2002 Field Season Report

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Automatic Weather Station Repairs

Swithinbank (ARGOS ID 21356 replaced with ARGOS ID 21355)

Date: 13 January 2002

GPS Location: 81.201°S 126.177°W
Elevation: 959 m

Station Characteristics:
ΔT boom: at snow surface
Enclosure: 112 cm
Junction Box: 198 cm
Solar Panel: 234 cm
Instrument Boom: 274 cm

Station Changes:
ΔT Boom: 91 cm
Enclosure: 119 cm

Field Team: Jonathan Thom

Transport: Kenn Borek Air, Ltd. from Onset D

Swithinbank stopped transmitting during a high wind speed event. The battery voltage checked out okay, therefore new batteries were not added. The antenna and cable were in good shape. The power was cycled; this did not revive the station. The station was replaced with ARGOS ID 21355. In addition to replacing the enclosure, the lower ΔT boom was raised, the upper booms cables were rerouted to aid in future tower raising. Transmission was received by the Telonics Up-link receiver before leaving the site.

Doug (ARGOS ID 8922)

Date: 14 January 2002

GPS Location: 82° 18.9'S 113° 14.4'W
Elevation: 1433 m

Field Team: Jonathan Thom

Transport: Kenn Borek Air, Ltd. from Onset D

Doug stopped transmitting during the same high wind speed event that knocked Swithinbank off the air. Doug site was not found at the GPS location above. A search was performed within a five mile radius of the site without locating the AWS.

Noel (ARGOS ID 8936)

Date: 14 January 2002

GPS Location: 79.334°S 111.0778°W
Elevation: 1833 m

Station Characteristics
- ΔT boom: buried
- Enclosure: buried
- Junction Box: 46 cm
- Solar Panel: 76 cm
- Instrument Boom: 157 cm
- R. M. Young Wind system

Station Changes
- Enclosure: REMOVED

Field Team: Jonathan Thom

Transport: Kenn Borek Air, Ltd. from Onset D

Noel had not been transmitting for some time. On arriving at the station, the first observation was the considerable accumulation. The lower boom and the enclosure were buried. The battery voltage was nominal; therefore, no new battery boxes were installed. The power was cycled and no signal was received by the up-link receiver. Owing to the lack of a replacement station, 8936 was removed, the cables were taped to the tower and capped, and the wind system was not removed. The site was flagged with bamboo flags to help in finding the site in the future. The tower will need at least a 7-foot section when raised.

Brianna (ARGOS ID 21362 replaced with ARGOS ID 8931)

Date: 15 January 2002

GPS Location: 83.889°S 134.154°W
Elevation: 525 m

Station Characteristics
- ΔT boom: 84 cm
- Enclosure: 127 cm
- Junction Box: 198 cm
- Solar Panel: 231 cm
- Instrument Boom: 292 cm
- R. M. Young Wind system

Station Changes
- Enclosure: Replaced with 8931
- Raised lower ΔT (new height was not measured)
- Replaced R. M. Young Wind System with Bendix Wind System

Field Team: Jonathan Thom

Transport: Kenn Borek Air, Ltd. from Onset D

Brianna had quietly gone off the air in early December. On arrival at Brianna , the first observation was that the solar panel was on the south side of the tower. The battery voltage was below 12, both battery boxes were replaced. Cycling the power on the station did not cause the AWS to transmit. The station was replaced with ARGOS ID 8931, the wind system was changed to a Bendix to match the station. The solar panel was moved to the north side of the tower and the ΔT boom was raised. The station was received by the up-link receiver before leaving. Our departure was delayed by 8 hours because of problems with the airplane. The problem was fixed and we were able to return to Onset D.

Willie Field (ARGOS ID 21364)

Date: 25 January 2002

Two new battery boxes were installed at Willie Field. No other changes done on station.

Iceberg C16 and B15-a Automatic Weather/Global Position System Stations

Iceberg C16

Date: 23 January 2002

Transport: Petroleum Helicopters, Inc. Bell 212

Field Team: Doug MacAyeal, Andy Bliss, Chuck Kurnik, Jonathan Thom

In December, Andy Bliss and his team installed an Automatic Weather/GPS station on C16. In addition to the permanent station, three geodetic GPS were installed in an array around the tower, and a tilt meter was installed near the tower. The subsequent trip to C16 was to retrieve the geodetic GPS units and the tilt meter, and to confirm wind direction orientation with respect to a flux gate compass.

Iceberg B15-a

Date: 26 January 2002

Transport: United States Coast Guard

Field Team: Doug MacAyeal, Andy Bliss, Thai Verzone, Jonathan Thom

After the stations were installed on B15-a last year some problems were discovered that affected the wind speed measurement. This year's mission was to raise the stations at Mother 2 and Daughter stations, change the configuration of Mother 2, and to re-program Mother 1. However, the weather did not cooperate and only Mother 2 work was performed as this was deemed most important. The updates to Mother 2 included adding a fluxgate compass, new GPS, a board to convert a pulse count wind speed measurement to voltage, and a new interface for the GPS and fluxgate compass. In addition to the new instrumentation, a new program was uploaded, a storage module was added, and the tower raised by three feet. The Mother 1 re-program was done on 30 January 2002.

Windless Bight (Argos 8927)

Date: 16 January 2002

GPS Location: 77.721°S 167.700°E
Elevation: 61 m

Station Characteristics on arrival:
ΔT boom: buried
Enclosure: buried
Junction Box: Buried
Solar Panel: Buried
Instrument Boom: Snow Level
R. M. Young Wind system

Station Changes
Raised Tower / Boom to 3.3 m

Field Team: George Weidner, Doug MacAyeal, Andrew Bliss

Transport: Helicopter 31L Pilot James

Windless Bight was no longer received as of November of 2001. The battery voltage had been slowly Declining with no indication of charging by the solar panel. Suspected AWS was buried as there is very High snow acumulation (~ 1 meter / year) there. This was confirmed by Berg Field Center personnel during a route reflagging on 14 January. They reported only the wind sensor above the snow. Additional time was requested via radio in order to completely raise the AWS unit. AWS restarted after Two attempts to initailize it. Weather was great!

Minna Bluff (Argos ID 8935)

Date: 23 January 2002

GPS Location: 78.555°S 166.691°E
Elevation: 895 m (NEW for 2002)

Station Characteristic
Enclosure: 50 cm
Junction Box: 46 cm
Solar Panel: 90 cm
Instrument Boom: 120 cm
High Wind speed Hydor-Tek

Station Changes
None

Field Team: Jonathan Thom, George Weidner

Transport: Helo 31L, Pilot James

Minna Bluff had not been transmitting since December.. On arriving at the station, the first observation was the antenna's vertical was gone. The battery voltage was nominal and the unit seemed in good shpae. After replacing the antenna the AWS started up and was received by the Argso Upling receiver. The guys were tightened to remove some slack.

Cape Spencer (Argos 8695)

Date: 29 January 2002

GPS Location: 79.97°S 167.55°E
Elevation: 15 m (Estimated)

Station Characteristics

ΔT boom:
Enclosure:
Junction Box:
Solar Panel:
Instrument Boom:
R. M. Young Wind system

Station Changes

Enclosure: AWS 8695 repaced 8722

Field Team: SPAWAR field team

Transport: Helo from Mcmurdo

The SPAWAR field team (POC Larry Lainey) had retruned the no working unit to us for possible repair. It had ceased being received after the big December2001 storm (as did Minna Bluff AWS). After several attempts to diagnoxe a problem , it was determined that given the time constraints, it would be easier to modify a standard AWS to the SPAWAR specs. George Weidner modified AWS 8921 and installed the SPAWAR porgram ROMS with Argos ID 8695. The SPAWAR team then deployed the AWS in the field.

Automatic Weather Station work in the summer season of 2001/2002

Introduction

All of the AWS sites were visited this season during the time around Christmas and New Year. On the following pages there are details of each visit. As well as listing the details of the work done on the weather stations I have also included data about snow accumulation, positions of the sites and movement since they were last visited

Problems

- We initially thought that the ARGOS test set was not working properly because we were not getting sensible numbers from it. Eventually it was realized that it uses a lot of power from the car battery it is powered from, it is therefore necessary to recharge it after each use. It is also dependant on its position in relation to the AWS and the airplane.
- A related problem to the above was that when we collected the weather observation to calibrate the AWS, we did not always have the exact weather data we wanted from it at the exact time. It was therefore necessary to get the data from the satellite once we were back at Rothera. This is not ideal because there is often a time lag between our observation and the AWS's observation.
- We had some trouble deciding whether or not the wind direction given by the AWSs was accurate. We presumed that as long as the boom arm containing the wind vain was pointing north – south, then it should be giving the correct direction. However with the limited data we collected at the sites it does not seem appropriate to be able to calibrate the wind direction.

Conclusions

The trips have been successful in that we have raised all of the AWSs where necessary and replaced faulty parts. I hope with the experiences learnt this season and advice from Cambridge, next year we can do a more thorough job of servicing the AWSs. During the winter I also plan to do more data analysis with initiatives from Cambridge to find other possible faults with AWS data.

RONNE SHELF (CAPE ADAMS) – 8925

Personnel: Richard Flower, Ian Martin, Geoff Porter (pilot)

Time of Visit: 1600 – 2025 Z
Date: 03/01/2002
Last Visited: 02/01/2000

Present Location: S 75 23.85 W 059 53 05

Elevation: 100 ft (aprox)

Boom Height as found: 3.41 m
Old Boom Height: 2.48 m (14th Jan 2000)
Accumulation: - 0.93 m
New Boom Height: 3.41 m

Magnetic Variation: E21

Boom Alignment: 354

Weather:

	Observed Weather	AWS recorded weather
Time of Observation	1945	2013
Pressure / mB	986.2	985.6
Temperature / 'C	+2.0	+1.6
Wind direction (magnetic)	090	080
Wind speed / knots	5	10

Work Done:

- Removed faulty areovane (it was not giving wind speed and the direction was dubious).
- Fitted new areovane. We found that this did not sit properly on the boom so put extra washers on the mounting to create a seal.
- Installed new set (2 new boxes) of batteries because old ones where running down over night during the winter.
- Mast was not raised due to negative accumulation. Stays were tightened.

Notes:

- About 10 km from ice edge. There was a discontinuity in the snow/ice to the south of AWS, may be on an iceberg in next year or so. I recommend that it is moved to the south next year.

SKY HI - 8917

Personnel: Richard Flower, Ian Martin, Nick Chittenden (pilot), Keith Grant (artist)

Time of Visit: 2000 – 2200 Z
Date: 27/12/2001
Last Visited: 09/02/2000

Present Location: S 74 47.53 W 071 29.31

Elevation: 1700 m (5500ft), exact height not known

Boom Height as found: 2.84 m
Old Boom Height: 3.50 m
Accumulation: + 0.66 m
New Boom Height: 3.74 m

Magnetic Variation: E29

Boom Alignment: 320

Weather:

	Observed Weather	AWS recorded weather
Time of observation / Z	2125	2128
Pressure / mB	808.1 (973.1 QFF)	977.6
Temperature / 'C	-10.0	-10.3
Wind direction (magnetic)	230	126
Wind speed / knots	8	12

Work Done:

- Raised mast by one short section (approximately 1m).

BUTLER ISLAND – 8902

Personnel: Richard Flower, Ian Martin, Nick Chittenden (pilot), Keith Grant (artist)

Time of Visit: 1420 – 1720 Z
Date: 27/12/2001
Last Visited: 10/01/2001

Present Location:	S 72 12.38	W 060 10.18	
Old Location:	S 72 12.00	W 060 09.60	
Drift:	S 00 00.38	E 000 00.78	0.84 knm (064' true)
Elevation:			

Boom Height as found: 4.03 m
Old Boom Height: 3.16 m
Accumulation: + 0.87 m
New Boom Height: 3.16 m

Magnetic Variation: E19

Boom Alignment: 345

Weather:

	Observed Weather	AWS recorded weather
Time of observation / Z	1630	1631
Pressure / mB	974.4	974.2
Temperature / 'C	-2.9	0
Wind direction (magnetic)	347	210
Wind speed / knots	8 – 11	12

Work Done:

- Moved Solar panel and electronic boxes up so all above 120cm allowing accumulation for the next year.

Notes:

- 4 guys at steep angle. Will need to be raised next year and have new dead men and guys.

ATOLL (Uranus glacier) - 8920

Personnel: Richard Flower, Felicity Aston, Nick Chittenden (pilot)

Time of Visit: 1100 – 2030 Z
Date: 22/12/2001
Last Visited: 05/01/2001

Present Location: S 71 21.67 W 68 47.83
Old Location: Wrong location, 5 km out
Drift:
Elevation: 870 m (2500ft)

Boom Height as found: 2.60 m
Old Boom Height: 3.66 m
Accumulation: + 1.06 m
New Boom Height: 3.64 m

Magnetic Variation: E24

Boom Alignment: 300

Weather:

	Observed Weather	AWS recorded weather
Time of observation / Z	2000	2041
Pressure / mB	883.2 (958.2 QFF)	970.4
Temperature / 'C	-1.0	0.5
Wind direction (magnetic)	Variable	041
Wind speed / knots		5

Work Done:

- Mast was non-verticle so dug down about 2 m and removed 3.6 m of mast and repositioned it 2m to the north putting in new dead men. Could not find original battery box so we left it and connected it to mast via cables in a trench.

LARSEN – 8926

Personnel: Richard Flower, Felicity Aston, Nick Chittenden (pilot), Philip (artist)

Time of Visit:	1500-1900		
Date:	21/12/2001		
Last Visited:	09/02/2000		
Present Location:	S 66 56.67	W 060 51.61	var
Old Location:	S 66 56.86	W 060 52.63	var
Drift:	S 00 00.19	W 000 01.02	1.04 knm (265 true)
Elevation:	100 ft		
Boom Height as found:	2.17 m		
Old Boom Height:	3.50 m		
Accumulation:	+ 1.33 m		
New Boom Height:	3.07 m		
Magnetic Variation:	E16		
Boom Alignment:	320		

Weather:

	Observed Weather	AWS recorded weather
Time of observation / Z	1230	1530
Pressure / mB	960	960.2
Temperature / 'C	+1.2	+1.3
Wind direction (magnetic)	032	070
Wind speed / knots		5

Work Done:

- Replaced aerovane (old one was about 100' out).
- Mast raised, used same dead men and chain guys.
- Raised solar panel and boxes so they are all at least 1m above the snow level.

Notes:

- There is a large fissure in the ice about 7km to the North West of the AWS, which is visible on satellite images and also from the air.

Shelf Micropaws

Personnel: Richard Flower, Ian Martin, Nick Chittenden (pilot), Keith Grant (artist)

Time of Visit: 2000 - 2200

Date: 03/01/2002
Last Visited: 31/10/2000

Present Location: S 75 42.99 W 058 01.48

Elevation: 100 ft

Boom Height as found:
Old Boom Height: unknown
Accumulation: -0.9 m (taken from Shelf AWS)
New Boom Height: 1.165m to bottom of solar panel, total height aprox 3m.

Samples from Micropaws:

Wind sample: 118.8'
Wind speed: 3.4 knts

RH(0): 85.9 RH(1): 80.8
Temp(0): 0.5'C Temp(1): 0.5

Pressure: 989.3

Observed weather:

Wind: 060 (magnetic) at 4 knts

Temp: 0'C

Pressure: 988.2

Work Done:

- Downloaded data
- Erased flash card
- Changed battery (old one at 12.49 V)
- Connected new battery (13.05V)
- Re-installed program
- Computer woke up thinking it was 12:10, January 1, 1995
- Set to winter mode
- Set time at 21:42, 3rd of January 2002