a laser, ice-penetrating radar, and gravity survey of the Larsen C Ice Shelf and some small glaciers nearby. The mission PEN 5 is a text book flight in glaciology. We followed the flow of ice from the interior of Antarctica all the way into the ocean. The survey starts with a flight over the ice caps on the Antarctic Peninsula from which we follow down the Starbuck Glacier that feeds into the remnants of the former Larsen B Ice Shelf. We then turned around and flew up the Melville Glacier before heading towards our survey lines on the Larsen C Ice Shelf. We extended our line to the ice shelf edge where we encountered, large ice bergs, sea ice and open water: an almost complete tour through the cryosphere in a single flight.

Over the Larsen C Ice Shelf we linked our airborne data to existing radar and seismic lines on the ground and an ice core drilling by flying over the LARISSA and SOLIS camp sites and the location of an old seismic profile from the British Antarctic Survey.

We had a minor delay of a bit more than an hour before take off due to an electrical problem on the aircraft. The aircraft crew was able to locate and fix the problem quickly which allowed us to complete the entire survey flight as planned.

The weather turned out to be fine and we mostly encountered the conditions that we have expected from the forecast.

16:08:14 Zulu: takeoff

17:45:55 Zulu: begin descent into survey area

18:03:40 Zulu: start of first survey line at waypoint START 0

23:59:34 Zulu: end of last survey line, starting to climb

02:15:13 Zulu: ramp over flight at Punta Arenas airport for ATM boresight alignment

02:27:30 Zulu: touchdown

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems experienced clear skies for the entire length of the survey's data lines and collected six hours of data--yielding over 200 million laser elevation measurements.

MCoRDS: Six hours Larsen Ice Shelf survey including the Starbuck, Melville, and Sumner Glaciers. MCoRDS collected 1.6 TByte of data and produced detectable bed observations about 45% of the time based on real-time quick look images.

Snow and Ku-Band radar: System performed as expected. Snow radar collected 310 GByte of data. Ku-band radar collected also 310 GByte of data.

LVIS: Was not in operation during today's flight.

DLH/DACOM: System work well.

AVOCET: System worked fine. No problems.

DMS: System worked well. No problems.

Gravity: System worked normally. No problems.

POS/AV: System worked well. No issues.

DC8 on board data: worked well.

Peninsula 5

11.1 hours total / 7.2 hrs survey
440 knots transit / 250 knots survey

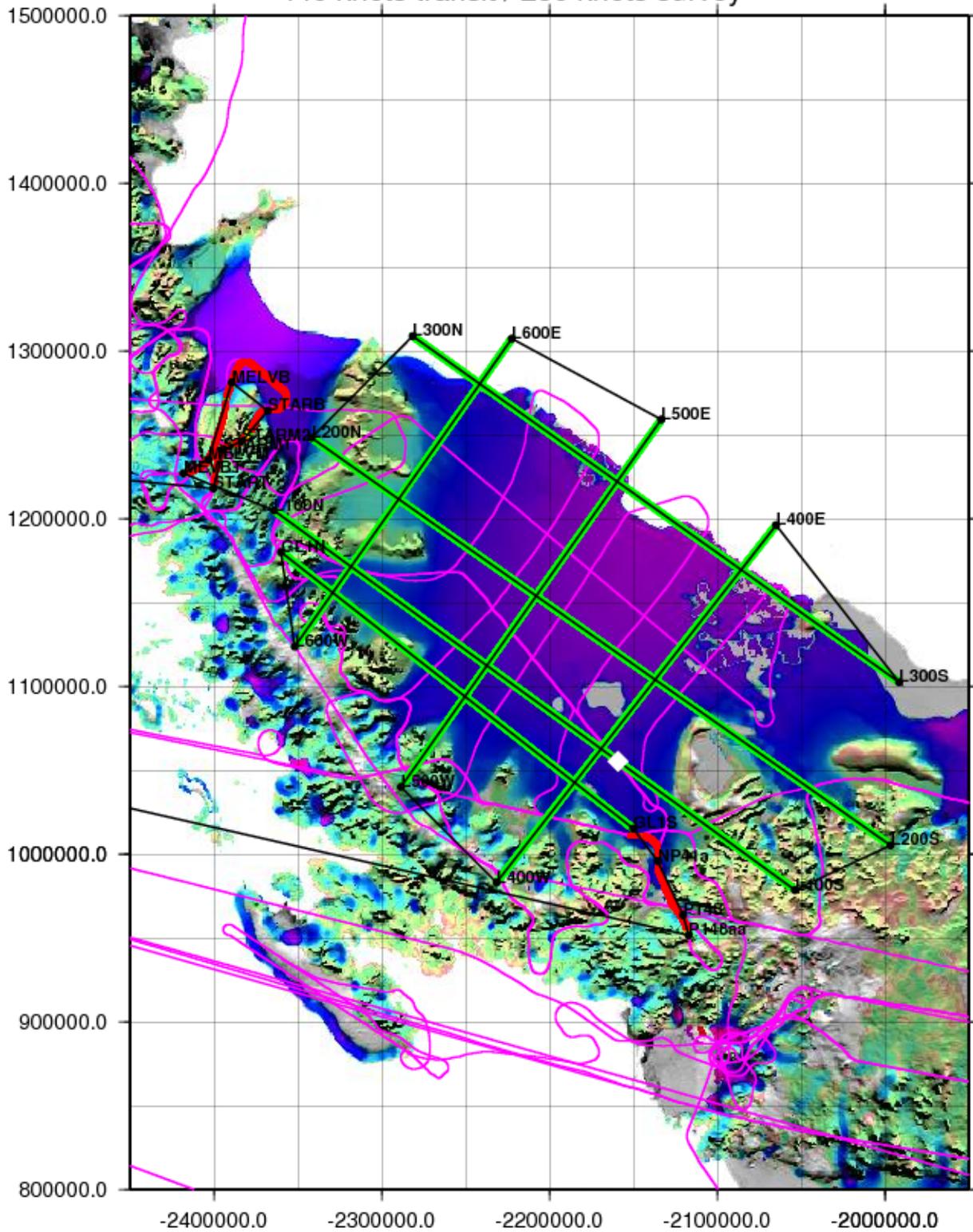


Figure 1: Waypoints and survey area of Flight 20 from John Sonntag – Mission ID PEN 5.