

<b>TRR MoM</b>	<b>Date:</b> 16 <sup>th</sup> November 2005	<b>NUMBER</b>	<b>SPIRE-RAL-MoM- 002540</b>
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<b>Spacecraft / Project</b>	Herschel / SPIRE
<b>Instrument / Model</b>	<i>PFM</i>
<b>Sub System / Serial No.</b>	<i>FPU</i>

<b>Type of Test</b>	<i>Cryo-vibration test</i>
<b>AIV Facility Test No.</b>	
<b>Location &amp; Date(s) of Testing</b>	<i>CSL starting 21/11/05</i>
<b>Applicable Test Specification (Document No. &amp; Issue)</b>	<i>SPIRE-RAL-PRC-002524</i>
<b>Applicable Test Procedure (Document No. &amp; Issue)</b>	<i>SPIRE-RAL-PRC-002539</i>
<b>AIV Facility Test Plan (if applicable?)</b>	
<b>Procedure Control Document (if applicable?)</b>	

<b>Documentation / Inspection Status</b>	
• <b>As Built Status?</b> <i>List of all items /Parts</i>	See annex A
• <b>Special Instructions</b>	
<b>Inspection Status and Records:</b>	
• Hazards Identified	<b><i>SPIRE contains a small amount of compressed helium gas</i></b>
• Cleanliness	Class 100 or class 10,000 for short exposure
• Unit/Item Bagged	Bagged for transport, not for vibration test
• Screws Locked	yes
• Connector Savers	Removed for this test
• Other	

<b>Assignment of Personnel</b>		
<b>Function</b>	<b>Name</b>	<b>Contact number</b>
Test Director	C Grodent CSL B Winter and E Sawyer - SPIRE	
Project Manager	E Sawyer	
AIV Facility Manager		
Safety Officer		
Product Assurance	E Clark	

**CONTINUATION SHEET**

<b>As Built Status</b> (Will the following have an Impact on the test performance / results?)	
Review of all "NCR's"	List of open NCRs in annex B No NCRs affect this test, with the exception of NCR128 which refers to a defective temperature sensor. To enable monitoring during cooldowns, the redundant sensor will be used.
Review of all "Waiver's"	List of open RFWs in annex C, Only RFWs 006 and 007 (attached to these minutes) affect this test
"Open Work"	Final packing
Other	
MIP's or KIP's	KIP carried out before closure of FPU

**ACTIONS / COMMENTS / OBSERVATIONS:**

TRR at CSL on Wednesday 23/11/05, at 09:00 CET

Carsten will be at CSL, other TRR attendees will be at their home institution.  
No support foreseen from Alcatel. TBC

**ACTION #1** Bernard to confirm if Alcatel will attend the test or not.

Resonance search before and after cooling.

It is possible to repeat a resonance search after all tests in the first axis, but this would mean reconfiguring the shaker.

Cooling rate of 5K per hour is not guaranteed.

PACS have the same requirement

CSL have problems controlling this rate.

10K /hour is achievable.

SPIRE temp sensors are not accurate at warm temperatures

Rate should be fairly reliable.

Critical temp range, ambient to 200K

200K to 100K 10K/hr is ok.

Below 100K 50K/hr.

Looking at past test results, cooldown rate of the interface was 24 hours. (SPIRE)

For PACS rate was 36 hours (interface)

PACS instrument cooldown was 2.5 to 3 days.

**ACTION #2** SPIRE will update the test plan with a more detailed cooling profile.

SMEC is DM. Flight like in all mechanical aspects.

SMEC accelerometers have been calibrated at 77K so need a low level test run to cross calibrate.

One cryo accelerometer and 8 non cryo is fitted to the SMEC.

Levels

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X axis 14.4 for 1000 cycles  
11.5 for the remaining test

Y axis Similar TBD

Waiver is required

[ACTION #3 SPIRE to raise a waiver to limit number of cycles](#)

Random. Slope is not to IID-A waiver required.

[ACTION #4 SPIRE to raise a waiver to modify the slope.](#)

Notching

Procedure will be followed as before, max RMS level limited by notching on primary mode. Notch was widened to ensure this is observed.

Meeting to explain the acoustic analysis is planned.

Max levels around 2.5g rms so 10g rms limit is very safe, therefore a limit of 8g rms is proposed.

Alcatel ask that notching is done is a clear way and should involve all parties.

This may be difficult is Alcatel do not support the test.

One SMEC accelerometer is connected to chassis ground. If only one sensor is connected it should be ok.

[ACTION #5 Add test levels to procedure.](#)

[ACTION #6 Delete reference to JFET in plan.](#)

This TRR will be continued after integration of SPIRE on the shaker and the first low level run.

<b>Decision for test continuation:</b>		<b>YES</b>	<b>Review Date:</b>	<b>23/11/05</b>
<b>Company</b>	<b>Name</b>		<b>Signature</b>	
<b>RAL</b>	<b>E Sawyer</b>			

Subsystem	Unit	Item	Drawing/Ref	Supplier	Required for PFM Cryo-vibration test		
Structure	Optical Bench Panel	Optical bench panel	5264-302-4	MSSL	yes		
					yes		
	Photometer Cover	Photometer Cover Wall	5264-302-6	MSSL	yes		
		Photometer cover lid	5264-302-10	MSSL	yes		
		Photometer Seal- Top	5264-302-7	MSSL	yes		
		Photometer Seal- Bottom	5264-302-8	MSSL	yes		
	Spectrometer Cover	Spectrometer Cover Wall	5264-303-1	MSSL	yes		
		Spectrometer Cover Lid	5264-303-2	MSSL	yes		
		Spectrometer seals top	5264-303-4	MSSL	yes		
		Spectrometer seals bottom	5264-303-5	MSSL	yes		
	FPU Supports (CFRP)	A Frames		5264-302-1	MSSL	yes	
			Fixed Mount Cone	5264-302-5	MSSL	yes	
		A Frame Support Plates and brackets (both sides)		5264-302-14	MSSL	yes	
				5264-302-15	MSSL	yes	
				5264-302-26	MSSL	yes	
			Insulating Bush	5264-302-2	MSSL	yes	
			Special Washer	5264-302-3	MSSL	yes	
			Dowel retaining Plate	5264-302-39	MSSL	yes	
			Tubular Dowels (8mm)	5264-302-40	MSSL	yes	
			Dowel - 'A' Frame support	5264-302-41	MSSL	yes	
			Dowel - 'A' Frame Top	5264-302-42	MSSL	yes	
			Special Washer - A Frame Brackets	5264-302-43	MSSL	yes	
		Photometer Box	Photometer detector box		5264-306-1	MSSL	yes
					5264-306-2	MSSL	yes
				5264-306-3	MSSL	yes	
	BDA Adapter Plate (5 off)		5264-911	MSSL	yes		
	Dichroic rings		5264-310-1	MSSL	yes		
			5264-310-2	MSSL	yes		
			5264-310-3	MSSL	yes		
			5264-311-1	MSSL	yes		
			5264-311-2	MSSL	yes		
	Detector Box support Cone		5264-312	MSSL	yes		
	Photometer Detector Box A frames supports(2 per set)		5234-313	MSSL	yes		
	Washer		5264-313-1	MSSL	yes		
	Bushes		5264-313-2	MSSL	yes		

<b>Spectrometer Box</b>	Spectrometer detector box		5264-307-1	MSSL	yes
		Filter mount	5264-307-2	MSSL	yes
		Spectrometer Detector Box supports(3 per set)	5264-307-4	MSSL	yes
		BDA Adapter Plate	5264-911	MSSL	yes
		Bushes	5264-307-5	MSSL	yes
<b>SCAL</b>		Scal Box	5264-314-1	MSSL	yes
		SCAL Cover	5264-314-2	MSSL	yes
		SCAL Exit Baffle Ring	5264-314-3	MSSL	yes
		SCAL Baffle Clamp	5264-314-4	MSSL	yes
		SCAL source	PFMB-000	UWC	yes
<b>Mirror Mounts</b>		Secondary optical Bench	5264-305-12	MSSL	yes
		Support PM6	5264-305-13	MSSL	yes
		PM6 Support Spare	5264-305-19	MSSL	yes
		Support PM8	5264-305-14	MSSL	yes
		PM10 Support	5264-305-17	MSSL	yes
		Support SM6	5264-305-2	MSSL	yes
		sm6 Support Spare	5264-305-18	MSSL	yes
		Support SM7	5264-305-3	MSSL	yes
		Bulkhead SM6 and SM7	5264-305-15	MSSL	yes
		Support SM8a	5264-305-4	MSSL	yes
		Support SM9-10a	5264-305-6	MSSL	yes
		Support SM9-10b	5264-305-7	MSSL	yes
		Support SM11a	5264-305-8	MSSL	yes
		Support SM11b	5264-305-9	MSSL	yes
		Support SM12a	5264-305-10	MSSL	yes
		Support SM12b	5264-305-11	MSSL	yes
<b>Other Optics</b>		SFIL2 Cold Stop	5264-305-22	MSSL	yes
		Photometer Cold Stop Clamp PFI13	5264-306-4	MSSL	yes
		Photometer Cold Stop PFI13	5264-306-5	MSSL	
		CFIL1 Baffle Mount	5264-304-6	MSSL	yes
		CFIL1 Baffle Clamp Ring	5264-304-7	MSSL	yes
		PFIL2 Mount Back Plate	5264-302-12	MSSL	yes
		PFIL2 Mount CLamp plate	5264-302-17	MSSL	yes
		Filter Mounts - SFIL2	5264-305-20	MSSL	yes
		Filter Mount - SFIL2 clamp ring	5264-305-21	MSSL	yes
		SFIL2 dowels	5264-305-27	MSSL	yes
		SBS 1and 2 Filter mount (2 per set)	5264-305-23	MSSL	yes
		SBS 1and 2 Filter Clamp	5264-305-24	MSSL	yes
		Clamp Plate SFIL -3	5264-307-3	MSSL	yes

Optics	Mirrors	CM3		LAM	yes	
		CM5		LAM	yes	
		PM6		LAM	yes	
		PM7		LAM	yes	
		PM8		LAM	yes	
		PM9		LAM	yes	
		PM10		LAM	yes	
		PM11		LAM	yes	
		SM6		LAM	yes	
		SM7		LAM	yes	
		SM8A		LAM	yes	
		SM9A		LAM	yes	
		SM10A		LAM	yes	
		SM11A		LAM	yes	
		SM12A		LAM	yes	
		SM8B		LAM	yes	
		SM9B		LAM	yes	
		SM10B		LAM	yes	
		SM11B		LAM	yes	
		SM12B		LAM	yes	
		SCCA1		LAM	yes	
		SCCA2		LAM	yes	
		SCCB1		LAM	yes	
	SCCB2		LAM	yes		
		Filters	CFIL1		UWC	yes
			PFIL-2		UWC	yes
			PFIL-3		UWC	yes
			PDIC-1		UWC	yes
			PDIC-2		UWC	yes
			PFIL-4S		UWC	yes
			PFIL-5S		UWC	yes
			PFIL-4M		UWC	yes
			PFIL-5M		UWC	yes
	PFIL-4L			UWC	yes	
	PFIL-5L			UWC	yes	
	PFIL-6L			UWC	yes	
	SBS1			UWC	yes	
	SBS2			UWC	yes	
	SFIL2		UWC	yes		
	SFIL3S		UWC	yes		
	SFIL3L		UWC	yes		
	SFIL4S		UWC	yes		
	SFIL5S		UWC	yes		
	SFIL6S		UWC	yes		
	SFIL4L		UWC	yes		
	SFIL5L		UWC	yes		
	SFIL6L		UWC	yes		

<b>Beam steering mirror</b>				ATC	yes
<b>3He Cooler</b>		Cooler s/n 1	2000-14B-000	SBT	yes
<b>300 mK thermal straps and supports</b>		Bus Bar Upper	5264-306-7	MSSL	yes
		Busbar Lower	5264-306-8	MSSL	yes
		BDA-Busbar Flange	5264-306-9	MSSL	yes
		Bus Connector PLW	5264-306-10	MSSL	yes
		Bus Junction ans PMW Connector	5264-306-11	MSSL	yes
		Bus Junction Clamp Plate	5264-306-12	MSSL	yes
		Light Trap to Bus Junction	5264-306-13	MSSL	yes
		Bus Connector PSW	5264-306-14	MSSL	yes
		BDA-Busbar Flange	5264-306-15	MSSL	yes
		PLW Bus Strap	5264-306-16	MSSL	yes
		PMW Bus Strap	5264-306-17	MSSL	yes
		PSW Bus Strap	5264-306-18	MSSL	yes
		End stop Photometer Light Trap	5264-306-19	MSSL	yes
		Light Trap Feed Through - Photometer	5264-306-20	MSSL	yes
		Stop Bush -Bus Bar Mountings	5264-306-21	MSSL	yes
		Light Trap Feedthrough spect.	5264-307-6	MSSL	yes
		Light Baffle Junction	5264-307-7	MSSL	yes
		SSW Spect. BDA to light trap strap (5N Cu not annealed)	5264-307-8	MSSL	yes
		SLW Spect. BDA to Light Trap Strap (5N Cu not annealed)	5264-307-9	MSSL	yes
		BDA Cold Interface Spectrometer	5264-307-10	MSSL	yes
		Bush inner Spectrometer light trap	5264-307-11	MSSL	yes
		Bush outer Spectrometer light trap	5264-307-12	MSSL	yes
		Cold Strap Support	5264-307-13	MSSL	yes
		Photometer Baffle	LTS PFM-300	UWC	yes
		Spectrometer Baffle	LTS PFM-400	UWC	yes
<b>L0 Thermal Straps</b>		Detector Box I/F		RAL	no
		Cooler Pump I/F		RAL	no
		Cooler Evap I/F		RAL	no
<b>300 mK Thermal control system</b>		PTC system s/n 2	10217660-1	JPL	yes

<b>BDA</b>	Photometer LW array	10209800-1	s/n 14	JPL	yes
	Photometer MW array	10209800-2	s/n 12	JPL	yes
	Photometer SW array	10209800-3	s/n 13	JPL	yes
	Spectrometer SW	10209800-5	s/n 09	JPL	yes
	Spectrometer LW array	10209800-4	s/n 08	JPL	yes
<b>SMEC</b>	CQM	LAM.SSP.SPI.ADP.041020		LAM	yes
<b>PCAL</b>				UWC	yes
<b>FPU RF Filters</b>	Box				yes
		RFI Filter Bracket Corner Bracket	A2/5264/302-27	MSSL	yes
		Tempory RFI Bracket	A2/5264/302-28	MSSL	yes
		RFI Filter Frame Edge Bracket	A2/5264/302-29	MSSL	yes
	RF Filter Modules	RF-13	10209780-1	JPL	yes
		RF-14	10209780-2	JPL	yes
		RF-15	10209780-3	JPL	yes
		RF-16	10209780-4	JPL	yes
		RF-17	10209780-5	JPL	yes
		RF-18	10209780-6	JPL	yes
		RF-19	10209780-7	JPL	yes
		RF-21	10209780-8	JPL	yes
		RF-22	10209780-9	JPL	yes
		RF-23	10209780-10	JPL	yes
		RF-24	10209780-11	JPL	yes
		RF-25	10209780-12	JPL	yes



<b>FPU internal harnesses</b>		F1 PSW BDA J01 to HSJFP J29	relabeled J31	Tekdata	yes
		F2 PSW BDA J02 to HSJFP J30	relabeled J32	Tekdata	yes
		F3 PSW BDA J03 to HSJFP J31		Tekdata	yes
		F4 PSW BDA J04 to HSJFP J32		Tekdata	yes
		F5 PSW BDA J05 to HSJFP J33		Tekdata	yes
		F6 PSW BDA J06 to HSJFP J34		Tekdata	yes
		F7 PLW BDA J01 to HSJFP J35		Tekdata	yes
		F8 PLW BDA J02 to HSJFP J36		Tekdata	yes
		F9 PMW BDA J01 to HSJFP J37	relabeled J39	Tekdata	yes
		F10 PMW BDA J02 to HSJFP to J38	relabeled J40	Tekdata	yes
		F11 PMW BDA J03 to HSJFP to J39		Tekdata	yes
		F12 PMW BDA J04 to HSJFP to J40		Tekdata	yes
		F13 SSW BDA J05 to HSJFS J11		Tekdata	yes
		F14 SSW BDA J06 to HSJFS J12		Tekdata	yes
		F15 SLW BDA J01 to HSJFS J13 (plus PTC Cold harnessing – F28)		Tekdata	yes
		F16 COOLER-P to FPU J19A		Tekdata	yes
		F17 COOLER-R to FPU J20A		Tekdata	yes
		F18 SCal-P to FPU J21A		Tekdata	yes
		F19 SCal-R to FPU J22A		Tekdata	yes
		F20 THERM-P to FPU J23A		Tekdata	yes
		F21 THERM-R from FPU J24A		Tekdata	yes
		F22 BSM-P to FPU J25A		Tekdata	yes
		F23 BSM-R to FPU J26A		Tekdata	yes
		F24 SMEC Launch (Prime) connected to FPU J27A		Tekdata	yes
		F25 SMEC Control (Prime) connected to FPU J29A		Tekdata	yes
		F26 SMEC Launch (Red.) connected to FPU J28A		Tekdata	yes
		F27 SMEC Control (Red.) connected to FPU J30A		Tekdata	yes

Thermometers					

FLIGHT

Level 1

Acronym	Location	Type	Serial No.	Cal Curve	Range (K)
EMCFIL_1	HSFPU Harness Filter Bracket	CX-1030	X30977		3>100K
T_SUB_1	M3,5,7 Optical Sub Bench	CX-1030	X30981		3>100K
T_BAF_1	Input Baffle	CX-1030	X29604		3>100K
T_BSMS_1	BSM/SOB I/F (SOB side)	CX-1030	X29597		3>100K
T_SCST_1	SCAL Structure	CX-1030	X28264		10>100K
T_SCL4_1	SCAL 4%	CX-1030	X29754		10>80K
T_SCL2_1	SCAL 2%	CX-1030	X29758		10>80K
T_BSMM_1	BSM	CX-1030	X31060		3-20K
T_FTSM_1	SMEC	CX-1030	X31075		3-20K
T_FTSS_1	SMEC/SOB I/F	CX-1030	X29752		3-100K

Level 0

Acronym	Location	Type	Serial No.	Cal Curve	Range (K)
T_CPHP_1	Cooler Pump	CX-1030	X29559		3>100K
T_CSHT_1	Cooler Shunt	CX-1030	X29577		0.2>5K
T_CEV_1	Cooler Evap	CX-1030	X29558		0.2>5K
T_CPHS_1	Cooler Pump Heat Switch (sieve)	CX-1030	X29554		1>50K
T_CEHS_1	Cooler Evap Heat Switch (sieve)	CX-1030	X29546		1>50K
T_PL0_1	Photometer Level 0 Enclosure	CX-1030	X29606		1-10K
T_SL0_1	Spectrometer Level 0 Enclosure	CX-1030	X29601		1-10K

ANNEX B Open NCRs

NCR Serial Code	NCR No	Level	Subsystem	Assembly	Part	Model	Issue Date	Title
HR-SP-JPL-NCR-	6	Major	JFET's			PFM	31-May-05	Yield Degradation of JFET Module
HR-SP-RAL-NCR-	67	Minor	FPU			PFM	07-Apr-04	Hole Miss-alignment
HR-SP-RAL-NCR-	93	Minor	S-CAL Box			PFM	30-Nov-04	S-Cal Box Blacking behind SM8B"
HR-SP-RAL-NCR-	100	Minor	BDA			PFM	25-Jan-05	Damage to PFM SSW BDA J06 and PFM F14 P06 Pin 26
HR-SP-RAL-NCR-	103	Minor	BSM			PFM	31-Jan-05	Inconsistent BSM position sensor signal polarity
HR-SP-RAL-NCR-	108	Major				PFM	11-Mar-05	Autonomous Shut Down of LIAs
HR-SP-RAL-NCR-	110	Major	MCU			PFM 1	19-Apr-05	Large noise spikes observed on the science data from the MCU
HR-SP-RAL-NCR-	113	Minor	Cold Black Body			PFM 1	19-Apr-05	Cold Black body
HR-SP-RAL-NCR-	115	Minor	Software			PFM 1	19-Apr-05	The TFTS rejected all commands from SCOS during PFM1 testing
HR-SP-RAL-NCR-	116	Minor	BSM & MCU			PFM 1	19-Apr-05	BSM and MCU Oscillations
HR-SP-RAL-NCR-	117	Minor	Software	Warm Electronics		PFM 1	19-Apr-05	Anomalous HK Parameter Values are observed during DCU science generation at some bias and sampling frequencies
HR-SP-RAL-NCR-	118	Minor	Software			PFM 1	19-Apr-05	Separate Switch on commands for DRCU, MCU, SPEC & PHOT LIA's
HR-SP-RAL-NCR-	119	Minor	Software			PFM 1	19-Apr-05	The CDMS Simulator clock drifts with respect to system time of computer
HR-SP-RAL-NCR-	120	Minor				PFM 1	19-Apr-05	PIXEL SWAP
HR-SP-RAL-NCR-	121	Minor				PFM	20-Apr-05	L0 straps fouls on integration due to Slight distortion
HR-SP-RAL-NCR-	123	Minor	Photo Box			PFM	12-Jul-05	Phot box Black tiles Foul on Dichroics.
HR-SP-RAL-NCR-	125	Minor	JFET	Back Harness		PFM	09-Aug-05	Short in JFET back harness
HR-SP-RAL-NCR-	126	Minor	JFET	JFET RACK		PFM	15-Aug-05	HSJFP connector labelling
HR-SP-RAL-NCR-	128	Minor	FPU	PHOT DETECT Box	Temp Sensor	PFM	18-Aug-05	Prime Photometer Detector Box Temp sensor
HR-SP-RAL-NCR-	130	Minor	FPU	PHOTO DETECT Box	Test Heater	PFM	06-Sep-05	NCR Title □ Photometer Detector Box Test Heater Open Circuit
HR-SP-RAL-NCR-	131	Minor	MCU			PFM	01-Nov-05	MCU Boot failure
HR-SP-RAL-NCR-	132	Minor	MCU			PFM	01-Nov-05	MCU switch off caused SCU and DCU to enter a hung status

## ANNEX C Open RFWs

RFW Serial Code	RFW No	Model	Subsystem	Issue Date	Remarks	Title	Organisation
HR-SP-CEA-RFW-	3.2	PFM	DRCU	22-Sep-05	Updated with additional information requested by Jan Rautakoski	HSFCU PSU electronic assembly not fully compliant with ECSS-Q-70-08 A	CEA-Sap
HR-SP-CEA-RFW-	4	PFM	DRCU	17-Aug-04	Circulated 08/02/05: REF: RFD_CEA_SPIRE_FCU-n13	HSFCU : conducted emissions on primary powerlines exceeds IIDA limits	CEA-Sap
HR-SP-JPL-RFW-	2.1	PFM	BDA	21-Dec-04	PMW & PLW to be checked	PFM Bolometer Detective Quantum Efficiency	JPL
HR-SP-JPL-RFW-	17	PFM & FS	JFET	26-Jul-05	Update received 13/08/05 Internal only	JFET Thermal Control (TC) Module 10209750-1 S/N 020	JPL
HR-SP-RAL-RFW-	5	PFM	JFETS	21-Apr-05	TBD	Photometer JFET Dissipation	RAL
RFD_CEA_SPIRE_DRCU	14	PFM	DRCU	05-Jan-05	Circulated 8/02/05	HSDCU, HSFCU : conducted susceptibility on signal bundles	CEA-Sap
HR-SP-RAL-RFW-	6	PFM	FPU	17-Nov-05	Waiver requested by ESA	Cryo-vibration test, to reduce levels after 1000 cycles	RAL
HR-SP-RAL-RFW-	7	PFM	FPU	17-Nov-05	Waiver requested by ESA	Cryo-vibration test, to increase the roll off slope from -6dB to -12dB	RAL

RFW/RFD Number:

**HR-SP-RAL-RFW-006**

Spacecraft / Project	<b>HERSCHEL</b>	Originator's Name	Eric Sawyer	
System / Experiment / Model	<b>SPIRE / PFM</b>	Signature / Date	18/11/05	
Sub-System	FPU cryo-vibration test	Request Type (Highlight applicable request)	Waiver (RFW)	Deviation (RFD)
Assembly		Organisation		
Sub-Assembly		Ref. Doc. / Drwg No.		
Item		References		
Serial No.				

<b>RFW/RFD Title</b>	<b>Cryo-vibration test, to reduce levels after 1000 cycles</b>
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End Items(s) Affected (Hardware, Software)				
Name	CI-Number	Model(s)		
FPU		PFM		
Requirement / Interface Documents Affected				
Specification/Drawing Title	Number	Issue	Date	App. Paragraph
IID-A	SCI-PT-IIDA-04624	3.3	30/6/04	9.5.3.3.2
Description of Deviation / Discrepancy / Non-Conformance				
<p>To avoid fatigue induced effects in the FPU mounting feet, it is requested to limit the number of cycles during the high level sine test.            It is proposed to limit the levels once 1000 cycles have been reached in each axis.            For X axis at 66 Hz reduce from 14.4 g to 11.5 g to            For Y and Z axis at 66 Hz reduce from 6.4 g to 4.8 g</p>				
Other Items or Requirements (Potentially) Affected				
Need for RFW/RFD and Rationale for Acceptance				
<p>The FPU is supported on CFRP legs as are the internal detector boxes. These items could be susceptible to fatigue induced failure. The reduction in the number of cycles will minimise this risk.</p>				

	Name	Approved (Sign & Date)	Rejected (Sign & Date)
Engineering:			
Product Assurance:			
CCB-Chairman:			
Principle Investigator			
Product Assurance:			
Co-Investigator			
Prime Contractor			



**REQUEST FOR WAIVER / DEVIATION  
(RFW/RFD)**

**PRODUCT ASSURANCE  
Space Science and Technology  
Department**

RFW/RFD Number:

HR-SP-RAL-RFW-006

ESA Project Office			
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RFW/RFD Number:

**HR-SP-RAL-RFW-007**

Spacecraft / Project	<b>HERSCHEL</b>	Originator's Name	Eric Sawyer	
System / Experiment / Model	<b>SPIRE /</b>	Signature / Date	18/11/05	
Sub-System	FPU Cryo-vibration test	Request Type (Highlight applicable request)	Waiver (RFW)	Deviation (RFD)
Assembly		Organisation		
Sub-Assembly		Ref. Doc. / Drwg No.		
Item		References		
Serial No.				

<b>RFW/RFD Title</b>	<b>Cryo-vibration test, to increase the high frequency roll off slope during sine test</b>
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End Items(s) Affected (Hardware, Software)		
Name	CI-Number	Model(s)
FPU		PFM

Requirement / Interface Documents Affected				
Specification/Drawing Title	Number	Issue	Date	App. Paragraph
IID-A	SCI-PT-IIDA-04624	3.3	30/6/04	9.5.3.4

**Description of Deviation / Discrepancy / Non-Conformance**

To avoid potential damage to some subsystems during the random cryo-vibration test it is requested that the high frequency roll off is changed from -7dB/oct to -12dB/oct

**Other Items or Requirements (Potentially) Affected**

**Need for RFW/RFD and Rationale for Acceptance**

Some subsystems have been shown to be sensitive to high frequency random vibration, so this reduction is designed to minimise the danger during instrument level tests. The system level analysis indicated that there are very low levels seen by SPIRE at high frequency.

	Name	Approved (Sign & Date)	Rejected (Sign & Date)
Engineering:			
Product Assurance:			
CCB-Chairman:			
Principle Investigator			
Product Assurance:			
Co-Investigator			
Prime Contractor			



**REQUEST FOR WAIVER / DEVIATION  
(RFW/RFD)**

**PRODUCT ASSURANCE**  
Space Science and Technology  
Department

RFW/RFD Number:

HR-SP-RAL-RFW-007

ESA Project Office			
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