

## EUSO\_SPB telcon August 1st 2016 Notes

### Some Action Items:

HK/LVPS: Juan Carlos stay focused on correcting issues identified in integration and testing last week at Toulouse. Claudio F. on standby to come to Toulouse

Takky: Prepare lens report

Lawrence: Track lens shipment and receive lenses

Guillaume: Follow up on packing and shipping of PDM/HK/DP from Toulouse

Guiseppe/Gustavo - coordinate remaining HK/DP integration/debugging

All: confirm travel plans for Colorado with Lawrence ASAP

People in the next wave include:

Lech, Guiseppe, Claudio, Will P. William H. (Mx), Aera(?) Simon (?)

Jacek: Review information about HV situation, suggest tests

Jim: Ship batteries and crinolin

Jim K/ Lawrence - review cable hatch design, get connectors

Yitz: Send updated exoskeleton design to CSBF, start on Battery box

### Notes:

-----

Takky Lenses: Middle lens finished last week, tested, and also 3 lens system. Then sent lenses to Colorado last Saturday. Now Lenses arrived at LAX. Expect arrival in Colorado August 4th. Now preparing a summary lens report

Lens testing: Lawrence/Peter (Johannes working in shop) Timmins lenses are in test stand. Scanning underway. Peter and student Abraham were in Golden last week and Abraham will stay until Aug 14th. Peter reports that lens testing set up looks quite good. Peter, Lawrence, and Randy (Mines Machine shop) figured out how to move the rear lens into the red box. Previously it had been attached to the base of the black electronics enclosure. This change means that the red box holds all the lenses and the tests can be made with all the lenses inside the red box in the flight configuration. Also frees up the electronics box for mechanical and electrical work.

Guillaume: Toulouse tests. 3 days of integration of DP updated, needed to change to change CPU, GPS, CLOCK, firmware, software, libraries. 8pm in vessel on Wednesday. Thursday cold start of system tried. Was possible to power all subsystems, but now power HV. Could not set HV at any voltage at any volts, not even 50V. Some questions at the time about the HK. Switched to HK emulator. Tried again at -20c. Still not possible to power HV. Warmed to 10c and verified it works to 50c. At 8mbar the entire time. In parallel at APC, tests at level of -15c, worked ok in small stand-alone tests. DP not entirely stable. Italian colleagues unable to work on it. Issue with data taking, HK firmware is not completely stable. Some bugs. Discussed this today earlier. Could be that we loose the grounding at low temperatures. Use one connection for grounding that was not the best one, but not most important link. Worked at APC without it. Still not sure what is the cause of the problem. Recommend sending to US. When in final configuration, go for temperature test. Left PDM at DP in Toulouse with remote access so Juan Carlos at site, and Italians can work remotely.

Key point about the HV issue is that the HV could not be brought to 50V below 10C. Independent of vacuum or no vacuum.

Dicsussion about how to test this in Golden. Jim recommend making a temporary thermal enclosure from stryfoam and cooling it with nitrogen vapor that evaporates from a liquid nitrogen dewar. Can lower a resistor attached to wires to heat n2 to make more vapor. Need fans and temp sensors in styrofoam enclosure. The nice part is that we can make an enclosure large enough to hold the radiator plate with all components mounted, or even the electronic black box. Need to vent the nitrogen to the outside for safety.

HV - Jacek requested more information about tests.

Discussed the issue that the HV could only be turned on at +10c and above in thermal/vac chamber. Peter noted that in case of COSI, they were never under 0c. Add a heater or more insulation around pdm?

Make a box around what you want to cool. Get LN dewar. Liquid vent and cold gas vent. Vent gass into the vent. Put twisted pair of wires with resistor. Fan in box

HK, LVPS: Juan Carlos is working on various issues with the HK and LVPS in Toulouse.

Relay of LVPS PDM failed twice in Toulouse Problem needs to be corrected J.C. has list. HK firmware needs more debugging. HK\_old LVPS monitoring not working. Claudio could come if needed.

DP Guiseppe via email:

The main result of the test at Toulouse concerning the DP are the following:

New CPU:

Was impossible power it by LVPS, not enough power on the 5V. Powered by external power supply.

Few problem on the software (64 bit architecture, the previous was 32 bit).

Good behavior at -20 and +50.

No communication with HK·NEW. The problem here seems due to the HK.

CLKB NEW

Good behavior at -20 and +50.

GPS new (dual GPS)

Good behavior at -20 )and +50.

Tested without antenna.

HK -old

Lvps monitoring not working;

PDM HK -old

Still missing Hk command;

shipping: CNES ready to send everything Friday.

Jean Evrard and Juan Carlos will do the packing. On a pallet.

Question about trigger tests. Colorado? Possible with health LED. Certainly with lasers in Colorado.

Batteries: Jim Extensive testing. Found that batteries have a charge "memory". Talked with manufacture.

Determined that manufacturer does not have experience with solar power applications like ours. Made telcon with CSBF. controller needs custom settings.

tested all the solar panels. Think the battery situation is in hand. Will use 10 batteries.

Al frame (crinoline) completed, packing today. Looking for plastic box for solar panels. Sent separately.

Controllers will be sent as soon as custom setting of charging parameters.

Gondola: Lawrence/Yitz Yitz working to finish the mods requested by CSBF for exoskeleton. Lawrence reported that the red box will be reduced by 24" this week. Need to do this before installing the lenses. First cart done.

SiPM Painter working on calibration and debugging. Pushing to figure out the operational settings. It can see light, but not at the level and accuracy expected. Adjusting ASICs. Complicated issue. In order to develop this device, switched from charge integration to simple trigger counting arrangement. Now finding trigger counting is more sensitive to errant behavior. Trying to find a stable setting. Mechanically looks fine. Electrically OK. Can simulate electrical connections almost entirely at KIT with updated interface commands with Claudio. Last issue is calibration.

UCIRC (S. Meyer, Chicago - email)  
Current UCIRC status:

The mechanical structure is nearly complete. What remains is wiring, painting the exterior panels for thermal control, and thermovac testing. The calibrator (non-flight) has been operating for about a month continuously. The Chicago thermovac system is ready to do the testing.

We have two MinnowBoard Turbots running (these are the low power USB-3 enabled SBCs). One has been used to run both cameras through a USB-3 hub. This configuration puts us almost within our power budget without a sleep mode setting. Sleep mode works and the cameras recover after waking the system which can be done over USB or (we assume) ethernet. We are using the second MinnowBoard to explore different Linux builds for compatibility.

The MinnowBoards currently have 128GB MicroSD system disks which enables the possibility of storing the image frames locally and uploading asynchronously to the CPU during the daytime.

However, we have had reliability issues with the connection between the CPU and the cameras. We are pretty sure it is a software issue in that a reboot reestablishes the connection for a time. We are exploring the issue with the camera backend electronics developer.

Mikhail and Francesco have been discussing the architecture of the link with the balloon CPU and everyone is happiest with the ethernet idea if it is viable. Mikhail and Toshihiro have been consulting on the software development.