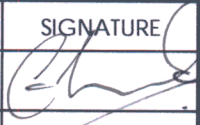


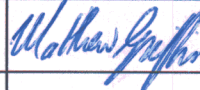


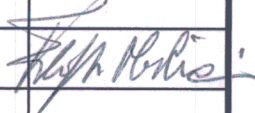


	REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 1 / 12
		PLACE : RAL / Chilton - UK	
<b>MINUTES OF MEETING</b>			

PURPOSE :			CLASSIFICATION :		
<b>SPIRE - Interface Meeting</b>					
PARTICIPANTS	FIRM	SIGNATURE	PARTICIPANTS	FIRM	SIGNATURE
G. Lund	Alcatel		J. Delderfield	RAL	
B. Collaudin	Alcatel		A.S. Goizel	RAL	
G. Doubrovik	Alcatel		E. Clark	RAL	
H. Faas	Astrium		M. Griffin	Cardiff University	
A. Frey	Astrium		B. Winter	MSSL	
E. Sawyer	RAL		A. Heske	ESA	
K. King	RAL		J. Rautakoski	ESA	
B. Swinyard	RAL		F. Mariani	ESA	
Written by : G. Lund.					
CONCLUSIONS :					
DISTRIBUTION : PARTICIPANTS	FOR FURTHER ACTION				
	FOR INFORMATION      M. Cornut, Ph. Clavel, B. Hibberd, B. Collaudin, J.J. Juillet - ASPI				

		REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 2 /9
<b>MINUTES OF MEETING</b>		PLACE : RAL / Chilton - UK	

## Agenda :

See **Annex 1.**

## Meeting

**Tuesday 26/11**

### AI status

from MN-1725 (22/07/02)

AI-3 Closed

AI-4 Open

AI-7 Closed

AI-8 Open

AI-9 Remained open, as Astrium has re-evaluated harness routing etc>., because of removal of 3<sup>rd</sup> ring of feed-through connectors on CVV.

Summary of MN-1725 AIs

n° 3 : Drawings with correct ref. n°s & dates, thermal capacity is still to be supplied.

n° 4 : Drawings with unambiguous dates still requested.

n° 7 : Request to be forwarded to harness provider (CEA).

n° 8 : Covered by new Instrument TMM, to be delivered 15/11/02 (see also AI-2 of present meeting).

n° 9 : Routing may also change due to cryoharness optimisation exercise. Astrium to include details of harness connectors at level of SVM upper closure panel. Due date now updated to 25/11/02.

From MN-2036 (08/10/02)

AI-1 closed

AI-2 imminent

AI-3 closed / ongoing exchange of models betw. Astrium / SPIRE.

AI-4 closed / lifetime reduction ~ 20 days. SPIRE comments that the more significant impact would be lower stability of FPU temperatures (HP-ASED-FX-0667/02, of 22-10-02).

AI-5 closed : fax has been sent to ESA. Astrium is now investigating ECR 0039.

AI-6 Email has been sent by ASPI confirming that ranges of reaction wheels can NOT be avoided, with present design.

AI-7 Closed

AI-8 Closed (Issue 2.3 sent by GL on 22/11/02)

AI-9 Closed : informal indication by ASPI that 345 mm could be accommodated. In any case, TBC by formal CR from SPIRE.



Summary of MN-2036 AIs

n°1: Deliver to Astrium an intermediate (steady-state only) updated model (informal version).

n°2 : Deliver to Astrium an updated TMM of SPIRE instrument, including timeline behaviour.

n°3 : Provide updated performance analysis (1 page) resulting from updated SPIRE TMM.

n°4 : Check the mission lifetime consequences of recycling the SPIRE cooler every 24 hrs, rather than once every 48 hrs.

		REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 3 / 9
<b>MINUTES OF MEETING</b>		PLACE : RAL / Chilton - UK	

- n°5 : Make formal request to ESA, for an overshield to be reconsidered as a design requirement for the cryoharness.
- n°6 : Check whether ranges of reaction wheel frequencies can be avoided.
- n°7 : Forward PA requirements wrt PADs to co-investigators
- n°8 : Alcatel to prepare red-lined update of SPIRE IIDB 2.3
- n°9 : Alenia to check on height restrictions / availability for FCU (current height without connector backshells is 336 mm).

**Status Report (BS)** – See **Annex 2.**

DRCU – schedule pbs. – Power supply delayed ... impacts in terms of CQM model functional representativity.

New sub-co appointed for Structure (previous one in receivership) => delays ...

Delays in delivery of optical components (mirrors in particular)

Detectors – pbs with testing / slippage of Kevlar suspension at cold vibrations.

**ECR Status (EC)**

Current ECRs on IIDBs : n° 9, 29, 30, 32, 33, 39, 40, 41

RFWs : 3 current :

2 on DRCU (11-12-01)

1 on JFETS (4-7-02)

SPIRE will send to ESA a request for PDF documents with electronic signatures to be formally acceptable as a means of submitting formal requests (eg. RFWs).

**TMM – presentation** / A.Sophie Goizel – See **Annex 3.**

L3 updates from Astrium have been patched into Cryostat reduced model.

Cooler Hold-time has been implemented as a function.

Current SPIRE assumptions : 100 mW/K total conductivity for Evaporator strap, 50 mW/K for Pump strap.

According to Astrium: L0 IF "domes" now under responsibility of sub-contractor to SENER (OBA contractor) ... the ultimate design, incl. conductivity (probably < ~ 150 mW/K for evaporator strap) remains TBD.

Alcatel proposes separating thermal conductivity of L0 straps into Astrium / SPIRE requirements. Exact numbers will have to be agreed later, following the OBA PDR (Feb. 2003).

BC recommends using "resistivity ratio" to define the conductivity of the high purity domes.

3 New Cases presented, and compared with previous "baseline". With 0.5 mm Kevlar cords in Cooler, the hold-time reaches ~ 36 hrs (see also Annex 3).



SMEC dissipation varies from 0.9 mW to ~ 3.2 mW, between low-res. (small amplitude) and hi-res (max. amplitude) spectrometer modes.

SPIRE expect to be ready with updated instrument TMM by ~ 10 December: - then to be forwarded to Astrium (normal work).

Astrium will deliver a full updated system TMM in ~ Jan. 03. Corresponding reduced model ~ 8 wks later.

Updating of ECR n° 9 : should await

- updated system TMM, including confirmed characteristics of the L0 domes, and revised dissipations for L2 and L3.
- Revised (where applicable) internal design of SPIRE instrument.

		REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 4 / 9
<b>MINUTES OF MEETING</b>		PLACE : RAL / Chilton - UK	

Alcatel proposes there be an initial exchange be made (between SPIRE & industry) of a draft re-issue of ECR-009, until an agreed version is found, which can then be included into the IIDB.

Temperature sensor positions and fixation to FPU : ongoing work at Astrium.

Thermal testing of SPIRE / FTS :

This requires the S/C to be tilted horizontally. SPIRE's initial comment is that ~ 3 hours could be sufficient for an FTS-specific test campaign. Industry believes the nominal He flow rate could be sufficient to maintain correct FPU temperatures for such a short duration.

SPIRE say that the most important test they need to perform is that of transient response in flight.

Following TB/TV working meeting of 20/11/02, Astrium is checking the expected thermal conditions for SPIRE, when the S/C is aligned horizontally outside thermal vacuum.

**Vibration levels (random)** – update from B. Winter

MSSL model has been updated for random vibration levels at instrument IF down to 0.0125 g<sup>2</sup>/Hz (+ 3-sigma notching of 1<sup>st</sup> resonance eigenfrequency) : initial results show the instrument can survive very well at this level.

However Alcatel points out that such reductions are not yet agreed by industry, in view of previous experience with ISO, and pending outcome of vibro-acoustic analysis of the Herschel S/C.

#### **Schedule**

Updated schedule presented by E. Sawyer.

Delays in supply of structure (~ 2 mo), leading to CQM delivery in Feb. 04. Recovery actions would involve reduction in STM cold vibration testing, with resultant implications in terms of risk.

AVM models could still be delivered on time, albeit with some shortcomings in terms of software.

FM schedule : no impact in principle, providing manpower limitations are not a driver.

#### **Mechanical IF issues**

Astrum have now received FPU step file from SPIRE, although JFET representation is missing.

IF torques at L1 : have been provided on drawings.



AI-1 of HP-ASED-MN-182 : closed by delivery of Issue 17 of Step Model.

AI-7 of HP-ASED-MN-182 : closed by delivery of Issue 17 of Step Model.

Contrary to requirements, present design of already constructed MGSE does not allow SPIRE to be integrated after PACS. Astrum fax Ref. 727 has tabled the requirements, which have been noted by SPIRE, but which they are not in a position to address before January 03.

Discussion of simultaneous integration of the FPU with the JFET racks : various open remain open for the time being, but remain 'normal work'.

**AI-1** : SPIRE to respond to set of questions sent out by Astrum in preparation for the (originally planned – 04/12/02) AIT meeting – see attached **Annex 4**.

		REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 5 / 9
<b>MINUTES OF MEETING</b>		PLACE : RAL / Chilton - UK	

### IIDB Updates

Issue 2.3 – Draft-1 has been sent by GL to SPIRE / Astrium on 22/11/02.

SPIRE is in good agreement with this version, but has various comments.

Last 2 columns of first table on p. 5-23 can be removed.

Annex 1 needs to be included into the updated IIDB (Alcatel to check updated ICD IP from ECR 0040).

ECR-0009 needs updating, before it can be finalised. In particular, the L1 temperature has yet to be refined.

Fixation of the JFETs onto the HOB need to be updated in the IIDB :- this is covered by ECR-0040.

Once an agreed version is reached, the relevant ECRs (where applicable) are to be closed out.

**AI-2** : SPIRE to send set of comments / details for final update of issue 2.3. This should include :

- § 5.16 - a more detailed hardware matrix, as per Excel spread-sheet already provided by Alcatel.
- § 9 - provide input wrt testing & verification, including details relevant to microvibration testing.
- § 5 - details of all points of electrical isolation on SPIRE FPU & JFETs.
- § 2 - Respond to proposed change in identification of Applicable and Reference documents. – Note that ESA PA advises that AD-8 should not refer to PSS-05-02, and that AD-9 should be completely removed. TBC by K King.

SPIRE list of ECRs provided in **Annex 5**.

### IIDA Updates

Review of proposed updates to the IIDA 3.0, according to **Annex 6**.

**AI-3** SPIRE to provide any comments to proposed updates to the IIDA 3.0 (PDR version) to Alcatel.

### Cryo-cover Splinter

SPIRE are basically happy with the design proposed by Astrium, involving toroidal mirrors which enable PACS & SPIRE to see themselves, reflected by an temperature-adjustable mirror with emissivity equivalent to a single Herschel telescope reflector. SPIRE would also be agreeable to such a system being implemented in the EQM.

Presently, no estimate is available for expected standing wave effects likely to be encountered by HIFI. This has to be investigated further.

**AI-4** : Astrium to update analysis of FP unit scattering, and deliver updated model back to SPIRE.



### Telemetry

Bus list has been sent (by BH) to SPIRE for comment. SPIRE may request the use of one additional sub-frame – i.e. to increase the total n° from 24 to 25. They will first contact BH to query the feasibility of such a change, before issuing a corresponding ECR.

Packet Structure ICD – new version has been given to SPIRE for comment. Some changes are not compatible with SPIRE's OBSW : - ESA first needs to receive all instrument comments, before re-issuing a formalised version. KK will send his comments to ESA (S. Thürey).

### Flight Harness - MTD

MTDs –need to be mechanically and thermally representative. Astrium will need various design details

		REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 6 / 9
<b>MINUTES OF MEETING</b>		PLACE : RAL / Chilton - UK	

for procurement of these by ~ April 2003.

Astrium to propose design for fixation of the harness MTDs to the FPU dummies.

### **Wednesday 27/11**

#### **AIV / CQM**

Clarifications from SPIRE on open points in HP-2-ASED-PL-0021 (Instrument Testing on PLM EQM levels) : SPIRE propose to respond to these according to priorities, to be defined by Astrium. Major areas are MGSE & EGSE, and comments to these will be provided by ~ end 02.

EGSE : SPIRE will provide test sequences/procedures to industry, as they would use them. This is however incompatible with CCS (Central Checkout System) definitions, defined in above-referenced document. This situation is unsatisfactory from SPIRE's point of view, and is likely to impose additional costs on them. At a minimum, this is likely to lead to the need for some sort of 'interpreter' and corresponding interface ICD.

SPIRE list of deliverables / corresponding table will be updated by BS, for introduction into the IIDB.

AIT meeting foreseen for 04/12 : this is postponed, date TBD, but SPIRE proposed to separate this into several components : main areas needing attention are considered to be EGSE, testing, & integration. Approach to this needs further clarification from industry..

AVM (DPU) may be delivered without any OBSW (reason – lack of availability of suitable EPROMs). The software can be loaded using SPIRE EGSE. SPIRE are not sure that this can be done via the CCS, at system level. This problem is also likely to apply (in principle) to ALL Herschel instruments.

SPIRE would also need to receive further updates on satellite AIT schedule. This is not likely to be ready before ~ end of the year.

#### **CQM**

Astrium indicate there is a small delay (< 2 mo) in OBA delivery.



Astrium confirm that the CQM (ISO) cryostat will have a 'cold plate' which will be different to the cryo-cover plate design (discussed on 26/11 in a splinter) used with the FM.

#### **Electrical / EMC**

*(Arrival of F. Marliani)*

Alcatel / Astrium indicate they have received SPIRE's ECR-0039 (Grounding Scheme update). This is currently under analysis at Astrium. First comments are that the introduction of an overharness will impact the following : Herschel lifetime, thermal behaviour of SPIRE instrument itself, mass and cost (possible delays with cryoharness procurement TBD). Astrium points out that the ultimate thermal impacts (and electrical performance) of such an overshield would depend quite strongly on the shield specification, which is currently not given in the ECR. Parameters of importance would include type of braid, % optical coverage, choice of material ... . Additional testing requirements have not been defined. Some iterations are needed between Astrium & SPIRE to agree on % optical coverage / traded against thermal conductivity & manufacturing difficulty – to be carried out over the coming week.

SPIRE is asked to provide appropriate modelling to justify their request for such an overharness. However, SPIRE points out that V. Hristov (JPL – Bolometer specialist) - would have very little faith in the reliability of any model at high frequencies ( > ~ 5 MHz). In particular they are concerned about EMC

		REF. : HP-ASPI-MN-2298	
		DATE 26-27/11/02	PAGE : 7 / 9
<b>MINUTES OF MEETING</b>		PLACE : RAL / Chilton - UK	

being conducted into the CVV through all instrument and S/C harnesses. Such perturbations should be compatible with SPIRE's (instrument-level) noise specification of  $7\text{nV}/\sqrt{\text{Hz}}$  at  $\sim 2.5\text{M}\Omega$  and  $300\text{mK}$ .

F. Marliani also points out that the effectiveness of overshielding can depend strongly on the way it is brought into the connectors. In the case of SPIRE, the proposed feed-through pin-connections may not be effective in the case of some of the SPIRE harnesses. In any case, if such an overshield were provided, its transfer impedance characteristics would need to be measured.

ESA (F. Marliani) and CEA (D. Schmitt) are looking into the possibility of refurbishing the PACS EMC model to represent the SPIRE configuration. ESA (with the support of CEA) will investigate the feasibility of this activity and, if the output of the pre-study is positive, will estimate the time needed to develop a SPIRE model. F. Marliani is prepared to devote some time to assisting SPIRE with this activity. However, the model would need to be elaborated by SPIRE to ensure sufficient representativity, and assumption of responsibility on their part. It is not yet clear whether this model could take into account the above-mentioned shielding efficiencies of the connectors.

**PA**

See **Annex 7**.

**AOB**

Next SPIRE IF meetings :



- 27 & 28 February 2003
- Proposed dates : week of 22 - 25 April 2003, or week of 19 - 23 May 2003 (TBC - SPIRE).



	REF. : HP-ASPI-MN-2298	
	DATE 26-27/11/02	PAGE : 8 / 9
<i>MINUTES OF MEETING</i>		<i>PLACE : RAL / Chilton - UK</i>

ACTION ITEMS from main Meeting			
N°	Description	Responsible	Due
1	Respond to set of questions sent out by Astrium in preparation for the (originally planned – 04/12/02) AIT meeting	SPIRE	06-12-02
2	Send set of comments / details for final update of issue 2.3, according to details in minutes.	SPIRE	06-12-02
3	Identify / supply any comments to proposed updates to the IIDA 3.0.	SPIRE	15-12-02
4	Update analysis of FP unit scattering, and deliver updated model back to SPIRE.	Astrium	06-12-02



 	REF. : HP-ASPI-MN-2298	
	DATE 26-27/11/02	PAGE : 9 / 9
<i>MINUTES OF MEETING</i>		<i>PLACE : RAL / Chilton - UK</i>

### LIST OF ANNEXES TO THE MINUTES

- Annex 1** Agenda.
- Annex 2** SPIRE status update.
- Annex 3** SPIRE TMM update.
- Annex 4** Astrium request for IP wrt Instrument AIT.
- Annex 5** SPIRE ECR Status.
- Annex 6** Alcatel proposed updates to the IIDA 3.0.
- Annex 7** P.A. Report from SPIRE

## **Annex 1 : Preliminary Agenda for SPIRE / Alcatel / Astrium Interface Meeting**

26/27th November 2002

CR4 R1 RAL

### **Expected attendance:**

#### **Industry/ESA**

Glenn Lund

Bernard Collaudin (26th only)

Guy Douvrovik

Albrecht Frey (26th pm only)

Jan Rautakoski

Astrid Heske

Horst Faas

Filippo Marliani (27<sup>th</sup> only)

#### **SPIRE**

Bruce Swinyard

Eric Sawyer

John Delderfield

Ken King

Matt Griffin

Doug Griffin (as needed)

Anne-Sophie Goizel (as needed)

Eric Clark (as needed)

Berend Winter (part)

John Coker (part)

### **Agenda Iss 3:**

#### **Tuesday 26/11**

(SPIRE responsible in brackets)

- i) 9:00 Review of Actions – 15 minutes (Eric Sawyer)
- ii) 9:20 SPIRE Technical Status Report - 20 minutes (Eric Sawyer/Bruce Swinyard)
- iii) 9:45 NCR/ECR/RFW Status report – 10 minutes (Eric Clark)
- iv) 10:00 IID-B Document status including Budgets (John Delderfield) – 25 minutes
- v) 10:25-10:30 Coffee
- vi) 10:30 Interface Issues (Eric Sawyer)
  - a. Thermal – status of SPIRE Model – 20 minutes (Anne-Sophie Goizel)
  - b. Discussion on plan for thermal modelling (Bruce Swinyard) – 90 minutes
    - To cover:
      - Clarification of TMM interface issues
      - Delivery of SPIRE reduced TMM to Astrium for integration in HEPLM TMM (ESA and ASPI approved)
      - Delivery of HEPLM TMM
      - Plans for thermal testing at instrument and PLM level for EQM and PFM
      - Re-issue of ECR#009
      - Position of temperature sensors (see HP-ASED-EM-0012-02, 18/11/02)
- vii) LUNCH 12:15-13:00

- viii) 13:00 IID-A change requests and status – 25minutes (?) (Ken King)  
Telemetry packet rate change request from SPIRE  
Packet Structure ICD – status and control  
Any others?
- ix) 13:30 (John Delderfield/Doug Griffin)-5minutes  
Procurement of a set of JFETs (JFP and JFS) fixation material (screws, washers and thermal washers) for HEPLM MTDs  
Procurement of F-harness (section between JFETs and FPU) for H-EPLM MTD's
- x) 13:35 Mechanical Interface Issues (Berend Winter) – 1 hour 25 minutes  
Also to cover Astrium raised issues:  
Delivery of Spire Structure IF drawings, Issue 17, 16/10/02 and delivery of STEP file on 12/11/02  
Open Actions and clarification of AI responses from Mech IF Mtg. HP-2-ASED-MN-0182  
ASED hoisting device comments (see fax HP-ASED-FX-0727-02, 8/11/02)
- xi) 15:00 Vibration Issues – status report 15 minutes (Berend Winter)
- xii) 15:30 Microvibration – analysis summary / verification approach 15 mins (Eric Sawyer)
- xiii) 15:45-17:30 Splinters:
  - a. Cryocover and straylight (Matt Griffin; Bruce Swinyard; Albrecht Frey)  
Discussion on cryocover implementation  
ASAP Straylight model (HP-2-ASED-TN-0023, Issue 2.0, 21/10/02; confirmation required that model sent by email on 17.05.02 represents SPIRE correctly)
  - b. PA (Eric Clark; Jan Rautakoski)

## Wednesday 27/11

- xiv) 09:00 AIT/EQM – 1 hour (Bruce Swinyard)
  - a. AVM/CQM deliverables and test plan – SPIRE View
  - b. AIT Meeting on 4 Dec. 2002 at Astrium in Friedrichshafen ((non)attendance by SPIRE)
- xv) 10:00–11:00 1 hour Parallel Sessions:
  - a. Schedule (Eric Sawyer)  
SPIRE's EQM/CQM/PFM/FS schedule (Presentation by Eric)  
Presentation on industry AIT schedule (Presentation by Alcatel?)  
Discussion on instrument/spacecraft schedule compatibility
  - b. Electrical interfaces (John Delderfield/Doug Griffin) Status of Astrium investigation of harness configuration and screening. SPIRE ECR#039 (Implementation of grounding review: Flight harness).
- xiii) 11:30 – 12:30 AOB
- xiv) Before everybody leaves! Minutes and actions

## Annex 2 - DRCU

- Still some delay in finalising PSU specification
- DCU EM schedule has been changed – hardware problem with DAQ board (now solved I think?) – this may cause delays in delivery
- DRCU DDR not finalised yet – awaiting response from CEA
- Commanding and telemetry interface not finalised – analysis of nominal operations found some issues – meeting planned soon
- Other parts proceeding – STM box design is complete

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - DPU/OBS/EGSE

- Problem found with simulator/DPU interface – could impact DPU hardware
- AVM version of OBS has been tested and is o.k.
- AVM acceptance review delayed to January 2002
- Problem with CDMS simulator now being debugged
- Awaiting patch to SCOS2000 from ESOC

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - Structure

- Problem at sub-contractor – new sub-contractor appointed (BW to comment)
- Delayed delivery – final parts now expected December or January
- 300mK support has been vibrated – o.k. – light trap is next (BW?)
- Black paint will be cold vibrated this week
- Outgas cannot be done at Estec on samples available – alternative methods will be investigated

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - SMEC

- STM parts available end Dec, delivery mid Feb.
- Vibration test of STM planned for January for structural analysis ( no flex pivots)

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - OPTICS

- Further delays to mirror manufacture – scheduling at sub-contractor
- Delivery not expected before January 2003
- Alignment procedures now finalised and OGSE expected mid December

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - BSM

- STM accepted and delivered
- CQM testing starts this week
- Due for delivery to LAM --- Dec 02
- Due for delivery to RAL ---- Feb 03

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - Cooler

- Cold vibration test at RAL (now)
- STM then delivered.
- CQM in construction, delivery estimated January 2003
- FM parts available.

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

## Annex 2 - Detectors

- Vibration remains single most difficult issue
- New levels for testing agreed – vibration will take place soon?
- Movement of detectors following vibration is still a problem – measures to improve this are being looked at JPL
- Test schedule remains critical – some testing may have to be abandoned to keep on schedule for CQM delivery in May.

26-27 November 2002

Alcatel/Astrium/SPIRE Interface  
meeting

# **Annex 3 - Thermal Analysis Update**

**Anne-Sophie Goizel**

**RAL**



## Progress Overview Since October02

- **Mechanisms Power Dissipation Updated**

<b>Photometer</b>		
	<i>Old</i>	<i>New</i>
PCAL (mean)	0.1 mW	0.033 mW
BSM (peak)	4 mW	3 mW
JFET	42 mW	42 mW
<b>Spectrometer</b>		
	<i>Old</i>	<i>New</i>
PCAL (mean)	-	0.033 mW
BSM (nominal)	1 mW	0.2 mW
SMECm (mean) R=1000	2.4 mW	3.2 mW
SCAL (mean)	5 mW	5.25 mW
JFET	14.1 mW	14.1 mW

- **Hold Time Function implemented for cooler.**
- **Steady State and Transient Patches incorporated.**

## Progress Overview Since October02

- **SPIRE L0 straps Design Update to achieve the following requirement on cooler straps:**
  - **100 mW/K for Evaporator strap and 50 mW/K for Pump strap, both from Hell Tank to Cooler Interface**
- **Limiting Factor – Interfaces Conductance**
  - **Hell Tank to SPIRE L0 external straps (Cone + Flexible)**
  - **SPIRE L0 external straps to Flexible Internal straps\***
  - **Flexible Internal straps to Cooler Interface**
- **300 mW/K as a design goal for each section**

\* *Include Electrical Insulation – Epoxy Joint*

## SPIRE L0 Straps Design

- **SPIRE Interface conductance set to 0.4W/K (constant)**
- **L0 External strap cross section changed from 60 mm<sup>2</sup> to 75 mm<sup>2</sup> (length unchanged)**
- **L0 Flexible strap cross section changed from 10 mm<sup>2</sup> to 30 mm<sup>2</sup> (length unchanged 76 mm)**
- **High Purity Aluminium 99.999%  $k = 5000 \text{ W/mK @ } 1.8\text{K}$**
- **Overall Conductance from Cooler linterface to bottom of SPIRE Strap ~ 0.15W/K**

## Sensitivity Analyses

- **Sensitivity Analysis on Spire L0 external and internal straps:**
  - High Purity annealed Copper  
~700 W/mK @ 1.8K
  - High Purity Aluminium (99.999%, unannealed)  
~ 5000 W/mK @ 1.8K
  - L0 external straps - 0.4 mW saving on total cooler load,
  - L0 internal straps - 2 mW saving on total cooler load,
- **Sensitivity Analysis on Evaporator Kevlar Supports strapping to L0 strap Interface:**
  - 5.5 mW saving on total cooler load.

## Sensitivity Analyses

- **L3 Patches Implemented**
  - **Old Interfaces between Spire and Hell Tank**
  - **Maximum of 2.5 % increase in harness load from JFETs to FPU (for photometer case)**
- **Further analysis – check general impact of an increased JFETs power dissipation with L3 configuration.**

## Results

- Baseline – presented at last Interface Thermal Meeting
- Case 1 – IF moved on Herschel side (still Copper strap)
- Case 2 – Power Dissipation Updated (no margin, 20% to be applied)
- Case 3 – Level 0 strap new design



## Results – Spectrometer Mode

	Baseline	CASE1	CASE2	CASE3
<b>MODE</b>	<b>Spectro</b>	<b>Spectro</b>	<b>Spectro</b>	<b>Spectro</b>
<b><u>Temperatures</u></b>				
HOB max	<b>10.86</b>	10.85	10.9	10.89
T SOB max	<b>5.9</b>	5.91	5.92	5.92
Detectors	<b>0.358</b>	0.357	0.358	0.351
T L1 IF	<b>5.32</b>	5.32	5.33	5.32
T L0 Enc IF*	<b>1.744</b>	1.755	1.755	1.742
T L0 Pump IF*	<b>1.766</b>	1.773	1.775	1.748
T L0 Evap IF*	<b>1.713</b>	1.715	1.715	1.71
<i>* New L0 Strap IFs definition</i>				
<b><u>Loads</u></b>				
<b><u>Q L1</u></b>	<b>21</b>	20.99	21.06	20.97
Q L0 Enc IF	<b>4.07</b>	4.076	4.102	4.174
Q L0 Pump IF	<b>2.69</b>	2.690	2.782	2.614
Q L0 Evap IF	<b>0.51</b>	0.51	0.509	0.507
<b><u>Q tot L0</u></b>	<b>7.27</b>	7.27	7.393	7.295
<b><u>Q Total Evap</u></b>	<b>42.08</b>	41.66	41.79	38.24
Hold Time (hr)	<b>&lt;33</b>	33.92	33.75	37.72



## Results – Photometer Mode

	<b>Baseline</b>	CASE1	CASE2	CASE3
<b>MODE</b>	<b>Photo</b>	Photo	Photo	Photo
<b><u>Temperatures</u></b>				
HOB max	<b>11.74</b>	11.74	11.7	11.69
T SOB max	<b>5.64</b>	5.64	5.49	5.49
Detectors	<b>0.355</b>	0.354	0.352	0.346
T L1 IF	<b>5.11</b>	5.11	4.98	4.97
T L0 Enc IF*	<b>1.74</b>	1.75	1.747	1.735
T L0 Pump IF*	<b>1.75</b>	1.77	1.769	1.744
T L0 Evap IF*	<b>1.71</b>	1.71	1.713	1.709
<i>* New L0 Strap IFs definition</i>				
<b><u>Loads</u></b>				
<b><u>Q L1</u></b>	<b>18.62</b>	18.62	17.56	17.49
Q L0 Enc IF	<b>3.689</b>	3.696	3.4687	3.529
Q L0 Pump IF	<b>2.147</b>	2.643	2.547	2.406
Q L0 Evap IF	<b>0.457</b>	0.458	0.43	0.428
<b><u>Q tot L0</u></b>	<b>6.293</b>	6.797	6.445	6.363
<b><u>Q Total Evap</u></b>	<b>40.12</b>	39.76	38.62	35.65
Hold Time (hr)	<b>37</b>	35.56	36.7	40.56



## ITMM Progress Update

- **initial steady-state and transient correlation of ITMM initially done with fixed boundary temperatures.**
- **Since the initial draft, the following has been updated:**
  - o Node numbering for better consistency
  - o L0 Strap Design
  - o Power dissipation (including average case)
  - o Updated instrument timeline (nominal mode-change case).

## ITMM Progress Update

Timeline (hr:min)		Instrument Operation	Duration (hrs)
00:00	1:30	Spire Recycling – JFET and Mechanisms OFF	1.5
1:30	13:30	Spire in Spectrometer Mode – SMECm R =1000	12
13:30	25:30	Spire in Spectrometer Mode – SMECm R =10	12
25:30	37:00	Spire in Photometer Mode – Chopping Mode	11.5
37:00	48:00	Spire in Photometer Mode – Scanning Mode	11

- **Steady state correlation done with ITMM integrated into Herschel RTMM.**
- **Transient correlation of ITMM within RTMM: on-going.**

## Annex 4 - Instrument AIT - input requested by Astrium

- AIT Meeting planned on 4 Dec. 2002 in Astrium OTN with PACS and HIFI, SPIRE AIT Meeting moved to Jan 2003 (date tba)
- Prior to the meeting we want to get the answers to the actions placed at the last meetings, which are overdue. This is mainly the review and commenting of the 2 documents “Instrument Tests on PLM/Spacecraft Level” (HP-2-ASED-PL-0021/31) with regard to
  - More detailed description of tests (Test Sheets).
  - Definition of Warm Unit Tests (with FPU simulator).
  - Definition of SFT for L0=4.2 K.
  - Identification of all test constraints (e. g. TB/TV test constraints, EMC test constraints, ESD, cleanliness, EGSE related constraints, hoisting, red tagged items, heaters, dangerous commands,...).
  - Proposal for test sequences/timelines for IST/IMT, EMC, TB/TV and SVT.
  - Detailed list of deliverable items with detailed description of their built standard (CQM, AVM's, EGSE).
  - Detailed definition of EGSE interfaces.
  - Definition of format of ILT sequences to be used for system level tests.
  - Definition of differences between the TC/TM data base for the on-ground and in-flight operation, if any.

## Annex 5 : IID-B Status + Budgets

2-1	13/02/2001	Unpublished version	According to SCI/PT/MM-11440 And DCN .. Includes HP-SP-RAL-ECR-005, 06, 07, 12, 14. ECR 9 and 10 not agreed.
2.2	01/06/2002	PDR version	According to agreed changes published in Minutes of convergence meeting HP-ASPI-MN- 1346
<u>2.3 - Draft-1</u>	<u>22/11/02</u>	<u>Redlined working version</u>	<u>Various, according to agreed or TBC updates.</u>

Spire agree that all existing ECRs have been addressed in 2.3 draft-1, 30,32,41, and most formatting comments not included in 2.2.

A quick check right through this document shows two types of comment that Spire has not yet had time to collate, information that it's clear has become out of date now we have a working IID-B, and a few editorial points.

Project Code	Instrument Unit	Dimensions (mm) incl. feet, & Drawing References.	Nominal Mass without margins (kg)	Allocated Mass (kg)
FSFPU	HS Focal Plane Unit	Non-rectangular, see section 5.4. drawing refs. : 5264 / 300 sheets 1,2 ... 6.	45.5	46.3
FSJFP	HS JFET Rack Photometer	270.5 x 104 x 114 TBC 6 JFET Assembly – KE2896 – 30/11/01.	3.0	3.3
FSJFS	HS JFET Rack Spectrometer	108.5 x 91 x 104 TBC 2 JFET Assembly – KE2897 – 30/11/01.	1.2	1.4
		Total OB Units	49.7	51.0
FSFCU	HS Digital Processing Unit	374 X 4091 X 330 SPIR-MX-5200 000 A – 12/01/02.	14.3	15.0
FSDCU	HS Detector Control Unit	494 X 289 X 305 SPIR-MX-5100 000 A – 11/01/02.	15.4	15.5
FSDPU	HS Digital Processing Unit	274 X 258 X 194 HER S003/02 – 10/02/02.	7.0	7.0
FSW1-8	HS Warm Inter-unit Harness		1.5	1.5
		Total SVM Units	38.2	39.0
		Instrument Total	87.9	90.0

26/11/02

SpireIID-B Technical Meeting at RAL

## 26th June Update...to go on ECR

<b>Project Code</b>	<b>Instrument Unit</b>	<b>Dimensions in mm<sup>3</sup></b>	<b>Nominal Mass</b>	<b>Allocated Mass</b>
HSFPU	HS Focal Plane Unit	Non-rectangular	44.81Kg	46.3Kg
HSJFP	HS JFET Rack-Photometer	262.5 x 101 x 114 TBC	2.4Kg	3.1Kg
HSJFS	HS JFET Rack-Spectrometer	101.5 x 91 x 104 TBC	0.85Kg	1.3Kg
	JFET "Back" harnesses		0.25Kg	0.3Kg
	<b>Total Mass for units on HOB</b>		<b>48.31Kg</b>	<b>51Kg</b>
HSDPU	HS Digital Processing Unit	274 x 258 x 200 TBC	7Kg	7Kg
HSFCU	HS FPU Control Unit	330 x 330 x 380 TBC	14.5Kg	15Kg
HSDCU	HS Detector Control Unit	460 x 290 x 300 TBC	15.4Kg	15.5Kg
HSW1-8	HS Warm Inter-unit Harness	To suit.	1.5Kg	1.5Kg
	<b>Total Mass for units on SVM</b>		<b>38.4Kg</b>	<b>39Kg</b>
	<b>Spire TOTAL MASS</b>		<b>86.71Kg</b>	<b>90Kg</b>

Component	Max. at component level (mW)	Mean at component level (mW)	Max in harness (mW)	Mean in harness (mW)
Photometer Cal	4	0.1		
Spectrometer Cal	5	2		
300 mK Cooler *	1.42	1.22		
BSM / Photometry	4	4		
BSM / Spectroscopy	4	1		
SMEC / Photometry	9.5	4.6		
SMEC / Spectroscopy	9.5	1.6		
JFETS / Photometry	42	42		
JFETS / Spectrometry	14.1	14.1		

**NOT  
SPIRE  
COMPONENTS**

Project Code	Instrument Unit	Dissipation	Comment
HSDPU	HS Digital Processing Unit	15.3 W	
HSFCU	HS FPU Control Unit	42.9 W	Includes power cond. losses
HSDCU	HS Detector Control Unit	37.0 W	Lower in spectrometer Mode
HSWIR	HS Warm Inter-unit Harness	0.1 W	
	<b>Total</b>	<b>95.3 W</b>	



Updated data available ??

Description	Data rate (Kbps)
Housekeeping data rate (non-prime)	2.1
Housekeeping data rate (prime)	2
Science data rate: Photometer only	93.6
Science data rate: Spectrometer only	97.4
Science data rate: Parallel mode	10
Science data rate: Serendipity mode	87

DESCRIPTION (FOR 1 SET=JFS and JFP)	DWG NO	QTY
STEPPED THERMAL STANDOFF	KE-0104-354	9
TOP THERMAL STANDOFF	KE-0104-355	9
M4 STUD	KE-0104-365	2
M4 NUT (SPECIAL)	KE-0104-386	2
M4 SCREWS	STANDARD	7
M4 WASHERS	STANDARD	9

### Cost dividing expenditure into 4 sets

labour	2,705.85
purchase	300

<b>TOTAL</b>	<b>£ 3,005.85 "+VAT"</b>
--------------	--------------------------

# ANNEX 6 : Alcatel Proposed IIDA updates

From Issue 3.0 to Issue 3 rev 1

section	section title	description of the change	responsible	
		Astrium Comments	Alcatel	B.Collaudin
		HIFI Comments	Alcatel	B.Collaudin
		PDR actions	Alcatel	B.Collaudin
2	APPLICABLE/REFERENCE DOCUMENTS	update AD/RD List (update issue/revision)	Alcatel	B.Collaudin
4.2	SATELLITE DESCRIPTION	Modify launch configuration description (sylda-->speltra)	Alcatel	B.Collaudin
4.3.1 & 5.8	Herschel PAYLOAD MODULE (HPLM)	Modify Herschel telescope obscuration ratio	Alcatel	P.Martin
4.3.2.	Helium Cryostat	add herschel Helium flow diagram	Astrium	
4.3.2. and 9.5.xx	Helium Cryostat	add description of Herschel Cover, and test environment for instruments	Astrium	
5.10	Connector identification	Section 5.10: Instrument warm interconnecting harness, SVM harness, cryoharness	All	
5.3.1	LOCATION AND ALIGNMENT	update LOU interface sharing	Astrium	
5.6.1.2	Herschel Payload Module	Update Spire JFET box interface + fig 5.6.1-1	Astrium	
5.6.3.4.7 + annex 5	Service Modules	update planck subplatform drawing (center BEU) fig 5.6.3-18	Alenia	
5.7.1.1.3	Herschel Payload Module	update Herschel FPU thermal interface description (drawings of levels 0, 1, 2, and now <b>new</b> level 3)	Astrium	
5.7.4.	Temperature monitoring	correct temperature monitoring table 5.7.4.1	Alcatel	M.Cornut
5.7.	THERMAL INTERFACES	add herschel thermal post launch and instrument timeline transients	Astrium	
5.7.	THERMAL INTERFACES	add Planck telescope lower temperature to 35K	Alcatel	B.Collaudin
5.7.	THERMAL INTERFACES	Change SCS non op temperature from 60°C to 50°C	Alcatel	B.Collaudin
5.7.	THERMAL INTERFACES	add presence of MLI on HIFI warm units	Alenia	
5.8.	OPTICAL INTERFACES	add straylight performances	Alcatel	Ph.Martin
5.10.3.	Grounding and Isolation	add grounding diagrams	Alcatel	L.trougnou
5.11.6.3.	Special signals	add accuracy on start of slew, + indicate that information should be available within 1 day to HFI & LFI for QLA	Alcatel	P.Couzin
5.11.	DATA HANDLING	add time format definitions	Alcatel	P.Couzin
5.12.	ATTITUDE AND ORBIT CONTROL/POINTING	update 5.12 (calibration od pointing)	Alcatel	D.Guichon
5.13.	ON-BOARD HARDWARE/SOFTWARE AND AUTONOMY FUNCTIONS	develop section 5.13 (software)	Alcatel	P.Couzin
5.14.	EMC	update EMC requirement (compatibility with EMC spec)	Alcatel	L.Trougnou
5.16.	Environmental requirements	add leak rate requirement for planck coolers (wrt testing at CSL)	Alcatel	B.Collaudin
5.16.	Environmental requirements	update cleanliness requirements (5000 ppm or 1000 ppm for launcher)	Alcatel	Ch.Masse
5.16.	Environmental requirements	add transport requirements	Alcatel	B.Collaudin
9	DEVELOPMENT AND QUALIFICATION	Section 9: Vibration test levels	Alcatel	P.Lodereau
9.2.2.	Deliverable Instrument Models	add instrument hardware matrix	Alcatel	D.Montet
9.5.	VERIFICATION AND TESTING	add a section describing Herschel EQM and test environment for instruments	Astrium	
10.8.2	General	correct instrument review dates	ESA	
10,13	MANAGEMENT, PROGRAMME, SCHEDULE	section 10.13: Delivery dates: Update Sorption cooler QM date	Alcatel	B.Collaudin
all		identify requirements	All	
all		Correct typos	All	
annex 1	Herschel Alignment Plan	update alignment concept document revision	Astrium	
annex 3	Planck Alignment Plan		Alcatel	
annex 4	Herschel Pointing Modes		ESA	
annex 5	Interface Control drawings SVM	add HIFI harness routing (Annex 5 to be maintained by Alenia)	Alenia	
annex 5	Interface Control drawings SVM	Add Planck harness routing (Annex 5 to be maintained by Alenia)	Alenia	
annex 6	Interface control drawings PPLM		Alcatel	Th.Lasic
annex 7	Interface control drawings HPLM	This annex should be maintained by Astrium	Astrium	
annex 8	Template for ICD (interface document)			

## Annex 7 : Product Assurance

**Eric Clark**

**RAL**

## NCR's

- We have 13 open NCR's
- Only 1 HR-SP-RAL-NCR-009 is on the instrument (JFET Thermal straps)
- The remainder are on CDMS Simulator and MGSE.

## ECR's

- We have 19 Open ECR's
- 4 are Open issues on the IIDB
- HR-SP-RAL-ECR-009
- HR-SP-RAL-ECR-013
- HR-SP-RAL-ECR-032
- HR-SP-RAL-ECR-033

## RFW

- We Have 3 Request for Waivers
- 2 on the DRCU dating from 11 Dec 01
- 1 on the JFETS dating from 4 July 02
- The DRCU ones will require some discussion with Alcatel as to the way forward



# List of Change Proposals

**PRODUCT ASSURANCE  
SPACE SCIENCE DEPARTMENT  
Rutherford Appleton Laboratory**

Spacecraft/Project: HERSCHEL	Originator: RAL/SSTD/PA
Instrument: SPIRE	Document No.: Interface Meeting
Model:	Issue: 1
Subsystems:	Date: 26-Nov-02

ECR Serial No.	Subsystem / Assembly	Model	ECR Title	Issue Date	Remarks	References	Approved?	Approval Date
1	BSM		BSM connector orientation changed	20-Feb-02			No	
					Actions Complete Date:			
2	BSM		Definition of requirements on deployable end stop	04-Mar-02			No	
					Actions Complete Date:			
3	BSM		Absolute Position of BSM.	08-Mar-02			No	
					Actions Complete Date:			
HR-SP-CDF-ECR-1	Internal FPU (PCAL & SCAL)	All	Changes to the callibrator specifications in the SPIRE instrument Requirements Document	25-Jul-01	Issue of V1.1 of Spire-RAL-PRJ-000034 closes ECR		No	
					Actions Complete Date:			
HR-SP-CDF-ECR-2	Spectrometer FPU		Changes to the SCAL FPU harness definition	08-Jan-02			No	
					Actions Complete Date:			
HR-SP-CDF-ECR-3	Internal SCAL		Changes to the SCAL number of operations requirement	11-Mar-02			No	
					Actions Complete Date:			
HR-SP-RAL-ECR-9	IID-B		SPIRE IID-B UPDATE, #5 based on Jean Bruston's list. Largely a re-submission of information collated on 26th September under points JD1-31,	19-Nov-01		SCI-PT-IIDB/SPIRE-02124	No	
					Actions Complete Date:			

Spacecraft/Project: HERSCHAL	Originator: RAL/SSTD/PA
Instrument: SPIRE	Document No.: Interface Meeting
Subsystems:	Issue: 1
Model:	Date: 26-Nov-02

ECR Serial No.	Subsystem / Assembly	Model	ECR Title	Issue Date	Remarks	References	Approved?	Approval Date
13	IID-B		Further SPIRE IID-B UPDATES, based on points JD25, 29,30 and 31, from even earlier information	19-Nov-01		SCI-PT-IIDB/SPIRE-02124	No	
					Actions Complete Date:			
15	Cryostat		Addition of port for vacuum pressure gauge head	23-Nov-01	Ref HP ASPI-MN-1725 Annex 2	KG0710-001	No	
					Actions Complete Date:			
29.2	Instrument level		SPIRE IID-B UPDATE, #16 implementing information transfer for Harness section as required by meeting actions.	18-Jul-02			No	
					Actions Complete Date:			
32	IIDB		SPIRE Shutter	19-Jul-02		SCI-PT-IIDB/SPIRE-02124	No	
					Actions Complete Date:			
33	IIDB		Updated Illustrations for IID-B	20-Jul-02		SCI-PT-IIDB/SPIRE-02124	No	
					Actions Complete Date:			
34	HSFPU 300mk Straps		Implementation of Grounding review 1ECR of 3.	07-Oct-02			No	
					Actions Complete Date:			
35	HSFPU 1.8K box moutin		Implementation of Grounding review 2ECR of 3.1.8K box mountings	07-Oct-02			No	
					Actions Complete Date:			
36	GSE Spire test Harne	RAL Test Cryostat as built	Implementation of Grounding review 3ECR of 3.1.8K box mountings	07-Oct-02			No	
					Actions Complete Date:			
38	MGSE Trolley		MGSE Trolley madifications	10-Oct-02			No	
					Actions Complete Date:			

Spacecraft/Project: HERSCHAL	Originator: RAL/SSTD/PA
Instrument: SPIRE                      Model:	Document No.:                      Interface Meeting                      Issue:                      1
Subsystems:	Date: 26-Nov-02

<i>ECR Serial No.</i>	<i>Subsystem / Assembly</i>	<i>Model</i>	<i>ECR Title</i>	<i>Issue Date</i>	<i>Remarks</i>	<i>References</i>	<i>Approved?</i>	<i>Approval Date</i>
HR-SP-RAL-ECR-39.1	GSE Spire Test Harn		Implementation of grounding review, flight cryoharness	12-Nov-02			No	
					Actions Complete Date:			
LAM-QUA-SPL-ECR-200101	LAM.QUA SMEC & BSM H		Current and resistance for launch Latch(es) Harness	12-Jul-01			No	
					Actions Complete Date:			
LAM-QUA-SPL-ECR-200102	LAM.QUA SMEC & BSM H		Addition of second latch for SMECm	12-Jul-01			No	
					Actions Complete Date:			

**END OF LIST**





# List of Requests for Waivers/Deviations

**PRODUCT ASSURANCE  
SPACE SCIENCE DEPARTMENT  
Rutherford Appleton Laboratory**

Spacecraft/Project: HERSCHEL	Originator: RAL/SSTD/PA
Instrument: SPIRE                      Model: Flight Models & Spares	Document No      Interface meeting 3      Issue:                      1
Subsystems: DRCU	Date: 26-Nov-02

<i>RFW Serial No.</i>	<i>Waiver (1) or Deviation (2)</i>	<i>Subsystem</i>	<i>Model</i>	<i>RFW Title</i>	<i>Issue Date</i>	<i>Status / Remarks</i>	<i>Approval Reference</i>	<i>Approval Date</i>
HR-SP-CEA-RFW-1	1	DRCU	Flight Models & Spares	Procurement of AD590MF in /883B level	11-Dec-01	Prime Contractor Status 1 ESA Status 1		
2	1	DRCU	CQM & PFM	PSU Models	06-Dec-01	Prime Contractor Status 1 ESA Status 1		
HR-SP-JPL-RFW-1	1	JFET's	CQM CQM	JFET CQM dissipation	04-Jul-02	Prime Contractor Status 1 ESA Status 1		

**END OF LIST**



# List of RAL Non-Conformances

**PRODUCT ASSURANCE**  
**SPACE SCIENCE DEPARTMENT**  
**Rutherford Appleton Laboratory**

Spacecraft/Project: Herschal	Originator: RAL/SSTD/PA
Instrument: CDMS-Sim	Document No Interface meeting 3 Issue : 1
Subsystems: EGSE	Date: 26-Nov-02

NCR Serial No.	Level	Subsystem Assembly/ Part	Model	NCR Title	Issue Date	Disposition/Corrective Actions	References	Close Out Date
HR-SP-RAL-NCR-1	2	EGSE		Double Click Error	27-Sep-01	Complete the removal. Whole packets are now displayed via the log file display. Awaiting Acceptance test before closing		
HR-SP-RAL-NCR-2	2	EGSE		Astrium Buslist Error	27-Sep-01	Corrected during Acceptance Test. Circulate correction sheet for users to amend their software release 0.6 installation.		
HR-SP-RAL-NCR-3	2	EGSE		Master Time error	27-Sep-01	Corrected during Acceptance Test. AAdd brackets to software text. Corrected during acceptance test Correct in version 0.7. See DDC.CPP Change Record Attached. (October 1st ) Awaiting next		
HR-SP-RAL-NCR-4	2	EGSE		DDC Bus Message log	27-Sep-01	Use Programme MTZDISK.EXE instead of ACE windows Menue. Check test plan instruction changed to reflect above instruction.		
HR-SP-RAL-NCR-5	2	EGSE		TMReq message timing	27-Sep-01	See DDC.CPP Change Record attached (October 10th Fix) Awaiting acceptance test results before closing NCR		
HR-SP-RAL-NCR-6	2	EGSE		RT implementation of Flow Control flags	27-Sep-01	The Instrument Simulator has been modified to set the FLOW CONTROL bits to indicate whether or not there is a telemetry packet awaiting transfer. Awaiting acceptance		
HR-SP-RAL-NCR-9	0	6 JFET assy	SPIRE	Out of tolerance thermal straps (6 JFET assy)	30-Sep-02	Use as is (see NCR) IF extra such items are ordered for STM, consider swapping to keep best ones for flight.		

Spacecraft/Project: Herschal	Originator: RAL/SSTD/PA
Instrument: SPIRE	Document No Interface meeting 3 Issue : 1
Model: SPIRE	Date: 26-Nov-02
Subsystems:	

<i>NCR Serial No.</i>	<i>Level</i>	<i>Subsystem Assembly/ Part</i>	<i>Model</i>	<i>NCR Title</i>	<i>Issue Date</i>	<i>Disposition/Corrective Actions</i>	<i>References</i>	<i>Close Out Date</i>
HR-SP-RAL-NCR-10	0		SPIRE	Spire MGSE rear frame assy	26-Sep-02	Return to manufacturer for re-work		
HR-SP-RAL-NCR-11	2	MGSE Support Fram Frame Parts	SPIRE	Aluchrome Finish on support rails	23-Sep-02	Components to be cleaned to remove bead blasting r Components to be cleaned to remove bead blasting residue and re-aluchromed to DEF 1200		
HR-SP-RAL-NCR-12	2	MGSE Trolley Bridge rails	SPIRE	Mismatch on Rail Cross Section	23-Sep-02	TBD		
HR-SP-RAL-NCR-13	1	HDPE Windo	SPIRE	Surface finish	30-Sep-02			
HR-SP-RAL-NCR-14	0		SPIRE		09-Oct-02			
MSSL-NCR 1	1	Structure Photometer co	SPIRE	Baffel panel damaged	13-Aug-02	implement recovery procedure once it has been appr		

**END OF LIST**