SPIRE-AST-MOM-001724

astrium

Minutes of Meeting

Herschel

Date:	20/05/03		
Doc.-No.:	HP-2-ASED-MN-390		
Meeting place:	Telecon: ESA, RAL, ASP, ASED	Chairman:	
Date/Time:	20.05.03/14h00	Secretary	H. Faas
Agenda dated:	HP-ASED-EM-023-03, 16/05/03	Close of Meeting:	20/05/03, 16h15

Subject: Telecon: SPIRE harness and shielding

Participants:	Carsten Scharmberg, B. Jackson, F. Marliani (ESTEC); John Delderfield, Doug Griffin (RAL); Bernard Collaudin, Guy Dubrovik (ASP), J. Lang. H. Faas (ASED)	Additional Distribution:	ESTEC: T. Passvogel, G. Crone, A. Heske; ASP: J.M. Reix, L. Trougnou RAL: E.C Sawyer ASED: W. Rühe, R. Hohn, E. Hölzle, G. Peters, W. Hund, C. Kalde.

Signature Not Verified

Carsten Scharmberg
cn=Carsten Scharmberg, ou=HERSCHEL/PLANCK PROJECT, o=ESA - ESTEC, c=NL
2003.05.27 12:01:21 +01'00'

Horst Faas
2003.05.23
13:22:35 +02'00'

2003.05.27
14:15:09 +01'00'

Page: 1 of 11 Page(s)

☒ Brief-Minutes (except following sheets)

☐ Summary of Results of Sheets 2 till

Reference	Results	Remarks
	Draft Agenda: 1. **Introduction (ASED)** 2. **Clarification of SPIRE ECR-039 rejection (ASP/ESA)** 3. **Clarification of SPIRE shielding concept** (assuming partial rejection of ECR-039) o Double overall shielding implementation of SPIRE Scientific Instrument Harness (SIH) on SVM o Double overall shielding of SIH between SVM I/F CB and CVV wall o Overall shield interconnection method and grounding concept at CVV Feedthroughs o Interconnection of external shields to cold units within CVV internal SIH 4. **Documentation of updated overall shielding (applicable, following partial rejection of ECR-039)** 5. **AOB** **References:** **Ref. 1:** ESA Fax SCI-PT/16976, Overshielding inside the cryostat, 14/03/03 **Ref. 2:** ASP Fax H-P-ASP-LT-3044, Alcatel CCB#19, 23/04/03 **Ref. 3**: ASP Fax H-P-ASP-LT-3046, Change Requests H-P-ASPI-CR-0291, Issue 2 and H-P-ASP-CR-0376, 24/04/03 **Ref. 4**: ASED ECP, HP-2-ASED-CP-0054 **Agenda Item 1: Introduction (ASED)** The draft agenda was agreed by added under AOB: SPIRE review of the ASED harness pin wiring list. Astrium initiated the telecon to draw the attention to two contradicting statements concerning the implementation	

astrium

Reference	Results	Remarks
	of the overshielding. Ref. 1 indicates a partial acceptance of ECR-039 with the rejection of the CVV internal shielding, but the acceptance of the double shielding outside the CVV and on the SVM. According to the formal response to the Astrium ECP (Ref. 4), Alcatel instructed Astrium not to take the ECR-039 into account as it 'does not have positive answer from ESA' (see Ref. 3 and Ref. 4). **Agenda Item 2: Clarification of SPIRE ECR-039 rejection (ASP/ESA)** Alcatel confirmed their position (see Ref. 2 and Ref. 3), that the SPIRE ECR-039 did not receive a positive answer from ESA that no additional shielding (internal and external) shall be implemented, i.e. one external overshield is sufficient. ASED confirmed that the formal baseline for the SPIRE harness as part of the Cryoharness PDR does not include the implementation of Faraday shielding nor overall shielding of ECR-039, but the pinning is according to SPIRE-RAL-PRJ-000608, Issue 1.1. <u>Additional remarks by ASED</u>: Harness branch S/H – CS//IS//SS contain inconsistent chain numbers. Warm and cold chain numbering is different. Also noted in email from Bernard Collaudin. Wrong channel numbers already corrected in HP-2-ASED-IC-0001, Issue 2 (part of CASA Data Package). ESA summarized their understanding reflected in Ref. 1 that only the internal shielding has been rejected. RAL/SPIRE confirmed the understanding that only the internal overshield has been rejected by ESA and that the second external overshield is required by SPIRE. Furthermore, RAL/SPIRE clarified that the internal overshield always existed in the SPIRE design, although an option for implementing it by wires was included when ESA did not want a shield in the ITT. **Agenda Item 3: Clarification of SPIRE shielding concept** RAL/SPIRE proposed to keep the external double shielding as in the SPIRE Harness Definition Document, Issue 1.1. Internal within the CVV low inductance wires shall connect the FPU grounds to some of the ground pins in the outer ring of the feed-through connector. Furthermore RAL/SPIRE proposed that, alternatively, ASED could investigate the best feasible solution for interconnection within the CVV internal. As further alternative a double screen of the existing 12-ax cables was proposed.	

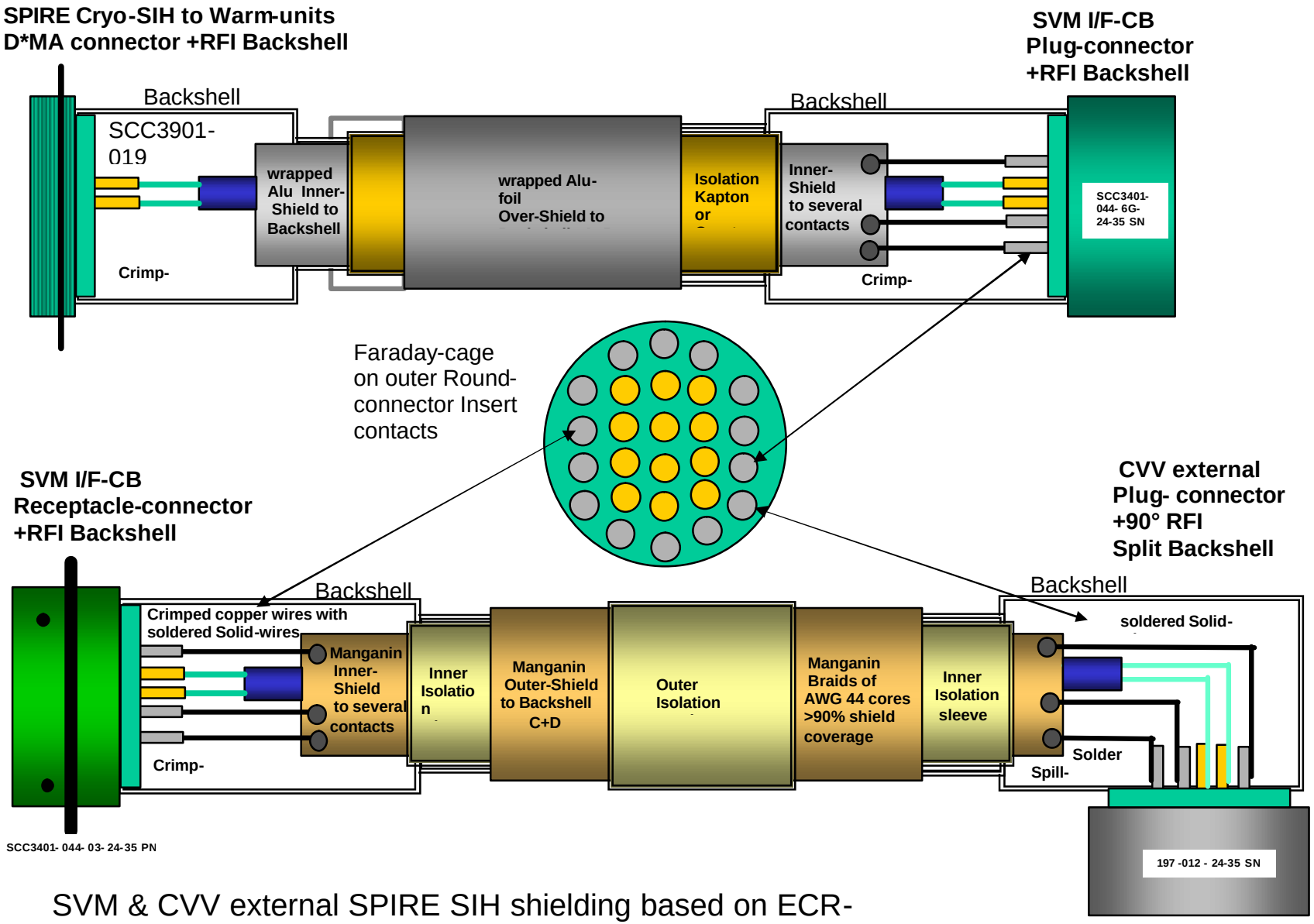
astrium

Reference	Results	Remarks
	Assuming that the SPIRE ECR-039 is only partially rejected (i.e. only internal overall shielding), ASED outlined an engineering solution (see also attached ASED viewgraphs, prepared as part of the ECR-039 analysis): - The SVM harness (i.e. harness between warm units and Connector Bracket, CB) would have an double Al overall shielding with an Goretex layer to ensure insulation between the two shields - The intermediate harness between the CB to CVV external wall would consist of two Manganin braids with an Goretex insulation in between. The outer overshields would be connected to the CVV external backshells of feed-through connectors. The inner overall shield would be interconnected to the outer ring pins of the feed-through connector by daisy chaining. - Internal in the CVV two wires would ensure the connection from those outer ring pins to the FPU ground. Several options need to be studied. It seems that two single wires in form of twisted cables could be most feasible solution. - The implementation of the splicing (position and method) need to be analysed, e.g. taking RAL/SPIRE proposal, see SPIRE HDD, Page 114 into account. ASED stated that an impact assessment with the input from CASA and ASSE would be available: 30 June 2003. ASED stated that the partial implementation of SPIRE ECR-039 could not be reflected in the Cryo Harness PDR baseline, as the PDR will take place on 26-27 Mai at CASA. The SPIRE Harness baseline will be according to the ASP instruction (see Ref. 2 and Ref. 4). The following implementation philosophy and action plan was agreed: 0. RAL will issue a note exploring non-overshield internal harness implementation, and the grounding of internal backshell, see annex 1. ASP will instruct ASED to perform an evaluation of effort and schedule impact assuming an partial implementation of the SPIRE ECR-039 2. ASED will review the cryo harness schedule and will inform ASP and ESA concerning critical dates of the harness manufacturing process for the EQM and FM harness to allow an implementation of the ECR-039 3. Following this instruction, ASED with the support of CASA and ASSE, will perform an analysis and present results (4 weeks later). Target date: 30 June 2003 4. ASED will update the Cryoharness ICD accordingly and will present an updated ECP (based on the ECP HP-2-ASED-CP-0054) 5. Based on this updated ECP, ASP and ESA will instruct ASED of the baseline for the SPIRE harness	AI#1: ASP to instruct ASED to start evaluation of the impact (effort and schedule) for an partial ECR-039 implementation. AI#2: ASED will present an updated ECP (partial implementation of ECR-039) following the request from ASP.

astrium

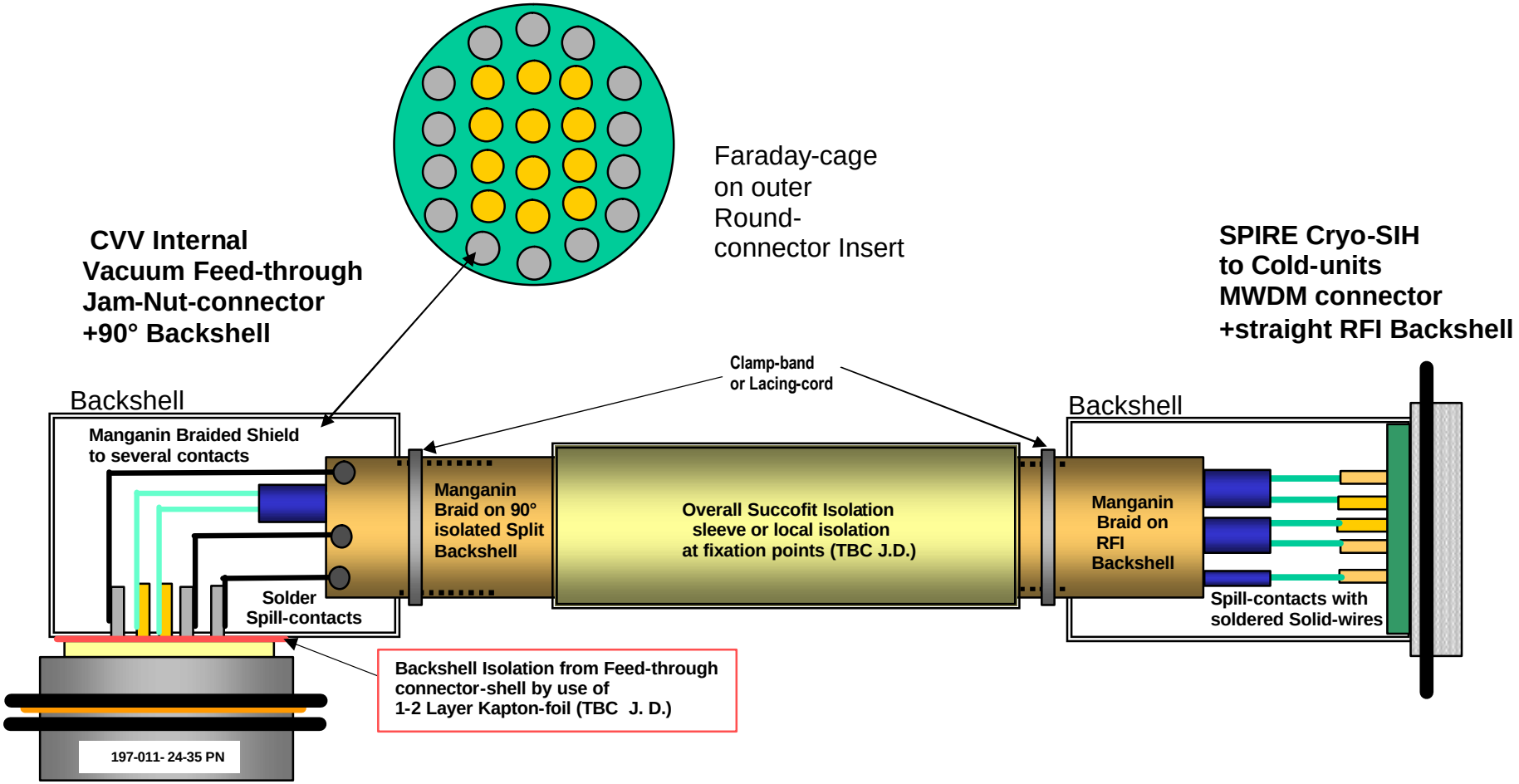
Reference	Results	Remarks
	Agenda Item 4: Documentation of updated overall shielding (applicable, following partial rejection of ECR-039) Covered under Agenda Item 3. **Agenda Item 5: AOB - SPIRE review of the ASED harness pin wiring list** RAL/SPIRE confirmed the lack for resources for the review of the ASED pin wiring list. ASP will sent a further request to RAL to highlight the importance of such a formal review. RAL/SPIRE will support ASED if specific questions arise and will appropriately clarify the pin wiring lists. ASED will distribute harness routing drawings to ESA, RAL, ASP, which are in the release cycle for presentation at the cryoharness PDR next week.	

astrium



SVM & CVV external SPIRE SIH shielding based on ECR-

astrium



CVV internal SPIRE SIH shielding based on ECR-

Meeting: HP-2-ASED-MN-0390
Title: Telecon: SPIRE Harness and Shielding
Date: 20/05/03

Action Item List

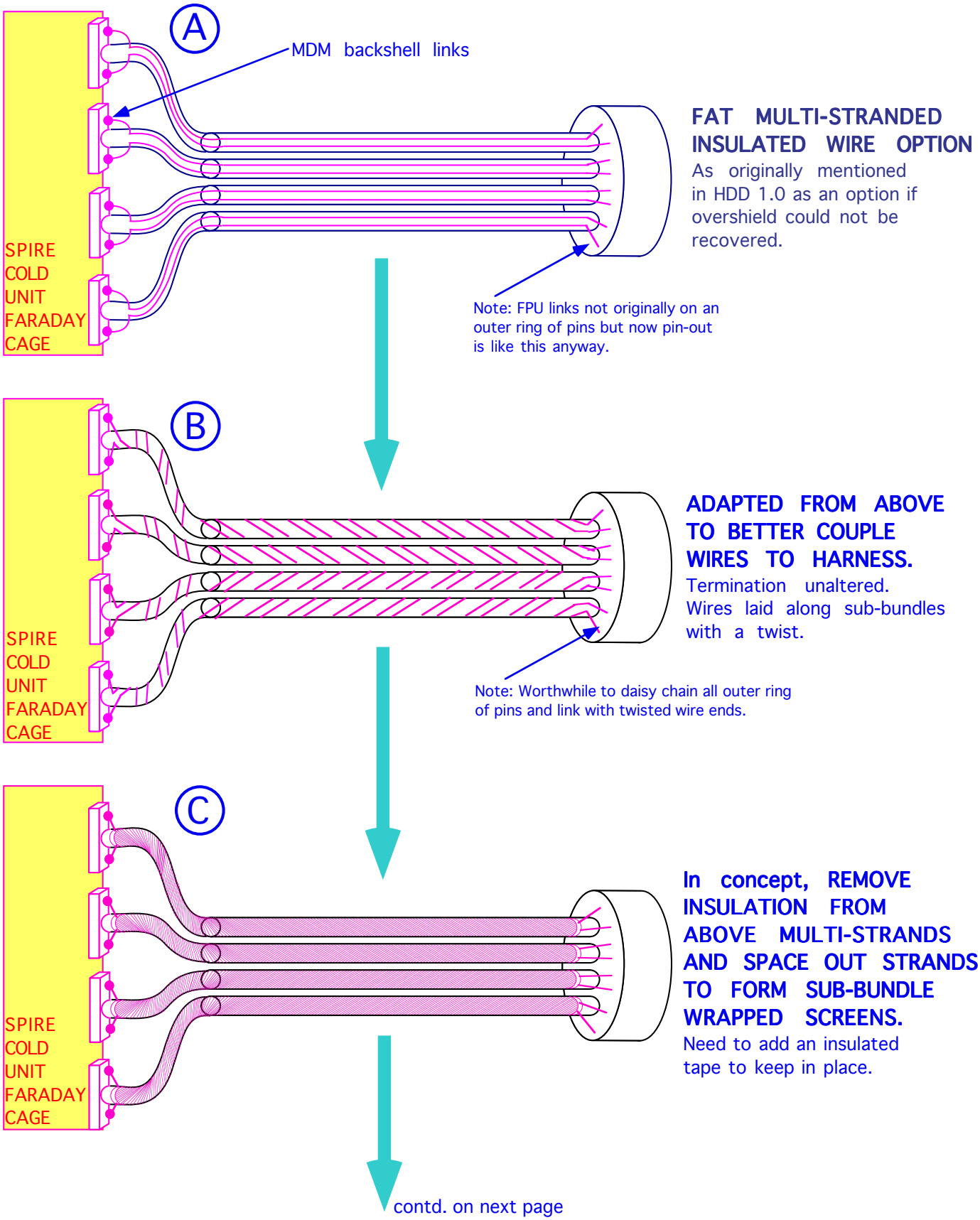
Herschel

No.:	Description:	Due Date	Originator Comp./Pers.	Actionee Comp./Pers.	Source	Completion
AI#1:	ASP to instruct ASED to start evaluation of the impact (effort and schedule) for an partial ECR-039 implementation.	28/05/03	H. Faas	B. Collaudin		
AI#2	: ASED will present an updated ECP (partial implementation of ECR-039) following the request from ASP.	30/06/03	B. Collaudin	H. Faas		

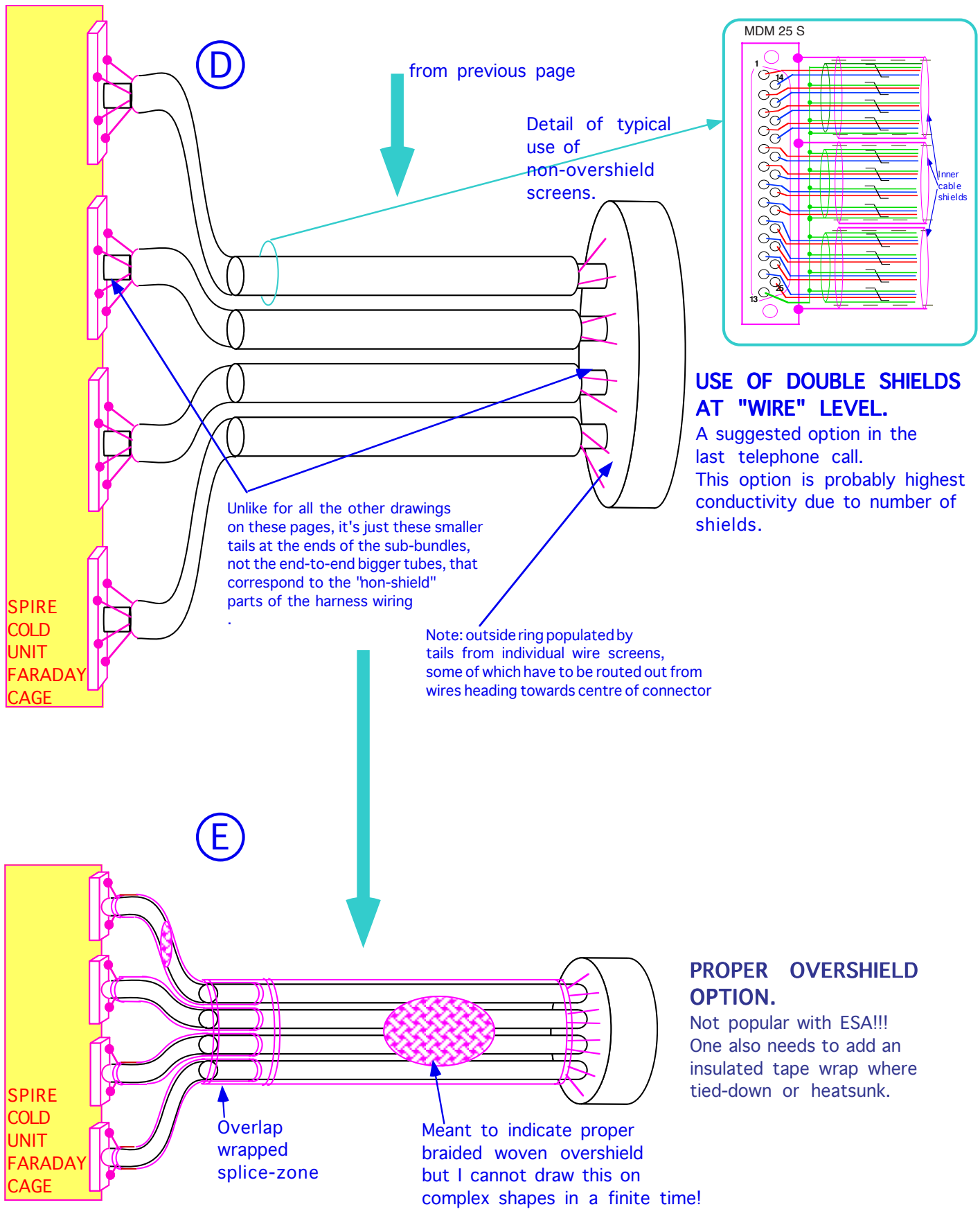
Drawings to illustrate options for SPIRE cryo-harness inside CVV only..

The items in black are the parts of a typical harness except the Faraday shield linkage. The items in mauve are how the FPU Faraday shield is connected to the outer ring of pins on the CVV connectors, the point under discussion. Spire designed in an overshield (option E) to keep the Faraday cage closed from day 1. ESA refused this, which is under appeal. The following explores options. Spire would accept C or D instead of E as fulfilling its functional requyirements, thereby avoiding an overshield.

JD May 2003



contd. on next page

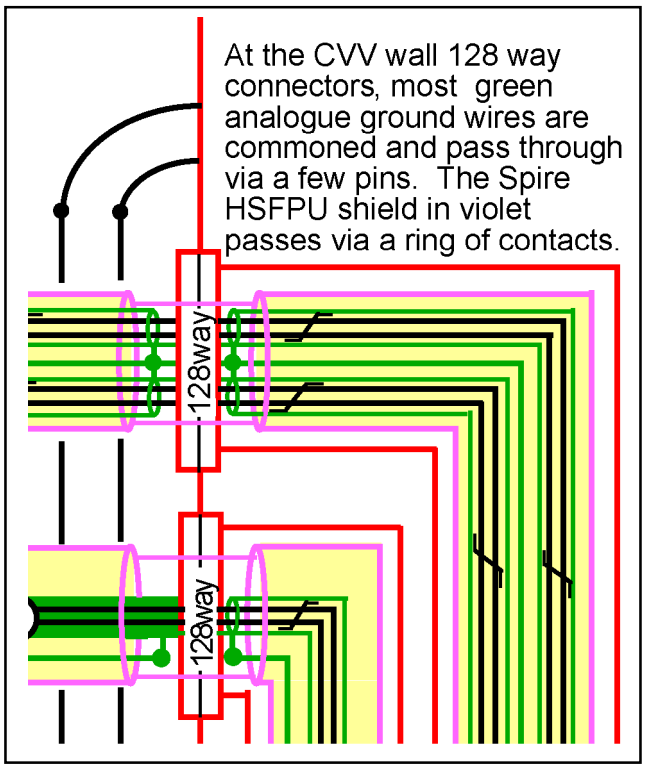


USE OF DOUBLE SHIELDS AT "WIRE" LEVEL.

A suggested option in the last telephone call.
This option is probably highest conductivity due to number of shields.

PROPER OVERSHIELD OPTION.

Not popular with ESA!!!
One also needs to add an insulated tape wrap where tied-down or heatsunk.

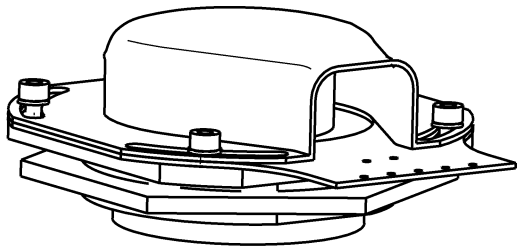


To the left is an extract from a drawing in the Spire Grounding Philosophy Document.

The previous couple of pages have explored options for implementing the violet or mauve shield.

I also said that I would write out some notes to explore the used of the internal CVV connector backshell.

With the connectors, they look like the item shown on the right, although what the point is of making the cap rotatable w.r.t. the fastener bolts to set the harness off at an angle but not the plate escapes me!



The HSFPU shield opens out on to pins at the CVV anyway. The backshell plate and cover have 2 grounding options:

- If the backshell is connected electrically to the 128way it acts as an extension to the red CVV/connector wall as shown in the top left diagram. In this case the mauve HSFPU shield is clearly insulated from it.
- Alternatively, if the backshell has Kapton sheet spacer between it and the connector flange with sleeved Vespel washers under the boltheads, (and it's not obvious to me that the backshell itself has to change because of this alone except for bolt clearance size), it becomes isolated from the red CVV and can form part of the mauve HSFPU shield. In this case the HSFPU shield clearly is made off to it, possibly by tying the bound-up ends of shields to the main securing plate rather than with formal tails.

I had discussed the second option with Astrium and was working on the assumption that it was agreed and baselined long ago. However it seems to have got caught up with the recent Alcatel "no-ECR-39" communication to Astrium. I can see that it is somewhat involved with the HSFPU shield, but not necessarily with its wireform.

Spire would prefer the second option as a better way of getting our signals quietly from the cold end to the warm with minimum chassis coupling in between, but don't request that we analyse how much worse a bit more capacitance between our wires and the CVV connector ring would be. I suppose the first option would probably work.