

10:10	DDS loopback
10:13	DDS off
10:17	Radar loopback
	30 dB transmit atten
	20 dB receive atten
	0 dB receive atten
10:19	
	Stopped wrapping at 1124
12:19	descent to 1500 ft.
12:27	1500 ft.
12:28	IceSAT track
	PRF 2 kHz
	250-300 MHz
	270 μ s pulse length
	Rect. window
	6 dB transmit atten.
	6 dB receive atten.
12:48	8m thick ice
13:11	switch aircraft radar altimeter
13:18	40 dB reflecti
	35 dB SNR
	<u>7% usage of 1 TB drive after 1 hr.</u>
13:22	<u>Both radar altimeters off</u>
13:38	Both radar altimeters on
14:55	Turn around at Svalbard
	open water and broken sea ice
15:58	Wrapping stopped at 9477
	attempt 3 attempted resumes
	started at 1 again
16:01	At wrap 210 repository message

repeat yum-updatesd-helper:

error getting update info:

Cannot retrieve repository metadata (rep and ~~g~~.xml) for repository: base. Please verify its path and try again

↳ Wrapped 8177

Stalled at shm_in 0x0000306, shm_out: 0x0000307

Resuming at shm_in 0x0000307, shm_out: 0x000031c

Stalled at shm_in 0x0000315, 0x000031c

Resuming at shm_in 0x000031c, 0x00000000

↳ Wrapped 1

Stalled at shm_in 0x000031f, shm_out 0x00000000

Resuming at shm_in 0x00000000, shm_out 0x00003d8

16:39

stop recording

247 GB for 4 hrs 20 min.

↳ Wrapped 1263

Stalled at shm_in 0x0000306, shm_out: 0x0000307

Resuming at shm_in 0x0000307, shm_out 0x000038e

↳ Wrapped 1

Stalled at 0x000031f, 0x00000000

Resuming at 0x00000000, 0x00003cc

STALL MESSAGES INDICATE THAT THE DISK WRITE CAN'T KEEP UP.

Land ice flight line

12:59:09

Start recording

Transmit Settings
Pulse Length Window

2 kHz
250 MHz
390 MHz
210 μs
Rectangular

13:01:53

Update
None

Window

~~13:02:20~~

~~Resume recording~~

13:04:10

Resume recording

13:05:48

Locked on 1st of 4 IceSAT tracks
Same transmit settings as 13:01:53

Filter Passband

41-58 MHz
41 MHz
58 MHz

1212 ft. altitude
1712 ft. altitude

~~2/3~~ (0:1:N-1)
~~N-2~~

14:39

Mapping stopped, but aircraft ascending

14:42

Mapping 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

16:01

16:04

~~16:04~~

16:11

PDF
Start
Stop
Length
Window

Started recording
250 to 365 MHz
return leg to Thule

stopped recording

varied beat frequency placement
transmit windowing and control

started recording

2 kHz
250 MHz
390 MHz
270 μ s
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
diases, and moves towards the right.

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

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

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

17:46:30

Stop recording

239 GB recorded

~~2 hr 35 min~~

9 min

1 hr 35 min

40 min

1 hr 40 min

4 hr 4 min

Sea ice flight to Fairbanks, AK

04/02/09

14:42

14:45

14:55

Start recording
Online
Stop recording

15:04

15:13

Start recording
IT to DAR cable loose

Data to backup

data00.04022009.0000.dat
to
data00.04022009.0020.dat

Transmit settings

~~PTA~~
start
stop
Length
Window
Presums
Data Write

2 kHz

250 MHz

30 MHz

270 μs

none

4

281 start index

18:41 - ~ 18:50

In close proximity to the magnetic north pole
Matt Elder is heard flying the P-3B

19:06

19:08

19:13:40

19:21:52

19:50

~~1700 ft~~ Descent to 1200 ft.

1700 ft.

Ascent to 1500 ft.

1500 ft.

Stop recording

~ 266 GB recorded

11:10:58

Transmit settings
Pulse
Start
Stop
Pulse length
Window

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

2 kHz 4 presums
250 MHz
390 MHz
270 μ s
none

11:21

For Future Reference

1500 ft. altitude

1800 ft. altitude

either a 270 MHz to 390 MHz or
250 MHz to 370 MHz chip
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 50 MHz surface return
321 MHz to 390 MHz chip
2.52 to 4.72 GHz output

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 80
For anything over that adjust the chip settings

~14:15

Hand flying PB
Altitude fluctuations of ~100 ft
More lateral variation than vertical

1200-1700ft
altitude

270 μ s pulse length
280-390 MHz chirp
1.5 GHz bandwidth

1700-2400ft

270 μ s pulse length
3.2 GHz bandwidth
↳ 290-390 MHz chirp
or 250 to 350

2400-3400ft

270 μ s pulse length
2.26 GHz bandwidth
↳ 320-390 MHz chirp
or 250 to 310

270 μ s pulse length
1.6 GHz bandwidth
340 to 390 or
280 to 300 MHz chirp

Change record length
to 11,000

Change PRF to
2.4 kHz

Change record length
to 8,000

Change PRF to
4 kHz

16:38

stop recording

308 GB recorded

12:18

Transmit settings
P1A
Start
Stop
Pulse Length
Window

Start recording

2 kHz

Record Length 16000
Presums 4

250 kHz

300 kHz

70 μs

none

13:25

Stop recording

13:31

Start recording

Transmit settings
P1A
Start
Stop
Pulse Length
Window
Record Length
Presums

8 kHz

250 MHz

} 6 to 7 GHz output

282 MHz

63 μs

none

4000

4

13:40

14:35

Not at 1500 ft. as we traverse over mountains
Back at 1500 ft. roughly
Stop recording

Noise Floor

From 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 kHz
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 (3 to 4 GHz output)
346 to 378 MHz

All other settings same as 13:39

17:14

Stop recording

251 GB recorded

Thule 4

04/17/09

10:46

PRF
Start
Stop
Pulse length
Windows
Presumes

Start recording
2 kHz

250 mHz

370 MHz

270 μ s

none

4

Rx Atten
Tx Atten

16¹⁴ dB } not including
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 fan
data01.0011 (roughly)

12:38

End sea ice
data01.0041

12:39

Begin (resume) land ice

12:49

stop recording

12:57

Start recording
16 dB Rx atten.

17:42

14
Stop recording
387 GB recorded

data03

Jump Pass
17:56 - 17:57

11:17

Start
Stop
PRF
Pulse Length
Tx Attenu
Rx Attenu
Window
Presumes

Start recording
250 MHz
390 MHz
2 kHz
210 μ s
8 dB
16 dB
None
4

~13:36

Approximately 1100 ft. altitude

13:41

Over floating sea ice
~ data 02.04202009.0257 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.

15:06

~~Stop recording~~
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

800 m altitude step
#1

~~400 μ s pulse length~~
 $50 \text{ MHz} = \frac{\text{delay} \times \text{bandwidth}}{\text{length}}$

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

Chirp (DDS) output
250 MHz to 329 MHz

Radar output
4.472 to 7 GHz

#2

150 μ s pulse length

15:11

Start recording data00

15:20

1500 ft altitude

15:22

On ENVISAT Line

PTA

2 kHz

Start

250 MHz

2.5 to 7.0 GHz output

Stop

329 MHz

Pulse Length

270 μ s

Record Length

16000

Presums

4

Rx Atten.
Rx Atten.

8 dB

16 dB

17:49

Stop recording

17:54

Turn ascending to 2500 ft.

Start recording data01

Start

250 MHz

Stop

329 MHz

everything else the same

Rx Atten.

13 dB

19:20

Stop recording

19:20

Start recording data02

Rx Atten.

10 dB

everything else the same

20:09

Stop recording

21:10

21:11

21:12

21:23:28

29

Start recording (data03)
Stop recording

ignore

Start recording (data04)
250 to 390 kHz Chirp

2 kHz PRF

210 μ s pulse length

13 dB Bx Atten.

Ramp pass @ 1500 Hz.

Stop Recording

285 GB

13:14

PRF
Start
Stop
Length
Window
Record Length
Presums
Tx Atten.
Rx Atten.

Start recording ~ 1700 ft altitude on
2 kHz short transit
250 MHz
390 MHz
270 μs
None
16000, start 281
4
8 dB
~~16 dB~~ 13 dB

Drive 2 of the
Slots 3 and 4
The previous day
Slots 2 and

SATA enclosure remains → 1 disk write
did not work
slots 1 and 3 did not work, after 3 restarts
4 worked.

14:04

Stop recording data00

14:08

Start recording
10 dB Rx Atten.
Flying over hard rock

14:10

~~14:00~~

14:43

Stop recording data01

14:45

Start recording
Transmit Window: ~~Hanning~~ rectangular
14:51: 3rd crossing - Petermann glacier

14:55

Stop recording data02

14:57

Start recording
Transmit window: Hanning
Stop recording data03

15:00

15:01

Start recording
Transmit window: none
Sea ice

17:43

20:39

Stop recording data04

20:40

Start recording ~~data05~~ Ignore data05
Ramp pass at 1200 ft.

12:36 12:44
 PRT
 Start
 Stop
 Pulse Length
 Window
 Record Length
 Prescans
 Tx Atten.
 Rx Atten.

Start recording (data00)
 2 kHz
 250 MHz
 390 MHz
 270 μ s
 none
 16000
 4
 0 dB
 13 dB

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

16:13

In Ice

16:15

Stop recording

16:26

Start recording (data01)

16:35

90° right turn

16:41

30° right turn

16:44

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

12:10

PRF
Start
Stop
Pulse Length
Windows
Record Length
Tx. Attenu.
Rx Attenu.

Start recording (data00)
2 kHz
250 MHz
390 MHz
270 μs
None
16000
8 dB
13 dB

12:28

Noise floor raised 20 dB?

13:05

Stop recording (investigate a rattling)

13:23

Start recording (data01)
No problems found

14:33-14:36

Sea Ice

19:08

Stop recording

19:12

Start
Stop

Start recording (data02)
240 MHz
380 MHz
2.84 - 7.82 GHz output

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

19:17

Stop recording

19:22

Start
Stop

Start recording (data03)
250 MHz
390 MHz
Stop recording

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

19:37

Start
Stop

Start recording (data04)
250 MHz
369 MHz

19:41:30 - 19:41:44

Ramp pass at 2000 ft.

19:41:57

Stop recording

11:55

PTA
Start
Stop
Pulse Length
Window
Record Length
Tx Atten
Rx Atten

Start recording (data 00)

2 kHz

250 MHz

390 MHz

270 μ s

None

10000

8 dB

16 dB

(+ cable losses)

2.5 to 7 GHz output

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

14:50 (data 02)

E-W pass @ 1500 ft. begin

14:58

E-W pass @ 1500 ft. end

16 dB Rx Atten.

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)

16:45

Stop recording

Thule 05 Land Ice

04/27/09

10:48

PRF
Start
Stop
Pulse Length
Window
Record Length
Presums
Tx Attenu
Rx Attenu

Start recording
2 kHz
250 MHz ~ 2.5 to 7 GHz output
390 MHz
270 μs
none
6000
4
8 dB
13 dB

Sandy 04 Land Ice

04/28/09

10:57

PRF
Start
Stop
Pulse Length
Window
Record Length
Presums
Tx Attenu
Rx Attenu

Start Recording (data00)
2 kHz
250 MHz
390 MHz
270 μs
none
6000
4
8 dB
13 dB
Stop recording

17:57

~~05/01/09~~

Sandy 03 Land Ice

05/01/04

10:52

PRF
 Start
 Stop
 Pulse Length
 Window
 Record Length
 Presums
 Tx Atten
 Rx Atten

Start recording (data00)

2 kHz
 250 MHz
 390 MHz
 270 μ s
 none
 16000
 4
 8 dB
 13 dB

11:33

Stop recording

Experiment #1
~~(data04/02)~~
 12:01 start recording
 13:17 stop recording

2.5 GHz Bandwidth (4.5 to 7 GHz)
 DDS Chip \rightarrow 250 to 308 MHz (data05)
 3600 Hz PRF
 150 μ s pulse length
 9000 record length
 4 presums
 17:27 \rightarrow start record

Data Rate

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

~~(data03)~~

~~Experiment #2
 Start recording
 Stop recording~~

~~Same as #1 except
 PRF = 4 kHz \rightarrow 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 Chip \rightarrow 250 to 312 MHz
 4.5 kHz PRF
 120 μ s pulse length
 7200 record length
 4 presums
 Data rate = 16.2 MB/s
 No window

Start recording 15:25
Stop recording 17:25
(data 04)

8 kHz PRF
250-282 MHz DDS chip
(6 to 7 GHz output)
63 μ s pulse length
4000 record length
4 presums
NO window
Data rate = 10 MB/s

17:27 start record
(data 05)

250-328 MHz DDS Chip (4.5 to 7 GHz out)
3.6 kHz PRF
150 μ s pulse length
200 record length, 4 presums

~~2000 ft delay = 900 m delay~~

17:41:58 -
17:45:00
17:45

Ramp pass (altitude?)
Stop record

↓
1600 ft.

11:17

PRF
Start
Stop
Pulse Length
Window
Record Length
Presums
Tx Atten
Rx Atten

13:25

Start recording (data00)

2 kHz

250 MHz

300 MHz

270 μs

none

16000

4

8 dB

13 dB

Stop Recording

2.5 to 7 GHz output

13:04-13:09 → ascending above 1500 ft.

13:12 → back at 1500 ft.

13:28

PRF
Start
Stop
Pulse Length
Record Length

15:41

Start Recording (data01)

3.6 kHz

250 MHz

328 MHz

150 μs

9000

Stop recording

4.5 to 7 GHz output

no window, 4 presums
8 dB Tx and 13 dB Rx atten.

15:43

PRF
Start
Stop
Pulse Length
Record Length

17:15

Start recording (data02)

3 kHz

250 MHz

282 MHz

63 μs

4000

Stop recording

6 to 7 GHz output

no window, 4 presums
8 dB Tx and 13 dB Rx atten.

17:14:39 -

17:14:54

Ramp pass @ 2000 ft.

13:00

PRF
Start
Stop
Pulse Length
Window
Record Length
Presums
Tx Attenu
Rx Attenu

14:32

14:33

PRF
Start
Stop
Pulse Length
Record Length

16:00

~~16:01~~

~~PRF
Start
Stop
Pulse Length
Record Length~~

~~16:28~~

Start recording (data00)

2 kHz

250 MHz

390 MHz

270 μs

None

10000

4

8 dB

13 dB

Stop recording

} 2.5 to 7 GHz output

13:30 - 13:31

Sea ice

13:40 back on land ice

13:31 - 13:40 → open water & mountains

Start recording (data01)

3.6 kHz

250 MHz

328 MHz

150 μs

9000

Stop recording

} 4.5 to 7 GHz output

everything else the same

~~Start recording (data02)~~

~~3 kHz~~

~~250 MHz~~

~~282 MHz~~

~~63 μs~~

~~1000~~

~~Stop recording~~

~~} 6 to 7 GHz output~~

~~everything else the same~~