

SOKKIA™

Avis - 1 - 2003 - 4

**LEVEL
BOOK**

INDEX

- Lund John
Grenfell Lakes building
University of Idaho ✓
Grenfell # 80307, USA
303 472 601
- Kenni home 303 494 6336
83 163 146 023
83 163 145 9165
- Vince (Cokin) 841648 office
524218 mob.
- Raven (et) home 88163 146 1321
- SFS met office 841623
- Kenni home 303 494 6336
off 303 492 4529
- J. email j.m.kn@greenland.com
- Kim Pedersen 841425 home
524420 mob.
- Air Alpha (et) 943 004
Air Alpha tveolsj@airalpha.com
Greenland Air 24 11 42

GC-NET AWS CHECKLIST	Site: CPI 4/19/03	mark
Field technician names	HUC, SARAH, BILL, Kelly	
problems on arrival?	✓ BACKUP SD-SD	
Data	Download Data from Logger (datafile name)	✓
AWS/CPI DS Set	Backup data on zip disk or memory card	✓
	Upload new program (name)	
Transmitter	Reset/program transmitter	✓
Data Logger	How Much drift of Data logger time?	✓
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: 1000 Ending Julian Day, Hour, and Minute: 1000	
Radiometers	Weather conditions during calibration	
✓ with	Tilt angles (elev/and azimuth)? 3° S	
	Level Radiometers	
Site Survey	Replace Net Radiometer Dome and Desiccant	✓
115 cm	Ice in net radiometer domes on arrival	✓
115 cm	Wind1 axle height before and after maintenance	✓
135 cm	Wind2 axle height before and after maintenance	✓
40 cm	radiometer height before and after maintenance	
40 cm	Enclosure height before and after maintenance	
40 cm	pieces	
40 cm	Profile Arm Orientation	✓
40 cm	Snow height 1 orientation	
40 cm	Snow height 2 orientation	
40 cm	Enclosure orientation + mag/az	
40 cm	Guy wire orientations	✓
	Instrument arms moved? (avoid this)	
New Instruments	serial numbers and instrument type	
GPS	GPS on AWS?	
Differential GPS meas.?	datafile and GPS instrument	
	Position of Site	
	Elevation of Site	
	Seal Enclosure ports	
	Synoptic Observations? No	
	Temperature string info	
	Level surf. By mast? Fill?	
	Local topog. slope?	
	Snow Pit Densities, who has the data	
	Mast Extension notes, time taken 216"	
Final Platform Check	wiring	

Arrived at site at 1300 local time

Wind over

T/KM ① = 110 cm

T/KM ② = 230 cm

- The tower bot 1 guy wire, so was leaning to the SSW, approximately 3°
- Wind orientation:

① Required new temperature string 2005 for next extension

② Should bring new power cable 1x200 ft.

- tower orientation did not return

- both axis instruments damaged, require new instruments

mag dec used = 40° W

rad orient = 180°

**GC-NET AWS
CHECKLIST**

	Site: Jar 1	4/26/03	mark
Field technician names problems on arrival?	Nic, Jason, Paul, Mally		
Data	Download Data from Logger (datafile name)	✓	
	Backup data on zip disk or memory card	✓	
	Upload new program (name)	✗	
Transmitter	Reset/program transmitter		
Data Logger	How Much drift of Data logger time?		
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute:	✗	
	Ending Julian Day, Hour, and Minute:	✓	
	Weather conditions during calibration		
Radiometers	Tilting angles (elev/and azimuth)?		
	Level Radiometers		
	Replace Net Radiometer Dome and Desiccant		
Site Survey	Ice in net radiometer domes on arrival	✓	
775 cm	Wind1 axle height before and after maintenance	✓	
395 cm	Wind2 axle height before and after maintenance		
	maintenance		
	maintenance		
	Radiometer height before and after maintenance	✗	
	Enclosure height before and after maintenance	✗	
	pieces		
Profile Arm Orientation			
Snow height 1 orientation		✗	
Snow height 2 orientation		✗	
Enclosure orientation		✗	
Guy wire orientations		✗	
Instrument arms moved? (avoid this)		✓	
New Instruments	serial numbers and instrument type	✓	
GPS	GPS on AWS?		
Differential GPS meas.?	datafile and GPS instrument		
	Position of Site:		
	Elevation of Site:		
	Seal Enclosure ports		
	Synoptic Observations?		
	Temperature string info		
	Level surf. By mast? Fill?		
	Local topog. slope?		
	Snow Pit Densities, who has the data		
	Mast Extension notes, time taken		
Final Platform Check	wiring		

4/26 Jar 1 : Looks moist and damp
drill GPS stake

- Dug datalogger out to find it at 2100,
may not have data between 4/24 - 4/25
- mast temp stayed out of use, 3 m not
in use
- went drilled for Jar 1, tall 3.6 m in use
(17' mast)

Bdol	Mcf
Wind ① 275 cm	164 cm
T/KN ① 270 cm	166 cm

- had 120 cm separation between portal
arm + instruments
- some ice in Q° domes, too high to
determine whether glacier advancing level
- very little ice in dome
- need to do domes in R°, done!

05/03

GC-NET AWS CHECKLIST	Site: JAOI see also pages later	Mark
Field technician names		
problems on arrival?		
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)	✓ ✓ ✓
Transmitter	Reset/program transmitter	✓
Data Logger	How Much drift of Data logger time?	0
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute: Weather conditions during calibration	
Radiometers	Tilting angles (elev/and azimuth)? Level Radiometer's	✓ ✓
Site Survey	Ice in net radiometer domes on arrival Wind1 axis height before and after maintenance Wind2 axis height before and after maintenance maintenance maintenance Radiometer height before and after maintenance Enclosure height before and after maintenance pieces Profile Arm Orientation Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations Instrument arms moved? (avoid this)	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
New Instruments	serial numbers and instrument type	
GPS	GPS on AWS?	✓
Differential GPS meas.?	datafile and GPS instrument Position of Site: Elevation of Site: Seal Enclosure ports	✓
	Synoptic Observations?	no
	Temperature string info	and from log
	Level surf. By mast? Fill?	✓
	Local topog. slope?	slip. up up
	Snow Pit Densities, who has the data?	no
	Mast Extension notes, time taken	
Final Platform Check	wiring	

need to bring 1 sonic
taken to sms a, plug
style
awsjri 03.dat

Top TC was @
is right at 0 m. 23 cm
wind - could use this at night to
test to extrap
rest base 3.6 m in line

05/04

- changed dessicant
and battery in pin
- re-attached upwind
guy wire.
- see also notes following
from 4/26.
- ~~✓~~

GC-NET AWS CHECKLIST	Site: Swiss AWS CAMP	mark
Field technician names		
problems on arrival?		
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)	
Transmitter	Reset/program transmitter	
Data Logger	How Much drift of Data logger time?	
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute Ending Julian Day, Hour, and Minute Weather conditions during calibration	
Radiometers	Tilt angles (elev/and azimuth)? Level Radiometers Replace Net Radiometer Dome and Desiccant	
Site Survey	Ice in net radiometer domes on arrival Wind1 axle height before and after maintenance Wind2 axle height before and after maintenance maintenance Radiometer height before and after maintenance Enclosure height before and after maintenance pieces	
Profile Arm Orientation	Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations	
New Instruments	Instrument arms moved? (avoid this)	
GPS	serial numbers and instrument type	
Differential GPS meas.?	GPS on AWS? datafile and GPS instrument Position of Site Elevation of Site Seal Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data Mast Extension notes, time taken	
Final Platform Check	wiring	

GC-NET AWS CHECKLIST	Site: DYE 2	05/09 1430Z	mark
Field technician names	JB, KP, MM		
problems on arrival?			
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)		
Transmitter	Transit/program transmitter		
Data Logger	How Much drift of Data logger time? none		
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute: Weather conditions during calibration		
Radiometers	Tilting angles (elev and azimuth)? Level Radiometers		
Site Survey	Replace Net Radiometer Dome and Disinfect ice in net radiometer domes on arrival Wind1 axle height before and after maintenance Wind2 axle height before and after maintenance maintenance Radiometer height before and after maintenance Enclosure height before and after maintenance pieces		
Profile Arm Orientation	Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations		
New Instruments	serial numbers and instrument type		
GPS	GPS on AWS?		
Differential GPS meas?	datafile and GPS instrument Position of Site Elevation of Site Soil Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data Mast Extension notes, time taken		
Final Platform Check	wiring		

- * sonic 1 has moved stay
be cables for sonic 2
- * propeller 1 and nut missing
- * heights TH1 124 cm
W1 121 cm

SADDLE!
after

W1	103 cm
TH1	87 cm
TH2	204
W2	207

Sonic height 1 increased.

GC-NET AWS CHECKLIST	Site: SADDLE	mark
Field technician names		
problems on arrival?		
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)	
Transmitter	Reset/program transmitter	
Data Logger	How Much drift of Data logger time? +/- min	
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute Ending Julian Day, Hour, and Minute Weather conditions during calibration	
Radiometers	Tilting angles (elev/and azimuth)? Level Radiometers Replace Net Radiometer Dome and Desiccant	
Site Survey	Ice in net radiometer domes on arrival Wind1 axle height before and after maintenance Wind2 axle height before and after maintenance Enclosure height before and after maintenance Domes Profile Arm Orientation Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations Instrument arms moved? (avoid this)	
New Instruments	serial numbers and instrument type	
GPS	GPS on AWS? ^{yes}	
Differential GPS meas.?	datafile and GPS instrument Position of Site Elevation of Site Seal Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data	
		YES
Final Platform Check	wiring	

63710
wind
Z1 = 59 59
Z2 = 178 177
sonic 1 5 cm
2 148 cm.

see heights after
on DYE-2 page
used piece of NASA-SI
no extension, will be
partially buried in '04

net domes replaced. much
ice inside.

SMSS cont.

the surface undulations who
ns are roughly 70 cm
in height ~ 50 cm amp.
after lowering:

16 cm wind

156 cm T/H

swapped out data
logger.

depart 20:30 z

we lowered but did not re-drill the base.

12% vol.

4/27
SMSS /
ERIO / SM 192

TB NC MM RH

tower was level

instr z

390 cm

collect all from storage
module @ 1200 band!

re drilling base, insert
9.2 m in ice!

instr z after ~ 167 T/H
177 Wind

tower is now leaning ~ SSW
3-4°!

will need to monitor tower more, because
it is leaning may consider replacing
most over through drilled 9.2 m in ice

JARI Download v1517

01:30 AM Z 4/28

aws working, just
not transmitting,
clock is off.

The glacier is cracking, clock drift intercept
each few seconds! ...
reset transmitter
talking

The lower $\frac{1}{2}$ of mast is
5 field books exposed.
~~at 6.4m~~, leaving only
2.8 m in ice.

The old mast cabled
along side will be
dangling before end
of melt season.

JARI cont.

Downloaded data
awsjrl93.dat

+ cleared memory.

#A76A#6A

reset transmitter

clock drift intercept
ed the xmit.

04/25

return to site 16:45

begin chipping out old mast
" steam drilling new "

05/01 SMS cap

JAR 2, mounted on
level 1 2042Z 50.322
should be first good cal
value, esp. clocks synced!

05/02

end SMS cal using 1200Z

SMS 3

1. HMP not working
time on site = 3h,
but failed getting data
trying to diagnose HMP,
abort SMS calibration,
very sorry Todd, I tried
hard.

SMS 3,

05/02

- reinstall base 5.9 m
in ice
- hummocky surface
- collected last 128h
of data to SMS-03b.dat
- swapped CR10X 2mb
for smart 5 CR10X
without extended memory
but with SM716 stor-
age module.
- roughest ice just
above SMS.

Swiss camp fuel inventory

- camping stove gallons III
- full Jerry cans III II
- 2 x $\frac{1}{2}$ full small propane gas with old push-on regulator.
- Lg gas bottles XII + II in (2) use

Swiss Alu inventory.

- JAR 2 or 3 extension piece I
- " " sleeve III
- smart stake extension 4.5 m
- " " sleeve III

Swiss misc. inventory

- 4 x AC extension cords
- 1 x 100' sent back to CU
- II shovels
- 3 x Scott tents.

- Return shipment
incl. broken instruments.
- Box 4. lg. Zargos
- lg wind turbine.
 - 81x x 2, lg drill bits
 - " battery x 3 for wood!
 - 100' AC extension cable.
 - 2x 10W old solar panel
 - misc electr. parts, wind?
 - Trimble 4000 (broken?) turbine?
 - sm 716 w/ sms cal data
 - propane torch
 - SC 532A
 - HMP 45 (broken?)
 - TC used in sms cal
 - Magellan parts
 - CR10 keypad (broken?)
 - CR10X broken?
 - ? SC 32b + 9pin cable
 - rad modem cable + modems.
 - 4x broken sonic height.
 - TGT 1 Goes transmitter,
broken?

Box 2. Lg zarges

5. Travers spare parts.

2002 - 2003
major problems.

AWS / SMS

(Instruments
+ Extensions)

2004

- DYE-2 Table 2 unactivated?
• SMS 2 melted out, lean.
• propellers off at SADDLE and DYE-2
 - propeller broken @ JAR2 during maintenance
 - multiplexer replaced @ DYE
 - keypad + CR/Ox shorted @ JAR1, replaced.
Jason's fault?
 - ADG membrane delamination
2x CPI, 1x DYE 2, 1x SDOME
1x SMS 2,
- Saddle = extension
= power cable extension
so not need new TC string
 - NASA - SE = extension
+ TC string redrill
 - SDOME - extension
- SW incoming
- multiplexer?
- ADG
- new TC string
 - Swiss Camp. - 1.350 VDC PIR
battery
 - DYE-2
- ADG x 1, x 2?
- JAR1 - GPS progr. cable
- ADG x 1
- GPI
- ADG x 1
- JAR 2 - GPS progr. cable
- propeller
- 2 non styrofoam wind sensors?

(p1 of 2) 2004

- measure grain size @ pits.

* bring 4x new ADG to increase number to 2 @ AWS sites mentioned on prev. page, plus at least 4 more in anticipation of future, i.e. 2003 failures.

* Do AWS extensions + servicing as pit stops rather than camping,

= $\frac{1}{2}$ flight hours. If you have 4-5 helpers, can reduce ground time to less than 3 h!

* get longer winch for tripod

and consider leg extensions and a faster method to join pieces.

2005 instruments

new TC strings or extens-
ion required @ CPI

More ^{p2} 2004 recommendations

- more crevasse rescue training. i.e. "self rescue"
- roping person - person in v. rough spots!

- earlier Twin Otter reservation so not require expensive Ken Borek, at least use tentative dates as place holder.

- employ Kim Petersen again, perhaps @ Swiss Camp + IAR.

Steam Drilling 2004

SMS # 5? , 3

AWS JARQ

JAR1 ? probably
JAR3

SMS not requiring re-drill

SMS1, but 2-3° leaning

SMS2, 2.0 m 2003
(9.2 m in 2003)

see ALU inventory in
this book, have pieces
for some of this work - no small fitting.

8-9 K

Air Alpha
Greenland Air

JAR3?

Molly + Kim

SMS 4
JAR 3

overhead

air alpha

steam drill box

Greenland

Ilulissat ft.

20 maj

22 "

Air

JAV

8:30 AM

12:35 PM

4314 Dkr

8628 Dkr

res # Y74 CVV

Air Alpha

JAV - SWC - JAR3

\$3683 swiss camp incl

265 Dkr.

1000 Dkr. tax / flt.

14575 cost

sans opening

* est

JAR3

33,800 Dkr

\$5000

5/30 Tunar-N

Konuk Russ

19303

153 cm to Arm Bottom (lower)

-29 from Arm Ass to TC

Station Clock is 8 minutes fast

Channel 1 Surface height (upper) is out.

Transfer chann. 1 - Fan but a blank outline

Thru channel 2 - same outline but good now

3-6 good

7-9 have holes - questionable

9,10 bad; near surface

* lower Arm raised

Arm Scratches is now 88.5 cm

Lower Arm is 205 cm above floor

Fist-bowling is now 25 cm above floor

\Rightarrow Lower fist-bowling is 73 cm

a base surface

Replace Radiation Shield

5/31 Tundra 5 snowpit by Russ Hall

0-23 cm: new snow layer, very buoyant

23-29 cm: weak wind, layer often heavily
morphed horizon

29-47 cm: soft homogeneous layer with
round crystal structure

*47-50 cm: heavily morphed snow, most
ice w/large air gaps of
over 1cm in height. Cysts
are regrowing in the air gaps.

*50-61 cm: This is the melt layer w/ 3-4
ice horizons:

-2 cm ice horizon at 54 cm

-57 cm: 2 cm thick ice

-60 cm: ~2 cm ice horizon

61-83 cm: large crystal (rounded)

and homogeneous,

*83 cm: 2-5 cm thick ice layer

This is the 2001 horizon
1 cm thick dense snow layer
that could be the 2nd melt horizon

Snow density
measured with
nucleonics calibrant density kit w/a

	0.5 L + g mals/cm ³	Volume	Temp. °C
0	190 g		-15.9
10	200 g		-18.4
20	180		-18.7
30	130		-20.9
40	150		-22.0
50	180		-22.7
60	175		-23.7
70	210		-25.1
80	130		-24.8
90	170		-25.1
100	200		-25.8
110	180		-27.4
120	200		-27.9

Radar Experiment r/21

Using 1 GHz

Samples at 24,000 MHz

=> Looking at top 3m

100m

10m



snow
pit

10m

100m

100 > 100 m Area

Gridded every 10 m

note: There is not enough baffle
cable + Thimister cable for
an extensivity

snowpit SADDLE Stratigraphy

0-105 continuous pencil hard
 105-110 ice layer
 110-114 faecal lipid hard
 114-148 continuous pencil hard
 146-150 ice layer

5/14/03 18:00 ±	SADDLE	
Depth (cm)	Temp	
0-10	291	
10-20	294	-22
30	304	-21
40	295	-21
50	296	-20
60	299	-20
70	279	-20
80	294	-20
90	316	-20
100	312	-21

← → ice layer

120	259	-21
130	296	-21
140	311	-21

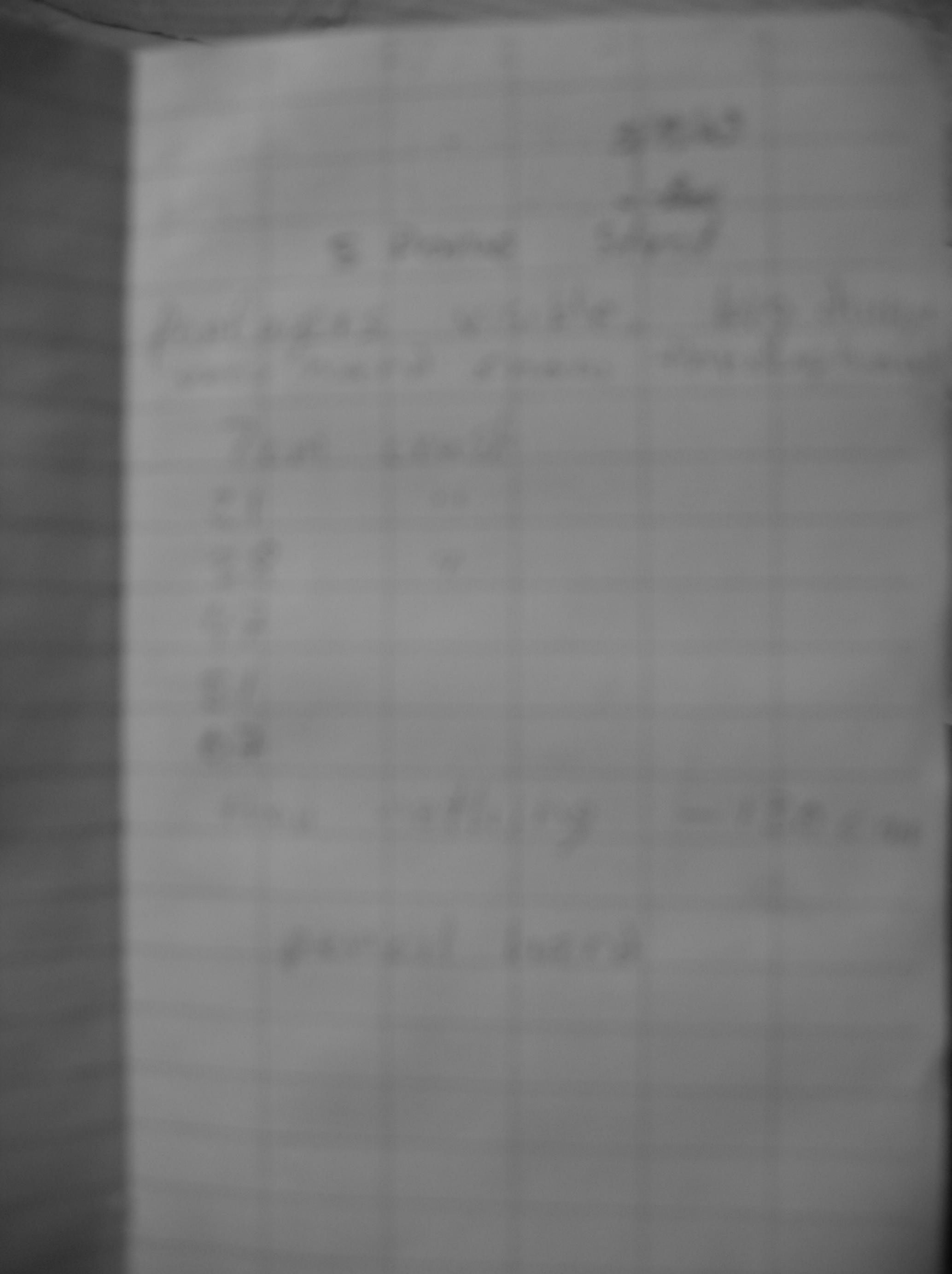
← → icelayer

150

ridge margin or
 Snowpit
 Temp °C
 -19.5

100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130

5/9/13 depth (cm)	(kg/m ³) DYE 2 Density	Temp (°C)	Molly MacFister Ken Peterson	5/9/13 20' P.E. cm	DYE 2 Soot + ice + water	+ Soot
1-10	373	-16		0-26	Wind packed	
10-20	329	-17		26-28	hard layer (pencil hard) big wind event?	
30	371	-18				
40	303	-17		31-38	Sugar $\approx \frac{1}{2}$ mm grains	
50	303	-17		38-45	Sugar One knuckle hard warm period possible melt? late summer? ≈ 1 mm grains	
60	386 w/ice	-18		45-50	$1\frac{1}{2}$ - 2 mm grain	
70	389	-18		50-51	1 cm ice layer (late summer melt)	
79-89	371	-18				
89-99(ICE)				55	melt event	
99-109	457 w/ice	-19		60-70	10 cm of melt complex (refrozen slush)	
				71-78	Thick ice layer	
				79-81	2 cm ice layer	
				89-99	10 cm Monstrous melt layer	



SOMMELIA®

and its logo

LIVET
DUCK

GC-NET AWS CHECKLIST	
Site:	Gillamay Valley 5/6
Field technician names	Kris, Mike & Russ
problems on arrival?	
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)
Transmitter	Reset/program transmitter
Data Logger	How Much drift of Data logger time? 4 min
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute: Weather conditions during calibration
Radiometers	Tilting angles (elev/and azimuth)? Level Radiometers Replace Net Radiometer Dome and Desiccant Ice in net radiometer domes on arrival
Site Survey	Wind 1 axle height before and after maintenance Wind 2 axle height before and after maintenance Radiometer height before and after maintenance Enclosure height before and after maintenance pieces
	Profile Arm Orientation Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations
#	Instrument arms moved? (avoid this)
New Instruments	serial numbers and instrument type
GPS	GPS on AWS?
Differential GPS meas.?	datafile and GPS instrument Position of Site: 60°40'32" N 60°15'20" W Elevation of Site: 25 m Seal Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data
Final Platform Check	Mast Extension notes, time taken wiring

5/6 1430 Clear + calm conditions

Note has a depression (ring) around the base.
may have melt surface well rounded
that expected, about 25 cm

- had looking in both Q° domes
- 4 minutes offset on altimeters. 1st check during data collection

Before

① T/RM = 168 cm ② 193 cm ③ 62 cm (17 cm)
④ Wind ① = 181 cm ② 314 cm ③ 77 cm (4 cm)

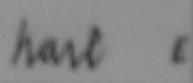
After

→
move to
in

- 12 cm separation between profile arms
- snow depth under seal 4-14 cm
- moved instruments down approx 105 cm
- started calibration at 1600 UTC. took good 1700 UTC, with instruments at 203 cm (May 6, 2003)
- finished calibration at 1540 UTC on May 10, 2003

GC-NET AWS CHECKLIST	
	Site: Riemann Station cont.
Field technician names	
problems on arrival?	
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)
Transmitter	Reset program transmitter
Data Logger	How Much drift of Data logger time?
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute: Weather conditions during calibration
Radiometers	Tilting angles (elev/and azimuth)? Level Radiometers
Site Survey	Replace Net Radiometer Dome and Desiccant Ice in net radiometer domes on arrival Wind1 axle height before and after maintenance Wind2 axle height before and after maintenance maintenance Radiometer height before and after maintenance Enclosure height before and after maintenance pieces
	Profile Arm Orientation Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations
New Instruments	Instrument arms moved? (avoid this)
GPS	serial numbers and instrument type
Differential GPS meas.?	GPS on AWS? datafile and GPS instrument Position of Site: $60^{\circ}40'32''N$ $60^{\circ}15'20''W$ Elevation of Site: 15 m
	Seal Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data
Final Platform Check	Mast Extension notes, time taken wiring

5/11 1830

- Imps① owl, looked at north - perched on base, appears to be on again at 1634
- decked wind sensors:
- ① Half way with compass, W-E, so half  if wind is 220° it is actually 140° , need to do $360^{\circ} - x - 90^{\circ}$
- ② Boxes not in line, - both appear to be 10° to W, thus leaning $190^{\circ}S$
- Δ^{st} domes at $1830-1840$ (5/11), and looking J lower, with polyethylene shaded / not clear
- SW!, 0° (rel., SW) assumed level.
- tc (temp string) 2 is 26 cm above snow, 32 cm above ice, thus tc3 is 68 cm in ~~ice~~!

**GC-NET AWS
CHECKLIST**

Field technician names

problems on arrival?

Data

Download Data from Logger (datafile name)

Backup data on zip disk or memory card

Upload new program (name)

Transmitter

Reset program transmitter

Data Logger

How Much drift of Data logger time? 11 min

Profile Instr. Calibration

Starting Julian Day, Hour, and Minute:

Ending Julian Day, Hour, and Minute:

Weather conditions during calibration

Radiometers

Tilting angles (elev/and azimuth)?

but SWL = 8°

Level Radiometers

Replace Net Radiometer Dome and Desiccant

Ice in net radiometer domes on arrival

Wind1 axle height before and after maintenance

Wind2 axle height before and after maintenance

maintenance

Radiometer height before and after maintenance

Enclosure height before and after maintenance pieces

Profile Arm Orientation

Snow height 1 orientation

Snow height 2 orientation

Enclosure orientation + height 164 cm

Guy wire orientations

Instrument arms moved? (avoid this)

serial numbers and instrument type

GPS on AWS?

datafile and GPS instrument

Position of Site:

Elevation of Site:

Seal Enclosure ports

Synoptic Observations?

Temperature string info

Level surf. By mast? File?

Local topog. slope?

Snow Pit Densities, who has the data

Mast Extension notes, time taken

wiring

mark

7/5

arrival at 1414 utc

- steady current(m)

height

before

after

① T/RM = 278 cm

133 cm

② Wind = 278 cm

- arm is 248 cm

- real task is done on arrival (long run!)

- about 9 cm short under surface height

- 19 mm Hg snow, Δ^{ed}

Instruments are 30 cm above X arm

New arm height is 29 cm (wind)

⇒ new profile height = 1.09 m

- without height 164 (wind) + 52 (star)

- same amount of height between XH + wind

due to ice hummocks, need to take into account

- 58 cm between T/RM + sonic + bottom

- 75 cm height on generic 1

GC-NET AWS CHECKLIST		Site: Humboldt 5/27/03	mark
Field technician names		Eric Klett, Craig	
Problems on arrival?			
Data		Download Data from Logger (datafile name) Backup data on zip disk or memory card	
Transmitter		Upload new program (name)	
Data Logger		Reset/program transmitter	
Profile Instr. Calibration		How Much drift of Data logger time? Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute:	
Radiometers		Weather conditions during calibration Tilting angles (elevation azimuth)? Level Radiometers	
Site Survey		Replace Net Radiometer Dome and Desiccant Ice in net radiometer domes on arrival	
Wind 1	Wind 1 tallest in S	Wind1 axle height before and after maintenance	
Wind 2		Wind2 axle height before and after maintenance	
		maintenance	
		Radiometer height before and after maintenance	
		Enclosure height before and after maintenance pieces	
		Profile Arm Orientation	
		Snow height 1 orientation	x
		Snow height 2 orientation	x
		Enclosure orientation	x
		Guy wire orientations	x
New Instruments		Instrument arms moved? (avoid this)	x
GPS		Serial numbers and instrument type	x
Differential GPS meas.?		GPS on AWS?	x
Not used in 2005		datafile and GPS instrument	x
		Position of Site	x
		Elevation of Site	x
		Seal Enclosure ports	x
		Synoptic Observations?	x
		Temperature string info	x
		Level surf. By mast? Fan?	x
		Local topog. slope?	
		Snow Pit Densities, who has the data	
Final Platform Check		Mast Extension holes, time taken	
		wiring	

Humboldt 5/27/03

- Ants buried except for top pot hole
now, have dug deep in snow (approx 2 m)

① TRK ② = 110 cm

② Wind ② = 115 cm

L-77 m is 6 min. 5 sec

Year 14 of 66 - 2009

radiometer and +
2 omni's buried

262 cm from Surface to lower Arm

39 cm from Arms to Instrument

- 301 cm Wind TRK ① after extension

- need pot hole information to calculate height of
TRK ② and wind ②

- Notes:

① Cut arm (mash) and used two sleeves to extend tower, had multiple years of height

② Extended power cables by 10 m, had cable for next extension

③ Will replace new temperature string in 2005

GC-NET AWS CHECKLIST	
Field technician names problems on arrival?	Site: Humboldt 5/27/03
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)
Transmitter	Reset/program transmitter
Data Logger	How Much drift of Data logger time?
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute:
Radiometers	Weather conditions during calibration Tilting angles (elev/and azimuth)? Level Radiometers
In Survey	Replace Net Radiometer Dome and Desiccant Ice in net radiometer domes on arrival Wind1 axle height before and after maintenance Wind2 axle height before and after maintenance maintenance Radiometer height before and after maintenance Enclosure height before and after maintenance pieces
	Profile Arm Orientation Snow height 1 orientation Snow height 2 orientation Enclosure orientation Guy wire orientations
New Instruments	Instrument arms moved? (avoid this) serial numbers and instrument type
GPS	GPS on AWS?
Differential GPS meas.?	datafile and GPS instrument Position of Site: Elevation of Site: Seal Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data Mast Extension notes, time taken
Platform Check	wiring

Humboldt continued:

- ④ Have 1 power loop with 2 voltmeters, linked power for solar panels, transmitter + datalogger
- ⑤ 1 HMP 45 c not working, all the others - have ice + snow in radiation shield - top pyranometer, most melted off SW!
- ⑥ Radiometers instruments well buried on ground, with ice in dome(s)

Required for next visit

- ① Consider new mounting bracket for enclosure, now only attached at bottom with cable
- ② HMP 45 c
- ③ Temperature string (2005)
- ④ Power cable + possibly new batteries if not transmitting

**GC-NET AWS
CHECKLIST**

Field technician names
problems on arrival?

Data

Transmitter

Data Logger

Profile Instr. Calibration

Radiometers

NR-600

Site Survey

26 Jan

New Instruments

GPS

Differential GPS meas.?

Checklist

Site: Summit 6/1/03

File No. 6001

mark

Download Data from Logger (datafile name)

Backup data on zip disk or memory card

Upload new program (name)

Reset/program transmitter

How Much drift of Data logger time?

Starting Julian Day, Hour, and Minute:

Ending Julian Day, Hour, and Minute:

Weather conditions during calibration

Tilting angles (elev and azimuth)?

Level Radiometers

Replace Net Radiometer Dome and Desiccant

loc in net radiometer domes on arrival

Wind1 axis height before and after maintenance

Wind2 axis height before and after maintenance

maintenance

maintenance

Radiometer height before and after maintenance

Enclosure height before and after maintenance

pieces

Profile Arm Orientation

Snow height 1 orientation

Snow height 2 orientation

Enclosure orientation

Guy wire orientations

Instrument arms moved? (avoid this)

serial numbers and instrument type

GPS on AWS?

datafile and GPS instrument

Position of Site:

Elevation of Site:

Seal Enclosure ports

Synoptic Observations?

Temperature string info

Level surf. By mast? Fill?

Local topog. slope?

Snow Pit Densities, who has the data

Summit General notes

Height 100 ① TKE & 156 cm

② Wind @ 153 cm Wind @ 271

- lower profile elevation, n° mast instruments up
- 107 cm to profile arm
- 110 cm separation between profile arms
- heat cable for power - temperature strong
- datalogger time out
- wind 2 46 cm above arm
- General notes

① Wind ② missing tail (bottom), needs replacing

GC-NET AWS
CHECKLIST

	Site: Napa E	mark
Field technician names problems on arrival?	Nic & Craig <i>interior part</i>	
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card	✓
	Upload new program (name)	
Transmitter	Reset/program transmitter	
Data Logger	How Much drift of Data logger time? <i>drift 11.5 min</i>	
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: 150 2230 Ending Julian Day, Hour, and Minute: 151 2009	
<i>clear, windy 7 m/s</i>	Weather conditions during calibration	✓
Radiometers	Tilting angles (elev/and azimuth)?	
	Level Radiometers	✓
	Replace Net Radiometer Dome and Desiccant	✓
Site Survey	Ice in net radiometer domes on arrival	
	Wind1 axle height before and after maintenance	
	Wind2 axle height before and after maintenance	
<i>190 cm</i>	maintenance	
	Radiometer height before and after maintenance	
	Enclosure height before and after maintenance	
<i>190 cm</i>	pieces	
<i>Enclosure</i>	Profile Arm Orientation	✗
	Snow height 1 orientation	✗
	Snow height 2 orientation	✗
	Enclosure orientation	✗
	Guy wire orientations	✓
New Instruments	Instrument arms moved? (avoid this)	
GPS	serial numbers and instrument type	
Differential GPS meas.?	GPS on AWS?	
	datafile and GPS instrument	✗
	Position of Site: 75° 00' 03" N 175° 59' 48" W	
	Elevation of Site: 2606 m	
	Seal Enclosure ports	
<i>Next for next visit</i>	Synoptic Observations?	✗
<i>in the part</i>	Temperature string info <i>Need new string!</i>	
	Level surf. By mast? Fill?	
	Local topog. slope?	
	Snow Pit Densities, who has the data	✓
	Mast Extension notes, time taken	✗
Final Platform Check	wiring	

Napa E : May 30 2003

- ① Datalogger time slow : 1 hours + 6½ minutes
- ① Collected data (564060) values at 1940,
2 years of data 157 1500 - 150 1800
- ① Set time on datalogger at 807 / 2007 UTC

Height : T/KH ① T/KH ②

- ① T/KH ① 227 cm ② 230 cm ③ 370 cm
- ② Wind ① 227 cm - ② 230 cm
- Wind - ③ 374 cm

- 140 cm separation between profile height 1 + 2

- Set up calibration at 1030 UTC (2230)

- Thing with data point 0 UTC

- calibration of T/KH ① ② at 227 cm,

wind ① + ② at 367 cm

Find:

- || ① Need new temperature string for next visit
- ① Will need to extend power cables

GC-NET AWS CHECKLIST	
Field technician names problems on arrival?	Site: Nage E contained Nic + Craig
Data	Download Data from Logger (datafile name) Backup data on zip disk or memory card Upload new program (name)
Transmitter	Reset/program transmitter
Data Logger	How Much drift of Data logger time? Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute:
Profile Instr. Calibration	Weather conditions during calibration Tilting angles (elev/and azimuth)?
Radiometers	Level Radiometers
<i>Level arm height</i>	
Site Survey	Replace Net Radiometer Dome and Desiccant Ice in net radiometer domes on arrival
	Wind1 axle height before and after maintenance
	Wind2 axle height before and after maintenance
	radiometer height before and after maintenance
	Enclosure height before and after maintenance pieces
	Profile Arm Orientation
	Snow height 1 orientation
	Snow height 2 orientation
	Enclosure orientation
	Guy wire orientations
	Instrument arms moved? (avoid this)
New Instruments	serial numbers and instrument type
GPS	GPS on AWS?
Differential GPS meas.?	datafile and GPS instrument Position of Site: Elevation of Site: Seal Enclosure ports Synoptic Observations? Temperature string info Level surf. By mast? Fill? Local topog. slope? Snow Pit Densities, who has the data Mast Extension notes, time taken
Final Platform Check	wiring

Added to google sheet:

- just vibratory conditions, winds approx 7 m/s²,
clear skies + -17°C at 0 UTC 20151

① had power at 59 100L - 120 1700 2005,
approx 60 days when power was down²

④ melt occurred in 200L, on JD 179, 120 + 183,
also 192 June 28-29 and July 2 2002

⑤ that precipitation + warmer in 02-03 compared
to 01-02

Precipitation 01-02 10-50 cm -> 48 cm

Precipitation 02-03 50 cm approx

⑦ power off at 1700 UTC May 31 (JD 151),
connected power transmitter + solar to small
lap. didn't load program, had C610
with extended 2 m/s memory

⑧ 2nd domes, had dome (lower) that was
pushed up, with tooling or bolts

⑨ ended calibration at 2000 UTC, 20151.
went for 20 hours between 0-2000 on 20151

⑩ collected all data that JD 152 0000 UTC

Position: 75°00'03"N 29°59'43"W

GC-NET AWS
CHECKLIST

	Site: Napa II 6/1/03	mark
Field technician names	Kerry, Russ, Chris, SASKIA, NICOLESS	
problems on arrival?	No data, CT error?	
Date	No data	
	Download Data from Logger (datafile name)	
	Backup data on zip disk or memory card	
New program?	Upload new program (name)	
Transmitter	Reset/program transmitter	✓
Data Logger	How Much drift of Data logger time?	-
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute	
No calibration	Ending Julian Day, Hour, and Minute	
Radiometers	Weather conditions during calibration	
	Tilting angles (elev/and azimuth)?	-
	Level Radiometers	✓
	Replace Net Radiometer Dome and Desiccant	✓
	Ice in net radiometer domes on arrival	
Wind Arm	Wind1 axle height before and after maintenance	
	Wind2 axle height before and after maintenance	
	maintenance	
	Radiometer height before and after maintenance	
	Enclosure height before and after maintenance	
	pieces	
	Profile Arm Orientation	
	Snow height 1 orientation	
	Snow height 2 orientation	
	Enclosure orientation	
	Guy wire orientations	
New Instruments	Instrument arms moved? (avoid this)	
GPS	serial numbers and instrument type	
Differential GPS meas?	GPS on AWS?	
	datafile and GPS instrument	
	Position of Site	
	Elevation of Site	
	Seal Enclosure ports	
	Synoptic Observations?	
	Temperature string info	
	Level surf. By mast? Fill?	
	Local topog. slope?	
	Snow Pit Densities, who has the data	
Final Platform Check	Mast Extension notes, time taken	
	wiring	

Napa II : June 1 + 2, 2003

- ① Enclosure buried, with lower profile beneath the surface

Wind ② 122 cm

T/KH ② 118 cm

After extension

- ① Full arm about vertical 232 cm

① T/KH ② 263 cm - 31 cm above arm

② Wind ② 263 cm - "

① full arm separation = 142 cm

T/KH ① + Wind ① 33 cm about arm 2 - 175 cm separation

Notes ..

- ① No data or program on datalogger program, thus had to modify program

② Replaced Z × CS500 with Z × RMP456

③ Switched old program power with PT61016

④ Will need power cable cutters (heat and extra) and temperature string of red and white

GC-NET AWS
CHECKLIST

Field technician names
problems on arrival?

Date

Transmitter

Data Logger

Profile Instr. Calibration

Radiometers

Site Survey

New Instruments

GPS

Initial GPS meas.?

Site: Name it untenued

Mark

Download Data from Logger (datafile name)
Backup data on zip disk or memory card
Uploaded new program (name)

Transmitter program transmitter

How Much drift of Data logger time?

Starting Julian Day, Hour, and Minute:

Ending Julian Day, Hour, and Minute:

Weather conditions during calibration

Tilting angles (elev and azimuth)?

Level Radiometers

Replace Net Radiometer Dome and Desiccant

Ice in net radiometer domes on arrival

Wind1 axle height before and after maintenance

Wind2 axle height before and after maintenance

maintenance

maintenance

Radiometer height before and after maintenance

Enclosure height before and after maintenance

PIREOS

Profile Arm Orientation

Snow height 1 orientation

Snow height 2 orientation

Enclosure orientation

Guy wire orientations

Instrument arms moved? (avoid this)

serial numbers and instrument type

GPS on AWS?

datafile and GPS instrument

Position of Site

Elevation of Site

Seal Enclosure ports

Synoptic Observations?

Temperature string info

Level surf. By mast? Fail?

Local topog. slope?

- ⑥ Furukawa Super SW: T4520024 (1181018)
- ⑥ CR10 with 2MB extended memory datalogger,
with SM 716 storage module
- ⑦ Argos 11181 (10), system No: 372327

**GC-NET AWS
CHECKLIST**

	Site: Jar 3 , Jun 3	mark
Field technician names	Kim, Alice + Russ	
problems on arrival?	NSL 1130 arrival	
Data	Download Data from Logger (datafile name)	✓
	Backup data on zip disk or memory card	✓
	Upload new program (name)	✓
Transmitter	Reset/program transmitter	✗
Data Logger	How Much drift of Data logger time? 85 seconds	✓
Profile Instr. Calibration	Starting Julian Day, Hour, and Minute: Ending Julian Day, Hour, and Minute:	✓ -
Radiometers	Weather conditions during calibration	-
	Tilting angles (elev/and azimuth)?	✓
	Level Radiometers	✓
Site Survey	Replace Net Radiometer Dome and Desiccant ice in net radiometer domes on arrival	✓
	Wind1 axle height before and after maintenance	
	Wind2 axle height before and after maintenance	
	maintenance	
	maintenance	
	Radiometer height before and after maintenance	
	Enclosure height before and after maintenance	
	pieces	
	Profile Arm Orientation	
	Snow height 1 orientation	
	Snow height 2 orientation	
	Enclosure orientation	
	Guy wire orientations	
	Instrument arms moved? (avoid this)	
New Instruments	serial numbers and instrument type	
GPS	GPS on AWS?	
Differential GPS meas.?	datafile and GPS instrument	
	Position of Site:	
	Elevation of Site:	
	Seal Enclosure ports	
	Synoptic Observations?	
	Temperature string info	
	Level surf. By mast? Fill?	
	Local topog. slope?	
	Snow Pit Densities, who has the data	
	Mast Extension notes, time taken	
Final Platform Check	wiring	

Jar 3 : Afternoon 2002

① 1 minute 25 seconds too fast (datalogger)

① Heights ① T/K1 0 365 cm

② Wind ② 365 cm

③ Collected all data, stored programs, new task

④ Cut old mast, took down to Boulder-Kangaroo

⑤ Only haul 1 bolt in each end of enclosure,
mast is approx 5m

Heights : Mast housing

① Arm (probly) = 48 cm

Wind ② = 84

T/K1 ② = 82

③ Bar separation = 127 cm

T/K1 ② = 39 cm above arm 2

④ Wind sensors oriented south using declination 40°W, haul last orientation

After exterior, assuming 40°W

- ① Tower not quite level, $2-3^{\circ}$ to East
- ② Old domes: previous domes just shaded, no ice in them

Notes:

- ① External damaged during lowering.
need new external or alternative to
shinglets, just attached at bottom

- ② Need temp. string
- ③ New Q* would be useful, old is
damaged - taped only

- ④ Dropped tower instrument with strings +

rope

- ⑤ Leveled SWL + Q*, original SWL is
level

final comment

- ① Water running in rivers near stations
- ② Huge volume of water in soil moist,
rapid melt

June 4 2003 : Sondrestrom Fjord

- ① Hand crane + tripod yellow box with all equipment (now the green box)
- ② 2 cumalongs
- ③ Cargo straps
- ④ Calsoft x 3
- ⑤ Crane plates - accessories
- ⑥ Gravel bolt
- ⑦ SMS cleat
- ⑧ Lope x 3

In storage

- ① Tripod
- ✓ ① 1x summit extender without shear
- ✓ ① 1x SMS extender with shear
- ✓ ② 1x SMS cleat (in green box)
- ✓ ① 1x JMKZ 1 inch mast / extension
- ✓ ① 1x SMS lower piece (small top section)
contained next page

Rademond : June 4 2003

- ① Hand balloons x 58
- ② radianders = 35
- ③ 7 balloons per gas bottle
- ④ 20 m cable from box to antenna

SMS ⑦ : Notes : Station SMS 15 ④

- ① Height = 3.72 m plus small junction
= 107 cm junction plus 1 bulb mast
 - didn't measure heights or take photo of station
 - hand above heights, 107 cm junction to protell arm. Thus have heights from there
- removed June 6 2003

- ✓ ① Jet 3 inch morts x 3 + 1 sleeve
- ✓ ② 4 inch, extensions 1m/s with sleeve
- ✓ ③ thin wall 615 poles = 20 3.1 m
- ✓ ④ 5 probe arms (and tips = prices) - 5-10
- ✓ ⑤ 1 3inch Jet 3 mort sleeve
- ⑥ 1 ground table
- ⑦ bottles 24 x 18 amp hr
- ⑧ Steam drills x 2
- ⑨ Jacked rolls x 46
- ⑩ Fours, typed together
- ⑪ Camsat arm x 2

Almenrohr

May 7, 2004

J0 130

Very little snow accumulation

Surface heights:

A' 282 cm

Arm height ① 173 cm ② 125 cm - between 1+2

Wind ① 203 cm

KII/T ① 184 cm

Wind ② 328 cm } check work

KII/T ② 309 cm } numbers

Jurichus ~ 70 cm

Erosions 177 cm

SW 290 cm

Snow depth Sonic ① 18 cm (East)

Sonic ② 3 cm (West)

Surface-T 295 cm

Snow height ~ 26 cm ① 20 cm ②

Comment
- had a mole around the tower, perhaps mud surface freezing

- 4 minutes too cool on stakes, bad with our winter
- need to account for this, Δ of time 1508

Location

$80^{\circ} 41' 00'' N$	$24 m$
$60^{\circ} 17' 53'' W$	

Added to google sheet

Height = 24 m above the surface
= 25 m on GPS navigation

Snow variable, between about 3-20 cm.
once walked on very little

- Thermocouple of us string 3 is 69 m above surface
- 69 cm above sub (lit 5)

metres from pole 5	snow depth at \pm 1 m's			
	N west	S west	E east	W east
12	2 cm	2 cm	2 cm	21 cm
13	5 cm	13 0.6 ft	1	2
14	4	20	2	2
15	9	5	2	1.5
16	3	17	15	3
17	1	12	2	1.5
18	2	11	14	1
19	11	2	2	1.5
20	4	2	10	4
21	3	2	2.5	15

GPS pole height Above snow 63 cm

1900 UTC

- arrived on site to check the lead, changed O₂ domes
- finished about 1945
- last night

- note filamentary AIDS continue

Peterson SMS

5/14/04

15:00 GHT

Location: $80^{\circ}36'12''N$
 $60^{\circ}03'13''W$

Added to google sheet

Elevation is 54 m

Sonic is above an L-shaped melt

Snow depth directly below Sonic = 12 cm
(26°1 to Infrared)
Ice to Arm Below wind is 240 cm

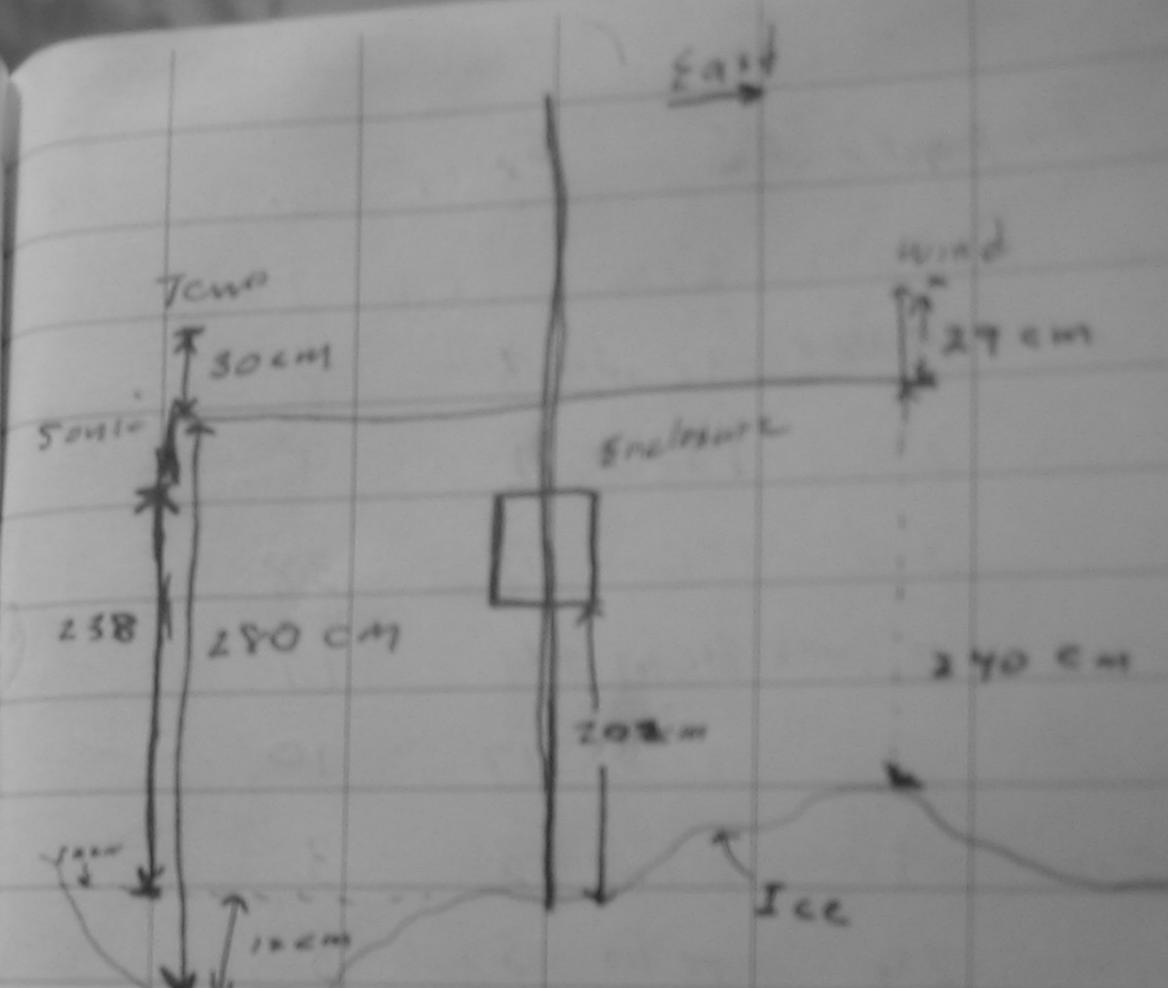
Note: Sonic is ~ below the Temp CIRM
(Temp)

Ice to Arm 280 cm (310 to temp
sensor)

Snow to Sonic $2\cancel{8} \pm 1$ cm

Ice to Bottom of Box

Ice to Radiation 274 cm



Clock is 30 s fast

Lower Radiation dome has some frost

Snow Depth

		N	S	East	W
5 m		3 cm	2 cm	2 cm	2 cm
10 m		3	3 cm	3	8
15 m		2	13 cm	2	4
20 m		3	18 cm	18	38
25 m		2	3 cm	4	17
30 m		3	3 cm	17	10
35 m		9	2 cm	3	3
40 m		29	5	3	3
45 m		2	11 cm	10	2
50 m		2	20	10	4

2-3 cm skinned snow w/drifting between
the big hummocks.

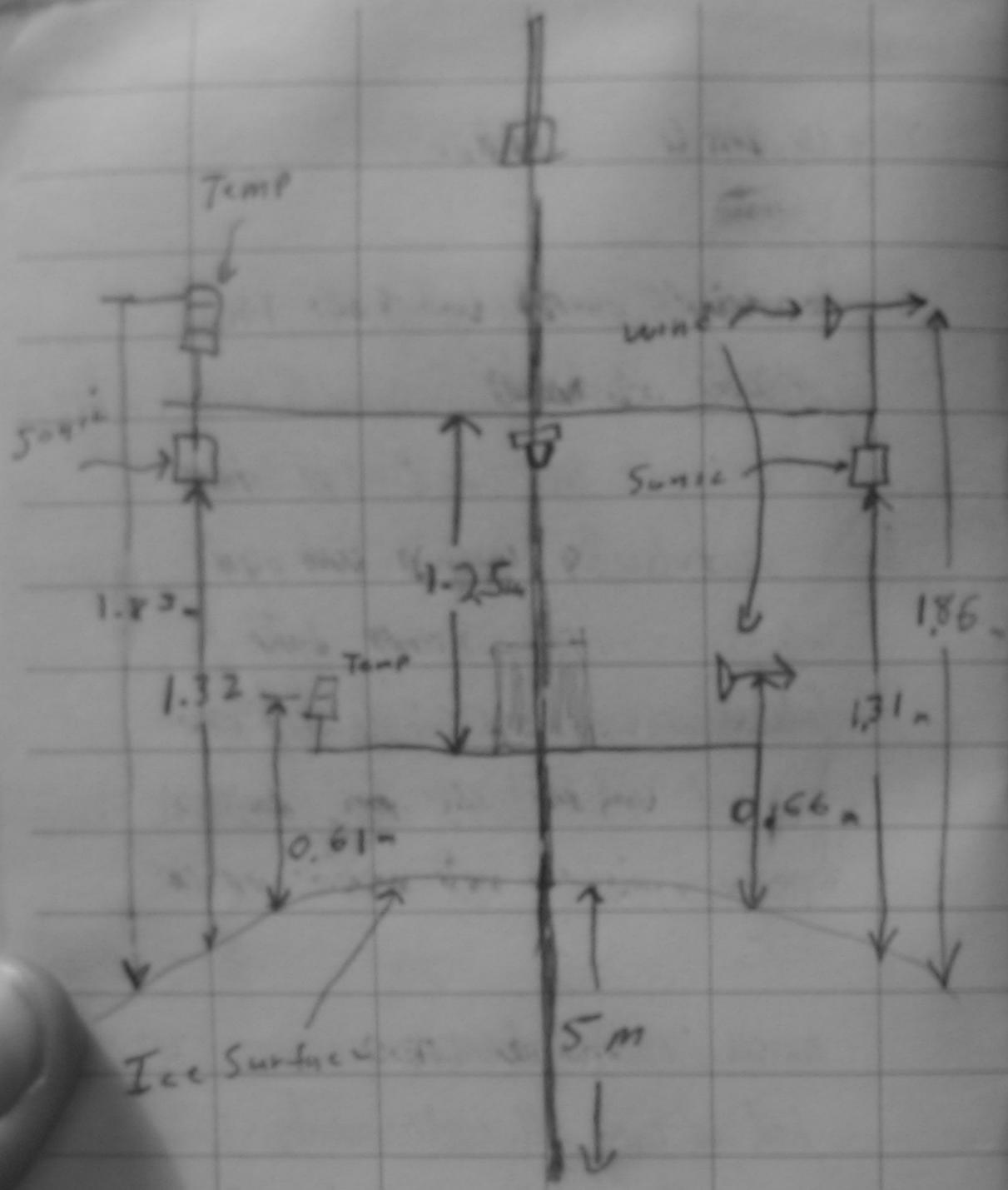
Depths are taken along 4 lines Radiating
from the pole outward every 5 m.
in the cardinal directions.

May 15, 2004 : Petermann AWS

- moved PINS into calibration mode
- started 2219 UTC, moved wind
to upper level and T/KH to
lower level

① Calibration 2219 UTC started,
ended calibration at 1900 UTC,
May 16, 2004

- moved station between 1900-2135 UTC,
had to move all instruments to
new tower
- used magnetic declination of 62°



Skin Temp Sensor 1.70 m
not
Radiation : 1.88 m

Original Pole is 87 cm above Ice
Thermistor string: H2 thermister is
69 cm above ice

May 24, 2004 JAR2

- departed Suus Camp at 1015, about $3\frac{1}{4}$ hours
- attempt to download failed when ladder supporting laptop fell over
- laptop continued to run but appeared to tail several of act on air
- started drilling at 230 pm, drilled 10 holes that all lost water up to 700 pm
- crushed drilling at 2130

Tower: leaning 16° towards ice sheet

Heights lower down 376 cm

W1 433 (+27) +/rh 433 (+57)

distances between arrays 196 mns

W: 36.5 mns E: 46.2 36 about array 2

series of 26 mns below array 2

next point at 0100

start acquisition:

① Solder for batteries

② Northhanded Commanders

③ Boxes

④ Level odometers

⑤ 2 next series

- drilled 5.7 m into soil + 6 mns deep
- re-drilled + installed

May 26, 2004 Arrived after 1530 (local)

started data collection

had time effect and lost power on

May 27, 2004

PC time: 15:50:00 GMT

Batlogger 00:47:18

- had 1.5 hour and 18 sec delay
- set datum clock off 1024 GMT

Note: had problems with clock.
downloaded program + sent back

- tool averages will be 3000. 3847
- will be a concern from they points to a problem
- see heights after \rightarrow 2 pages

that there are different sub-
types of lung cancer
and
the problem is you have
different
types of cancers and other
things

such as

mesothelioma

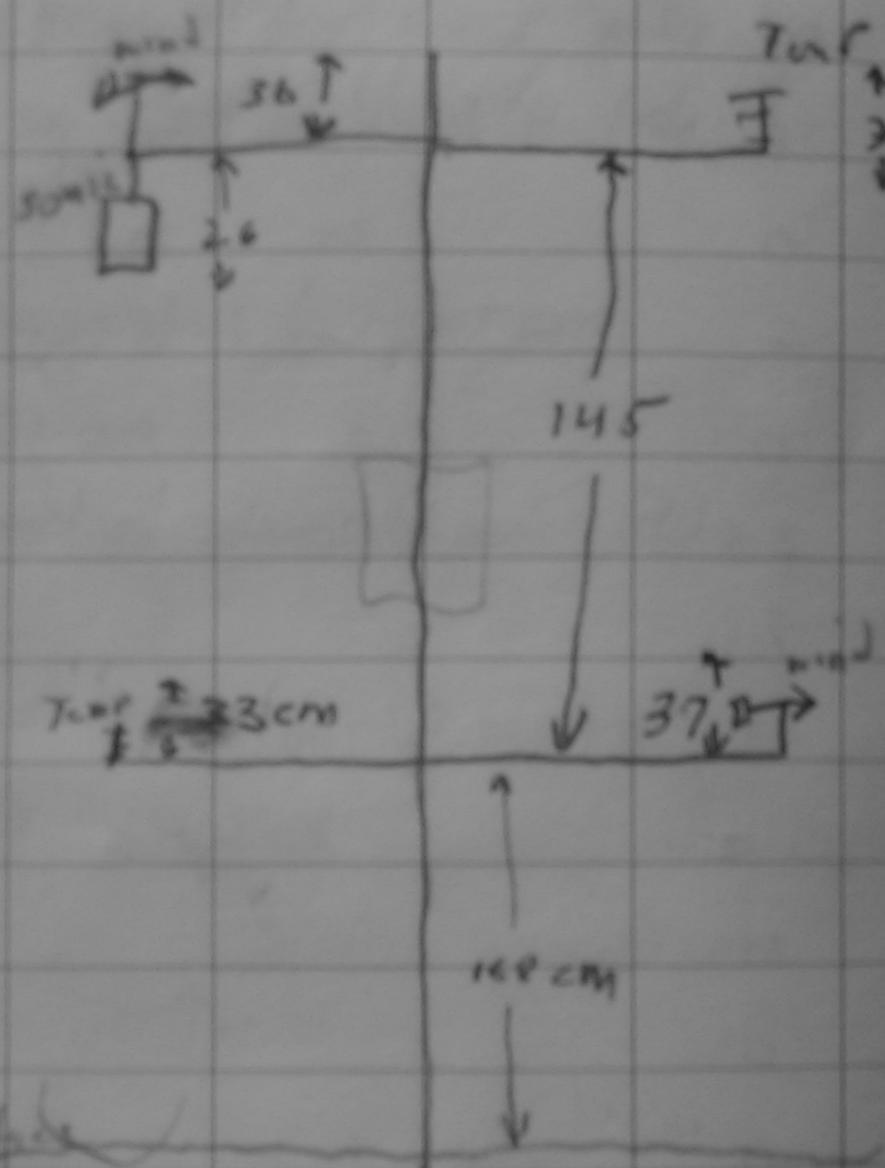
etc.

but we will find, like
all cancers

it will not all follow a
certain pattern and
will not all

5/26/04 Jar 2 completed station

GPS Solar panels are at 10° magnetic from the Tower at 20 m distance



Only 1 sonic

need 40° declination to set Radiometer

orientation. Tower is leaning $\sim 1^{\circ}$ west
Replaced Hwy 1 wind 1 & 50mH

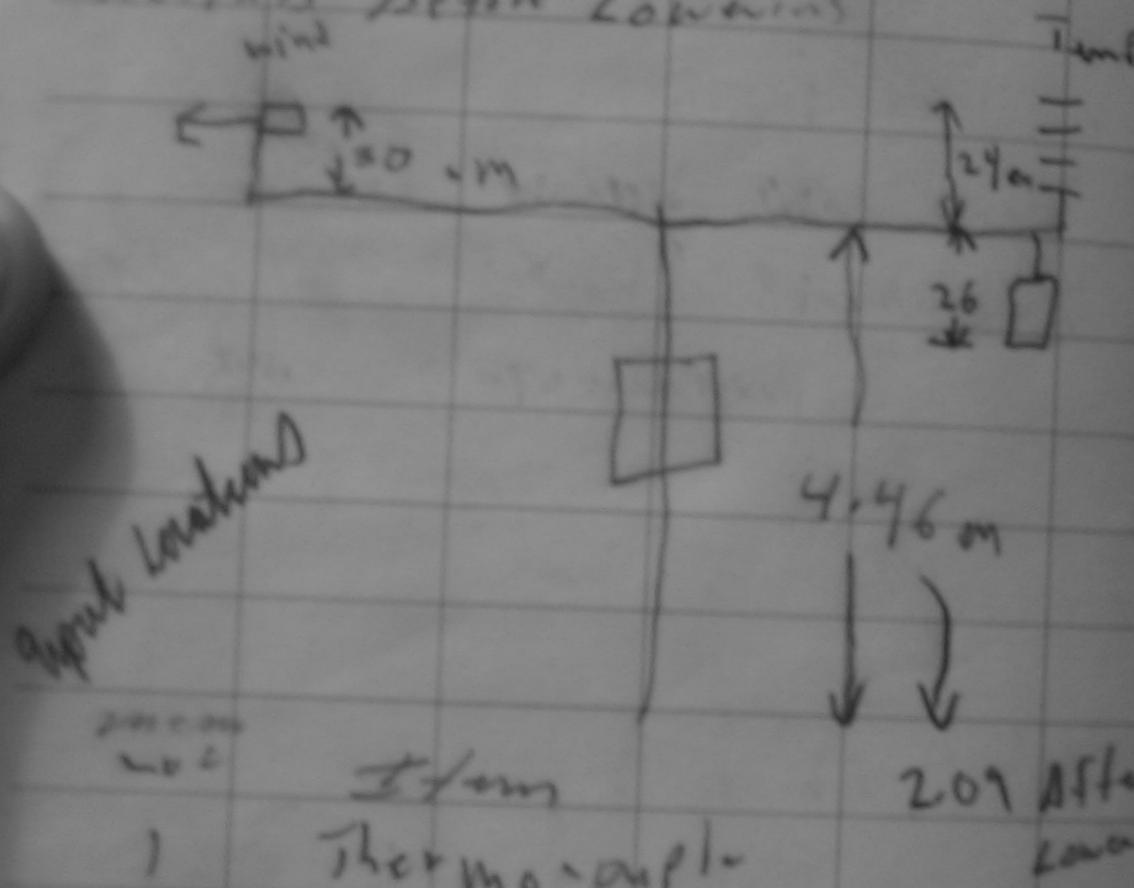
May 27, 2004 : SMS(3)

Heights below: Amg 1 above
surface

Tower is 6.6 m into ice

Boiled wood smear back to surface
using 40° magnetic declinations

heights before lowering



depth backhand

- | | | |
|---|-----------------|-----------------------|
| 1 | Thermocouple | 207 After
lowering |
| 2 | Hyp. Temp. | |
| 3 | Temp hum. & air | |
| 4 | w. Speed | |
| 5 | w. Dir. | |
| 6 | Sonic | 8-panel |
| 7 | Batteries | |

- ① 6.6 m into ice
- ② Charged sonic - nothing
- ③ Thermocouple (input 1) not working, tested with new and still not working: appears to be programming issue

Heights after melt + lowering

Amg 210 cm at most

trhi 234 cm

wind Ø 240 cm

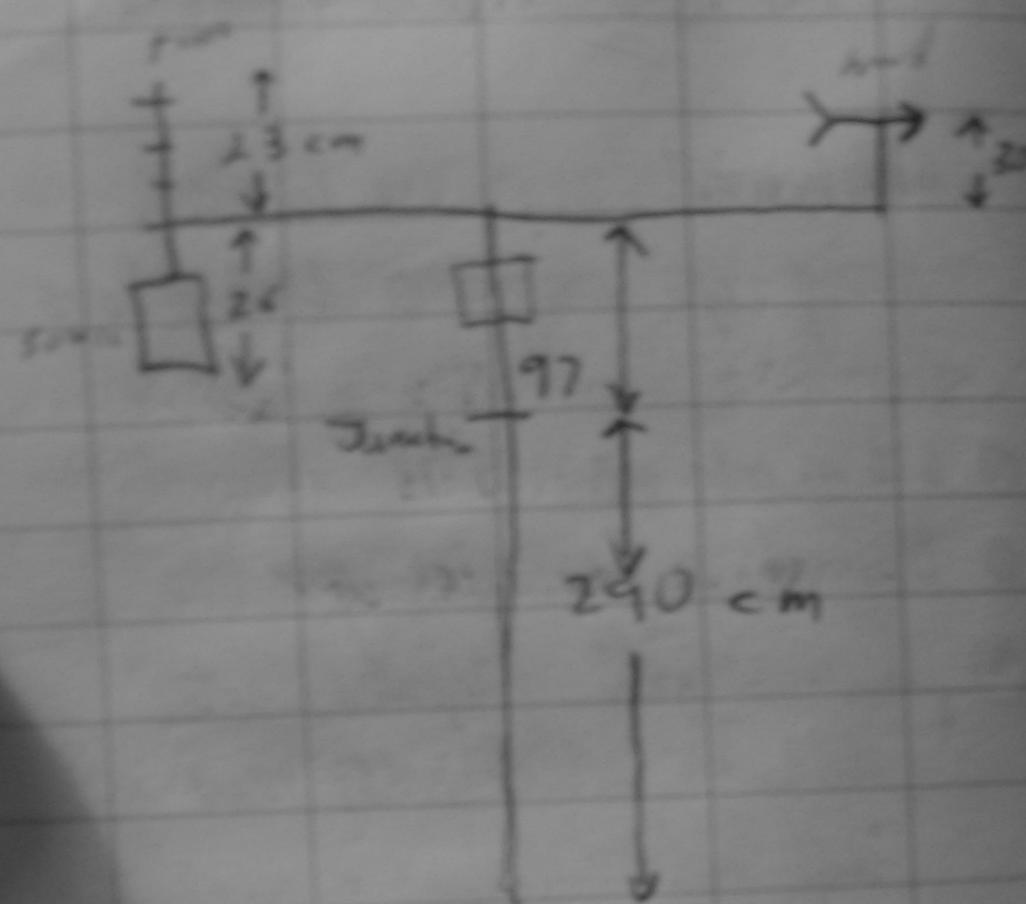
Junction 90 cm

- all above ice

new melt equipment 27
65

May 27

5/27 SMS-5



May 27, 2004

- brent yoke 5 over boat ice with anchor
spinning around the axis
- took heights, took off battery and
demarshalled tower at 1300 UTC
- dock sms-5 12:50:00 rc

12:48:30 sublogger

sublogger 21 minutes 38 seconds later

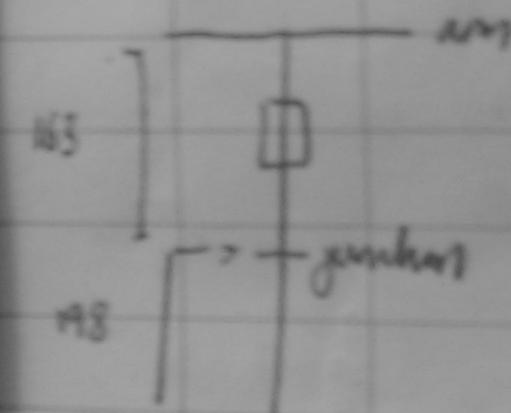
May 27, 2004 : 1500 UTC

Surface heights

Junction: 198 cm from sea

Snow depth 7-10 cm

Junction to Aars: 163 cm



- wind parking zenith with 40° deceleration
- charged SKSO, used instrument
from SMSS
- all channels working
- tower leaning 5.8° to 300' N (avg)

height after leaving 3000(?)

Avg.	167 m
T/KA	191 m
Wind	197 m
Surf	183 m
Flat land about 100	2 m

(msc) May 27, 1993

heights

171
179

171 m (below surface)

177 m (below surface)

171

171 m (below surface)

heights above sea level 3000 m
atmosphere 1 month 10 seconds above
surface elevation of wind at
wind leading bank
all instruments working

Note need to check 1993
payments, they don't
all appear to be the
same

Wind measurements used 30° declination
true N bearing 7.8° to 282° N

Task ① May 30, 2004

- laser leaning 10° to west (296°) using 40° mag.
- surface heights

Arm ① 381 cm (bars up)

- snow depth 98 cm at arm
- haul range of snow depths based on surface topography
87-98 cm

Star boring

Arm ① 200 cm (bars up)

Heights above snow

Arm ① = 110 cm

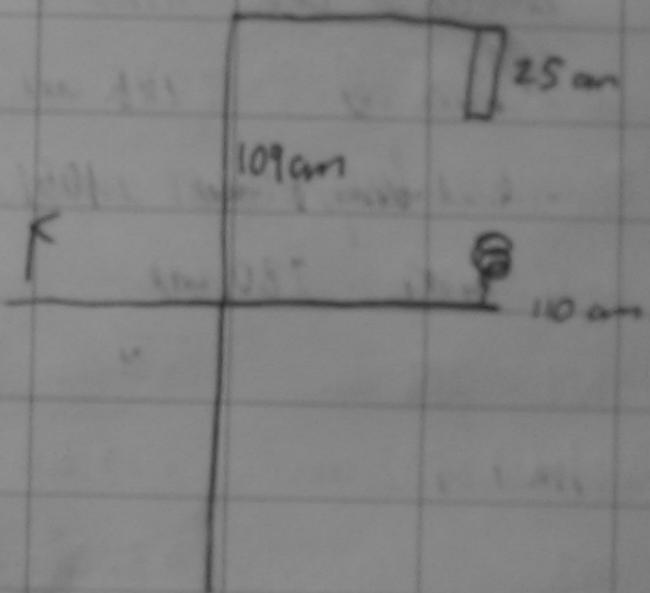
Arm ② 230 cm

KN/T ① = 155 cm + 45

Wind ① = 156 cm + 46

KN/T ② 275 cm + 45

- haul 120 cm separation between arms
- haul changed 2 series
- 109 cm about arm ① and 25 cm below arm



- haul about 1 m of snow at site, with 50-90 cm elevations
- all instruments working, did put ground into multiplexer
- haul snow density at back of truck
- Note: drilled mast into 3 m of ice

June 8, 2004 Swiss lamp tower

- tower was redrilled after falling over in 2003
- Heights after new mast

lower arm ♂ 175 cm

vertical between arms 105 cm

upper arm 280 cm

W1 206 cm + 31 cm (abut arm)

t/rh 1 202 cm + 27 cm "

W2 + 32 cm "

t/rh 2 + 27 cm "

sonic 1 (arm height) = 286 cm - 26

sonic 2 (arm height) = 299 cm - 26

Profile arm orientation 20° N

Q° zenith using 40° mag declination

June 10, 2004

Gantod trial 1658 UTC

Julian heights:

without (T) profile

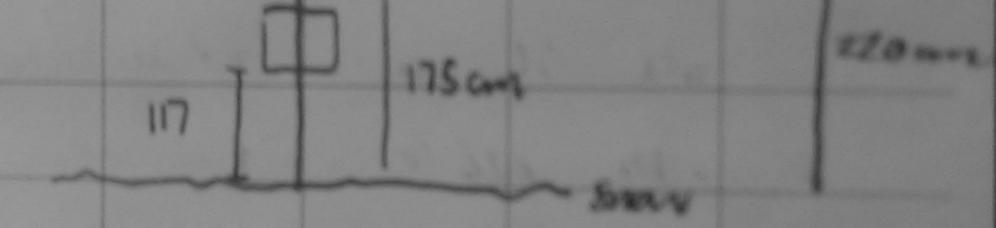
30. T

30. T

120 cm

30.

30 cm



- time accurate
- problems with panel temps - thermocouples
- all other instruments nothing
- 1 sonic instrument
- need new instruments (sonic) only have 1
- 10ml instruments - 10 ml

June 8, 2004 Swiss lamp lower

- tower was redrilled after falling over in 2003

Heights after new mount

lower arm ♂ 175 cm

vertical between arms 105 cm

upper arm 280 cm

W1 206 cm + 31 cm (abrel arm)

t/rh1 202 cm + 27 cm "

W2 + 32 cm "

t/rh2 + 27 cm "

series 1 (arm height) = 296 cm - 26

series 2 (arm height) = 299 cm - 26

- Profile arm orientation 26° N

- R^o south using 40° may delineate

June 10, 2004

Crawford Point 1658 UTC

Surface heights:

difficult to mount

30. " "

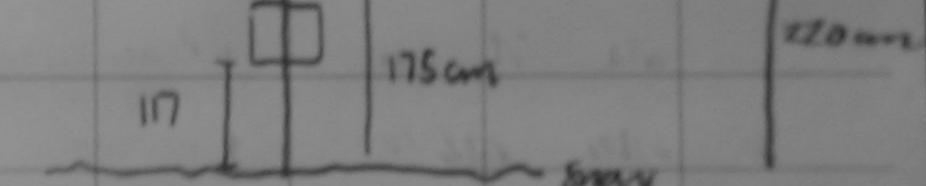
30. " "

30. " "

did not do dunes

♀ 30.

♀ 30 cm



- tool accurate

- problems with panel temps - thermocouples

- all other instruments working

- 1 min instrument

- need new instrument (series), only
has 1

- some instruments need not be big

Bottom: Coated part

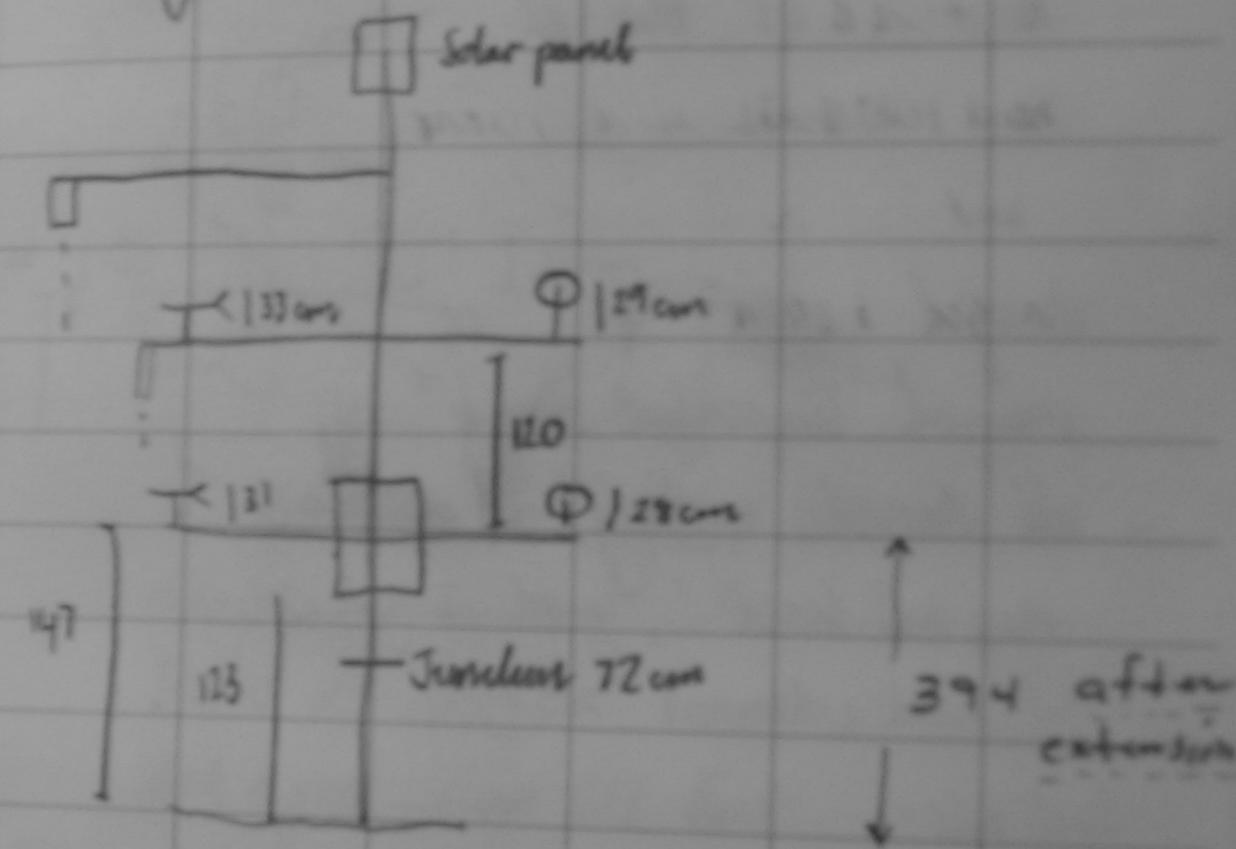
- fuel temp was 44°C
- had measurements of about 7.1-6.9 for $t_{\text{c}1} + t_{\text{c}2}$
- thermistor string data perhaps a little high
- ≈ 42 fuel temperature correct?

Jan. 11, 2004

NASA SE

Time: 1400 GMT - (clear skies, sun at 6°C)

Heights:



Time: Time is exact. 12:02:24 GMT

Indications: All working except wind speed!

R.H. ① too high, otherwise good

Data: 287147

: wind laptop ended

and good - will not mind
a little
imported drug

Wish you to do so

Yours very truly

Frank C. Smith
Frank Imported Drug
A monthly writing to Captain
John Hill house - just to you
will forward to you

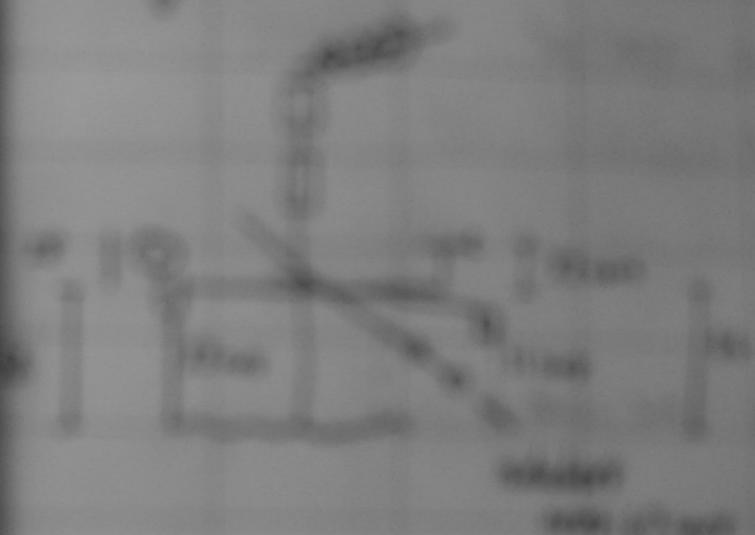
and all

2nd house - present and will not
be sent elsewhere (now)

And same price as above (not good)

John & son - salter

Good man (and)
Hoping to do



Dear friend John

Frank & son

and a good house (not bad)

and a house all right

Frank house and will not be sent

elsewhere (not good)

and a house good as house

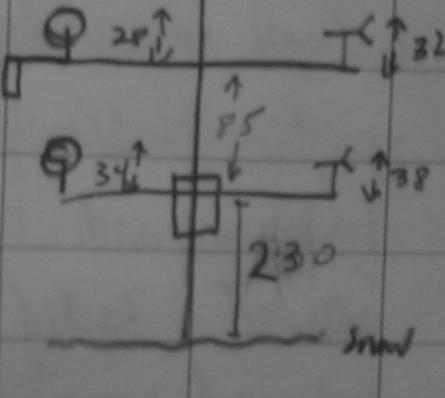
Frank house and (not good)

Frank house

Frank house

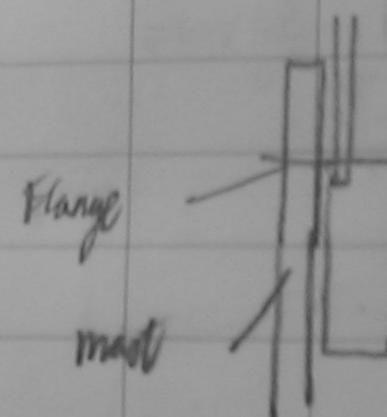
- put new power cable on, 10m/m²
- each line: (1) datalogger and
(2) transmitter
- replaced wind propeller
- some vibrations but still good
- hasn't found weak areas on cables
- dug own pit: see back of book
- will need to replace tie string at next calibration
- needs to be extended in 2005

Heights after:



Other comments:

- (1) Enclosure not attached at bottom rod, could extend bar or attach to mast



- (2) Will require extension in 2005
- (3) Need new tie string

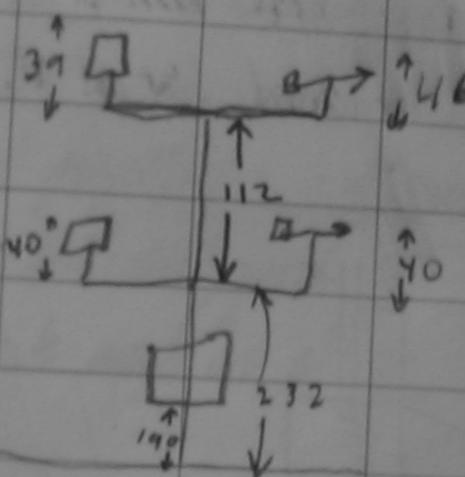
- (4) Replaced sonic 1, both sonics working

Dig 2:

Area 6/meters

Arrive: 10:43 local

All sensors and sonic H2 are functioning



Date: 30/11/12

- use storage module to download
- replaced sonic
- dug snow pit - see back of book
- all instruments working

Note: Clock 17 minutes slow, CR5
not powered (5V)

- Set clock + gain GPS 5V.
- time 1400 UTC

Final Comment: Dig 2

- will need to strengthen next level
- have power cables for next extension?
- extension in 2006 (or 2005 & big
snow year)

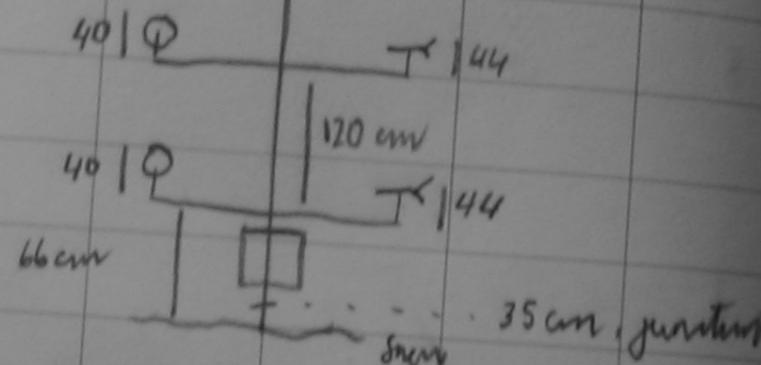
June 14, 2004

Surveillance: Annual 1237 AMT

Alt: GPS lone - working

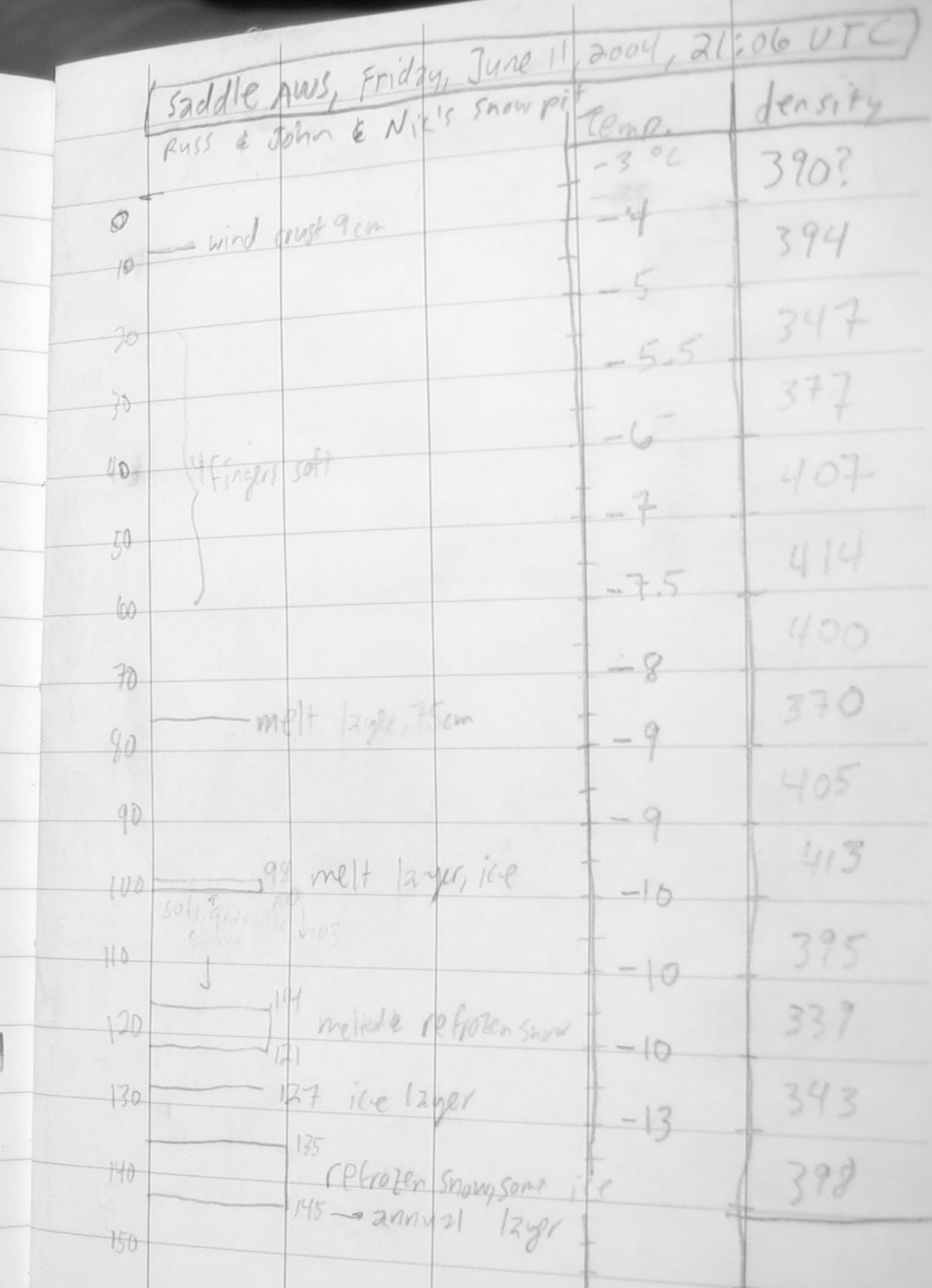
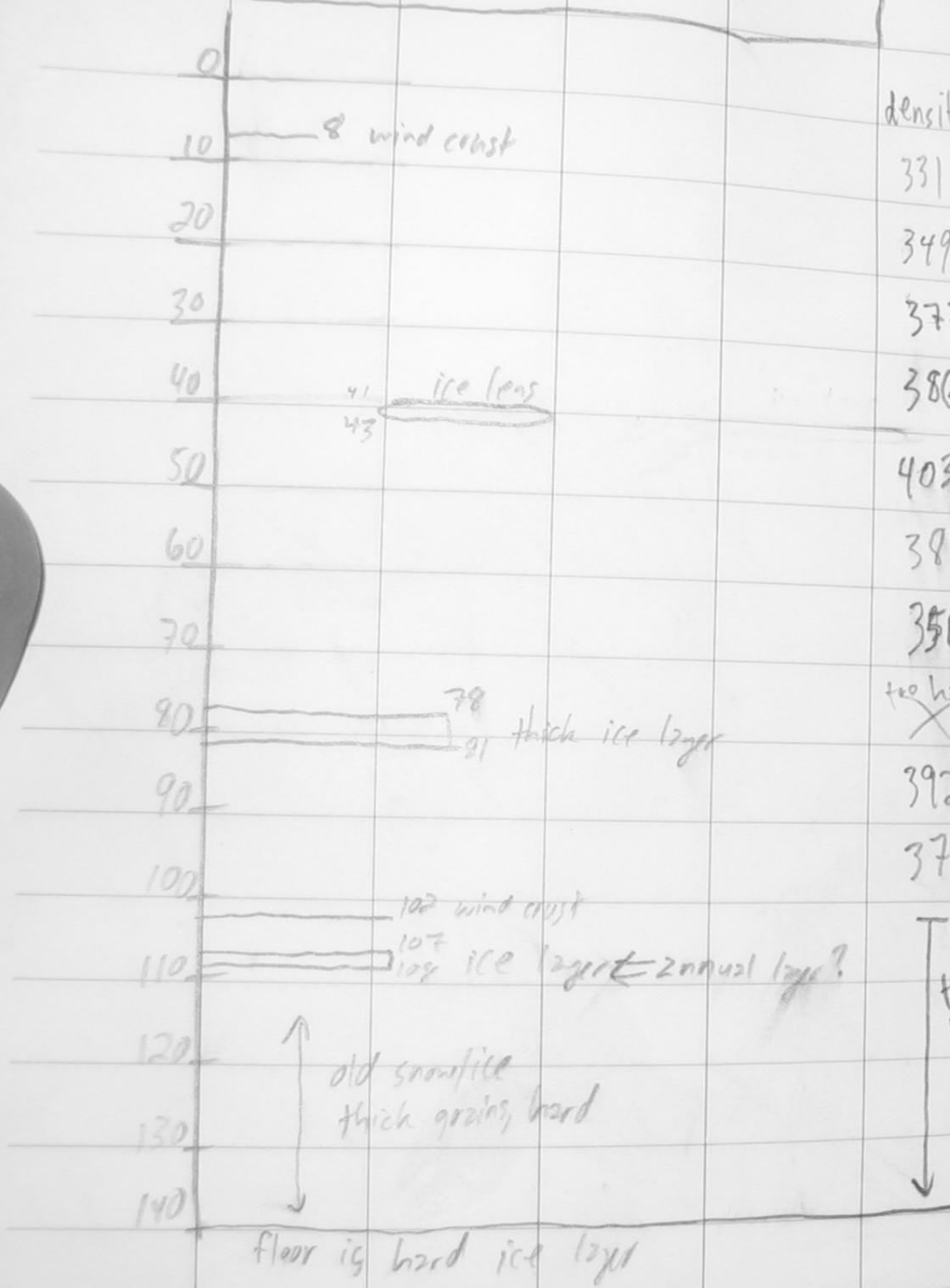
Heights:

- wind ① has damaged tail
- soniv 2 needs updating
- collected 83% of data

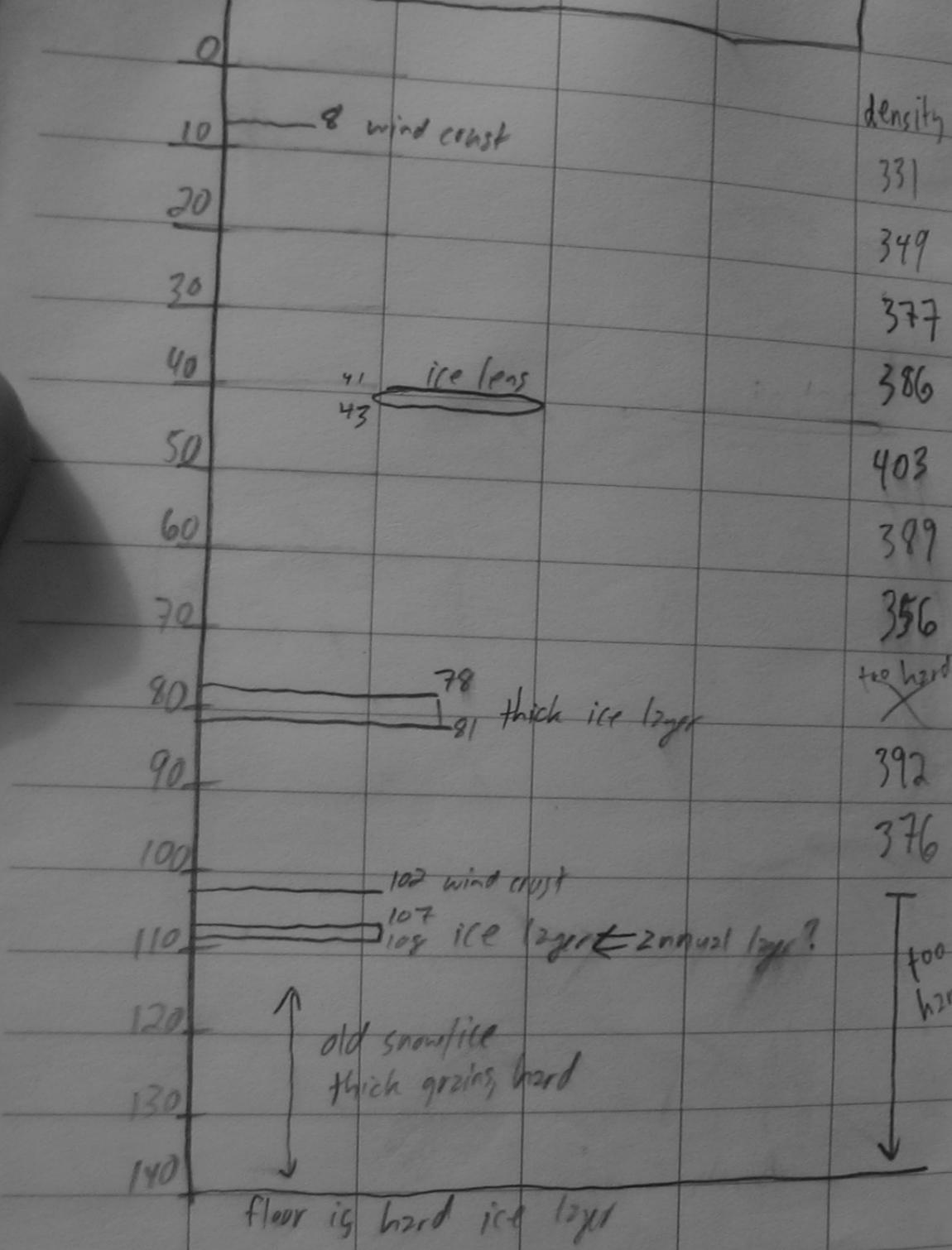


- have NK hts
- soniv height
- junction of towers at endmost
- tower will be slightly buried - endmost, but all endmostments will remain above the surface
- have power cable + temps - string for 2005 extension

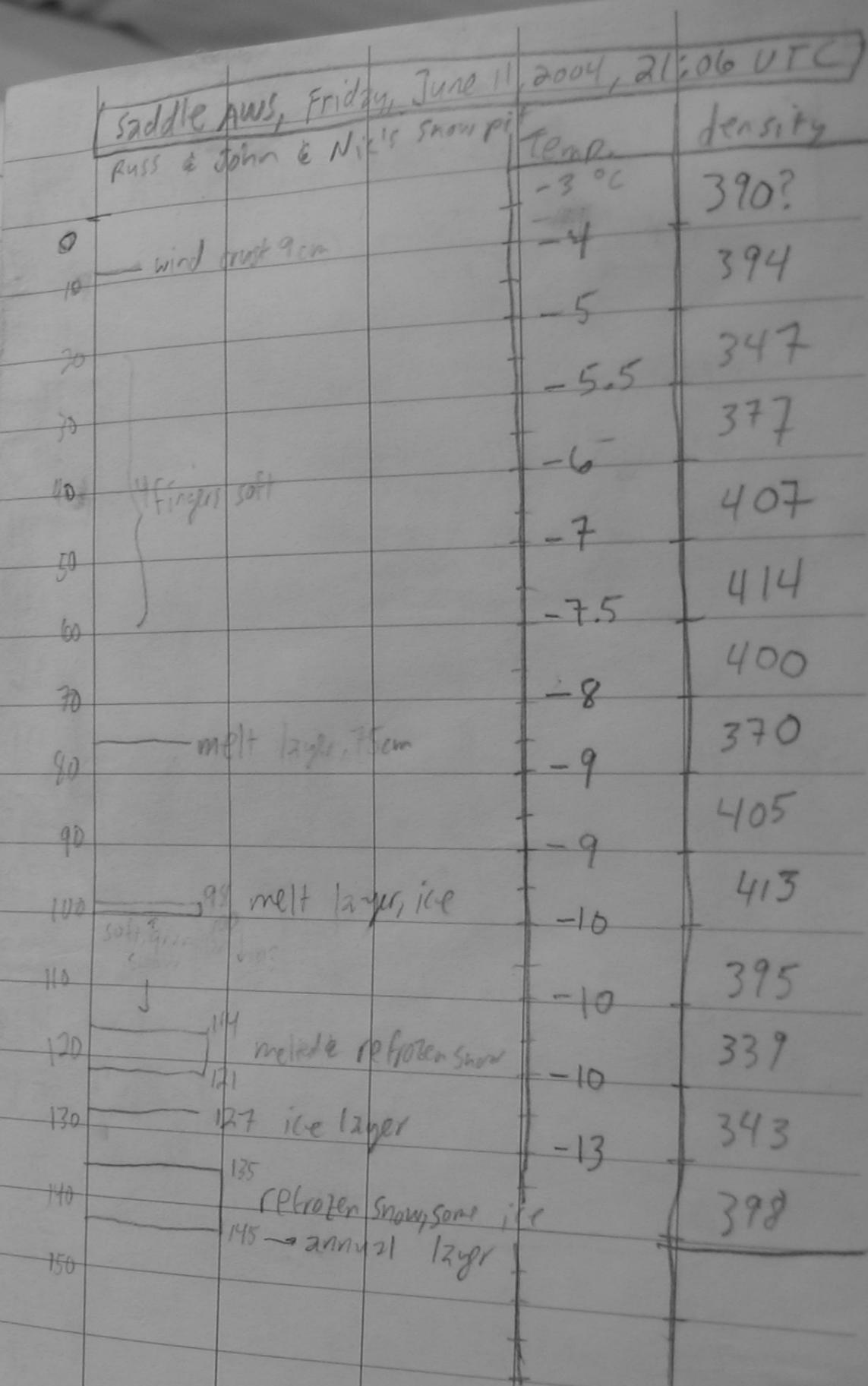
Dye-2, Saturday, June 12, 2004, 13:31 UTC
Snow pit by John Maurer



Dye-2, Saturday, June 12, 2004, 13:31 UTC
snow pit by John Maurer



saddle AWS, Friday, June 11, 2004, 21:06 UTC
RUSS & John & Nic's snow pit



149-171
174-182
154
353
402

NASA-SE, Friday, June 11, 2004, 13:12 UTC

snow pit, by John Maurer

cm

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

hard top layer

↓ ↓ ↓ hard snow
↑ ↑ ↑ soft snow, continuous

wind crust,
continuous

130
131
Snow falls out
possibly
at these two
lines

153: below this layer, snow has
noticeably larger grains.

165: ice layer, thin, continuous

annual layer, light blue ice, continuous

169
171

178
192 → heat
frost, continuous

density

402

364

376

344

382

396

414

437

398

423

418

419

404

424

426

393

426

369

Jar ① 2004 snow density

0-10 595

10-20 525

20-30 495

30-40 400

40-50 376

50-60 386

60-70 387

70-80 365

80-90 381

90+

JAR① : Snompit 2004

May 30, 2004 1700 UTC

- clear skies, wind
- depth to ice 97 cm

Temp

0°C

0

Surface snow

7

melted grains, rounded

17

ice lens

27

ice lens

34

ice lens

62

depth hor

111

depth hor

77

depth hor

11

depth hor

90

97 cm

Temp: 0 m - 0°C, 10 m - -0.2, 20 m - -0.5, 30 m - -0.1
40 m - -0.1°C, 50 m - -1°C, 60 m - -2.0C, 70 m - -2.0C
80 m - -2.5°C, 90 m - -4°C

HWS goes regular

1 wf

2 sl

3 si

4 a°

5-14 tc1-10

15-16 tc1-2

17-18 long 1-2

19 rh1

20 rh2

21 u1

22 u2

23-24 wd1+2

25 prout

26 snow 1

27 snow 1

28 bald

29 xmt power

Notes: Related to this pit

① Top of metal marks for radar

② 62 cm

③ 93 cm

④ 150 cm

No. E: Snow stratigraphy

June 2 2003

0 surface

-26 Wind crust (wc)

Fine grained, new
seasonal snow

-56 Wind crust

met^a
fuzzed

62-72

72

75

76

78

80

82

85

88

90

92

95

98

100

102

105

108

110

112

115

118

120

122

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466

468

470

472

474

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490

492

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496

498

500

502

504

Naga U : snow density June 2 2003

0-10	307		
10-20	315	170-180	385
20-30	341	180-190	403
30-40	357	190-200	427
40-50	373	200-210	434
50-60	313	210-220	391
60-70	322	220-230	373
70-80	404	230-240	340
80-90	388	~443	ICC Lens
90-100	397	250-260	ICC Lense
100-110	1cc Layer	260-270	333
110-120	398	270-280	378
120-130	399	280-290	408
130-140	381		~386
140-150	400	400' on	
150-160	333	down - Vert	
160-170	359	Dense - knife	
		hard	

111
718
443

1114
720
816

Naga U : snow temperature

(cm)	0	-5.7	170	-17.7
10-	-8.4	180	-18.8	
20	-9.5	190	-18.8	
30	-11.2	200	-17.2	
40	-11.2	210	-17.2	
50	-12.3	220	-18.4	
60	-13.0	230	-19.1	
70	-13.3	240	-19.5	
80	-14.0	250	-18.7	
90	-15.9	260	-19.0	
100	-16.5	270	-19.4	
110	-16.8	280	-20.0	
120	-17.5	290	-20.0	
130	-17.2	300	-20.4	
140	-17.0			
150	-16.9			
160	-16.6			

Nova E : Snow pit 30/5

- 0 - soft new snow
- 10 - fine grained
- 21 - ~ wind crust
- = 3 wind crusts
- 46 - death hoar $\times \times$
 $\times \times$
- 50 - rounded mica crystals, old
wind crusts
- 64 - ice lenses, 4 cm, distinct but
multilayered
- 70 - multilayered
= skins of small crusts
- 100 - ~ wind crust
- 110 - soft layer, crusted
- 130 - faceted crystals \rightarrow crusted
- 135 - crust, with wind crusts
- 150 -

annual layer or
heat approx
50-60 mm/month

↓ here
multilayered
lenses in this
region

Nova E : Snow density, 5/30/03

0-10	340	70-80	294
10-20	380	80-90	309
20-30	354	90-100	313
30-40	308	100-110	349
40-50	235	110-120	325
50-60	422	120-130	361
60-70	388	130-140	375
		140-150	402

↓
water
snow

22
Snow Density - Humboldt

10 cm	361 g
20 cm	329
30	274
40	318
50	440
60	394
70	328
80	335
90	358
100	362
110	362
120	359
130	387
140	310
150	353
160	316
170	380
180	364
190	392
200	374

5/27/13 Humboldt Pt Russ Huff

5 cm	4cm thick hard wind crust
9 cm	soft snow
14 cm	3cm hard wind crust
17 cm	very soft snow
33 cm	knife hard wind layer - 5cm
38 cm	
40 cm	Refrozen melt snow
47 cm	↓ 2 cm ice lens
72 cm	Hoar from 47-72 cm
73 cm	wind layer - 1cm
106 cm	Homogeneous large rods - physical density changes - much thicker
118 cm	wind crust
152	Homogeneous hoar
	Increasing hardness to 2m

Snow Density - Humboldt		5/27/83 Humboldt Pt Russ Huff	
10cm	361 g	5 cm	4 cm thick hard wind crust
20cm	329	7 cm	soft snow
30	274	14 cm	3 cm hard wind crust
40	318	17 cm	very soft snow
50	440	33 cm	knife Hard wind Layer - 5cm
60	394	38 cm	
70	328	40 cm	Refrozen melt snow
80	335	47 cm	~2 cm Ice lens
90	358	72 cm	Hoar from 47-72 cm
100	362	73 cm	wind Layer - 1cm
110	362	106 cm	Homogenous large Rnd - 8x5cm
120	359		density changes - much thicker
130	387	118 cm	wind crust
140	310	152	Homogenous hoar
150	353		Increasing hardness to 200
160	316		
170	380		
180	364		
190	392		
200	374		

Wind Wining

nd p1 ~ p2

green $11\frac{1}{4}$ L

blue e2

Black + White + should AC

DKTA 3N - 3W
=

- snow at northern stake about 5 cm
- 192 cm from snow to stake top (height)
- 141 cm from snow to marker
- approx 146 cm melt

- snow at southern stake 27 cm
- 157 cm from snow to top of stake (height)
- 122 cm from snow to marker
- approx 149 cm = of total melt.

Peterson : May 9 2003

① KTK 3E

- northern stake has 13 cm of snow
- stake height = 202 cm
- snow to marker = 148 cm
- haul approx 161 cm of surface less,
including snow

- southern stake has 42 cm of snow
- stake height from snow surface = 179 cm
- snow to marker = 123 cm
- haul approx 165 cm of surface less

note: haul drifted snow at southern
stake, on lee of ridge