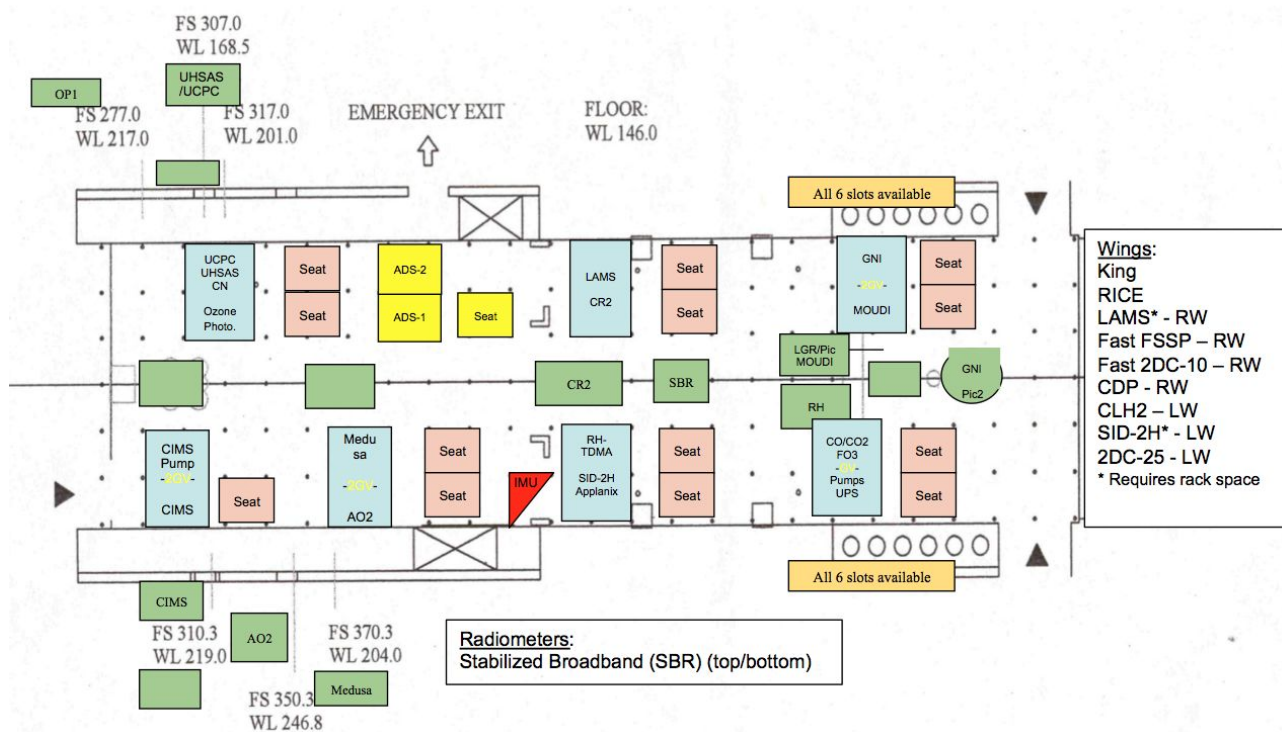


ARISTO-2015 Project Manager Report Aircraft payload

C-130 LAYOUT FOR ARISTO 8/25/2015



| Instrument | Instrument PI | Affiliation |
|------------------------|------------------|-------------|
| 2DC 10 micron | Jorgen Jensen | NCAR |
| AO2 | Britt Stephens | NCAR |
| Applanix | Dick Friesen | NCAR |
| Auto-GNI | Jorgen Jensen | NCAR |
| CIMS | Joel Thornton | Washington |
| CLH-2 | Darin Toohey | Colorado |
| CR2 | Teresa Campos | NCAR |
| Fast FSSP | Jorgen Jensen | NCAR |
| LAMS | Dick Friesen | NCAR |
| LGR/Picarro | Teresa Campos | NCAR |
| Medusa | Britt Stephens | NCAR |
| MOUDI | Amir Naqwi | MSP Corp |
| OP1 | Pavel Romashkin | NCAR |
| RH-TDMA | Suresh Dhaniyala | Clarkson |
| SID-2H | Aaron Bansemer | NCAR |
| Stabilized Radiometers | Julie Haggerty | NCAR |
| UCPC | Jeff Snider | Wyoming |
| UHSAS | Jeff Snider | Wyoming |

General Data Notes

ARISTO-2015 used LAMS on the C-130 for the second time to attempt calculation of the radome sensitivity coefficients for the attack calculation using the algorithms developed during DEEPWAVE. Application of this algorithm to the C-130 remains a challenge, with LAMS data requiring a substantial amount of processing. As the result, vertical wind calculations from ARISTO-2015 are inaccurate in the first data release: they can have a significant non-zero average over the course of a flight, and this offset can be altitude dependant.

Some failures of the CN counter sample flow measurement (FCN) occurred during RF02 and RF04. The problem was determined to be with the measurement of the flow only, and while the actual flow was not affected, the derived particle concentration was. For RF02 and RF04, therefore, CONCNC was calculated assuming a constant value of 1.5 vlpn for FCNC in place of that normally calculated from the FCN mass flow measurement. Because the true FCNC varies slightly with altitude, the error introduced into CONCNC by setting FCNC to a fixed, intermediate value is found to range from 1.3% overestimation at low altitude to 2.7% underestimation at high altitude.

In RAF's data processing, there is no direct means of holding a derived variable constant only for specific flights. In this case FCNC was held constant for RF02 and RF04 by setting the desired flow as a calibration constant for FCN, then passing FCN in place of FCNC to the calculation of CONCNC. A consequence of this workaround is that the affected FCN and FCNC arrays in the netCDF files for those two flights are invalid and should be ignored.

The RAF CN counter shared an SMAI inlet with the University of Wyoming UCPC and UHSAS, and was plumbed last in the line following two flow splits. The additional length of sample line and the presence of flow splitters can lead to small, size-dependent particle losses that are not quantifiable.

Flight Specific Data Notes

RF01

9/16/2015

CR-2 did not operate on this flight.

LAMS INS did not operate properly on this flight.

Speed runs were performed from 18:08 to 18:19.

Pitch maneuvers were performed from 18:28 to 18:30.

Yaw maneuvers were performed from 18:31 to 18:33.

A reverse heading maneuver was performed from 18:34 to 18:41.

Roll maneuvers were performed from 18:44:50 to 18:48:00. Roll maneuver resulted in significant yaw of the aircraft.

RF02

9/23/2015

CR-2 did not operate on this flight.

Speed runs were performed from 18:34 to 18:55 and 19:23 to 19:37.

Pitch maneuvers were performed from 19:37:30 to 19:38:45.

A reverse heading was performed from 18:58 to 19:04.

Circle maneuvers were performed from 19:48 to 19:56.

King probe failed at 18:05:50.

Dewpoint exceeds ambient temperature by 1-1.5 degrees on multiple flight segments in straight and level flight.

FCN and FCNC are invalid and should be ignored.

RF03

9/25/2015

CR-2 did not operate on this flight.

Speed runs were performed from 17:15 to 17:34 and 18:35 to 18:57.

Circle maneuvers were performed from 20:58 to 21:08.

ATH1 experienced a problem from the beginning of the flight until 16:52 when the DSM was re-booted. After this the normal operation resumed. ATH2 was used as the reference temperature for this flight.

LAMS INS pitch and roll measurements were bad from the beginning of flight until 19:21.

RF04

9/30/2015

Pitch maneuvers were performed from 18:21 to 18:25, and from 18:58 to 19:00. Sideslip maneuvers were performed from 18:28 to 18:30, and 19:01 to 19:04. A reverse heading maneuver was performed at 19:06. Several circle and figure-eight maneuvers were performed on this flight.

Speed runs were performed from 17:43 to 18:05.

FCN and FCNC are invalid and should be ignored.

RF05

10/2/2015

Maneuvers performed from approximately 16:00 to 16:40 were for testing and calibration of the radiometer stabilized platforms. There were pitch and roll maneuvers as well as what looks like a reverse heading that is 5 degrees off. These maneuvers may not be suitable for wind calibrations.

Technician Flight Notes

RF01

TECH: John Cowan

DATE: 9/16/15

Preflight :

Corrected numerous problems including no Satcom, various fastener issues, adding a new Ethernet to get POE to a rack. Installed CN counter. We were delayed about 15 min by an issue with the CIMS rack.

The RW DSM failed to come up after the power transfer. I suspect that it was a heat issue since I was able to get it up in flight after we reached a cool altitude. Once the DSM was up the C-MIGITS for LAMS would not come out of initialization. I am guessing it will not start if the plane is moving.

BO 1709, TO 1716

After takeoff it was found that we did not have a bunch of derived variables. This was traced to an issue in the depend table. It was fixed and NIMBUS was restarted at 1739. All data from there forward should be correct.

1842 Matt lost something on the LAMS and the OP1 also went to NAN. This seemed to clear up within a minute or so.

1848 Data on both 2DC probes

1933 Noticed that the radar altimeter display was not working (post flight found that it had been turned down, now turned up).

1951 Landed

Saw data on all PMS probes during the flight.

Power readings at 1833

400 Hz 3 Phase

A phase 7.5A 113.5V

B Phase 6.1A 114.2V

C Phase 6.2A 114.1V

115V 60 Hz

Left 115.1V 57Hz 21A

Right 114.6V 60Hz 15.4A

Data 114.1V 60Hz 6.1A

28V User 28.6V 000A

28V AI 27.3V 63A

RF02

Tech: Kyle Holden

23Sept15

Takeoff: 17:02

Landing: 20:35

Preflight 14:55, DSM 321 A0 analog card failed. Reboot fixed it.

Cockpit is without Internet this flight. Chris W. is aware.

17:57 pwr cycle LWP for SID2 probe.

Had to power cycle LWP again to get 2DC to communicate. When we did that, we lost the PLWC. May be coincidental because I think PLWC is 28VAI. Turns out we lost LW 2DC-25 data for about 45 minutes. It was communicating but no concentrations. Cycled power 2 more times and it finally came back.

LAMS UDP packet dropped out a few times during flight. Chris W. is aware.

CN plate had flow issues the whole flight. Mike R. is aware. CN stable ~ 18:30.

Saw returns from all probes at some point during flight.

DSM 321 A0 analog card worked the whole flight.

RF03

TECH: Ta

DATE: 09/25/2015

Take off: 9:28AM

DSM 321 still have same problem as previous flight, on preflight check. Reboot will fix the problem temporary. Will debug on next maintenance day. All RAF instruments perform well except Video DSM 321.

10:54 reboot DSM 321

11:51 reset RW DSM for LAMS due to the data didn't seem right.

12:49 Reset RWP for LAMS again.

1:00 PM Reset RW DSM & RWP power, with 3rd time reset, LAMS back to normal.

Landed: 3:43 PM

RF04

TECH: Ed Kosciuch, Bill Irwin

DATE: 9/30/15

Taxi: 1654z

Takeoff: 1702z

Landing: 2049z

~1800z lost fwd projector - due to overheating, at 25Kft heat was on in the back - maybe a bit too much. Bill used the dust buster to cool it down.

1807z fwd projector working.

2004z recycled power on LWP for 2DC (Aaron) - didn't help.

2008z recycle LW DSM, LWP pwr off.

2010z LWP pwr on, 2DC is back on.

RF05

TECH: Kurt Zrubek

DATE: 10/05/15

TO 15:01

Normal flight...

Just after takeoff OP1 SELPOS_OP1 status stuck at 4

OP1 off 15:37

OP1 on 17:41