



Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Re: MOSAiC turbulence mast

38 messages

Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>

Thu, Mar 21, 2019 at 10:39 PM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Ola Persson <ola.persson@noaa.gov>, Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Ian, I've included Chris in this email as well.

Ola and Chris: This is to update you on something that was discussed in Potsdam. Markus Frey was wanting to sample particle fluxes on the tower and I figure that instead of him running another sonic along with his particle counter that we could simply mount the particle counter on the boom next to our 2m sonic and this could be integrated into our overall system. If anyone sees major issues with that, please let me know. Ian has indicated that this should be relatively straight forward.

As for the 30m mast. Chris or Ola, do you see any problem in integrating those instruments into our central data logging? The only challenge that I see is in the cabling. This will be something on the order of 50m away, plus the 30m height. Is that too far a distance?

Ian: What were you thinking for the mast? Would this simply be a sonic, or does it make sense to put met up there as well?

Cheers, Matt

On Mon, Mar 18, 2019 at 3:49 AM Ian Brooks <i.brooks@see.leeds.ac.uk> wrote:

Matt (cc Ola)

Following our discussion with Markus about getting a CLASP integrated with the flux mast measurement system, could you put me in touch with...Chris Cox? or whoever I need to talk to about sorting this out. I should be able to ship an instrument to Boulder by end of April for integration.

Also, does it make sense to integrate my metek sonic on the 30m mast with the rest of the flux logging system to keep everything consistent?

Ian

--

Prof Ian M. Brooks

Institute for Climate & Atmospheric Science

School of Earth & Environment, University of Leeds, Leeds, LS2 9JT

phone: +44(0)113 343 6743 (Lab: 0113 343 6805) | fax: +44(0)113 343 5259

i.brooks@see.leeds.ac.uk | www.see.leeds.ac.uk/~lecimb | t:@IanMBrooks

Ian Brooks <i.brooks@see.leeds.ac.uk>

Fri, Mar 22, 2019 at 12:41 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>

Cc: Ola Persson <ola.persson@noaa.gov>, Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

I was thinking just a sonic for the top of the 30m mast, as we did in ASCOS...

For 12m mast, the CLASP output is RS485 (4-wire/full-duplex), and it needs 12V DC power. If the main power distribution is 24V, I'll stick a DC/DC converter inside to simplify things.

Ian

On 22/03/2019 04:39, Matthew Shupe - NOAA Affiliate wrote:

Ian, I've included Chris in this email as well.

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i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk> |
www.see.leeds.ac.uk/~lecimb <http://www.see.leeds.ac.uk/~lecimb> |

t:@lanMBrooks

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Tue, Mar 26, 2019 at 4:12 PM

To: i.brooks@see.leeds.ac.uk

Cc: Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>, Ola Persson <ola.persson@noaa.gov>

Matt and Ian,

I don't see any problem with integrating CLASP. It would be best if we were logging the CLASP data stream (10 Hz is it?) with the same computer we will log the sonic data stream such that the sample timing is most easily managed. It should also be possible to log the mast sonic with the same system if it is rs485 or network at 50 m.

-Chris

[Quoted text hidden]

--

Christopher J. Cox
Research Scientist
CIRES/NOAA-ESRL
R/PSD3
325 Broadway
Boulder, CO 80305

Ian Brooks <i.brooks@see.leeds.ac.uk>

Wed, Mar 27, 2019 at 1:25 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Cc: Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>, Ola Persson <ola.persson@noaa.gov>

CLASP & the Metek both RS485.

CLASP is usually run at 10Hz, but is configurable to anything up to 20Hz.

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On 26/03/2019 22:12, Christopher Cox - NOAA Affiliate wrote:

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Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>

Thu, Apr 4, 2019 at 7:08 AM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Ola Persson <ola.persson@noaa.gov>

Ian, Ok, it sounds like this all should not be a problem to incorporate into our data logging situation. I think the best plan is for Ian to first make sure you have the mount stuff figure out for the Metek onto the mast then to send both the Metek and the CLASP with their cables to us here in Boulder. We will incorporate them into our tower set up and make sure that the data is all handled. Metek cabling should probably be 90-100m if feasible. CLASP cabling should be something like 5-6m. Does this sound reasonable? The sooner the better on sending that stuff as we are starting to assemble the tower. Cheers. Matt

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Matthew Shupe <matthew.shupe@noaa.gov>

Wed, Apr 24, 2019 at 7:53 PM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Ola Persson <ola.persson@noaa.gov>

Ian, just checking in on the status of the stuff you are sending us. We are starting the integration of the tower and will need the other instruments sooner rather than later. Thanks, Matt

Sent from my iPhone

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Thu, Apr 25, 2019 at 1:16 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Matthew Shupe <matthew.shupe@noaa.gov>

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Ola Persson <ola.persson@noaa.gov>

Hi Matt

Might get to ship by late next week - was travelling for the 3 weeks after Potsdam, had to wrap up prep and shipping for Greenland, bunch of other deadlines...and it's only me, I have no tech support for this stuff (and no funding for the stuff for Markus). I only got to start work on the CLASPs yesterday - needing to rebuild and calibrate.

A quick tech question - the CLASP has power and data (RS485 4-wire) going up a single cable, which will need breaking out at the logger end. I have some interface boxes made up for other projects that separate power and data and do RS485-RS232 conversion. Would one of those help simplify things at your end? I'll throw one in the pack anyway - might help with initial set up and testing.

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On 25/04/2019 02:53, Matthew Shupe wrote:

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Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Thu, Apr 25, 2019 at 8:30 AM

To: i.brooks@see.leeds.ac.uk

Cc: Matthew Shupe <matthew.shupe@noaa.gov>, Ola Persson <ola.persson@noaa.gov>

Ian,

We should be able to handle just fine, but if you have an interface box for the system please do send it along. What is the voltage for CLASP and how many watts?

-Chris

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Ian Brooks <i.brooks@see.leeds.ac.uk>

Thu, Apr 25, 2019 at 8:36 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Hi Chris

It takes 12V and uses about 10W.

Ian

On 25/04/2019 15:30, Christopher Cox - NOAA Affiliate wrote:

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Reply-To: i.brooks@see.leeds.ac.uk

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Thu, Apr 25, 2019 at 9:51 AM

Actually, I just finished doing the particle size calibration on the CLASP I'm sending out to you, and stuck it on another power supply to check the current drawn.

12V, 0.15A = 1.8W

Will get the flow calibration done tomorrow, and should be able to ship this and the metek sonice anemometer next week.

Could you confirm the shipping address to send it to.

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[Quoted text hidden]

[Quoted text hidden]

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>
To: i.brooks@see.leeds.ac.uk

Mon, Apr 29, 2019 at 9:16 AM

NOAA/PSD-POP
Attn: Christopher Cox/Matthew Shupe
R/PSD3 325 Broadway
Boulder, CO 80305
United States
Tel: 303-497-4518
email: christopher.j.cox@noaa.gov

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>
Reply-To: i.brooks@see.leeds.ac.uk
To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Wed, May 1, 2019 at 7:57 AM

Cc: Matt Shupe <Matthew.Shupe@noaa.gov>

Hi Chris

CLASP and Metek sonic anemometer should be on their way to you tomorrow.
I've included cables for testing, but need to make up new ones with Arctic grade cable for final deployment.

Attached is a word document with some quick details of what should be in the boxes, and another with detailed instructions for use of CLASP - with luck you won't need most of it. Just connect CLASP to power via the RS485-to-RS232 interface box, and plug that into an RS232 terminal, and data should appear (baud rate 38400).

Also attached, two matlab functions to import the data. These probably won't quite work since the first one, CLASP_read_MOSAiC.m is set up for my logging system which adds a date/time stamp to the start of each line as 'YYYY MM DD hh mm ss.ss' - that will need modifying for the NOAA system. There's a matlab data file (calibration_CLASP_P_Apr2019.mat) which contains the calibration information for this unit, for use by CLASP_apply_cal_MOSAiC.m.

Finally, there's an ascii file CLASPV5Config_MOSAiC_unit_P.txt which is the config file to send to CLASP if you manage to screw up the settings on it. With luck you'll never need it.

Shout if you have questions.

cheers

Ian

On 29/04/2019 16:16, Christopher Cox - NOAA Affiliate wrote:

NOAA/PSD-POP
Attn: Christopher Cox/Matthew Shupe
R/PSD3 325 Broadway
Boulder, CO 80305
United States
Tel: 303-497-4518
email: christopher.j.cox@noaa.gov <mailto:christopher.j.cox@noaa.gov>

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[Quoted text hidden]

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6 attachments

-  **CLASP_apply_cal_MOSAiC.m**
4K
-  **CLASP_read_MOSAiC.m**
5K
-  **CLASP-instructions.docx**
321K
-  **CLASP-to-NOAA - Notes.docx**
14K
-  **CLASPv5Config_MOSAiC_unit_P.txt**
1K
-  **calibration_CLASP_P_Apr2019.mat**
1K

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>
To: i.brooks@see.leeds.ac.uk
Cc: Matt Shupe <Matthew.Shupe@noaa.gov>

Wed, May 1, 2019 at 9:51 AM

Great, thanks Ian! I'll let you know when the equipment arrives and if I have questions.

-Chris

[Quoted text hidden]

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Wed, May 8, 2019 at 5:37 PM

To: i.brooks@see.leeds.ac.uk

Cc: Matt Shupe <Matthew.Shupe@noaa.gov>

Ian,

The equipment arrived. More later.

-Chris

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Thu, May 9, 2019 at 1:37 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Cc: Markus Frey <maey@bas.ac.uk>

Great, thanks Chris.

Something I think I forgot to put in the notes about CLASP. When it is finally installed on the mast, it should have the inlet pointing down - to prevent precip falling into the inlet; also provides uniform inlet characteristics regardless of wind direction. The ideal is for the inlet to be close to the sonic anemometer sensing head, though we also need to minimise possible obstruction to the flow around the sonic, and there are practical issues for physically mounting it.

Easy option is to install it with inlet at same height as a sonic head but on, or very close to the mast itself. The horizontal separation will result in some loss of correlation, but there are theoretical corrections that can be applied to try and correct that...they'll get smaller the higher it is.

I've cc'd Markus - he might want to comment on how high he really wants this.

cheers

Ian

On 09/05/2019 00:37, Christopher Cox - NOAA Affiliate wrote:

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-Chris

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Frey, Markus M. <maey@bas.ac.uk>
To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>
Cc: Ian Brooks <i.brooks@see.leeds.ac.uk>

Thu, May 9, 2019 at 9:12 AM

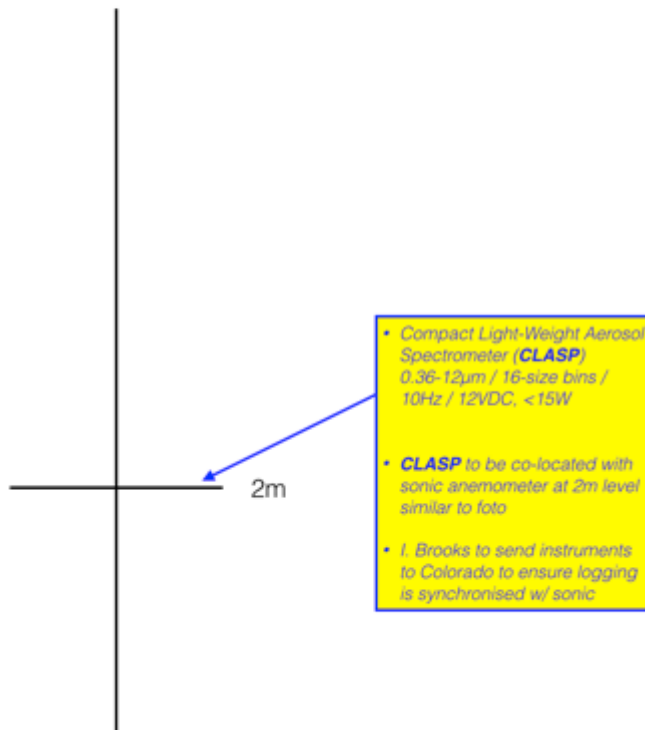
Hi Chris

please see attached foto of the CLASP/sonic (METEK) set up I used on N-ICE2015. It's a possibility but depends also on how you want to mount things on the 12m mast.

Best wishes,
Markus

3. MetCity - 12m mast

c) OPC (CLASP)



[Quoted text hidden]

Markus M. Frey, PhD | Atmospheric & Ice Chemist | British Antarctic Survey
High Cross, Madingley Road, Cambridge CB3 0ET

Email: maey@bas.ac.uk | Tel: +44 (0)1223 221268 | Web: <https://www.bas.ac.uk/profile/maey/>

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Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Fri, May 24, 2019 at 5:21 PM

To: i.brooks@see.leeds.ac.uk

Cc: Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>

Hi Ian,

Sorry for the delay. I ran the CLASP and usa-1 this afternoon. The metek output looks normal. Being unfamiliar with the CLASP I collected about an hour data in hyperterm so that I could forward it along to you. The CLASP was run at room temp in the lab, ~22-23 C. We are at near 1500 m elevation here and the atmospheric pressure was ~830 hpa today. I did not get a new calibration for the lower pressure. I modified CLASP_read_MOSAIC.m to bypass "timebits" (line 45) and begin with statusbyte as the first column because the instrument didn't output a time stamp. Nearest I can tell, the instrument does not output a time so this part of the code must be a holdover from a prior logging system (?). The file containing the data is attached. Let me know if you see anything amiss. Looked like data to me :) It even sampled a realistic looking signal about halfway through the test.

Next week we will hook up all of the 10 and 20 Hz instruments for the met city tower together in the lab so that we can run some tests on the computer/logging software with the full load. Nominally, we would be archiving the raw strings and attaching a time stamp, but we have the capability to add a couple features:

- (1) automated instrument controls. For example, the EPROM settings could be automatically sent after a power interruption to make things more seamless in the case those settings were lost in the power cycle.
- (2) statistical summaries for status updates. These could be a variety of things like std deviations of some variable, covariances, counts of missing data, etc

If you think any of this would be useful let me know specifically what would be useful and we will try to implement it.

Cheers,
Chris

[Quoted text hidden]

 **clasp.dat**
2617K

Ian Brooks <i.brooks@see.leeds.ac.uk>

Sun, May 26, 2019 at 5:24 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Hi Chris

CLASP data looks pretty good - a quick plot of the size spectra attached. The dip in the middle, around $R = 1-2 \mu\text{m}$ is a bit suspect, but I think that's a minor

calibration issue. The scatter cell has a 2-stage amplifier, with the second stage kicking in at around this size. I had problems getting a calibration point close to the transition point on this unit, so I suspect that there may be a small low bias around there.

Otherwise all looks good.

Don't worry about the flow calibration in Boulder...it'd only need changing again when it's brought back down to sea level.

Might be worth implementing the automatic re-setting of the EPROM settings after a power loss. It's usually OK, but can get corrupted if there's a brown-out, or the power cycles very quickly.

Will have a think & chat with Markus about what data summary might be useful.

cheers

Ian
ps. I've attached revised copies of the matlab code to work with this file. The time stamp was something added by logging code.

cheers

Ian

Sorry for the delay. I ran the CLASP and usa-1 this afternoon. The metek output looks normal. Being unfamiliar with the CLASP I collected about an hour data in hyperterm so that I could forward it along to you. The CLASP was run at room temp in the lab, ~22-23 C. We are at near 1500 m elevation here and the atmospheric pressure was ~830 hpa today. I did not get a new calibration for the lower pressure. I modified CLASP_read_MOSAIC.m to bypass "timebits" (line 45) and begin with statusbyte as the first column because the instrument didn't output a time stamp. Nearest I can tell, the instrument does not output a time so this part of the code must be a holdover from a prior logging system (?). The file containing the data is attached. Let me know if you see anything amiss. Looked like data to me :) It even sampled a realistic looking signal about halfway through the test.

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(2) statistical summaries for status updates. These could be a variety of things like std deviations of some variable, covariances, counts of missing data, etc

If you think any of this would be useful let me know specifically what would be useful and we will try to implement it.

Cheers,
Chris

On Thu, May 9, 2019 at 9:12 AM Frey, Markus M. <maey@bas.ac.uk> <<mailto:maey@bas.ac.uk>>> wrote:

Hi Chris

please see attached foto of the CLASP/sonic (METEK) set up I used on N-ICE2015. It's a possibility but depends also on how you want to mount things on the 12m mast.

Best wishes,
Markus

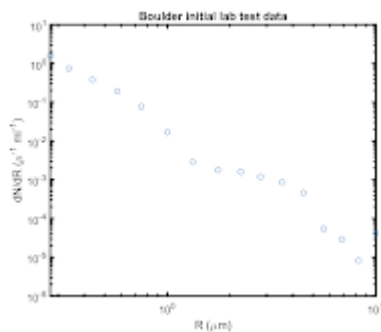
On 9 May 2019, at 08:37, Ian Brooks <i.brooks@see.leeds.ac.uk

[Quoted text hidden]

Markus M. Frey, PhD**I Atmospheric & Ice Chemist | British Antarctic Survey
High Cross, Madingley Road, Cambridge CB3 0ET____
Email: maey@bas.ac.uk <mailto:LMCA@bas.ac.uk> | Tel: +44 (0)1223 221268 | Web: ____<https://www.bas.ac.uk/profile/maey/>
Visit our website www.bas.ac.uk <<http://www.bas.ac.uk/>> | Follow BAS on Twitter <https://twitter.com/BAS_News> and Facebook <<https://www.facebook.com/BritishAntarcticSurvey>>____
NERC is part of UK Research and Innovation www.ukri.org <<http://www.ukri.org/>>
P/Please think of the environment before printing out this message/
/
/

[Quoted text hidden]

3 attachments



CLASP_Boulder_lab_test.png
36K

 CLASP_apply_cal_MOSAIC.m
4K

 CLASP_read_MOSAIC.m
5K

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Mon, May 27, 2019 at 2:38 PM

To: i.brooks@see.leeds.ac.uk

Ok, thanks.

Unfortunately, we did have a problem appear yesterday with the sonic. During that first run of a couple minutes last week everything looked ok, but yesterday it was mostly printing "invalid data" messages. I started to recalibrate because if the cal is off that can sometimes cause this problem. As part of this, I tested that paths and found P2 unresponsive. P2 is chirping so it's not a power issue. I traced it to where the blue cable integrates into the sensor head. Some wiggling of that cable created intermittent data. Today I went back over this with someone else and we are in agreement that it seems to be associated with that connection.

Have you seen this before? Can't be certain, but my best guess is that there is a bad solder joint for the P2 comms wire at the sensor head. Note that I'm talking about the sensor itself and not the electronics box. At the sensor head the cable is hard-wired into the instrument body rather than having a connector. I'm not really sure what's inside there and I certainly won't open it up unless you want me to. Let me know how you would like to proceed.

-Chris

[Quoted text hidden]

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Mon, May 27, 2019 at 2:58 PM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Hi

No, not had this problem before - or not exactly. A few years ago I had similar problem crop up in the field, which was finally tracked down to corrosion on the sensor/interface connections. So a bad connection at the sensor would be expected to do similar problems.

If you're happy to open it up, it can't make it any worse, so go ahead and take a look. If we have to send it back to metek, we probably have time - or I may be able to borrow another instrument if needed.

Ian

On 27/05/2019 21:38, Christopher Cox - NOAA Affiliate wrote:

Ok, thanks.

Unfortunately, we did have a problem appear yesterday with the sonic. During that first run of a couple minutes last week everything looked ok, but yesterday it was mostly printing "invalid data" messages. I started to recalibrate because if the cal is off that can sometimes cause this problem. As part of this, I tested that paths and found P2 unresponsive. P2 is chirping so it's not a power issue. I traced it to where the blue cable integrates into the sensor head. Some wiggling of that cable created intermittent data. Today I went back over this with someone else and we are in agreement that it seems to be associated with that connection.

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-Chris

On Sun, May 26, 2019 at 5:24 AM Ian Brooks <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>> wrote:

Hi Chris

[Quoted text hidden]

> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>> wrote:

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> Hi Chris

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> please see attached foto of the CLASP/sonic (METEK) set up I used on

> N-ICE2015. It's a possibility but depends also on how you want to

> mount things on the 12m mast.

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> Best wishes,

> Markus

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>> On 9 May 2019, at 08:37, Ian Brooks

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[Quoted text hidden]

<mailto:christopher.j.cox@noaa.gov <mailto:christopher.j.cox@noaa.gov>>

>>> <mailto:christopher.j.cox@noaa.gov

<mailto:christopher.j.cox@noaa.gov>>> wrote:

>>> Great, thanks Ian! I'll let you know when the equipment

>>> arrives and

>>> if I have questions.

>>> -Chris

>>> On Wed, May 1, 2019 at 6:57 AM Ian Brooks

>>> <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>

<mailto:i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>>

[Quoted text hidden]

> Email: maey@bas.ac.uk <<mailto:maey@bas.ac.uk>>
<<mailto:LMCA@bas.ac.uk> <<mailto:LMCA@bas.ac.uk>>> |Tel: +44 (0)1223
> 221268 | Web: <https://www.bas.ac.uk/profile/maey/>
> Visit our website www.bas.ac.uk <<http://www.bas.ac.uk>>
<<http://www.bas.ac.uk/>> | Follow BAS
> onTwitter <https://twitter.com/BAS_News> and Facebook
> <<https://www.facebook.com/BritishAntarcticSurvey>>____
> *NERC* is part of UK Research and Innovationwww.ukri.org
<<http://Innovationwww.ukri.org>>

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Ian Brooks <i.brooks@see.leeds.ac.uk>

Mon, May 27, 2019 at 2:59 PM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

By the way - I meant to check when I sent everything out, but did you hang on to the 'commercial invoice' paperwork that came with the stuff I sent out? May be needed to return ship them without incurring import duties. If it wasn't binned already, hang on to it!

Ian

On 27/05/2019 21:38, Christopher Cox - NOAA Affiliate wrote:

Ok, thanks.

Unfortunately, we did have a problem appear yesterday with the sonic. During that first run of a couple minutes last week everything looked ok, but yesterday it was mostly printing "invalid data" messages. I started to recalibrate because if the cal is off that can sometimes cause this problem. As part of this, I tested that paths and found P2 unresponsive. P2 is chirping so it's not a power issue. I traced it to where the blue cable integrates into the sensor head. Some wiggling of that cable created intermittent data. Today I went back over this with someone else and we are in agreement that it seems to be associated with that connection.

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-Chris

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<<mailto:i.brooks@see.leeds.ac.uk> <<mailto:i.brooks@see.leeds.ac.uk>>>

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> Email: maey@bas.ac.uk <<mailto:maey@bas.ac.uk>>
<<mailto:LMCA@bas.ac.uk> <<mailto:LMCA@bas.ac.uk>>> | Tel: +44 (0)1223
> 221268 | Web: <https://www.bas.ac.uk/profile/maey/>
> Visit our website www.bas.ac.uk <<http://www.bas.ac.uk>>
<<http://www.bas.ac.uk/>> | Follow BAS
> on Twitter <https://twitter.com/BAS_News> and Facebook
> <<https://www.facebook.com/BritishAntarcticSurvey>>____
> *NERC* is part of UK Research and Innovation www.ukri.org
<<http://Innovationwww.ukri.org>>

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Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>
To: i.brooks@see.leeds.ac.uk
Cc: Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>

Wed, May 29, 2019 at 5:44 PM

Ian,

Dave Costa and I put some time into troubleshooting the sonic yesterday. We did find some minor corrosion on the P2 wires where they are spliced with the sensor electronics and repaired the connection, but it did not fix the problem. We found that running the heater correlates with improved the output, but that this effect is not

always repeatable. When it does work, dropouts increase over a period of time after the heater is turned off while the amount of good data increases faster when the heater is turned back on. This seems more consistent with it being the warming of the sensor heads that are responsible for the improvement rather than the act of powering the heater. In general, it has been very intermittent and not very predictably so. This might explain why the data looked good the first time I turned it on, but not afterward. I spoke with a couple other engineers as well and the consensus is that Metek will need to have a look. Dan Gottas, who is developing the logging software, has been using the intermittency to dial in management of bad data and I expect he will be done testing by Friday. We have a similar USA-1 here that can serve as a stand-in for bench testing after we send yours back to you (ours needs to be repaired too so it isn't a candidate of a field replacement at this time).

In short, it is a bummer about the sonic trouble, but I think we have (will very soon have) what we need as far as integration goes. We can return the sonic to you without it needing to come back to Colorado.

I have a question about integration. In your opinion, how important is it to be precise about the time syncing with the other meteks on the tower? (I will ask Ola P the same question). These will be some distance away, but sometimes there is interest in comparing covariances between heights. The reason I ask is that if it is important we might have rig up a way to benchmark the lag in the cable since it is long (do you know how long? The blue cable looked like 10 m, but I didn't measure the serial cable).

I do have the commercial invoice.

-Chris

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>
Reply-To: i.brooks@see.leeds.ac.uk
To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>
Cc: Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>

Wed, May 29, 2019 at 5:58 PM

Hi Chris

That is a pain about the metek...but better it shows up now than once we're on the ice. If you send it back as soon as you can, I'll get metek primed that it'll be coming back for servicing.

Regarding time syncing of the multiple sonics. I don't think we need to worry about lags resulting from cable length. We'll be comparing data from different heights, but that will be for the final fluxes, so a least 10-minute averages. Time syncing to the order of a second or so should be fine.

cheers

Ian

On 30/05/2019 00:44, Christopher Cox - NOAA Affiliate wrote:

Ian,

[Quoted text hidden]

> <<mailto:i.brooks@see.leeds.ac.uk>
<<mailto:i.brooks@see.leeds.ac.uk>>>> wrote:
>
> Hi Chris
>

[Quoted text hidden]

[Quoted text hidden]

<<mailto:i.brooks@see.leeds.ac.uk>> <<mailto:i.brooks@see.leeds.ac.uk>>

[Quoted text hidden]

<<mailto:maey@bas.ac.uk>> <<mailto:maey@bas.ac.uk>>>

[Quoted text hidden]

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Fri, May 31, 2019 at 10:09 AM

To: i.brooks@see.leeds.ac.uk

Cc: Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>

Ian,

Would you prefer us to ship it to you or to Metek directly?

-Chris

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Fri, May 31, 2019 at 12:39 PM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

If you could ship direct to metek that would save some time - I'm at Greenland Summit camp at the moment, not home until next friday, but away all but 2 days in the following 2 weeks.

I sent details of the issue to metek, and their anemometer engineer, Matthias, Lück knows it will be on it'll be on the way soon.

METEK GmbH
Fritz-Strassmann-Str. 4
25337 Elmshorn
Germany

Tel.: +49 4121 43590
Fax: +49 4121 4359 20
e-mail: info@metek.de / lueck@metek.de
<http://www.metek.de>

If they have a US address that you deal with it could probably also go there.

Ian

On 31/05/2019 17:09, Christopher Cox - NOAA Affiliate wrote:

Ian,

Would you prefer us to ship it to you or to Metek directly?

-Chris

On Wed, May 29, 2019 at 5:58 PM Ian Brooks <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>> wrote:

Hi Chris

[Quoted text hidden]

[Quoted text hidden]

> > <mailto:i.brooks@see.leeds.ac.uk
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<mailto:i.brooks@see.leeds.ac.uk> <mailto:i.brooks@see.leeds.ac.uk

[Quoted text hidden]

> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>

[Quoted text hidden]

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Fri, May 31, 2019 at 12:42 PM

To: Sara Morris - NOAA Affiliate <sara.morris@noaa.gov>

Sara,

See below for the shipping info for the Metek.

-chris

[Quoted text hidden]

Sara Morris - NOAA Affiliate <Sara.Morris@noaa.gov>

Wed, Jun 5, 2019 at 1:01 PM

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, i.brooks@see.leeds.ac.uk

Hi Ian,

I'm working on getting the Metek to Germany... could you send me your phone number and address information as the end user of the instrument.

Best,

Sara

[Quoted text hidden]

--

Sara M. Morris
Associate Scientist II

Cooperative Institute for Research in Environmental Sciences
NOAA/ESRL
Physical Sciences Division / Polar Observations & Processes
Global Monitoring Division / Global Radiation Group
Boulder, Colorado 80305 USA
Office: [303.497.4453](tel:303.497.4453)
Email: Sara.Morris@noaa.gov

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>
To: Sara Morris - NOAA Affiliate <Sara.Morris@noaa.gov>
Cc: Ian Brooks <i.brooks@see.leeds.ac.uk>

Wed, Jun 5, 2019 at 2:29 PM

Sara,

Prof Ian Brooks
School of Earth and Environment
University of Leeds,
Leeds, LS2 9JT, UK

+44(0)113 343 6743

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>
Reply-To: i.brooks@see.leeds.ac.uk
To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Mon, Jun 24, 2019 at 4:42 AM

Hi Chris

Metek came back to me with a quote for repair work...unfortunately, they haven't reproduced the fault, and I don't think the work they quote for will fix the problem.

I'm trying to scrape together a little more information. Do you have an example of the error message the instrument was giving? Something like:

"E: invalid data (200)"

I suspect the number in that message should give some indication of where the problem is (probably just which transducer), though I can't find any details in the manuals. The message above is from 2014 when we had some some bad data problems, but only on random samples, and not enough to cause a processing problem...but the error rate did correlate with relative humidity. 2016 I had the sonic sort of fail - it worked fine in lab and at mobilisation, but output only error messages (555) in the field...but worked again when brought inside and warmed up.

I sent it for repair, and they claimed to fix it - corrosion on interface box connector from sensor head, which they replaced.

I'm beginning to suspect that some more fundamental issue with the P2 transducers may have been there all along. Although it worked fine all last summer in the

Arctic.

Ian

On 30/05/2019 00:44, Christopher Cox - NOAA Affiliate wrote:

Ian,

[Quoted text hidden]

> <<mailto:i.brooks@see.leeds.ac.uk>

<<mailto:i.brooks@see.leeds.ac.uk>>> wrote:

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[Quoted text hidden]

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Mon, Jun 24, 2019 at 9:46 AM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>, Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>

Hi Ian,

The error was 040, which according to the reference you provided (thanks) corresponds to the lower transducer of P2 not receiving a valid signal. Though we didn't have the error code reference, this is consistent with our assessment. I expect that sometimes the 020 code also appeared. I'll review the data to try to confirm this, but my reasoning is because our evaluation was based on the output of the debugging mode, which I think showed the upper and lower data independently. Mostly, our interpretation of the debugging mode output was failure in the lower transducer, but sometimes it was the upper that was missing data and sometimes both were missing data. Turning on the heater produced some improvement, at least at first. If you are concerned that RH could be a factor, it is worth noting that the RH indoors (~22 C, where all tests were conducted) here is low (~10-20%). Perhaps also relevant, the air pressure is also low, around 830 hPa.

Hope this helps. I'll let you know if I find anything else.

-Chris

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Mon, Jun 24, 2019 at 10:01 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Thanks, I'll pass that on. I did wonder if the air pressure might be the issue. The metek sonics we just installed up on Greenland Summit are labelled as having had

the signal power adjusted for use at 3000m.

Metek ran the following tests:

- unpacking sonic, visual inspection
- connection to power/data
- record and store present parameter setting
- looking for data/error messages while bending the sensorheadcable heater off
- looking for data/error messages while bending the sensorheadcable heater on
- place sonic in climatic chamber and record data (1s averaged) for about 6 hours
for this test the heater of the sonic is in automatic mode (HT=2) and the climatic chamber changes temperature from -30°C to +60°C intermittant
- open sensorhead to reach internal cabling of sensorhead (spliced to sensorhead cable)
- visual inspection of splices
- bending splices while watching data/error messages

I *think* the cable is probably not the issue...but they suggest replacing it anyway to be sure it's not the source of the problem.

Ian

On 24/06/2019 16:46, Christopher Cox - NOAA Affiliate wrote:

Hi Ian,

The error was 040, which according to the reference you provided (thanks) corresponds to the lower transducer of P2 not receiving a valid signal. Though we didn't have the error code reference, this is consistent with our assessment. I expect that sometimes the 020 code also appeared. I'll review the data to try to confirm this, but my reasoning is because our evaluation was based on the output of the debugging mode, which I think showed the upper and lower data independently. Mostly, our interpretation of the debugging mode output was failure in the lower transducer, but sometimes it was the upper that was missing data and sometimes both were missing data. Turning on the heater produced some improvement, at least at first. If you are concerned that RH could be a factor, it is worth noting that the RH indoors (~22 C, where all tests were conducted) here is low (~10-20%). Perhaps also relevant, the air pressure is also low, around 830 hPa.

Hope this helps. I'll let you know if I find anything else.

-Chris

On Mon, Jun 24, 2019 at 4:42 AM Ian Brooks <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>> wrote:

Hi Chris

[Quoted text hidden]

[Quoted text hidden]

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Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Mon, Jun 24, 2019 at 11:19 AM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>, Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>

Ok. Let me know if there is anything more I can do to help. From our side, the logging system is set up and the fault tolerance of the logging is pretty robust. It is good information to know that air pressure is a plausible factor.

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Mon, Jul 1, 2019 at 12:49 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Cc: Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>, Matthew Shupe - NOAA Affiliate <Matthew.Shupe@noaa.gov>

Hi Chris

Metek did more tests and confirmed that the lower P2 transducer was operating with reduced power output, which would have caused the intermittent signal problem at low air pressure.

They are going to replace that & the sensor head cable (just in case).

Do you want this unit back in Boulder for more testing, or should I just have them return it to me and ship it to MOSAiC with the rest of my gear?

cheers

Ian

On 24/06/2019 18:19, Christopher Cox - NOAA Affiliate wrote:

Ok. Let me know if there is anything more I can do to help. From our side, the logging system is set up and the fault tolerance of the logging is pretty robust. It is good information to know that air pressure is a plausible factor.

[Quoted text hidden]

> <<mailto:i.brooks@see.leeds.ac.uk>>

<<mailto:i.brooks@see.leeds.ac.uk>>>> wrote:

>

> Hi Chris

>

[Quoted text hidden]

[Quoted text hidden]

> > > <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>
> > <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>>>> wrote:
> > >
> > > Hi Chris
> > >

[Quoted text hidden]

[Quoted text hidden]

<mailto:i.brooks@see.leeds.ac.uk>>> <mailto:i.brooks@see.leeds.ac.uk

[Quoted text hidden]

> > <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>

[Quoted text hidden]

Matthew Shupe <matthew.shupe@noaa.gov>

Mon, Jul 1, 2019 at 6:54 AM

To: i.brooks@see.leeds.ac.uk

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>

Ian. Have it sent back to Boulder if they can send it this week. Thanks, Matt

Sent from my iPhone

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Mon, Jul 1, 2019 at 7:34 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Matthew Shupe <matthew.shupe@noaa.gov>

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>

It'll be a couple of weeks - they say 10 days from receipt of order, so some uncertainty depending if they start on my say-so, or wait for official purchase order from Uni.

Ian

[Quoted text hidden]

Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>

Mon, Jul 1, 2019 at 8:36 AM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>

OK. You'll have to make the decision here. We have pretty much tested the system and I think we are good to go (although more testing is always better than less!). If the system can be here no later than July 12, then it is ok to send it here and we could plug it into our system for a final test. If it will get here later than that, it is not worth sending it as we will be packing everything up. Thanks, M

[Quoted text hidden]

Ian Brooks <i.brooks@see.leeds.ac.uk>

Mon, Jul 1, 2019 at 8:37 AM

Reply-To: i.brooks@see.leeds.ac.uk

To: Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>

Cc: Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>, Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>

I doubt it'll get to you before July 12. I'll have it shipped back here.

cheers

Ian

On 01/07/2019 15:36, Matthew Shupe - NOAA Affiliate wrote:

OK. You'll have to make the decision here. We have pretty much tested the system and I think we are good to go (although more testing is always better than less!). If the system can be here no later than July 12, then it is ok to send it here and we could plug it into our system for a final test. If it will get here later than that, it is not worth sending it as we will be packing everything up. Thanks, M

On Mon, Jul 1, 2019 at 7:34 AM Ian Brooks <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>> wrote:

It'll be a couple of weeks - they say 10 days from receipt of order, so some uncertainty depending if they start on my say-so, or wait for official purchase order from Uni.

Ian

On 01/07/2019 13:54, Matthew Shupe wrote:

> Ian. Have it sent back to Boulder if they can send it this week.

Thanks, Matt

>

> Sent from my iPhone

>

>> On Jul 1, 2019, at 12:49 AM, Ian Brooks

<i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>> wrote:

>>

>> Hi Chris

>>

>> Metek did more tests and confirmed that the lower P2 transducer was operating with reduced power output, which would have caused the intermittent signal problem at low air pressure.

>>

>> They are going to replace that & the sensor head cable (just in case).

>>

>> Do you want this unit back in Boulder for more testing, or should I just have them return it to me and ship it to MOSAiC with the rest of my gear?

>>

>> cheers

>>

>> lan

>>

>>> On 24/06/2019 18:19, Christopher Cox - NOAA Affiliate wrote:

>>> Ok. Let me know if there is anything more I can do to help.

From our side, the logging system is set up and the fault tolerance of the logging is pretty robust. It is good information to know that air pressure is a plausible factor.

>>> On Mon, Jun 24, 2019 at 10:01 AM Ian Brooks

<i.brooks@see.leeds.ac.uk <<mailto:i.brooks@see.leeds.ac.uk>>

<<mailto:i.brooks@see.leeds.ac.uk> <<mailto:i.brooks@see.leeds.ac.uk>>>>

wrote:

>>> Thanks, I'll pass that on. I did wonder if the air pressure might be

>>> the

>>> issue. The metek sonics we just installed up on Greenland Summit are

>>> labelled as having had the signal power adjusted for use at 3000m.

>>> Metek ran the following tests:

>>> - unpacking sonic, visual inspection

>>> - connection to power/data

>>> - record and store present parameter setting

>>> - looking for data/error messages while bending the sensorheadcable

>>> heater off

>>> - looking for data/error messages while bending the sensorheadcable

>>> heater on

>>> - place sonic in climatic chamber and record data (1s averaged) for

>>> about 6 hours

>>> for this test the heater of the sonic is in automatic mode

>>> (HT=2) and

>>> the climatic chamber changes

>>> temperature from -30°C to +60°C intermittent

>>> - open sensorhead to reach internal cabling of sensorhead (spliced to

>>> sensorhead cable)

>>> - visual inspection of splices

>>> - bending splices while watching data/error messages

>>> I *think* the cable is probably not the issue...but they suggest

>>> replacing it anyway to be sure it's not the source of the problem.

>>> lan

>>> On 24/06/2019 16:46, Christopher Cox - NOAA Affiliate wrote:

>>> > Hi lan,

>>> >

>>> > The error was 040, which according to the reference you

provided
>>> > (thanks) corresponds to the lower transducer of P2 not receiving
>>> a valid
>>> > signal. Though we didn't have the error code reference, this is
>>> > consistent with our assessment. I expect that sometimes the 020 code
>>> > also appeared. I'll review the data to try to confirm this, but my
>>> > reasoning is because our evaluation was based on the output of the
>>> > debugging mode, which I think showed the upper and lower data
>>> > independently. Mostly, our interpretation of the debugging mode
>>> output
>>> > was failure in the lower transducer, but sometimes it was the
>>> upper that
>>> > was missing data and sometimes both were missing data. Turning on
>>> the
>>> > heater produced some improvement, at least at first. If you are
>>> > concerned that RH could be a factor, it is worth noting that the RH
>>> > indoors (~22 C, where all tests were conducted) here is low
>>> (~10-20%).
>>> > Perhaps also relevant, the air pressure is also low, around 830 hPa.
>>> >
>>> > Hope this helps. I'll let you know if I find anything else.
>>> >
>>> > -Chris
>>> >
>>> >
>>> >
>>> >
>>> >
>>> > On Mon, Jun 24, 2019 at 4:42 AM Ian Brooks
>>> <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>>
>>> > <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>>> wrote:
>>> >
>>> > Hi Chris
>>> >

>>> > Metek came back to me with a quote for repair
>>> work...unfortunately,
>>> > they
>>> > haven't reproduced the fault, and I don't think the
work they
>>> quote for
>>> > will fix the problem.
>>> >
>>> > I'm trying to scrape together a little more
information. Do
>>> you have an
>>> > example of the error message the instrument was giving?
>>> Something like:
>>> >
>>> > "E: invalid data (200)"
>>> >
>>> > I suspect the number in that message should give some
>>> indication of
>>> > where the problem is (probably just which
transducer), though
>>> I can't
>>> > find any details in the manuals. The message above
is from
>>> 2014 when we
>>> > had some some bad data problems, but only on random
samples,
>>> and not
>>> > enough to cause a processing problem...but the error
rate did
>>> correlate
>>> > with relative humidity. 2016 I had the sonic sort of
fail -
>>> it worked
>>> > fine in lab and at mobilisation, but output only
error messages
>>> > (555) in
>>> > the field...but worked again when brought inside and
warmed up.
>>> > I sent it for repair, and they claimed to fix it -
corrosion on
>>> > interface box connector from sensor head, which they
replaced.
>>> >
>>> > I'm beginning to suspect that some more fundamental
issue
>>> with the P2
>>> > transducers may have been there all along. Although
it worked
>>> fine all

>>> > last summer in the Arctic.
>>> >
>>> > Ian
>>> >
>>> > On 30/05/2019 00:44, Christopher Cox - NOAA
Affiliate wrote:
>>> > > Ian,
>>> > >
>>> > > Dave Costa and I put some time into
troubleshooting the sonic
>>> > yesterday.
>>> > > We did find some minor corrosion on the P2 wires
where
>>> they are
>>> > spliced
>>> > > with the sensor electronics and repaired the
connection,
>>> but it
>>> > did not
>>> > > fix the problem. We found that running the heater
>>> correlates with
>>> > > improved the output, but that this effect is not
always
>>> > repeatable. When
>>> > > it does work, dropouts increase over a period of time
>>> after the
>>> > heater
>>> > > is turned off while the amount of good data increases
>>> faster when
>>> > the
>>> > > heater is turned back on. This seems more
consistent with it
>>> > being the
>>> > > warming of the sensor heads that are responsible
for the
>>> improvement
>>> > > rather than the act of powering the heater. In
general, it has
>>> > been very
>>> > > intermittent and not very predictably so. This might
>>> explain why the
>>> > > data looked good the first time I turned it on,
but not
>>> afterward. I
>>> > > spoke with a couple others engineers as well and the
>>> consensus is
>>> > that
>>> > > Metek will need to have a look. Dan Gottas, who is
>>> developing the

>>> > > logging software, has been using the
intermittency to dial in
>>> > management
>>> > > of bad data and I expect he will be done testing
by Friday. We
>>> > have a
>>> > > similar USA-1 here that can serve as a stand-in
for bench
>>> testing
>>> > after
>>> > > we send yours back to you (ours needs to be
repaired too so it
>>> > isn't a
>>> > > candidate of a field replacement at this time).
>>> > >
>>> > > In short, it is a bummer about the sonic trouble,
but I
>>> think we
>>> > have
>>> > > (will very soon have) what we need as far as
integration
>>> goes. We
>>> > can
>>> > > return the sonic to you without it needing to
come back to
>>> Colorado.
>>> > >
>>> > > I have a question about integration. In your
opinion, how
>>> > important is
>>> > > it to be precise about the time synching with the
other
>>> meteks on
>>> > the
>>> > > tower? (I will ask Ola P the same question).
These will be
>>> some
>>> > distance
>>> > > away, but sometimes there is interest in
comparing covariances
>>> > between
>>> > > heights. The reason I ask is that if it is
important we might
>>> > have rig
>>> > > up a way to benchmark the lag in the cable since
it is
>>> long (do
>>> > you know
>>> > > how long? The blue cable looked like 10 m, but I

didn't
>>> measure the
>>> > > serial cable).
>>> > >
>>> > > I do have the commercial invoice.
>>> > >
>>> > > -Chris
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > >
>>> > > On Mon, May 27, 2019 at 2:59 PM Ian Brooks
>>> > <i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>
>>> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>>
>>> > > <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>
>>> > <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>>>>> wrote:
>>> > >
>>> > > By the way - I meant to check when I sent
everything
>>> out, but
>>> > did you
>>> > > hang on to the 'commercial invoice' paperwork
that
>>> came with the
>>> > > stuff I
>>> > > sent out? May be needed to return ship them
without
>>> incurring
>>> > import
>>> > > duties. If it wasn't binned already, hang on
to it!
>>> > >
>>> > > Ian

>>> > >
>>> > > On 27/05/2019 21:38, Christopher Cox - NOAA

Affiliate

>>> wrote:

>>> > > > Ok, thanks.

>>> > > >

>>> > > > Unfortunately, we did have a problem appear

>>> yesterday with the

>>> > > sonic.

>>> > > > During that first run of a couple minutes

last week

>>> everything

>>> > > looked

>>> > > > ok, but yesterday it was mostly printing

"invalid data"

>>> > messages. I

>>> > > > started to recalibrate because if the cal

is off

>>> that can

>>> > sometimes

>>> > > > cause this problem. As part of this, I

tested that

>>> paths and

>>> > > found P2

>>> > > > unresponsive. P2 is chirping so it's not a

power

>>> issue. I

>>> > traced

>>> > > it to

>>> > > > where the blue cable integrates into the

sensor

>>> head. Some

>>> > > wiggling of

>>> > > > that cable created intermittent data.

Today I went back

>>> > over this

>>> > > with

>>> > > > someone else and we are in agreement that

it seems

>>> to be

>>> > > associated with

>>> > > > that connection.

>>> > > >

>>> > > > Have you seen this before? Can't be

certain, but my

>>> best

>>> > guess is

>>> > > that

>>> > > > there is a bad solder joint for the P2

comms wire
>>> at the
>>> > sensor
>>> > > head.
>>> > > > Note that I'm talking about the sensor
itself and
>>> not the
>>> > > electronics
>>> > > > box. At the sensor head the cable is
hard-wired
>>> into the
>>> > > instrument body
>>> > > > rather than having a connector. I'm not
really sure
>>> what's
>>> > inside
>>> > > there
>>> > > > and I certainly won't open it up unless
you want me
>>> to. Let me
>>> > > know how
>>> > > > you would like to proceed.
>>> > > >
>>> > > > -Chris
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > >
>>> > > > On Sun, May 26, 2019 at 5:24 AM Ian Brooks
>>> > > <i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>
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<mailto:i.brooks@see.leeds.ac.uk>>>
>>> > > <mailto:i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk>>
>>> > <mailto:i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk>
<mailto:i.brooks@see.leeds.ac.uk>>>>>>>> wrote:
>>> > > >
>>> > > > Hi Chris
>>> > > >
>>> > > > CLASP data looks pretty good - a quick
plot of the
>>> > size spectra
>>> > > > attached. The dip in the middle,
around R = 1-2
>>> um is
>>> > a bit
>>> > > suspect,
>>> > > > but
>>> > > > I think that's a minor calibration
issue. The
>>> scatter
>>> > cell has a
>>> > > > 2-stage
>>> > > > amplifier, with the second stage
kicking in at
>>> around this
>>> > > size. I had
>>> > > > problems getting a calibration point
close to the
>>> > transition
>>> > > point on
>>> > > > this unit, so I suspect that there may
be a
>>> small low bias
>>> > > around there.
>>> > > >
>>> > > > Otherwise all looks good.
>>> > > >
>>> > > > Don't worry about the flow calibration in
>>> > Boulder...it'd only

>>> > > need
>>> > > > changing again when it's brought back
down to
>>> sea level.
>>> > > >
>>> > > >
>>> > > > Might be worth implementing the automatic
>>> re-setting
>>> > of the EPROM
>>> > > > settings after a power loss. It's
usually OK,
>>> but can get
>>> > > corrupted if
>>> > > > there's a brown-out, or the power
cycles very
>>> quickly.
>>> > > >
>>> > > > Will have a think & chat with Markus
about what
>>> data
>>> > summary
>>> > > might be
>>> > > > useful.
>>> > > >
>>> > > > cheers
>>> > > >
>>> > > > Ian
>>> > > > ps. I've attached revised copies of
the matlab
>>> code to
>>> > work
>>> > > with this
>>> > > > file. The time stamp was something
added by
>>> logging code.
>>> > > >
>>> > > > cheers
>>> > > >
>>> > > > Ian
>>> > > >
>>> > > > > Sorry for the delay. I ran the
CLASP and
>>> usa-1 this
>>> > afternoon.
>>> > > > The metek
>>> > > > > output looks normal. Being
unfamiliar with
>>> the CLASP I
>>> > > collected

>>> > > > about
>>> > > > > an hour data in hyperterm so that I
could
>>> forward
>>> > it along to
>>> > > > you. The
>>> > > > > CLASP was run at room temp in the lab,
>>> ~22-23 C. We
>>> > are at
>>> > > near
>>> > > > 1500 m
>>> > > > > elevation here and the atmospheric
pressure was
>>> > ~830 hpa
>>> > > today. I
>>> > > > did
>>> > > > > not get a new calibration for the lower
>>> pressure. I
>>> > modified
>>> > > > > CLASP_read_MOSAIC.m to bypass
"timebits"
>>> (line 45) and
>>> > > begin with
>>> > > > > statusbyte as the first column
because the
>>> > instrument didn't
>>> > > > output a
>>> > > > > time stamp. Nearest I can tell, the
>>> instrument does not
>>> > > output a
>>> > > > time so
>>> > > > > this part of the code must be a
holdover
>>> from a prior
>>> > > logging system
>>> > > > > (?). The file containing the data is
>>> attached. Let
>>> > me know
>>> > > if you
>>> > > > see
>>> > > > > anything amiss. Looked like data to
me :) It
>>> even
>>> > sampled a
>>> > > > realistic
>>> > > > > looking signal about halfway
through the test.
>>> > > > >
>>> > > > > Next week we will hook up all of

the 10 and

>>> 20 Hz

>>> > > instruments for

>>> > > > the

>>> > > > > met city tower together in the lab

so that

>>> we can

>>> > run some

>>> > > tests

>>> > > > on the

>>> > > > > computer/logging software with the

full load.

>>> > Nominally,

>>> > > we would be

>>> > > > > archiving the raw strings and

attaching a time

>>> > stamp, but

>>> > > we have

>>> > > > the

>>> > > > > capability to add a couple features:

>>> > > > > (1) automated instrument controls. For

>>> example, the

>>> > EPROM

>>> > > > settings could

>>> > > > > be automatically sent after a power

>>> interruption to

>>> > make

>>> > > things more

>>> > > > > seamless in the case those settings

were lost in

>>> > the power

>>> > > cycle.

>>> > > > > (2) statistical summaries for status

>>> updates. These

>>> > could be a

>>> > > > variety

>>> > > > > of things like std deviations of

some variable,

>>> > covariances,

>>> > > > counts of

>>> > > > > missing data, etc

>>> > > > >

>>> > > > > If you think any of this would be

useful let

>>> me know

>>> > > specifically

>>> > > > what

>>> > > > > would be useful and we will try to

implement it.

>>> > > > > please see attached foto of the
>>> CLASP/sonic (METEK)
>>> > > set up I
>>> > > > used on
>>> > > > > N-ICE2015. It's a possibility but
>>> depends also

>>> > on how
>>> > > you want to
>>> > > > mount things on the 12m mast.

>>> > > > >
>>> > > > > Best wishes,
>>> > > > > Markus

>>> > > > >
>>> > > > >
>>> > > > >
>>> > > > >

>>> > > > >> On 9 May 2019, at 08:37, Ian
Brooks

>>> > > > <i.brooks@see.leeds.ac.uk

<mailto:i.brooks@see.leeds.ac.uk>

>>> <mailto:i.brooks@see.leeds.ac.uk

<mailto:i.brooks@see.leeds.ac.uk>>

>>> > <mailto:i.brooks@see.leeds.ac.uk

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<mailto:i.brooks@see.leeds.ac.uk>>> <mailto:i.brooks@see.leeds.ac.uk

<mailto:i.brooks@see.leeds.ac.uk>

>>> <mailto:i.brooks@see.leeds.ac.uk

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<mailto:i.brooks@see.leeds.ac.uk>

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>>> <mailto:i.brooks@see.leeds.ac.uk

<mailto:i.brooks@see.leeds.ac.uk>>> <mailto:i.brooks@see.leeds.ac.uk

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<mailto:i.brooks@see.leeds.ac.uk>
>>> <mailto:i.brooks@see.leeds.ac.uk
<mailto:i.brooks@see.leeds.ac.uk>>>>>>>>> wrote:
>>> > > > >>
>>> > > > >> Great, thanks Chris.
>>> > > > >>
>>> > > > >> Something I think I forgot to
put in
>>> the notes
>>> > about
>>> > > CLASP. When
>>> > > > >> it is finally installed on the
mast, it
>>> should
>>> > have
>>> > > the inlet
>>> > > > >> pointing down - to prevent precip
>>> falling into the
>>> > > inlet; also
>>> > > > >> provides uniform inlet
characteristics
>>> > regardless of wind

>>> > > > >> direction. The ideal is for
the inlet to be
>>> > close to
>>> > > the sonic
>>> > > > >> anemometer sensing head,
though we also
>>> need
>>> > to minimise
>>> > > > possible
>>> > > > >> obstruction to the flow around the
>>> sonic, and
>>> > there are
>>> > > > practical
>>> > > > >> issues for physically mounting it.
>>> > > > >>
>>> > > > >> Easy option is to install it
with inlet
>>> at same
>>> > > height as a
>>> > > > sonic
>>> > > > >> head but on, or very close to
the mast
>>> itself. The
>>> > > horizontal
>>> > > > >> separation will result in some
loss of
>>> > correlation, but
>>> > > > there are
>>> > > > >> theoretical corrections that
can be
>>> applied to try
>>> > > and correct
>>> > > > >> that...they'll get smaller the
higher
>>> it is.
>>> > > > >>
>>> > > > >> I've cc'd Markus - he might
want to
>>> comment on how
>>> > > high he
>>> > > > really
>>> > > > >> wants this.
>>> > > > >>
>>> > > > >> cheers
>>> > > > >>
>>> > > > >> Ian
>>> > > > >>
>>> > > > >> On 09/05/2019 00:37,
Christopher Cox - NOAA

>>> <mailto:christopher.j.cox@noaa.gov
<mailto:christopher.j.cox@noaa.gov>>
>>> > <mailto:christopher.j.cox@noaa.gov
<mailto:christopher.j.cox@noaa.gov>
>>> <mailto:christopher.j.cox@noaa.gov
<mailto:christopher.j.cox@noaa.gov>>>>>>>>> wrote:
>>> > > > >>> Great, thanks Ian! I'll
let you
>>> know when the
>>> > > equipment
>>> > > > >>> arrives and
>>> > > > >>> if I have questions.

Christopher Cox - NOAA Affiliate <christopher.j.cox@noaa.gov>

Mon, Jul 1, 2019 at 8:45 AM

To: Ian Brooks <i.brooks@see.leeds.ac.uk>

Cc: Matthew Shupe - NOAA Affiliate <matthew.shupe@noaa.gov>, Daniel Gottas - NOAA Federal <daniel.gottas@noaa.gov>

More testing better than less is a fair point. That said, we were able to get what we needed before and the errors actually provided the opportunity for Dan to build a more robust fault tolerance for the system. So long as the output format of is the same as before, we have no additional planned work. If the output has changed, it will still be possible to record the data, just without the value-adds, i.e., fault tolerance and real-time statistics. If there is any risk in missing shipping deadlines, it isn't worth it IMO.

-Chris

On Mon, Jul 1, 2019 at 8:37 AM Ian Brooks <i.brooks@see.leeds.ac.uk> wrote:

I doubt it'll get to you before July 12. I'll have it shipped back here.

cheers

Ian

On 01/07/2019 15:36, Matthew Shupe - NOAA Affiliate wrote:

> OK. You'll have to make the decision here. We have pretty much tested
> the system and I think we are good to go (although more testing is
> always better than less!). If the system can be here no later than July
> 12, then it is ok to send it here and we could plug it into our system
> for a final test. If it will get here later than that, it is not worth
> sending it as we will be packing everything up. Thanks, M
>

> On Mon, Jul 1, 2019 at 7:34 AM Ian Brooks <i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>> wrote:

>
> It'll be a couple of weeks - they say 10 days from receipt of order, so
> some uncertainty depending if they start on my say-so, or wait for
> official purchase order from Uni.
>

> lan
>
> On 01/07/2019 13:54, Matthew Shupe wrote:
> > lan. Have it sent back to Boulder if they can send it this week.
> Thanks, Matt
> >
> > Sent from my iPhone
> >
> >> On Jul 1, 2019, at 12:49 AM, Ian Brooks
> <i.brooks@see.leeds.ac.uk <<mailto:i.brooks@see.leeds.ac.uk>>> wrote:
> >>
> >> Hi Chris
> >>
> >> Metek did more tests and confirmed that the lower P2 transducer
> was operating with reduced power output, which would have caused the
> intermittent signal problem at low air pressure.
> >>
> >> They are going to replace that & the sensor head cable (just in
> case).
> >>
> >> Do you want this unit back in Boulder for more testing, or
> should I just have them return it to me and ship it to MOSAiC with
> the rest of my gear?
> >>
> >> cheers
> >>
> >> lan
> >>
> >>> On 24/06/2019 18:19, Christopher Cox - NOAA Affiliate wrote:
> >>> Ok. Let me know if there is anything more I can do to help.
> From our side, the logging system is set up and the fault tolerance
> of the logging is pretty robust. It is good information to know that
> air pressure is a plausible factor.
> >>> On Mon, Jun 24, 2019 at 10:01 AM Ian Brooks
> <i.brooks@see.leeds.ac.uk <<mailto:i.brooks@see.leeds.ac.uk>>
> <<mailto:i.brooks@see.leeds.ac.uk> <<mailto:i.brooks@see.leeds.ac.uk>>>>
> wrote:
> >>> Thanks, I'll pass that on. I did wonder if the air pressure
> might be
> >>> the
> >>> issue. The metek sonics we just installed up on Greenland
> Summit are
> >>> labelled as having had the signal power adjusted for use at
> 3000m.
> >>> Metek ran the following tests:
> >>> - unpacking sonic, visual inspection
> >>> - connection to power/data
> >>> - record and store present parameter setting
> >>> - looking for data/error messages while bending the

> sensorheadcable
> >>> heater off
> >>> - looking for data/error messages while bending the
> sensorheadcable
> >>> heater on
> >>> - place sonic in climatic chamber and record data (1s
> averaged) for
> >>> about 6 hours
> >>> for this test the heater of the sonic is in automatic mode
> >>> (HT=2) and
> >>> the climatic chamber changes
> >>> temperature from -30°C to +60°C intermittant
> >>> - open sensorhead to reach internal cabling of sensorhead
> (spliced to
> >>> sensorhead cable)
> >>> - visual inspection of splices
> >>> - bending splices while watching data/error messages
> >>> I *think* the cable is probably not the issue...but they
> suggest
> >>> replacing it anyway to be sure it's not the source of the
> problem.
> >>> Ian
> >>> On 24/06/2019 16:46, Christopher Cox - NOAA Affiliate wrote:
> >>> > Hi Ian,
> >>> >
> >>> > The error was 040, which according to the reference you
> provided
> >>> > (thanks) corresponds to the lower transducer of P2 not
> receiving
> >>> a valid
> >>> > signal. Though we didn't have the error code reference,
> this is
> >>> > consistent with our assessment. I expect that sometimes
> the 020 code
> >>> > also appeared. I'll review the data to try to confirm
> this, but my
> >>> > reasoning is because our evaluation was based on the
> output of the
> >>> > debugging mode, which I think showed the upper and lower
> data
> >>> > independently. Mostly, our interpretation of the
> debugging mode
> >>> output
> >>> > was failure in the lower transducer, but sometimes it
> was the
> >>> upper that
> >>> > was missing data and sometimes both were missing data.
> Turning on
> >>> the

> >>> > heater produced some improvement, at least at first. If
> you are
> >>> > concerned that RH could be a factor, it is worth noting
> that the RH
> >>> > indoors (~22 C, where all tests were conducted) here is low
> >>> (~10-20%).
> >>> > Perhaps also relevant, the air pressure is also low,
> around 830 hPa.
> >>> >
> >>> > Hope this helps. I'll let you know if I find anything else.
> >>> >
> >>> > -Chris
> >>> >
> >>> >
> >>> >
> >>> >
> >>> > On Mon, Jun 24, 2019 at 4:42 AM Ian Brooks
> >>> <i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk <mailto:i.brooks@see.leeds.ac.uk>>
> >>> > <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>>> wrote:
> >>> >
> >>> > Hi Chris
> >>> >
> >>> > Metek came back to me with a quote for repair
> >>> work...unfortunately,
> >>> > they
> >>> > haven't reproduced the fault, and I don't think the
> work they
> >>> quote for
> >>> > will fix the problem.
> >>> >
> >>> > I'm trying to scrape together a little more
> information. Do
> >>> you have an
> >>> > example of the error message the instrument was giving?
> >>> Something like:
> >>> >
> >>> > "E: invalid data (200)"
> >>> >
> >>> > I suspect the number in that message should give some
> >>> indication of
> >>> > where the problem is (probably just which
> transducer), though
> >>> I can't
> >>> > find any details in the manuals. The message above
> is from

> >>> 2014 when we
> >>> > had some some bad data problems, but only on random
> samples,
> >>> and not
> >>> > enough to cause a processing problem...but the error
> rate did
> >>> correlate
> >>> > with relative humidity. 2016 I had the sonic sort of
> fail -
> >>> it worked
> >>> > fine in lab and at mobilisation, but output only
> error messages
> >>> > (555) in
> >>> > the field...but worked again when brought inside and
> warmed up.
> >>> > I sent it for repair, and they claimed to fix it -
> corrosion on
> >>> > interface box connector from sensor head, which they
> replaced.
> >>> >
> >>> > I'm beginning to suspect that some more fundamental
> issue
> >>> with the P2
> >>> > transducers may have been there all along. Although
> it worked
> >>> fine all
> >>> > last summer in the Arctic.
> >>> >
> >>> > Ian
> >>> >
> >>> > On 30/05/2019 00:44, Christopher Cox - NOAA
> Affiliate wrote:
> >>> > > Ian,
> >>> > >
> >>> > > Dave Costa and I put some time into
> troubleshooting the sonic
> >>> > yesterday.
> >>> > > We did find some minor corrosion on the P2 wires
> where
> >>> they are
> >>> > spliced
> >>> > > with the sensor electronics and repaired the
> connection,
> >>> but it
> >>> > did not
> >>> > > fix the problem. We found that running the heater
> >>> correlates with
> >>> > > improved the output, but that this effect is not
> always

> >>> > repeatable. When
> >>> > > it does work, dropouts increase over a period of time
> >>> after the
> >>> > heater
> >>> > > is turned off while the amount of good data increases
> >>> faster when
> >>> > the
> >>> > > heater is turned back on. This seems more
> consistent with it
> >>> > being the
> >>> > > warming of the sensor heads that are responsible
> for the
> >>> improvement
> >>> > > rather than the act of powering the heater. In
> general, it has
> >>> > been very
> >>> > > intermittent and not very predictably so. This might
> >>> explain why the
> >>> > > data looked good the first time I turned it on,
> but not
> >>> afterward. I
> >>> > > spoke with a couple others engineers as well and the
> >>> consensus is
> >>> > that
> >>> > > Metek will need to have a look. Dan Gottas, who is
> >>> developing the
> >>> > > logging software, has been using the
> intermittency to dial in
> >>> > management
> >>> > > of bad data and I expect he will be done testing
> by Friday. We
> >>> > have a
> >>> > > similar USA-1 here that can serve as a stand-in
> for bench
> >>> testing
> >>> > after
> >>> > > we send yours back to you (ours needs to be
> repaired too so it
> >>> > isn't a
> >>> > > candidate of a field replacement at this time).
> >>> > >
> >>> > > In short, it is a bummer about the sonic trouble,
> but I
> >>> think we
> >>> > have
> >>> > > (will very soon have) what we need as far as
> integration
> >>> goes. We
> >>> > can

> <mailto:i.brooks@see.leeds.ac.uk>>>
> >>> > > <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>
> >>> > <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>>>> wrote:
> >>> > >
> >>> > > By the way - I meant to check when I sent
> everything
> >>> out, but
> >>> > did you
> >>> > > hang on to the 'commercial invoice' paperwork
> that
> >>> came with the
> >>> > > stuff I
> >>> > > sent out? May be needed to return ship them
> without
> >>> incurring
> >>> > import
> >>> > > duties. If it wasn't binned already, hang on
> to it!
> >>> > >
> >>> > > lan
> >>> > >
> >>> > > On 27/05/2019 21:38, Christopher Cox - NOAA
> Affiliate
> >>> wrote:
> >>> > > > Ok, thanks.
> >>> > > >
> >>> > > > Unfortunately, we did have a problem appear
> >>> yesterday with the
> >>> > > sonic.
> >>> > > > During that first run of a couple minutes
> last week
> >>> everything
> >>> > > looked
> >>> > > > ok, but yesterday it was mostly printing
> "invalid data"
> >>> > messages. I
> >>> > > > started to recalibrate because if the cal
> is off
> >>> that can
> >>> > sometimes
> >>> > > > cause this problem. As part of this, I
> tested that
> >>> paths and

> >>> > > found P2
> >>> > > > unresponsive. P2 is chirping so it's not a
> power
> >>> issue. I
> >>> > traced
> >>> > > it to
> >>> > > > where the blue cable integrates into the
> sensor
> >>> head. Some
> >>> > > wiggling of
> >>> > > > that cable created intermittent data.
> Today I went back
> >>> > over this
> >>> > > with
> >>> > > > someone else and we are in agreement that
> it seems
> >>> to be
> >>> > > associated with
> >>> > > > that connection.
> >>> > > >
> >>> > > > Have you seen this before? Can't be
> certain, but my
> >>> best
> >>> > guess is
> >>> > > that
> >>> > > > there is a bad solder joint for the P2
> comms wire
> >>> at the
> >>> > sensor
> >>> > > head.
> >>> > > > Note that I'm talking about the sensor
> itself and
> >>> not the
> >>> > > electronics
> >>> > > > box. At the sensor head the cable is
> hard-wired
> >>> into the
> >>> > > instrument body
> >>> > > > rather than having a connector. I'm not
> really sure
> >>> what's
> >>> > inside
> >>> > > there
> >>> > > > and I certainly won't open it up unless
> you want me
> >>> to. Let me
> >>> > > know how
> >>> > > > you would like to proceed.
> >>> > > >

> >>> > > > -Chris
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > >
> >>> > > > On Sun, May 26, 2019 at 5:24 AM Ian Brooks
> >>> > > <i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk> <mailto:i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk>
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> <mailto:i.brooks@see.leeds.ac.uk> <mailto:i.brooks@see.leeds.ac.uk>
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> <mailto:i.brooks@see.leeds.ac.uk>>
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> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk>
> <mailto:i.brooks@see.leeds.ac.uk>>>>>>> wrote:
> >>> > > >
> >>> > > > Hi Chris
> >>> > > >
> >>> > > > CLASP data looks pretty good - a quick
> plot of the
> >>> > size spectra
> >>> > > > attached. The dip in the middle,
> around R = 1-2

> >>> um is
> >>> > a bit
> >>> > > suspect,
> >>> > > > but
> >>> > > > I think that's a minor calibration
> issue. The
> >>> scatter
> >>> > cell has a
> >>> > > > 2-stage
> >>> > > > amplifier, with the second stage
> kicking in at
> >>> around this
> >>> > > size. I had
> >>> > > > problems getting a calibration point
> close to the
> >>> > transition
> >>> > > point on
> >>> > > > this unit, so I suspect that there may
> be a
> >>> small low bias
> >>> > > around there.
> >>> > > >
> >>> > > > Otherwise all looks good.
> >>> > > >
> >>> > > > Don't worry about the flow calibration in
> >>> > Boulder...it'd only
> >>> > > need
> >>> > > > changing again when it's brought back
> down to
> >>> sea level.
> >>> > > >
> >>> > > >
> >>> > > > Might be worth implementing the automatic
> >>> re-setting
> >>> > of the EPROM
> >>> > > > settings after a power loss. It's
> usually OK,
> >>> but can get
> >>> > > corrupted if
> >>> > > > there's a brown-out, or the power
> cycles very
> >>> quickly.
> >>> > > >
> >>> > > > Will have a think & chat with Markus
> about what
> >>> data
> >>> > summary
> >>> > > might be
> >>> > > > useful.

```
> >>> > > >
> >>> > > > cheers
> >>> > > >
> >>> > > > Ian
> >>> > > > ps. I've attached revised copies of
> the matlab
> >>> code to
> >>> > work
> >>> > > with this
> >>> > > > file. The time stamp was something
> added by
> >>> logging code.
> >>> > > >
> >>> > > > cheers
> >>> > > >
> >>> > > > Ian
> >>> > > >
> >>> > > > > Sorry for the delay. I ran the
> CLASP and
> >>> usa-1 this
> >>> > afternoon.
> >>> > > > The metek
> >>> > > > > output looks normal. Being
> unfamiliar with
> >>> the CLASP I
> >>> > > collected
> >>> > > > about
> >>> > > > > an hour data in hyperterm so that I
> could
> >>> forward
> >>> > it along to
> >>> > > > you. The
> >>> > > > > CLASP was run at room temp in the lab,
> >>> ~22-23 C. We
> >>> > are at
> >>> > > near
> >>> > > > 1500 m
> >>> > > > > elevation here and the atmospheric
> pressure was
> >>> > ~830 hpa
> >>> > > today. I
> >>> > > > did
> >>> > > > > not get a new calibration for the lower
> >>> pressure. I
> >>> > modified
> >>> > > > > CLASP_read_MOSAiC.m to bypass
> "timebits"
> >>> (line 45) and
> >>> > > begin with
```

> >>> > > > > statusbyte as the first column
> because the
> >>> > instrument didn't
> >>> > > > output a
> >>> > > > > time stamp. Nearest I can tell, the
> >>> instrument does not
> >>> > > > output a
> >>> > > > time so
> >>> > > > > this part of the code must be a
> holdover
> >>> from a prior
> >>> > > logging system
> >>> > > > > (?). The file containing the data is
> >>> attached. Let
> >>> > me know
> >>> > > if you
> >>> > > > see
> >>> > > > > anything amiss. Looked like data to
> me :) It
> >>> even
> >>> > sampled a
> >>> > > > realistic
> >>> > > > > looking signal about halfway
> through the test.
> >>> > > > >
> >>> > > > > Next week we will hook up all of
> the 10 and
> >>> 20 Hz
> >>> > > instruments for
> >>> > > > the
> >>> > > > > met city tower together in the lab
> so that
> >>> we can
> >>> > run some
> >>> > > tests
> >>> > > > on the
> >>> > > > > computer/logging software with the
> full load.
> >>> > Nominally,
> >>> > > we would be
> >>> > > > > archiving the raw strings and
> attaching a time
> >>> > stamp, but
> >>> > > we have
> >>> > > > the
> >>> > > > > capability to add a couple features:
> >>> > > > > (1) automated instrument controls. For
> >>> example, the
> >>> > EPROM

> >>> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>
> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>>
> >>> > <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>
> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>
> >>> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>
> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>>>>
> >>> > > > > <mailto:maey@bas.ac.uk
> <mailto:maey@bas.ac.uk>
> >>> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>
> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>
> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>>
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> >>> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>
> <mailto:maey@bas.ac.uk <mailto:maey@bas.ac.uk>>>>>>>>> wrote:
> >>> > > > >
> >>> > > > > Hi Chris
> >>> > > > >
> >>> > > > > please see attached foto of the
> >>> CLASP/sonic (METEK)
> >>> > > set up I
> >>> > > > used on
> >>> > > > > N-ICE2015. It's a possibility but
> >>> depends also
> >>> > on how
> >>> > > you want to
> >>> > > > > mount things on the 12m mast.
> >>> > > > >
> >>> > > > > Best wishes,
> >>> > > > > Markus
> >>> > > > >
> >>> > > > >
> >>> > > > >
> >>> > > > >
> >>> > > > >> On 9 May 2019, at 08:37, Ian
> Brooks
> >>> > > > <i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>>
> >>> > <mailto:i.brooks@see.leeds.ac.uk

> >>> > > <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>
> >>> > <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>>>>>> wrote:
> >>> > > > >>
> >>> > > > >> Great, thanks Chris.
> >>> > > > >>
> >>> > > > >> Something I think I forgot to
> put in
> >>> the notes
> >>> > about
> >>> > > CLASP. When
> >>> > > > >> it is finally installed on the
> mast, it
> >>> should
> >>> > have
> >>> > > the inlet
> >>> > > > >> pointing down - to prevent precip
> >>> falling into the
> >>> > > inlet; also
> >>> > > > >> provides uniform inlet
> characteristics
> >>> > regardless of wind
> >>> > > > >> direction. The ideal is for
> the inlet to be
> >>> > close to
> >>> > > the sonic
> >>> > > > >> anemometer sensing head,
> though we also
> >>> need
> >>> > to minimise
> >>> > > > possible
> >>> > > > >> obstruction to the flow around the
> >>> sonic, and
> >>> > there are
> >>> > > > practical
> >>> > > > >> issues for physically mounting it.
> >>> > > > >>
> >>> > > > >> Easy option is to install it
> with inlet
> >>> at same
> >>> > > height as a
> >>> > > > sonic
> >>> > > > >> head but on, or very close to
> the mast

> >>> itself. The
> >>> > > horizontal
> >>> > > > >> separation will result in some
> loss of
> >>> > correlation, but
> >>> > > > there are
> >>> > > > >> theoretical corrections that
> can be
> >>> applied to try
> >>> > > and correct
> >>> > > > >> that...they'll get smaller the
> higher
> >>> it is.
> >>> > > > >>
> >>> > > > >> I've cc'd Markus - he might
> want to
> >>> comment on how
> >>> > > high he
> >>> > > > really
> >>> > > > >> wants this.
> >>> > > > >>
> >>> > > > >> cheers
> >>> > > > >>
> >>> > > > >> Ian
> >>> > > > >>
> >>> > > > >> On 09/05/2019 00:37,
> Christopher Cox - NOAA
> >>> > Affiliate
> >>> > > wrote:
> >>> > > > >>> Ian,
> >>> > > > >>> The equipment arrived. More
> later.
> >>> > > > >>> -Chris
> >>> > > > >>> On Wed, May 1, 2019 at 9:51 AM
> >>> Christopher Cox -
> >>> > > NOAA Affiliate
> >>> > > > >>> <christopher.j.cox@noaa.gov
> <mailto:christopher.j.cox@noaa.gov>
> >>> <mailto:christopher.j.cox@noaa.gov
> <mailto:christopher.j.cox@noaa.gov>>>
> >>> > <mailto:christopher.j.cox@noaa.gov
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> >>> > <mailto:christopher.j.cox@noaa.gov

> >>> > > <mailto:i.brooks@see.leeds.ac.uk
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> >>> > <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>
> >>> <mailto:i.brooks@see.leeds.ac.uk
> <mailto:i.brooks@see.leeds.ac.uk>>>>>>>> wrote:
> >>> > > > >>> Hi Chris
> >>> > > > >>> CLASP and Metek sonic
> anemometer
> >>> > should be on
> >>> > > their
> >>> > > > way to you
> >>> > > > >>> tomorrow.
> >>> > > > >>> I've included cables for
> >>> testing, but

> >>> > need to
> >>> > > make
> >>> > > > up new
> >>> > > > >>> ones with
> >>> > > > >>> Arctic grade cable for
> final
> >>> deployment.
> >>> > > > >>> Attached is a word
> document
> >>> with some
> >>> > quick
> >>> > > details
> >>> > > > of what
> >>> > > > >>> should be in
> >>> > > > >>> the boxes, and another
> with
> >>> detailed
> >>> > instructions
> >>> > > > for use of
> >>> > > > >>> CLASP -
> >>> > > > >>> with luck you won't
> need most
> >>> of it.
> >>> > Just connect
> >>> > > > CLASP to
> >>> > > > >>> power
> >>> > > > >>> via the
> >>> > > > >>> RS485-to-RS232
> interface box,
> >>> and plug
> >>> > that
> >>> > > into an
> >>> > > > RS232
> >>> > > > >>> terminal, and
> >>> > > > >>> data should appear
> (baud rate
> >>> 38400).
> >>> > > > >>> Also attached, two matlab
> >>> functions to
> >>> > import the
> >>> > > > data. These
> >>> > > > >>> probably
> >>> > > > >>> won't quite work since the
> >>> first one,
> >>> > > > CLASP_read_MOSAiC.m
> >>> > > > >>> is set
> >>> > > > >>> up for
> >>> > > > >>> my logging system
> which adds a

> >>> > date/time stamp to
> >>> > > > the start of
> >>> > > > >>> each line
> >>> > > > >>> as 'YYYY MM DD hh mm
> ss.ss' - that
> >>> > will need
> >>> > > > modifying for the
> >>> > > > >>> NOAA system.
> >>> > > > >>> There's a matlab data file
> >>> > > > >>>
> (calibration_CLASP_P_Apr2019.mat) which
> >>> > > > >>> contains the calibration
> >>> information
> >>> > for this
> >>> > > unit,
> >>> > > > for use by
> >>> > > > >>> CLASP_apply_cal_MOSAIC.m.
> >>> > > > >>> Finally, there's an
> ascii file
> >>> > > > CLASPV5Config_MOSAIC_unit_P.txt
> >>> > > > >>> which is
> >>> > > > >>> the config file to
> send to CLASP if
> >>> > you manage to
> >>> > > > screw up the
> >>> > > > >>> settings
> >>> > > > >>> on it. With luck
> you'll never
> >>> need it.
> >>> > > > >>> Shout if you have
> questions.
> >>> > > > >>> cheers
> >>> > > > >>> Ian
> >>> > > > >>>
> >>> > > > > Markus M. Frey, PhD**I
> Atmospheric & Ice
> >>> > Chemist |British
> >>> > > > Antarctic
> >>> > > > > Survey
> >>> > > > > High Cross, Madingley Road,
> Cambridge
> >>> CB3 0ET____
> >>> > > > > Email: maey@bas.ac.uk
> <<mailto:maey@bas.ac.uk>>
> >>> <<mailto:maey@bas.ac.uk>> <<mailto:maey@bas.ac.uk>>>
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> >>> > > > > 221268 | Web:
> >>> > <https://www.bas.ac.uk/profile/maey/>
> >>> > > > > Visit our website www.bas.ac.uk
> <<http://www.bas.ac.uk>>
> >>> <<http://www.bas.ac.uk>>
> >>> > <<http://www.bas.ac.uk>> <<http://www.bas.ac.uk>>
> >>> > > <<http://www.bas.ac.uk>>
> >>> > > > <<http://www.bas.ac.uk>> | I Follow BAS
> >>> > > > > onTwitter
> <https://twitter.com/BAS_News> and
> >>> > Facebook
> >>> > > > >
> >>> > <<https://www.facebook.com/BritishAntarcticSurvey>>_____
> >>> > > > > *NERC* is part of UK Research and
> >>> > > [Innovationwww.ukri.org](http://www.ukri.org)
> <<http://Innovationwww.ukri.org>> <<http://Innovationwww.ukri.org>>
> >>> <<http://Innovationwww.ukri.org>>
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> >>> > > > <<http://Innovationwww.ukri.org>>
> >>> > > > > <<http://www.ukri.org>>
> >>> > > > > *P*/Please think of the environment
> >>> before printing
> >>> > > out this

> >>> > > > message/
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> >>> > > > >
> >>> > > > >
> >>> > > > > This email and any attachments
> are intended
> >>> > solely for
> >>> > > the use of
> >>> > > > the named recipients. If you
> are not the
> >>> intended
> >>> > > recipient
> >>> > > > you must
> >>> > > > > not use, disclose, copy or
> distribute
> >>> this email or
> >>> > > any of its
> >>> > > > > attachments and should notify
> the sender
> >>> > immediately and
> >>> > > > delete this
> >>> > > > > email from your system.
> >>> > > > > UK Research and Innovation has
> taken every
> >>> > reasonable
> >>> > > > precaution to
> >>> > > > > minimise risk of this email or any
> >>> attachments
> >>> > containing
> >>> > > > viruses or
> >>> > > > > malware but the recipient
> should carry
> >>> out its own
> >>> > > virus and
> >>> > > > malware
> >>> > > > > checks before opening the
> attachments. UK
> >>> > Research and
> >>> > > Innovation
> >>> > > > > does not accept any liability
> for any
> >>> losses or
> >>> > > damages which the
> >>> > > > > recipient may sustain due to
> presence of any
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> >>> > > message and
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> >>> > > >--
> >>> > > > Christopher J. Cox
> >>> > > > Research Scientist
> >>> > > > CIRES/NOAA-ESRL
> >>> > > > R/PSD3
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> >>> > > > Boulder, CO 80305
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