

AWS Field Report 2017-18

Field Team: Carol Costanza, George Hademenos, Andy Kurth, Matthew Lazzara, Marian Mateling, and Dave Mikolajczyk

1. Nov. 7 – **Lorne (99507)** clock is set to the correct time, no data card, power system not dugout
2. Nov. 21 – **Marble Point II (99503)** and **Marble Point (8906)** Successful inspection
3. Nov. 21 – **Cape Bird (99504)** Successful inspection
4. Nov. 21 – **Minna Bluff (99501)** Full of rimming, temperature sensor missing shield, tower leaning
5. Nov. 21 – **White Island (99505)** Successful inspection
6. Nov. 22 – **Phoenix (8908)** Installation without HMP and no transmissions
7. Nov. 26 – Phoenix (8908) Check transmissions
8. Nov. 29 – **Gill (8911)** Station raise with 5' tower section
9. Nov. 30 – **Alexander Tall Tower! (99601)** Station inspection
10. Dec. 1 – Gill (8911) Install new Paros
11. Dec. 6 – Phoenix (8908) Install HMP
12. Dec. 7 – **Pegasus North (99508)** and **Linda (99603)** Pictures of PGN, remove pressure sensor at LDA
13. Dec. 8 – **AWS1 (99604)** Install by Jan and Stef
14. Dec. 10 – **AWS2 (99605)** Install by Jan and Stef
15. Dec. 15 – Pegasus North (99508) Successfully remove AWS, including towers and guy wires
16. Dec. 16 – Lorne (99507) Raise power system, lower T, enclosure, boom, and remove Freewave modem
17. Dec. 19 – **D-10 (8914)** Download data from SD card and reformatted, SD card not recording new data
18. Dec. 24 – D-10 (8914) Install new program on CR1000 to start transmitting the HMP-155 temp sensor
19. Dec. 29 – **Kathie (8929)** Station raise with 7' tower section
20. Dec. 31 – **Bear Peninsula (8922)** Station inspection
21. Jan. 02 – **Harry (8900)** Raise lower instrumentation, dig out power system, install boom with ADG and solar radiation
22. Jan. 03 – **Austin (8901)** Station raise with 7' and 5' tower section
23. Jan. 04 – **Kominko-Slade (21364)** Station raise with 5' tower section
24. Jan. 05 – Kominko-Slade (21364) Finish station raise
25. Jan. 11 – **Janet (8936)** Station raise with 7' tower section
26. Jan. 12 – Janet (8936) Retrieve extra solar panel and power cable left at site; further secure antenna mount to tower with wire
27. Jan. 13 – **Evans Knoll (8923)** Attempt to install Taylor high wind system, but crevassing on the hill made the AWS unreachable
28. Jan. 15 – D-10 (8914) Install new program on CR1000 and new upper and lower temperature sensors
29. Jan. 16 – **Thurston Island (8930)** and Evans Knoll (8923) Boomerang at THI (too cloudy) but get more pictures of Evans Knoll snow/ice field and crevassing
30. Jan. 18 – Phoenix (8908) Recce trip to determine why the station is no longer transmitting
31. Jan. 20 – Linda (99603) Install new Paroscientific barometer
32. Jan. 20 – Phoenix (8908) Check Argos transmission issues, remove enclosure to troubleshoot at Crary
33. Jan. 24 – Phoenix (8908) Remove power system and solar panel
34. Jan. 27 – Lorne (99507) Install new Freewave modem, still not transmitting
35. Jan. 27 – **Willie Field (99502)** Swap power system, raise lower temperature and enclosure
36. Jan. 29 – Phoenix (8908) Reinstall enclosure and install new power system and solar panel
37. Jan. 30 – **Elaine (21357)** Station raise with 5' tower section and installed a new power system
38. Feb. 1 – **Windless Bight (99506)** Reinstall instrumentation on new tower
39. Feb. 6 – Alexander Tall Tower! (99601) Install new ADG sensor
40. Feb. 7 – Lorne (99507) Last attempt to fix Freewave modem
41. Feb. 7 – Minna Bluff (99501) Setup new guy system, replace temperature sensor, dig out deadmen
42. Feb. 8 – Willie Field (99506) Install Madison College temperature sensor and new PCWS board, etc.

11/07/17: Helo flight to Lorne (LOR) AWS

Purpose: Power system and lower instrumentation raise and reset modem clock

Helo Pilot: Bryan

AWS Team: Carol, George

1237: Depart Helo Pad

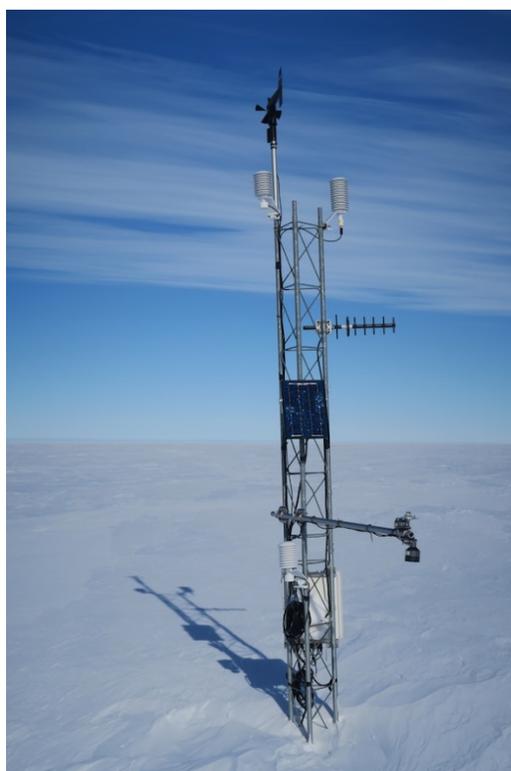
1309: Arrive LOR

First, we found out that the datalogger clock is correct. Second, we tried to raise the power system, but there was too much ice. We even tried to take out one of the batteries, and it was still very stuck in the snow. Once we had about 20 minutes until we needed to leave, we decided to just plug all the power cables back in. We didn't get to confirm that the power connected properly, so that will need to be double checked when we go back.

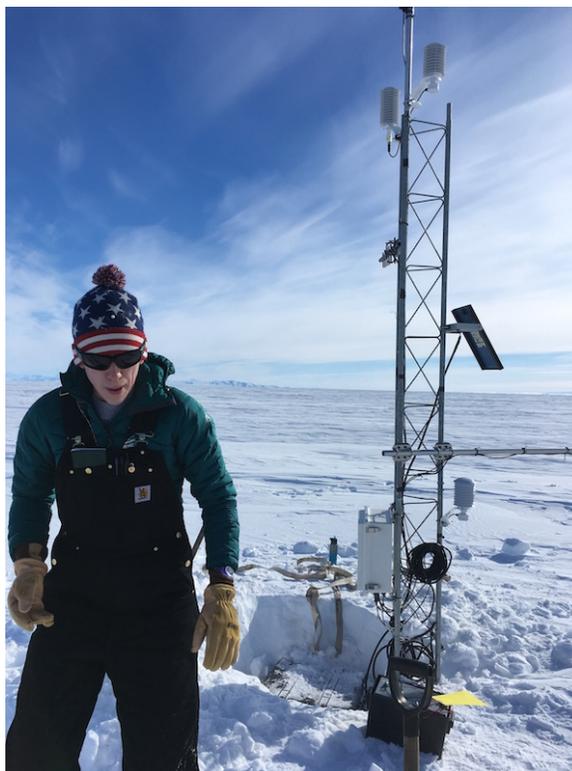
1520: Depart LOR

1551: Arrive Helo Pad

Pilot Coordinates: $-78^{\circ} 11.36'$ / $170^{\circ} 01.88'$



LOR before



LOR after

11/21/17: Helo flight to Marble Point (MPT), Marble Point II (MP2), Cape Bird (CBD), Minna Bluff (MNB), and White Island (WTI)

Purpose: Station inspection for all 5 AWS

Helo Pilot: Richard

AWS Team: Carol, George

1211: Depart Helo Pad

1238: Arrive MPT

Both Marble Point and Marble Point II were inspected. The guy wires are the correct tightness and all nuts are nice and tight. Everything else at the AWS looks to still be in great shape!

1307: Depart MPT

1355: Arrive CBD

Cape Bird had a fair amount of sea spray, but nothing out of the ordinary. The solar panel seems to be getting a little covered with sea spray in one corner. All guys are the appropriate tightness.

1450: Depart CBD

1518: Arrive Helo Pad

Refuel at McMurdo

1535: Depart Helo Pad

1606: Arrive MNB

There was severe riming at Minna Bluff. All the snow / ice was removed as best as possible. We found that the temperature sensor at the top was missing its Gill shield. The temperature sensor was taped down with electrical tape and wire. The real-time data values were checked with the keypad (see pictures below). Finally, it was determined that the tower is leaning about 10°. Another visit will be needed to fix the temperature sensor, tower, and maybe the wind speed sensors.

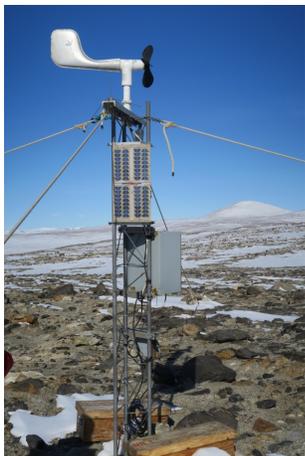
1652: Depart MNB

1710: Arrive WTI

The guy wires are the correct tightness and all nuts are nice and tight. Everything else at the AWS looks to still be in great shape!

1728: Depart WTI

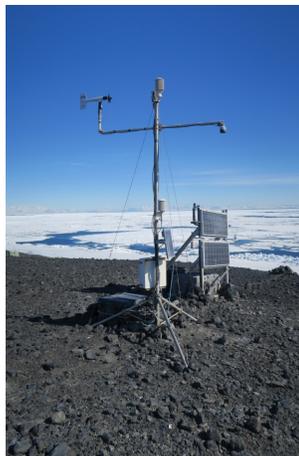
1744: Arrive Helo Pad



MPT



MP2



CBD



MNB before



MNB loose temp. sensor without a shield



MNB temp. output of -153.54 °C



MNB wind direction 244.760° and wind speed of 0 m/s



MNB after with a tilt of about 10°



WTI

11/22/17: Truck to Phoenix (PHX) AWS

Purpose: Install new instrumentation at Phoenix AWS

Helo Pilot: Richard

AWS Team: Carol, George

The tower had previously been installed with Carol and the riggers (Johnny and Mikey) on 11/15/2017.

As we were putting the equipment in the truck to drive out to Phoenix, we cracked one of the plastic handles on the hardigg case for the power system. We got some help from Kevin from PASSCAL to fix it with a cargo strap and metal rings. It turns out that power system was not used because it was wired incorrectly and one of the batteries crack. There was a leak of battery acid inside the case.

1425: Depart Crary

1508: Arrive Phoenix

First, we had to carry all the equipment about 500 feet to the AWS from the groomed section of the road via 2 banana sleds. Upon arrival, we first installed the aerovane. Then we noticed an issue with the HMP since it's missing one of the bolts on the shield. We decided to not install the HMP since I knew we could drive back easily. Then we installed the rest of the instrumentation successfully. Finally, we plugged in all the cables and started to look at the keypad. All the values looked correct, so then we decided to insert a data card. Then the keypad showed that the data card was initializing table format or something similar for more than 5 minutes. We thought that the transmissions weren't sending, but it turns out they were working as of 00 UTC. Then we measured heights measurements for the sensors and took pictures.

1845: Depart Phoenix

1925: Arrive Crary

UNAVCO GPS coordinates: -77.947/166.757

UNAVCO GPS elevation: 10 m

We will need to verify transmissions and fix the HMP shield on the next visit.

Instrument Heights from surface

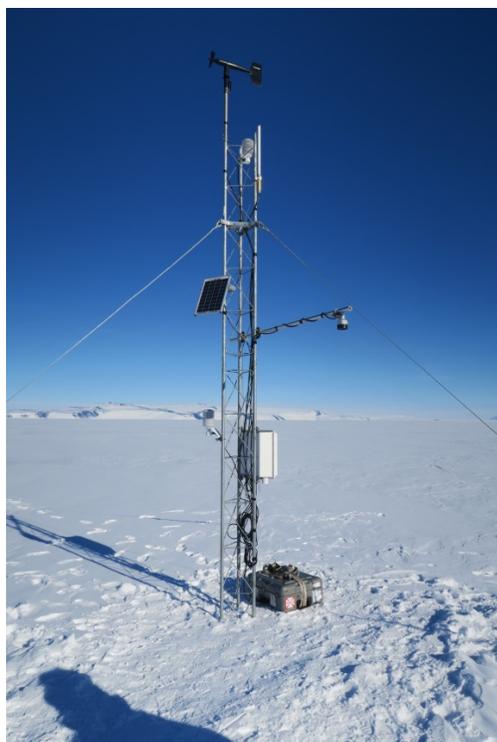
Enclosure: 48"

Lower Temperature: 63"

ADG: 96"

Upper Temperature: 173"

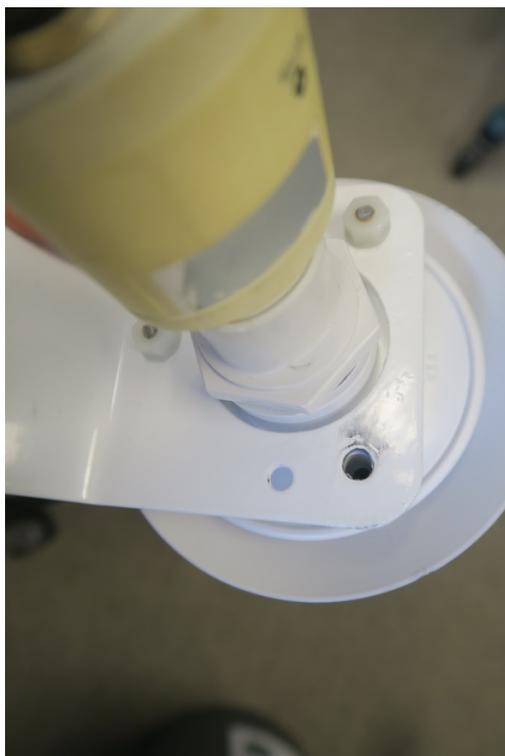
Aerovane: 203"



PHX



PHX enclosure



PHX HMP



PHX power system with a cargo strap



11/26/17: Truck to Phoenix (PHX) AWS

Purpose: Check the transmissions and data card at Phoenix AWS.

Before going to the site, Carol had thought there was an issue with the data card. The AWS was transmitting correctly. Without knowing that information, the data card was removed. Thus, Phoenix will need another visit to install the HMP and to insert a data card, but the transmissions are working correctly. This was a case of the Argos transmitter transmitting via 8931 instead of 8908. The Argos ID was corrected after passing 00 UTC the next day.

11/29/17: Otter to Gill (GIL) AWS

Purpose: Raise and replace pressure

Otter Pilots (BBV): Steve, Kim

Boondogglers: Drew (Janitor), Ryan (Food Supply), Kate (MacCenter)

AWS Team: Carol

0910: Depart WFD

1051: Arrive GIL

We had thought this was going to be a difficult AWS to find, but our guessed coordinates were within .10 nm of the true location. Once we got to the site, Carol decided that a 5' tower would be needed for the raise. First, the team worked to remove all the instrumentation. The lower temperature was buried about a foot under the snow. Then the yellow power cables were extended to their maximum to raise the junction box as high as possible. The GPS was also setup during this time. Next, the 5-ft. tower section was added with ease! What a relief! Then all the instrumentation was re-installed on the tower, and all the plugs were plugged into the enclosure. Carol got the Telonics setup and received an 8911 transmission while checking the sensor values with the keypad. All sensors looked to be functioning properly. Next we took out the laptop to try and switch the program for a new Paros pressure sensor. First, the program was retrieved from the datalogger. Then Carol realized that the Station on the left side in the Connect screen was still referencing 'Phoenix AWS' not Gill. Then she tried to call Lee, and he didn't answer. Next she tried Dave, but that phone call lasted about 5 seconds. Then she got the datalogger disconnected from the laptop (hopefully), and waited for more transmission. The new Paros pressure sensor was not installed. After messing with the datalogger, the Telonics received 2 or 3 transmissions from 8903. With that, they left the site since there was nothing else Carol knew to try. Hopefully this is just a 00 UTC error with the CR1000 and the Argos transmitter. Otherwise, another visit might be necessary to fix the transmissions and install the new Paros.

1450: Depart GIL

1617: Arrive WFD

Pilot's Coordinates: -79° 49.84' / -178° 32.22'

UNAVCO GPS coordinates: -79.831/-178.540

UNAVCO GPS elevation: 54 m

Instrument Heights from surface

Enclosure: 54''

Lower Temperature: 65''

ADG: 100''

Upper Temperature: 176''

Aerovane: 204''



Gill before



Gill after



11/29/17: Otter to Alexander Tall Tower! (BAT) AWS

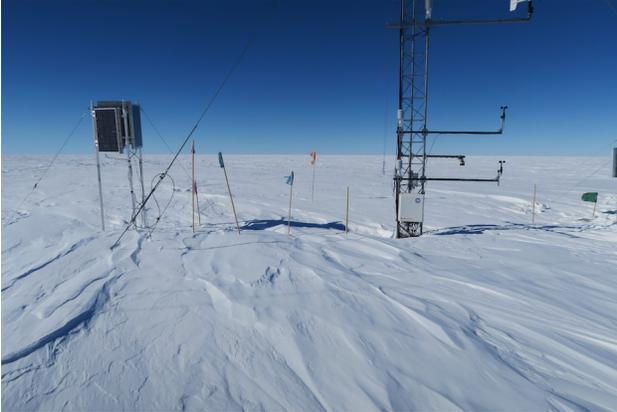
Purpose: Station inspection

Otter Pilots (KBH): Lindsey, Tanner

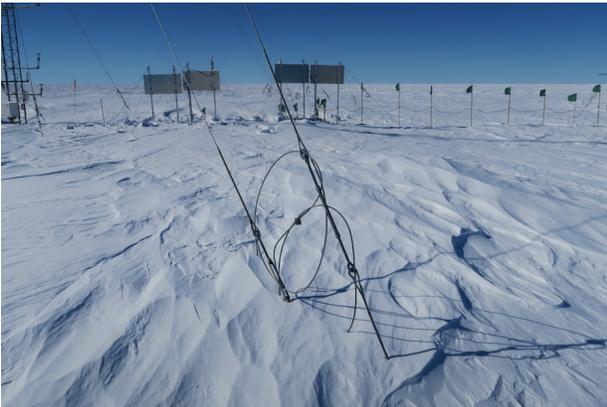
Boondoggler: Molly (Air Guard)

O-456 Team: Mark, Scott

AWS Team: Carol



Solar Panels and lower instrumentation at BAT



Turnbuckles getting buried at BAT



All the instrumentation now installed at BAT

12/01/17: Otter to Gill (GIL) AWS

Purpose: Install new Paros pressure sensor

Otter Pilots (KBH): Lindsey, Tanner

Boondoggler: Robyn (Shuttles), Rebecca (MacOps)

AWS Team: Carol

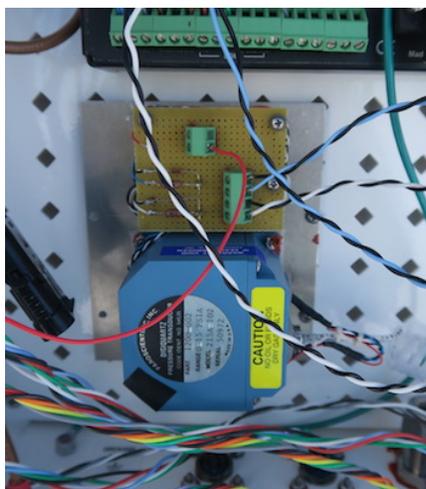
0922: Depart WFD

1105: Arrive GIL

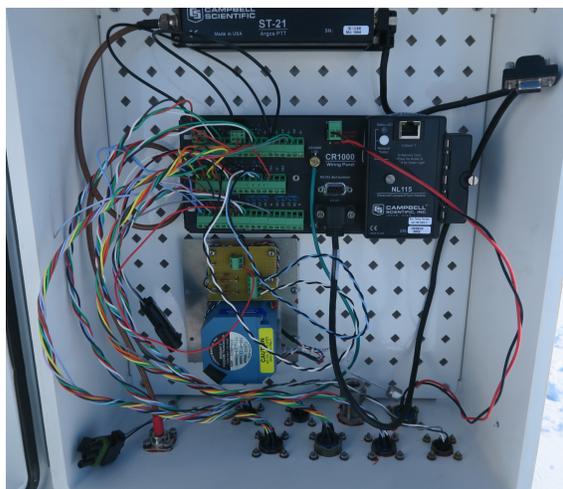
1. Received one 8911 transmission
2. Checked the keypad and verified that 14240.CR1 was running
3. Found the lithium battery levels and they were 3.35
4. Checked that 14240.CR1 was the only file on the datalogger
5. Disconnected the laptop and the power
6. Installed Paros 50972 (as a note only 2 of the 4 screws matched, so it's only mounted on one side.... see picture)
7. Reconnect the power and laptop
8. Stop the 14240.CR1 program
9. Retrieve the 14240.CR1 program
10. Delete the 14240.CR1 program
11. Send the Gill.CR1 program and set the Run Option to 'Run Always'
12. Verify good values from the Paros (378 and 377 or 978 and 977 hPa)
13. Remove the old data card by hitting the removal button first
14. Insert a new data card
15. Verify the program is running via the Keypad
16. Received two 8903 transmissions

1246: Depart GIL

1416: Arrive WFD



Paros sensor 50972 at Gill



Gill enclosure (right)

12/06/17: Truck to Phoenix (PHX) AWS

Purpose: Install HMP

AWS Team: Dave, Carol, Marian

After Dave and Marian arrived, we got the third bolt fixed onto the HMP shield. Then we drove to Phoenix to install the HMP. We also inserted a new, blank data card into the CR1000 and received multiple 8908 transmissions via the Telonics. Finally, we also taped the Argos transmitter to the left side of the enclosure with some electrical tape.

Instrument Heights from surface

Enclosure: 48"

Lower Temperature: 63"

ADG: 96"

Upper Temperature: 173"

Humidity: 153"

Aerovane: 203"



Phoenix AWS, after installing HMP

12/07/17: Helo to Pegasus North (PGN) AWS and Linda (LDA) AWS

Purpose: Pictures of tilt of PGN and check the Vaisala pressure sensor at LDA

AWS Team: Dave, Carol, Marian

1113: Depart MCM

1120: Arrive PGN

Took pictures of the tower. It is leaning significantly and only being supported by 1 of the 3 guy wires. It was decided that the whole AWS will be removed this season.

1127: Depart PGN

1207: Arrive LDA

Swapped the data card and updated the CR1000 clock to current UTC time. The existing Vaisala pressure sensor had malfunctioned in early October 2017 and read a fairly consistent ~509 mb. We thought this was due to insufficient power and maybe a loose wire. We checked the wire continuity before rewiring anything, and the continuity for each wire was good between the datalogger and the sensor. After moving the power from SW12V to 12V, values still read ~509 mb, so we removed the sensor. A new one will need to be installed.

1250: Depart LDA

1354: Arrive MCM



Pegasus North AWS



Linda AWS

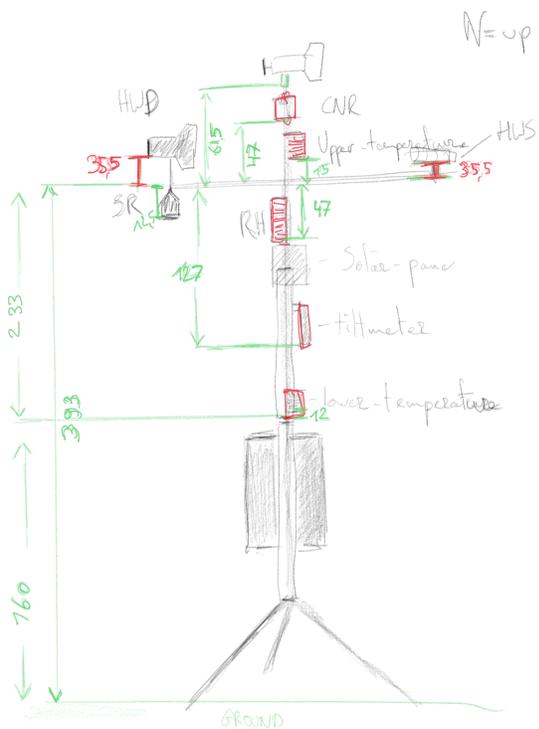
12/08/17: Installation of AWS1 from Princess Elisabeth Station

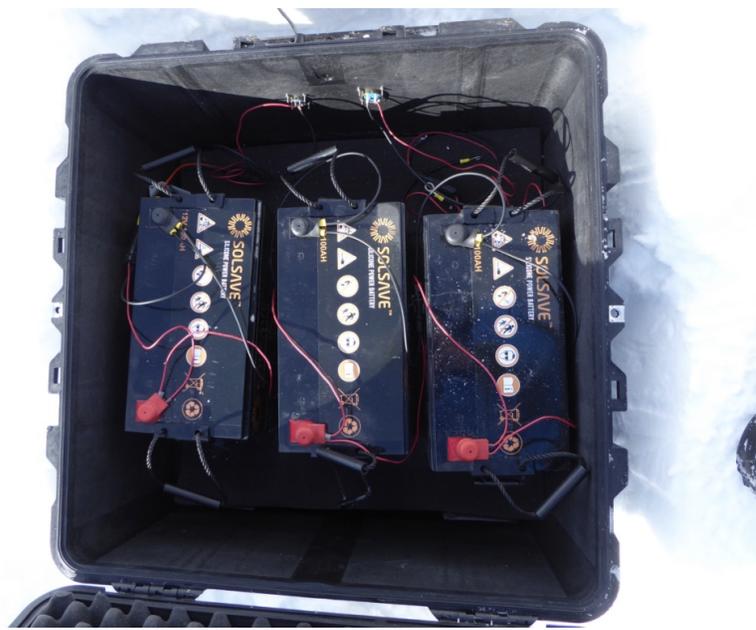
Team: Jan Lenaerts and Stef Lhermitte

IMEI Iridium: 300234065842750

GPS Coordinates: -70.5364 / 23.7803

Photos sent by Stef Lhermitte of AWS1





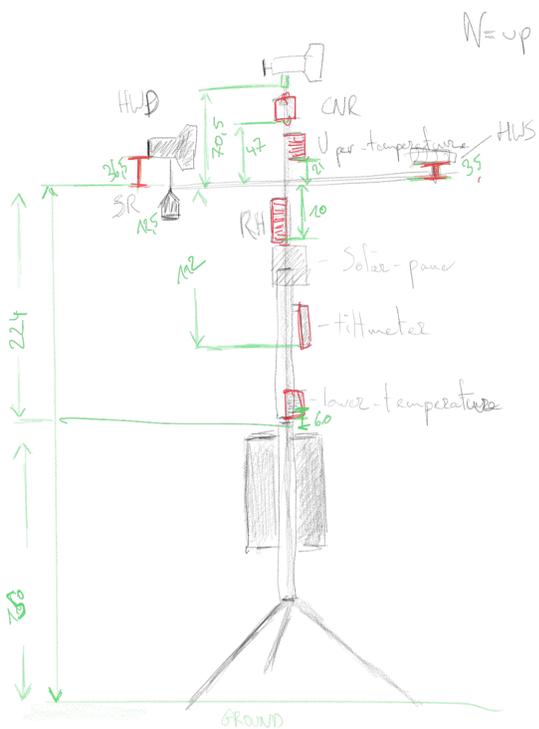
12/10/17: Installation of AWS2 from Princess Elisabeth Station

Team: Jan Lenaerts and Stef Lhermitte

IMEI Iridium: 300234065846040

GPS Coordinates: -70.5366 / 24.1833

Photos sent by Stef Lhermitte of AWS2







12/15/17: MatTraks to Pegasus North (PGN) AWS

Purpose: Remove PGN, including tower, tower base, and guy wires

AWS Team: Dave, Marian

1251: Depart Crary

1253-1257: Fill the gas tank to full

1424: Arrive PGN

The drive was relatively smooth the whole way. Despite Pegasus airfield being derelict, there were still flags along the road to Pegasus which essentially led us straight to PGN.

For the first hour, we removed the instrumentation and then the power system. Then we began digging and ice-picking the snow and ice around the guy wires. They were only ~1 foot buried and were removed within the next hour. We did not find any deadmen, so we think only a looped rope at the end of the guy wires was buried.

The tower base was only about 6 inches below snow surface. We were able to wiggle it free without too much effort. A 4-inch piece of one of the tower legs was sheared off, however, as we removed the tower. It remained stuck in the ice, rendering the bottom tower section junk.

1651: Depart PGN

1824: Arrive Crary



PGN upon arrival.



PGN with instruments removed.



PGN after removal.

12/16/17: Helo to Lorne (LOR) AWS

Purpose: Troubleshoot Freewave modem issues and raise the power system, lower temperature sensor, enclosure, and boom.

Boondoggler: Kristy Queen (Cargo)
AWS Team: Dave, Marian

1137: Depart McMurdo
1205: Arrive LOR

While Marian and Kristy worked on digging out and raising the power system, Dave worked on troubleshooting the Freewave modem.

Program running on LOR: newawsFWv3_L3.CR1
Baud rate: -115200

Dave was unable to connect to the modem, after attempting communication via Putty (using RS232-ethernet connection) and command line (using Ethernet). Modem was pulled to bring back to the lab.

At the lab, it was determined that the Ethernet and comports on the modem were not turning on, therefore despite the modem indicating it was powering on, it could not transmit data.

Once Marian and Kristy raised the power system to the surface, the lower instrumentation was raised.

Instrument heights before:
Enclosure: 15"
Lower temperature: 32"
Boom: 41"
RH: 118"
Upper temperature: 120"
Wind: 151"

Instrument heights after:
Enclosure: 48"
Lower temperature: 28"
Boom: 75"
All other instruments unmoved

1610: Depart LOR
1644: Arrive McMurdo

****NOTE****: LOR will need to be revisited to install a functioning Freewave modem



Lorne AWS upon arrival



Inside LOR enclosure, before



Inside LOR enclosure, after



Lorne AWS, after

12/19/17: French visit D-10 (D10) AWS

Purpose: Check the status of D-10

Report written by Jonathan Wille

Before arriving in Antarctica, Matthew Lazzara informed me that the upper temperature sensor on D-10 was not operational. Without a replacement temperature sensor, the AMRC team sent me a datalogger program that would transmit the HMP-155's temperature reading on ARGOS. I first visited the station D10 on December 19th with two colleagues and downloaded the data from the memory card. It appeared the card was full and stopped recording data over a year ago. We reformatted the card and reinserted it into the datalogger, but it appears the card is not recording new data.

12/24/17: French visit D-10 (D10) AWS

Purpose: Install new program to read the temperature from the HMP-155

Report written by Jonathan Wille

After receiving the new datalogger program, Victor Reyesmar and I successfully installed the new program which began transmitting the HMP-155 temperature data over ARGOS on December 24th. We also noted that the lower temperature sensor was broken.

12/29/17: Otter to Kathie (KTH) AWS

Purpose: Raise the station with a 7' tower section

Otter Pilots (KBG): Troy McKerral, Brandon Shendruk

AWS Team: Dave, Marian

0845: Depart WAIS (WSD)

1015: Arrive KTH

Program running on KTH: argos_Kathie.CR1

Surface conditions: Clear, light winds, temperatures around -13 C.

UNAVCO GPS coordinates: -77.995/-97.266

UNAVCO GPS elevation: 1607 m

Upon arrival, the power system and enclosure were buried. The lower temperature sensor was just above snow surface. The UNAVCO GPS was setup right away, then instrument heights obtained.

Instrument heights upon arrival:

Enclosure: Buried

Lower temperature: Snow surface

Boom: 41"

Relative Humidity: 62"

Upper temperature: 114"

Wind: 150"

Dave and Marian began digging to uncover the enclosure and power system. Once Troy and Brandon were done refueling the Otter, they helped dig as well. Dave climbed up to loosen the anemometer pipe and needed to use the "Murder Wrench" to loosen it enough. All the cables needed to be dug out and picked free of snow before any instruments could be removed.

Troy and Brandon were a huge help in digging. Once they reached the top of the power system, Dave went down to check that the AWS was running properly, then powered it down and freed the cables from the snow. Dave went up to remove the anemometer and upper temperature sensor and begin installing the new tower section while Troy, Brandon, and Marian continued to dig.

Neither of the two new 7' tower sections fit well on the tower. Dave and Marian spent a good hour or more trying to fit the slightly better fitting of the two new towers onto the existing one. Two of the three new tower legs fit on the existing tower, but the third leg on the existing tower was bowing out too much. Dave and Marian used a sledge hammer and a hammer to try to kink it back in. After hundreds of strikes, it still didn't fit on. Finally, Brandon suggested using a small cargo strap to synch the old tower together. This worked like a charm! Both Troy and Brandon then used regular-sized cargo straps to pull the new tower section down enough to match up the tower bolt holes.

With the new tower section on, Dave and Marian were finally able to reinstall all the instruments. The AWS was powered back on, then Dave removed the data card and installed a new one. The Telonics squelched indicating a transmission, but we did not confirm the ID number coming through. As happened with Gill earlier this season, the transmissions for 8929 (Kathie's Argos ID) did not come through until the next 00 UTC came around.

Instrument heights after:

Enclosure: 75"

Lower temperature: 105"

Boom: 145"

Relative Humidity: 160"

Upper temperature: 192"

Wind: 237"

1612: Depart KTH

1736: Arrive WSD



Kathie upon arrival



Kathie's enclosure innards



The pit



Kathie after

****NOTE**:** **On connecting tower sections:** When new tower section doesn't fit well, using a small (~1" width) cargo strap works well to tighten the old tower poles to fit the new tower section on. If one can't pull the new tower section down far enough to match the tower bolt holes, using two Herc cargo straps connected to a Z-bar on each tower to synch them together works well.

12/31/17: Otter to Bear Peninsula (BRP) AWS

Purpose: Station checkup, swap data cards

Otter Pilots (KBG): Troy McKerral, Brandon Shendruk

Boondogglers: Brian Wilson (heavy equipment operator), Gus Allen (observer)

AWS Team: Dave, Marian

1031: Depart WSD

1258: Arrive BRP

Program running on BRP: NONAME.CR1

Surface conditions: Overcast, calm winds, temperatures around -3 C.

UNAVCO GPS coordinates: -74.548/-111.868

UNAVCO GPS elevation: 396 m

After landing on an ice/snow field near BRP, we needed to hike ~15 minutes up to the rocky point where BRP is installed. The snow field typically has blue ice and can be very slippery. Dave and Marian brought crampons to strap over their bunny boots. The first half of the hike was on ice, the second half on rocky terrain (large rocks). On this day, there was about an inch of snow on the ice that made it much less slippery.

Upon reaching the AWS, the UNAVCO GPS unit was turned on. The radiation shields for the temperature and relative humidity sensors were each missing a long screw rod, and each had one of the rods loose and about to fall out. Dave Screwed the loose rods and secured one on the temperature sensor with tape, as it was missing its nut.

The anemometer is gritty when it turns. It is loose on the pipe it sits on, so the anemometer sensor can be lifted about half an inch before stopping. This indicates that the connection from the wiring to the potentiometer is loose, so wind direction measurements are incorrect. Dave and Marian did some spot checking of direction values, and they were way off with no evident offset. The propeller was about an eighth of an inch separated from the nose cone but seemed like it was still secure. Spot checking of wind speed values appeared to be OK. However, since the anemometer doesn't turn properly, all direction values should be considered incorrect and low wind speed values should be suspect since the anemometer may not be able to turn into the wind effectively.

The keypad indicated the ADG is only showing zeroes. The wiring connections seemed good, so investigation into the sensor, or replacement, may be necessary.

The existing data card was 256 MB capacity and filled. The new one installed is 1 GB. Back at the lab, the old data card was unable to be read by the Getac, so some software may need to be installed to properly view it once the team is back in McMurdo or Wisconsin.

One of the three guy wires is getting worn down due to proximity to a large rock. In high wind events, the shaking of the guy wire is most likely causing it to rub against the

rock. A cargo strap was secured from the turnbuckle to the anchor to act as a backup in case the guy wire snaps. This is a temporary fix, and a new guy wire and anchor should be installed during the next visit to BRP.

Instrument heights:

Enclosure: 81"

Boom: 104"

Temperature and relative humidity: 126"

Solar radiation: 136"

Wind: 171"

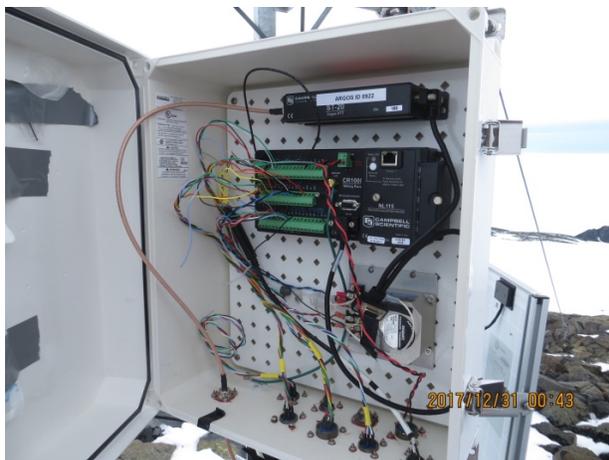
****NOTE****: For next visit: pull program from data logger to laptop, install new guy wire and anchor (bring rock drill), install new radiation shields for temperature and RH, install new anemometer, possibly install new ADG.



BRP upon arrival



The radiation sensors missing a screw rod



Inside the enclosure



The tape job for the rod without a nut



The separation of the prop



The cargo strap fix on the bad guy wire



The worn guy wire



BRP after

01/02/18: Otter to Harry (HRY) AWS

Purpose: Raise power system and lower instrumentation, install boom with ADG and solar radiation

Otter Pilots (KBG): Troy McKerral, Brandon Shendruk
AWS Team: Dave, Marian

0905: Depart WSD

1045: Arrive HRY

Program running on Harry: 14362_Harry.CR1

Surface conditions: Windy but clear, winds sustained around 20 knots throughout

UNAVCO GPS coordinates: -83.005/-121.409

UNAVCO GPS elevation: 956 m

The UNAVCO GPS unit was setup for the duration of the visit. The power system was only buried a few inches, which was a pleasant surprise. The data card was removed. Troy and Brandon dug out the power system and brought it to the surface. The existing cargo strap holding the top tower section to the one beneath it was removed, and two cargo straps were used to better synch the tower sections together.

The tower was leaning a little bit, so Troy suggested using a cargo strap as a guy wire and one of our shovels as the deadman.

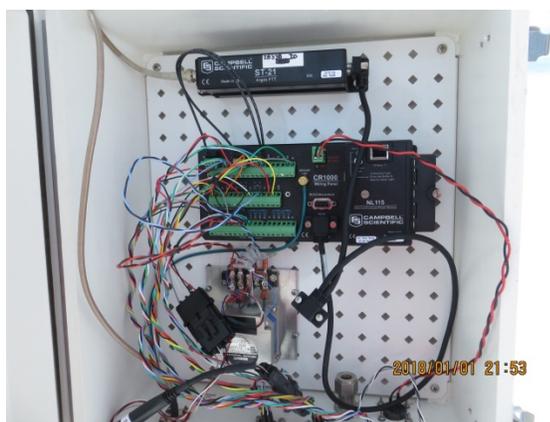
The enclosure and solar panel were raised. Dave and Marian installed a boom with an ADG and moved the solar radiation from the top of the tower to the boom.

No issue was found with the pressure wiring on the data logger, so the pressure issues are yet unresolved.

After powering on again and installing a new data card, the Telonics was turned on to test for a transmission. When it squelched, it indicated 8986 (Harry is 8900). It is thought that this is due to the recurring issue with Argos after we power cycle the data logger.



Harry upon arrival



Inside Harry's enclosure



The shovel as a deadman



Harry AWS after.

01/03/18: Otter to Austin (ATN) AWS

Purpose: Raise the station

Otter Pilots (KBG): Troy McKerral, Brandon Shendruk

AWS Team: Dave, Marian

0845: Depart WSD

1133: Arrive ATN

Program running: 15357_Austin.CR1

Surface conditions: Clear skies, calm winds, temperatures around -8 C.

UNAVCO GPS coordinates: -75.994/-87.479

UNAVCO GPS elevation: 1292 m

The station was not on when we arrived, as we had expected. Upon power up at the end of the visit, the date on the datalogger was June 25, 2017, which was probably when it turned off for the last time. The time and date were updated to the current UTC time and day. The UNAVCO GPS unit was set up for the duration of the visit.

There was about 8 feet of accumulation in the two years since ATN was last visited (and installed). The snow surface was just below the enclosure, leaving the lower temperature and boom buried. We spent around 2 hours digging out the temperature, boom, and power system. The top of the lower temperature Gill radiation shield was damaged when digging down to recover it. It was repaired with some white tape and some pieces of the shield that were recovered.

Due to the large amount of accumulation, the station was raised with a 7' and a 5' tower section.

Instrument heights before:

Lower temperature: Buried

Boom: Buried

Enclosure: 2"

Upper temperature and Relative Humidity: 80"

Wind: 111"

Instrument heights after:

Lower temperature: 124"

Boom: 138"

Enclosure: 145"

Upper temp and RH: 238"

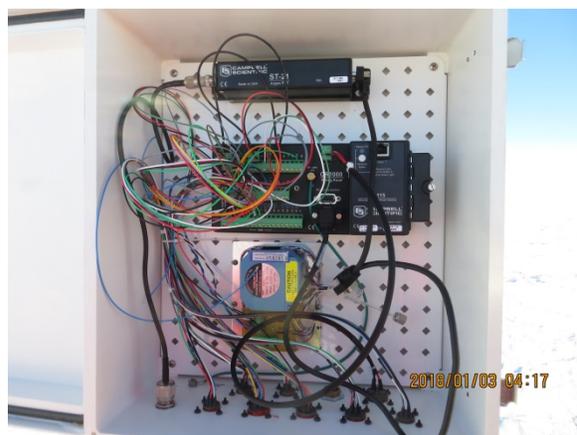
Wind: 268"

1739: Depart ATN

2013: Arrive WSD



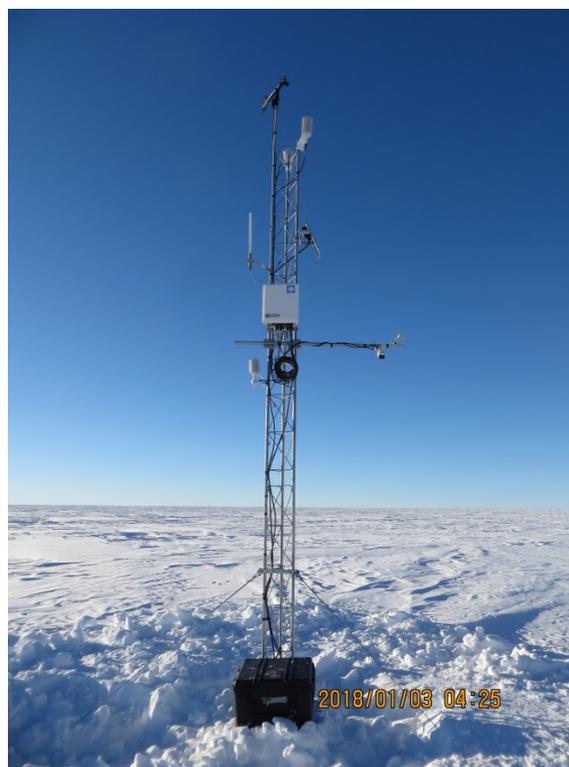
Austin upon arrival



Inside ATN enclosure at end of visit



The repairs to lower temp Gill shield



ATN after

****NOTE****: ATN is not transmitting via Argos. It was powered on and measuring nominally, with the data card successfully installed, upon departure.

01/04/18: Snowmobile to Kominko-Slade (KMS) AWS

Purpose: Raise the station

AWS Team: Dave, Marian

0927: Depart WSD

0933: Arrive KMS

Program running: WAISDivide.CR3

Surface conditions: Clear skies, light winds, temperatures around -13 C.

UNAVCO GPS coordinates: -79.466/-112.107

UNAVCO GPS elevation: 1801 m

The UNAVCO GPS was setup for the duration of the visit. The multiplexer enclosure, lower temperature boom, and ADG/CNR2 boom were buried upon arrival.

A 5' tower section was added because the only 7' section available would not fit.

With all of the digging, tower installation, and numerous instruments, we were not able to finish the raise in one day.

****NOTE**:** The two battery boxes were stacked one on top of the other. As a note for future diggers, the top battery box is connected to the lower battery box by two blue cables, which were on the side of the battery boxes facing away from the tower, so this poses a risk of rupturing a cable with a shovel.

The snow temperature string instruments were not recovered (too buried). The solar panel appeared to be damaged, just on the surface, but still seems to be functioning properly.

The existing data card was removed.

Instrument heights before:

Lower temperature boom: Buried

Multiplexer enclosure: Buried

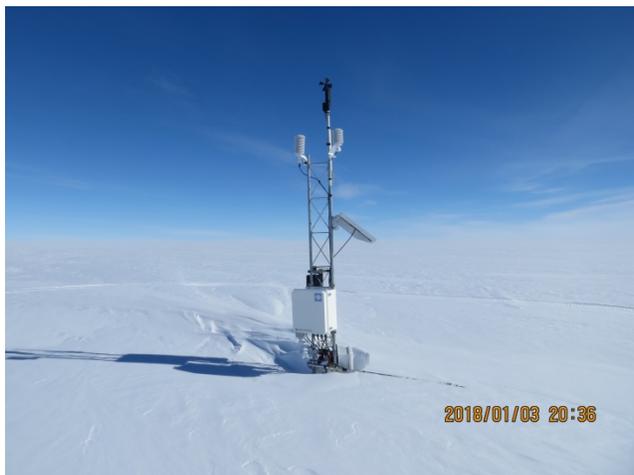
ADG/CNR2 boom: Buried

Lower temperature: 9"

Enclosure: 16"

Upper temperature and Relative humidity: 95"

Wind: 122"



KMS upon arrival



KMS upon arrival, different angle



The pit from digging out the battery boxes



Potential damage to the solar panel



KMS when we left for the day

01/05/18: Snowmobile to Kominko-Slade (KMS) AWS

Purpose: Complete the station raise from the previous day.

AWS Team: Dave, Marian

Surface conditions: Clear skies, calm winds, temperatures around -10 C.

The lower temperature boom, lower temperature, ADG/CNR2 boom, and enclosure were installed. The battery boxes were stacked and hooked up identically to how they were previous set up. The snow temperature string instruments were not recovered, but the cables were still hooked up to the multiplexer. We may return to cut the cables.

The battery boxes are stacked, with the top one connected to the tower by a wire.

A new data card was installed.

Instrument heights after:

Lower temperature boom: 69"

Multiplexer enclosure: 76"

ADG/CNR2 boom: 86"

Lower temperature: 76"

Enclosure: 94"

Upper temperature and Relative humidity: 157"

Wind: 186"



The CNR2 mounted on the boom



Inside KMS enclosure



KMS after



The stacked battery boxes

01/11/18: Otter to Janet (JNT) AWS

Purpose: Raise the station

Otter pilots (CKB): Phil Amos, Tyson Taylor

Boonies (POLENET): Peter Matheny, Alex Wernle, Dave Saddler, Austin White-Gaynor

AWS Team: Dave, Marian

0822: Depart WSD

0955: Arrive JNT

Surface conditions: Partly cloudy with clearing through visit, light winds

Program running on Janet: 14413.CR1

UNAVCO GPS coordinates: -77.175/-123.391

UNAVCO GPS elevation: 2085 m

We set up the UNAVCO GPS, got instrument heights, then started digging out the enclosure and power system. The enclosure was buried a couple inches below the surface. The power system was about 6 feet buried.

Instrument heights before:

Enclosure: buried

Lower temperature: 13"

ADG/solar rad boom: 26"

Upper temperature and Relative Humidity: 100"

Wind: 152"

A 7' tower section was added to raise the station.

The UNAVCO GPS was setup for the duration of the visit. Overall, the station raise went very smoothly, save removing the aerovane pipe off the tower. It was hammered on, and while the large orange handle wrench could twist it, it would not make any progress in coming off. To remove it, Dave used the channel locks and a hammer to hammer it off. Dave gripped the tower section with the channel locks just under the pipe, then hammered upward.

The aerovane pipe didn't fit well on the new tower installed, so it was pushed on as far as it could go (not hammered) then secured with wire and electrical tape (see picture).

The antenna mount is missing a U-bolt.

Instrument heights after:

Enclosure: 113"

Lower temperature: 82"

ADG/solar rad boom: 105"

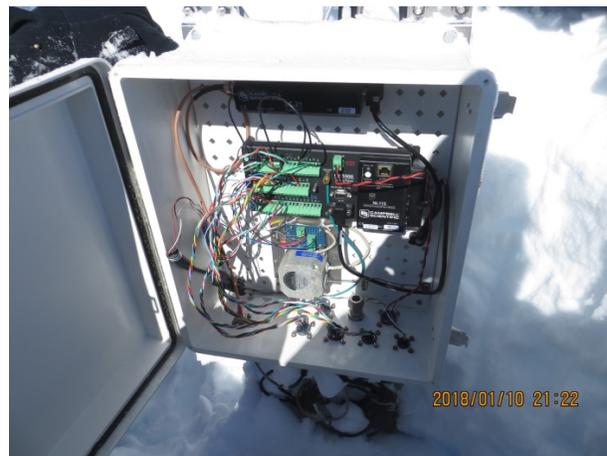
Upper temperature and Relative Humidity: 183"

Wind: 248"

The data card was swapped with a blank one. Argos transmissions were (actually) successfully verified with the Telonics.



Janet upon arrival.



Inside JNT enclosure



The anemometer pipe mounting.



JNT after.

01/12/18: Otter to Janet (JNT) AWS

Purpose: Retrieve extra solar panel and power cable left in the power system box and further secure the antenna mount

Otter pilots (CKB): Phil Amos, Tyson Taylor

Boonie (POLENET): Peter Matheny

AWS Team: Dave, Marian

0756: Depart WSD

0932: Arrive JNT

Retrieved solar panel and power cable and secured the antenna mount to the tower with wire, since a U-bolt is missing.

0950: Depart JNT

Flew to POLENET Kohler Glacier site to help dig up their seismic and GPS units.



Wire on antenna mount.

01/13/18: Otter to Evans Knoll (EKN) AWS and Thurston Island (THI) AWS

Purpose: EKN: Replace RM Young aerovane with Taylor high wind system and check RH sensor. THI: Replace RM Young aerovane with Taylor high wind system.

Otter pilots (CKB): Phil Amos, Tyson Taylor

Boonie (POLENET): Alex Wernle

AWS Team: Dave, Marian

0816: Depart WSD

1048: Arrive EKN (1055 after taxi)

Surface conditions: Cloudy (flat light) and warm, calm winds

Dave, Marian, and Alex gathered all the gear necessary (Taylor high wind system, harnesses, UNAVCO GPS, tool bag, laptop) to carry up the hill to EKN AWS and started hiking. About 30 to 50 feet up the hill, Dave, Marian, and Alex encountered a crevasse. The three decided to turn around and go to the Twin Otter and reassess a route up. They decided to try and do a more gradual incline up the slope. Dave used one of the bamboo sticks from the fuel cache as a poker to test the snow. There was a crevasse that extended all the way along the slope that needed to be crossed (as far as the team knew) in order to reach the site. It was too deep, wide, and dangerous to cross, so the team turned around and canceled the mission for the day. Total hiking time was approximately 1.5 hours.

*****WE SHOULD BRING A MOUNTAINEER WITH US THE NEXT TIME WE WANT TO VISIT EKN AND GET CREVASSE TRAINING****

After waiting about 45 minutes for weather to (possibly) clear at Thurston Island, the group departed EKN for THI.

1257: Depart EKN

1321: Boomerang (pilots determine too much flat light for safe landing at THI) and head back to WSD.

1550: Arrive WSD



EKN on arrival (horizon)



Black dashed lines of part of our hiking path



The crevasse (glove [size Medium] for scale)



Zoomed picture of EKN, taken from bottom of hill.

01/15/18: French visit D-10 (D10) AWS

Purpose: Install new program and 2 new temperature sensors

Report written by Jonathan Wille

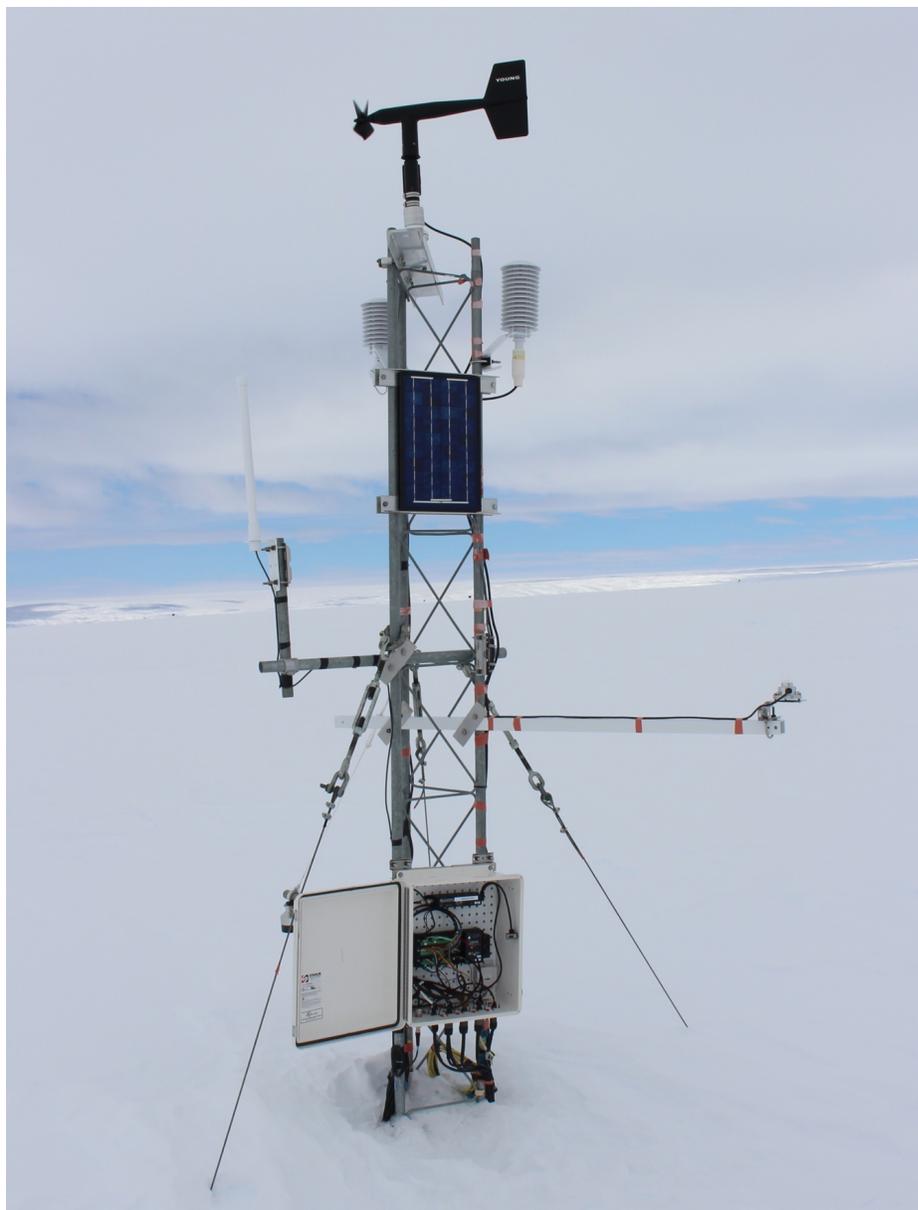
On January 5th, two temperature sensors randomly arrived at Cap Prud'Homme. They were sent from Wisconsin one year ago and were destined for D-10. After testing the sensors, Victor and I installed the sensors and a new datalogger program on January 15th. We also secured all the wires with new tape. All the sensors should be working properly now, but the station probably needs to be raised within the next few years.



D-10 new upper temperature sensor



D-10 new lower temperature sensor



Final photo of D-10

01/16/18: Otter to Thurston Island (THI) AWS and Evans Knoll

Purpose: THI: Replace the RM Young anemometer with a Taylor high wind speed system.

Otter pilots (CKB): Phil Amos, Tyson Taylor
AWS Team: Dave, Marian

0817: Depart WSD

1127: Boomerang over Thurston Island. Too much low cloud cover and flat light. We ended up going under the cloud deck briefly.

1226: Arrive EKN to refuel

We didn't go up to the AWS, but we did take photos of the ice and snow field on Evans Knoll and the potential crevassing.

1316: Depart EKN

1533: Arrive WSD

Back at WAIS, we talked with Mike Roberts (POLENET mountaineer) about surface conditions at Evans Knoll. He thinks that the crevasse that we were attempting to cross when we visited EKN on 01/13/18 is caused by a "bergschrund," or a crevasse that forms at the base of a hill, separating the snow and ice field on the hill and the glacier at the bottom. He estimates that the crevasse could be a meter wide in some parts. He thinks that the next time we visit, we should bring a mountaineer and have at minimum 3 people roped up (all with crevasse training) to climb up the hill to the AWS. One hypothesis is that the snow bridges covering the crevasse(s) melted this late in the summer season, so visiting earlier in the season may be better.



Evans Knoll. The fuel cache is on the lower left, with the AWS visible in the upper center. The bergschrund runs horizontally and is a little bit above the fuel cache on the hill.

01/16/18: Drive to Phoenix (PHX) AWS

Purpose: Recce trip to determine why the station stopped transmitting data.

AWS Team: Andy, Matthew

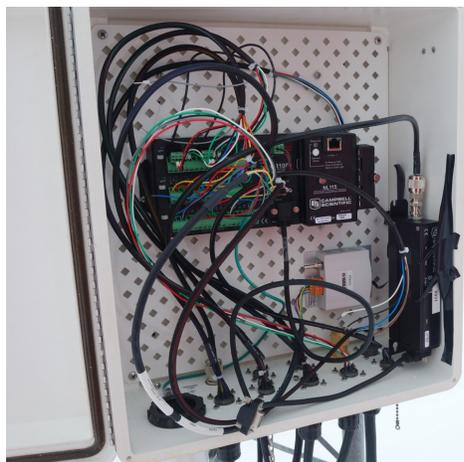
1300: Depart Crary (with fuel stop)

1500: Arrive at Phoenix

1600: Depart Phoenix

1700: Return to Crary

Upon arriving at the airfield, meet with Jack Green to help us know where to park and where to walk toward the AWS several hundred yards away. Upon arriving at the station, we noted that the battery box was iced in. Upon opening the enclosure, the Argos transmitter is just taped on the side, with that not holding so well. However, the connections on the transmitter are rock solid. A test of the voltage coming into the CR1000 is 12 volts. Unplugged and plugged back in the power supply. The station appeared to be working, after hooking up the GetAc computer and checking the data values after making a new connection. Transmissions were seen/reported via Argos for only 5 to 6 hours, before transmissions were no longer received.



PHX enclosure



Phoenix AWS upon arrival

01/16/18: Helo to Linda (LDA) AWS

Purpose: Install new Paros

Helo Pilot: Richard

Boonies: Art Gordon (Fire Department)

AWS Team: Andy, Matthew

0835: Depart Crary

1025: Arrive at Linda

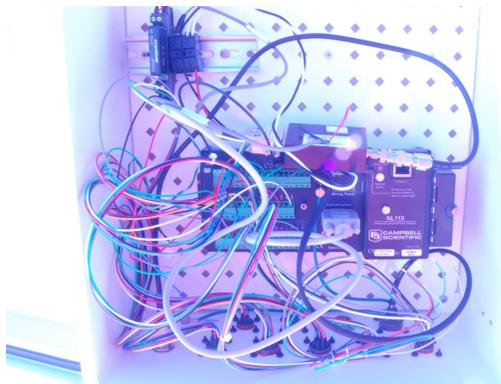
Arrived at Linda AWS in strong winds – roughly 20 knots and limited blowing snow. Successfully installed the new Paroscientific pressure gauge, serial number 45549. The Iridium modem is unfortunately hanging loose, and is probably not ideal the way it has been left behind with the various connectors on it. Thanks to support from Dave Mikolajczyk for helping via Iridium to get the right program changes in place and ensure there was a successful transmission and posting of data to the web. The program for Linda and header were both recovered from the CR1000 and placed on the GetAc (header file: headerI_lindav2.CR1 and program: iridiumlindav2.CR1 – both on the desktop of the GetAc).

1130: Depart Linda

1200: Return to Crary



Linda AWS upon arrival.



LDA enclosure upon arrival. The pressure sensor was installed on the backplate above the enclosure, with the Iridium modem moved to the right side of the box.

01/20/18: Truck to Phoenix (PHX) AWS

Purpose: Investigate Argos transmission issues

AWS Team: Dave, Marian

1317: Depart McM (Crary)

1406: Arrive Phoenix Field

1413: Arrive PHX (walked from truck to AWS)

The datalogger was on and running, but the data tables were not updating. The last data was timestamped 2018-01-18 at 08:50 UTC. We removed the enclosure to bring back to Crary to troubleshoot the issues.

1510: Depart PHX

1555: Arrive McM



Phoenix upon arrival.



The cable spool. The lower T has white tape.

1/24/18: Truck to Phoenix (PHX) AWS

Purpose: Remove power system and solar panel

AWS Team: Dave, Marian, Andy

0809: Depart Crary

0848: Arrive PHX

We removed the power system and the solar panel to bring back to the lab in Crary and diagnose any issues with it, to help with the investigation of why PHX had stopped transmitting via Argos.

0945: Depart PHX

1034: Arrive Crary



PHX with the power system and solar panel removed.

01/27/18: Helo to Lorne (LOR) AWS

Purpose: Install new Freewave modem

Helo Pilot: Chris Deen

AWS Team: Matt, Andy

1245: Depart McM (Crary)

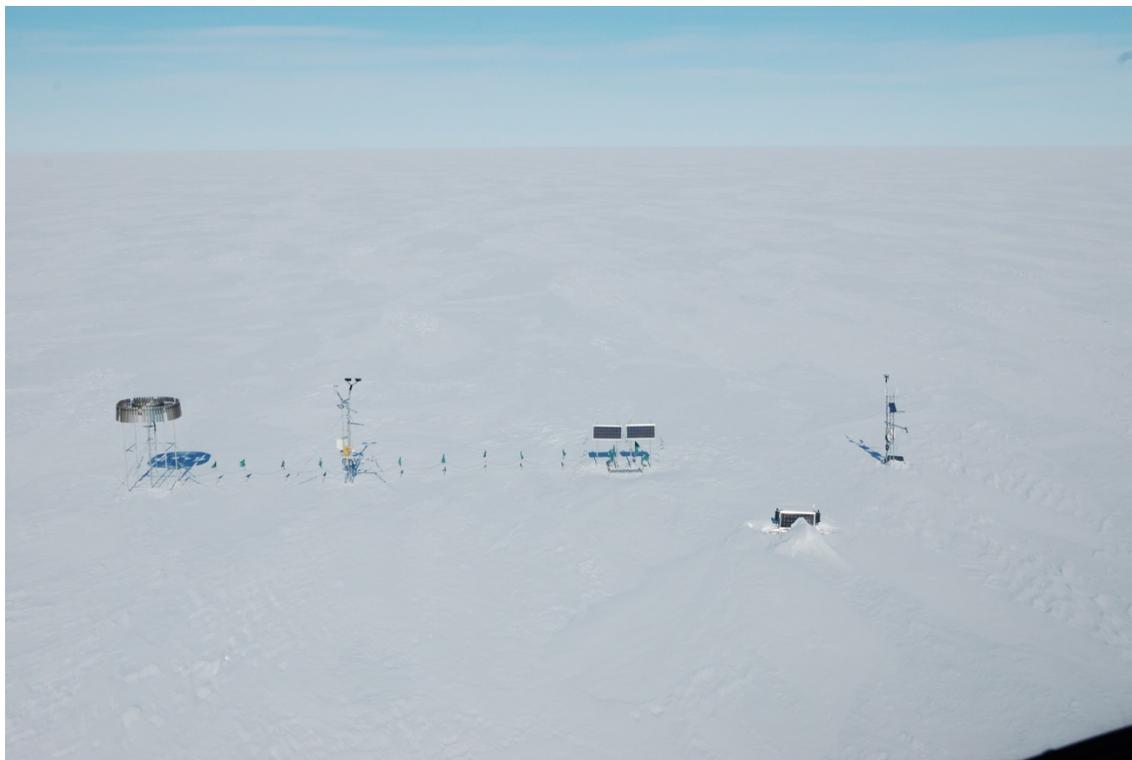
1300: Depart Helo Pad

1330: Arrive LRN

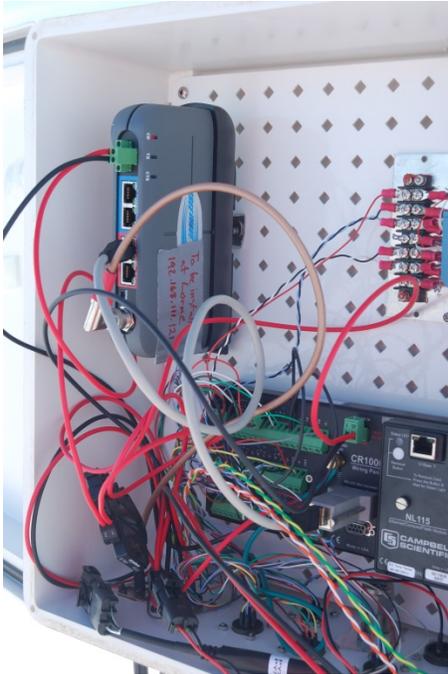
After taking photos of the station, a new Freewave modem was installed. Proper power was plugged in (which happened to catch a cycle of when the relay was on), and then antenna was hooked up. GetAc computer verified a connection to the modem. Once the next cycle was on, call to Lee Welhouse to verify data was being relayed, but unfortunately, he was not able to verify as he was driving and not near a computer. Attempts were made to connect to White Island and T-site without success. A second call was placed to verify, and there was some initial verification data was on the AMRC website. Later, it appears that perhaps that data is very old. Investigation on-going. Battery box was found with a crack/chip spot. That was duct taped up to prevent snow and water getting into the box. Weather observation with the Kestrel: 2.9 m/s wind, temperature of -11.4°C and relative humidity of 60%.

1240: Depart LRN

1510: Arrive McM (Helo Pad)



Lorne upon arrival – with Mark Seefeldt's systems to the left and the old power system and chemistry system nearly buried near the station.



Lorne Electronics with new modem and battery box showing damage to the side seem.

1/27/18: Truck to Willie Field (WFD) AWS

Purpose: Swap power system, raise lower temperature and enclosure

AWS Team: Dave, Marian

1257: Depart Crary

1326: Arrive WFD

The top of the power system was only about a foot below snow surface. We dug out the power system and replaced it with a 3-battery power system. We also raised the lower temperature and enclosure.

Program running: WillieFieldFW_1 (there may be more to the program name...)

Instrument heights before:

Lower temperature: 24"

Enclosure: 37"

Upper temperature and Relative Humidity: 144"

Wind: 175"

Instrument heights after:

Lower temperature: 54"

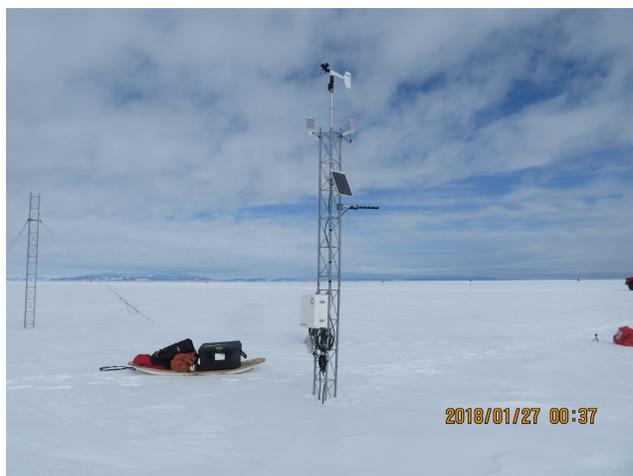
Enclosure: 65"

Upper temperature and Relative Humidity: 144"

Wind: 175"

1536: Depart WFD

1605: Arrive Crary



WFD upon arrival



WFD enclosure



WFD after

01/29/18: Truck to Phoenix (PHX) AWS

Purpose: To reinstall enclosure with CR1000 from PGN, and install new power system and solar panel

AWS Team: Dave, Marian, Andy

1425: Depart Crary

1505: Arrive PHX

After testing the PHX Argos transmitter and CR1000 in the lab, it was found that the issue with the Argos transmissions was due to the PHX data logger. We reprogrammed the PGN data logger to be installed in the PHX enclosure.

Once at the site, we installed the enclosure on the tower and set up the power system. We brought the wrong solar panel, and we needed to fix wiring with the half bridges on the CR1000. Dave and Andy went back to Crary to get the appropriate solar panel and find a solution for the temperature half bridge wiring.

1633: Depart PHX

1710: Arrive Crary

1745: Depart Crary

1820: Arrive PHX

We installed the new solar panel and fixed the wiring with the half bridges for the temperature sensors. We confirmed Argos transmissions with the Telonics and verified that all data looked nominal.

The enclosure height is 39".

1845: Depart PHX

1925: Arrive Crary



PHX after installing the power system, solar panel, and enclosure.



PHX enclosure

01/30/18: Otter to Elaine (ELN) AWS

Purpose: To raise the station and install a new power system and solar panel.

Otter pilots (CKB): Phil Amos, Tyson Taylor
Boonies: Shawn Masters (Janitor), Steve (NYANG)
AWS Team: Dave, Matt

0903: Depart WFD
1114: Arrive Holland Range fuel cache
1202: Depart Holland Range fuel cache
1246: Arrive ELN

We set up the UNAVCO GPS unit for the duration of the visit.

Coordinates from Pilots: 83° 04.17' S, 174° 14.54' E.

UNAVCO GPS coordinates: -83.069/174.239
UNAVCO GPS elevation: 59 m

Program running:

It took us about 10 to 15 minutes to find ELN, as the coordinates the pilots were using were almost 10 years old.

Instrument heights upon arrival were not taken, but those can be discerned from the pictures. We added a 5' tower section. We did not recover the old batteries, as they were buried too deep. We did recover about 5 feet of power and solar panel cable that was buried. The power cable we brought with the new power system had the incorrect plug end to connect to the enclosure, so we spliced said cable to the old power cable. We also installed a new solar panel. We swapped data cards.

Instrument heights after:
Lower temperature: 67.5"
Enclosure: 95"
Boom: 87"
Upper temperature and Relative Humidity: 131"
Wind: 157"

1706: Depart ELN
1923: Arrive WFD



ELN upon arrival.



ELN enclosure upon arrival.



The spliced power cable.



ELN after.

02/01/18: Snowmobile to Windless Bight (WDB) AWS

Purpose: To reinstall instrumentation on new tower that the riggers set up next to existing tower

AWS Team: Dave, Marian, Matt, Andy

1000: Depart snowmobile station on snow road just past transition

1137: Arrive WDB

Weather conditions: Sunny, calm to no winds, temperatures around -8 C.

UNAVCO GPS coordinates: -77.729/167.673

UNAVCO GPS elevation: 40 m

The UNAVCO GPS unit was set up for the duration of the visit. The program running on WDB is newawsFW31_WB.CR1. There was no data card present. It was discovered that the Compact Flash Module on the CR1000 was dysfunctional, as it could not read a data card. The CF Module was left at the site but should be considered to be replaced.

Instrument heights before:

Lower temperature: Buried

Enclosure: Buried ~4"

Boom: 16.5"

Relative Humidity: 41"

Upper temperature: 74"

Wind: 105"

Instrument heights after:

Lower temperature: 88"

Enclosure: 125"

Boom: 112"

Relative Humidity: 217"

Upper temperature: 217"

Wind: 247"

We dug down about 6 feet to raise the power system. There seemed to be a lot of accumulation this year, as the snow was very soft at the surface. It was up to our waists walking through it. Since the riggers came before us with Pisten Bullies, that gave us a good trail to snowmobile on and compacted the snow nicely around the new tower. The upper most tower section on the old tower was removed.

1601: Depart WDB

1707: Arrive snowmobile station (Dave Saddler from POLENET picked us up to drive us back to town.)



The new tower (left) and WDB (right).



WDB upon arrival.



WDB enclosure.



WDB after.

02/06/18: Otter to Alexander Tall Tower! (BAT) AWS

Purpose: Install new ADG sensor (co-visit with UNAVCO)

Otter Pilots (CKB): Phil and Tyson

Boonies: Ronny (USAF/ Air Guard), Brian Eisenstett (Dining Hall), Lizzy (Shuttles)

UNAVCO: Annie

AWS Team: Matt

1030: Depart Crary Lab

1119: Depart WFD

1205: Arrive Tall Tower

(Second landing...with CKB)

Instruments heights:

Old ADG: 49.5''

Enclosure: 12''

Junction Bo: 35''

New ADG: 49.75''

First wind speed (cups) sensor: 51''

Second wind speed (cups) sensor: 72''

ADG replaced with a new ADG sensor. New cable plug did not fit with new cable plug on the AWS. Used old cable, and data looked good on keypad. Cable recoiled and taped/wired it in place.

Weather at ~1335

Wind speed of 7.1 m/s (direction not recorded)

-16.2°C

74.4% RH

Depart Tall Tower: 1346

Arrive WFD: 1420



BAT



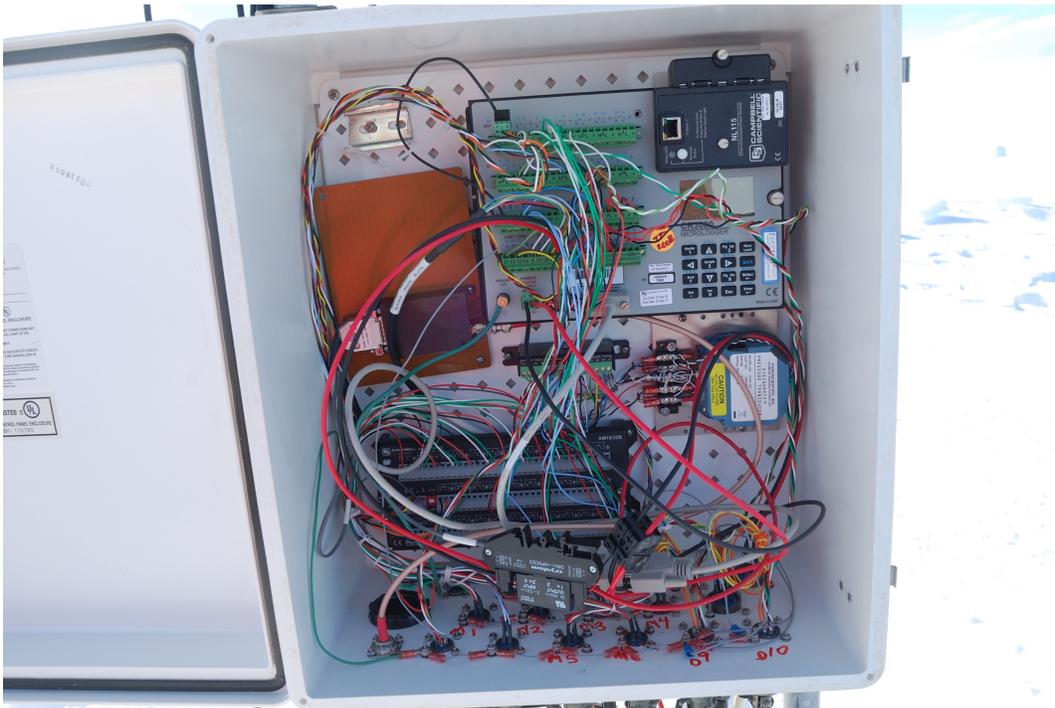
Bottom of enclosure



Another angle of the bottom of the enclosure



Top of BAT



Inside the enclosure at BAT

02/07/18: Helo to Lorne (LOR) AWS

Purpose: Last attempt to fix Freewave modem

Helo Pilot: Ryan

Bonnies: Billy Tate (SOPP)

AWS Team: Andy Kurth

1332: Depart Helo Pad

1403: Arrive LRN

Pulled power cord, powered down the AWS. Attempted install of new antenna and new modem. Powered up the system and contacted Lee. No luck getting the communications to work. A new data card was installed as well. Helo broke down – second helo arrives to repair first helo. All return to McMurdo after repairs made.

Missing (Very Late – after 1800): Depart LRN

Missing (Very Late – after 1800): Arrive McM (Helo Pad)

02/07/18: Helo to Minna Bluff (MNB) AWS

Purpose: Setup new guy system, replace temperature sensor, dig out deadmen

Helo Pilot: Chris Deen, and Helo Tech

Bonnies: Ryan Morse (SOPP)

AWS Team: Matthew Lazzara

Riggers: Andrew Asher, Michiel Lofton, and Bodie Davies

0850: Depart Helo Pad

0930: Arrive PoleNet site – accidentally due to wrong coordinates given to Pilot

0945: Arrive MNB

Arrived to Minna Bluff completely rimed ice in. Helo left the whole group. Ice removed, the Riggers installed new guy system, and removed old chain guy system. After the guying system was installed, a new temperature sensor was installed on the tower. While awaiting return of the helo, all 5 dead-men were dugout and drilled out. They are all now at Minna Bluff awaiting a retro shipment back to McMurdo next field season.

Weather measurement at 1035: Wind: 3 m/s, temperature of 19.3°C, RH 70%

Instruments heights after:

Sensor boom: 92"

Enclosure: 19"

Antenna: 73"

1135: Depart MNB

Missing: Arrive Helo Pad

NOTE: There are 5 old deadman that were recovered by the riggers. This equipment will NOT be able to fit in a 212, so a sling load will need to be prepared in order to get this old equipment sent back to McMurdo. This can be done by another group, like environmental, if needed.



Bodie and one old deadman



Lower right one set of equipment for deadman



Minna Bluff upon arrive with Rime Ice



Finished installation of new guys and temperature sensor

02/08/18: Truck to Willie Field (WFD) AWS

Purpose: Install Madison College temperature sensor and new PCWS board

AWS Team: Matthew, Andy

2120: Depart Crary Lab

2205: Arrive WFD/Truck stuck

Truck stuck just past mile marker 4 – just before the AWS...on the side of the road (between the main road and South Pole traverse road/route). Work on installing the Madison College AWS. Communications not working to connect the AWS to the Freewave network. The Madison College board installed, running, no data saved or communicated out, due to issues with the Freewave network.

On the Willie AWS the new Madison College thermistor installed – unclear which program to run afterwards (and the data card was changed). The proper program was later installed and this system is running and relaying data.

2335: Depart WFD

Missing: Arrive Crary Lab



Prototype Madison College system installation at Willie Field.
