Snow Radar Field Deployments
Ben Panzer
1st Revision – 12/13/11

1. RADAR REVISIONS

SEASON	GR 2009*	ANT 2009**	GR 2010 (DC-8)	GR 2010 (P-3)	ANT 2010	GR 2011	ANT 2011
Base Oscillator	933.12 MHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz	1 GHz
DDS Output	250-390 MHz	214-295 MHz	214-295 MHz	214-295 MHz	214-295 MHz	214-295 MHz	214-295 MHz
PLL Multiplier	32	56	56	56	56	56	56
PLL Output	8-12.5 GHz	12-16.5 GHz	12-16.5 GHz	12-16.5 GHz	12-16.5 GHz	12-16.5 GHz	12-16.5 GHz
PLO Freq	15 GHz	10 GHz	10 GHz	10 GHz	10 GHz	10 GHz	10 GHz
Tx Freq	2.5-7.0 GHz	2.0-6.5 GHz	2.0-6.5 GHz	2.0-6.5 GHz	2.0-6.5 GHz	2.0-6.5 GHz	2.0-6.5 GHz
Antennas	ETS Lindgren 3115	Pasternack PE9861-15	Q-Par Angus WBH2-24S	ETS Lindgren 3115	ETS Lindgren 3115	ETS Lindgren 3115	ETS Lindgren 3115
Ant. Location	Bomb bay, aft panel	Nadir port enclosure	Nadir port enclosure	Bomb bay, fwd panel	Wing roots	Bomb bay, fwd panel	Wing roots
Separation	36” CT	8” CT	8” CT	36” AT	>120” CT	36” AT	>120” CT
Alignment	E-plane CT	E-plane CT	E-plane CT	E-plane AT	E-plane CT	E-plane AT	E-plane CT
Tx Cable	10 ft LMR300, 10 ft LMR300	23 ft HF290, 1 ft LMR300	23 ft HF290, 1 ft LMR300	? ft Heliax, ? ft Heliax	15 ft LMR300, 14 in LMR190	8 ft Heliax, 8 ft Heliax	15 ft LMR300, 1 ft PE304-24
Rx Cable	10 ft LMR300, 10 ft LMR300	23 ft HF290, 1 ft LMR300	23 ft HF290, 1 ft LMR300	? ft Heliax, ? ft Heliax	12 ft LMR300, 14 in LMR190	8 ft Heliax, 8 ft Heliax	12 ft LMR300, 1 ft PE304-24

Notes not mentioned above

1. Greenland 2009
    a. Initial and experimental build.
2. Antarctica 2009
    a. Second build and has been the primary since.
    b. Phase-locked loop was updated.
        i. 10-GHz phased-locked oscillator with an input reference of 10 MHz required.
        ii. Base oscillator was changed to 1 GHz.
            1. Sampling frequency and 2nd Nyquist zone changed.
            2. IF filters used were for the old 933.12 MHz oscillator.
    c. Wing roots installation unavailable.
        i. Place in a nadir port enclosure in the week leading up to the campaign.
        ii. Reduced bandwidth.
3. Greenland 2010 DC-8
    a. New antennas allowing full bandwidth operation.
    b. New IF filters for the 2nd Nyquist zone.
4. Greenland 2010 P-3
    a. Custom cables made on site at WFF.
    b. Not able to measure these lengths.
5. Antarctica 2010
    a. Tx cable run was Tx - 17 ft LMR 300 jumper-Isolator - 2 dB pad- 4 inch hand formable cable – Bulkhead - 14 in LMR 190 jumper – SMA female to N-type male adapter-Antenna.
    b. Rx cable run was Antenna – N type male to SMA female adapter – 14 inch LMR 190 jumper – Bulkhead – 4 inch hand formable cable - Isolator – 4 dB pad – 12 ft LMR 300 jumper.
    c. The transmit bulkhead was shorted.
6. Greenland 2011
    a. Revision made to the phase-locked loop.
7. Antarctica 2011
    a. Remove the isolator, pad, and hand formable cable from the Tx cable run.

2. NORMAL OPERATING PARAMETERS VS. FIELD SEASON

	GR 2009	ANT 2009	GR 2010	ANT 2010	GR 2011	ANT 2011
BANDWIDTH	2.5-7.0 GHz	4.0-6.0 GHz	2.0-6.5 GHz	2.0-6.5 GHz	2.0-6.5 GHz	2.0-6.5 GHz
PULSE LENGTH	270 us	100-240 us	250 us	250 or 255 us	250 or 255 us	250 or 255 us
PRF	2 kHz	2 or 3 kHz	2 kHz	2 kHz	2 kHz	2 kHz
TX POWER	100 mW	100 mW	100 mW	100 mW	100 mW	100 mW
IF FREQ	29-58 MHz	31-62 MHz	31-62 MHz	31-62 MHz	31-62 MHz	31-62 MHz
SAMP. FREQ	58.32 MHz	62.5 MHz	62.5 MHz	62.5 MHz	62.5 MHz	62.5 MHz

3. RAMP PASSES

Greenland 2009

DATE	TIME	DATA SET	BANDWIDTH	PULSE LENGTH	PRF	RECORD LENGTH	PRESUMS
04/17 - Thule	17:56	3	4.48 GHz	270 us	2 kHz	16000	4
04/21 – Thule	21:23	4	4.48 GHz	270 us	2 kHz	16000	4
04/23 – Thule	20:01	2	4.48 GHz	270 us	2 kHz	16000	4
04/23 – Thule	?	3	4.48 GHz	270 us	2 kHz	16000	4
04/24 – Thule	19:41	4	3.81 GHz	270 us	2 kHz	16000	4
05/01 – Sondy	17:44	5	2.496 GHz	150 us	3.6 kHz	9000	4
05/02 - Sondy	17:14	2	1.024 GHz	63 us	8 kHz	4000	4

Antarctica 2009

No ramp passes. Refer to the field notes for instances of open water and the ship altimeter log for calibration.

Greenland 2010 – DC-8

DATE	TIME	DATA SET	BANDWIDTH	PULSE LENGTH	PRF	RECORD LENGTH	PRESUMS
03/26 - Thule	18:09	0	4.536 GHz	250 us	2 kHz	16000	4
03/30 – Thule	18:40	2	4.536 GHz	250 us	2 kHz	16000	4
04/02 – Thule	18:14	0	4.536 GHz	250 us	2 kHz	16000	4
04/05 – Thule	18:28	1	4.536 GHz	250 us	2 kHz	16000	4
04/12 – Thule	19:20	2	4.536 GHz	250 us	2 kHz	16000	4
04/13 - Thule	18:26	0	4.536 GHz	250 us	2 kHz	16000	4
04/19 - Thule	19:17	1	4.536 GHz	250 us	2 kHz	16000	4
04/20 - Thule	19:40	1	4.536 GHz	250 us	2 kHz	16000	4

Greenland 2010 – P-3

Ramp passes were completed. Field notes were lost. Refer to the Sondy ramp survey file and Matlab picker to find dates.

Antarctica 2010

No ramp passes. Refer to the field notes for instances of open water and the ship altimeter log for calibration.

Greenland 2011

DATE	TIME	DATA SET	BANDWIDTH	PULSE LENGTH	PRF	RECORD LENGTH	PRESUMS
03/28 - Thule	18:40	2	4.536 GHz	250 us	2 kHz	16000	4
03/29 – Thule	18:36	1	4.032 GHz	250 us	2 kHz	16000	4
04/06 – Sondy	18:23	2	2.800 GHz	255 us	2 kHz	16000	4
04/07 – Sondy	17:40	3	4.032 GHz	255 us	2 kHz	16000	4
04/08 – Sondy	18:24	1C	2.800 GHz	255 us	2 kHz	16000	4
04/11 - Sondy	16:00	3B	4.032 GHz	255 us	2 kHz	16000	4
04/12 - Sondy	17:13	0B	4.032 GHz	255 us	2 kHz	16000	4
04/13 - Sondy	15:59	1B	3.528 GHz	255 us	2 kHz	16000	4
04/14 - Sondy	17:31	0B	5.040 GHz	255 us	2 kHz	16000	4
04/16 - Sondy	16:30	1B	3.528 GHz	255 us	2 kHz	16000	4
04/18 - Sondy	18:28	4B	4.032 GHz	255 us	2 kHz	16000	4
04/19 - Sondy	17:53	3B	5.544 GHz	255 us	2 kHz	16000	4
04/22 - Sondy	18:40	1	4.032 GHz	255 us	2 kHz	16000	4
04/23 - Sondy	16:46	1B	4.536 GHz	255 us	2 kHz	16000	4
04/25 - Sondy	17:30	4B	3.528 GHz	255 us	2 kHz	16000	4
04/26 - Sondy	18:21	2	4.032 GHz	255 us	2 kHz	16000	4
04/28 – Thule	13:09	1	4.536 GHz	255 us	2 kHz	16000	4
05/06 – Thule	11:12	0B	4.032 GHz	255 us	2 kHz	16000	4
05/07 – Thule	11:06	0	4.032 GHz	255 us	2 kHz	16000	4
05/10 – Thule	18:04	5	3.528 GHz	255 us	2 kHz	16000	4
05/11 – Thule	18:34	0	4.032 GHz	255 us	2 kHz	16000	4
05/16 – Thule	17:57	0	4.032 GHz	255 us	2 kHz	16000	4

Antarctica 2011

DATE	TIME	DATA SET	BANDWIDTH	PULSE LENGTH	PRF	RECORD LENGTH	PRESUMS
10/12 – PUQ	12:50	0	4.536 GHz	250 us	2 kHz	16000	4
10/12 – PUQ	12:57	0	4.536 GHz	250 us	2 kHz	16000	4
10/13 – PUQ	23:20	4	4.536 GHz	250 us	2 kHz	16000	4
10/13 – PUQ	23:26	4	4.536 GHz	250 us	2 kHz	16000	4
10/18 – PUQ	12:28	0	4.536 GHz	250 us	2 kHz	16000	4
10/18 – PUQ	12:35	0	4.536 GHz	250 us	2 kHz	16000	4
10/20 – PUQ	23:25	1	4.536 GHz	250 us	2 kHz	16000	4
10/23 – PUQ	12:06	0	4.536 GHz	250 us	2 kHz	16000	4
10/23 – PUQ	12:14	0	4.536 GHz	250 us	2 kHz	16000	4
10/25 – PUQ	12:00	0	4.536 GHz	250 us	2 kHz	16000	4
10/25 – PUQ	12:07	0	4.536 GHz	250 us	2 kHz	16000	4
10/30 – PUQ	23:40	1	4.032 GHz	255 us	2 kHz	16000	4
11/07 – PUQ	12:00	0	4.032 GHz	255 us	2 kHz	16000	4
11/07 – PUQ	12:06	0	4.032 GHz	255 us	2 kHz	16000	4
11/13 – PUQ	13:02	0	4.032 GHz	255 us	2 kHz	16000	4
11/14 – PUQ	12:59	0	4.032 GHz	255 us	2 kHz	16000	4
11/14 – PUQ	13:06	0	4.032 GHz	255 us	2 kHz	16000	4
11/17 – PUQ	23:00	7	4.032 GHz	255 us	2 kHz	16000	4
11/19 – PUQ	23:49	1	4.032 GHz	255 us	2 kHz	16000	4

4. DATES OF INTEREST

04/25/09 – Overflight of the GreenArc in-situ sea ice camp
03/22/11 – IceX Camp overflight at high altitude
03/23/11 – IceX Camp overflight at low altitudes
IceX Camp had several corner reflectors set up. No coordinates given.
04/15/11 – CryoVex Camp overflight at low altitudes with two corner reflectors.

Buoy2	83.6180	-62.9068
Buoy3	83.6196	-62.8722

05/05/11 – Overflew three corner reflectors on Devon-Bylot

CRNRTH	75.366152	-82.660633
CRSUMM	75.338106	-82.677997
CRMAY1	75.382760	-82.705860

11/09/11 – Overflew seven previous/potential core sites

ACORE	-76.770230	-101.737510	17:19:38 UTC	
BCORE	-77.957997	-95.962942	17:46:27 UTC	17:54:10 UTC
CCORE	-79.383000	-111.239000	18:39:50 UTC	18:50:42 UTC
DCORE	-79.462950	-112.086000	18:53:12 UTC	
ECORE	-79.751000	-114.550000	19:00:37 UTC	19:10:46 UTC
FCORE	-79.123000	-113.040000	19:20:45 UTC	
GCORE	-78.488000	-111.700000	19:30:36 UTC	

5. LEVER ARMS

All lever arm distances are given using the GPS phase center as the origin.
All dimensions given in inches and rounded to the nearest tenth.
+X is defined as out the front of the fuselage
+Y is defined as out the starboard (right facing forward) wing
+Z is defined as down

Greenland 2009

GPS antenna located at FS751, 2.3 cm off center left facing forward.

	Left Antenna	Right Antenna
X	335.6	335.6
Y	-17.1	18.9
Z	146	146

Antarctica 2009 / Greenland 2010 (DC-8)

GPS antenna located at 4.625 in aft of FS330 on center.

	Monostatic Phase Center
X	-975.5
Y	33.25
Z	136.75

Greenland 2010 (P-3) / Greenland 2011

	Left Antenna	Right Antenna
X		
Y		
Z		

Antarctica 2010 / Antarctica 2011

	Left Antenna	Right Antenna
X		
Y		
Z		

Date	Mission Name	Sea Ice/Land Ice	Data Set	Start	Stop	PRF	Bandwidth	Pulse Length	Presums	Record Length	Window	Notes
03/31/09	Thule to Svalbard	Sea Ice	0	0	469	2 kHz	4.48 GHz	270 us	4	16000	Rectangular	
04/01/09	East Central Gap Filler	Land Ice	0	0	9	2 kHz	4.48 GHz	270 us	4	16000	Rectangular	
			1	0	180	2 kHz	4.48 GHz	270 us	4	16000	None	
			2	0	73	2 kHz	4.48 GHz	270 us	4	16000	None	
			3	0	20	2 kHz	3.68 GHz	270 us	4	16000	None	
			4	0	170	2 kHz	4.48 GHz	270 us	4	16000	None	
04/02/09	Thule to Fairbanks	Sea Ice	0	0	457	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	50	2 kHz	4.48 GHz	270 us	4	16000	None	
			0	0	20	2 kHz	4.48 GHz	270 us	4	16000	None	drive28 directory
04/05/09	Fairbanks to Thule	Sea Ice	0	0	586	2 kHz	4.48 GHz	270 us	4	16000	None	
04/06/09	Northwest Gap Filler	Land Ice	0	0	119	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	100	8 kHz	1.024 GHz	63 us	4	4000	None	6 to 7 GHz output
			2	0	186	8 kHz	1.024 GHz	63 us	4	4000	None	6 to 7 GHz output
			3	0	36	8 kHz	1.024 GHz	63 us	4	4000	None	5 to 6 GHz output
			4	0	35	8 kHz	1.024 GHz	63 us	4	4000	None	4 to 5 GHz output
			5	0	5	8 kHz	1.024 GHz	63 us	4	4000	None	3 to 4 GHz output
04/17/09	Thule 04	Land Ice	0	0	155	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	60	2 kHz	4.48 GHz	270 us	4	16000	None	Sea ice from file 11 to 41
			2	0	521	2 kHz	4.48 GHz	270 us	4	16000	None	
			3	0	9	2 kHz	4.48 GHz	270 us	4	16000	None	
04/20/09	Thule 02	Land Ice	0	0	291	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	89	2 kHz	4.48 GHz	270 us	4	16000	None	
			2	0	533	2 kHz	4.48 GHz	270 us	4	16000	None	Sea ice from file 16 to 36
04/21/09	Sea Ice Science	Sea Ice	0	0	281	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	153	2 kHz	2.528 GHz	270 us	4	16000	None	2500 ft. altitude
			2	0	87	2 kHz	2.528 GHz	270 us	4	16000	None	2500 ft. altitude
			4	0	19	2 kHz	4.48 GHz	270 us	4	16000	None	
04/22/09	Thule 01	Land Ice	0	0	88	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	64	2 kHz	4.48 GHz	270 us	4	16000	None	
			2	0	19	2 kHz	4.48 GHz	270 us	4	16000	Rectangular	
			3	0	5	2 kHz	4.48 GHz	270 us	4	16000	Hanning	
			4	0	604	2 kHz	4.48 GHz	270 us	4	16000	None	17:43 Sea ice
04/23/09	Thule 03	Land Ice	0	0	377	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	381	2 kHz	4.48 GHz	270 us	4	16000	None	
			2	0	3	2 kHz	4.48 GHz	270 us	4	16000	None	
			3	0	0	2 kHz	4.48 GHz	270 us	4	16000	None	
04/24/09	Northeast Gap Filler	Land Ice	0	0	99	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	618	2 kHz	4.48 GHz	270 us	4	16000	None	14:33-14:35 Sea ice
			2	0	10	2 kHz	4.48 GHz	270 us	4	16000	None	2.84 to 7.32 GHz output
			3	0	24	2 kHz	4.48 GHz	270 us	4	16000	None	
			4	0	8	2 kHz	3.81 GHz	270 us	4	16000	None	
04/25/09	Ice Camp Mission	Sea Ice	0	0	220	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	93	2 kHz	4.48 GHz	270 us	4	16000	None	
			2	0	12	2 kHz	4.48 GHz	270 us	4	16000	None	
			3	0	169	2 kHz	4.48 GHz	270 us	4	16000	None	
04/27/09	Thule 05	Land Ice	0	0	719	2 kHz	4.48 GHz	270 us	4	16000	None	
04/28/09	Sondy 04	Land Ice	0	0	741	2 kHz	4.48 GHz	270 us	4	16000	None	
05/01/09	Sondy 03	Land Ice	0	0	109	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	50	3.6 kHz	2.496 GHz	150 us	4	9000	None	4.5 to 7 GHz output
			2	0	85	3.6 kHz	2.496 GHz	150 us	4	9000	None	4.5 to 7 GHz output
			3	0	218	4.5 kHz	1.984 GHz	120 us	4	7200	None	5 to 7 GHz output
			4	0	214	8 kHz	1.024 GHz	63 us	4	4000	None	6 to 7 GHz output
			5	0	32	3.6 kHz	2.496 GHz	150 us	4	9000	None	4.5 to 7 GHz output
05/02/09	Sondy 02	Land Ice	0	0	227	2 kHz	4.48 GHz	270 us	4	16000	None	
			1	0	241	3.6 kHz	2.496 GHz	150 us	4	9000	None	4.5 to 7 GHz output
			2	0	164	8 kHz	1.024 GHz	63 us	4	4000	None	6 to 7 GHz output
05/05/09	UAVSAR Flight	Land Ice	0	0	164	2 kHz	4.48 GHz	270 us	4	16000	None	13:30-13:31 Sea ice
			1	0	156	3.6 kHz	2.496 GHz	150 us	4	9000	None	

Sea ice flight line to Svalbard — 03/31/09

10:40 DDS loopback
10:13 DDS off
10:17 Radar loopback
30 dB transmit atten
24 dB receive atten
10:19 6 dB receive atten

Stopped wrapping at 1124

12:19 descent to 1500 ft.

12:27 1500 ft.
12:28 IceSAT track — 6 dB transmit atten.
PRF 2 kHz — 6 dB receive atten.
250-390 MHz
220 μs pulse length
Rect. window

12:48 8m thick ice

13:11 Switch aircraft radar altimeter
13:18 40 dB reflecti
33 dB SNR

7% usage of 1 TB drive after 1 hr.

13:22 Both radar altimeters off

13:35 Both radar altimeters on

14:55 Turn around at Svalbard
open water and broken sea ice
15:58 Wrapping stopped at 8477
after 3 attempted resumes
started at 1 again

16:01 At wrap 210 repository
message

East Central Gap Filler 04/01/09

Land ice flight line

12:59:09	Start recording
~~PRF~~	
Transmit Settings	
PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Pulse Length	270 μs
Window	Rectangular
13:01:53	Update
Window	None
~~13:02:20~~	~~Resume recording~~
13:04:10	Resume recording
13:05:48	Locked on 1st of 4 Ice SAT tracks
	Same transmit settings as 13:01:53
Filter Passband	
41–58 MHz	
41 MHz	1212 ft. altitude
58 MHz	1712 ft. altitude
	$\frac{f_s}{N \cdot 2} \cdot (0:1:N-1)$
14:39	Wrapping stopped, but aircraft ascending
14:42	Wrapping stopped
14:44	Stopped recording
	aircraft not @ correct altitude
15:10	Resumed recording
	Same settings
15:20	Surface return seen again
15:50	Stopped recording

15:53 Started recording
250 to 365 MHz

16:01 return leg to Thule

16:04 stopped recording

varied beat frequency placement
transmit windowing and control

16:11 started recording

PRF	2 KHz
Start	250 MHz
Stop	390 MHz
Length	270 μs
Window	none

Able to discern signal of interest w/ 4000 pt. FFT

As we descend from higher altitudes the surface return appears at the right of quick look and moves towards the left.

When it reaches the left side of the screen it aliases, and moves towards the right.

* Is it a problem for the signal to switch btw. these two states?

No, it can be corrected in post proc. w/ knowledge of the aircraft attitude

* Should I be concerned about the placement of the surface return within the quick look?

17:46:30 Stop recording

239 GB recorded

~~Total: 1 hr 33 min~~

9 min
1 hr 33 min
40 min
1 hr 40 min
4 hr 4 min

Sea ice Flight to Fairbanks, AK. 04/02/09

14:42	Start recording
14:45	Online
14:55	Stop recording
15:04	Start recording
15:13	IF to DAQ ~~cable~~ loose
Data to backup	data00.04022009.0000.dat
	to
	data00.04022009.0020.dat
Transmit settings	
PRF	2 kHz
start	250 MHz
stop	350 MHz
length	270 μs
window	none
Pressums	4
Data Write	281 start index
18:41 – ~18:50	In close proximity to the magnetic north pole Matt Elder is hand flying the P-3B
19:06	~~Ascent~~ Descent to 1200 ft.
19:08	1200 ft.
19:13:40	Ascent to 1500 ft.
19:14:52	1500 ft.
19:50	Stop recording
	~266 GB recorded

Sea ice flight Fairbanks to Thule

04/05/09

11:10:58

Start recording
1800 ft.
Can't drop down until VFR applies

Transmit settings
PRF 2 kHz
Start 250 MHz
Stop 390 MHz
Pulse length 270 μs
Windows none

4 passes

11:21

1500 ft. altitude

1800 ft. altitude
either a 270 MHz to 390 MHz or
250 MHz to 370 MHz chirp
reduce the bandwidth ~ 3.84 GHz
Surface return at 52 MHz

270 to 390 MHz : 8.64 GHz to 12.48 GHz
2.52 to 6.36 GHz output

250 to 370 MHz : 8 to 11,84 GHz
3.16 to 7 GHz output

3000 ft. altitude
2.2 GHz bandwidth for 59 MHz surface return
321 MHz to 390 MHz chirp
2.52 to 4,72 GHz output

** For future reference **

Blue sky

Feed the aircraft altitude to the waveform generator
For gross changes in the aircraft altitude adjust the pulse length or pulse bandwidth

Typical rates of climb for maintaining a constant altitude are less than 30
For anything over that adjust the chirp settings

~14:15

Hand flying P3
Attitude fluctuations of ~100 ft.
More lateral variation than vertical

1200–1700 ft altitude

270 μs pulse length
250–390 MHz chirp
1.5 GHz bandwidth

1700–2100 ft

270 μs pulse length
3.2 GHz bandwidth
→ 290–390 MHz chirp
or 250 to 350

Change record length to 4,000
Change PRF to 24 kHz

2400–3400 ft

270 μs pulse length
2.26 GHz bandwidth
→ 320–390 MHz chirp
or 250 to 310
270 μs pulse length
1.6 GHz bandwidth
340 to 390 or
250 to 300 MHz chirp

Change record length to 8,000
Change PRF to 14 kHz

16:38

Stop recording

308 GB recorded

Northwest Gap - Filter

04/06/09

17:18 — Start recording

Transmit settings
- PRF: 2 kHz — Record length 16000
- Start: 250 MHz — Pressums 4
- Stop: 320 MHz
- Pulse length: 270 μs
- Window: none

13:25 — Stop recording

13:39 — Start recording

Transmit settings
- PRF: 8 kHz
- Start: 250 MHz } 6 to 7 GHz output
- Stop: 282 MHz
- Pulse length: 63 μs
- window: none
- Record length: 4000
- Pressums: 4

Not at 1500 ft. as we traverse over mountains

13:48 — Back at 1500 ft. roughly

14:35 — Stop recording

Noise floor — 5 to 6 GHz is 30 dB higher than 6 to 7 GHz on the fly

14:43 — Start recording
Same settings as @ 13:39

16:27 — Stop recording

16:28 — Start recording
282 to 314 MHz
5 to 6 GHz output
Other settings same as 13:39

16:48 — Stop recording

16:50 — 314 to 346 MHz
4 to 5 GHz output
Start recording
All other settings same as 13:39

17:10 — Stop recording

17:11 — Start recording
346 to 378 MHz (3 to 4 GHz output)
All other settings same as 13:39

17:14 — Stop recording

254 GB recorded

Thule 4 04/17/09

10:46	Start recording
PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Pulse length	270 μs
Window	none
Presums	4
Rx Atten	~~16~~ 14 dB } not including
Tx Atten	8.6 dB } cable losses
~~12:15~~ 12:13	Stop recording
12:15	Start Recording Same settings except: ~~19 dB Rx~~ atten: 17 dB
12:21	Sea ice run data01.0011 (roughly)
12:38	End sea ice data01.0041
12:39	Begin (resume) land ice
12:49	Stop recording
12:51	Start recording ~~16~~ 14 dB Rx atten.
17:42	Stop recording 387 GB recorded
data03	ramp pass 17:56 - 17:57

Thule or Land Ice

04/20/09

11:17 Start recording

Start 250 MHz
Stop 390 MHz
PRF 2 kHz
Pulse length 270 μs
Tx Atten 8 dB
Rx Atten 16 dB
Window None
Pressums 4

~13:36 Approximately 1100 ft. altitude

13:41 Over floating sea ice
~ data 02. 04202009. 0256 or 0258

14:00 Stop recording

14:03 Start recording
10 dB Rx atten.

14:53 Stop recording

~~14:54~~ 14:57 Start recording
13 dB Rx atten.
~~Stop recording~~

15:06 Sea ice
~ data 02. 04202009. 0016

15:17 Back to land ice
~ data 02. 04202009. 0036

19:55 Stop recording
480 GB recorded

From here on out

16 dB attenuation for sea ice flights
13 dB attenuation for land ice flights

Sea Ice Science 01 — 04/21/09

800 m altitude step

#1

~~400 µs pulse length~~

50 MHz = $\frac{\text{delay} \times \text{bandwidth}}{\text{length}}$

BW = $\frac{(50\ \text{MHz}) \times 270\ \mu\text{s}}{(16000)/328} = 2.5\ \text{GHz}$

Chirp (DDS) output
250 MHz to 329 MHz

Radar output
9.472 to 7 GHz

~~#2~~ ~~150 µs pulse length~~

15:11 Start recording data00
15:20 1500 ft altitude
15:22 On EnVSAT Line

PRF 2 kHz
Start 250 MHz
Stop 390 MHz
} ~~2.5~~ to 7.0 GHz output
Pulse Length 270 µs
Record length 16000
Pressums 4
Rx Atten. 8 dB
Rx Atten. 16 dB

17:49 Stop recording

Turn ascending to 2500 ft.

17:54 Start recording data01
Start 250 MHz
Stop 329 MHz
Rx Atten. 13 dB
} everything else the same

19:20 Stop recording

19:20 Start recording data02
Rx atten. 10 dB
everything else the same

20:09 Stop recording

21:10 Start recording (data03) } ignore
21:11 Stop recording

21:12 Start recording (data04)
250 to 390 MHz Chirp
2 kHz PRF
270 µs pulse length
13 dB Rx Atten.
Ramp pass @ 1500 ft.

21:23:28 Stop Recording
29

285 GB

Thule 01 Land Ice | 04/22/09

13:14 Start recording ~ 1700 ft altitude on short transit

PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Length	270 μs
Window	None
Record length	16000, ~~start~~ 281
Presums	4
Tx Atten.	8 dB
Rx Atten.	~~60 dB~~ 13 dB

Drive 2 of the SATA enclosure remains → 1 disk write
Slots 3 and 4 did not work
The previous day slots 1 and 3 did not work, ~~after~~ 3 restarts
Slots 2 and 4 worked.

14:04 Stop recording data00

14:08 Start recording
10 dB Rx Atten.

14:10 Flying over hard rock

~~14:20~~

14:43 Stop recording data01

14:45 Start recording
Transmit Window: ~~Hanning~~ rectangular
14:51: 3rd crossing – ~~Peterman~~ glacier

14:55 Stop recording data02

14:57 Start recording
Transmit window: Hanning

15:00 Stop recording data03

15:01 Start recording
Transmit window: none

17:43 Sea ice

20:39 Stop recording data04

20:40 Start recording ~~data05~~ Ignore data05
Ramp pass at 1200 ft.

Thule 03 Land Ice 04/23/09

~~12:36~~ 12:44 Start recording (data00)

PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Pulse Length	270 μs
Window	none
Record Length	16000
Presums	4
Tx Atten.	6 dB
Rx Atten.	8 dB

Due to it being Thursday, two slots of the SATA enclosure work. I plugged in the drive's prior to powering the enclosure.

16:13 Sea Ice
16:15 Stop recording

16:26 Start recording (data01)
16:35 90° right turn
16:41 30° right turn
16:49 Start glacier, sharp left turn

COMPUTER TIME IS 5 HRS BEHIND UTC

19:59 Stop recording

20:00 Start recording (data02)
20:01:40 Ramp pass (east)
~~20:01:40~~ Stop recording

Start recording (data03)
Ramp pass (middle)
Stop recording

Northeast Gap Filler

04/24/09

12:10 Start recording (data00)

PRF 2 kHz

Start 250 MHz

Stop 390 MHz

Pulse Length 270 μs

Windows None

Record Length 16000

Tx. Atten. 8 dB

Rx Atten. 13 dB

12:28 Noise floor raised 20 dB?

13:05 Stop recording (investigate a rattling)

13:23 Start recording (data01)

No problems found

14:33 - 14:35 Sea Ice

19:08 Stop recording

19:12 Start recording (data02)

Start 240 MHz

Stop 380 MHz

2.84 - 7.32 GHz output

Lower limit on the chirp (upper limit on the output)

19:17 Stop recording

19:22 Start recording (data03)

Start 250 MHz

Stop 390 MHz

Stop recording

Really hard to see the benefits of pushing the lower limit on the output

19:37 Start recording (data04)

Start 250 MHz

Stop 369 MHz

19:41:30 - 19:41:44 Ramp pass at 2000 ft.

19:41:57 Stop recording

Ice Camp Mission 04/25/09

11:55	Start recording (data 00)
PRF	2 KHz
Start	250 MHz } 2.5 to 7 GHz output
Stop	390 MHz
Pulse Length	270 μs
Window	None
Record Length	16000
Tx Atten	8 dB (+ cable losses)
Rx Atten	16 dB
	Flying over open water and broken sea ice
13:07	Solid sea ice
13:57	Stop recording
13:59	Start recording (data 01)
	13 dB Rx attenuation
	1st pass over the Danish ice camp
14:07	2nd pass begin
14:09	2nd pass end
14:16	3rd pass begin
14:19	3rd pass end
14:27	4th pass begin
14:29	4th pass end
14:37	5th pass begin
14:39	5th pass end
14:56 (data 02)	E-W pass @ ~~1200 ft.~~ 1500 begin } 16 dB Rx Atten.
14:58	E-W pass @ ~~1200 ft.~~ 1500 end
14:46	6th pass begin
14:50	6th pass end
14:58	On top of ice camp
14:59	Stop recording
15:09	Start recording (data 03)
16:43	Stop recording

Thule 05 Land Ice — 04/27/09

10:48 — Start Recording

PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Pulse Length	270 μs
Window	none
Record Length	16000
Presums	4
Tx Atten	8 dB
Rx Atten	13 dB

2.5 to 7 GHz output

Sandy 04 Land Ice — 04/28/09

10:57 — Start Recording (data00)

PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Pulse Length	270 μs
Window	none
Record Length	16000
Presums	4
Tx Atten.	8 dB
Rx Atten.	13 dB

17:57 — Stop recording

~~04/28/09~~

Sondy 03 Land Ice

05/01/09

10:52 Start recording (data00)

PRF	2 kHz
Start	250 MHz
Stop	390 MHz
Pulse Length	270 μs
Window	none
Record Length	16000
Presums	4
Tx Atten	8 dB
Rx Atten	13 dB

11:33 Stop recording

Experiment #1 (data01 ~~02~~)
12:01 start recording
13:17 stop recording

2.5 GHz Bandwidth (4.5 to 7 GHz)
DDS Chirp → 250 to 328 MHz
3600 Hz PRF
150 μs pulse length
9000 record length
4 presums

17:27 → Start record (data05)

Data Rate $= \frac{2 \times PRF \times Record\ Length}{Presums} = 16.2$ MB/s

~~(data03)~~
~~Experiment #2~~
~~Start recording~~
~~Stop recording~~

~~Same as #1 except~~
~~PRF = 4 kHz → Data rate = 18 MB/s~~
~~May not be able to do a double disk write~~

Experiment ~~#2~~
Start recording 13:21
Stop recording 15:21
(data03)

2 GHz bandwidth (5 to 7 GHz)
DDS Chirp → 250 to 312 MHz
4.5 kHz PRF
120 μs pulse length
7200 record length
4 presums
Data rate = 16.2 MB/s
No window

Start recording 15:25 Stop recording 17:25 (data04)	8 KHz PRF 250-282 MHz DDS chirp (6 to 7 GHz output) 63 μs pulse length 4000 record length 4 presums NO window Data rate = 16 MB/s
17:27 Start record (data05)	250-328 MHz DDS Chirp (4.5 to 7 GHz out) 3.6 KHz PRF 150 μs pulse length 4000 record length, 4 presums
	~~3000 ft delay = 914.4 m delay~~
17:44:58 – 17:45:00 17:45	Ramp pass (altitude ?) Stop record 1600 ft.

Sandy 02 Land Ice 05/02/09

11:19 Start recording (data00)

PRF 2 kHz
Start 250 MHz } 2.5 to 7 GHz output
Stop 320 MHz
Pulse Length 270 μs
Window none
Record Length 16000 13:04–13:09 = ascending above 1500 ft.
Pressums 4
Tx Atten 8 dB 13:12 = back at 1500 ft.
Rx Atten 13 dB

13:25 Stop Recording

13:28 Start Recording (data01)

PRF 3.6 kHz
Start 250 MHz } 4.5 to 7 GHz output
Stop 328 MHz
Pulse Length 150 μs no window, 4 pressums
Record Length 9000 8 dB Tx and 13 dB Rx atten.

15:41 Stop recording

15:43 Start recording (data02)

PRF 8 kHz
Start 250 MHz } 6 to 7 GHz output
Stop 282 MHz
Pulse Length 63 μs no window, 4 pressums
Record Length 4000 8 dB Tx and 13 dB Rx atten.

17:15 Stop recording

17:14:39 – 17:14:54 Ramp pass @ 2000 ft.

UAVSAR Flight 05/05/09

13:00 Start recording (data00)

PRF 2 kHz
Start 250 MHz
Stop 390 MHz
} 2.5 to 7 GHz output
Pulse Length 270 μs
Window None
Record Length 16000
Pressums 4
Tx Atten 8 dB
Rx Atten 13 dB

13:30 - 13:31 Sea ice
13:40 back on land ice
13:31 - 13:40 → open water & mountains

14:32 Stop recording

14:33 Start recording (data01)

PRF 3.6 kHz
Start 250 MHz
Stop 528 MHz
} 4.5 to 7 GHz output
Pulse Length 150 μs
Record Length 9000

everything else the same

16:00 Stop recording

16:01 Start recording (data02)

PRF 8 kHz
Start 250 MHz
Stop 282 MHz
} 6 to 7 GHz output
Pulse Length 63 μs
Record Length 4000

everything else the same

16:28 Stop recording

Date	Mission Name	Sea Ice/Land Ice	Data Set	Start	Stop	PRF	Bandwidth	Pulse Length	Presums	Record Length	Window
10/16/09	Getz Island	Land Ice	0	0	34	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			1	0	302	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			2	0	0	2 kHz	2.016 GHz	175 us	4	16000	Hanning
10/18/09	TSK2	Land Ice	0	0	160	2 kHz	1.96 GHz	175 us	4	16000	Hanning
			1	0	57	2 kHz	1.96 GHz	175 us	4	16000	Hanning
			2	0	143	2 kHz	1.96 GHz	175 us	4	16000	Hanning
10/21/09	Amundsen & Bellingshausen Seas	Sea Ice	0	0	1	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			1	0	166	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			2	0	16	2 kHz	2.016 GHz	150 us	4	16000	Hanning
			3	0	267	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			0	0	53	2 kHz	2.016 GHz	175 us	4	16000	Hanning
10/24/09	Weddell Sea (Sea ice #2)	Sea Ice	0	0	16	3.5 kHz	2.016 GHz	142 us	8	9000	Hanning
			1	0	169	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			2	0	25	2 kHz	3.36 GHz	175 us	4	16000	Hanning
			3	0	141	2 kHz	2.016 GHz	150 us	4	16000	Hanning
			4	0	96	2 kHz	2.8 GHz	150 us	4	16000	Hanning
			0	0	52	2 kHz	2.8 GHz	150 us	4	16000	Hanning
			0	0	10	2 kHz	2.8 GHz	140 us	4	16000	Hanning
			1	0	144	3.5 kHz	2.016 GHz	142 us	4	9000	Hanning
10/28/09	TSK3	Land Ice	0	0	107	2 kHz	2.016 GHz	140 us	4	16000	Hanning
			1	0	10	2 kHz	2.016 GHz	160 us	4	16000	Hanning
			2	0	18	2 kHz	2.016 GHz	200 us	4	16000	Hanning
			3	0	10	2 kHz	2.016 GHz	200 us	4	16000	Hanning
			4	0	3	2 kHz	2.016 GHz	130 us	4	16000	Hanning
			5	0	41	2 kHz	2.016 GHz	190 us	4	16000	Hanning
			6	0	35	2 kHz	2.016 GHz	190 us	4	16000	Hanning
			7	0	5	2 kHz	2.016 GHz	140 us	4	16000	Hanning
			8	0	78	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			9	0	14	2 kHz	2.016 GHz	140 us	4	16000	Hanning
			10	0	15	2 kHz	2.016 GHz	180 us	4	16000	Hanning
			11	0	25	2 kHz	2.016 GHz	130 us	4	16000	Hanning
10/29/09	Pine Island Glacier 1	Land Ice	0	0	39	2 kHz	2.016 GHz	140 us	4	16000	Hanning
			1	0	500	2 kHz	2.016 GHz	160 us	4	16000	Hanning
10/30/09	Weddell Sea (Sea ice #3)	Sea Ice	0	0	7	2 kHz	2.016 GHz		4	16000	Hanning
			1	0	2	2 kHz	2.016 GHz		4	16000	Hanning
			2	0	3	2 kHz	2.016 GHz	240 us	4	16000	Hanning
			3	0	17	2 kHz	2.016 GHz	270 us	4	16000	Hanning
			4	0	148	2 kHz	2.016 GHz	130 us	4	16000	Hanning
			5	0	8	2 kHz	2.016 GHz	190 us	4	16000	Hanning
			6	0	10	2 kHz	2.016 GHz	190 us	4	16000	Hanning
			7	0	269	2 kHz	2.016 GHz	130 us	4	16000	Hanning
			8	0	11	2 kHz	2.016 GHz	160 us	4	16000	Hanning
			9	0	163	2 kHz	2.016 GHz	140 us	4	16000	Hanning
			10	0	27	2 kHz	2.016 GHz	130 us	4	16000	Hanning
			11	0	12	2 kHz	2.016 GHz	110 us	4	16000	Hanning
			12	0	23	2 kHz	2.016 GHz	100 us	4	16000	Hanning
10/31/09	PEN2	Land Ice	0	0	13	2 kHz	2.016 GHz	170 us	4	16000	Hanning
			1	0	67	2 kHz	2.016 GHz	170 us	4	16000	Hanning
			2	0	24	2 kHz	2.016 GHz	270 us	4	16000	Hanning
			3	0	116	2 kHz	2.016 GHz	200 us	4	16000	Hanning
			4	0	75	2 kHz	2.016 GHz	170 us	4	16000	Hanning
			5	0	5	2 kHz	2.016 GHz	220 us	4	16000	Hanning
			6	0	101	2 kHz	2.016 GHz	180 us	4	16000	Hanning
			7	0	11	2 kHz	2.016 GHz	270 us	4	16000	Hanning
			8	0	3	2 kHz	2.016 GHz	270 us	4	16000	Hanning
			9	0	4	2 kHz	2.016 GHz	200 us	4	16000	Hanning
			10	0	14	2 kHz	2.016 GHz	170 us	4	16000	Hanning
11/02/09	TSK1	Land Ice	0	0	13	2 kHz	2.016 GHz	175 us	4	16000	Hanning
			1	0	10	2 kHz	2.016 GHz	200 us	4	16000	Hanning
			2	0	21	2 kHz	2.016 GHz	180 us	4	16000	Hanning
			3	0	66	2 kHz	2.016 GHz	180 us	4	16000	Hanning
			4	0	330	2 kHz	2.016 GHz	160 us	4	16000	Hanning
11/07/09	PIG Modified Grid	Land Ice	0	0	40	3 kHz	2.072 GHz	200 us	4	16000	Hanning
			1	0	18	3 kHz	2.072 GHz	240 us	4	16000	Hanning
			2	0	38	3 kHz	2.072 GHz	200 us	4	16000	Hanning
			3	0	76	3 kHz	2.072 GHz	175 us	4	16000	Hanning
			4	0	550	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			5	0	5	3 kHz	2.072 GHz	160 us	4	16000	Hanning
11/09/09	PIG4	Land Ice	0	0	88	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			1	0	563	3 kHz	2.072 GHz	160 us	4	16000	Hanning
11/12/09	Abbot Ice Shelf	Land Ice	0	0	230	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			1	0	13	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			2	0	3	3 kHz	2.072 GHz	240 us	4	16000	Hanning
			3	0	101	3 kHz	2.072 GHz	180 us	4	16000	Hanning
			4	0	14	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			5	0	44	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			6	0	7	3 kHz	2.072 GHz	160 us	4	16000	Hanning
			7	0	50	3 kHz	2.072 GHz	160 us	4	16000	5% Tukey
			8	0	122	3 kHz	2.072 GHz	160 us	4	16000	Hanning
11/15/09	Evans Glacier	Land Ice	0	0	26	3 kHz	2.072 GHz	175 us	4	16000	Hanning
			1	0	665	3 kHz	2.072 GHz	160 us	4	16000	Hanning
11/16/09	PEN5	Land Ice	0	0	417	2 kHz	2.072 GHz	160 us	4	16000	Hanning
			1	0	198	2 kHz	2.072 GHz	160 us	4	16000	Hanning
11/18/09	TSK4	Land Ice	0	0	552	3 kHz	2.072 GHz	160 us	4	16000	Hanning

Getz Island Flight 10/16/09

Snow Radar
4-6 GHz output → DDS frequencies
250 MHz to 286 MHz

Corresponding beat freq.

$$\frac{\left(\frac{1000\,m}{3e8}\right)(7e9)}{\cancel{240e-6}\ 175e-6} = \underline{38.09\ MHz}$$

250 to 286 MHz
175 μs pulse length

Ku-band

DDS frequencies
~~252-250 MHz~~ 250-268 MHz
240 μs pulse length
1000 MHz PRF
~~1 presum~~ 4 presums

~~[illegible]~~ UTC
16:37:00
Snow Radar

Start recording
1:35:57 on the DAQ

Thwaites TSK2 — 10/18/09

Snow Radar settings

2000 Hz PRF
250-285 MHz DDS
175 μs pulse length
4 presums
15 dB front-end attenuation

Ku-band settings

3000 Hz PRF
250-268 MHz DDS
240 μs pulse length
4 presums
933.12 MHz DDS frequency

data00.dat

15:38:20 Start Recording Snow — data00.

1:00:45 15:31:07 seconds UTC Start-record Ku-band — data00

Pancake Ice and Lead

15:43 Entered ICESAT track
15:44-15:46 Sea ice w/ snow layer
15:46 Glacier tongue
15:51:30 Crossed grounding line

17:02 Stop recording-snow
17:04 Start recording-snow — data01
0 dB front-end attenuation

17:16 Sea ice then open water
17:18 open water
17:19 Sea ice
17:20 Pancake ice
17:22 Sea ice w/ snow cover

→ Banking while flying over

17:29 Ice shelf
17:35 Stop recording — SNOW
17:37 Start recording-SNOW — data02
No front-end attenuation

18:55
18:55:41
18:56
18:57

Calving front
End of survey
Sea ice
Stop recording — BOTH

SNOW - 3600 files, 189 GB
KM - 369 files, 194 GB

tmp = out(istart : istop, :)
b = fir1(32, 0.1, 'high')
tmp2 = filtfilt(b, 1, tmp)

tmp3 = medfilt2(tmp2, [3,3])

10/20/09

~~B~~ Pine Island High Altitude
4-6 GHz output
(281 to 343 MHz DDS)
240 μs pulse length
expecting a beat frequency of
592 MHz @ 35,000 ft.

10/21/09
14:55:13

Sea Ice Science 1 Amundsen & Bellingshausen
Science line starts data01
↳ both radars

Snow Radar

PRF	2 kHz	data01
DDS	250-286 MHz	
Pulse Length	175 μs	
Record Length	16000	
Presums	4	

Ku-band radar

PRF	8 kHz	data01
DDS	250-268 MHz	
Pulse length	240 μs	
Record length	16000	
Presums	4	
DDS Freq.	933.12 MHz	

data02.
Snow Radar

Pulse length decreased to 150 μs.
Plane's altitude ~1200 ft.
Expected beat frequency ~ 32 MHz

data03
Snow Radar

Pulse length increased to 175 μs
Plane's altitude ~1500 ft.

16:~~28~~29

Small amount of snow cover on
sea ice

Ku-band
Stop recording

17:28:20

18:02 Probably 1-m thick ice
18:08 Thick snow cover
18:19 10-20 cm thick snow cover
18:38 Thick snow cover
18:40 Thick piece of outlet glacier
18:53:35 Snow Radar Stop Recording → d1

10/22/09

Telecom w/ Prasad, Steve, Carl, Toby

ADC has 700-MHz
Keep frequencies beneath 400 MHz
Ku-band software coming this weekend

Presums { 1, 2, 4 / 8 / 16 / ~~32~~ } 0 / 1 / 2 / 3 } Output Range

1 presum 8000 mean
More presums → higher mean

10/24/09

Sea Ice Science #2 Waddell
possible repeat

Snow Radar
PRF 3.5 kHz
DDS ~~[illegible]~~ 250-286 MHz
Pulse length 142 μs
Record length 9000
Presums 8

Ku-band radar 933.12 MHz DDS frequency
PRF 3 kHz
DDS 250-268 MHz
Pulse Length 240 μs
Presums 8
Record Length 16000

13:59 Start Recording Both systems — data00

14:02 Multi-year ice
Large snow depth, ice depth

14:07 Descent to 1000 ft altitude

data01
Snow Radar
2 kHz PRF
250-280 MHz DDS
175 μs
16000 Record length
4 presums

Ku-band Radar
8 to 4 presums

data02
Snow Radar
2 kHz PRF
250-310 MHz DDS
175 μs
16000 Record length
4 presums
16:25 180 μs pulse length

data03
Snow Radar
2 kHz PRF
250-280 MHz DDS
175 μs
16000 Record length
4 presums

16:56 Removed BPF from Ku-band
17:12 Thick snow cover over sea ice

17:20 Turn to waypoint #2

data01

36:14 radar time
18:08 UTC time

UTC is intermitting in 2-sec intervals
2 kHz PRF
250-300 MHz DDS
150 μs pulse length
16000 record length

18:15 — Added 50 MHz LPF to DAQ input of Ku-band radar

38:08 — Snow Radar time
140 μs pulse length

2nd data drive
data00

2 kHz PRF
250-300 MHz DDS
140 μs pulse length
16000 record length
} 4 presums

data01

3.5 kHz PRF
250-286 MHz DDS
142 μs pulse length
9000 record length
4 presums

21:05 UTC — Stop recording

10/25/09
Snow Radar

→ 86° Arc
High-Altitude

→ 281 to 312 MHz
4-5 GHz output
10-11 GHz up-converted chirp
312.5 – 343.75 MHz DDS generated
270 μs pulse length
@ 35,000 ft altitude
f_b = 263 MHz

5-6 GHz output
312-343 MHz

10/27/09

Snow Radar

Pine Island PIG2
2 kHz PRF
250-285 MHz DDS
175 μs pulse length
16000 samples
4 prescans

Ku Band Radar

3 kHz PRF
250-286 MHz DDS
240 μs pulse length
16000 samples
4 prescans

1 GHz DDS Frq.

data00 Snow Radar

10 dB receiver front-end attenuation

data01 Snow Radar

5 dB receiver front-end attenuation

data03 Snow Radar

0 dB receiver front-end attenuation

$$43\ \text{MHz} = \frac{\left(\frac{3000}{3.28}\right)\left(1.9609\right)}{\text{Pulse length}}$$

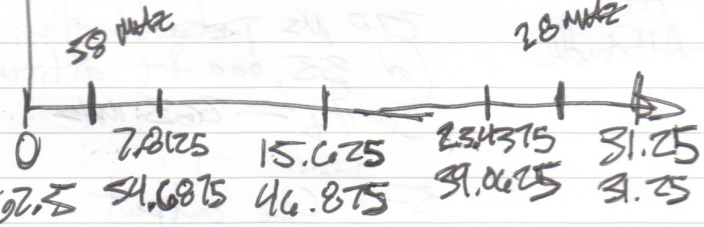
$$\text{Pulse length} = 138\ \mu s$$

data04 Snow Radar

138 μs pulse length (8625 pts.)

Beat Frequency axis

only parameter changed



data05
Snow Radar

9000 record length
raises the noise floor 5-10 dB

Ku-band 11-DAQ has
Frozen twice

3.5 kHz
PRF

data06
Snow Radar

16000 record length

data07
Snow Radar

2 kHz PRF
Noise floor lowered from ~5 dB to
-20 dB
First 5 datasets → banking

→ Throw out

data08
Snow Radar

2kHz PRF
250-285 MHz DDS
138 μs pulse length
16000 samples
4 Presums
0-dB front-end attenuation

data02
Ku band

3kHz PRF
250-286 MHz DDS
240 μs pulse length
16000 samples
4 Presums

933.12 MHz
DDS Frequency

data03
Ku band

200 μs pulse length

michael.t.gaunce@nasa.gov
Jill Hudson's blog

Total data

Snow 196 GB ~3:40
Ku-band 191 GB

10/28/09

TSK3

Snow Radar data00

2 kHz PRF
250-286 MHz DDS
140 μs pulse length
16000 record length
4 presums
0 dB attenuation

Ku band Radar data00

3 kHz PRF
250-286 MHz DDS
240 μs pulse length
16000 record length
4 presums
933.12 MHz DDS freq

data01 Snow
data02 Snow
data03 Snow
data04 Snow
data05 Snow
data06 Snow
data07 Snow
data08 Snow
data09 Snow
data10 Snow
data11 Snow

160 μs pulse length
200 μs pulse length
Same as data02
130 μs pulse length
190 μs pulse length
190 μs pulse length
140 μs pulse length
173 μs pulse length
140 μs pulse length
180 μs pulse length
130 μs pulse length

Total Data

Snow Radar - 184 GB
Ku band — 306 GB

10/29/09

FIG 1

Snow Radar data00

2 kHz PRF
250-286 MHz DDS
140 μs pulse length
16000 record length
4 presums
0 dB attenuation

Ku band data00

3 kHz PRF
250-286 MHz DDS
240 μs pulse length
16000 record length
4 presums
933.12 MHz DDS frequency

Hand flying the aircraft for the entire science line

data01 Ku band
data01 Snow

170 μs pulse length
160 μs pulse length

Turn monitor fading off

xset s noblank

Turn screensaver off

xset s off

Watch command

watch -n 60 df -h /d1

Total Data

271 GB – Snow
402 GB – Ku-band

10/30/09

Sea Ice Science #3 Waddell

Snow Radar

2 kHz PRF
250-286 MHz DDS
16000 record length
4 presums
5 dB receiver attenuation
Noise
240 μs pulse length
270 μs pulse length
Pancake ice and open water
~2200 ft.
130 μs pulse length
~1500 ft
190 μs pulse length
~1840 ft.

data00, 01
data02
data03

data04

data05

Ku-band
data00

8 kHz PRF
250-286 MHz DDS
16000 record length
4 presums
170 μs pulse length

933.12 MHz
DDS freq.

data00.dl Snow	No attenuation
data01.dl Snow	3 dB attenuation 130 μs pulse length
data01 Ku band	same as data00
data07 Ku band	150 μs pulse length
	ATM lost 300-350 km from 70 to 73° south 40 minutes or so
data08 Snow	160 μs pulse length
data09 Snow	140 μs pulse length
	Snow Radar is a pulse limited system
data10 Snow	130 μs pulse length
data03 Ku band	130 μs pulse length
data04 Ku band	150 μs pulse length
	Every 10 μs in pulse length change corresponds to a 1 dB change in pulse compression gain
data11 Snow	110 μs pulse length
data05 Ku band	180 μs pulse length
data12 Snow	100 μs pulse length
Total Data	Snow Radar - 354 GB Ku band - 400 GB

10/31/09

PENZ

Snow Radar
data00

2 kHz PRF — 0 dB attenuation
250-286 MHz DDS freq.
170 μs pulse length
16000 record length
4 presums

Ku band
data00

3 kHz PRF
250-286 MHz DDS freq.
170 μs pulse length
16000 record length
4 presums
933.12 MHz DDS freq.

data01 Snow — same as data00

Sea Ice w/ snow cover — up to data01, File 13

data02 Snow — 270 μs pulse length

data01 Ku-band — 270 μs pulse length

~~1/12.5Hz~~ (15000)

data03 Snow — 200 μs pulse length

data02 Ku-band — 240 μs pulse length

data03 Ku-band — 270 μs pulse length

data04 Snow — 170 μs pulse length

data04 Ku-band — 200 μs pulse length

data05 Snow — 220 μs pulse length

data06 Snow — 180 μs pulse length

data07, data08 Snow — 270 μs pulse length

data03 Ku-band — 270 μs pulse length

data09 Snow — 200 μs pulse length

data10 Snow
data06 Ku-band — 170 μs pulse length

Total Data — 220 GB – Snow
325 GB – Ku-band

11/02/09 — TSK 1

Snow Radar
data00 — 2 kHz PRF — 5 dB receiver attenuation
250-286 MHz Baseband
175 μs pulse length
16000 record length
2 pressums

~16:41 Start Recording

Ku-band
data00 — 3 kHz PRF
250-286 MHz Baseband
220 μs pulse length
16000 record length
4 pressums

data01 Snow — 200 μs pulse length
data02 Snow — 160 μs pulse length
data03 Snow — 8 dB receiver attenuation
data04 Snow — 160 μs pulse length

data01 Ku-band — 170 μs pulse length

Total Data — Snow – 222 GB
Ku-band – 321 GB

LEVENGER 800-544-0880

11/03/09

PEN 1

Snow Radar data00

2 kHz PRF
250-286 MHz baseband
180 μs pulse length
16000 record length
4 presums
1 GHz clock freq

Ku-band data00

8 kHz PRF
250-286 MHz baseband
240 μs pulse length
16000 record length
4 presums
933.12 MHz clock freq.

data01 Ku-band 200 μs pulse length

17:40 } Thin old ice, no snow cover and open water
17:41:50 } 1550 ft.

data01 Snow 160 μs pulse length

data02 Ku-band 170 μs pulse length

data02 Snow 190 μs pulse length

data03 Ku-band 200 μs pulse length

data03 Snow 130 μs pulse length

data04 Ku-band 240 μs pulse length

data05 Ku-band 180 μs pulse length

18:34:45 1810 ft above sea ice

data04 Snow 170 μs pulse length

18:38:50 — 1575 ft above sea ice

data05 Snow — 130 μs pulse length

data06 Ku-band — 220 μs pulse length

data07 Ku-band — 160 μs pulse length

data06 Snow — 180 μs pulse length

data08 Ku-band — 220 μs pulse length

data07 Snow — 200 μs pulse length

data 08 Snow — 140 μs pulse length

19:35:30 — 1547 ft ASL, open water and thin sea ice

19:40:55 — 1610 ft ASL (open water)

data09 Ku-band — 180 μs pulse length

data10 Both — same as data09

Total Data — Snow – 254 GB
Ku-band – 379 GB

11/07/09 — Pine Island Mod. Grid

Snow Radar
data 00

3 kHz PRF
249 – 286 DDS freq.
200 μs pulse length
16000 record length
4 presums

10 dB receiver front-end attenuation

Ku-band
data00

3 kHz PRF
250 – 286 DDS freq.
200 μs pulse length
16000 record length
4 presums

16:37 Sea Ice
16:41:38 Open water
16:47:05 Sea Ice

data01 Ku band 240 μs pulse length
data01 Snow 240 μs pulse length
data02 Snow 200 μs pulse length
5 dB receiver front end attenuation

data02 Ku band 200 μs pulse length
data 03 Snow 175 μs pulse length
17:39:40 } Open water
–17:39:55 }

data03 Ku band 160 μs pulse length
data04 Snow 160 μs pulse length

data05 Snow } same as the previous
data04 Ku band } data set

Total Data Snow – 366 GB
Ku band – 392 GB

11/09/09 PIG 4

Snow Radar data00
8 kHz PRF
249–286 MHz DDS freq.
160 μs pulse length
16000 record length
4 presums
5-dB Rx attenuation

Ku band data00
8 kHz PRF
250–286 MHz DDS freq.
240 μs pulse length
16000 record length
4 presums
933.12 MHz DDS Clock base

data01 Ku band — 180 μs pulse length
data01 Snow — same as data00
data02 Ku band — same as data01

18:24:20 — Open water w/ thin sea ice but turning while flying over
18:27:30 — Investigate Roll angles over this time period
Open water w/ thin sea ice not banking
18:29:59 — End open water

18:58:45 — Banking over open water w/ thin sea ice
18:59:30 — Leveled off over open water w/ thin sea ice
19:02:41 — Over ice shelf

19:27:30 — Level over open water w/ thin sea ice
Series of banks
(Check roll on GPS data)
19:33:45 — End open water

160 μs pulse length sampled at 62.5 MHz → 10000 samples

Question
Am I actually digitizing half of the preceding pulse splitting it in half over two records?

20:04:05 — Open water, but rolling (Check roll and pitch angles)
20:06:00 — Level out
20:08:27 — End Open water

20:32:48 — Open water, (Check roll and pitch angles)
20:39:23 — End open water

21:01:50 — Open water (Check roll and pitch angles)
21:10:06 — End open water

Total Data
Snow – 327 GB
Ku band – 328 GB

11/12/09

~~ABORT~~ ICE Shelf

Snow Radar
data00

3 kHz PRF
249-286 MHz DDS frequencies
160 μs pulse length
16000 record length
4 presums
5 dB Rx attenuation

Ku band Radar
data00

3 kHz PRF
250-286 MHz DDS frequencies
200 μs pulse length
16000 record length
4 presums

18:21:32 Open water and thin sea ice

18:23:55 Snow covered sea ice (banking)

18:26:15 Open water and thin sea ice

Multiple turns check roll and pitch angles

data01 Ku 240 μs pulse length

Return at 1500 ft altitude w/ specified parameters ~ 26 MHz

data02 Ku band 180 μs pulse length

Task Compile spreadsheet w/ all radar configurations find out which configurations need calibration data

18:38:55 End open water

18:40:46 Open water

18:41:10 End open water

data03 Ku band same as data02

data01 Snow same as data00

data02 Snow — 240 µs pulse length
Changed the DC Waveform length to match
1st time the entire trip

data03 Snow — 180 µs pulse length
180 µs DC waveform length

19:24:00 — open water
19:25:00 — End open water

data04 Snow — 160 µs pulse length
220 µs DC waveform length

data05 Snow — same as data04

data06 Snow — 1660 µs pulse length, 5% Tukey Weighting
~~DC waveform length~~ 220

data06 Snow — Ignore

20:21:30 — Open water
20:23:35 — End open water

data08 Snow — Hanning weighting, 220 µs length
20:47:50 — Finally under Sea Ice.

21:01:50 — Open water and thin sea ice
(check roll and pitch angles)

21:15:05 — End open water

21:18 — Noise floor at right side of Snow. Radar display decreases to 0 dB w/ no change in settings

Total Data
Snow - 296 GB
Ku-band - 372 GB

11/15/09

Evans Glacier

Snow Radar data00

3 kHz PRF — 5 dB Rx attenuation
249-286 MHz DDS
175 μs pulse length
270 μs weighting
16000 record length
4 presums

Ku-band data00

3 kHz PRF
250-286 MHz DDS
200 μs pulse length
16000 record length
4 presums

data01

240 μs pulse length

Snow Radar data01
Ku-band data02

160 μs pulse length
270 μs pulse length

Total Data

Snow - 346 GB
Ku-band - 346 GB

11/16/09

PEN5

Snow Radar data00

2 kHz PRF — 5 dB Rx attenuation
249-286 MHz DDS
160 μs pulse length
270 μs weighting
16000 record length
4 presums

Ku-band data00

2 kHz PRF
250-286 MHz DDS
200 μs pulse length
16000 record length
4 presums

18:10:21

Past the rotas. @ the beginning of the peninsula

20:22:09	Open water w/ thin sea ice
20:27:00	Snow cover over sea ice
20:36:00	End open water
20:38:40	Snow cover over sea ice
20:41:10	open water
	→ snow covered sea ice
20:49:20	Ice shelf
	↕ Snow covered sea ice
21:28:48	Ice shelf
data01 Both	same as data00
data02 Ku-band	180 μs pulse length
22:29	Snow covered sea ice
22:51	End sea ice
	Ice shelf begin
Total Data	Snow – 309 GB
	Ku-band – 310 GB
Data Backups	Copy backup_snow and backup_ku and dcfldd-_____.tar ~~and~~ to /bin
	Unpack dcfl w/ tar zxvf dcfldd
	See a directory, cd into it
	./configure
	make
	make install or
	./configure && make && make install
	which dcfldd should return full path
	Run scripts

11/18/09

TSK4

Snow Radar data00

3 kHz PRF — 5 dB Rx attenuation
249-286 MHz PDS
160 μs pulse length
270 μs weighting
16000 record length
4 presums

Ku-band radar data00

3 kHz PRF — 933.12 MHz clock rate.
250-286 MHz PDS
180 μs pulse length
16000 record length
4 presums

Initially over open water and thin sea ice
open water appears relatively smooth

15:33 Snow covered sea ice
15:57:40 Ice shelf
15:58 Snow covered sea ice w/ leads and bergs
16:04:30 Ice shelf or snow covered sea ice
16:35 open water but plane rolling
check pitch and roll angles

16:37 Snow covered sea ice
~16:40 Ice shelf / glacier tongue
18:43 Snow covered sea ice

if data write stalls for the Ka-band system
seems to correspond to screen blanks

18:45:05 Open water / thin sea ice
check roll and pitch angles

Total data
Snow — 277 GB
Ku-band — 274 GB

Date	Mission Name	Sea Ice/Land Ice	Data Set	Start	Stop	PRF	Bandwidth	Pulse Length	Presums	Record Length	Window
03/23/10	Sea Ice Science 05	Sea Ice	0	109	132	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	1	10	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	8	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			3	1	22	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			4	1	217	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			5	1	5	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			6	1	109	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			7	1	53	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			8	1	103	2 kHz	4.536 GHz	250 us	4	16000	Hanning
03/24/10	Petermann Glacier	Land Ice	0	1	610	2 kHz	4.536 GHz	250 us	4	16000	Hanning
03/26/10	Sea Ice Science 03	Sea Ice	0	63	628	2 kHz	4.536 GHz	250 us	4	16000	Hanning
03/30/10	NEIS 01	Land Ice	0	21	240	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	1	145	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	365	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/02/10	Northwest Passage	Sea Ice	0	17	614	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/05/10	Sea Ice Science 06	Sea Ice	0	104	383	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	1	271	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/12/10	Sea Ice Science 04	Sea Ice	0	101	512	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	1	7	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	115	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	203	277	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/13/10	NEIS 02	Land Ice	0	36	660	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/19/10	Sea Ice Science 01	Sea Ice	1	66	476	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/20/10	Sea Ice Science 07	Sea Ice	1	148	654	2 kHz	4.536 GHz	250 us	4	16000	Hanning
04/21/10	Sea Ice Science 02	Sea Ice	0	147	353	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	1	23	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	138	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/07/10A	Geikie 01	Land Ice	0	1	398	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/07/10B	Geikie 01	Land Ice	0	1	419	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/08/10A	Helheim-Kangerdlugssuag	Land Ice	1	1	47	2 kHz	4.48 GHz	250 us	4	16000	Hanning
			2	1	77	2 kHz	4.48 GHz	250 us	4	16000	Hanning
			3	1	133	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/08/10B	Helheim-Kangerdlugssuag	Land Ice	1	1	296	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/10/10A	Russell Glacier 01	Land Ice	1	1	386	2 kHz	4.48 GHz	250 us	4	16000	Hanning
05/10/10B	Russell Glacier 01	Land Ice	0	1	205	2 kHz	4.48 GHz	250 us	4	16000	Hanning
05/12/10A	SE Coastal	Land Ice	0	1	9	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	1	30	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	150	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			3	1	3	2 kHz	4.424 GHz	250 us	4	16000	Hanning
			4	1	204	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/12/10B	SE Coastal	Land Ice	0	1	253	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/13/10A	SE Glaciers	Land Ice	0	35	414	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/13/10B	SE Glaciers	Land Ice	0	1	196	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/14/10A	Jakobshavn 01	Land Ice	0	15	381	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/14/10B	Jakobshavn 01	Land Ice	0	1	418	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/15/10A	Russell 01R + Sukkertoppen	Land Ice	1	1	76	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	80	174	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	178	316	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	52	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/15/10B	Russell 01R + Sukkertoppen	Land Ice	0	1	122	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/17/10A	Jakobshavn 02	Land Ice	1	1	164	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	167	195	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	60	2 kHz	3.75 GHz	250 us	4	16000	Hanning
			3	1	27	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/17/10B	Jakobshavn 02	Land Ice	0	1	63	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	64	2 kHz	4.0 GHz	250 us	4	16000	Hanning
			3	1	126	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			4	1	29	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/19/10A	NW Glaciers	Land Ice	2	1	378	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/19/10B	NW Glaciers	Land Ice	0	1	244	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/20/10A	NW Coastal 01	Land Ice	0	1	367	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/20/10B	NW Coastal 01	Land Ice	0	1	257	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/21/10A	NW Coastal 02	Land Ice	0	1	348	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/21/10B	NW Coastal 02	Land Ice	0	1	300	2 kHz	4.536 GHz	250 us	4	16000	Hanning
05/25/10A	NEIS 03	Land Ice	1	1	27	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	29	250	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			1	252	282	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			2	1	6	2 kHz	3.75 GHz	250 us	4	16000	Hanning
			3	1	5	2 kHz	4.48 GHz	250 us	4	16000	Hanning
			4	1	82	2 kHz	4.0 GHz	250 us	4	16000	Hanning
05/25/10B	NEIS 03	Land Ice	0	1	19	2 kHz	4.0 GHz	250 us	4	16000	Hanning
			1	1	79	2 kHz	4.48 GHz	250 us	4	16000	Hanning
05/25/10C	NEIS 03	Land Ice	0	1	280	2 kHz	4.48 GHz	250 us	4	16000	Hanning
05/26/10A	NEIS 04	Land Ice	0	1	33	2 kHz	4.536 GHz	250 us	4	16000	Hanning
			0	38	223	2 kHz	4.536 GHz	250 us	4	16000	Hanning

Sea Ice Science 05 — 08/23/10

11:13	Start recording (high altitude)
Snow Radar settings	2 kHz PRF
	214-295 MHz DDS chirp
data00	250 μs Pulse length
	16000 Record length
	4 Presums
	7 dB Tx attenuation
	10 dB Rx attenuation
data01	0 dB Tx attenuation
data02	7 dB Tx atten.
	1000 ft. altitude
data03	4 dB Tx attenuation
data04	5 dB Rx attenuation
data05 → data08	200 μs pulse length
data06 & data07	250 μs pulse length
Ku-band data01	8 kHz PRF
	250-268 DDS chirp
	160 μs pulse length
	16000 Record length
	4 Presums
	16 dB Tx attenuation
	10 dB Rx attenuation
Ku-band data02	loopback - 800 m fiber
Ku-band data03	loopback - 800 m fiber
Snow data	348 GB

Peterman Glacier 03/24/10

data00 Snow

2 kHz PRF
214-295 MHz chirp
250 μs pulse length
16000 record length
4 presums
7 dB Tx attenuation
10 dB Rx attenuation

Ramp pass 2000 ft.

17:39:28 beginning
17:39:36 end

Sea Ice Science 03 03/26/10
data00 Snow

2 kHz PRF
214-295 MHz chirp
250 μs pulse length
16000 record length
4 presums
7 dB Tx attenuation
10 dB Rx attenuation

Snow - 370 GB
Ku band - 316 GB

17:18 Zulu → interesting ice formation (arc btw. Ellesmere and Greenland)

data00 Ku

2 kHz PRF
223-241 MHz chirp
240 μs pulse length
16000 record length
4 presums
*** MC time is exactly two times what it really is ***
No Tx or Rx attenuation

Science Line

Starts around file 67 for the Snow Radar

File 526 16:51

In flooding of sea ice

17:11 Ramp pass @ 1200 ft.

End of science line
Beginning of ramp 18:09:54
End of ramp 18:10:10

Northeast Ice Stream 01 — 08/30/10

data00 Snow
2 kHz PRF
214-295 MHz DDS chirp
250 μs pulse length
16,000 record length
4 presums
7 dB Tx attenuation
10 dB Rx attenuation

data00 Ku-band
2 kHz PRF
223-241 MHz DDS chirp
240 μs pulse length
16,000 record length
4 presums
UTC time is double the actual value

data01 Snow
data02 Snow
same as data00
4 dB Tx attenuation
5 dB Rx attenuation

1x2 driver release freeze caused by not directly clicking on the DDS output
resolved by exiting IDL and starting over

~~Waterville~~ 1500 ft.
Ramp pass begin 18:40:06
Ramp pass end 18:40:15

Snow Radar 395 GB
Ku-band Radar 399 GB

Northwest Passage

04/02/10

data00 Snow

2 kHz PRF
214-295 MHz DDS Chirp
250 μs pulse length
16000 record length
4 presums
7 dB Tx atten.
10 dB Rx atten.

data00 Ku-band

2 kHz PRF
223-241 MHz DDS Chirp
240 μs pulse length
16000 record length
4 presums

Snow Radar UTC time is
one second slow

Ku-band Radar time is twice the UTC time
~~[illegible]~~
12:55:00 UTC = 25:50:02

2000 ft
Ramp pass start

18:14:00

Total Data

Snow	373 GB
Ku-band	350 GB

Sea Ice Science 06 | 04/05/10

data00 Snow
2 kHz PRF
214-295 MHz chirp
250 μs pulse length
16000 record length
4 psums
7 dB Tx attenuation
12 dB Rx attenuation

data00 Ku-band
8 kHz PRF
223-241 MHz chirp
240 μs pulse length
16000 record length
4 psums

Science Line
1500 ft. AGL
File #104 Snow
File #143 Ku-band

Ku-band UTC time is double the actual UTC time

data01 Snow
data01 Ku-band
10 dB Rx attenuation
2 kHz PRF

1200 ft. ramp
Pass
begin 18:28:30
end
} data02 Ku-band

Total Data
Snow 396 GB
Ku-band 597 GB

Sea Ice Science 04 | 04/12/10

Snow Radar data00	2 kHz PRF 214-295 MHz chirp 250 μs pulse length 16000 record length 4 presums 7 dB Tx attenuation 10 dB Rx attenuation	
Ku-band radar data00	2 kHz PRF 223-241 MHz chirp 240 μs pulse length 16000 record length 4 presums	are time double the actual value
Science line	file 100 - Snow file 93 - Ku-band	
data01 - Snow data02 - Snow	200 μs pulse length 250 μs pulse length	
data02, file 117 data00, file 633	end of science line	
data02, file 203 data00, file 719	2nd leg science line	
2000 ft. ramp pass	begin → 19:20:29	
Total Data	Snow - 414 GB Ku-band - 412 GB	

Northeast Ice Stream 02 — 04/13/10

data00 Snow Radar
- 2 kHz PRF
- 214-295 MHz chirp
- 250 μs pulse length
- 16,000 record length
- 4 presums
- 7 dB Tx attenuation
- 12 dB Rx attenuation

1500 ft. altitude — ~file 40

data00 Ku-band
- 2 kHz PRF
- 223-241 MHz chirp
- 240 μs pulse length
- 16000 record length
- 4 presums

UTC time double the actual value

1500 ft. altitude — ~file 28

16000 ft ramp pass — begin 18:26:01

Total Data
- Snow 365 GB
- Ku-band 358 GB

LVIS Southeast — 04/14/10

data00 Snow Radar
- 2 kHz PRF
- 290.97-295 MHz chirp
- 250 μs pulse length
- 16000 record length
- 4 presums
- 7 dB Tx attenuation
- 12 dB Rx attenuation

Data collection — Camp Summit area centered about data01. file 20

data02 — Same settings moving out East open waters

Sea Ice Science 01 — 04/19/10

Snow Radar data00	2 kHz PRF 214-295 MHz chirp 250 μs pulse length 16000 record length 4 presums 7 dB Tx attenuation 10 dB Rx attenuation
Ku-band Radar data00	2 kHz PRF 223-241 MHz chirp 240 μs pulse length 16000 record length 4 presums UTC time is double the actual value
Snow – 1500 ft. altitude	~file 05, data01
Ku – 1500 ft. altitude	~file 78, data00
Snow – end of 1500 ft. science line	~file 475, data01
Ku – end of 1500 ft. science line	~file 490, data00
2,000 ft. ramp pass	19:17:39
Total Data	Snow Radar 348 GB Ku-band Radar 339 GB

Sea Ice Science 07 | 04/20/10

Snow Radar data00 and 01

2 kHz PRF
214-295 MHz chirp
230 μs pulse length
16000 record length
4 presums
7 dB Tx attenuation
10 dB Rx attenuation

Low altitude science line

data01, file 145 Snow
data00, file 145 Ku band

Ku band Radar data00 and 01

2 kHz PRF
223-241 MHz chirp
240 μs pulse length
16000 record length
4 presums

UTC time double the actual value

1200 ft. Temp Pass

19:40:45

Total Data

Snow Radar 429 GB
Ku band Radar 424 GB

Sea Ice Science 02 | 04/21/10

Snow Radar data00
2 kHz PRF
214-295 MHz DDS chirp
250 μs pulse length
16000 record length
4 ptesums
7 dB Tx attenuation
10 dB Rx attenuation

1500 ft. science line
~File 148

Ku-band data00
2 kHz PRF
223-241 MHz DDS chirp
240 μs pulse length
16000 record length
4 ptesums
UTC time digit by the actual value

1500 ft. science line
~File 128

data01 both 180 μs pulse length
data02 Ku-band 150 μs pulse length
data02 Snow 250 μs pulse length
data03 Ku-band 240 μs pulse length

End of the line
data02, File 139 Snow
data03, File 140 Ku-band

Total Data
Snow Radar 281 GB
Ku-band Radar 270 GB

Date	Mission Name	Sea Ice/Land Ice	Data Set	Start	Stop	PRF	DDS Start [MHz]	DDS Stop [MHz]	Bandwidth [GHz]	Pulse Length	Presums	Record Length	Window
10/26/10	Sea Ice 03	Sea Ice	0	1	544	2 kHz	214	295	4.536	250 us	4	16000	Hanning
			1	1	8	2 kHz	214	295	4.536	250 us	4	16000	Hanning
			2	1	81	2 kHz	214	295	4.536	250 us	4	16000	Hanning
10/28/10	Sea Ice 02	Sea Ice	0	1	814	2 kHz	214	295	4.536	250 us	4	16000	20% Tukey
10/30/10	Sea Ice 01	Sea Ice	0	1	487	2 kHz	214	295	4.536	250 us	4	16000	20% Tukey
11/05/10	Getz & Devicq	Land Ice	0	1	19	2 kHz	214	295	4.536	250 us	4	16000	20% Tukey
			1	1	118	2 kHz	214	286	4.032	250 us	4	16000	20% Tukey
			2	1	29	2 kHz	214	295	4.536	252 us	4	16000	20% Tukey
			3	1	55	2 kHz	214	286	4.032	250 us	4	16000	20% Tukey
			4	1	1	2 kHz	214	286	4.032	250 us	4	16000	20% Tukey
			5	1	118	2 kHz	214	286	4.032	250 us	4	16000	20% Tukey
11/06/10	Dotson Ice Shelf	Land Ice	0	1	20	2 kHz	214	295	4.536	250 us	4	16000	20% Tukey
			1	1	55	2 kHz	214	295	4.536	255 us	4	16000	20% Tukey
			2	1	290	2 kHz	214	286	4.032	255 us	4	16000	20% Tukey
11/10/10	86 South Pole Hole	Land Ice/High Alt.	0	1	47	2 kHz	214	218	0.224	255 us	4	16000	20% Tukey
			1	1	144	2 kHz	214	218	0.224	255 us	4	16000	20% Tukey
11/13/10	PEN 2/3R	Land Ice	0	1	38	2 kHz	214	295	4.536	255 us	4	16000	20% Tukey
			1	1	16	2 kHz	214	259	2.520	255 us	4	16000	20% Tukey
			2	1	17	2 kHz	214	295	4.536	255 us	4	16000	20% Tukey
			3	1	17	2 kHz	214	295	4.536	255 us	4	16000	20% Tukey
			4	1	30	2 kHz	214	286	4.032	255 us	4	16000	20% Tukey
			5	1	12	2 kHz	214	295	4.536	255 us	4	16000	20% Tukey
			6	1	157	2 kHz	214	286	4.032	255 us	4	16000	20% Tukey
			7	1	93	2 kHz	214	286	4.032	255 us	4	16000	20% Tukey
			8	1	6	2 kHz	214	295	4.536	255 us	4	16000	20% Tukey
11/19/10	TSK2-Cryo	Land Ice	0	1	12	2 kHz	214	218	0.224	255 us	32	16000	20% Tukey
			1	1	439	2 kHz	214	286	4.032	255 us	4	16000	20% Tukey
11/20/10	PIG Arch	Land Ice	0	1	384	2 kHz	214	286	4.032	250 us	4	16000	20% Tukey
			RAID/0	1	72	2 kHz	214	286	4.032	250 us	4	16000	20% Tukey

Sea Ice 03 | 10/26/10

Snow Radar

640 GB drive
214-295 MHz DDS
250 μs pulse length
16000 record length
4 ptsums

No Tx/Rx attenuation

/d2/ 640 GB
/d1/ RAID

Ku-band Radar

223-295 MHz DDS
240 μs pulse length
16000 record length
4 ptsums
UTC time doubled

Open water @ 1500 ft.

Snow file 7
Ku-band file 6

Pack ice @ 1500 ft

Snow file 10
Ku-band file 10

14:30 UTC
14:35 UTC
14:36 UTC
14:43 UTC

Good calibration targets
Leads for system response calibration
Lead for system response Cal
Good snow cover
Snow file 35
Ku file 61

14:54 UTC
15:15 UTC

Healthy snow according to Seelye
Smooth surface for calibration

Snow Radar 2 seconds behind UTC time

Sea Ice 02 10/28/10	Received unknown WMI event? (dell-wmi)
Snow Radar data 00, RAID	214-295 MHz baseband chirp 250 μs pulse length 16000 record length 4 presums 2 kHz PRF 20% Tukey windowing on Tx
Ku-band Radar data 00, RAID	~~[illegible]~~ 232-304 MHz DDS chirp 240 μs pulse length 16000 record length UTC time doubled 4 presums 2 kHz PRF
UTC Time	Snow Radar appears to be 1 second behind Reveal Can we write a VI script to sound the BIOS if the IU-DAQ freezes?
Data drives	Snow Radar drives from 10/26 died Replaced the internal data drive in the Ku-Band laptop
Science line file start	Snow Radar - file 23 Ku-band Radar - file 23 OS Drive in the Ku-band laptop has uncorrectable sectors According to Seelye, we should see the thickest snow yet @ the beginning
-5.0°C 5° pitch	~~[illegible]~~ Indication of thick pack ice @ Beginning of science line due to a tailwind on the transit
16:06 UTC	Thick, pack ice
Calibration maneuver	UTC: 23:15:50 - 23:17:20 File #:

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End of the CryoSat-2 Underflight — 23:01:19 UTC

Snow Radar — 408 GB, 815 files
Ku-band Radar — 408 GB, 815 files

Sea Ice 01 10/30/10
data 00 1-12 data02 1-290
data 01 1-55

Snow Radar data 00, RAID
214-295 MHz baseband chirp
250 μs pulse length
16000 record length
4 pressums
2 kHz PRF
20% Tukey window on Tx

Ku-band Radar data 00, RAID
252-304 MHz baseband chirp
240 μs pulse length
16000 record length
4 pressums
2 kHz PRF
UTC time doubled

Data drives — Snow Radar RAID drives from 10/28 died

Science line — Snow Radar File 17
Ku-band Radar File 17

15:58 UTC — Deep snow cover

Snow Radar files 79, 80 — Missing u/ control signal to VGA in Tx chain

Reveal UTC offset — Appears to be 8 seconds too. Snow and Ku-band systems and the Reveal

Snow Radar — 488 files 245 GB
Ku-band Radar — 488 files, 245 GB

11/05/10
Getz Ice Shelf and Dotson Glacier

Snow Radar data00

214-295 MHz DDS chirp
250 μs pulse length
16000 record length
4 presums
2 kHz PRF
20% Tukey window on Tx

UTC time is 1 second behind the Riegl system

Ku-band Radar data00

232-304 MHz DDS chirp
240 μs pulse length
16000 record length
4 presums
2 kHz PRF

UTC time should be that of the Snow Radar

Science line

file 12 – both radars

data01 – Snow

214-286 MHz

~15:49:30 UTC
~17:39:00 UTC

Grease Ice
Open water and little grease ice

data02 Snow

214-295 MHz
252 μs pulse length

214
3/4/18

17:58:18 UTC to 18:08:00 UTC

Open water, thin pancake ice
Snow covered sea ice

data03 Snow and data04 and data05

214-286 MHz
250 μs pulse length

data00 – Ku 640 GB drive

Same as data00 RAID

19:49:00

Open water

End of the line

Snow Radar 350 files, 172 GB
Ku-band Radar

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11/06/10
Dotson Ice Shelf

Snow Radar
data00, RAID

Ku-band Radar
data00, RAID

Science Line

data01 – Snow
data02 – Snow

17:59:15 UTC –
17:44:33 UTC

18:27:00 UTC –
18:34:00 UTC

19:11:20 UTC –
19:19:34 UTC

data00 – Ku
640 GB drive

19:54:29 UTC –
19:56:51 UTC

Total data

Smith and Kohler Glaciers
feed the Dotson Ice Shelf

214-295 MHz DDS chirp
250 μs pulse length
16000 record length
4 presums
2 kHz PRF
20% Tukey window on Tx

2 sec. behind
Reveal System

232-304 MHz DDS chirp
240 μs pulse length
16000 record length
4 presums
2 kHz PRF

UTC double that of
the Snow Radar

File 17 – both radars
starts with open water

255 μs pulse length
214-286 DDS frequency

Open water (not very calm)

Open water followed by thin sea ice

Thin sea ice

same as data00, RAID

Thin sea ice @ end of the line

Snow Radar – 368 files, 184 GB
Ku band Radar – 371 files, 187 GB

11/10/10
2 UKS 86 s. Pole
Hole

Snow Radar
data00
data01

214-218 MHz DDS
255 μs pulse length
16000 record length
2 kHz PRF
4 pressums

Ku-band Radar
data00
data01

232-236 MHz DDS
255 μs pulse length
16000 record length
2 kHz PRF
4 pressums
UTC time doublechecked of the Snow Radar

11/13/10
PEN 2/3 TC

Snow Radar
data00

214-295 MHz DDS
255 μs pulse length
16000 record length
2 kHz PRF
4 pressums

Science time
File start: 29

Time lag from Reveal:
2 seconds

Ku-band Radar
data00
data01

232-304 MHz DDS
240 μs pulse length
16000 record length
2 kHz PRF
4 pressums

Science time
File start: 29

UTC time doubled

data01 Snow
data02 Snow
and data03

214-259 MHz DDS
214-295 MHz DDS

data04 Snow
data05 Snow
data06, 07 Snow
data08 Snow

214-286 MHz DDS
214-295 MHz DDS
214-286 MHz DDS
214-295 MHz DDS

Snow Radar
Ku-band

196 GB, ~398 files
217 GB, ~487 files

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11/19/10
TSK2-Cryo

Snow Radar data00	High altitude 30,000 ft. 214-218 MHz DDS 2 kHz PRF 255 µs pulse length 16000 record length 32 presums	UTC time 1 second behind Reveal display
data01	214-286 MHz DDS 2 kHz PRF 255 µs pulse length 16000 record length 4 presums	Science line start file 17
Ku-band Radar	232-304 MHz DDS 240 µs pulse length 2 kHz PRF 16,000 record length 4 presums	UTC time doubled Science line start file 17
Total data	Snow - 456 files, 227 GB Ku - 444 files, 222 GB	

11/20/10
PIG-Arch

Ku - 462 files, 232 GB
Snow -

Snow Radar data00 RAID data 00 40GB	214-286 MHz DDS 250 µs pulse length 2 kHz PRF 16000 record length 4 presums	UTC time 1 second behind Reveal display Science line file 38 surface - 15
Ku-band Radar	232-304 MHz DDS 240 µs pulse length 2 kHz PRF 16000 record length 4 presums	UTC time doubled Science line file 38 surface 15

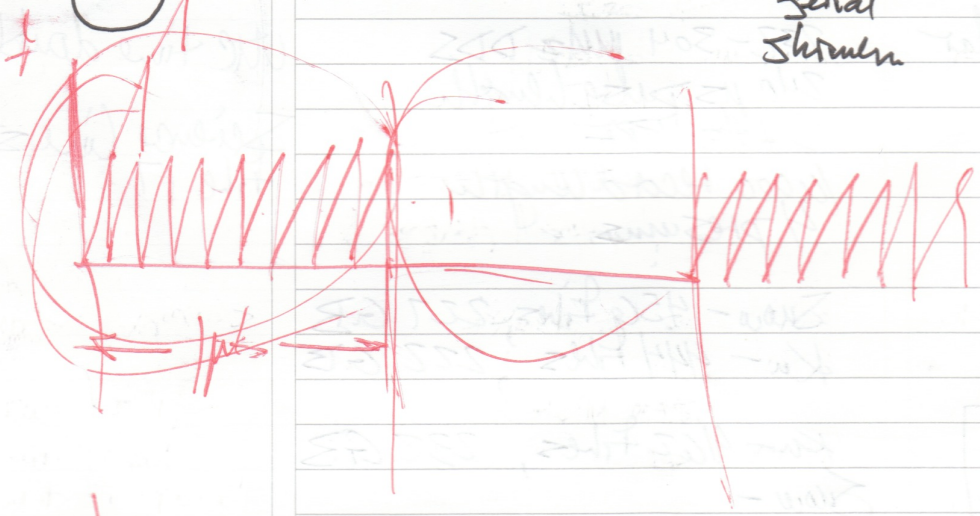
Ku-band settings

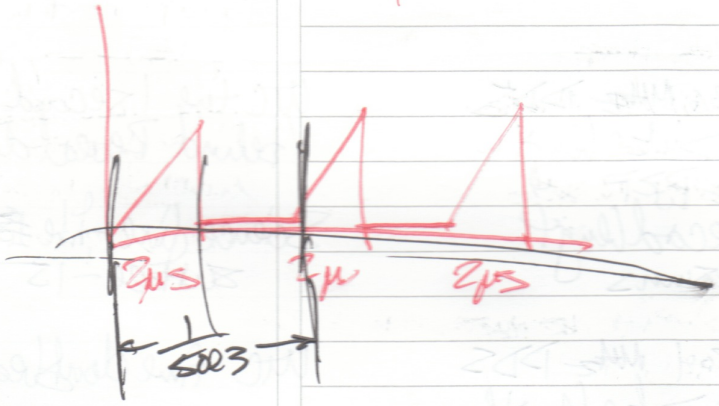
232 - 286 MHz
250 μs pulse length
2 kHz PRF

Accum startup

```
tail -f /var/log/messages
cd /projects/ftx2drv/
insmod ftx2.ko
cd /projects/accum
idl
24/26 V switch
5/15 V switch
1u DAQ
dlm_register, './serial_idl/serial_idl.dlm'
serial_open
.run mod_dd_reg.pro
.run wavegen.pro
dlm_register, "../dlm/ftx2/ftx2_idl.dlm"
```

serial
shmem





LEVENGER 800-544-0880

Date	Mission Name	Sea Ice/Land Ice	Data Set	Start	Stop	PRF	DDS Start [MHz]	DDS Stop [MHz]	Bandwidth [GHz]	Pulse Length	Presums	Record Length	Window
03/16/11	Connor Corridor	Sea Ice	0	1	11	2 kHz	214	295	4.536	250 us	4	16000	None
			1	1	218	2 kHz	214	295	4.536	250 us	4	16000	None
			3	1	27	2 kHz	214	295	4.536	250 us	4	16000	None
03/17/11	CryoSat	Sea Ice	0	1	437	2 kHz	214	295	4.536	250 us	4	16000	None
03/18/11	ZZ West (Shortened)	Sea Ice	0	1	423	2 kHz	214	295	4.536	250 us	4	16000	None
03/22/11	North Basin Transect	Sea Ice	0	1	212	2 kHz	214	295	4.536	250 us	4	16000	None
			1	1	37	2 kHz	214	295	4.536	255 us	4	16000	None
			2	1	52	2 kHz	214	322	6.048	255 us	4	16000	None
			3	1	33	2 kHz	214	295	4.536	255 us	4	16000	None
			4	1	84	2 kHz	214	219	0.280	255 us	4	16000	None
03/23/11	ICEX Camp	Sea Ice	0	1	24	2 kHz	214	295	4.536	250 us	4	16000	None
			1	1	15	2 kHz	214	321	5.992	250 us	4	16000	None
			2	1	35	2 kHz	214	295	4.536	125 us	4	16000	None
			3	1	237	2 kHz	214	295	4.536	250 us	4	16000	None
			4	1	19	2 kHz	214	259	2.520	250 us	4	16000	None
			5	1	30	2 kHz	214	265	2.856	250 us	4	16000	None
			6	1	3	2 kHz	214	259	2.520	250 us	4	16000	None
			7	1	6	2 kHz	214	250	2.016	250 us	4	16000	None
03/25/11	South Basin Transect	Sea Ice	0	1	17	2 kHz	250	295	2.520	250 us	4	16000	None
			1	1	33	2 kHz	245	295	2.800	250 us	4	16000	None
			2	1	1	2 kHz	214	254	2.240	250 us	4	16000	None
			3	1	29	2 kHz	214	260	2.576	250 us	4	16000	None
			4	1	76	2 kHz	214	264	2.800	250 us	4	16000	None
			5	1	29	2 kHz	214	264	2.800	255 us	4	16000	None
			6	1	71	2 kHz	214	295	4.536	255 us	4	16000	None
			7	1	3	2 kHz	214	290	4.256	255 us	4	16000	None
			8	1	17	2 kHz	214	280	3.696	255 us	4	16000	None
			9	1	16	2 kHz	214	265	2.856	255 us	4	16000	None
			10	1	187	2 kHz	214	295	4.536	255 us	4	16000	None
03/26/11	ZZ East	Sea Ice	0	1	535	2 kHz	214	295	4.536	250 us	4	16000	None
03/28/11	Fram Gateway	Sea Ice	0	1	612	2 kHz	214	295	4.536	250 us	4	16000	None
			2	1	24	2 kHz	214	295	4.536	250 us	4	16000	None
03/29/11	CryoSat	Land Ice	0	1	440	2 kHz	214	286	4.032	250 us	4	16000	None
			1	1	282	2 kHz	214	286	4.032	250 us	4	16000	None
03/31/11	Jakobshavn 02	Land Ice	0	1	376	2 kHz	214	286	4.032	250 us	4	16000	None
			1	1	9	2 kHz	214	238	1.344	250 us	4	16000	None
			2	1	110	2 kHz	214	264	2.800	250 us	4	16000	None
			3	1	2	2 kHz	260	295	1.960	250 us	4	16000	None
			4	1	13	2 kHz	245	295	2.800	250 us	4	16000	None
			5	1	73	2 kHz	214	264	2.800	250 us	4	16000	None
			6	1	3	2 kHz	214	295	4.536	250 us	4	16000	None
			7	1	128	2 kHz	214	286	4.032	255 us	4	16000	None
04/06/11	Jakobshavn 01	Land Ice	0	1	10	2 kHz	232	286	3.024	255 us	4	16000	None
			1	1	779	2 kHz	214	286	4.032	255 us	4	16000	None
			2	1	16	2 kHz	245	295	2.800	255 us	4	16000	None
04/07/11	Umanaq 01	Land Ice	0	1	455	2 kHz	214	286	4.032	255 us	4	16000	None
			1	1	161	2 kHz	214	286	4.032	255 us	4	16000	None
			2	1	18	2 kHz	214	268	3.024	255 us	4	16000	None
			3	1	89	2 kHz	214	286	4.032	255 us	4	16000	None
04/08/11	SW Mop-up 1	Land Ice	0A	1	79	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	429	2 kHz	214	286	4.032	255 us	4	16000	None
			0C	1	296	2 kHz	214	286	4.032	255 us	4	16000	None
			1C	1	12	2 kHz	214	264	2.800	255 us	4	16000	None
04/11/11	SE Mop-up	Land Ice	0A	1	431	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	3	2 kHz	214	232	1.008	255 us	4	16000	None
			1B	1	26	2 kHz	214	286	4.032	255 us	4	16000	None
			2B	1	5	2 kHz	277	295	1.008	255 us	4	16000	None
			3B	1	77	2 kHz	214	286	4.032	255 us	4	16000	None
04/12/11	SE Coastal 02	Land Ice	0A	1	436	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	282	2 kHz	214	286	4.032	255 us	4	16000	None
04/13/11	Russell Mop-up 01	Land Ice	0A	1	41	2 kHz	214	286	4.032	255 us	4	16000	None
			1A	1	361	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	187	2 kHz	214	286	4.032	255 us	4	16000	None
			1B	1	12	2 kHz	214	277	3.528	255 us	4	16000	None
04/14/11	SE Flank 01	Land Ice	0A	1	176	2 kHz	214	286	4.032	255 us	4	16000	None
			1A	1	141	2 kHz	214	304	5.040	255 us	4	16000	None
			2A	1	115	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	3	2 kHz	214	304	5.040	255 us	4	16000	None
			1B	1	240	2 kHz	214	286	4.032	255 us	4	16000	None
			2B	1	7	2 kHz	214	304	5.040	255 us	4	16000	None
04/15/11	CryoVex	Sea Ice	0	1	221	2 kHz	214	295	4.536	255 us	4	16000	None
04/16/11	SW Mop-up 2	Land Ice	0A	1	4	2 kHz	214	286	4.032	255 us	4	16000	None
			1A	1	340	2 kHz	214	286	4.032	255 us	4	16000	None
			2A	1	74	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	143	2 kHz	214	286	4.032	255 us	4	16000	None
			1B	1	4	2 kHz	214	277	3.528	255 us	4	16000	None
04/18/11	SE Fjords 01	Land Ice	0A	1	165	2 kHz	214	286	4.032	255 us	4	16000	None
			1A	1	108	2 kHz	214	286	4.032	255 us	4	16000	None
			2A	1	21	2 kHz	214	250	2.016	255 us	4	16000	None
			3A	1	141	2 kHz	214	260	2.576	255 us	4	16000	None
			0B	1	49	2 kHz	214	250	2.016	250 us	4	16000	None
			2B	1	132	2 kHz	214	250	2.016	250 us	4	16000	None
			3B	1	99	2 kHz	214	286	4.032	255 us	4	16000	None
			4B	1	15	2 kHz	214	286	4.032	255 us	4	16000	None
04/19/11	Helheim-Kangerd	Land Ice	0A	1	437	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	228	2 kHz	214	286	4.032	255 us	4	16000	None
			1B	1	114	2 kHz	214	286	4.032	255 us	4	16000	None
			3B	1	7	2 kHz	214	313	5.544	255 us	4	16000	None
04/22/11	Jak Lakes – Lakes	Land Ice	0	1	320	2 kHz	214	286	4.032	255 us	4	16000	None
			1	1	93	2 kHz	214	286	4.032	255 us	4	16000	None
04/23/11	Umanaq 02	Land Ice	0A	1	413	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	221	2 kHz	214	286	4.032	255 us	4	16000	None
			1B	1	26	2 kHz	214	295	4.536	255 us	4	16000	None
04/25/11	Duck/Clusters Plus	Land Ice	0A	1	120	2 kHz	214	286	4.032	255 us	4	16000	None
			1A	1	23	2 kHz	214	232	1.008	255 us	4	16000	None
			2A	1	27	2 kHz	214	286	4.032	255 us	4	16000	None
			3A	1	9	2 kHz	214	250	2.016	255 us	4	16000	None
			4A	1	5	2 kHz	214	241	1.512	255 us	4	16000	None
			5A	1	15	2 kHz	214	247	1.848	255 us	4	16000	None
			6A	1	188	2 kHz	214	250	2.016	255 us	4	16000	None
			2B	1	15	2 kHz	214	286	4.032	255 us	4	16000	None
			3B	1	285	2 kHz	214	286	4.032	255 us	4	16000	None
			4B	1	8	2 kHz	214	277	3.528	255 us	4	16000	None
04/26/11	Geikie 01	Land Ice	0	1	490	2 kHz	214	286	4.032	255 us	4	16000	None
			1	1	4	2 kHz	214	286	4.032	255 us	4	16000	None
			2	1	309	2 kHz	214	286	4.032	255 us	4	16000	None
04/28/11	Baffin Ice	Sea Ice	0	1	10	2 kHz	214	295	4.536	255 us	4	16000	None
			1	1	236	2 kHz	214	295	4.536	255 us	4	16000	None
04/29/11	Petermann 03	Land Ice	0	1	696	2 kHz	214	286	4.032	255 us	4	16000	None
05/02/11	NEIS 04	Land Ice	0	1	8	2 kHz	214	286	4.032	255 us	4	16000	None
			1	1	774	2 kHz	214	286	4.032	255 us	4	16000	None
			2	1	28	2 kHz	214	277	3.528	255 us	4	16000	None
05/05/11	Devon-Bylot	Land Ice	0B	1	46	2 kHz	214	286	4.032	255 us	4	16000	None
			1B	1	17	2 kHz	214	259	2.520	255 us	4	16000	None
			2B	1	104	2 kHz	214	277	3.528	255 us	4	16000	None
			3B	1	9	2 kHz	214	286	4.032	255 us	4	16000	None
			4B	1	9	2 kHz	214	264	2.800	255 us	4	16000	None
			5B	1	19	2 kHz	214	286	4.032	255 us	4	16000	None
05/06/11	North Layers	Land Ice	0A	1	387	2 kHz	214	286	4.032	255 us	4	16000	None
			0B	1	173	2 kHz	214	286	4.032	255 us	4	16000	None
05/07/11	Petermann 02	Land Ice	0	1	747	2 kHz	214	286	4.032	255 us	4	16000	None
05/09/11	North Glaciers	Land Ice	0	1	823	2 kHz	214	286	4.032	255 us	4	16000	None
05/10/11	Ellesmere 01	Land Ice	0	1	4	2 kHz	214	286	4.032	255 us	4	16000	None
			1	1	329	2 kHz	214	295	4.536	255 us	4	16000	None
			2	1	92	2 kHz	214	295	4.536	255 us	4	16000	None
			3	1	50	2 kHz	214	295	4.536	255 us	4	16000	None
			4	1	33	2 kHz	214	295	4.536	255 us	4	16000	None
			5	1	35	2 kHz	214	277	3.528	255 us	4	16000	None
05/11/11	NW Coastal 04	Land Ice	0	1	776	2 kHz	214	286	4.032	255 us	4	16000	None
05/12/11	Barnes-Bylot	Land Ice	0	1	301	2 kHz	214	286	4.032	255 us	4	16000	None
			1	1	35	2 kHz	214	286	4.032	255 us	4	16000	None
			2	1	21	2 kHz	214	286	4.032	255 us	4	16000	None
05/13/11	NW Glaciers	Land Ice	0	1	681	2 kHz	214	286	4.032	255 us	4	16000	None
05/16/11	NW Coastal 05	Land Ice	0	1	728	2 kHz	214	286	4.032	255 us	4	16000	None

03/10/11 Project Check Flight

Accum settings

Ku band Radar data01
- 232-286 MHz
- 250 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

Snow Radar data00 internal
- 214-295 MHz
- 250 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

data01 - Snow
data02 - Ku
data02 - Snow
data03 - Ku
- 255 μs pulse length
- 232-295 MHz
- same as data01
- 232-304 MHz

03/16/11 Sea Ice Connor Corridor

Snow Radar data00, 01 raid data03 internal
- 214-295 MHz
- 250 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

Ku band Radar data00 internal RAID data shut
- 232-295 MHz
- 250 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

Ku band RAID ~~att~~ Tower died switched to internal

Tried to copy data from the internal drive to a usb stick but the data stream is interrupted and multiple records were dropped.

Recorded time appears to be off by 1 second

Ku band file total: 230 files, ~~xxx~~ 21 in RAID dir.

Snow file total: 259 files, 28 in int_drive dir

03/17/11 — Sea Ice – CryoSat

Snow Radar
TAID array
214-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums
Science line start
File 14

Ku-band Radar
data00
internal drive
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums
6 dB attenuation on Rx front end
Science line start
File 15

Snow and Ku time of day
appears NOT to be synced

Ku-band data01
232-286 MHz
1900 ft. AGL transition back to
1500 ft AGL

Ku-band data02
232-295 MHz
1200 ft. AGL

Ku-band data03
232-286 MHz

Accum total
297 files, 149 GB
Snow total
438 files, 220 GB
Ku-band total
437 files, 219 GB

03/18/11 — ZZ West (Shortened)

Snow Radar
data00
214-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums
data start
File 2

Ku-band Radar
data00
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums
data start
File 1

LEVENGER 800-544-0880

Start w/ ICESat track 0136

Accum Total 346 files, 173 GB
Snow Total 424 files, 213 GB
Ku band Total 424 files, 213 GB

03/22/11 — Sea Ice North Basin Transect

Snow Radar data00
214–295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

ICESAT tracks in this order
0529
0328
0534

Ku-band Radar data00
232–295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Total data
Snow – 338 files, 169 GB
Ku – 338 files, 168 GB
Accum – 296 files, 148 GB

Science line start
Snow File 24
~~Ku~~ File 23

Ku data01
232–286 MHz
1st Nyquist zone

Internal drives
20,000 ft

Ku data02
232–295 MHz

Snow – data04
214–219 MHz
255 μs pulse length

Snow data01
255 μs pulse length

Ku – data 04
232–237 MHz
255 μs pulse length

Ku data03
232–304 MHz

Snow data02
~~232~~ 214–322 MHz

Ku data04
232–313 MHz

Ice Camp Line
GPS 19:34:31
– 17:35:17

Snow data03
214–295 MHz

2 kHz PRF
16000 record length
4 presums

03/23/11 Sea Ice – ICEX Camp

Snow Radar data00
214-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku-band Radar data00
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Total data
Snow 377 files, 188GB
Ku 377 files, 188GB
Accum 318 files, 160GB

New notebook
double A batteries
pens

2 700 ft passes
2 1500 ft passes

Snow Radar data01
700 ft pass #1
214-321 MHz
250 μs pulse length
17:43:45 – 17:44:38

Snow Radar data02
700 ft pass #2, #3
214-295 MHz
125 μs pulse length
17:52:58 – 17:54:20
18:03:20 – 18:04:42

Snow Radar data03
214-295 MHz
250 μs pulse length
1500 ft pass #1, #2
#3, #4, #5
#6, #7, #8
#9, #10, #11
18:13:24 – 18:14:49
18:22:40 – 18:24:02
18:32:09 – 18:33:38
18:41:48 – 18:43:14
18:51:22 – 18:52:48
19:01:05 – 19:02:30
19:10:30 – 19:12:24
19:20:22 – 19:21:52
19:30:00 – 19:31:30
19:39:09 – 19:40:40
19:49:08 – 19:50:35

* somewhere Snow and Ku-band recorded times offset 15 sec. ?

Orthogonal passes

Southern pt. 19:57:41
– 19:57:56

Northern pt.
20:03:00 – 20:03:26

Corner reflector?

Snow Radar data04 — 214–259 MHz
Ku band data01 — 232–277 MHz
} 2500 ft altitude

Upon restart of recording both Radars recorded times resynchronized

Snow Radar data05 — 214–265 MHz, still at 2500 ft
Snow data06 — 214–259 MHz, moved into beginning of 3rd Nyquist zone

Snow data07 — 214–250 MHz

Ku band data02 — 232–260 MHz

03/25/11 — Sea Ice South Basin Transect

Snow Radar data00 — 250–295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 pressums

Ku band Radar data00 — 232–277 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 pressums

2500 ft. AGL
File 11 – Snow
File 10 – Ku band

Ku data01 — 232–280 MHz
Snow data01 — 245–295 MHz
Ku data02 — 6 dB atten. TX
Snow data02 — 214–254 MHz
Snow data03 — 214–260 MHz
Snow data04 — 214–264 MHz
Snow data05 — 255 μs pulse length
Snow data06 — 214–295 MHz
Ku data03 — 232–295 MHz
} 1500 ft AGL

Snow data07 — 214–290 MHz

→ The data00 settings pointed the receive signal on a noise floor bump.

Snow data08 — 214-280 MHz
climbing due to icing on MCoRDS wing fairings
Back @ 2500 ft AGL

Ku data04 — 232-277 MHz
Snow data09 — 214-265 MHz
Ku data05 — 232-295 MHz
Ku data06 — 232-304 MHz
Snow data10 — 214-295 MHz
} 1000 ft. AGL

parked on the 1st/2nd Nyquist Zone detect

Total data
Snow – 490 files, 243 GB
Ku – 479 files, 239 GB
Accum – 264 files, 133 GB

03|28|11 — Sea Ice ZZ East

Snow Radar data00
214-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku/Ground Radar data00
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Total Data
Snow – 536 files, 268 GB
Ku – 536 files, 268 GB
No Accum data as MCoRDS was being tested

03|28|11 — Sea Ice Fram Gateway

Snow Radar data00
214-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku-band Radar
data00

232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Recorded time is 1 second behind

17:23

File 587, Ice Arch
no snow cover

* Ignore data 0Z for both radars *

Total data

Snow 613 files, 307 GB
Ku 613 files, 307 GB
Accum 325 files, 163 GB

Ramp pass

1000 ft. AGL, data02 for Snow and Ku-band → data03Z

Mark on ramp

18:40:58

03/29/11 – Land Ice – CryoSat

Snow Radar — 214-286 MHz
data00 — 250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Kuband Radar — 232-295 MHz
data00 — 250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Kuband disks were mounting as read only, swapped disks, but had to erase 3 days of data
lost 10 minutes of collection at the beginning

1st line is an IceSat track
2nd line is a CryoSat track
3 other tracks connect the coastline to the ridge line → 3rd set which flies over the NEEM site

Open water
files: Snow
Ku

@ 7000 ft AGL
reprogramming the spectrum settings caused multiple crashes of the IU-DAQs

Upon restart of the IU-DAQs, the Snow and Ku-band were off 15 seconds.
No open water as a result.

IU-DAQs ARE RECORDING AND DISPLAYING UTC TIME

data01 Snow and Ku
~17:22:45
same settings as data00
Overflight of the NEEM drill site

Recorded time appears to be 1 second slow

Pitch maneuvers over sea ice outside Thule
18:29:20 UTC
18:30:11 UTC

Sidebreak Fjord Glacier
18:21:10 UTC

Pituffik Glacier
18:24:07 UTC

Ramp pass 1500ft AGL
18:36:45 UTC

Total data
Snow 358GB, 719 files
Ku 349GB, 701 files
Accum 264GB, 529 files

18:27:00 UTC
Calving front

03/31/11 – Land Ice – Jakobshavn 02

Snow Radar
data00

214-286 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 Presums

Kuband Radar
data00

232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 Presums

Rink Glacier → calving front 13:36:30
13:26:33 UTC
Kangerdlugssup Glacier 13:58:57 UTC
Jakobshavn Glacier → calving front 13:58:57
Russell Glacier

13:38 over the fjord past the Rink Glacier calving pt.
UTC time is the standard output of NMEA strings
13:49 over the fjord leading up to Kangerdlugssup
13:52 over open water, both radars 1st Nyquist
14:05 onset area of Kangerdlugssup

Transit over ice sheet flank to Jakobshavn
Data over the fjords might be useful for system response calibration

Snow Radar data01 214-238 MHz
Ku band data01 232-256 MHz
Noise floor looks terrible
@ 4500 ft AGL above the cloud deck
forced to 2200 ft AGL & above as the
CRESS TO is in the area
→ Accum and MCorrs off
Snow data02 } @ 2200 ft AGL 214-264 MHz
Ku data02 } AGL 232-282 MHz

Ku data03 same as data01
Snow data03 260-295 MHz
Snow data04 245-295 MHz
Snow data05 214-264 MHz
Ku data04 same as data02

Data is real spotty over Jakobshavn, especially for the Snow Radar.
It seems as though when the in-flight SNR of the Ku band is high, the Snow is low and vice versa.

Snow data06 ~~same as data00~~ 214-295 MHz
Ku data05 same as data05

Snow data07 214-286 MHz, 255 μs pulse length

Total data Accum, 199 files, 100 GB
Snow 716 files, 357 GB
Ku-band 739 files, 369 GB

~~Ramp pass @ 2000 ft~~
~~data08 Snow, data06 Ku~~ both were deleted

Ignore data08 Snow, data06 Ku

0	376
1	9
2	110
3	2
4	13
5	73
6	3
7	178

04/06/11 – Jakobshavn 01

Snow Radar
data00
232-286 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Snow data01
214-286 MHz

Ku-band Radar
data00
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Snow Radar noise floor decreases every time John Doyle or Brian Yates press on the rack start.
Originally thought to be a ground issue, come to find out it's a vibration issue.
New Snow Radar needs to be shock mounted

13:51 UTC over sea ice @ 600 ft AGL
gravimeter line ascend to 1530 ft later

14:07 - 14:08 UTC

14:45 UTC

~~50820~~ SOD

possibly flying over a frozen lake

Snow Radar returns = 30dB

Ramp pass @ 2000 ft and ~~pitch maneuver~~

Snow data02 245-295 MHz

Ku data01 232-282 MHz

Total data 18:23:28 UTC

Snow 791 files, 396 GB

Ku 793 files, 397 GB

Accum 633 files 317 GB

Ignore Snow data03, Ku data02

04/07/11 – Umiaq 01

Snow Radar data00 — 214–236 MHz
data01 — 255 μs pulse length
2 kHz PRF
16000 record length
4 pressums

Ku band Radar data00 — 232–295 MHz
IGNORE — 250 μs pulse length
2 kHz PRF
16000 record length
4 pressums

Ku data01 same as data00
data02 as well

Leaving Disko Bay 11:37 UTC

4 GHz and 250 μs 125
With 2 GHz of bandwidth, ~~250~~ μs ?
31.25 MHz → ~~1875~~ 960 ft
62.5 MHz → 1921 ft

Data appears to be spotty at best.
~~Lot of~~ altitude variation

Snow Radar RAID array would not open. Two screws latched loose from the top drive, so the set couldn't be swapped.
Snow Radar laptop froze twice during data collection.

Snow data02 — 214–268 MHz
Ku data03 — 232–286 MHz
} 2000 ft AGL

Progress back down to 1500 ft.

Ku data04 — 232–295 MHz
Snow data03 — 214–286 MHz

The internal drive for the Snow Radar recording has stalled ~~30~~ times
~~32 33 34 35 36~~ >40

First and last legs are an ICESat-1 track for instrument verification.

→ One stall caused a computer freeze.

data03 files 15, 16 Snow seeing some interesting A-scopes in flight

Total Data (** not including the Ramp pass, Pitches, Russell **)
Snow 680+ files, 336 GB
Ku 691+ files, 346 GB
Accum 380+ files, 290 GB

Ramp pass @ 1200 ft. — 17:40:33
Pitch maneuvers — 17:42

04/08/11 – Southwest Map-Up

Snow Radar data00	214-286 MHz	
	255 μs pulse length	
TCAID and SSD A and SSD B	2 kHz PRF	
	16000 record length	
	4 pressums	
Ku-band Radar data00	232-295 MHz	data01 has 3dB atten. on Tx & Rx
	250 μs Pulse length	
	2 kHz PRF	
	16000 record length	
	4 pressums	

2 data write stalls on the Snow Radar TCAID @ the beginning

GULL, BIG, JBOD, FAST, SAFE, SAFE33, SAFE50
→ to 12:21 or 22

12:14 UTC open water / thin sea ice progress to snow covered sea ice

Snow RAID array (the disks) failed in the 1st hr. of collection, subbed in a single SSD duct taped to the RAID tower
↳ maybe the RAID data is recoverable

12:45 UTC snow covered sea ice to open water

15:05 UTC snow covered sea ice to open water

Interesting A-scope response Snow set B
Files 39, 40, 41, 47, 48

Lora Koenig wants GPS information in the header

2000 ft. Ramp pass 18:24:30 UTC

Pitch Maneuvers

Total Data

Snow

Ku 415 GB, 828 Files

Accum 318 GB, 636 files

** Add ramp pass and pitch maneuvers to status report **

Attitude extent of Ku band with 3.5 GHz bandwidth and 250 μs pulse length

data of Snow drive B ~~214-264 MHz~~ ~~245-295~~ MHz

Really strong response at each end of the Russell Glacier lines → maybe snow covered rock?

04/11/11 – SE Mop-up

Snow Radar
data00 set A
214-286 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 stacks

Ku-band Radar
data00
3dB attenuation
Tx and Rx
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 stacks

Start on the North-South line, part of the 2000-m traverse line, then IceSat Hook 0010

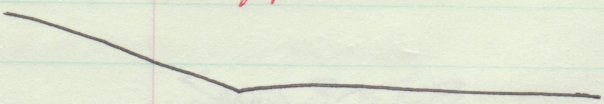
Heimdall Glacier down and back
12:33 UTC possible open water
12:41 UTC thin sea ice
Gudbrandsdalen Glacier down, Skintaxe up
13:16 UTC open water
13:33 UTC open water
13:35 UTC thin sea ice
Bernsdorff Glacier down and back
14:15 snow covered sea ice and open water
Gyldenlove Glacier
14:19 thin sea ice
14:24 open water on/off

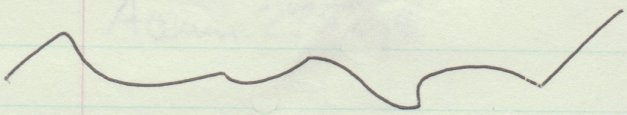
Snow Radar data00 set B	214-232 MHz
Ku-band data01	232-250 MHz
Snow data01 set B	214-230 MHz
Ku-band data02	232-295 MHz
Snow data02 set B	277-295 MHz
Ku-band data03	232-250 MHz
Snow data03 set B	214-286 MHz
Ku-band data04	232-295 MHz

1500ft. Ramp pass 16:00:35 UTC

Total data Accum, 444 files, 222 GB
Snow, 543 files 271 GB
~~[illegible]~~
Ku, 556 files, 277 GB

440 445 431 3
3 23 26
25 + 5
6 470 77
77 86
556





04/12/11 – SE Coastal 02

Snow Radar data00 set A	714-786 MHz
	255 μs pulse length
437 files, 218 GB	2 kHz PRF
	40000 record length
	4 presums
Ku band data00	732-795 MHz
	250 μs pulse length
	2 kHz PRF
	40000 record length
	4 presums
Snow Radar data00 set B	same as data00 set A

Why do I need to exit SDR before unmounting the disk I was recording to?

16:57 over rock

1000 ft jump pass	17:13:11 – 17:13:24
Pitch maneuvers	17:16,

Total data	Snow 345 GB
	Ku 350 GB
	Accum 275 GB

04/13/11 – Tossed Mop-up 01

Snow Radar data00
set A, set B

214-286 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku-band Radar data00

232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Both radars appear to be 14 seconds ahead of UTC time. → data00

data01 both radars saved as data 00, but recorded time is 1 second behind
If displayed time is ahead of ATM, by 14-16 seconds, turn off recording and hit update in the dds_gui.

Total Data Accum – 468 files, 233 GB

Snow →

Ku

2000 ft. AGL Ramp pass → data01, set B, snow 214-277 MHz ~~data01 Ku band 232-286 MHz~~ → 15:59:~~29~~

Pitch maneuvers @ 1500 ft AGL → 16:01:10, 16:01:45

04/14/11 - SE Flank 01 IGNORE Snow set B data03

Snow Radar data00, set A
214-286 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku-band Radar data00
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Both radars appear to be 2 seconds behind ATM NAV

Snow Radar data01 set A — 214-304 MHz
Ku-band data01 — 232-313 MHz
} 1000 ft. AGL

Snow Radar data02 set A — 214-286 MHz
Ku-band data02 — 232-295 MHz → and data03

Snow Radar data00 set B — 214-304 MHz → and data02

Snow Radar data01 set B — 214-286 MHz

178
220
287
10

Total data
176 3
141 240
115 7

Accum 547 files, 274 GB
Snow, 342 GB
Ku 688 files, 344 GB

ramp pass @ 1000 ft AGL data02 Snow, data03 Ku

~~pitch maneuver > data03 Snow~~ 17:31:43

04/15/11 – Cryovex – Sea Ice

Snow Radar data00 drive A
214-295 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku band Radar data00
232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

First passover @ 1000 ft AGL ~13:37 UTC – 13:39
Next 3 passes @ 1500 ft AGL
No Accum data as the transit was @ 20,000 ft AGL and the sidelobes of the surface interfere w/ detecting any other dielectric interfaces
Both radars recorded time are the same and 1 second behind the ATM Nav GPS

Surface @ File 28

Ku band data01 232-304 MHz
Survey line is only 0.5 km long
flying 5 km before & after
2nd pass @ 1500 ft. AGL

Buoy positions

	Lat	Lon
Buoy 2	83.6180,	-62.9068
Buoy 3	83.6196,	-62.8722

Ramp pass @ 17000 ft AGL 18:15:43

~~Snow data01 214-217 MHz~~

~~Ku data02 232-245 MHz~~

Total data Snow - 112 GiB (exclude 12 GiB of noise)

Ku - 111 GiB.

~~**~~ Ignore Snow data01 and Ku band data02 ~~**~~

04/ice/4 – Southwest Map-up 2

Snow Radar data00 4 — 214-286 MHz
drive A data01 3410 — 255 μs pulse length
data02 74 — 2 kHz PRF
11000 record length
4 pleasums

drive B data00 143
01 4

Ku-band Radar data00 — 232-295 MHz
data01 — 250 μs pulse length
2 kHz PRF
11000 record length
4 pleasums

data00 for both radars is GPS time, but w/ the 1 second lag, so subtract 14 seconds
If the GPS receiver isn't allowed sufficient warmup time, then the output is GPS time.
→ Have to allow sufficient time for the GPS receiver to download the correction.

12:21:50 utc sea ice
12:22:50 utc sea ice
12:25:00 utc open water
13:04:20 utc open water & sea ice

Snow Radar set A, files 221 and 222 show a strong sub surface response

Random drive ~~write stalls~~ on the Ku-band RAID tower that do not coincide with any turbulence or extreme vibrations.

Snow Radar ~~set~~ A, files 319-321, potential subsurface frozen lakes

Ramp pass @ 2000 ft. 16:30:52

data01, ~~set~~ B Snow 214-217 files

~~data02~~, still data01 for the Ku-band

04/18/11 – SE Fjords 01

Snow Radar
data00, driveA
data01

214-286 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 pl esums

Ku band Radar
data00 302

232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 pl esums

Snow data02, A
Ku band data01 304
Snow data03, A
Snow data00, B

214-250 MHz
232-268 MHz
214-260 MHz
214-250 MHz
250 μs pulse length
Recording GPS time

15:41:20 utc
N; Snow data01 B
Snow data02 B

Calm open water
→ recording utc time
214-250 MHz
250 μs pulse length

Ku band, data00 int. 67

232-268 MHz
250 μs pulse length

Snow data03 B

214-286 MHz
255 μs pulse length

Ku data01 int. 98

232-295 MHz
250 μs pulse length

Ramp pass @ 1500ft AGL — Ku data02 int. 15 / Snow data04 B — 18:28:57

Pitch maneuvers — 18:29:30

Total data

Snow 362 GB

Ku 390 GB

Accum 314 GB

	49
165	—
108	132
21	99
141	15

04/~~14~~/11 - Helheim - Kangerd

Snow Radar data00 drive A, drive B 437

214-286 MHz
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ku-band Radar data00 drive A, drive B 361

232-295 MHz
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Both radars recorded time synched, and 1 second behind ATM Nav.

Transit to the North first

Kangerdlugssuaq Glacier next

12:20 UTC fjord run, sea ice and bergs
12:26 UTC open water and ice @ 600 ft AGL
12:32 UTC pitch maneuvers @ 1300 ft AGL
12:56 UTC end open water / sea ice
14:53 UTC open water / sea ice
14:55 UTC pitch maneuvers ascend to 1500 ft AGL @ 12:51 UTC
15:01 UTC @ 600 ft AGL
15:06 UTC back to 1500 ft AGL over sea ice
potentially good calibration targets
15:09 calving front DeFrance Glacier

Kangerdlugssuaq (x2)
Midgard
Kristians
Steenstrup
DeFrance — 1st altimetry run
Midgard
Paris
Fenras
Main branch Midgard
Champselyesee
Pourquoi pas

S. Channel
Helheim

15:40 transition to 600 ft AGL
15:45 transition back to 1500 ft AGL
15:46 calving wall
16:11:50 snow
16:12:48 transition to 600 ft AGL
16:19:50 transition to 1500 ft AGL

data01B Snow — additional 6 dB of Tx attenuation

16:45:30 begin Accumulation Traverse line
file 538 on the Accumulo

Total data
Snow 393 GB
Ku 393 GB
Accum 311 GB

Ramp pass @ 10000 ft AGL 17:53:13 UTC

data02B Snow and data00B Ku

data02B Snow → 214-304 MHz

↳ IGNORE

Need to consider SSDs for the Accumulation Radar

→ data03B Snow 214-313 MHz

228
114
8
7

Jak Lakes (Mims Lakes) April 22

Snow Data 00
Start 214 MHz
Stop 286 MHz
Pulse len: 255us
Rec len: 16000
presums: 4

Ku Band Data 00
Start 232 MHz
Stop 295 MHz
pulse len: 250 us
Rec len: 16000
Presums: 4

Both Radar UTC Time synced.
Behind UTC by 1 sec

- Snow File 040 and Ku file 204

Ice Sat 151
Data 00
- Snow File 320 Ku File 264 recording stopped at end of line

- Data 01 Snow : Ku File 000 last line start

- Data 02 Ku change 3dB for 6dB on RX

April 22

1500 ft Ramp
18:40:50
Snow Data 01 file 90
Ku Data 02 file 08

18:41:30 } Pitch
18:42:30 }

Umanaq ϕ2 April 23

UTC Time -1 sec

DATA ϕϕ a

Snow

Start: 214 MHz

stop: 286 MHz

PRF: 2kHz

Pulse length: 255 μs

start index: 281

Reclen: 16000

Presums: 4

DATA ϕϕ Drive A

KU

Start: 232 MHz

stop: 295 MHz

PRF: 2kHz

Pulse len: 250 μs

start index: 281

Rec len: 16000

Presums: 4

Shortly after 10:54:12 UTC Cross calibrg front

16:17:17

Snow Drive B Data ϕϕ File 193

Ku Drive B Data ϕϕ File 191

Open Water

April 23

Snow Drive B Data #1

Start ~~214~~
Stop 295
pulse length ~~255~~ 128
PRF 2kHz
Presums 4
Rec len 16,000

Ramp Pass 1000 FT 16:46:05 UTC
Drive B Data #1 File 023 – Snow
Drive B Data #4 File 243 – Ku Band

Duck/Clusters Plus

April 25

Snow Data 00 Drive A	Ku Data 00 Drive A
Start: 214	start: 232
Stop: 286	Stop: 295
pulse len: 255 μs	pulse len: 250 μs
PRF: 2kHz	PRF: 2kHz
Rec length: 16,000	Rec length: 16,000
Presums: 4	Presums: 4
PDS: 1GHz	DDS: 1GHz

- 10:33:20 UTC, File 04 on both radars, surface return seen

- 11:10:10 Seg 3 Point - 1st Core site

• 11:14:00	File 077	2nd Core
• 11:17:39	File 083	Core site
11:19:22	File 086	Core Site
11:22:40	File 091	Core site
11:23:28	File 094	Core Site

April 25

Snow Data ϕ1 Drive A
Start 214
Stop 232

Ku Data ϕ1 Drive A
Start 232
Stop 250

Snow Data ϕ2 Drive A
Start 214
Stop 286

12:01:17 Calving Front

Ku Data ϕ2 Drive A
Start 232
Stop 295

Snow Data ϕ3 Drive A
Start 214
Stop 250

Ku Data ϕ3 Drive A
Start 232
Stop 263.5

Snow Data ϕ4 Drive A April 25
Start 214
Stop 241

Ku Data ϕ4 Drive A
Start ~~214~~ 232
Stop 254

Snow Data ϕ5 Drive A
Start 214
Stop 247

Ku Data ϕ5 Drive A
Start 232
Stop 260.5

Snow Data ϕ6 Drive A
Start 214
Stop 250
In GPS Time - 15 sec ahead

12:56:13 UTC - open water

April 25

Snow Data ~~ØØ~~ Drive B
Start: 214 / Data Ø1 : Ø2
Stop: 286

Snow Back on UTC Time

Ø1
Ku Data ~~ØØ~~ Drive B
Start: 232
Stop: 295

14:55:18 Down to 200ft open water
to 15:12:00

15:18:00 open water
Snow Data Ø3. File 64
Ku Data Ø1 File 74

17:3Ø:5Ø
2000 FT Ramp pass
Snow Data Ø4 Drive B
File ØØ5

Ku Data Ø1
File 311

Snow
Start 214
Stop 277

April 25

Pitch at 17:31:44

Snow File 006 - 007

Ku File 313 - 314

Greikie 01

April 26

Snow Data 00
Start: 214
Stop: 286
PRF: 2kHz
Pulse len: 255 μs
Record length: 16,000
Presums: 4

Ku Data 00
Start ~~214~~ 232
Stop 295
Pulse length: 250 μs
PRF 2kHz
Rec len: 16,000
Presums 4

Ku Data 00 probably not good

Ku Data 01 Start 232 Stop 295

12:01:42 UTC Transit stop Glacier
Run start. Snow - Data 00 File 173
Ku - Data 01 File 150

12:21:00 UTC - Over sea ice for ~15 min
Data 00 208 - snow
Data 01 File 185 - Ku

12:58:00 Snow File 274 Ku File 250
sea ice

April 25

13:37:00 UTC Snow File 344
Ku File 320
Open water

13:48:21 UTC Snow File 362
Ku File 339
Sea Ice

14:43 Snow File 463
Ku File 440
Sea Ice

14:53 UTC Snow File 480 Ku File 456
Climb above clouds

14:59 Snow File 496 Ku File 466
Pass 11,000 ft Rec off

14:04 Snow File 61 Ku File 62
Sea Ice

April 28

Ramp Pass @ 1500 ft
18:21:24
Snow Data ϕ2 File 306

Ku Data ϕ3 File 306

Pitch @ 1500 ft
18:22:06
Snow Data ϕ2 File 307
Ku Data ϕ3 File 307

~~Data ϕ2 File 305~~
~~307~~
~~FILE~~

Baffin Ice

April 28

~~Time off by 14 sec~~
off by 1

Removed 6dB on ku Rx and replaced with 3dB

Snow		Ku	
~~Start~~	214	Start	232
Stop	295	Stop	295
pulse	255 μs	pulse	255 μs
PRF	2kHz	PRF	2kHz
Rec len	16,000	Rec len	16,000
Presums	4	Presums	4

11:01 UTC Snow Data 01 File 05
Ku Data 00 File 017 Coast to ~~sea ice~~ Open water

1104 UTC Snow File 9
Ku File 20
Broken sea ice

11:12 Snow 25 Ku 36
over land

11:22 Snow 42 Ku 54
sea ice

April 28

11:38 Snow 71 Ku 82
open water

Snow 83 Rx off to calel Atten
Snow 88 Rx on
Added 6dB on Rx. Processed
Snow 18-19 showed really bad
ringing over sea ice

1201 Snow 112 Ku 124
Land

1205 Snow 118 Ku 130
open water

~~1208~~

12:57 UTC Snow 213 Ku 225
climb above 3000 ft

13:09:21
Ramp @ 1000 Ft
Snow file 233
Ku file 245

April 28

Pitch

Snow 235

Ku 246

Petermann 3 Apr 29

(Time / File # Pitch, Ramp, Open Water)

Snow time: GPS time
Ku time: UTC time

Reid: 785-813-1185 (sick, not flying)

Ramp Pass	KU	Snow
UTC ~~GPS~~	11:19:58	~~11:20~~
file #	2	2
(start of flight)		

No open water except pitch maneuver.

Ku
file 44/45, switched to
259-295 MHz (2 GHz)
file 49/50, switched to
232-295 MHz (3.5 GHz)
or sea ice?

Some open water for Ku-band, file 46-48. But ~~ve~~ high altitude, >3000ft.

Con't Apr-29

KU:

File 55: Can see surface on quick look

Snow

File 53: Can see surface on quick look

On Ku system, noticed errors on /dev/sda, maybe nothing. Snow did not have. This is the internal 750GB drive.

Tried copying snow file 93 while recording to file 96-97. No stall messages, but about every fifth range-line would look like a large burst interferer (so range domain on display was flat/broad band noise). Stopped transfer and stopped seeing this. Did not see Ku-band change during this process.

Note: running default settings:

Snow 255 μs, 214-286 MHz, 2000 Hz, 16000, 4

Ku 250 μs, 232-295 MHz, " " "

These are for the whole day unless noted otherwise.

Tukey

~~No~~ window on wf0 for snow

Hanning window on wf1 for Ku

CON'T

May 29

No pitch, ran out of time.

350GB for each instrument.

NEIS #4 May 2

Snow
Start 214
Stop 286
PRF 2kHz
Pulse: 255 μs
Rec len: 16,000
Presum: 4

Ku
start: 232
Stop: 295
PRF: 2kHz
Pulse: 250 μs
Rec len: 16,000
Presum: 4

UTC Time off by 1.

Data #1 File #3 Snow and Ku radar on

File 11 Pitch maneuver

11:08:59 UTC
~~11:08:59~~ Ramp

File 16

11:15 utc File 28 Climb above 1500 ft. low Clouds

11:23 File #42 1500 ft

May 2

Camp Century

77.19 N
61 W

11:39:30 utc
File 70

Interesting Snow return at File 77

13:36.19 File 280 600 Ft

Snow - Data Ø2
Start 214
Stop 277

Ramp 2000 ft
Snow ~~Data~~ Ø2 File 26 Missed Ramp
~~Ku Data~~ Ø1 File 802

Pitch - 18:26 utc
Snow ~~Data~~ Ø2 File 22
~~Ku Data~~ Ø1 File 798

Devon - Bylot May 5

UTC time off by 1 sec

Snow	Ku
Start 214	Start 232
Stop 286	Stop 295
Pulse len 255	Pulse len 250
Rec len 16,000	Rec len 16,000
Psum 4	Psum 4
PRF 2kHz	PRF 2kHz

14:40 UTC

Both Radars were not behaving properly on start. No way to check until we were on the line.

Ku restarted with 14 sec GPS time offset

Snow was stalling and had to use SSD

May 5

1501 UTC ~~Radio~~ Return seen

1510 UTC Snow start 215 stop 259
2.5 GHz BW

1511 UTC Ku start 232 stop 277
Ku UTC back to 1 sec off

1521 UTC Snow start 214 stop 277
Ku start 232 stop 295

15:23:29 Corner Ref N.

~~Summit~~

15:24:01 Corner Ref Summit

15:33 Snow start 214 stop 286

15:43:00 Summit Corner Ref

15:43:37 May 1st Corner Ref.

15:46 Inc. Altitude Due to weather

May 5

15:56 Return seen on snow and Ku

16:32 Recordly off. Transit above 1500 ft

16:53 Record ~~Started~~ Start
Snow start 214 Stop 264
Ku start 232 Stop 282

16:59 UTC Snow start 214 stop 286
Ku start 232 Stop 295

17:10 UTC End of line. Rec off.

No Pitch nb Ramp b/c weather

North Layers May 6

11:11 Pitch @ 1 sec UTC offset

11:12:38 Ramp at 2K Ft

Snow	Ku
Start 214	Start 232
Stop 286	Stop 295
Pulse len 255	Pulse len 250
PRF 2kHz	PRF 2kHz
Rec len 16,000	Rec len 16,000
Psum 4	PreSum 4

11:41:52 Camp Century

12:12:26 NEEM

16:25 End science line. Transit at 18500 ft.

Both recorded 283G

Peterman Ø2 May 7

Snow	Ku
Start 214	Start 232
Stop 286	stop 295
Pulse len 255	Pulse len ~~255~~ 250
PRF 2kHz	PRF 2kHz
Rec len 16,000	Rec len 16,000
Presum 4	Presum 4

1 sec offset

Pitch 11:05 UTC Snow File 2-3
Ku File 1-2

1000 FT Ramp Pass 11:06:31 UTC
Snow File Ø5 Ku File Ø5

11:42 UTC Snow and Ku File 7Ø
- Return seen

Ku File 125 - 2 returns?
" " 129 "
2nd spike around 2000 on A-Scope

Snow & Ku File 429 Lake off to west

May 7

Snow and Ku File 508
-600 ft for grav. 15:48 UTC

Snow and Ku File 541, 16:06 UTC
-1500 ft

Snow and Ku file 718 17:44 UTC 600 ft

1800 UTC 18,000 FT. Ramp
-Rec off

375 Gr Parker

North Glaciers May 9

Snow	Ku
Start 214	Start 232
Stop 286	Stop 295
Pulse len 255	Pulse len 250
PRF 2kHz	PRF 2kHz
Rec len 16,000	Rec len 16,000
PreSum 4	PreSum 4

1 sec offset

Ramp Pass 1500 Ft 11:14:30 UTC

~~Pitch~~ Snow ~~out~~ File 09

Ku File 09

Snow and Ku File 194

-600 FT

Snow and Ku File 359

-600 FT Sea ice

Snow and Ku

File 451 Pitch manner 1500 Ft

open water / Sea ice - Broken

May 9

Snow and Ku File 229
up to 1500 Ft from 600 ft

Ellesmere 01 May 10

Snow	Ku
Start 214	Start 232
Stop 286	Stop 295
Pulse len 255	Pulse len 250
PRF 2kHz	PRF 2kHz
Rec len 16,000	Rec len 16,000
Presum 4	Presum 4

1 sec offset

Snow File 03 - No return seen
Re updated DDS and seemed to fix the problem although return weak

Snow File ≥2 - stronger return seen

File 91 - Pitch

1711 UTC File 00 Snow
Start 214
Stop 295 - sea ice for duration of flight

Snow File 027
Ku File 078 - ice arch
Snow 31 Ku 82 transition to open water

May 10

1751 UTC - Rec back on

Snow
Start 214
Stop 277

Ramp Pass at 2000 FT
Snow File 023 18:04:44 UTC
Ku File 023

NW Coastal #4 May 11

Snow
Start: 214
Stop: 286
Pulse Len: 255 μs
Rec Len: 16,000
Presum: 4
PRF 2kHz

Ku
Start: 232
Stop: 295
Pulse len: 250 μs
PRF: 2kHz
Rec Len; 16,000
Presum: 4

1sec offset
Start of line, start of record,
high altitude b/c of clouds

Snow/Ku file #15 Returns seen
Ramp Pass @ 1000 Ft
Ku file/snow file 773/774
18:34:00 UTC

Barnes - Bylot May 12

Snow

Start: 214
Stop: 286
Pulse Len: 255
Rec Len 16,000
Presum 4
PRF 2kHz
1sec offset

KU

Start 232
Stop: 295
Pulse len: 250
Rec len 16,000
Presum 4
PRF 2kHz

Changed KU Rx coax and bulkhead port. No improvement

Ramp @ 18,000 FT

Pitch at 1500 FT
17:07 UTC Snow: Ku file 20

NW Glaciers May 13

File 09 Broken sea ice
11:18 UTC

File 29 over bay, likly water
11:29 UTC obscured by fog

File 266 13:42 Ice/Water
Obscured by fog

File 341 14:24 UTC Ice/water
Obscured by fog

High altitude Reemp

1500 Ft Pitch - Snow; ku File 680
1733 UTC

Snow	Ku
Start 214	Start 232
Stop 286	Stop 295
Pulse len 255	Pulse len 250
PRF 2kHz	PRF 2kHz
Rec len 16,000	Rec len 16,000
Presum 4	Presum 4

1sec offset

NW Coastal 05

May 16

Snow	Ku
Start 214	Start 232
Stop 286	Stop 295
Pulse len 255	Pulse len 250
PRF 2kHz	PRF 2kHz
Rec len 16,000	Pre Sum 4
Pre Sum 4	Rec len 16,000

1 sec offset

- lots of up and down at start of science line. Cannot adjust for terrain
- Really strong surface returns from snow

Snow/Ku
File 217 Sea Ice/Broken open water

Pitch @ 1500 FT

Snow/Ku File 727 17:57 utc

Record off 17:58 UTC

Date	Mission Name	Sea Ice/Land Ice	Data Set	Start	Stop	PRF	DDS Start [MHz]	DDS Stop [MHz]	Bandwidth [GHz]	Pulse Length	Presums	Record Length	Window
10/12/11	Seelye Loop	Sea Ice	0			2 kHz	214	295	4.536	250 us	4	16000	none
			1			2 kHz	214	295	4.536	250 us	4	16000	none
10/13/11	Endurance	Sea Ice	0			2 kHz	214	295	4.536	250 us	4	16000	none
			1			2 kHz	214	304	5.040	250 us	4	16000	none
			2			2 kHz	214	295	4.536	250 us	4	16000	none
			3			2 kHz	214	295	4.536	240 us	4	16000	none
			4			2 kHz	214	295	4.536	250 us	4	16000	none
10/14/11	PIG Grounding Line 1	Land Ice	0			2 kHz	214	286	4.032	250 us	4	16000	none
10/17/11	Getz Ice Shelf 3	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	241	1.512	255 us	4	16000	none
			2			2 kHz	214	286	4.032	255 us	4	16000	none
			3			2 kHz	214	286	4.032	255 us	4	16000	none
10/18/11	Twisted	Sea Ice	0			2 kHz	214	295	4.536	250 us	4	16000	none
			1			2 kHz	214	295	4.536	250 us	4	16000	none
			2			2 kHz	214	295	4.536	220 us	4	16000	none
			3			2 kHz	214	295	4.536	250 us	4	16000	none
10/20/11	Recover Mid Lakes	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	295	4.536	250 us	4	16000	none
10/21/11	Slessor 01	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
10/23/11	Bellingshausen 01	Sea Ice	0			2 kHz	214	295	4.536	250 us	4	16000	none
			1			2 kHz	214	295	4.536	250 us	4	16000	none
			2			2 kHz	214	295	4.536	220 us	4	16000	none
			3			2 kHz	214	286	4.032	250 us	4	16000	none
			4			2 kHz	214	295	4.536	250 us	4	16000	none
			5			2 kHz	214	313	5.544	250 us	4	16000	none
			6			2 kHz	214	295	4.536	250 us	4	16000	none
			7			2 kHz	214	295	4.536	220 us	4	16000	none
			8			2 kHz	214	295	4.536	250 us	4	16000	none
			9			2 kHz	214	295	4.536	220 us	4	16000	none
			10			2 kHz	214	295	4.536	250 us	4	16000	none
10/24/11	Alexander 01	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	268	3.024	255 us	4	16000	none
			2			2 kHz	214	268	3.024	255 us	4	16000	none
			3			2 kHz	214	236	1.232	255 us	4	16000	none
			4			2 kHz	214	259	2.520	255 us	4	16000	none
10/25/11	Seelye Prime	Sea Ice	0			2 kHz	214	295	4.536	250 us	4	16000	none
			1			2 kHz	214	295	4.536	250 us	4	16000	none
			2			2 kHz	214	295	4.536	220 us	4	16000	none
			3			2 kHz	214	295	4.536	190 us	4	16000	none
			4			2 kHz	214	295	4.536	250 us	4	16000	none
			5			2 kHz	214	295	4.536	220 us	4	16000	none
			6			2 kHz	214	295	4.536	250 us	4	16000	none
10/26/11	PIG 2B	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	286	4.032	255 us	4	16000	none
			2			2 kHz	214	250	2.016	255 us	4	16000	none
			3			2 kHz	214	286	4.032	255 us	4	16000	none
10/29/11	Recovery Grounding Line	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
10/30/11	Slessor Grounding Line	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	286	4.032	255 us	4	16000	none
11/03/11	Getz Ice Shelf 4	Land Ice	0			2 kHz	590	890	6.000	250 us	4	16000	none
			1			2 kHz	590	890	6.000	250 us	4	16000	none
11/04/11	Thwaites Grounding Line	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
11/07/11	Recovery Downstream	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	286	4.032	255 us	4	16000	none
11/09/11	WAIS Cores	Land Ice/Sea Ice	0			2 kHz	214	295	4.536	250 us	4	16000	none
			1			2 kHz	214	286	4.032	255 us	4	16000	none
			2			2 kHz	214	295	4.536	250 us	4	16000	none
11/11/11	Thwaites Upstream 01	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	227	240	0.728	255 us	4	16000	none
			2			2 kHz	227	239	0.672	255 us	4	16000	none
11/12/11	TSK2Cryo	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	250	2.016	255 us	4	16000	none
11/13/11	Crosson 1a	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	286	4.032	255 us	4	16000	none
11/14/11	North Peninsula	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	264	2.800	255 us	4	16000	none
			2			2 kHz	214	277	3.528	255 us	4	16000	none
			3			2 kHz	214	286	4.032	255 us	4	16000	none
11/16/11	Elbow	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
11/17/11	Middle Peninsula	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	259	2.520	255 us	4	16000	none
			2			2 kHz	214	277	3.528	255 us	4	16000	none
			3			2 kHz	214	286	4.032	255 us	4	16000	none
			4			2 kHz	214	264	2.800	255 us	4	16000	none
			5			2 kHz	241	259	1.008	255 us	4	16000	none
			6			2 kHz	241	259	1.008	255 us	4	16000	none
			7			2 kHz	214	286	4.032	255 us	4	16000	none
11/19/11	George VI Ice Shelf	Land Ice	0			2 kHz	214	286	4.032	255 us	4	16000	none
			1			2 kHz	214	286	4.032	255 us	4	16000	none

10/12/11 – Seelye Loop, Weddell Sea

snow00_20111012_*.dat
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Kuband00_20111012_*.dat
232-295 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

#1 ~12:50:40 ramp pass at PUQ @ 1500 ft AGL
~12:57:32 ramp pass at PUQ @ 1500 ft AGL

Snow Radar interfering with on-board radar altimeter.
→ Adding a 3dB pad on the Tx path resolved the issue

snow01_20111012_*.dat
same settings as snow00, but the isolator and 4 dB pad were added at the Tx output

Kuband01_20111012_*.dat
same settings as Kuband01

Snow and Ku-band UTC times are synched but
1 sec off of the ATM nav.
↳ behind

Kuband02_2011012_*.dat
232-304 MHz DDS output

Kuband03_2011012_*.dat
232-313 MHz DDS output

18:44:39 UTC - Brunt Ice Shelf
18:51:15 UTC - Doublet pitch maneuver

Total data
Snow 408 GB, 816 files
Ku-band 407 GB, 815 files

10/13/11 - Endurance, Weddell Sea

snow00_20111013_*.dat
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length, 281 start index
4 presums

Isolator and 4 dB pad at Tx output

kuband00_20111013_*.dat
232-304 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length, 281 start index
4 presums

Snow and Kuband UTC times are synched and 1 second behind ATM nav.

snow01_20111013_*.dat
214-304 MHz DDS output

kuband01_20111013_*.dat
232-295 MHz DDS output

kuband02_20111013_*.dat
232-304 MHz DDS output

snow02_20111013_*.dat
214-295 MHz DDS output

CryoSat-2 crossing
17:21:52

Kuband03_20111013_*.dat
223-304 MHz DDS output

Kuband04_20111013_*.dat
240 μs pulse length

Snow03_20111013_*.dat
240 μs pulse length

Total data
Snow 308 GB, 619 files
Kuband 308 GB, 618 files

#2 Ramp pass @ 1500 ft AGL @ 23:20:00 UTC
Snow04_20111013_*.dat → 214-295 MHz
Kuband05_20111013_*.dat → 232-295 MHz

#3 Ramp pass @ 1000 ft AGL @ 23:26:33 UTC

10/14/11 – PIG GL1 Pine Island Glacier Grounding Line 1

snow00_20111014_*.dat
214-286 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

kuband00_20111014_*.dat
232-304 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Total Data ~~195~~ 390 GB
Snow ~~205~~ GB, [illegible] files
Kuband 211 GB, 422 files

snow02_20111014_*.dat
Delay line 2.95 us with
40 dB attenuation
Connected with 5 ft. LMR 195 Jumpers
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF

20 dB attached to Rx front end

snow02_20111014_*.dat
Delay line (2.95 us) with 60 dB attenuation (40 Tx, 30 Rx) to line up with expected signal path from air/snow interface
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF
5 ft LMR 195 Jumpers used

snow03_20111014_*.dat
Delay line w/ 40 dB Tx attenuation and additional 50 ft of LMR-195 attached to the Rx input
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF
5 ft LMR 195 Jumpers used

snow04_20111014_*.dat
Delay line w/ 40 dB attenuation
Rx terminated in matched load
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF
one 5 ft LMR 195 Jumper used
fiber optic transceiver term. in matched load

Kuband01_20111014_*.dat
- Same setup as Snow01_20111014_*.dat
- 232-304 MHz TDDS output
- 250 μs pulse length
- 2 kHz PRF

Kuband02_20111014_*.dat
- Same setup as Snow02_20111014_*.dat
- Same params as Kuband01_20111014_*.dat
- Rx attenuation changed to 30 dB

Kuband03_20111014_*.dat
- Same setup as Snow03_20111014_*.dat
- Same params as Kuband01_20111014_*.dat

Kuband04_20111014_*.dat
- Same setup as Snow04_20111014_*.dat
- Same params as Kuband01_20111014_*.dat

10/17/11 – Getz Ice Shelf 3

snow00_20111017_**.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Kuband00_20111017_*.dat
232-304 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

Snow and Ku-band UTC times are synched and I see behind the ATM nav.

Science line starts of files
Snow:
Ku-band:

Snow01_20111017_*.dat
214-241 MHz
Kuband01_20111017_*.dat
232-259 MHz
Snow02_20111017_*.dat
214-~~[illegible]~~ MHz → 286
Kuband02_20111017_*.dat
232-304 MHz

snow03_20111017_*.dat
saved as snow002
kuband03_20111017_*.dat
saved as kuband002

Total data		
Snow	200 GB	401 files
Ku-band	197 GB	393 files

10/18/11 - Sea Ice, Weddell Sea, Twisted

snow00_20111018_*.dat
- 294-295 MHz DDS output
- 250 μs pulse length
- 2kHz PRF
- 16000 record length
- 4 ptsums

6dB Tx atten.
3dB Rx atten.

kuband00_20111018_*.dat
- 232-304 MHz DDS output
- 250 μs pulse length
- 2kHz PRF
- 16000 record length
- 4 ptsums

Ramp pass @ 1500 ft AGL
- mark on ramp at 12:28:04
- mark on ramp at 12:35:01

snow01_20111018_*.dat
- same as snow00

kuband01_20111018_*.dat
- same as kuband00

kuband02_20111018_*.dat
- 223-304 MHz DDS output

kuband03_20111018_*.dat
- 220 μs pulse length

snow02_20111018_*.dat
- 220 μs pulse length

Kuband04_20111018_*.dat
250 μs pulse length
Snow03_20111018_*.dat
250 μs pulse length

Total data	
Snow	317 GB, 635 files
Ku-band	316 GB, 634 files

10/20/11 - Recovery Mid Lakes

snow00_20111020_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

6 dB Tx atten.
0 dB Rx atten.

kuband00_20111020_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

15:47:07 core site

→ only includes fileset 00

Total data
snow 202 GB, 403 files
Ku-band 202 GB, 403 files

#6
snow01_20111020_*.dat
214-295 MHz, 250 μs pulse length
kuband01_20111020_*.dat
232-304 MHz, 250 μs pulse length
Ramp pass @ 1000 ft @ 23:25:01

10/21/11 – Slessor 01

Snow00_20111021_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Kuband00_20111021_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

16:26:10 mark on drill site

Total data
Snow 230 GB 459 files
Ku-band 230 GB, 459 files

10/23/11 – Bellingshausen Sea Ice 01

snow00_20111023_*.dat
214–295 MHz PRDS output
250 μs pulse length
2 kHz PRF
100000 record length
4 presums

6 dB Tx atten.
3 dB Rx atten.

Kuband00_20111023_*.dat
232–304 MHz PRDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

~~7~~ 8 Ramp pass @ 1000 ft AGL at 12:06:59 UTC
Ramp pass @ 1000 ft AGL at 12:14:40 UTC

snow01_20111023_*.dat
Same as snow00
kuband01_20111025_*.dat
same as kuband00
kuband02_20111023_*.dat → no change
~~220 μs pulse length~~ 250 μs pulse length
snow02_20111023_*.dat
220 μs pulse length
snow03_20111023_*.dat
214–286 MHz
250 μs pulse length

Snow04_20111023_*.dat
  Same as Snow00 and Snow01
Snow05_20111023_*.dat
  214-313 MHz DDS output
Kuband03_20111023_*.dat
  223-304 MHz DDS output
Snow06_20111023_*.dat
  214-295 MHz
  250 μs pulse length
Kuband04_20111023_*.dat
  220 μs pulse length
Snow07_20111023_*.dat
  220 μs pulse length
Snow08_20111023_*.dat
  250 μs pulse length
Kuband05_20111023_*.dat
  250 μs pulse length
Snow09_20111023_*.dat
  220 μs pulse length
Kuband06_20111023_*.dat
  220 μs pulse length
Snow10_20111023_*.dat
  250 μs pulse length
Kuband07_20111023_*.dat
  250 μs pulse length

Total data
Snow 394 GB, 793 files
Kuband 397 GB, 797 files

10/24/11 - Alexander 01

Snow00_20111024_*.dat
214-286 MHz DDS output
256 μs pulse length
2 kHz PRF
16000 record length
4 presums

6 dB Tx atten.
0 dB Rx atten.

Kuband00_20111024_*.dat
232-304 MHz DDS output
256 μs pulse length
2 kHz PRF
16000 record length
4 presums

Snow01_20111024_*.dat (~2500 ft AGL)
214-268 MHz DDS output
Kuband01_20111024_*.dat (~2500 ft AGL)
232-286 MHz DDS output
hard drive freeze that required a laptop reboot
→ snow02 same as snow01
→ lost 5 minutes of data collection
Snow03_20111024_*.dat
214-236 MHz DDS output (4000-5000 ft AGL)
Kuband02_20111024_*.dat
232-254 MHz DDS output
Snow04_20111024_*.dat
214-259 MHz DDS output

kuband03_20111024_*.dat
232-277 MHz DDS output

Total data
Snow 280 GB, 562 files
kuband 288 GB, 576 files

10/25/11 – Seelye Prime

snow00_20111025_*.dat
214-295 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums
6 dB Tx atten.
3 dB Rx atten.

kuband00_20111025_*.dat
232-304 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums

#9
Ramp pass @ 1500ft AGL @ 12:00:24 UTC
Ramp pass @ 1500ft AGL @ 12:07:08 UTC

snow01_20111025_*.dat
same as snow00
kuband01_20111025_*.dat
same as kuband00
snow02_20111025_*.dat (800 ft AGL)
220 μs pulse length
snow03_20111025_*.dat
190 μs pulse length (700 ft AGL)
kuband02_20111025_*.dat
220 μs pulse length

Snow04_20111025_*.dat
250 μs pulse length
Snow05_20111025_*.dat
220 μs pulse length
Kuband03_20111025_*.dat
220 μs pulse length
Kuband04_20111025_*.dat
190 μs pulse length
Snow06_20111025_*.dat
250 μs pulse length
Kuband05_20111025_*.dat
250 μs pulse length

Total data
Snow 400 GB, 800 files
Ku-band 399 GB, 799 files

10/26/11 – PIG 2B

snow00_20111026_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums
6 dB Tx atten.
3 dB Rx atten.

snow01_20111026_*.dat
same as snow00, except 0 dB Rx atten.

kuband00_20111026_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

snow02_20111026_*.dat
214-250 MHz DDS output
kuband01_20111026_*.dat
232-268 MHz DDS output
snow03_20111026_*.dat
214-286 MHz DDS output
kuband02_20111026_*.dat
232-304 MHz DDS output

Total data
Snow 229 GB, 458 files
Kuband 232 GB, 463 files

10/29/11 – Recovery Grounding Line

snow00_20111029_*.dat
- 214-286 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 166000 Record length
- 4 presums

6 dB Tx attenuation
0 dB Rx attenuation

Kuband00_20111029_*.dat
- 282-304 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 166000 Record length
- 4 presums

Total data
- Snow 182 GB, 364 files
- Kuband 182 GB, 364 files

10/30/11 – Slessor Grounding Line 01

Snow00_20111030_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

6 dB Tx attenuation
0 dB Rx attenuation

Kuband00_20111030_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Total data
Snow 177 GB, 352 files
Ku-band 177 GB, 353 files

*10 Ramp pass @ 1500 ft AGL @ 23:40:39 UTC
Same settings for both radars

11/03/11 – Getz to Shelf 4

Fred00_20111103_*.dat
1.8 - 7.8 GHz Tx output
250 μs pulse length
2 kHz PRF
16000 record length
4 pressums
0 dB Tx/Rx atten.

Kuband00_20111103_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 pressums

#11 and 12
Ramp ~~pass~~ @ 1400 ~~ft~~ AGL @ 12:06:46 UTC
Ramp pass @ ~~1500~~ 1440 ft AGL @ 12:14:26 UTC

Fred01_20111103_*.dat
same as Fred00
Kuband01_20111103_*.dat
same as Kuband00

Pitch maneuvers @ 18:06 UTC
Deep depression @ 19:19: GPS

Total data
Fred – 210 GB, 419 files
Kuband 212 GB, 422 files

11/04/11 – Thwaites Glacier Grounding Line 1

snow00_20111104_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 stacks
6 dB Tx attenuation
0 dB Rx attenuation

kuband00_20111104_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 stacks

Total data
Snow 207 GB, 414 files
Ku-band 206 GB, 410 files

11/07/11 - Recovery Downstream

Snow00_20111107_*.dat
- 214-286 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

60 dB Tx attenuation
0 dB Rx attenuation

Ku band00_20111107_*.dat
- 232-304 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

→ Both in the 1st Nyquist zone

*13 and 14
- Ramp pass 12:00:35 UTC @ 950 ft.
- Ramp pass 12:06:59 UTC @ 950 ft.

Snow01_20111107_*.dat
- same as Snow00

Ku band01_20111107_*.dat
- same as Ku band00

Total Data
- Snow 212 GB, 423 files
- Ku band 212 GB, 423 files

11/09/11 — WAIS Cores

snow00_20111109_*.dat
214–295 MHz DDS output
250 μs pulse length
2 kHz PRF
16000 record length
4 presums
6 dB Tx attenuation
3 dB Tx attenuation

Kuband00_20111109_*.dat
232–304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

snow01_20111109_*.dat
214–286 MHz DDS output
255 μs pulse length
6 dB Tx attenuation
0 dB Rx attenuation

A core site 17:19:38 UTC
B core site 17:46:27 UTC Crossover @ 17:54:10
C core site 18:39:50 UTC, 18:50:42 UTC
D core site 18:53:12 UTC
E core site 19:00:37 UTC, 19:10:46 UTC
F core site 19:20:45 UTC
G core site 19:30:36 UTC

20:33:12 transition to sea ice

snow02_20111109_*.dat
214-295 MHz DDS output
250 μs pulse length

6 dB Tx attenuation
3 dB Tx attenuation

Total data
Snow 276 GB, 551 files
Ku-band 279 GB, 556 files

11/11/11 – Thwaites Upstream 01

snow00_20111111_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

6 dB Tx attenuation
0 dB Rx attenuation

Kuband00_20111111_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

snow01_20111111_*.dat
227-240 MHz DDS output
255 μs pulse length

Kuband01_20111111_*.dat
232-245 MHz DDS output
255 μs pulse length

snow02_20111111_*.dat
227-239 MHz DDS output

kuband02_20111111_*.dat
245-257 MHz DDS output

Total Data
Snow 208 GB, 415 files
Ku-band 210 GB, ~118 files

11/12/11 - TSK2Cryo

snow00_20111112_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

6 dB Tx attenuation
0 dB Rx attenuation

kuband00_20111112_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

snow01_20111112_*.dat
214-250 MHz DDS output

kuband01_20111112_*.dat
232-268 MHz DDS output

PIG PRF overflight

~~PRF overflight~~

Total data
Ku-band 232 GB, 463 files
Snow 232 GB, 463 files

11/13/11 - Crosson 1a

snow00_20111113_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

6 dB Tx attenuation
0 dB Rx attenuation

kuband00_20111113_*.dat
282-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

Ramp pass @ 1000 ft AGL @ 13:02:17 UTC
Both radars recording GPS time
→ Time correction for data ~~&~~ param sheets is -14 seconds

snow01_20111113_*.dat
214-286 MHz DDS output
kuband01_20111113_*.dat
same as kuband00

Total Data
Snow 210 GB, 420 files
Ku-band 209 GB, 418 files

11/14/11 – North Peninsula

snow00_20111114_*.dat
214–286 MHz DDS output
255 μs pulse length
2 kHz PRF
160000 record length
4 presums
6 dB Tx attenuation
0 dB Rx attenuation

kuband_20111114_*.dat
232–304 MHz DDS output
255 μs pulse length
2 kHz PRF
160000 record length
4 presums

Ramp pass @ 1500 ft AGL @ 12:59:20 UTC
Ramp pass @ 1500 ft AGL @ 13:06:33 UTC

snow01_20111114_*.dat
214–264 MHz
snow02_20111114_*.dat
214–277 MHz
kuband01_20111114_*.dat
232–282 MHz
kuband02_20111114_*.dat
232–295 MHz
kuband03_20111114_*.dat
232–304 MHz

snow03_20111114_*.dat
214–286 MHz

Total data
Snow 298 GB, 596 files
kuband 295 GB, 588 files

11/16/11 - Elbow

snow00_20111116_*.dat
- 214-286 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

6 dB Tx attenuation
0 dB Rx attenuation

kuband00_20111116_*.dat
- 232-304 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

Total data
- Snow 341 GB, 680 files
- Ku-band 340 GB, 678 files

11/17/11 - Middle Peninsula

snow00_20111117_*.dat
214-286 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums
6 dB Tx attenuation
0 dB Rx attenuation

kuband00_20111117_*.dat
232-304 MHz DDS output
255 μs pulse length
2 kHz PRF
16000 record length
4 presums

snow01_20111117_*.dat
214-259 MHz DDS output
snow02_20111117_*.dat
214-277 MHz DDS output
kuband01_20111117_*.dat
232-295 MHz DDS output
kuband02_20111117_*.dat
232-304 MHz DDS output
snow03_20111117_*.dat
214-286 MHz DDS output
snow04_20111117_*.dat
214-264 MHz DDS output
kuband03_20111117_*.dat
232-250 MHz DDS output

snow05_20111117_*
241-259 MHz
snow06
~~214-277 MHz~~

Snow02_20111117_*.dat
214-286 MHz DDS output
Kuband04_20111117_*.dat
232-304 MHz DDS output

Ramp pass @ 11000 ft AGL @ 23:00:08

Total data (excluding ramp pass)		
Snow	357 GB,	701 files
Kuband	359 GB,	718 files

11/19/11 - George the 6th George VI

snow00_20111119_*.dat
- 214-286 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

6 dB Tx attenuation
0 dB Rx attenuation

ku band00_20111119_*.dat
- 232-304 MHz DDS output
- 255 μs pulse length
- 2 kHz PRF
- 16000 record length
- 4 presums

Pitch maneuver @ 15:24:20 UTC

Total data (excluding ramp pass)
- Snow 336 GB, 671 files
- Ku-band 336 GB, 671 files

snow01_20111119_*.dat
- same as snow00

ku band01_20111119_*.dat
- same as ku band00

Ramp pass @ 1500 ft AGL @ 23:49:35 UTC