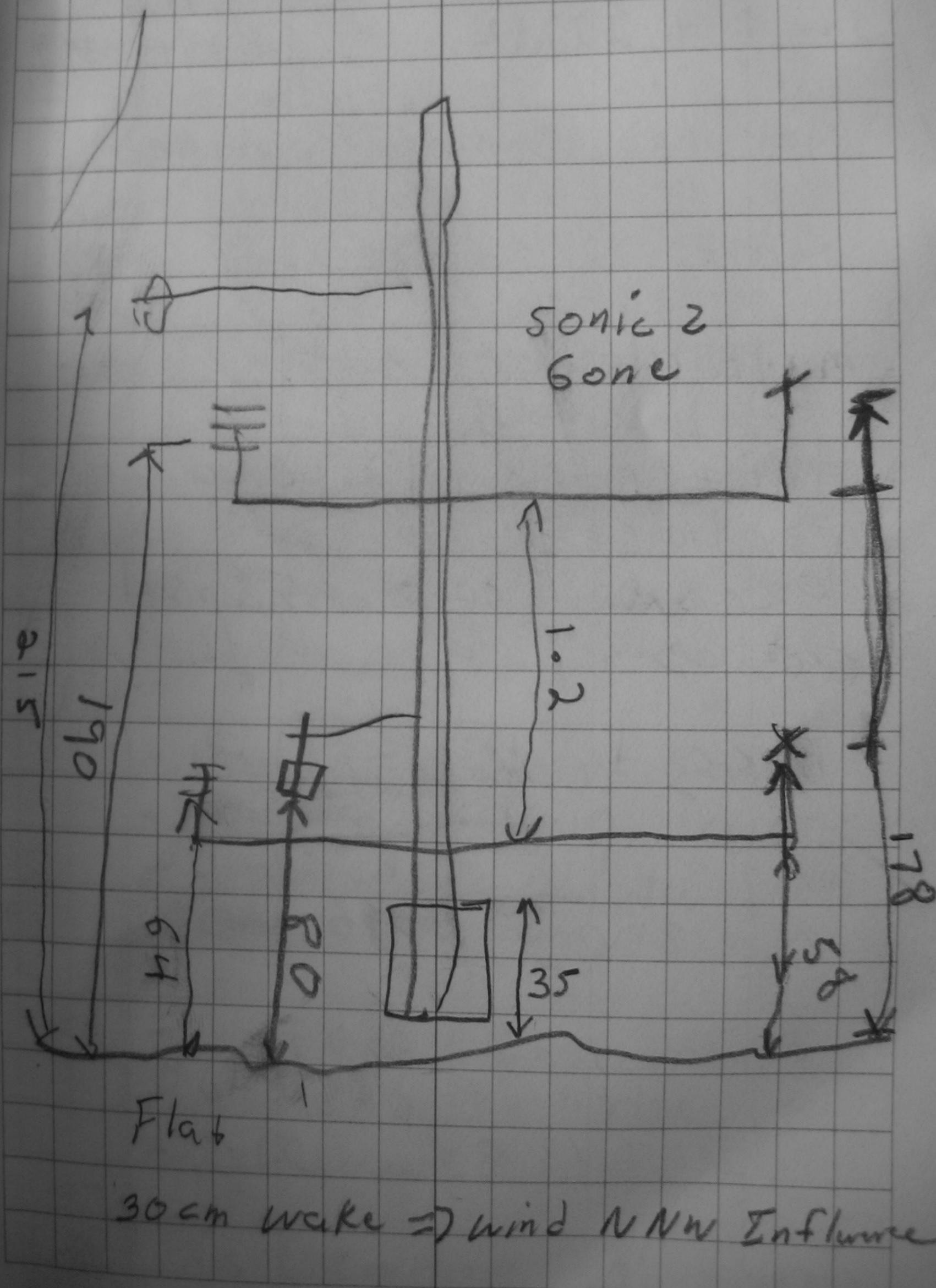


CPI

2005

May 2

1500 SFJ



5/2/05 CPI p. 9

Radiometer updated

(SW ↓ # 22209

Level, NY 33114
(new)

SW ↑ # 22212

PG440639 ↑

Net rad domes replaced.

sonic & added.

multiplexer out

those were old ones
replaced today
because cold snapped
cables.

Russ took S/N of
new pyranometers
w/ white resistor
old ones were too.

clock read 2:27
when it should
be 1:07, UTC

Transmitter activated.

No snow pit. Poor wx

densities

swiss camp

05/05/05

pg 1

T °C	g
0 - 10	-8.1
10 - 20	-8.9
20 - 30	-9.0
30 - 40	-9.4
40 - 50	-10.5
50 - 60	-10.5
60 - 70	-11.1
70 - 80	-11.8
80 - 90	-11.1
90 - 100	-11.1
100 - 110	-11.3
110 - 120	-11.8
120 - 130	-11.8
130 - 140	-11.6
140 - 150	-11.5
150 - 160	-11.3
160 - 170	-11.1
170 - 180	-10.9
175 - 185	239

748 g = empty
1g cutter164 = small
cutter emptybent kelly
cutter lid~ $\frac{2}{3}$ ice lensesuse small cutter
also has vaguely

under catch

"This is totally
fucking sucks"

N. Molotch

@ bottom, i.e. top

3 h later, T_{surf} of corn

ice.

= -11.5

Time end 21:30 Z

PG 1

swiss camp snow pit pg 7
May 05 '05
J. Box
N. Molotch

0 new snow deposited yesterday
- 8.5 - 12 cm wavy faint layer
fresh snow
- 17 cm sugary
- 21.5 cm

21 - 31 cm pencil hard wind
pack
underlain by ~ 8 mm hoar

recrystallized, soft
sugary down to 54 cm
below 54 cm a melt
layers each 1 - 2.5 mm
thickness, separated by J. Box
snow! See digi photo PA95
lowest layer bottom = 64 cm

vague layer @ 75 cm, snow
above and below to

vague horizon @ 91 cm

Swiss Camp		5/5/05 pg 3.
layer (thin) @	96 cm	
105 - 120	dense but sugary	pencil hard
120 - 135	softer	
135 - 143	layer	
143 - 154		
154 - 159	hoar	
159 - 168	hard sugar	
168 - 174	depth hoar	
174 - 180	refrozer "corn ice" large grain ~ 0.5 mm	

hardness variable
grain size less so

Swiss Camp pit 5/5/05	sampling on slope down pg 4
crystals from stratigraphic top 8 cm	round / new 0.2 mm
8 - 21 cm	0.2 mm homo
21 - 27 cm	0.4 mm round
27 - 37	0.2 mm round
37 - 42	0.3 mm round
42 - 44	0.3 mm round
44 - 52	melt complex
52 - 60	0.3 mm round
60 - 68	0.2 mm round
68 - 72	0.3 mm round
72 - 90	0.3 mm round
90 - 103	0.5 mm round
103 - 125	0.65 mm more angular
125 - 131	0.7 mm "
131 - 141	1 x 0.6 mm
141 - 151	0.4 mm angular
151	ice layer 5 mm
151 - 161	faceted 0.8 mm
161 - 163	ice
below 1 -	depth hoar 2.5 mm

Jar 2 traverse #1

May 7 2005

Depart swiss camp 1:10^{pm}

stop 1:20 pm change
viking spark plug.

stop DN 10 69 30' 34"N
49 32' 15"W
15:40 UTC 10 43 m

Arrive JARI 15:57 Z

only collect data

69 29 47 N
49 41 39 W
929 m

tower leaning ~40° to W
280 magnetic

some frost in net dome

S↑ 24560

S↓ 24563

sonic 1 some snow in

" 2 membrane shown
wear

return later to reinstall
base.

JARI

05/07/05

clock 2 days behind or 1?
no leap year adjustment in '04
time ok, GPS working.

1 T/H out, both are CS500

80303482 = TGT #

program thinks 27 min
into hour, is it 29?
pix taken

sms 1 1707 UTC

CR10, not CR10X, has sm716

69 28 56 N

49 48 06 W

822 m

data collecting

tower leaning toward 300°*

sonic membrane looks ok

pix taken by T BOX

clock 1m50s slow

* magnetic,

visit to collect data

SMS 2

May 7 2005

-6.1C 69° 28' 40" N
1740Z 49° 52' 58" N
727 m
SR 50° sonic reading zero

visit to collect data

snowing, ~ white out.

CR 10X not CR 10

clock 2m 40 s slow

tower leaning ~5° 360° mag
94 cm from ice to bottom of upper mast
depart 18:05Z

arrive SMS 3 position
1840Z, snowing, white
out, looking for SMS 3

SMS 3 not found,
poor visibility, try
later.

found it! See 2 pages
later

JAR 2 | May 7 2005
1st visit, only collect data
Arrive : 19:10 UTC 508 m
69° 25' 03" N, 50° 04' 30" W
upper arm flange bolt
missing. *

storm wind blowing, wind in lee of enclosure -

* consequently, only sonic is tilted away from nadir by ~30°

AWS has HMP T/H sensors

year is 2004

clock reads:

5/26/2004 12:53

should be: 20:08 5/7/05

Russ climbed the tower
many pix by J Box + Koni

upper arm just fell into
different position: 20:13Z

JAR 2 5/7/2005

page 2.

2 TC out, only 1
sonic (SK-50), reading
zero. Other channels seem
OK.

Patagonia caption:
"Russel Huff is a
victim of global
warming."

Depart JAR2 21:05 z

SMS3 21:20 UTC
69° 26' 25" N
49° 58' 13" W 605 m

tower is level.

Russ climbed using
Aide gear, harness, rope,
and NRS friction strap.

Logger had been rattled
loose, mounting plate
detached from enclosure,

SMS3

cont. 5/7/05
p2.

logger canister detached
from panel.
storage module taken
to Swiss camp,
hope for data. logger
not responding.
logger needs replace-
ment.

2 CR10 X's needed

1 @ SMS 3
1 @ JAR2

weather calm, cloudy

depart SMS 3 2200 z.

arrive JAR1 2250 z

copy GPS data to Konis PC.

depart JAR1 2305 z

arrive Swiss camp

2340 z,

drove fast
fresh snow!



: cheyenne!

JAR 1, trip 2

May 8 2005

arrive 16:50 z

69°29'47", 49°41'40" w

Life link clinometer
34.5° tilt slope meter.
Jackson Hole WY
lower

S \downarrow 28° perpendicular to slope
26° parallel to slope

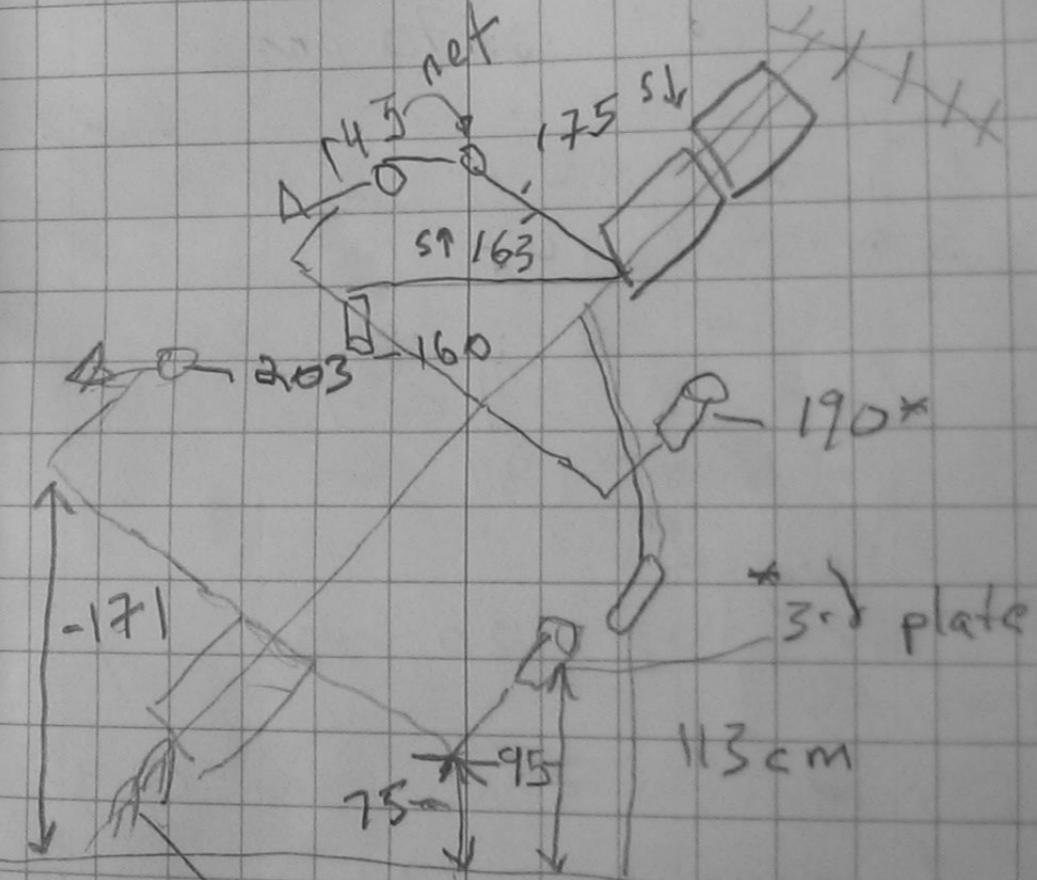
sonic 2 54°

sonic 1 54.5°

JAR 1

5/8/05

sketch before maintenance



176 = height from ice
to junction.

101 cm = enc bracket top
to mast bottom

JAR 1 5/8/05
lowering

new mast base

$$83 + x = 150$$

$x = \text{base height above ice}$
in 2005.

wind 1 @ 44 cm

2 170 cm

S ↓ 157 cm
S ↑ 147

T/H 1 54 cm
2 180 cm

bracket
Enc. top 20 cm

S ↓ sees solar panel @ 40°
from horizon

mast was installed 3m
into ice in 2004 w 89
cm of snow

LAKE JAR

(A)

69 29 56

49 40 13

921 m

center point approx

JAY'S

Predicted moulin @ lake bottom,

(B) • 69°29'58.8" 49°40'27.2"

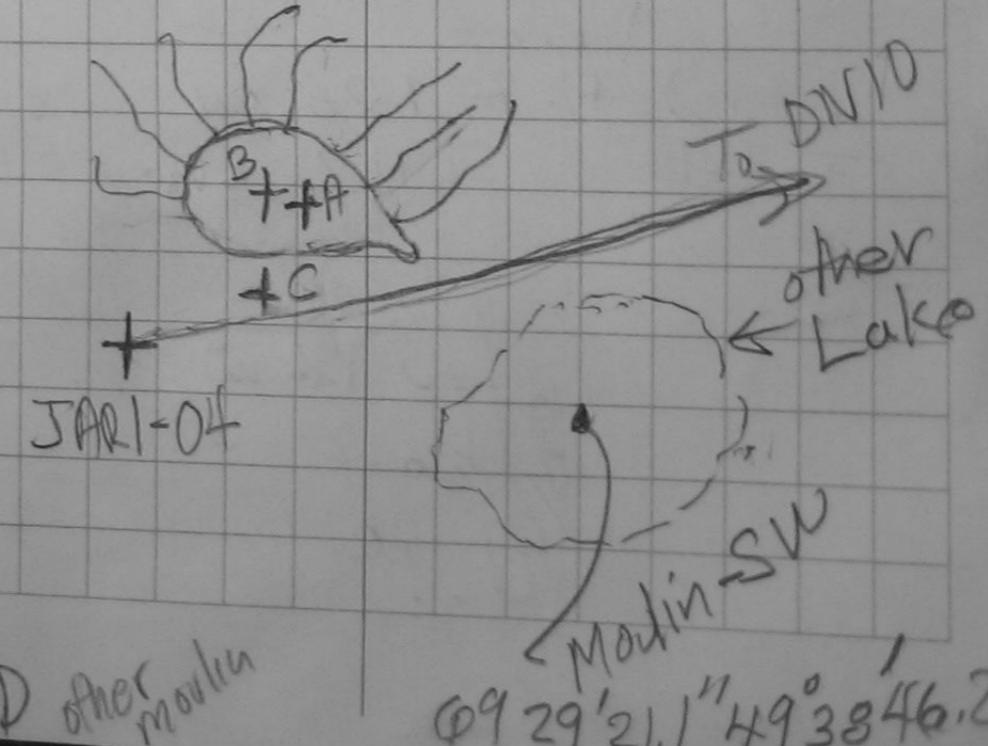
(possible camera)
location

(C) South of pred moulin
• 69 29 47.9 49 40 27.2"

Other moulin
(over the hill)

• 69°29'9.0" 49°42'4.15"

South by SE of JAR 1



* D other moulin

69 29'21.1" 49°38'46.2

5/9/05

MEMORY STICK

SMS I maintenance

tower lean angle
 $= 12.5^\circ$ using clinometer

36 cm = distance from
 snow surface to junction

upper mast length = 224 cm

210 = distance to sonic

236 = distance to profile
 arm @ sonic 1 side

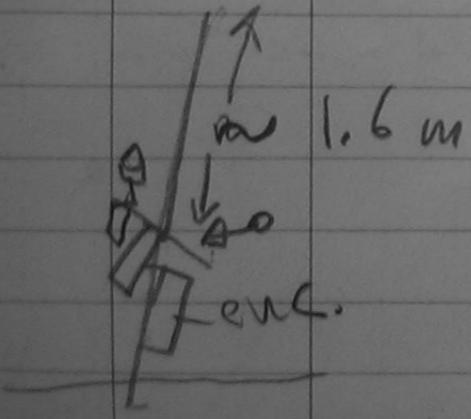
wind 1 = 265 cm

after lowering instrum.

wind 1 = 126 cm

T/H = 112 cm

after

SMS I snow pit 5/9/05
18 z

depth	g in ft	T °C
0 - 10	2 3 2	- 10.6 @ 10 cm
20	2 4 1	- 10.4
30	2 5 3	- 9.2
40	2 4 3	- 9.5
50	2 6 2	- 9.6 ice complex
60	2 7 2	- 9.8
70	2 6 4	- 10.0
80	2 6 5	- 10.0 ice layer
90	2 6 0	- 10.0
100	2 6 0	- 10.0
110	2 5 8	- 10.0
120	2 6 9	- 10.0
130	2 6 5	- 9.9
140	2 6 2	- 9.8
150	2 4 6	- 9.7
160	2 5 5	- 9.7
170	2 6 7	- 9.7
180	2 6 2	- 9.6

Tsurf @ 18:35 = -12.5.

pg 1
of 2

- N. Molotch, J. Box

Pg 2

SMS 1

5/9/05
Stratigraphy

3 mm melt @ 30 cm
more @ 32-33
more @ 36-37

melt layers @ 44.5

46
47.5
51
54
57
60
61
62

65-69 thick melt
complex

55 from bottom,
transition to lg grains

40 cm from bottom sugar

layer
- 22 cm from bot.

2 cm depth near
bottom

5/9

SMS 2

pit

Science Tower

old 30 m tower base

in locs
1 cm 3 ↓

2 cm 3 ↑

3 CG 3 ↓

4 CG 3 ↑

5 CNRTC

U

dir

8 bridge

9 Tair 1

10 2

11 Tsnow 1

12 2

13 3

14 4

15 5

16 6

17 SR50

18 SW ↓

19 battery

5/14/05

Icecam C by SMS 3

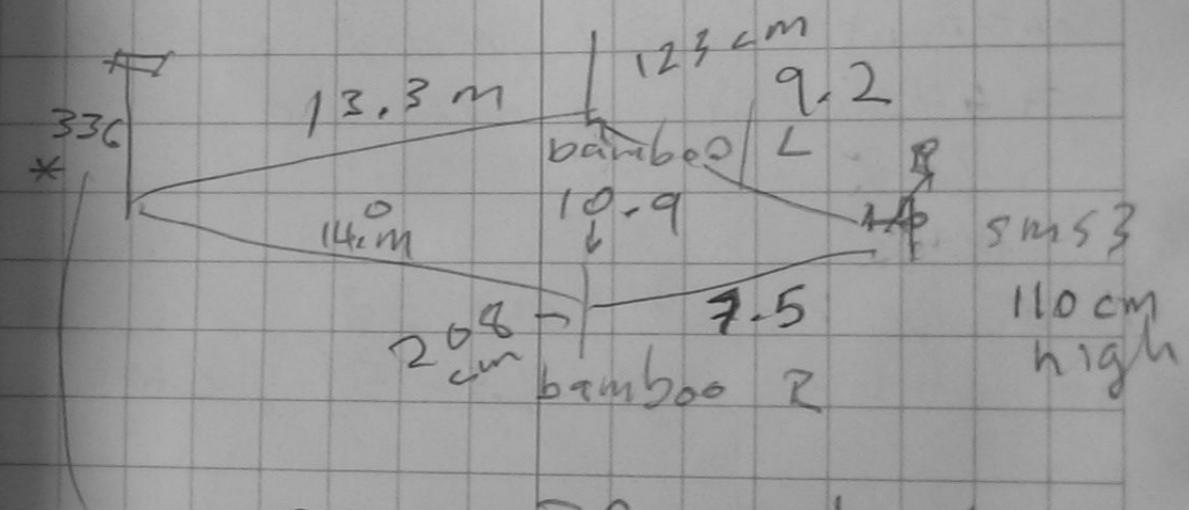
Advanced time lapse

UTC times 10, 14, 18, 22

arrive 20:04 z.

install along hummock axis.

* to bottom of EM2000



ene 39 cm high

+ ~0.25 cm = camera height

ca

JAR 2 05/12/05

Pg. 3

✓ replace 10x with 10x
S/N 17508

✓ 1 new SR50 both non-
1 new X plug type
1 refurbished ✓

arrive 20:20 5/13/05

bottom of upper mast section
= 445 cm above ice

~~452~~

442

wind 1 = 443.5 + 52

T/H 1 = 443.5 + 51 cm

S↓ 28408

S↑ 28407

Q Net 9.29 11.54
top bottom

- E102 on transmitter
re-program

- use 3x 18ah batteries for
- GPS missing both 10x +
- bring 3/4 x 1" nurail TGT 1
for sonic 2 in 2006

Sm S 3 05/12/05

arrive 0:25 05/13
white out,

commence drilling 15 05/13
1st hole drained @ 3M 15:08 2
2nd hole " @ 5m
3rd hole good. took 1.5h

replace data logger
formerly S/N 130102 *
no extended mem.
now S/N 17506 extended mem.

wiring SE

SE 1	K	HMP	c1	G	SR50
2	Br		E1	B1	Young
3	G	Dip	w	G	SR50
4			P1 Red		

5 TC { old mast S of new
6 TC by 70 cm, has sleeve
on it.

* problem w/ ch 3 (diff)
after lowering, T/H @ 108
wind @ 125

Mast (upper) bottom length = 120
" → @ -10 cm relative
to ice

sms3 + JAR 2 pg. 4
✓ new data logger
S/N 17506

TC not working
see prior page.

depart sms 3 20:00 Z

JAR 2 5/13/05 cont.

replaced net domes

new mast in 7.2 m

after lowering

wind 2 198 cm

1 42 cm

rad 160 cm

wind directions set
using 43° W; same
for JAR 1 + all
others on this traverse

T/H 1 = 40 cm
2 = 189 cm

sms 2

5/12/05

✓ new sonic

✓ lower instruments
✓ insert pin

/ depart
23:20 Z

arrive 21:05 Z

SR50 → Surface (ie. height) = 191 cm

Top pole to snow 256 cm

256cm wind sensor height

tower then slipped down
11 cm, unexpectedly,
think slipped down to
mast junction below.

- 94 cm = height of old mast
upper piece above ice
- $263.5 + 103$ cm = upper mast
length

new installation ~ 30 cm above
ice and was drilled in
6.9 m into ice.

after lowering instruments

wind ~ 120

T/H ~ 113

9 cm

surface
very disturbed
fresh snow

JARZ

Pg 5.

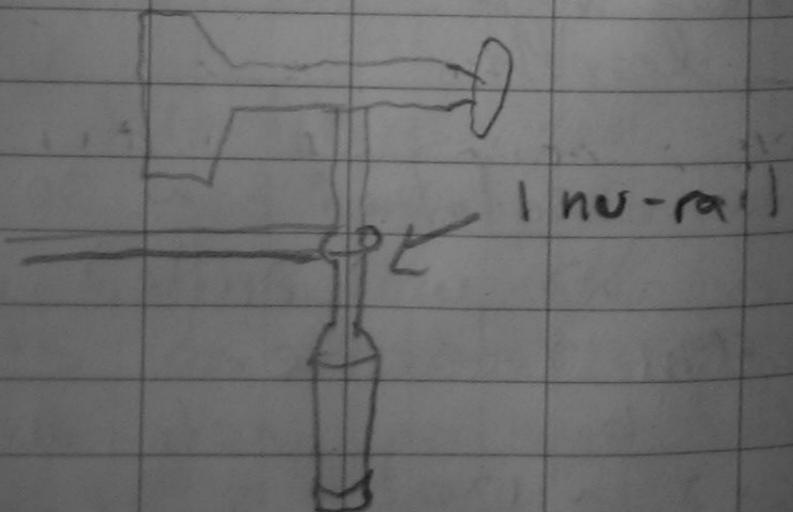
05/14/05

wind 1 obstructed for
southerly winds.

Radiometers completely
leveled, use 1400 day 134
+ onward

winds at 1300 ± down wind
of tent ~ 10 m, winds
good after depart.

wind 2 49 cm above middle
of profile arm, while T/H 2
is 38 cm above arm b/c
wind 1 shares nu-rail w/
sonic 1 ...



JARZ

5/14/05 Pg 6!

we cut the old pole @ 30
cm above ice. The piece
left on was 45 cm
long + goes back to
swiss camp. It remains
jammed on to former upper
section from being bent?
by Russ climbing on
tower, so be prepared
in future, i.e. come
with sufficient mast
length + sleeves, don't
count on existing length
unless you can saw an
drill and make use of existing.

uppermost mast bottom
8 cm below snow, of
19 cm depth, i.e., 11 cm
above todays ice level.

JAR 2 T.C string. 05/14/05

1 nearest surface, 10 deep
8 out, -
50 cm spacing.

9 and 10 now placed
at snow-ice interface
19 cm beneath boot packed
snow.

8 @ 26 cm depth in ice
26 + 50
26 + 100 etc
226
326
381 + snow

Transmitter re-activated.

installed cap @ mast top
to prevent rain-gauge drilling
mast to prematurely melt out

complete maintenance

1540Z

xmit ok
depart 19:35Z

5/15/05

JAR 1 lake com

depart swiss camp
2120Z arrive after
equip pickup @ jar 1
2241

complete drilling 1st hole
5.5 m in ice

complete installation
03:50:2 begin
drilling target g.

G1

Lake JAR GPS
Survey.

Sample begins @
ice cam site
1.5 m S

camera height: see
pix

closed pole 2 m
W of GPS. pause 2
04 03 8

04 14 7 parked by
nearest flag

04 17 flag 2

Swiss Camp Sci Tower
5/16/05

1	S↓
	S↑
3	L↓
	L↑
5	CNRIT [C]
	VV
7	Dir
	Am 25T bridge T °C
9	Tair 1, fine wire, ventilate
	" 2 " (above Tair 1)
11	Tsoil 1
	2
13	3
	4
15	5
	6
17	height, SR50
	56 cm
19	battery W m ⁻² X

0418 flag 2
70 cm to cams

0439 flag 3 metal
0452 flag

455 flag 2?

451 flag 4
metal

5/17/05

Glacier cam

Sermeg Avannarleq

69 20 04-1
50 19 23.3

~ 299 m

tilt angle 17°
azimuth 25° magnetic

pix taken

T/H / VDC measured

Greenland XI, 2005
INDEX

Property of J. Box

Address Scott hall rm 108

1090 carmack Rd

Telephone columbus OH

43210-1002

USA

If found, please contact
box.11@osu.edu

+1 614 506 0830

sat phone numbers

primary 88 162 144 8508
JASON'S 88 162 144 8508
JAY'S 88 162 144 9302

VECO CTS: boxj, vec072

wireless: veco
veco

Noah molotch@ciros.

303 492 1351

Konni mobile:

+1 303

Martina krueger@nordic.

greenpeace.org
stockholm

+46 8 702 70 78 office

+46 70 550 29 13 mob.

Hotel Hvid Valk +299 94 3343

rm 305: 299 947 200 x 305

Post Box 20 DK-3950 Ilulissat

4/30/2005

Depart columbus,
US Air → Pittsb.
→ Albany. ETA ~6PM
ET

met J Zwoolley

R Huff

Swiss K Steffens
Comp [Noah
Team] J Box

+ R peters, our "film
crow".

5/1/2005

Depart Scotia ANG
Base 8:30 AM ET
• skier 00, retirod
Navy here.

sorted cargo

5/2/05

sunny, preped to
depart, submitted
J. Climate paper.

GDES Sequence

1	UTCH	5	15	1
2	JTC M		0	
3	UTCS		17	0
4	8 JAR			0
5	0 2	19		0
6	3			0
	0	21		0
8	9	22	min	33 JARRZ
	4	23		0
10	7			0
	A (10)	25		0
12	81	26		1
	0			
14	0			

#	min
SC 80300118	58
CPI 8030126 E	59
SUM 803027 F	26
DYE2 803064 FF	28
JARI 80303482	a7
Sadi 80307788	29
SDome 80305164	20?
	23

$$A = 10, F = 15$$

$$C = 12, E = 14$$

Nikon 8700

S/N 3241790

5/12/05 cont.

Ken Borek Dash-6
pilot John again
SFJ → SWISS CAMP

Depart: ~ 12:20 SFJ

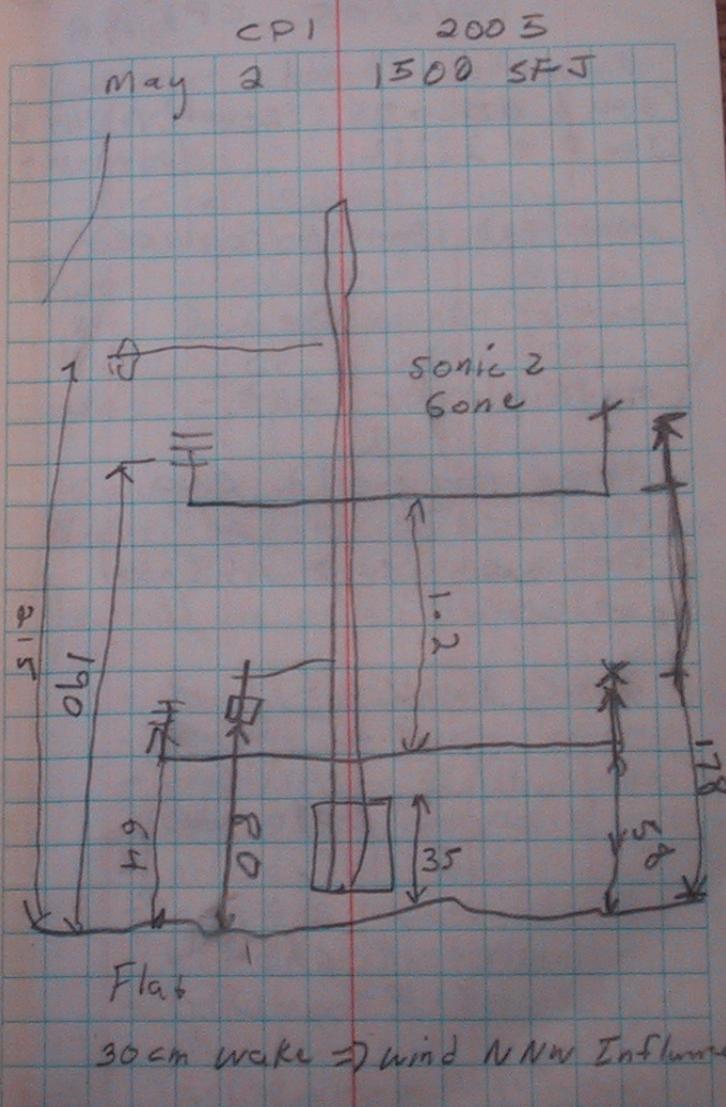
~ 1:15 h flight time

arrive

* camp in good
shape from outside,

1:20 pm SFJ depart
to CPI to overnite,

service AWS.



5/2/05 CPI p.9

Radiometer - updated

(SW ↓ #22209 Level 1, P133114 ↓
SW ↑ #22212 P1440039 ↑ new)

Net rad domes replaced.

sonic 2 added.

multiplexer out

the
those were old ones
replaced today
because cold snapped
causes.

Russ took S/N of
new pyranometers
w/ white resistor,
old ones were too.

clock read 2:27
when it should
be 1:07. UTC

Transmitter activated.

No snow pit. Poor wux

5/3/05

Depart CPI by twin
otter 9:33 AM SFJ.

Arrive Swiss camp,
felt much warmer
was somewhat warmer.
Mid day temperature was
-4C! CP night temp.
was -29°.

Owing to a very pleasant
surprise of NO ice refrozen
into kitchen and work
tents, we accomplished a
lot.

- cleared frost from inside tents
- organized cargo since
- towed 3 x fuel drums
from landing site ~500m away
- pitched 4 tents
- erected new kitchen tent shop
- got 1 skidoo running
- exhumed & large sleds
- shoveled out snow from
inside camp.
- organized work tent, w/ carpets
- refilled 8 lg empty propane tanks +

densities		swiss camp	05/05/03	PSI
T °C	g			
0 - 10	-8.1	1115	748 g = empty	
10 - 20	-8.9	1031	15 cutter	
20 - 30	-9.0	1058		
30 - 40	-9.4	1101	164 = small cutter empty	
40 - 50	-10.5	1125	bent kelly	
50 - 60	-10.5	1166	cutter lid	
60 - 70	-11.1	1203	~ $\frac{2}{3}$ ice lenses	
70 - 80	-11.9	252	use small cutter	
80 - 90	-11.1	247	also has vaguely	
90 - 100	-11.1	251	under catch	
100 - 110	-11.3	278		
110 - 120	-11.8	269	"This lid totally fucking sucks!"	
120 - 130	-11.8	262	N. Molotch	
130 - 140	-11.6	260		
140 - 150	-11.5	268		
150 - 160	-11.3	261		
160 - 170	-11.1	265		
170 - 180	-10.9	238		
175 - 185	↑	239		

② bottom, i.e. top

2 h later, T_{surf} of corn ice.
= -11.5

Time end 21:30 ±

swiss camp snow pit pg 7
May 05 '05
J. Box
N. Molotch

0 new snow deposited yesterday

- 8.5 - 12 cm wavy faint layer fresh snow
- 17 cm sugary
- 21.5 cm

21 - 31 cm pencil hard wind pack underlain by ~ 8 mm hoar

recrystallized, soft
sugary down to 54 cm
below 54 cm 9 melt
layers each 1 - 2.5 mm
thickness, separated by J. Box
snow! See digi photo: PA95
lowest layer bottom = 64 cm

vague layer ② 75 cm, snow
above and below to

vague horizon @ 91 cm

Swiss Camp 5/15/05 pg 3.

layer (thin) @	96 cm
105 - 120	dense but sugary pencil hard
120 - 135	soft or
135 - 143	layer
143 - 154	
154 - 159	hoar
159 - 168	hard sugar
168 - 174	depth hoar
174 - 180	refrozen "corn ice" large grain ~ 0.5 mm

hardness variable
grain size less so

Swiss Camp pit 5/15/05 sampling on slope down crystals from stratigraphic top 8 cm	pg 4 ~ 8 cm round / new 0.2 mm
8 - 21 cm	0.2 mm homo
21 - 27 cm	0.4 mm round
27 - 37	0.2 mm round
37 - 42	0.3 mm round
42 - 44	0.3 mm round
44 - 52	melt complex
52 - 60	0.3 - round
60 - 68	0.2 round
68 - 72	0.3 round
72 - 90	0.3 round
90 - 103	0.5 round
103 - 125	0.65 more angular
125 - 131	0.7 "
131 - 141	1 x 0.6 mm
141 - 151	0.4 ~ angular
151	ice layer 5 mm
151 - 161	faceted 0.8 mm
161 - 163	ice

below 1 - depth hoar

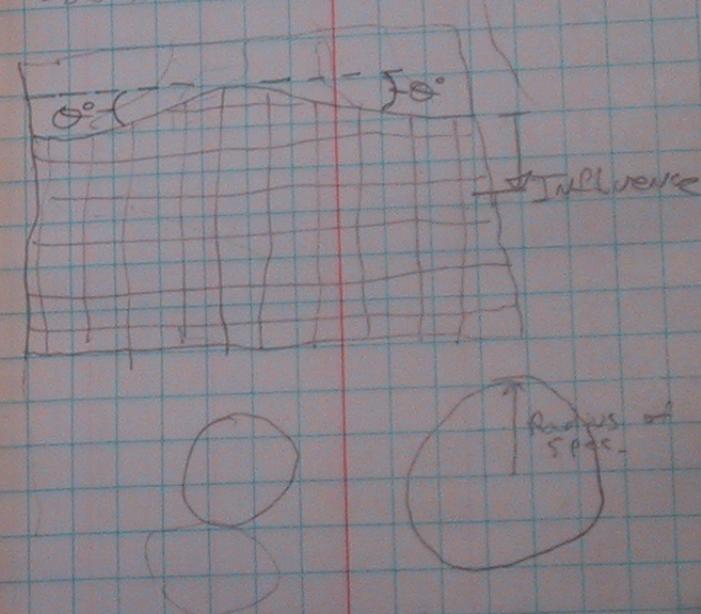
5/5

We've accomplished much, to say the least, as usual for the initial days @ Swiss Camp, were ahead of the normal schedule simply owing to absence of refrozen last-summer melt water in work tent. It's been 'so far so very good', so far.

This morning the 'NOVA' film crew arrived today exciting with their presence a catalyst for our work... I got ICECAM running. we all got long interviews, (one especially, of course) somehow amounting to a less than 10 minute segment on PBS Maine.

~~MAPS AND PLANS~~

10 25 14 60
588 x 316



Jar 2 traverse #1

May 7 2005

Depart swiss camp 1:10
PM

stop 1:20 PM charge
viking spark plug.

stop DN 10 69 30' 34"N
49 32' 15'W
15:40 UTC 10 43 m

Arrive JARI 15:57 Z

[only collect data]
69 29 47 N
49 41 39 W
929 m

tower leaning ~40° to W
280 magnet

some frost in net domes

S↑ 24560

S↓ 24563

sonic 1 some snow in
" 2 membrane shown
wear

return later to reinstall
base.

JARI

05/07/05

clock 2 days behind at ?
no leap year adjustment in '04
time OK, GPS working.

1 T/H out, both are CS500

80303482 = TGT #

program thinks 27 min
into hour, is it 29?
pix taken

SMS 1 1707 UTC

CR10, not CR10X, has sm716
69 28 56 N

|-5.3 C| 49 48 06 W
822 m

data collecting

tower leaning toward 300°x

sonic membrane looks ok

pix taken by T BOX

clock init GPS slow

* magnetic,

visit to collect data

SMS 2

-6.1C

1740 Z

SR50
sonic reading zero

visit to collect data

snowing, ~ white out.

CR10X not CR10

clock 2m 40 s slow

tower leaning ~ 5° 360° mag
94 cm from ice to bottom of upper
depart 18:05 Z most

arrive SMS 3 position
1840 Z, snowing, white
out, looking for SMS 3

SMS 3 not found,
poor visibility, try
later.

Paradox: 1 t

May 7 2005

69 28 40 N

49 52 58 N

727 m

Pg.1

May 7 2005

1st visit, JAD 2 only collect data

Arrive 19:10 UTC 508 m

69°25'03"N, 50°04'30"W

upper arm flange bolt

missing. *

storm wind blowing, wind
in lee of enclosure -

* consequently, only sonic
is tilted away from nadir
by ~ 30°

AWS has HMP T/H sensors

year is 2004

clock reads:

5/26/2004 12:53

should be: 20:08 5/7/05

Russ climbed the tower
many pix by J Box + Koni

upper arm just fell into
different position: 20:13 Z

JAR 2 5/7/2005

page 2.

2 TC out, only 1
sonic (SR-50), reading
zero. Other channels seem
OK.

Patagonia caption:
"Russel Huff is a
victim of global
warming."

Depart JAR2 21:06Z

SMS 3 21:20 UTC
69° 26' 25" N
49° 58' 13" W 605 m

tower is level.

Russ climbed using
side gear, harness, rope,
and NRS friction strap.

Logger had been rattled
loose, mounting plate
detached from enclosure

5/7/05

SMS 3 cont. p2

logger canister detached
from panel,
storage module taken
to Swiss camp,
hope for data. logger
not responding
logger needs replace-
ment.

2 CR10 X's needed

- 1 @ SMS 3
- 1 @ JAR2

weather calm, cloudy

depart SMS 3 2200Z

arrive JARI 2250Z

copy GPS data to Ken's PC

depart JARI 2305Z

arrive Swiss camp

2340Z

Drove fast

Fresh snow!



: cheyenne!

JAR 1, trip 2

May 8 2005

arrive 16:50 ±

69°29'47", 49°41'40"N

Life links clinometer
39.5° tilt slope meter,
Jackson Hole wy
lower

S↓ 28° perpendicular to slope
26° parallel to slope

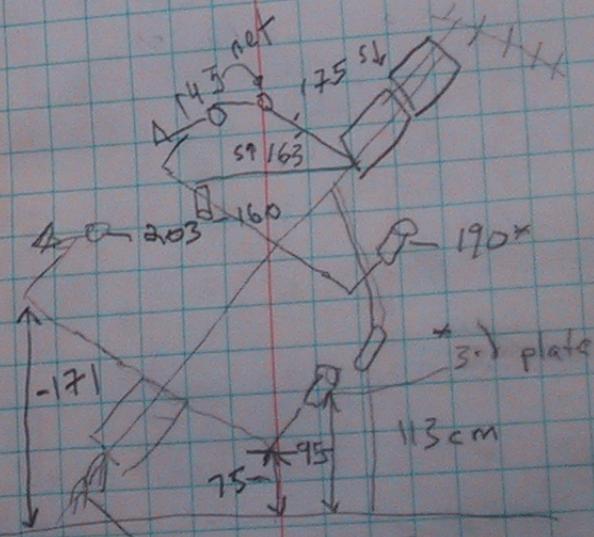
sonic 2 54°

sonic 1 54.5°

JAR 1

5/8/05

sketch before maintenance



176 = height from ice
to junction.

101 cm = enc bracket top
to mast bottom

JAR 1 Lowering

5/8/05

new mast base

$$83 + x = 150$$

x = base height above ice
in 2005.

w. n. 2 1 0 44 cm
2 170 cm

S ↓ 157 cm
S ↑ 147

T/H 1 54 cm
2 180 cm

bracket
Enc. top 20 cm

S ↓ sees solar panel @ 40°
from horizon

mast was installed 3 m
into ice in 2004 w 89
cm of snow

LAKE JAR

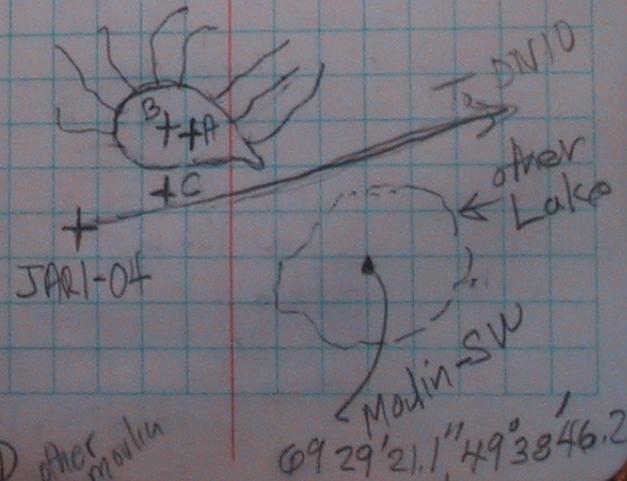
(A) 69 29 56
49 40 13 921 m

center point approx

JAY'S

- Predicted moulin (① lake bottom
② • 69°29'58.8" 49°40'27.2"
③ South of med moulin (possible camera
location)
• 69 29 47.9 49 40 27.2"

Other moulin south by SE of JAR 1
(over the hill)
• 69°29'9.0" 49°42'4.15"



SMS | Maintenance

5/9/05

lower lean angle
= 12.5 using clinometer

36 cm = distance from
snow surface to junction

upper mast length = 224 cm

210 = distance to sonic 1

236 = distance to profile
arm @ sonic 1 side

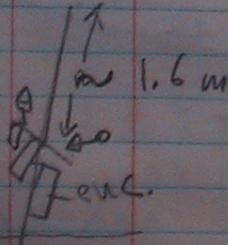
wind 1 = 265 cm

after lowering instrum.

wind 1 = 186 cm

T/H = 112 cm

after



SMS 1 snow pit 5/9/05
18 z

depth	g meter	T°C
0-10	232	-10.6 @ 10 cm
20	241	-10.4
30	253	-9.2
40	243	-9.5
50	262	-9.6
60	272	-9.8
70	264	-10.0
80	265	-10.0
90	260	-10.0
100	260	-10.0
110	258	-10.0
120	269	-10.0
130	265	-9.9
140	268	-9.8
150	246	-9.7
160	255	-9.7
170	267	-9.7
180	262	-9.6

Tsurf @ 18:35 = -12.5,
pg 1
of 2

-N. Molotch, I. Box

Pg 2

SMS 1

5/9/05
stratigraphy

3 mm melt @ 30 cm
note @ 32-33
more @ 36-37

melt layers @ 44.5

46

47.5

51

54

57

60

61

62

65-69 thick melt

complex

55 from bottom,
transition to lg grains

46 cm from bottom sugar

layer ✓

- 22 cm from bot,

2 cm depth near @
bottom

5/9

SMS 2

pit

5/10/2005

BBC crew arrived,
shot film near ups
km melt lake.

David, Kevin, Rob
BBC crew.

weather closed,

worked on CNRI
net radiometer

weather closed, white
out and snow.

5/11/05

continued working
on CNRI, + show
temp profile, 'Science
Tower' instruments
mounted on the old
swiss (ETH) 30 m
tower base.

Installed tower with
RUSS.

filmed mole w BBC
crew.

Weather ~ white out +
snow

Science Tower

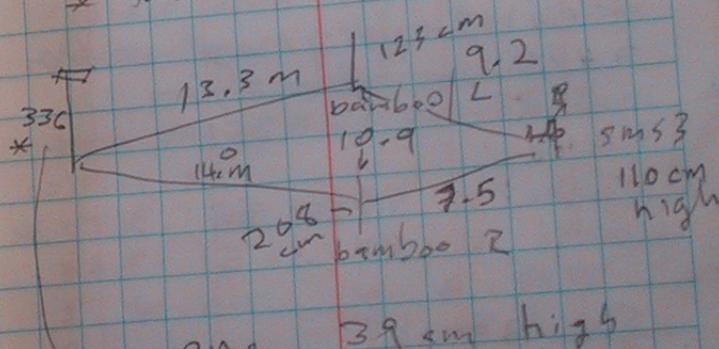
- old 30 m tower base
 in locs.
 1 cm3 ↓
 2 cm3 ↑
 3 CG3 ↓
 4 CG3 ↑
 5 CNRTC
 6 U
 7 dir
 8 bridge
 9 Tair 1
 10 2
 11 Tsnow 1
 12 2
 13 3
 14 4
 15 5
 16 6
 17 SR50
 18 SW ↓
 19 battery

5/14/05
 Icecam C by SMS 3

Advanced time lapse

UTC times 10, 14, 18, 22
 arrive 20:04 z.
 install along hummock
 axis.

* to bottom of EM2000



ena 39 cm high
 + ~0.25 cm = camera height

ca

JAR 2 05/12/05
P 8,3

✓ replace 10x with 10x
S/N 17508

✓ 2 now SR50 both non-
1 now x plug type
1 refurbished ✓

arrive 20:20 ± 5/13/05

bottom of upper mast section
= 445 cm above ice
452
442

wind 1 = 443.5 + 52
T/H 1 = 443.5 + 51 cm

S1 28408
S1 28407

Qnet 9.29 11.54
top bottom

- E102: on transmitter
re-program
- use 3x 18ah batteries for
GPS missing both 10x +
- bring 3/4x1" nurail T6T1
for sonic 2 in 2006

SM S 3 05/12/05

arrive 0:25 ± 05/13
white out,

commence drilling 15Z 05/13
1st hole drilled @ 3M 15:08 ±
2nd hole " @ 5m
3rd hole good took 1.5 h
5th hole, 6.2 m in ice.

replace data logger
formerly S/N X30102 *
no extended mem.
now S/N 17506 extended mem.

wiring SE

SE 1	K HMP	c1 G SR50
2	Br	E1 B1 Young
3	G Dir	W G SR50
4		P1 Red
5	TC	old mast S of new
6	TC	by 70 cm, has sleeve on it.

* problem w/ ch 3 (diff)
after lowering T/H @ 108
wind @ 125

Mast (copper) bottom length = 120
" " → @ -10 cm relative
to ice

SMS3 + JAR2 pg. 4

✓ new data logger
S/N 17506

TC not working
see prior page

depart SMS 3 20:00 Z

JAR2 5/13/05 cont.

replaced net domes

new mast in 7.2 m.

after lowering 7.4 m. in ice.

wind 2 198 cm
1 42 cm
rad 160 cm

wind directions set
using 43° W; same
for JAR 1 + all
others on this traverse

T/H 1 = 40 cm
2 = 189 cm

SMS 2

5/12/05

✓ new sonic
✓ lower instruments
✓ insert pin

/ Depart
23:20 Z

arrive 21:05 Z
SRSO — Surface (i.e. height) = 191 cm
Top pole to snow 256 cm
256 cm wind sensor height

tower then slipped down
11 cm, unexpectedly?
think slipped down to
nearest junction below.

- 94 cm = height of old mast
upper piece above ice
- $263.5 + 103$ cm = upper mast
length

new installation ~ 30 cm above
ice and was drilled in
6.9 m into ice

after lowering instruments

wind ~ 120 surface
T/H ~ 113 very disturbed
9 cm fresh snow

JAR2
Pg 5.

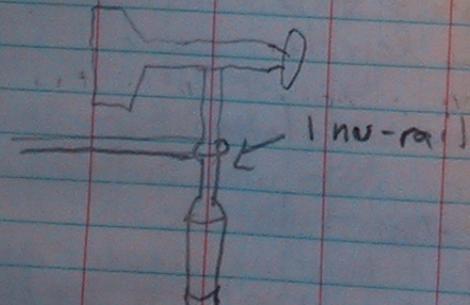
05/14/05

wind 1 obstructed for
southerly winds.

Radiometers completely
leveled, use 1400 day 134
+ onward

winds at 1300 ± down wind
of tent ~ 10 m, winds
good after depart.

wind 2 49 cm above middle
of profile area, while T1/H 2
is 38 cm above arm b/c
wind 1 shares nu-rail w/
sonic 1 ...



JAR2 5/14/05 Pg 6!

we cut the old pole @ 30
cm above ice. The piece
left on was 45 cm
long + goes back to
swiss camp. It remains
jammed on to former upper
section from being bent?
by Russ climbing on
tower, so be prepared
in future, i.e. come
with sufficient mast
length + sleeves, don't
count on existing length,
unless you can saw and
drill and make use of existing.

uppermost mast bottom
8 cm below snow, of
19 cm depth, i.e., 11 cm
above todays ice level.

JAR 2 T.C string. 05/14/05

1 nearest surface, 10 deep.
8 out, -
50 cm spacing.

9 and 10 now placed
at snow-ice interface
19 cm beneath boat packed
snow.

8 @ 26 cm depth in ice
7 26 + 50
6 26 + 100 etc
4 226
2 326
1 381 + snow

transmitter re-activated.

installed cap @ mast top
to prevent rain-gauge drilling
mast to prematurely melt out

complete maintenance
15:40 z

depart xmit ok
19:35 z

JAR 1 Lake com 5/15/05

depart swiss camp
2120z arrive after
equip pickup @ mar 1
2241

complete drilling 1st hole
5.5 m in ice

complete installation
03:50z begin
drilling target line

G1

LAKE JAR GPS
survey.

5/15

sample begins @
ice cam site
1.5 m S

camera height: see
pix

closed pole 2 m
W of GPS. pause
04 03 2

04 14 2 Parker by
nearest flag

04 17 flag 2

Swiss Camp Sci Tower
5/16/05

- | | |
|----|--|
| 1 | S↓ |
| | S9 |
| 3 | L↓ |
| | L↑ |
| 5 | CNRIT [C] |
| | UV |
| 7 | Dir |
| | Am 2ST bridge T °C |
| 9 | Tair 1, fine wire, ventilate |
| | " 2 " (above Tair 1) |
| 11 | Tsoil 1 |
| | 2 |
| 13 | 3 |
| | 4 |
| 15 | 5 |
| | 6 |
| 17 | height SR50
sw in W m ⁻² X |
| 19 | battery |

86 42

6 1 3 1 1 1 5200, ref-T
-0.00100
0.09707

59 1 ref-T, 100%

16 1 1 1 1 0

Sci tower output

10 min

year, day, hr mn

S_x, S_y, L_x, L_y, T_{air}, T_{CR}

mean wind speed

wind vector + speed

max wind speed

60 min

year, day, hr mn

T_{air} 1, 2

6x hires T_{show} m/s
battery

0418 flag 2
70 cm to cam

0439 flag 3 metal
0452 flag 1

455 flag 2?

459 flag 4
metal

5/17/03

cam

Glacier

Sermeg Avannarleg

69 20 04-1
50 19 23.3

~299 m

tilt angle 17°
azimuth 25° magnetic

pix taken

+/- / VDC measured

Sermeg Avannarleg
ignar Cam' Ü

for S. plan
Travers

5/27 DYE SE SDI
5/28 SDome SDI overn.
29 SDome → Kanger
30 SFJ → CPH → US

weathered inn
Hotel Hotel Valk, a.k.a.
hotel hellfisk
halibut

Zephyr = Icelandic
forecast model

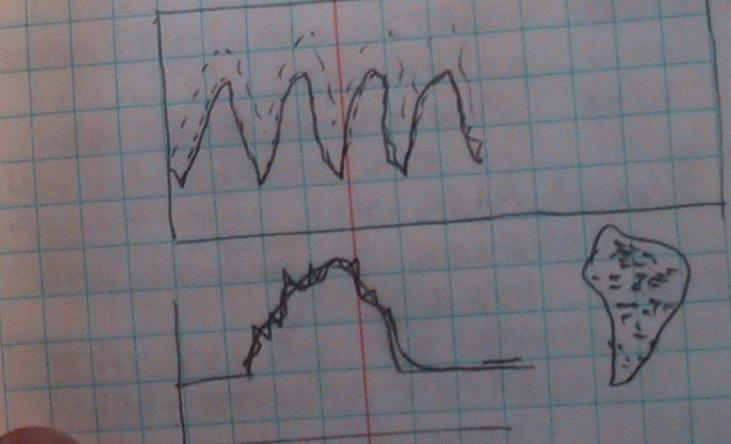
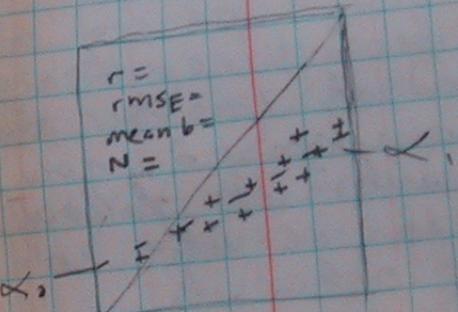
United Records R4ZP00

1 June CMH DEN MTJ
(we do not) 12:24 arrive

12 June MTJ DEN CMH
take this 10 AM depart
leg

Martina Krueger
Greenpeace International

31 20 525 6203 1997
wrong number now



JAR 3 positions

2002 69 23.661
 50 18.611

Moved * to 228 ft

69 23.697
50 18.628
in 2002.

* bearing 349 true

Swiss camp

69 34.047
49 19.288
3740 feet.

Ilulissat Airport
3-years construction
1982-1984
4 km from town center
opened 19 Sept 1984

Upernivik 5/24/05

met stations @ airport
and at former heli port.
latter same design as in
Ilulissat, former daffidy,
having both stevenson screen,
exp taken of both sites]

position of met station
by heli port, near sea
level, exposed, but
upslope SE from site.

position measured 5/25
using handheld GPS

N 72 47' 30.7"
W 56 08' 35.8" 30 m

wx data must be strongly
influenced by sea ice variability

made photo tour of Upernivik, surprisingly many single-family dwellings, much new construction, many new sun decks, sign of prosperity + climate change?

Stay in 'hotel' Upernivik rooms not bad, otherwise somewhat spartan.

Many sled dogs, seem better cared for than in Ilulissat.

Saw many smokers and in Ilulissat, speculate culture is healing past of health compromise by cigarettes + alcohol though many still smoke cigarettes.

5/25/

We are on standby, weather marginal here, but apparently good @ summit. We await twin otter from Atuleq with Jonas + Stoli as pilots.

We are anxious to get work done, our return flight draws uncomfortably near, with return options 5/27 and increasingly more likely 5/31 via Copenhagen, the former (via C130) via New York ANG 109th.

Depart Upernivik
w/ OY-POF 17:22 Z

were flying above the clouds, mountains poking up through, beautiful.

now plan v is to extend NASA-U, collect data at NGRIP, extent @ summit, overnight there.
~ NASA-U ~
~ 22 54 departure
3h25 m ground time.

before:

47 cm lower arm
80 cm profile T/H

-21 cm = junction
bottom of top mast

after: +

367 = profile arm
80
227

5/25/2005
NASA-U pit.
J. Box empty bag

192130 Z	depth	weight	2
	0-10 cm	10 1 1	
	20	10 5 8	
	30	10 6 4	
	40	10 5 3	
	50	10 5 5	
	60	11 1 1	
	70	10 6 4	
	80	10 9 0	
	90	10 8 2	
	100	10 6 9	
	110	10 5 9	
	120	10 3 9	
	130	10 8 1	
	140	10 6 5	
	150	10 9 8	
	160		
	170		

125 summer
layer

NASA-U pit stratig.
5/25/05

crust @ 6 cm

layer transition @ 16

" 18

23

33

wind crust

49

" inclined 57

" " 61.5

layer transition @ 66

inclined wind crust

@ 79.

layer x-t @ 81

1 mm thick crust 97.5

2 mm depth hoar

layer x-t @ 101.5

3-4 mm chunky crust @ 109.5

1 cm depth hoar @ 120

last year summer @ 125

next layer transition @ 140

5 mm depth hoar @ 145

wind crust @ 150

" @ 155

NASA-U Grain size
5/25/05

SURFACE 1 MM grains 10 3.5 cm
dendrite 20 5 mm
aggregates 30 1 cm

sugar snow, by
grains begin @
104 cm - 1 mm

"

dendrite 20 5 mm
aggregates 30 1 cm

1 cm

50 "

60 5 mm

70 5 mm

80 30 mm

90 40 mm

100 5 mm

1.5 mm grains
@ 130 chunky
crust layer.

NGRIP

5/25/05

clock 1 min slow
cables causing lean
towards NNE

heights

bottom of profile: 30
T/H 1 38 cm → 78 cm ↑ 79.
Wind 1 72.5

profile separation 121

T/H 2 ← 198
Wind 2 + 42 from arm
+ 42 bottom
191 cm

NGRIP pit 5/25/05

~ 23:45 ±
tare wt

	717 g	0.5 cutter
0 - 10	361	
10 - 20	345	
- 30	314	
- 40	288	!
- 50	288	
- 60	407	
- 70	334	
- 80	65-75	
70 - 80	350	
- 90	335	
- 100	360	
90 - 100	332	
- 110	325	
120		

layering. pit taken
crust @ 8 cm, vinched @ 15
1 mm white crust @ 36
soft snow above to 32
thin crusts 38, 39, 40
lg soft grains 52-55
top of summer @ 57
thick crust @ 72
crust @ 85, 91
summer 2003 @ 105 117
sh @ 110 2 cm dk @

Koni's idea's

lg grain size change
C 50
@ 115

summit

5/26

I AM SFJ
clock is on

U₁ 32 cm
U₂ 32 + 123 cm

FH1 38
TH2 38 + 114 cm

frost on NR Lite

" " S↓ 24554
none on S↑ 24562 S/N
pyranometers are type
w white resistor
packet. red, white, black
clear.

n 1 cm
frost on radiation shields
see pix

Summit Pit

5/26/05

~52

depth		
0 - 10	986	(714)
20	325	
30	363	
40	351	
50	301	
60	358	
70	335	
80	311	
90	294	← summer '04
100	324	
110	330	sugar
120	383	sugar
130	326	sugar

Summit stratig.

5/26/05

0 - 10 soft fresh
 10 - 15 layer
 15 - 24 layer
 24 - 46 wind crust incline
 46 - 58 fine, all fine above
 64 wind crust
 64 - 72 larger grains
 70 - 75 soft
 84 2cm depth hoar
 90 interface
 102 1.5 mm white
 crust, inclined.
 below 102 grains again
 larger.

summer layer @ 86?
 grains > 1 mm below 86
 " > 1.5 mm " 102

NASA - SE

- 0.8 cm fresh (g x styl)
- 0.8-1 changed Fresh snow
- 1-2 metamorphic layer
- 15 cm weak layer
- 27-30 " "
- 42 crust
- 46-49 weak layer
- 67-68 harder weak lay.
- 105 wind crust
- 124-125 weak hard layer
- 139 chunky crust
- 150 hard surface
- 160 another harder



5/26/05
Jason, Russ + Koni @ NASA 5E
Depth mss

0	
10	1013 - 715
20	315
30	286
40	345
50	347
60	380
70	377
80	398
90	377
100	400
110	360
120	370
130	1067 - 715
140	359
150	413
160	

Depth down in lower 1/2
mix crust & snow

lower 1/2 snow + ice
layers

Below 160 = most complex ~10cm
Thick at least
hour Below melt complex

DYE 2 Pit 5/26/05
~142

0 - 3 cm fresh snow,
surrounding surface is
smooth.

11 - 12 inclined crust

38 thin wind crust

55 chunky crust ~ 5mm

65 crust

70 "

97 - 101 hoar sugar
interval @ 110

117 - 120 hoar

120 + below = solid
melt layer, ~~depth~~,
depth = ?

bonded
rim

Dye 2 Pit densities
5/26/05

J. Box

0 - 10	812
20	858
30	237
40	320
50	297
60	340
70	385
80	365
90	363
100	342
110	290
120	353
130	366
	480

↑ rough sample
of chunky
under
summer
layer

SADDLE 5/26/93

PIC before extension
by KENN & SAWYER

sun & membrane
broken, replaced
w/ plugged sensor.

5V	223.11	small 7.11
5A	223.01	18.5W

TH1 16.7 deg
wind 1 120 cm

time accurate
transmission active

replaced wind 2
speed reading off

replaced sensor 2

re-wired net radiometer

very sufficient PIC
extension cable out
not at next extension

SADDLE AWE 5/26/93

faner extended

enclosure bottom @ 320cm

SADDLE Snow Pit

J. Box, R. Humpf 5/26/05

wind crusts @ 16, 25, 34
37, and 52 cm depth.

Snow otherwise lacking
lots of stratigraphic
features above 50 cm

52 cm layer 2 mm
melt layer?

79-80 cm soft layer

86 cm soft layer

96 cm crust layer

107-108, 5 hoar layer

113-115 "

hard firm @ 120 cm
121-125 melt complex

Depth	melt	refr.
0	297	(711 corrected for bed - 424)
10	367	
20	392	
30	398	; 346 rounded (unreliable)
40	353	
50	394	
60	390	
70	397	unreliable
80	371	1001 + 0.82
90	371	new
100	372	unreliable. Total 373
110	280	- 1125
120		
		total pit depth = 122

Ocean floor layer - Results from
melt complex ab. 100-120 cm thick
- 121-125

Ocean floor is flat snowfield

125-135 ~ 1113-1118

melt complex ~ 575

South Dome AWS

5/27/0005 T.B., R.H. +
clock accurate!

replace 2 sonics
only 1 existing

wind 1 = 35, 2 = 105 + 35

TH1: Q1, Q2 = 22 + 142

S_↑ 28086
S_↓ 28091

tower leaning S ~5°

ice in lower net dome

new TC, 1 m spacing

Transmitter clock was
accurate within 10 sec
unclear why we were not
rx transmissions & unpower-
cled and re-activated by.

* 8w3/1001 8sec 2001

South Dome

5/27/05

PZ

new TC set up
depths 1, 2 - ~260cm
3 - 46cm
4 - 1,46cm
.. - 2,46cm
each meter