ALCATEL SPACE

REF. : H.P.ASPI.MN.164

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COMPTE RENDU DE REUNION / *MINUTES OF MEETING* | LIEU / PLACE : 6x Ford - RAL

OBJET / *PURPOSE* :

SPIRE - Technical progress Meeting n°1.

CLASSIFICATION :

PARTICIPANTS *ATTENDEES*	SOCIETE *FIRM*	SIGNATURE *SIGNATURE*	PARTICIPANTS *ATTENDEES*	SOCIETE *FIRM*	SIGNATURE *SIGNATURE*
A. HESKE	ESTEC		J. DELDERFIELD	RAL	
J. BRUSTON	ESTEC		B. WINTER	UCL	
H. FAAS	ASTRIUM		M. GRIFFIN	QMW	
G. LUND	ALCATEL		J. RAWTAKOSKI	ESTEC	
B. COLLAUDIN	ALCATEL		D. GRIFFIN	RAL	
K. KING	RAL				
B. SWINYARD	RAL				

REDACTEUR / WRITTEN BY :

CONCLUSION :

DISTRIBUTION : PARTICIPANTS / *ATTENDEES*

POUR ACTION : *FOR FURTHER ACTION*

POUR INFORMATION : *FOR INFORMATION*

APPROUVE PAR / APPROVED BY

NOM / NAME				
SIGNATURE / *SIGNATURE*				

M052-1

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SUITE / CONTINUED :

ACTION

Review of Action items

- HP-ASPI-MN-41 - n°1 (1Ø bus sensitive to LCL failure).
  -> 5.10.1.4 of IIDB - wording is not clear.
  Do the DPU's have unique remote terminal identifiers on the 1553 ?
  'Rewrite this § in the IIDB
  &
- HP-ASPI-MN-41 - n°2 (LCL dimensioning)
  -> See IIDB §5.9.3 / Fig. 5.2.1 - closed.
- HP-ASPI-MN-41 - n°3 (DC/DC synchronisation).
  closed by EMC working group meeting.
- HP-ASPI-MN-41 - n°4 (Thermistors). IIDB §5.7.5.2
- HP-ASPI-MN-41 - n°7 (common ground) - open
  Main concern is bonding of chassis to SVM.
  Grounding straps supplied by Alc. Bonding stud needed on SPIRE boxes.
  -> Alcatel still needs to look into the resolution and accuracy of the thermistors .... this is normal work.
- HP-ASPI-MN-41 - n°8 - CLOSED (EMC - Power W.G.).
- " " - n°9 - Supply of "on-target" signal is confirmed. See also discussion of IIDB - §5.13.3
- HP-ASPI-MN-22 - n°2 - Sketch of I/F + feet has been supplied. - CLOSED.
- " " n°3 - Config. drawings of FPU Layout.
  -> geometry / envelope model has been made available in IGES format. Closed

ACTION

SUITE / CONTINUED :

- HP-ASPI-MN-22 n°4 Harness / routing.

  Astrium has completed review of SPIRE harness definition doc. (V.3). - Comments will be supplied by end of this week (29.06). Preliminary cryo-harness design will be ready, end of July, according to schedule.

- HP-ASPI-MN-22 n°8. - Accommodation of units. - Still open. n° 2
  SPIRE to provide information about box size & mass Date:

SPIRE Design & Devt. Status

→ presentation by M. Griffin of Science Team Meeting Slides 8 (20-22 June 01) - See annex.

o FMECA should become available in Sept. 01.
- Sorption cooler is considered a critical SPF item.
- See Criticality Analysis doc. - in IIDR data package.

Thermal design

progress made on 300mK temp. ctrl. implementation.
Routing identified.
300mK thermal strap. initial testing starting in next days, test model has been delivered.

SCHEDULE

- Tight schedule means limited time available for testing + calibration of FM. - SPIRE might consider doing this on the FS (- BC/ - depends also on funding).
- V. important for SPIRE to identify cam test plan ASAP, and therefore to hold planned meeting soon (v. mid July - TBC / ESA).

ACTION

SUITE / CONTINUED :

Influence of background levels on SPIRE performance:
- analysis shows this is not as critical as previously thought.

Microvibrations - See IIDB 5.6.1.1 Specified level of ~ 80 μg appears unacceptable for system.
System level analysis (HERSCHEL) has been initiated.
M.G. would expect the Planck requirements (0.1 to 1 mg) to be somewhat more stringent than for Herschel.
- Analysis for Planck shows the reaction wheels and coolers produce similar levels of perturbation.

Internal Monitoring and Reporting

Steps are being made to improve this throughout the consortium.
Importance of Alcatel receiving monthly Reports on a regular basis. (even when some internal reports are missing).

Discussion of parallel Mode (PACS + SPIRE)
- Impacts on data rate for both instr. working together.
- " " dual 300 mK cooling /-> lifetime issue
- major interest is for large sky area surveys.
- System-level parametric analysis will be needed to see whether this mode is efficient in terms of overall lifetime / science data collection.
- First cut "guestimate" of possible duration of the parallel obs. mode is ~ 3 months (M.G.).

Action n°3

SPIRE to produce tech. report on Parallel Mode observations, what parameters have influence, etc.

SUITE / CONTINUED :

ACTION

Similar tech. report on impacts / usefulness of the Serendipitous observations. (n°4)

Discussion of thermal models & performance

- See M.E. presentation p. 34 (impact on lifetime of 50 mW dissipation of JFETs – shown to be ~ −3.3%.
- Analysis appears to show that there is virtually no science advantage achieved with JFETs run with 50 mW, rather than 33 mW. In fact, it implies almost 20% worse science / l of He
- JPL is still working towards the 3 mW baseline.

Background Signal

- See slides of M.E. presentation. Analyses valid for SPIRE only (not PACS).
- Achieving reduction in telescope E and temp can enable significant improvement in lifetime to be achieved (observing time reductions).
- Design of SPIRE bolometers wrt expected background level is not as sensitive as originally thought (and appears less sensitive than in the case of PACS).
- SPIRE will provide details of their model to PACS.
- Astrium will use simplified "box" to represent SPIRE FPU in their simplified thermal model.

ACTION

SUITE / CONTINUED :

SPIRE state that it does not have the resources to convert their APART optical model to ASAP standard for straylight analysis. SPIRE could do the translation (~ 3 weeks) but would request funding for this.

Same situation could also arise with translation to NASTRAN of SPIRE's FPU / mech. model, since SPIRE is not (yet) sure the translation is valid and works – this will soon be known.

note
- o ASAP model does not include baffles & structures.
- o ESA will be supplying the ASAP model for HIFI
- o PACS has the beginnings of an ASAP model.

This pb should be addressed by the Telescope (optical System) W.G.

Discussion of IIDB / Discrepancies, actions. ACTIONS

(Chapter references relate to PDF version of SPIRE IIDB 2/2 – 19-06-01).

§5.5 Include size and mass properties of SVM on boxes. ← SPIRE

§5.5.1-2 Mass

Mass-reduction excess is needed to bring the "Estimate + contingency" mass down to the total allocation (Total mass allocation = 90.0 Kg - ex IIDA). ← SPIRE

§5.6.1.1

10 µg requirement appears very severe. This needs to be checked (Planck sensitivity indicates 1 to 2 orders of magnitude higher can be tolerated). ← SPIRE

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SUITE / CONTINUED :

ACTION

§ 5.7.1.1 Astrium to confirm - asap - details of cryostrap cross-sections. ←

~~PACS~~ SPIRE to define / agree details of stress relief support brackets for cryostraps. ←

§5.7.1.2 Table needs clarification, or replacement by required thermal conductances of each strap. ←

§5.7.5.2 For information, include resolution and accuracy performance ←

~~§5.3~~

§5.3 Astrium will look into the possibility of distributing an "early version" of the OB layout to all instruments in July 01. (This is intended to allow feedback from instruments. ~~ASAP~~

§5.9.1 AEA / ESA to update IIDA max. ave heat load budget figures.
"When powered" and "when not powered" (i.e off) heat loads should be provided, Turkey into account the conductive loads of the "off" instruments.
It is proposed to provide a table with "Current Status" of SPIRE heat loads, with the caveat that this is not ~~yet~~ a requirement on Prime. Further OB modeling is needed by Astrium before this can be validated.

§5.13.2 To be modified such that it is clear that this data is provided to ground. ←

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ACTION

§5.10.1.4 – Clarify – (LCL fault conditions)

§5.10.2. – remove text (keep chapter N°).

§5.11.2 – Allocated is not in favour of clock line, bundled with 1553 bus.

§5.13.1.1 – Not consistent with IIDA. / or correct "Science data rate" to "Total data rate" – clarify table.

§5.13.1.2 – Quality the exact meaning of "short duration", and provide the "Maximum average" requirement over this period.

§5.13.1.3 – Clarify exact requirement.

§5.13.2. – Housekeeping data is sent to ground. Clarify.

§5.13.3 – Clarify exact requirements for Scan Synchronisation.

§5.14.1 – Raster Mode 1.7 arcsec is not applicable to S/C, only to BSM.

↳ Remove, as it is an internal mirror reqt, not an I/F reqt.

S/C System spec reqt. is for 2.0 arcsec Steps – not 1.7 arcsec.

§5.17.3.1 replace "class 10000" by "class 100 000"

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ACTION

SUITE / CONTINUED :

PA

ESA will send PA information to SPIRE this week.
Meeting to be arranged, after 05 July.
SPIRE state that cleanliness rqts. pose no problems to them, and agree with them.

Vibration levels - FPU.

Random vibration spec. appears far too high for SPIRE, with potentially disastrous implications for the instrument.

Prime is working on this issue, and outcome of 1st run with mechanical model will be supplied to SPIRE. It is expected that the load issues will be reduced - TBC. ← ALC.
ICDA would then be updated accordingly.

Look into possibility of a dedicated meeting with instruments, once first analysis run has been completed.

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SUITE / CONTINUED :

ACTION

1. Cryostat shields and shutter
   - What is the Heat flux on the shutter during testing from the lid — Astrium #1
   - joint of instrument cover to optical bench: what are the characteristics in order to reduce EMC problems

2. Thermal model
   - The budget for the JFET dissipation in the refocal reduced Spire thermal model is 49.8 mW. The project baseline is 33 mW
   - material of thermal straps (copper or aluminium) and what are the characteristics of sapphire (thermal characteristic of the joint) — Astrium #

Peak heat load :

11-D-A specifies 100 mW, but SPIRE produces up to 600 mW over a period of about 10 minutes. (see Thermal-TN released 20 June 2001). What are impacts on the cryostat thermal model? — Astrium #

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SUITE / CONTINUED :

ACTION

Harness routing between FPU and JFET need to clarified. RAL need to identify their requirements to Alcatel / Astrium concerning the harness routing and fixing to the optical bench. Check that the harness is clamped every 10 mm close to microphonic signals due to micro vibrations.

Minutes of Meeting

Purpose	Meeting	Ref	Date	Origin	Action n°	Description	Responsible	Due	Status	Close date	Document	Closing Reference	Remark	Days to closure	Overdue ?
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**1**	Include the text resulting from HP-ASPI-MN-42 / Action Item n°1 (concerning **I/P Lines sensitive to LCL failure**) into § 5.10.1.4 of the SPIRE IID-B.	SPIRE	13-Jul-01	OPEN					4	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**2**	Provide ALCATEL with details of **SVM warm electronics boxes** : **mass & dimensions.**	SPIRE	13-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf		Doc = Proposed IID-B update, sent by mail by JD.	0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**3**	Provide a **Technical Report** on **Parallel Mode Observations**, and requirements.	SPIRE	20-Jul-01	OPEN					11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**4**	Provide a **Technical Report** on objectives, constraints & requirements of **Serendipitous mode observations**.	SPIRE	20-Jul-01	OPEN					11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**5**	**IIDB** - §5.5.1-2 (20.06.01) : **Mass reduction exercise** needed to bring the "stimate + contingency" total mass down to the ESA allocation of **90 kg.**	SPIRE	20-Jul-01	OPEN					11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**6**	**IIDB** - §5.6.1.1 (20.06.01) : **Random vibration** acceleration reqt. of **10 µg** to be checked, and justified with a technical note.	SPIRE	20-Jul-01	OPEN		SPIRE_IIDB5(JD)_2_3.pdf			11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	SPIRE	**7**	**IIDB** - §5.7.1.1 (20.06.01) : Confirm details of **cryostrap cross-sections.**	ASTRIUM	6-Jul-01	OPEN					-3	**Overdue**
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ASTRIUM	**8**	**IIDB** - §5.7.1.1 (20.06.01) : Define, in accordance with Astrium, details of **stress-relief** brackets for the **cryostraps**.	SPIRE	6-Jul-01	OPEN					-3	**Overdue**
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**9**	**IIDB** - §5.7.1.2 (20.06.01) : Table (interface temp. Reqts.) needs clarification, or replacement by **thermal conductance** of each strap.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**10**	**IIDB** - §5.7.5.1 - 2 (20.06.01) : **Temperature sensors** : include specification of **resolution** & **accuracy** requirements.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**11**	**IIDB** - §5.10.1.4 (20.06.01) : **LCL fault conds**. : clarify phrasing.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**12**	**IIDB** - §5.10.2 (20.06.01) : **KAL** : remove requirement.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**13**	**IIDB** - §5.13.1.1 (20.06.01) : **Data rate** : replace "science data rate" by "Total data reate".	SPIRE	6-Jul-01	OPEN					-3	**Overdue**
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**14**	**IIDB** - §5.13.1.2 (20.06.01) : **Data rate** : Qualify exact meaning of "short duration", and provide "Maximum average" reqt. Over this period.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**15**	**IIDB** - §5.13.1.3 (20.06.01) : **Data packets** : Qualify exact requirement.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**16**	**IIDB** - §5.7.13.2 (20.06.01) : Modify phrasing, such that it is clear tha this housekeeping data is provided to **ground** (only).	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**17**	**IIDB** - §5.13.3 (20.06.01) : **Scan synchronisation** - clarify exact requirements.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**18**	**IIDB** - §5.14.1 (20.06.01) : **Raster Mode** : S/C System reqt. = **2.0 arcsec** steps, not 1.7 arcsec. Clarify.	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	ALCATEL	**19**	**IIDB** - §5.17.3.1 (20.06.01) : **Transport Container** : Replace "Class 10 000" by "**Class 100 000**".	SPIRE	6-Jul-01	Closed	02-Jul-01	SPIRE_IIDB5(JD)_2_3.pdf			0	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	SPIRE	**20**	**Random vibrations** spec. for the **FPU** : Current reqt. appears dangerously high. Produce 1st run of pechanical model, to check on random levels really expected.	ALCATEL / ASTRIUM	20-Jul-01	OPEN					11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	SPIRE	**21**	**Cryostat shields & shutter** : Provide expected thermal heat flux on the shutter during tests.	ASTRIUM	20-Jul-01	OPEN					11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	SPIRE	**22**	**Thermal Straps** : Define material used to make these straps (copper or Al), and thermal characteristics of the **sapphire insulating spacer**.	ASTRIUM	20-Jul-01	OPEN					11	
Herschel	SPIRE Technical meeting #1	HP-ASPI-MN-**164**	27-Jun-01	SPIRE	**23**	Check out the **impacts** on the **cryostat thermal model** of : up to **600 mW** thermal load from SPIRE - during up to 10 minutes.	ASTRIUM	20-Jul-01	OPEN					11	