



Procedure for connecting PFM1 FPU to Warm Electronics in Cryolab

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Date	Index	Affected Pages	Changes
	0.1	All	First Draft



1 Scope of Document

This document describes the correct sequence to connect and disconnect the SPIRE FPU to the warm electronics.

NOTE: This procedure applies only to the **PFM1** build which only has spectrometer detectors mounted.

2 Applicable Document

	Title	Author	Reference	Date
RD 1	Making SPIRE ESD Safe	Doug Griffin	SPIRE-RAL-NOT-002028 Issue 2	28-Oct-2004



3 Constraints

- Personnel carrying out this operation are to wear ESD wrist straps at all times when carrying out this procedure.
- Only the following harnesses are present
 - C1 – Spect. Bias and SLW (Warm and Cold)
 - C2 - SSW (Warm and Cold)
 - C10 – Prime S/S A (Warm and Cold)
 - C11 – Prime S/S B (Warm and Cold)
 - C12 – Red S/S A (Warm and Cold)
 - C4 – PMW and PTC readout (Warm only)

4 Procedure

4.1 Transport of FPU

- During transport of the FPU, the JFET Bias shorting plugs and must be in place
- The FPU harnesses are to be mated to the gates of the JFET modules
- A grounding strap shall connect the chassis of the FPU to the HOB plate

4.2 Verify correct installation of the Cryoharnesses

Pre-requisites

- The internal-cryoharnesses are routed on the back of the HOB plate in the cryostat and any obvious contact points between the cryoharness and the chassis of the cryostat are removed.
- The internal and external Cryoharnesses are mated at the vacuum feed-through
- The FPU Faraday Shield Links are **not** mated
- The HOB Plate is mounted on the external MGSE with the instrument mounted in the vertical position
- The 10K and 77K shields are not installed (as this would imply that the instrument has been placed inside the cryostat)
- The cryoharness is not mated with the warm units

Verify that the shield of the internal cryoharness and the chassis of the cryostat are isolated.

Checked:

Who:

When:

Comments:



4.3 Mating Cryoharnesses to DRCU

- Check that the chassis of the DCU and FCU are bonded to local lab ground
- Route C1, C2, C4, C10 and C11 from cryostat to DRCU
- Mate J22 link between C2 and C4
- In the sequence outlined in Table 1, mate the cryoharness to the DRCU. In each case, place a conductive foil over the contacts of the harness connector immediately prior to mating the harness to discharge any static charge on the harness

Table 1 – Sequence for mating Cryoharnesses to DRCU

Harness	Connector
C1	DCU J31 – Bias Prime
	DCU J32 - Bias Red.
	DCU J27 – SLW LIA
	DCU J28 – SLW LIA
C2	DCU J23 – SSW LIA
	DCU J24 – SSW LIA
	DCU J25 – SSW LIA
	DCU J26 – SSW LIA
C4	DCU J22 – PTC LIA + PWM LIA
C10	FCU J11 – Prime Cooler Tail
	FCU J25 – Thermometry Tail B (Plus S-Cal)
	FCU J23 – Thermometry Tail A
C11	FCU J13 – P-Cal Prime
	MCU J17 – SMEC Control Prime
	MCU J19 – BSM Prime
	FCU J21 – Thermometry C
	MCU J29 – SMEC Launch Tail

Who:

When:

Comments:



4.4 Mating Cryoharnesses to FPU

Pre-requisites

- FPU is mounted on MGSE in the horizontal position

Notes

- Ensure that when the harnesses are mated, that the MGSE can be removed and the instrument inserted into the cryostat without having the cryoharness tangled

Procedure

- Verify that the chassis of the FPU is electrically connected to the chassis of the cryostat
- Verify that the cryostat is electrically connected to the local lab ground
- Mate all FPU Faraday Shield Link pins in the cryoharness
- Remove Safeing plug from JFS J09
- Mate C1 JFS P09 to JFS J09
- Mate C1 JFS P05 to JFS J05
- Mate C1 JFS P06 to JFS J06
- Mate C1 JFS P07 to JFS J07
- Mate C2 JFS P01 to JFS J01
- Mate C2 JFS P02 to JFS J02
- Mate C2 JFS P03 to JFS J03
- Mate C2 JFS P04 to JFS J04
- Remove safeing plug from JFS J10
- Mate C1 JFS P10 to JFS J10
- Mate C10 FPU P19 to FPU J19 (Cooler prime)
- Mate C10 FPU P21 to FPU J21 (S-Cal Prime)
- Mate C10 FPU P23 to FPU **J24** (sic.) (Thermometry harness plus PTC. There are no thermistors connected to this harness only the thermometry....)
- Mate C11 FPU P25 to FPU J25 (BSM Prime)
- Mate C11 FPU P27 to FPU J27 (SMEC Launch Prime)
- Mate C11 FPU P29 to FPU J29 (SMEC Control Prime)
- Mate C12 FPU P24 to FPU **J23** (sic.) (Thermometry harness read out by Lakeshore units)
- Remove the grounding strap between the FPU and the cryostat chassis
- Demate all the FPU Faraday Shield Links
- Verify that the harness is not shorting to chassis
- Mate all the FPU Faraday Shield Links
- Replace the grounding strap between the FPU and the cryostat chassis

Who:

When:

Comments:



4.5 Warm functional Test

- Rotate MGSE so that the instrument is in the vertical position
- Route harness on the back of the HOB
- Remove the grounding strap between the FPU and the cryostat chassis
- Demate all the FPU Faraday Shield Links
- Verify that the harness is not shorting to chassis
- Carry out Warm Functional Test (ref SPIRE-RAL-PRC-002223 step 4)
- Mate all the FPU Faraday Shield Links
- Replace the grounding strap between the FPU and the cryostat chassis

4.6 Roll instrument into cryostat

Move FPU into cryostat (SPIRE-RAL-PRC-002223 step 5)

4.7 Install thermal straps and then check isolation

Pre-requisites

- Thermal straps have been connected to the interfaces (ref SPIRE-RAL-PRC-002223 step 5)

Procedure

- Remove the grounding strap between the FPU and the cryostat chassis
- Demate all the FPU Faraday Shield Links
- Verify that the harness is not shorting to chassis
- Mate all the FPU Faraday Shield Links
- Replace the grounding strap between the FPU and the cryostat chassis

Who:

When:

Comments:

4.8 Complete integration activities

Perform optical alignment of telescope simulator (SPIRE-RAL-PRC-002223 step 6)

Install Cold Blackbody (SPIRE-RAL-PRC-002223 step 7)

Perform short functional test (SPIRE-RAL-PRC-002223 step 8)

Perform cryostat functional test (SPIRE-RAL-PRC-002223 step 9)



4.9 Install 10K Shield

Ref: SPIRE-RAL-PRC-002223 step 10

- Remove the grounding strap between the FPU and the cryostat chassis
- Demate all the FPU Faraday Shield Links
- Carry out a final check of the FPU isolation
- Install 10K shield
- Route harnesses on 10K
- Check FPU isolation

Who:

When:

Comments:

4.10 Install 77K Shield

Ref: SPIRE-RAL-PRC-002223 step 10

- Install 77K shield
- Route harnesses on 77K
- Check FPU isolation

Who:

When:

Comments:

4.11 Close cryostat

Ref: SPIRE-RAL-PRC-002223 step 10

- Check FPU isolation on FPU Faraday Shield Links
- Mate all FPU Faraday Shield Links

Who:

When:

Comments: