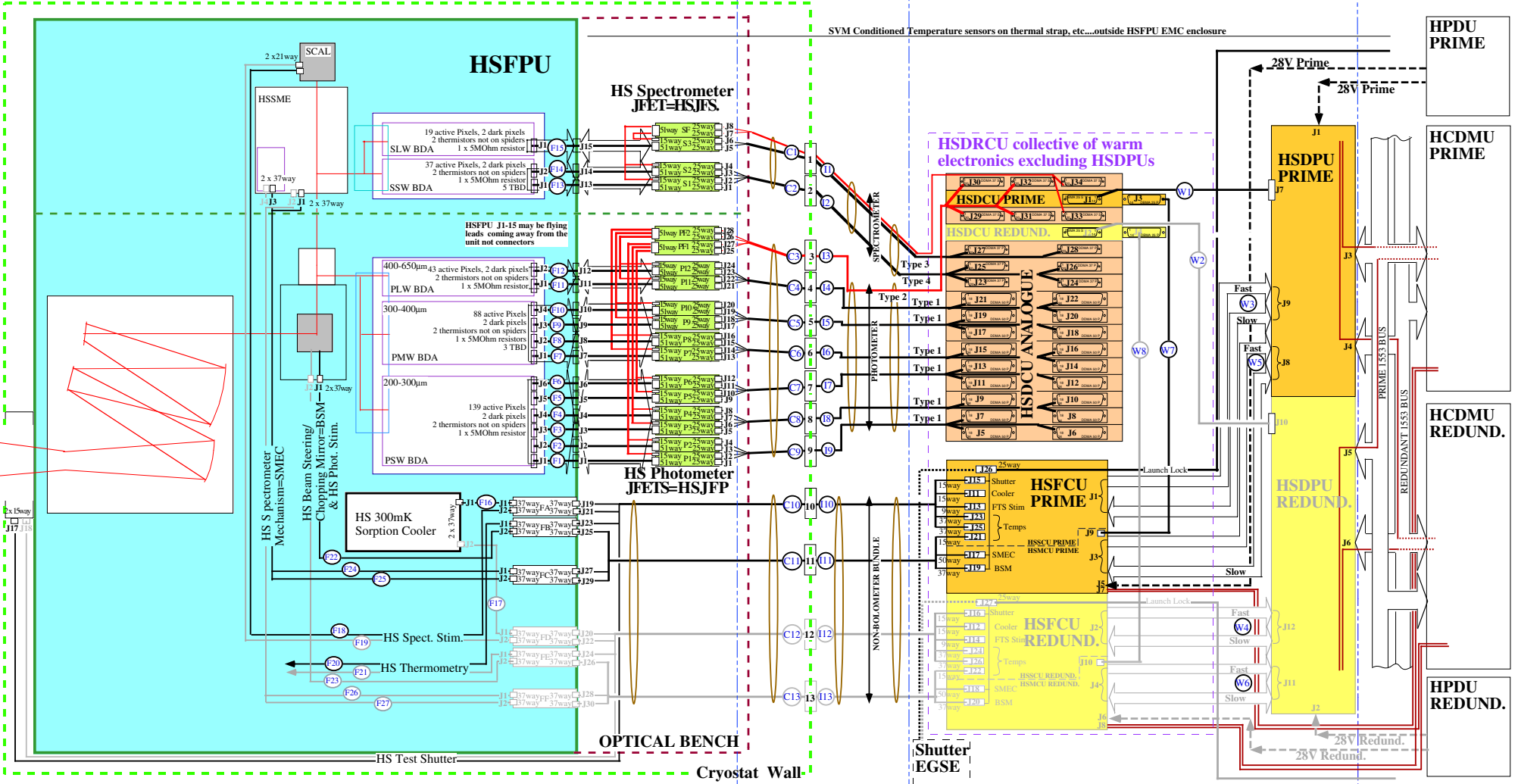


HERSCHEL-SPIRE(HS)

HERSCHEL

HERSCHEL-SPIRE(HS)

HERSCHEL



KEY

- Bundled together, not electrical screen
- Twisted pair of sync. clock
- Herschel to Herschel/Spire I/F lines, drawn simplified...I/Fs are all at HS connector planes
- Flight Harness Identity

Give SCAL two connectors/harnesses

Temp. Control Thermistor and JFET temps. still to sort.

FCU J21 and J22 to 15 way

Shutter EGSE

OPTICAL BENCH

Cryostat Wall

SVM Conditioned Temperature sensors on thermal strap, etc....outside HSFPU EMC enclosure

HSFPU J1-15 may be flying leads coming away from the unit not connectors

HSDRCU collective of warm electronics excluding HSDPUs

HSDCU ANALOGUE

HS Photometer JFETS=HSJFP

HS Spectrometer JFET=HSJFS

HSFPU

HPDU PRIME

HCDMU PRIME

HCDMU REDUND.

HPDU REDUND.

28V Prime

28V Redund.

PRIME 1553 BUS

REDUNDANT 1553 BUS

Fast

Slow

Fast

Slow

Fast

Slow

Fast

Slow

Fast

Slow

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**SPIRE
HARNESS DEFINITION**

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 1 of 124

Subject: **SPIRE HARNESS DEFINITION**

PREPARED BY: D.K. GRIFFIN **Date:**

APPROVED BY: J. DELDERFIELD..... **Date:**

APPROVED BY: K. KING..... **Date:**



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 2 of 124

CHANGE RECORD

ISSUE	DATE	SECTION	CHANGE(S) MADE
Draft 0.1	28/3/01	All	First Issue
Draft 0.2	11/4/01	All	Still getting it together! No unified style for lists yet.
Draft 0.3	10/5/01	Section 3	Update diagrams to fit latest SPIRE block diagram
		W1-6	Clarify screens as per communication 26/4/01, leaving other pins unchanged.
		C&I 1&3	Update Type 2 and Type 3 harnesses to fit 1:1 to membranes' back harness contacts, using 25pin filters.
		C Type1s	Simplify by carrying signal ground on screens.
		I1	Remove nasty 3 row double density 44 way connectors
		All Cs	Put in JFET and FET filter designations
		I1 Type3	Nasty 44pin 3row DCU connectors removed.
		C10-C13	Add tail wiring details. omitting FCU pin details until unit layout confirmed. Changed HSFCU J21 and J22 to 15 way because don't need more pins.

ACRONYM LIST

To be inserted



SPIRE HARNESSES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 4 of 124

CONTENTS

CHANGE RECORD	2
ACRONYM LIST	2
DISTRIBUTION LIST	3
1 SCOPE	6
2 APPLICABLE DOCUMENTS	6
3 INTRODUCTION	7
4 HARNESSES DETAILS	11
4.1 WARM HARNESSES.....	11
4.1.1 W1 HSDPU-P to HSDCU-P	11
4.1.2 W2 HSDPU-R to HSDCU-R.....	12
4.1.3 W3 HSDPU-P to HSSCU-P.....	13
4.1.4 W4 HSDPU-R to HSSCU-R.....	14
4.1.5 W5 HSDPU-P to HSMCU-P.....	15
4.1.6 W6 HSDPU-R to HSMCU-R.....	16
4.1.7 W7 HSFCU-P to HSDCU-P	17
4.1.8 W8 HSFCU-R to HSDCU-R.....	18
4.2 INTERMEDIATE HARNESSES.....	19
4.2.1 I1 HSDCU to CVV1 Type3.....	19
4.2.2 I2 HSDCU to CVV2 Type4.....	24
4.2.3 I3 HSDCU to CVV3 Type2.....	28
4.2.4 I4 HSDCU to CVV4 Type1.....	33
4.2.5 I5 HSDCU to CVV5 Type1.....	37
4.2.6 I6 HSDCU to CVV6 Type1.....	38
4.2.7 I7 HSDCU to CVV7 Type1.....	39
4.2.8 I8 HSDCU to CVV8 Type1.....	40
4.2.9 I9 HSDCU to CVV9 Type1.....	41
4.2.10 I10 HSDCU to CVV10 AUX-P.....	42
4.2.11 I11 HSDCU to CVV11 DRV-P.....	46
4.2.12 I12 HSDCU to CVV12 AUX-R.....	51
4.2.13 I13 HSDCU to CVV13 DRV-R.....	52
4.3 CRYOGENIC HARNESSES.....	53
4.3.1 C1 CVV1 to HSJFS Type3	53
4.3.2 C2 CVV2 to HSJFS Type4	57
4.3.3 C3 CVV3 to HSJFP Type2.....	58
4.3.4 C4 CVV4 to HSJFP Type1	63
4.3.5 C5 CVV5 to HSJFP Type1.....	68
4.3.6 C6 CVV6 to HSJFP Type1.....	69
4.3.7 C7 CVV7 to HSJFP Type1	70
4.3.8 C8 CVV8 to HSJFP Type1.....	71
4.3.9 C9 CVV9 to HSJFP Type1.....	72
4.3.10 C10 CVV10 to HSFPU AUX-P.....	73
4.3.11 C11 CVV11 to HSFPU DRV-P.....	80



SPIRE HARNESSES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 5 of 124

4.3.12	C12 CVV12 to HSFPU AUX-R.....	85
4.3.13	C13 CVV13 to HSFPU DRV-R.....	86
4.4	FPU HARNESSES	87
4.4.1	F1 PSW-A BDA to HSJFP	87
4.4.2	F2 PSW-B BDA to HSJFP	88
4.4.3	F3 PSW-C BDA to HSJFP	89
4.4.4	F4 PSW-D BDA to HSJFP.....	90
4.4.5	F5 PSW-E BDA to HSJFP	91
4.4.6	F6 PSW-F BDA to HSJFP	92
4.4.7	F7 PMW-A BDA to HSJFP.....	93
4.4.8	F8 PMW-B BDA to HSJFP.....	94
4.4.9	F9 PMW-D BDA to HSJFP	95
4.4.10	F10 PMW-D BDA to HSJFP	96
4.4.11	F11 PLW-A BDA to HSJFP.....	97
4.4.12	F12 PLW-B BDA to HSJFP.....	98
4.4.13	F13 SSW-A BDA to HSJFS.....	99
4.4.14	F14 SSW-B BDA to HSJFS.....	100
4.4.15	F15 SLW-A BDA to HSJFS.....	101
4.4.16	F16 COOLER-P to FA.....	102
4.4.17	F17 COOLER-R to FA.....	103
4.4.18	F18 SPECT_STIM-P to FA.....	104
4.4.19	F19 SPECT_STIM-R to FD	105
4.4.20	F20 THERM-P from FA.....	106
4.4.21	F21 THERM-R from FE.....	107
4.4.22	F22 BSM-P to FB.....	108
4.4.23	F23 BSM-R to FE.....	109
4.4.24	F24 SMECSIG-P to FC.....	110
4.4.25	F25 SCECDRV-P to FC.....	111
4.4.26	F26 SMECSIG-R to FF.....	112
4.4.27	F27 SMECDRV-P to FF	113
4.5	TEST HARNESSES.....	114
4.5.1	T1 DPU-P Power.....	114
4.5.2	T2 DPU to (1553+SYNC)-P	115
4.5.3	T3 DPU-R Power.....	116
4.5.4	T4 DPU to (1553+SYNC)-R	117
4.5.5	T5 FCU-P Power	118
4.5.6	T6 FCU-P SYNC.....	119
4.5.7	T7 FCU-R Power	120
4.5.8	T8 FCU-R SYNC.....	121
4.5.9	T9 SHT-EGSE-LNK.....	122
4.5.10	T10 SHT via FCU-P.....	123
4.5.11	T11 SHT via FCU-R.....	124



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 6 of 124

1 SCOPE

This document is the primary definition of all HERSCHEL SPIRE flight harnesses.

It is an applicable document in the SPIRE IID-B, and as such is called up, and is applicable in full, to all SPIRE subsystems

It also contains information covering some test harnesses, but harnesses / back-planes that stay entirely within sub-systems are not necessarily included.

Electrical and physical data are included, included contact functions, screening details, hold-down/shape details if appropriate, etc..

2 APPLICABLE DOCUMENTS

ID	TITLE	NUMBER
AD 1	HERSCHEL/Planck Instrument Interface Document Part B (IID-B) Instrument "SPIRE"	PT-SPIRE-02124.
AD-2	SPIRE Development Plan and Model Philosophy	SPIRE-RAL-PRJ-000035

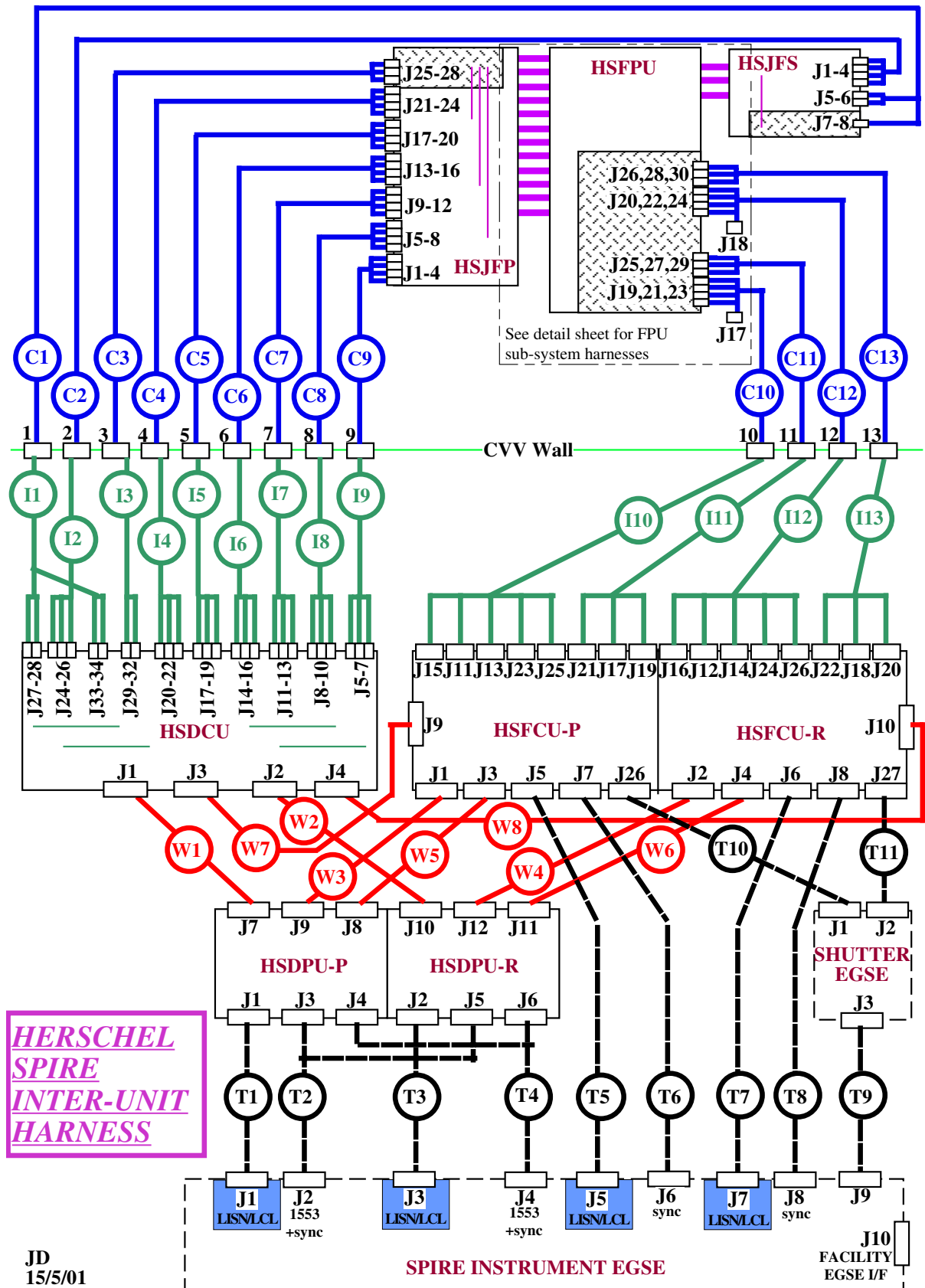


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 7 of 124

3 INTRODUCTION

The overall HERSCHEL SPIRE harnesses are configured as shown:





SPIRE HARNES DEFINITION

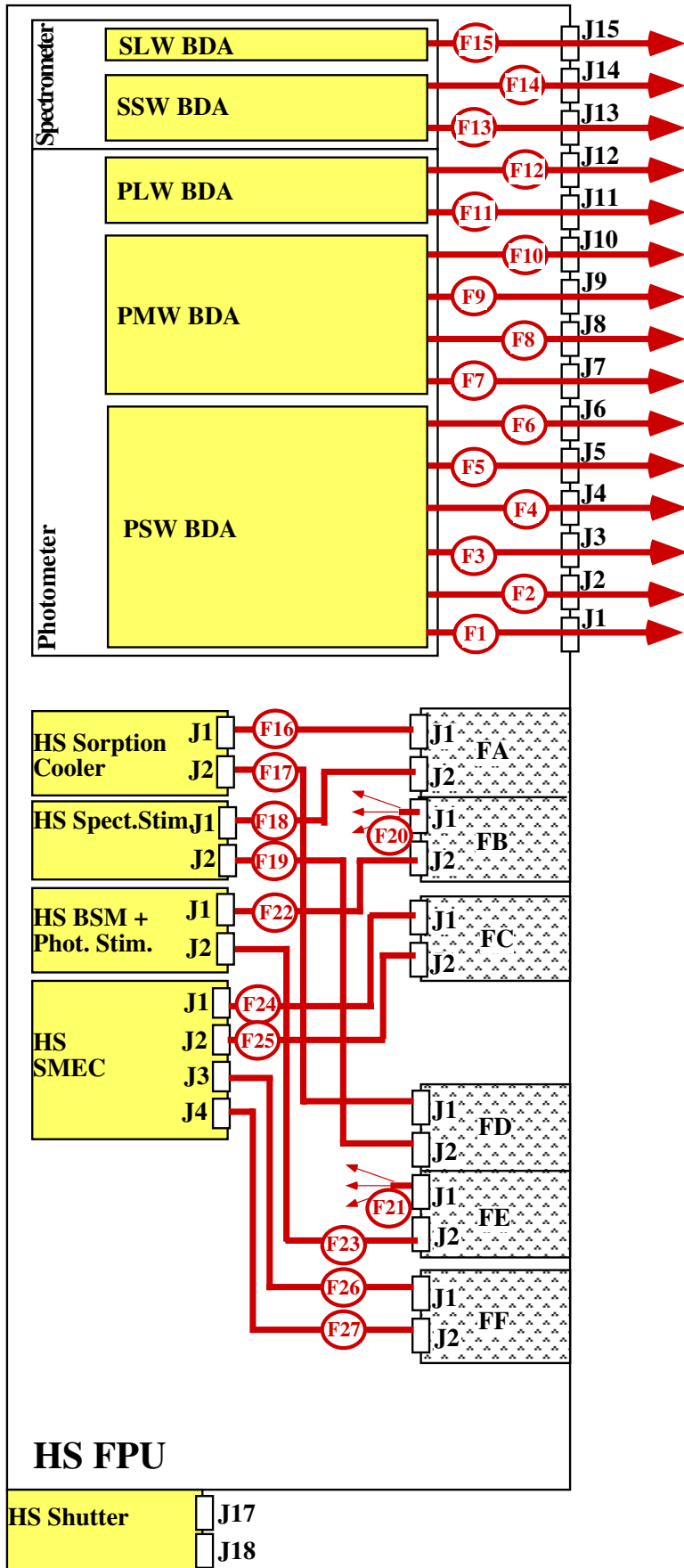
Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 8 of 124

The detail in the HS FPU are as follows:

Note:

J1-J15 FPU connectors are baselined as being replaced with cable to wall feedthrough via two interface plates. So F1-15 needs outer r.f. screens from this I/F to the JFET boxes but not necessarily from the I/F inwards.

***HERSCHEL
SPIRE
FPU
INTER-SUBSYSTEM
HARNES***



N.B. The 300mK temperature control harness still has to be included here.



SPIRE HARNESS DEFINITION

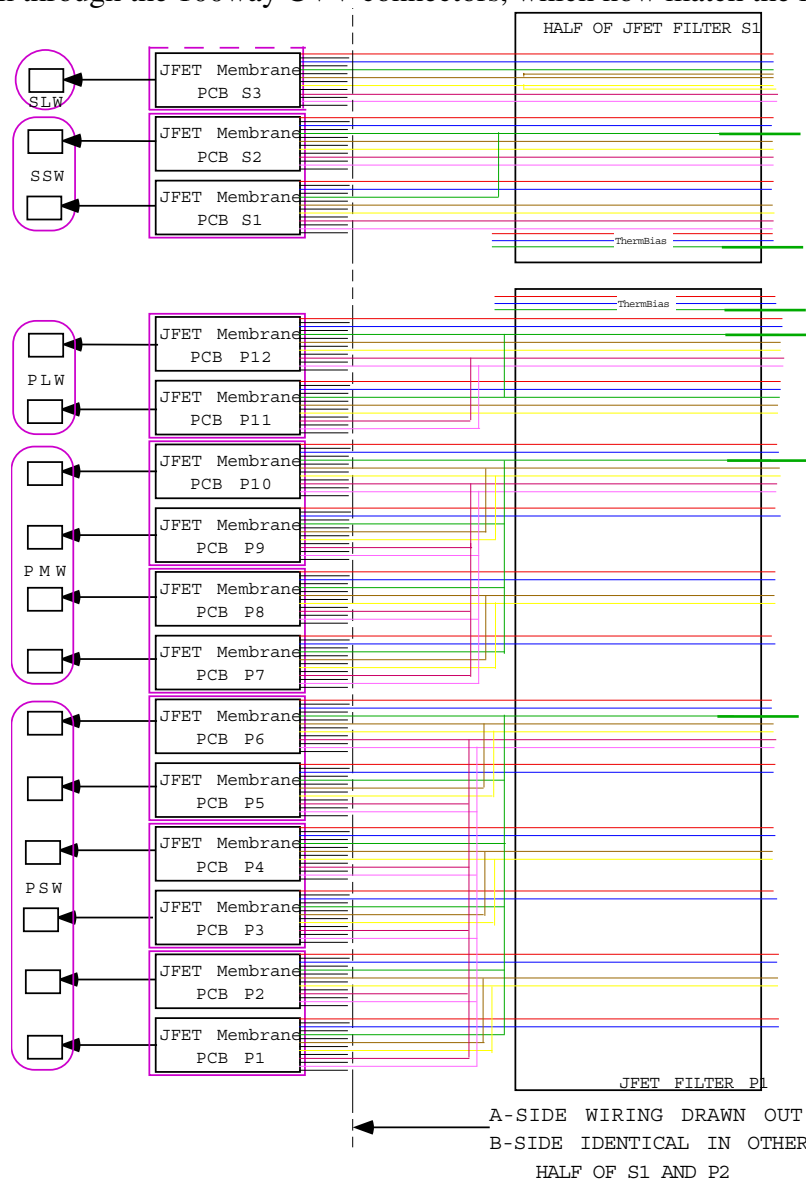
Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 9 of 124

The Bolometer Back Harness, not detailed herein, provides the following routing of wires from the JFET membrane 15way connectors into harnesses C3 and half of C1. The 15ways each provide double wired functions as follows, all d.c. isolated from ground in the JFET boxes themselves:

Function	A-wire	B-wire
JFET V-	1	8
JFET V +	10	14
JFET Vgnd	9	15
Bias +	2	7
Bias -	4	5
Heater +	3	6
Heater -	11	13

These colour codes are carried through to the drawing below

The cryoharness detailed herein can be considered to be as follows. The only paralleling wires that occurs is required to get them through the 100way CVV connectors, which now match the filter pin quantities.



Note that the A and B wires for each of these functions must be linked in the DCU to maintain robustness against single wire breakage, *whether or not* they then split into two again and feed into Prime and Redundant DCU electronics functions. The reason that A and B wires do not follow each other in the same harness tail and get linked inside the harness itself at the warm end is that mechanical distress to the cryoharness is likely to be on a tail-by-tail (connector-by-connector) basis and one does not want both the A and B wires of any function broken.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 10 of 124

Notes:

There are some "loop" harnesses that terminate within a given unit, such as on the HS DCU and the HSJFS + HSJFP "back-harnesses". These are presently treated as parts of the units rather than instrument harness.

The Test harnesses, type T, are non-flight and will be substituted by ESA Contractor furnished items as SPIRE is integrated on to HERSCHEL. They will be RAL furnished for use with the instrument EGSE, but individual suppliers will need to make their own versions for unit level testing before delivery to the instrument.

The Cryogenic and Intermediate harnesses, types C and I, are RAL furnished for instrument level calibration but again are substituted by ESA Contractor furnished items as SPIRE is integrated on to HERSCHEL.

The FPU harnesses, F series, are each provided by the institute which sources the sub-system to which they connect.

The model philosophy definition, in AD-2, can be used to determine how many versions of each harness are required for the programme. For SPIRE it is necessary that most harnesses, of whatever version, are EMC and thermally representative, obviously as well as functioning electrically as harnesses.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 11 of 124

4 HARNESS DETAILS

4.1 Warm Harnesses

4.1.1 W1 HSDPU-P to HSDCU-P

Overall Mechanical Drwg.

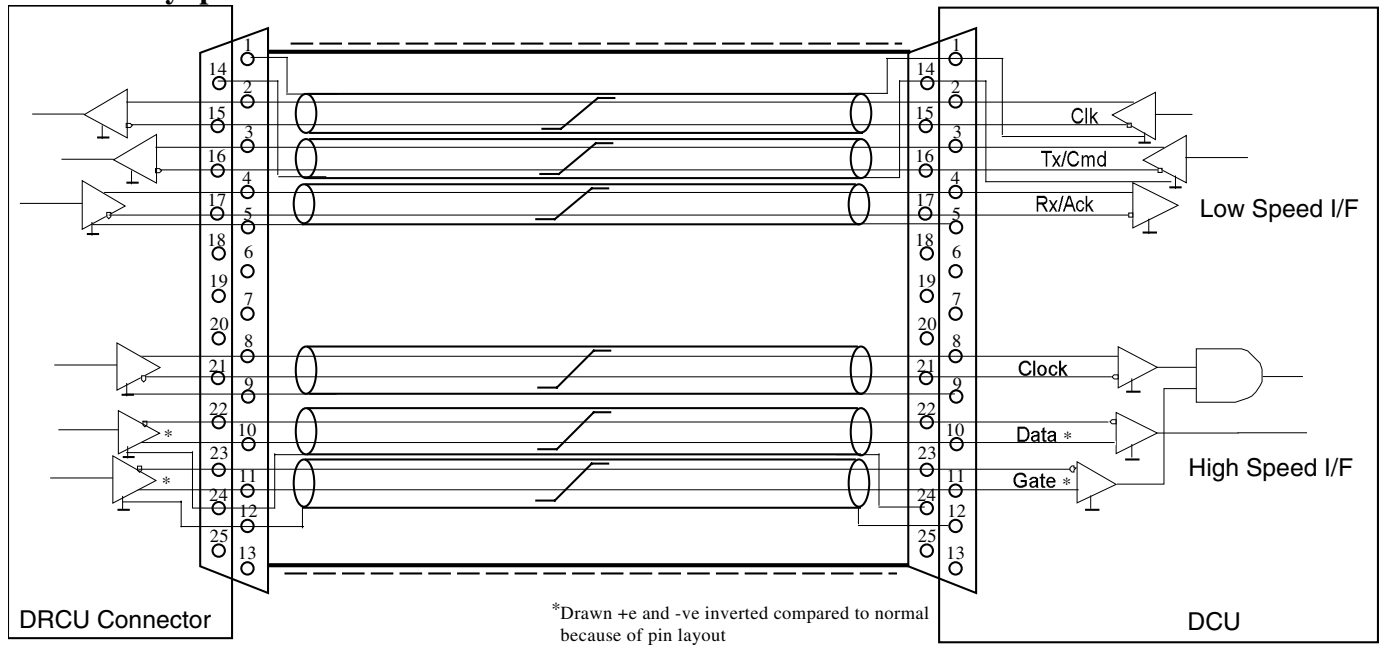
1:1 harness of insulated screened 28AWG twisted pairs with backshell to backshell screen, covered on outside with insulation.

Connector/Backshell Details

Prime Side Harness

DBMA 25 P +XXXX to mate with DCU J1 t o DBMA 25 S +XXXX to mate with DPU J7

Harness Layup



Contact Details

Wired 1:1 in harness

Signal Name	Pin	Wire	Signal Name	Pin	Wire
CLKS-DCU_P_shd	1	28AWG STP-A	CMD-DCU_P_shd	14	28AWG STP-B
CLKS-DCU_P_+	2	28AWG STP-A	CLKS-DCU_P_-	15	28AWG STP-A
CMD-DCU_P_+	3	28AWG STP-B	CMD-DCU_P_-	16	28AWG STP-B
ACK-DCU_P_+	4	28AWG STP-C	ACK-DCU_P_-	17	28AWG STP-C
ACK-DCU_P_shd	5	28AWG STP-C		18	
	6			19	
	7			20	
CLKF-DCU_P_+	8	28AWG STP-D	CLKF-DCU_P_-	21	28AWG STP-D
CLKF-DCU_P_shd	9	28AWG STP-D	DATA-DCU_P_-	22	28AWG STP-E
DATA-DCU_P_+	10	28AWG STP-E	GATE-DCU_P_-	23	28AWG STP-F
GATE-DCU_P_+	11	28AWG STP-F	DATA-DCU_P_shd	24	28AWG STP-E
GATE-DCU_P_shd	12	28AWG STP-F		25	
	13				



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 12 of 124

4.1.2 W2 HSDPU-R to HSDCU-R

Overall Mechanical Drwg.

1:1 harness of insulated screened 28AWG twisted pairs with backshell to backshell screen, covered on outside with insulation.

Connector/Backshell Details

Redundant side harness

DBMA 25 P +XXXX to mate with DCU J2 t o DBMA 25 S +XXXX to mate with DPU J10

Harness Layup

As W1

Contact Details

Wired 1:1 in harness

Signal Name	Pin	Wire	Signal Name	Pin	Wire
CLKS-DCU_R_shd	1	28AWG STP-A	CMD-DCU_R_shd	14	28AWG STP-B
CLKS-DCU_R_+	2	28AWG STP-A	CLKS-DCU_R_-	15	28AWG STP-A
CMD-DCU_R_+	3	28AWG STP-B	CMD-DCU_R_-	16	28AWG STP-B
ACK-DCU_R_+	4	28AWG STP-C	ACK-DCU_R_-	17	28AWG STP-C
ACK-DCU_R_shd	5	28AWG STP-C		18	
	6			19	
	7			20	
CLKF-DCU_R_+	8	28AWG STP-D	CLKF-DCU_R_-	21	28AWG STP-D
CLKF-DCU_R_shd	9	28AWG STP-D	DATA-DCU_R_-	22	28AWG STP-E
DATA-DCU_R_+	10	28AWG STP-E	GATE-DCU_R_-	23	28AWG STP-F
GATE-DCU_R_+	11	28AWG STP-F	DATA-DCU_R_shd	24	28AWG STP-E
GATE-DCU_R_shd	12	28AWG STP-F		25	
	13				



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 13 of 124

4.1.3 W3 HSDPU-P to HSSCU-P

Overall Mechanical Drwg.

1:1 harness of insulated screened 28AWG twisted pairs with backshell to backshell screen, covered on outside with insulation.

Connector/Backshell Details

Prime Side Harness

DBMA 25 P +XXXX to mate with FCU J1 t o DBMA 25 S +XXXX to mate with DPU J9

Harness Layup

As W1

Contact Details

Wired 1:1 in harness

Signal Name	Pin	Wire	Signal Name	Pin	Wire
CLKS-SCU_P_shd	1	28AWG STP-A	CMD-SCU_P_shd	14	28AWG STP-B
CLKS-SCU_P_+	2	28AWG STP-A	CLKS-SCU_P_-	15	28AWG STP-A
CMD-SCU_P_+	3	28AWG STP-B	CMD-SCU_P_-	16	28AWG STP-B
ACK-SCU_P_+	4	28AWG STP-C	ACK-SCU_P_-	17	28AWG STP-C
ACK-SCU_P_shd	5	28AWG STP-C		18	
	6			19	
	7			20	
CLKF-SCU_P_+	8	28AWG STP-D	CLKF-SCU_P_-	21	28AWG STP-D
CLKF-SCU_P_shd	9	28AWG STP-D	DATA-SCU_P_-	22	28AWG STP-E
DATA-SCU_P_+	10	28AWG STP-E	GATE-SCU_P_-	23	28AWG STP-F
GATE-SCU_P_+	11	28AWG STP-F	DATA-SCU_P_shd	24	28AWG STP-E
GATE-SCU_P_shd	12	28AWG STP-F		25	
	13				



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 14 of 124

4.1.4 W4 HSDPU-R to HSSCU-R

Overall Mechanical Drwg.

1:1 harness of insulated screened 28AWG twisted pairs with backshell to backshell screen, covered on outside with insulation.

Connector/Backshell Details

Redundant side harness

DBMA 25 P +XXXX to mate with FCU J2 t o DBMA 25 S +XXXX to mate with DPU J12

Harness Layup

As W1

Contact Details

Wired 1:1 in harness

Signal Name	Pin	Wire	Signal Name	Pin	Wire
CLKS-SCU_R_shd	1	28AWG STP-A	CMD-SCU_R_shd	14	28AWG STP-B
CLKS-SCU_R_+	2	28AWG STP-A	CLKS-SCU_R_-	15	28AWG STP-A
CMD-SCU_R_+	3	28AWG STP-B	CMD-SCU_R_-	16	28AWG STP-B
ACK-SCU_R_+	4	28AWG STP-C	ACK-SCU_R_-	17	28AWG STP-C
ACK-SCU_R_shd	5	28AWG STP-C		18	
	6			19	
	7			20	
CLKF-SCU_R_+	8	28AWG STP-D	CLKF-SCU_R_-	21	28AWG STP-D
CLKF-SCU_R_shd	9	28AWG STP-D	DATA-SCU_R_-	22	28AWG STP-E
DATA-SCU_R_+	10	28AWG STP-E	GATE-SCU_R_-	23	28AWG STP-F
GATE-SCU_R_+	11	28AWG STP-F	DATA-SCU_R_shd	24	28AWG STP-E
GATE-SCU_R_shd	12	28AWG STP-F		25	
	13				



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 15 of 124

4.1.5 W5 HSDPU-P to HSMCU-P

Overall Mechanical Drwg.

1:1 harness of insulated screened 28AWG twisted pairs with backshell to backshell screen, covered on outside with insulation.

Connector/Backshell Details

Prime Side Harness

DBMA 25 P +XXXX to mate with FCU J3 t o DBMA 25 S +XXXX to mate with DPU J8

Harness Layup

As W1

Contact Details

Wired 1:1 in harness

Signal Name	Pin	Wire	Signal Name	Pin	Wire
CLKS-MCU_P_shd	1	28AWG STP-A	CMD-MCU_P_shd	14	28AWG STP-B
CLKS-MCU_P_+	2	28AWG STP-A	CLKS-MCU_P_-	15	28AWG STP-A
CMD-MCU_P_+	3	28AWG STP-B	CMD-MCU_P_-	16	28AWG STP-B
ACK-MCU_P_+	4	28AWG STP-C	ACK-MCU_P_-	17	28AWG STP-C
ACK-MCU_P_shd	5	28AWG STP-C		18	
	6			19	
	7			20	
CLKF-MCU_P_+	8	28AWG STP-D	CLKF-MCU_P_-	21	28AWG STP-D
CLKF-MCU_P_shd	9	28AWG STP-D	DATA-MCU_P_-	22	28AWG STP-E
DATA-MCU_P_+	10	28AWG STP-E	GATE-MCU_P_-	23	28AWG STP-F
GATE-MCU_P_+	11	28AWG STP-F	DATA-MCU_P_shd	24	28AWG STP-E
GATE-MCU_P_shd	12	28AWG STP-F		25	
	13				



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 16 of 124

4.1.6 W6 HSDPU-R to HSMCU-R

Overall Mechanical Drwg.

1:1 harness of insulated screened 28AWG twisted pairs with backshell to backshell screen, covered on outside with insulation.

Connector/Backshell Details

Redundant side harness

DBMA 25 P +XXXX to mate with FCU J4 t o DBMA 25 S +XXXX to mate with DPU J11

Harness Layup

As W1

Contact Details

Wired 1:1 in harness

Signal Name	Pin	Wire	Signal Name	Pin	Wire
CLKS-MCU_R_shd	1	28AWG STP-A	CMD-MCU_R_shd	14	28AWG STP-B
CLKS-MCU_R_+	2	28AWG STP-A	CLKS-MCU_R_-	15	28AWG STP-A
CMD-MCU_R_+	3	28AWG STP-B	CMD-MCU_R_-	16	28AWG STP-B
ACK-MCU_R_+	4	28AWG STP-C	ACK-MCU_R_-	17	28AWG STP-C
ACK-MCU_R_shd	5	28AWG STP-C		18	
	6			19	
	7			20	
CLKF-MCU_R_+	8	28AWG STP-D	CLKF-MCU_R_-	21	28AWG STP-D
CLKF-MCU_R_shd	9	28AWG STP-D	DATA-MCU_R_-	22	28AWG STP-E
DATA-MCU_R_+	10	28AWG STP-E	GATE-MCU_R_-	23	28AWG STP-F
GATE-MCU_R_+	11	28AWG STP-F	DATA-MCU_R_shd	24	28AWG STP-E
GATE-MCU_R_shd	12	28AWG STP-F		25	
	13				



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 17 of 124

4.1.7 W7 HSFCU-P to HSDCU-P

Overall Mechanical Drwg.

1:1

Connector/Backshell Details

Prime side harness

DBMA 25 P +XXXX to mate with FCU J9 t o **DBMA 25 S** +XXXX to mate with DCU J3

Harness Layup

Contact Details

TBC



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 18 of 124

4.1.8 W8 HSFCU-R to HSDCU-R

Overall Mechanical Drwg.

1:1

Connector/Backshell Details

Redundant side harness

DBMA 25 P +XXXX to mate with FCU J10 t o DBMA 25 S +XXXX to mate with DCU J4

Harness Layup

As W7

Contact Details

As W7



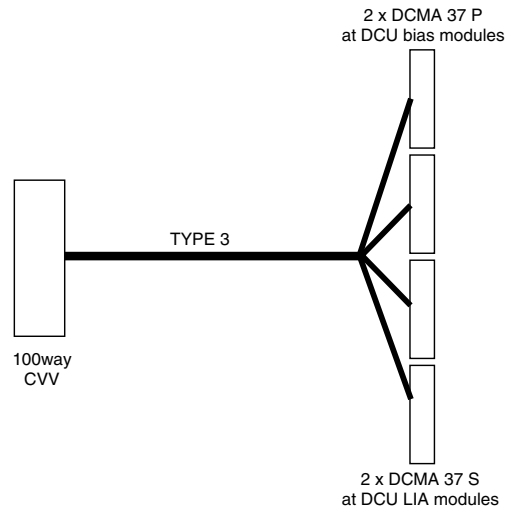
SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 19 of 124

4.2 Intermediate Harnesses

4.2.1 I1 HSDCU to CVV1 Type3

Overall Mechanical Drwg.

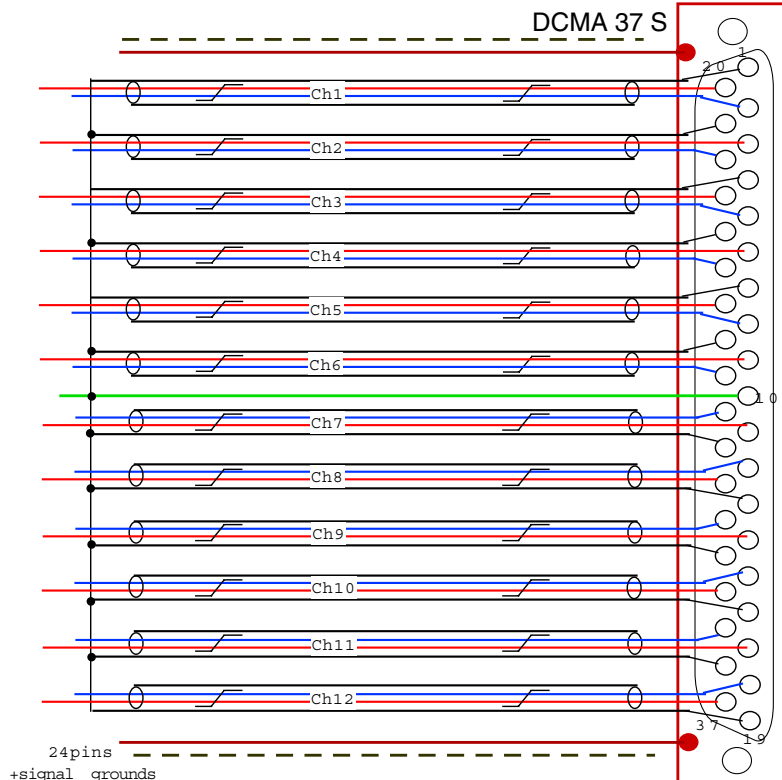


Connector/Backshell Details:

DCMA 37 S + XXXX: interface to HFDCU J27 12ch. bolometer
 DCMA 37 S + XXXX: interface to HFDCU J28 12ch. bolometer
 DCMA 37 P + XXXX: interface to HFDCU J33 Spect bias A
 DCMA 37 P + XXXX: interface to HFDCU J34 Spect bias B

Harness Lay-up

Two Bolometers Tails thus:



12 Channel Bolometer Tail (typ)

Common to all such tails, although others have ch. 13-24, etc.
 Good flat layup for cryoharness

12 insulated screened twisted pairs plus 1 ground pins with a good conductor attached.

The whole overlain with RF screen

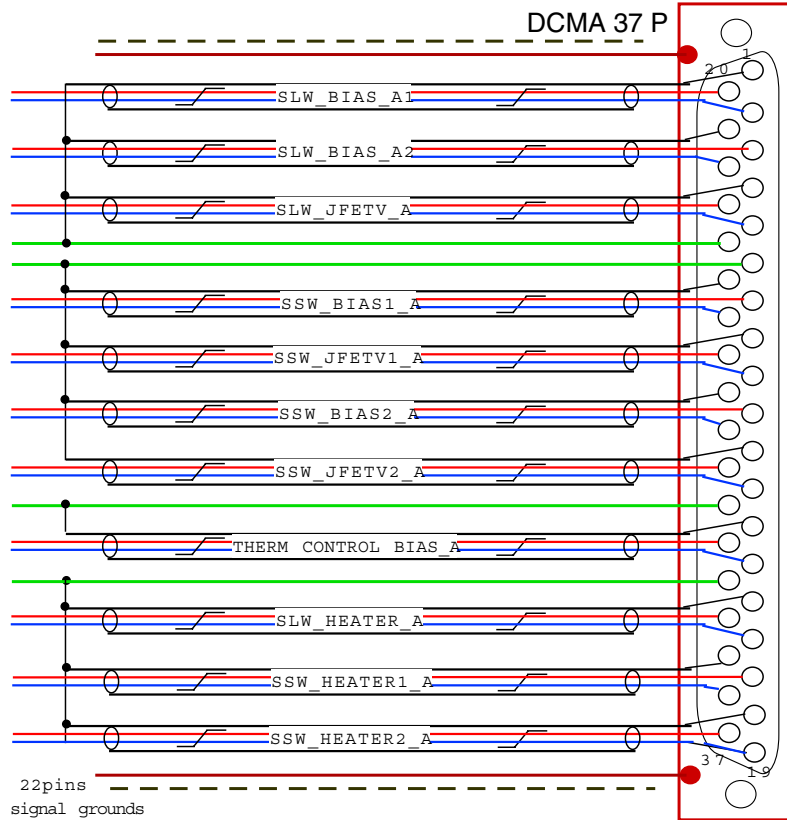
Dotted lines show insulation, probably put around bundles but only strictly needed at clamp points.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 20 of 124

Two Spectrometer Bias tails thus:



DCU Type 3 Bias.

Two such tails, other with B instead of A at end of each name.

Good flat layup for cryoharness

11 insulated screened twisted pairs plus 4 ground wires.
 Gauge TBD because all TPs need 5mA rating...heaters have same current as JFET supplies if are substitute power off the same value of voltage.

The whole overlain with RF screen

Dotted lines show insulation, probably put around bundles but only strictly needed at clamp points.

Contact Details

Note that this harness carries signal and bias etc. for two BDAs, so to keep the ground configuration loopfree the 4 signal ground pins through the 100way are not all commoned together as in Type 1 harness

Name	100Way #1	37way A J27	37wayBJ28	37way C J33	37way D J34
Channel 1 +	TBD	20			
Channel 1 -	TBD	2			
Channel 1gnd shld	XXX	1			
Channel 2 +	TBD	3			
Channel 2 -	TBD	22			
Channel 2gnd shld	XXX	21			
Channel 3 +	TBD	23			
Channel 3 -	TBD	5			
Channel 3gnd shld	XXX	4			
Channel 4 +	TBD	6			
Channel 4 -	TBD	25			
Channel 4gnd shld	XXX	24			
Channel 5 +	TBD	26			
Channel 5 -	TBD	8			
Channel 5gnd shld	XXX	7			
Channel 6 +	TBD	9			
Channel 6 -	TBD	28			
Channel 6gnd shld	XXX	27			
SSW GND WIRE	XXX	10			
Channel 7 +	TBD	11			
Channel 7 -	TBD	29			
Channel 7gnd shld	XXX	30			
Channel 8 +	TBD	31			
Channel 8 -	TBD	12			



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 21 of 124

Name	100Way #1	37way A J27	37wayBJ28	37way C J33	37way D J34
Channel 8gnd shld	XXX	13			
Channel 9 +	TBD	14			
Channel 9 -	TBD	32			
Channel 9gnd shld	XXX	33			
Channel 10 +	TBD	34			
Channel 10 -	TBD	15			
Channel 10gnd shld	XXX	16			
Channel 11 +	TBD	17			
Channel 11 -	TBD	35			
Channel 11gnd shld	XXX	36			
Channel 12 +	TBD	37			
Channel 12 -	TBD	18			
Channel 12gnd shld	TBD	19			
Channel 13 +	TBD		20		
Channel 13 -	TBD		2		
Channel 1gnd shld	XXX		1		
Channel 14 +	TBD		3		
Channel 14 -	TBD		22		
Channel 1gnd shld	XXX		21		
Channel 15 +	TBD		23		
Channel 15 -	TBD		5		
Channel 15gnd shld	XXX		4		
Channel 16 +	TBD		6		
Channel 16 -	TBD		25		
Channel 16gnd shld	XXX		24		
Channel 17 +	TBD		26		
Channel 17 -	TBD		8		
Channel 17gnd shld	XXX		7		
Channel 18 +	TBD		9		
Channel 18 -	TBD		28		
Channel 18gnd shld	XXX		27		
SSW GND WIRE	XXX		10		
Channel 19 +	TBD		11		
Channel 19 -	TBD		29		
Channel 19gnd shld	XXX		30		
Channel 20 +	TBD		31		
Channel 20 -	TBD		12		
Channel 1gnd shld	XXX		13		
Channel 21 +	TBD		14		
Channel 21 -	TBD		32		
Channel 21gnd shld	XXX		33		
Channel 22 +	TBD		34		
Channel 22 -	TBD		15		
Channel 22gnd shld	XXX		16		
Channel 23 +	TBD		17		
Channel 23 -	TBD		35		
Channel 23gnd shld	XXX		36		
Channel 24 +	TBD		37		
Channel 24 -	TBD		18		
Channel 24gnd shld	TBD		19		
SLW_BIAS_A1+ve	TBD			20	
SLW_BIAS_A1-ve	TBD			2	
SLW_BIAS_A1 shld	XXX			1	
SLW_BIAS_A2 +ve	TBD			3	
SLW_BIAS_A2 -ve	TBD			22	
SLW_BIAS_A2 shld	XXX			21	
SLW_JFETV_A +ve	TBD			23	



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 22 of 124

Name	100Way #1	37way A J27	37wayBJ28	37way C J33	37way D J34
SLW_JFETV_A -ve	TBD			5	
SLW_JFETV_A shld	XXX			4	
SLW_GND WIRE_A	TBD			24	
SSW_GND WIRE_A	TBD			6	
SSW_BIAS1_A +ve	XXX			7	
SSW_BIAS1_A -ve	TBD			26	
SSW_BIAS1_A shld	TBD			25	
SSW_JFETV1_A +ve	XXX			27	
SSW_JFETV1_A -ve	XXX			9	
SSW_JFETV1_A shld	TBD			8	
SSW_BIAS2_A +ve	XXX			10	
SSW_BIAS2_A -ve	TBD			29	
SSW_BIAS2_A shld	TBD			28	
SSW_JFETV2_A +ve	XXX			30	
SSW_JFETV2_A -ve	XXX			12	
SSW_JFETV2_A shld	TBD			11	
THERM. CONTROL GROUND WIRE_A	XXX			31	
THERM CONTROL BIAS_A +ve	XXX			32	
THERM CONTROL BIAS_A -ve	TBD			14	
THERM CONTROL BIAS_A shld	TBD			13	
S_HEATER GROUND WIRE_A	XXX			33	
SLW_HEATER_A +ve	XXX			34	
SLW_HEATER_A -ve	TBD			16	
SLW_HEATER_A shld	TBD			15	
SSW_HEATER1_A +ve	XXX			17	
SSW_HEATER1_A -ve	TBD			36	
SSW_HEATER1_A shld	TBD			35	
SSW_HEATER2_A +ve	XXX			37	
SSW_HEATER2_A -ve	TBD			19	
SSW_HEATER2_A shld	TBD			18	
SLW_BIAS_B1+ve	TBD				20
SLW_BIAS_B1-ve	TBD				2
SLW_BIAS_B1Eshld	XXX				1
SLW_BIAS_B2 +ve	TBD				3
SLW_BIAS_B2 -ve	TBD				22
SLW_BIAS_B2 shld	XXX				21
SLW_JFETV_B +ve	TBD				23
SLW_JFETV_B -ve	TBD				5
SLW_JFETV_B shld	XXX				4
SLW_GND WIRE_B	TBD				24
SSW_GND WIRE_B	TBD				6
SSW_BIAS1_B +ve	XXX				7
SSW_BIAS1_B -ve	TBD				26
SSW_BIAS1_B shld	TBD				25
SSW_JFETV1_B +ve	XXX				27
SSW_JFETV1_B -ve	XXX				9
SSW_JFETV1_B shld	TBD				8
SSW_BIAS2_B +ve	XXX				10
SSW_BIAS2_B -ve	TBD				29
SSW_BIAS2_B shld	TBD				28
SSW_JFETV2_B +ve	XXX				30
SSW_JFETV2_B -ve	XXX				12
SSW_JFETV2_B shld	TBD				11
THERM. CONTROL GROUND WIRE_B	TBD				31
THERM CONTROL BIAS_B +ve	XXX				32
THERM CONTROL BIAS_B -ve	TBD				14
THERM CONTROL BIAS_B shld	TBD				13



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 23 of 124

Name	100Way #1	37way A J27	37wayBJ28	37way C J33	37way D J34
S_HEATER GROUND WIRE_B	TBD				33
SLW_HEATER_B +ve	XXX				34
SLW_HEATER_B -ve	TBD				16
SLW_HEATER_B shld	TBD				15
SSW_HEATER1_B +ve	XXX				17
SSW_HEATER1_B -ve	TBD				36
SSW_HEATER1_B shld	TBD				35
SSW_HEATER2_B +ve	XXX				37
SSW_HEATER2_B -ve	TBD				19
SSW_HEATER2_B shld	TBD				18

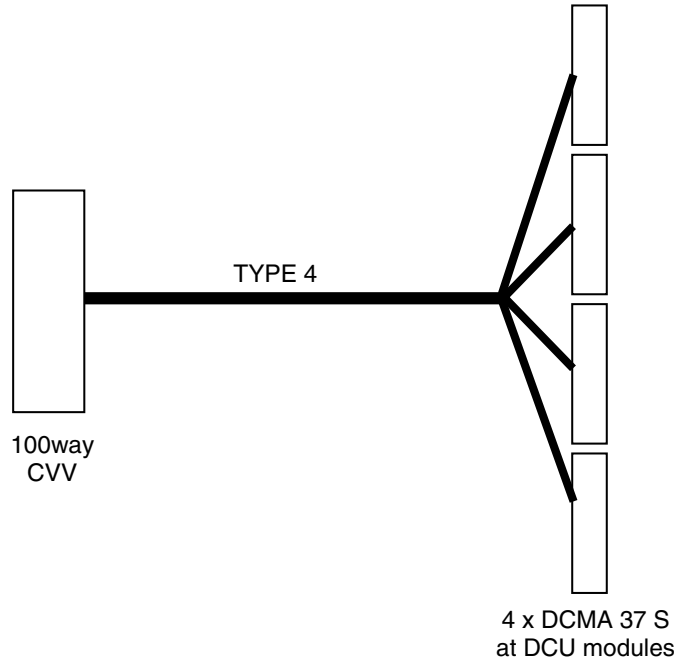


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 24 of 124

4.2.2 I2 HSDCU to CVV2 Type4

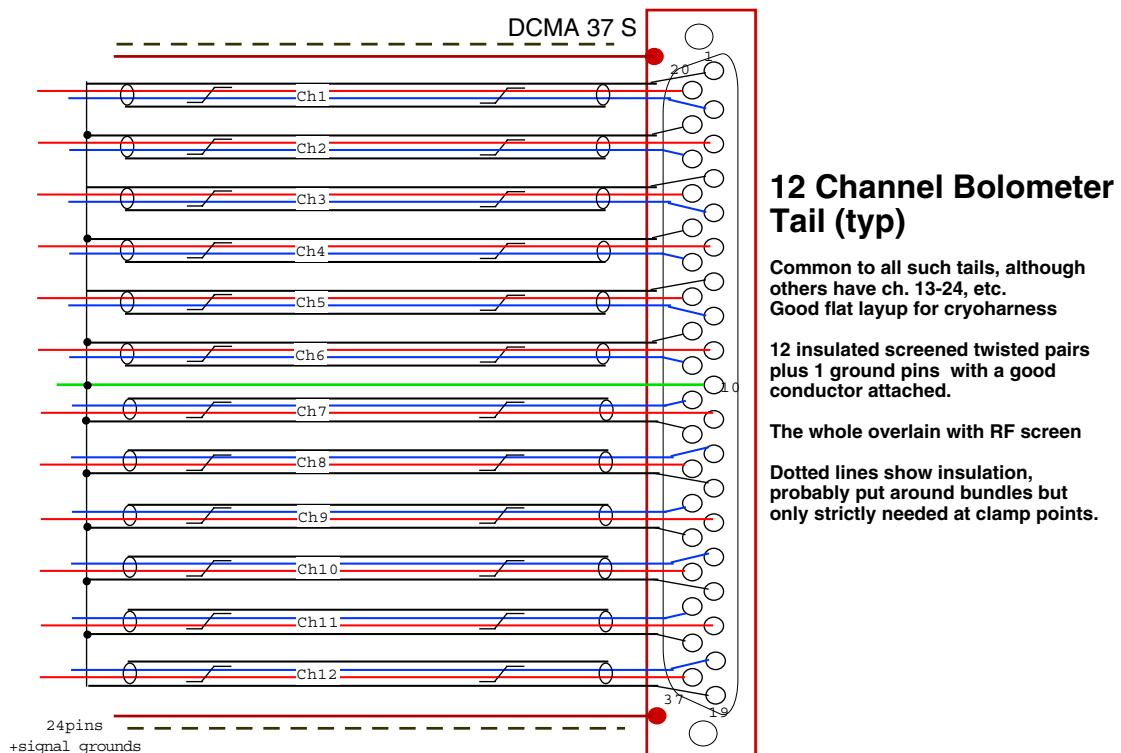
Overall Mechanical Drwg.



Connector/Backshell Details

DCMA 37 S + XXXX: interface to HFDCU J23 12ch. bolometer
DCMA 37 S + XXXX: interface to HFDCU J24 12ch. bolometer
DCMA 37 S + XXXX: interface to HFDCU J25 12ch. bolometer
DCMA 37 S + XXXX: interface to HFDCU J26 12ch. bolometer

Harness Layup





SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 25 of 124

Contact Details

Name	100Way #2	37way J23	37way J24	37way J25	37way J26
Channel 1 +	TBD	20			
Channel 1 -	TBD	2			
Channel 1gnd shld	XXX	1			
Channel 2 +	TBD	3			
Channel 2 -	TBD	22			
Channel 2gnd shld	XXX	21			
Channel 3 +	TBD	23			
Channel 3 -	TBD	5			
Channel 3gnd shld	XXX	4			
Channel 4 +	TBD	6			
Channel 4 -	TBD	25			
Channel 4gnd shld	XXX	24			
Channel 5 +	TBD	26			
Channel 5 -	TBD	8			
Channel 5gnd shld	XXX	7			
Channel 6 +	TBD	9			
Channel 6 -	TBD	28			
Channel 6gnd shld	XXX	27			
GND	XXX	10			
Channel 7 +	TBD	11			
Channel 7 -	TBD	29			
Channel 7gnd shld	XXX	30			
Channel 8 +	TBD	31			
Channel 8 -	TBD	12			
Channel 8gnd shld	XXX	13			
Channel 9 +	TBD	14			
Channel 9 -	TBD	32			
Channel 9gnd shld	XXX	33			
Channel 10 +	TBD	34			
Channel 10 -	TBD	15			
Channel 10gnd shld	XXX	16			
Channel 11 +	TBD	17			
Channel 11 -	TBD	35			
Channel 11gnd shld	XXX	36			
Channel 12 +	TBD	37			
Channel 12 -	TBD	18			
Channel 12gnd shld	TBD	19			
Channel 13 +	TBD		20		
Channel 13 -	TBD		2		
Channel 1gnd shld	XXX		1		
Channel 14 +	TBD		3		
Channel 14 -	TBD		22		
Channel 1gnd shld	XXX		21		
Channel 15 +	TBD		23		
Channel 15 -	TBD		5		
Channel 15gnd shld	XXX		4		
Channel 16 +	TBD		6		
Channel 16 -	TBD		25		
Channel 16gnd shld	XXX		24		
Channel 17 +	TBD		26		
Channel 17 -	TBD		8		
Channel 17gnd shld	XXX		7		
Channel 18 +	TBD		9		
Channel 18 -	TBD		28		
Channel 18gnd shld	XXX		27		



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 26 of 124

Name	100Way #2	37way J23	37way J24	37way J25	37way J26
GND WIRE	XXX		10		
Channel 19 +	TBD		11		
Channel 19 -	TBD		29		
Channel 19gnd shld	XXX		30		
Channel 20 +	TBD		31		
Channel 20 -	TBD		12		
Channel 1gnd shld	XXX		13		
Channel 21 +	TBD		14		
Channel 21 -	TBD		32		
Channel 21gnd shld	XXX		33		
Channel 22 +	TBD		34		
Channel 22 -	TBD		15		
Channel 22gnd shld	XXX		16		
Channel 23 +	TBD		17		
Channel 23 -	TBD		35		
Channel 23gnd shld	XXX		36		
Channel 24 +	TBD		37		
Channel 24 -	TBD		18		
Channel 24gnd shld	TBD		19		
Channel 25 +	TBD			20	
Channel 25 -	TBD			2	
Channel 25gnd shld	XXX			1	
Channel 26 +	TBD			3	
Channel 26 -	TBD			22	
Channel 26gnd shld	XXX			21	
Channel 27 +	TBD			23	
Channel 27 -	TBD			5	
Channel 27gnd shld	XXX			4	
Channel 28 +	TBD			6	
Channel 28 -	TBD			25	
Channel 28gnd shld	XXX			24	
Channel 29 +	TBD			26	
Channel 29 -	TBD			8	
Channel 29gnd shld	XXX			7	
Channel 30 +	TBD			9	
Channel 30 -	TBD			28	
Channel 30gnd shld	XXX			27	
GND WIRE	XXX			10	
Channel 31 +	TBD			11	
Channel 31 -	TBD			29	
Channel 31gnd shld	XXX			30	
Channel 32 +	TBD			31	
Channel 32 -	TBD			12	
Channel 32gnd shld	XXX			13	
Channel 33 +	TBD			14	
Channel 33 -	TBD			32	
Channel 33gnd shld	XXX			33	
Channel 34 +	TBD			34	
Channel 34 -	TBD			15	
Channel 34gnd shld	XXX			16	
Channel 35 +	TBD			17	
Channel 35 -	TBD			35	
Channel 35gnd shld	XXX			36	
Channel 36 +	TBD			37	
Channel 36 -	TBD			18	
Channel 36gnd shld	TBD			19	
Channel 37 +	TBD				20



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 27 of 124

Name	100Way #2	37way J23	37way J24	37way J25	37way J26
Channel 37 -	TBD				2
Channel 37gnd shld	XXX				1
Channel 38 +	TBD				3
Channel 38 -	TBD				22
Channel 38gnd shld	XXX				21
Channel 39 +	TBD				23
Channel 39 -	TBD				5
Channel 39gnd shld	XXX				4
Channel 40 +	TBD				6
Channel 40 -	TBD				25
Channel 40gnd shld	XXX				24
Channel 41 +	TBD				26
Channel 41 -	TBD				8
Channel 41gnd shld	XXX				7
Channel 42 +	TBD				9
Channel 42 -	TBD				28
Channel 42gnd shld	XXX				27
GND WIRE	XXX				10
Channel 43 +	TBD				11
Channel 43 -	TBD				29
Channel 43gnd shld	XXX				30
Channel 44 +	TBD				31
Channel 44 -	TBD				12
Channel 44gnd shld	XXX				13
Channel 45 +	TBD				14
Channel 45 -	TBD				32
Channel 45gnd	XXX				33
Channel 46 +	TBD				34
Channel 46 -	TBD				15
Channel 46gnd shld	XXX				16
Channel 47 +	TBD				17
Channel 47 -	TBD				35
Channel 47gnd shld	XXX				36
Channel 48 +	TBD				37
Channel 48 -	TBD				18
Channel 48gnd shld	TBD				19

XXX= on ground wire ring, supported by the 4 otherwise unused contacts.

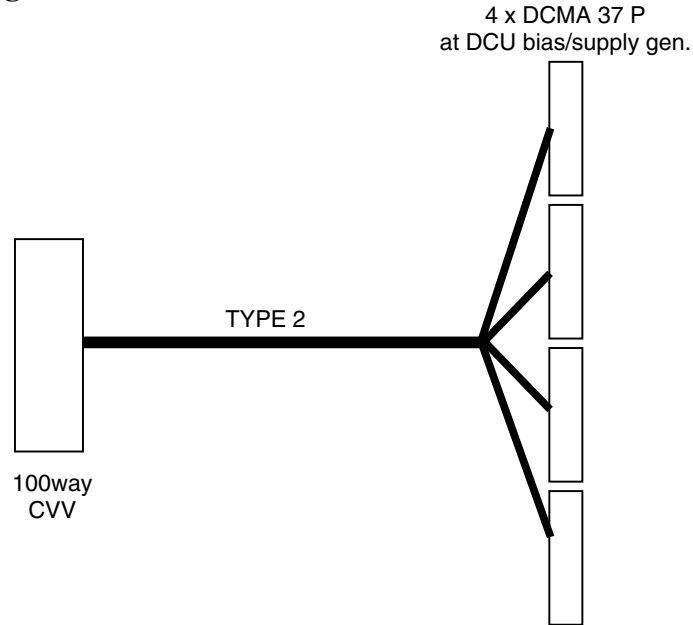


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 28 of 124

4.2.3 I3 HSDCU to CVV3 Type2

Overall Mechanical Drwg.



Connector/Backshell Details

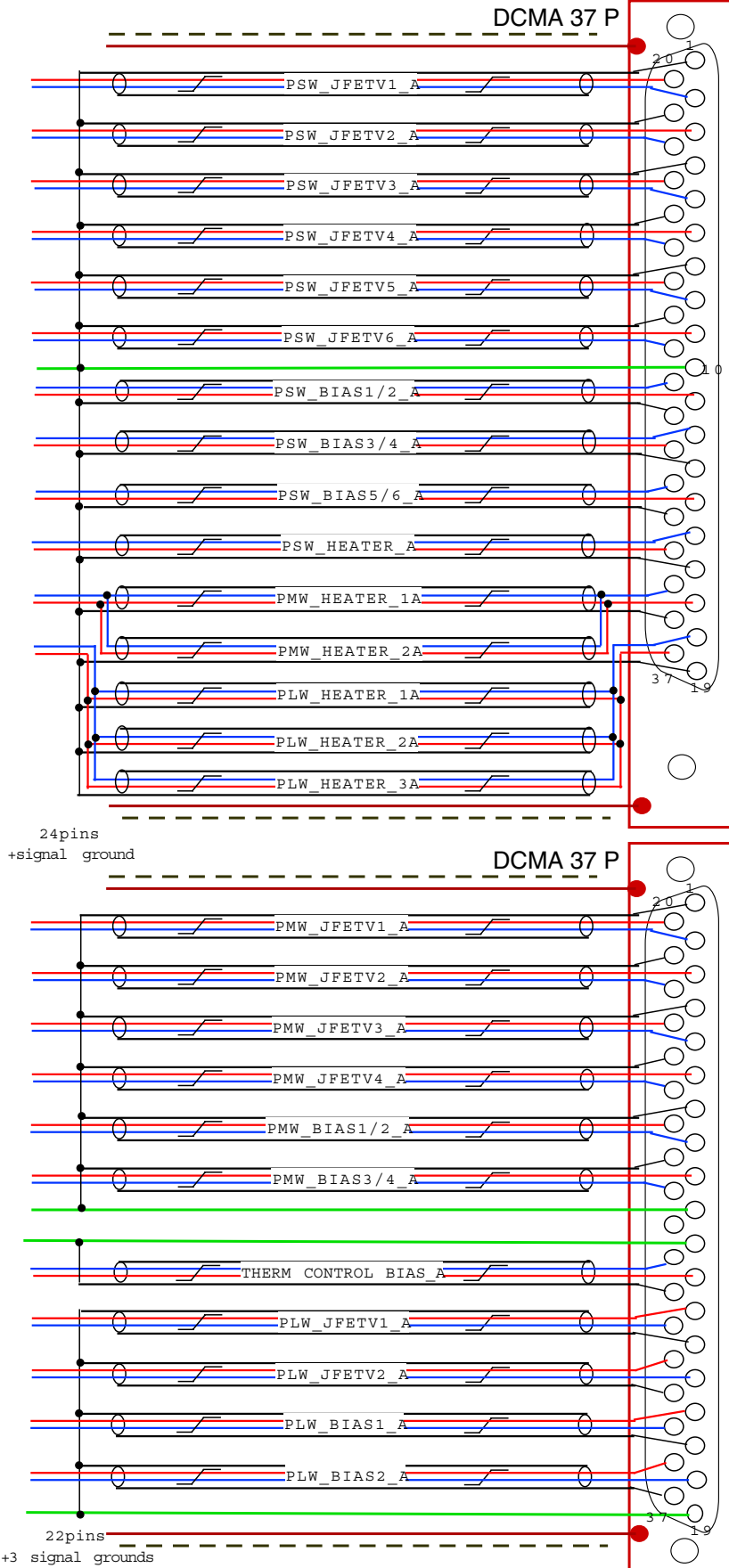
- DCMA 37P + xxxxxx: interface to HFDCU J29 PHOT BIAS A1
- DCMA 37P + xxxxxx: interface to HFDCU J31 PHOT BIAS A2
- DCMA 37P + xxxxxx: interface to HFDCU J30 PHOT BIAS B1
- DCMA 37P + xxxxxx: interface to HFDCU J32 PHOT BIAS B2



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 29 of 124

Harness Layup



Type 2A Side Photometer Bias/Supply at DCU

Gauge TBD because they all need 5mA rating...heaters have same current as JFET supplies if are substitute power off the same value of voltage.

Note ground separation on 2nd tail.

The whole overlain with RF screen

Dotted lines show insulation, probably put around bundles but only strictly needed at clamp points.

Note that for the other Bias tails change the last A in each name to B

WARNING: Depending on DCU H/W, and heater/bias/supply partitioning, the split into 2 x 37 could change, TBC.



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 30 of 124

Contact Details

Name	100Way #3	37way J29	37way J31	37Way J30	37way J32
PSW_JFETV1_A +		20			
PSW_JFETV1_A -		2			
PSW_JFETV1_A shld		1			
PSW_JFETV2_A +		3			
PSW_JFETV2_A -		22			
PSW_JFETV2_A shld		21			
PSW_JFETV3_A +		23			
PSW_JFETV3_A -		4			
PSW_JFETV3_A shld		5			
PSW_JFETV4_A +		6			
PSW_JFETV4_A -		25			
PSW_JFETV4_A shld		24			
PSW_JFETV5_A +		26			
PSW_JFETV5_A -		8			
PSW_JFETV5_A shld		7			
PSW_JFETV6_A +		9			
PSW_JFETV6_A -		28			
PSW_JFETV6_A shld		27			
PSW GRND_A		10			
PSW_BIAS1/2_A +		11			
PSW_BIAS1/2_A -		29			
PSW_BIAS1/2_A shld		30			
PSW_BIAS3/4_A +		31			
PSW_BIAS3/4_A -		12			
PSW_BIAS3/4_A shld		13			
PSW_BIAS5/6_A +		14			
PSW_BIAS5/6_A -		32			
PSW_BIAS5/6_A shld		33			
PSW_HEATER_A +		34			
PSW_HEATER_A -		15			
PSW_HEATER_A shld		16			
PMW_HEATER_A +x2		17			
PMW_HEATER_A -x2		35			
PMW_HEATER_A shldx2		36			
PLW_HEATER_A + x3		37			
PLW_HEATER_A- x3		18			
PLW_HEATER_A shld x3		19			
PMW_JFETV1_A +			20		
PMW_JFETV1_A -			2		
PMW_JFETV1_A shld			1		
PMW_JFETV2_A +			3		
PMW_JFETV2_A -			22		
PMW_JFETV2_A shld			21		
PMW_JFETV3_A +			23		
PMW_JFETV3_A -			5		
PMW_JFETV3_A shld			4		
PMW_JFETV4_A +			6		
PMW_JFETV4_A -			25		
PMW_JFETV4_A shld			24		
PMW_BIAS1/2_A +			26		
PMW_BIAS1/2_A -			8		
PMW_BIAS1/2_A shld			7		
PMW_BIAS3/4_A +			9		
PMW_BIAS3/4_A -			28		
PMW_BIAS3/4_A shld			27		
PMW_AGND WIRE			10		



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 31 of 124

Name	100Way #3	37way J29	37way J31	37Way J30	37way J32
Therm_AGND WIRE			11		
THERM CONTROL BIAS_A +			12		
THERM CONTROL BIAS_A -			30		
THERM CONTROL BIAS_A shld.			31		
PLW_JFETV1_A +			13		
PLW_JFETV1_A -			32		
PLW_JFETV1_A shld			15		
PLW_JFETV2_A +			33		
PLW_JFETV2_A -			15		
PLW_JFETV2_A shld			34		
PLW_BIAS1/2_A +			16		
PLW_BIAS1/2_A -			36		
PLW_BIAS1/2_A shld			17		
PLW_BIAS3/4_A +			37		
PLW_BIAS3/4_A -			18		
PLW_BIAS3/4_A shld			37		
PLW_A GND WIRE			19		
PSW_JFETV1_B +				20	
PSW_JFETV1_B -				2	
PSW_JFETV1_B shld				1	
PSW_JFETV2_B +				3	
PSW_JFETV2_B -				22	
PSW_JFETV2_B shld				21	
PSW_JFETV3_B +				23	
PSW_JFETV3_B -				4	
PSW_JFETV3_B shld				5	
PSW_JFETV4_B +				6	
PSW_JFETV4_B -				25	
PSW_JFETV4_B shld				24	
PSW_JFETV5_B +				26	
PSW_JFETV5_B -				8	
PSW_JFETV5_B shld				7	
PSW_JFETV6_B +				9	
PSW_JFETV6_B -				28	
PSW_JFETV6_B shld				27	
PSW GRND_B				10	
PSW_BIAS1/2_B +				11	
PSW_BIAS1/2_B -				29	
PSW_BIAS1/2_B shld				30	
PSW_BIAS3/4_B +				31	
PSW_BIAS3/4_B -				12	
PSW_BIAS3/4_B shld				13	
PSW_BIAS5/6_B +				14	
PSW_BIAS5/6_B -				32	
PSW_BIAS5/6_B shld				33	
PSW_HEATER_B +				34	
PSW_HEATER_B -				15	
PSW_HEATER_B shld				16	
PMW_HEATER_B +x2				17	
PMW_HEATER_B -x2				35	
PMW_HEATER_B shldx2				36	
PLW_HEATER_B + x3				37	
PLW_HEATER_B- x3				18	
PLW_HEATER_B shld x3				19	
PMW_JFETV1_B +					20
PMW_JFETV1_B -					2
PMW_JFETV1_B shld					1



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 32 of 124

Name	100Way #3	37way J29	37way J31	37Way J30	37way J32
PMW_JFETV2_B +					3
PMW_JFETV2_B -					22
PMW_JFETV2_B shld					21
PMW_JFETV3_B +					23
PMW_JFETV3_B -					5
PMW_JFETV3_B shld					4
PMW_JFETV4_B +					6
PMW_JFETV4_B -					25
PMW_JFETV4_B shld					24
PMW_BIAS1/2_B +					26
PMW_BIAS1/2_B -					8
PMW_BIAS1/2_B shld					7
PMW_BIAS3/4_B +					9
PMW_BIAS3/4_B -					28
PMW_BIAS3/4_B shld					27
PMW_GND_B					10
Therm GND_B					11
THERM CONTROL BIAS_B +					12
THERM CONTROL BIAS_B -					30
THERM CONTROL BIAS_B shld.					31
PLW_JFETV1_B +					13
PLW_JFETV1_B -					32
PLW_JFETV1_B shld					15
PLW_JFETV2_B +					33
PLW_JFETV2_B -					15
PLW_JFETV2_B shld					34
PLW_BIAS1/2_B +					16
PLW_BIAS1/2_B -					36
PLW_BIAS1/2_B shld					17
PLW_BIAS3/4_B +					37
PLW_BIAS3/4_B -					18
PLW_BIAS3/4_B shld					37
PLW_B GND WIRE					19

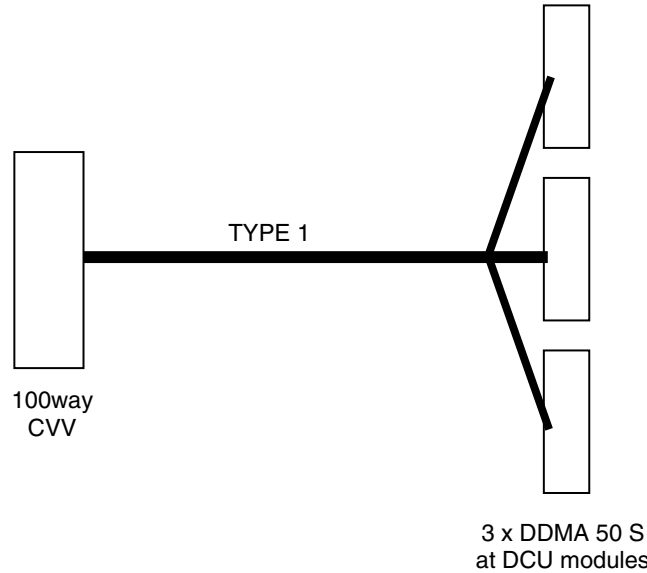


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 33 of 124

4.2.4 I4 HSDCU to CVV4 Type1

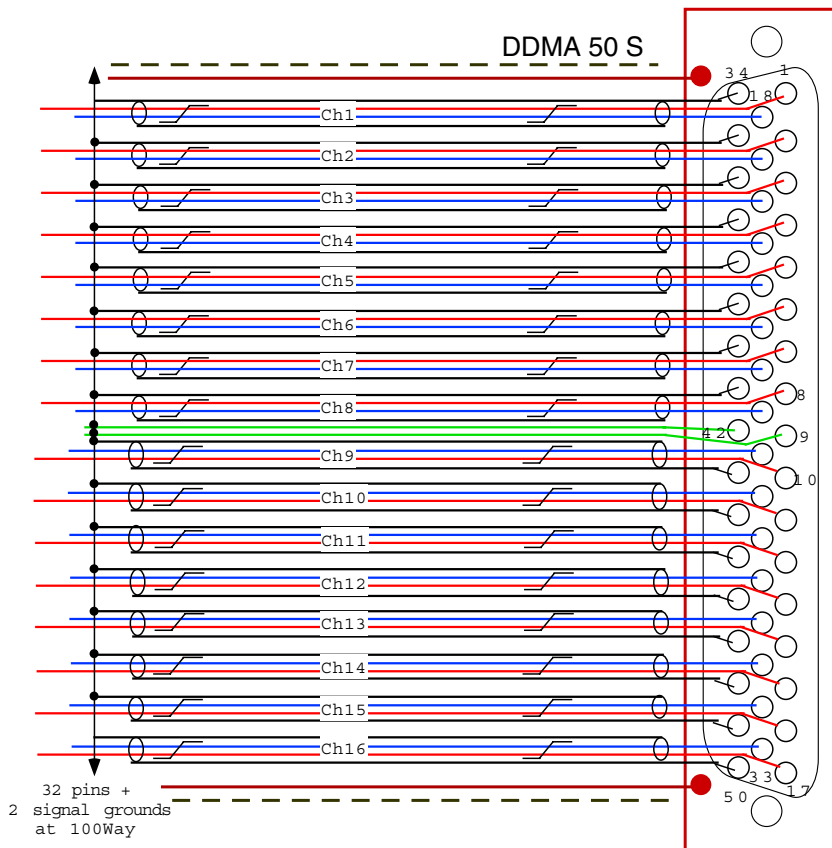
Overall Mechanical Drwg.



Connector/Backshell Details

DDMA 50 S + XXXX: interface to HFDCU J20 16ch. bolometer
 DDMA 50 S + XXXX: interface to HFDCU J21 16ch. bolometer
 DDMA 50 S + XXXX: interface to HFDCU J22 16ch. bolometer

Harness Layup



Type 1 DCU tails

Common to all 3 tails, although others have ch. 17-32 and 33-48.
 Good flat layup for cryoharness

16 insulated screen twisted pairs plus 2 ground pins with single higher conductivity signal gnd. conductors....even 2 x 28AWG standard copper might add little to total harness' conductivity TBC.

The whole overlain with RF screen shown:

Dotted lines indicate insulation, probably put all around bundles but only strictly needed at clamp points.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 34 of 124

Contact Details

Note the contacts are named as "channels 1-48" end-to-end, and mapping to specific detector position is only maintained internally to the instrument.

Name	100Way #4	50way A	50wayB	50way C
Channel 1 +	TBD	1		
Channel 1 -	TBD	18		
Channel 1gnd shld	XXX	34		
Channel 2 +	TBD	2		
Channel 2 -	TBD	19		
Channel 2gnd shld	XXX	35		
Channel 3 +	TBD	3		
Channel 3 -	TBD	20		
Channel 3gnd shld	XXX	36		
Channel 4 +	TBD	4		
Channel 4 -	TBD	21		
Channel 4gnd shld	XXX	37		
Channel 5 +	TBD	5		
Channel 5 -	TBD	22		
Channel 5gnd shld	XXX	38		
Channel 6 +	TBD	6		
Channel 6 -	TBD	23		
Channel 6gnd shld	XXX	39		
Channel 7 +	TBD	7		
Channel 7 -	TBD	24		
Channel 7gnd shld	XXX	40		
Channel 8 +	TBD	8		
Channel 8 -	TBD	25		
Channel 8gnd shld	XXX	41		
GND WIRE	XXX	9		
GND WIRE	XXX	42		
Channel 9 +	TBD	10		
Channel 9 -	TBD	26		
Channel 9gnd shld	XXX	43		
Channel 10 +	TBD	11		
Channel 10 -	TBD	27		
Channel 10gnd shld	XXX	44		
Channel 11 +	TBD	12		
Channel 11 -	TBD	28		
Channel 11gnd shld	XXX	45		
Channel 12 +	TBD	13		
Channel 12 -	TBD	29		
Channel 12gnd shld	TBD	46		
Channel 13 +	TBD	14		
Channel 13 -	TBD	30		
Channel 1gnd shld	XXX	47		
Channel 14 +	TBD	15		
Channel 14 -	TBD	31		
Channel 1gnd shld	XXX	48		
Channel 15 +	TBD	16		
Channel 15 -	TBD	32		
Channel 15gnd shld	XXX	49		
Channel 16 +	TBD	17		
Channel 16 -	TBD	33		
Channel 16gnd shld	XXX	50		
Channel 17 +	TBD		1	
Channel 17 -	TBD		18	
Channel 17gnd shld	XXX		34	



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 35 of 124

Name	100Way #4	50way A	50wayB	50way C
Channel 18 +	TBD		2	
Channel 18 -	TBD		19	
Channel 18gnd shld	XXX		35	
Channel 19 +	TBD		3	
Channel 19 -	TBD		20	
Channel 19gnd shld	XXX		36	
Channel 20 +	TBD		4	
Channel 20 -	TBD		21	
Channel 1gnd shld	XXX		37	
Channel 21 +	TBD		5	
Channel 21 -	TBD		22	
Channel 21gnd shld	XXX		38	
Channel 22 +	TBD		6	
Channel 22 -	TBD		23	
Channel 22gnd shld	XXX		39	
Channel 23 +	TBD		7	
Channel 23 -	TBD		24	
Channel 23gnd shld	XXX		40	
Channel 24 +	TBD		8	
Channel 24 -	TBD		25	
Channel 24gnd shld	TBD		41	
GND WIRE	XXX		9	
GND WIRE	XXX		42	
Channel 25 +	TBD		10	
Channel 25 -	TBD		26	
Channel 25gnd shld	XXX		43	
Channel 26 +	TBD		11	
Channel 26 -	TBD		27	
Channel 26gnd shld	XXX		44	
Channel 27 +	TBD		12	
Channel 27 -	TBD		28	
Channel 27gnd shld	XXX		45	
Channel 28 +	TBD		13	
Channel 28 -	TBD		29	
Channel 28gnd shld	XXX		46	
Channel 29 +	TBD		14	
Channel 29 -	TBD		30	
Channel 29gnd shld	XXX		47	
Channel 30 +	TBD		15	
Channel 30 -	TBD		31	
Channel 30gnd shld	XXX		48	
Channel 31 +	TBD		16	
Channel 31 -	TBD		32	
Channel 31gnd shld	XXX		49	
Channel 32 +	TBD		17	
Channel 32 -	TBD		33	
Channel 32gnd shld	XXX		50	
Channel 33 +	TBD			1
Channel 33 -	TBD			18
Channel 33gnd shld	XXX			34
Channel 34 +	TBD			2
Channel 34 -	TBD			19
Channel 34gnd shld	XXX			35
Channel 35 +	TBD			3
Channel 35 -	TBD			20
Channel 35gnd shld	XXX			36
Channel 36 +	TBD			4



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 36 of 124

Name	100Way #4	50way A	50wayB	50way C
Channel 36 -	TBD			21
Channel 36gnd shld	TBD			37
Channel 37 +	TBD			5
Channel 37 -	TBD			22
Channel 37gnd shld	XXX			38
Channel 38 +	TBD			6
Channel 38 -	TBD			23
Channel 38gnd shld	XXX			39
Channel 39 +	TBD			7
Channel 39 -	TBD			24
Channel 39gnd shld	XXX			40
Channel 40 +	TBD			8
Channel 40 -	TBD			25
Channel 40gnd shld	XXX			41
GND WIRE	XXX			9
GND WIRE	XXX			42
Channel 41 +	TBD			10
Channel 41 -	TBD			26
Channel 41gnd shld	XXX			43
Channel 42 +	TBD			11
Channel 42 -	TBD			27
Channel 42gnd shld	XXX			44
Channel 43 +	TBD			12
Channel 43 -	TBD			28
Channel 43gnd shld	XXX			45
Channel 44 +	TBD			13
Channel 44 -	TBD			29
Channel 44gnd shld	XXX			46
Channel 45 +	TBD			14
Channel 45 -	TBD			30
Channel 45gnd shld	XXX			47
Channel 46 +	TBD			15
Channel 46 -	TBD			31
Channel 46gnd shld	XXX			48
Channel 47 +	TBD			16
Channel 47 -	TBD			32
Channel 47gnd shld	XXX			49
Channel 48 +	TBD			17
Channel 48 -	TBD			33
Channel 48gnd shld	TBD			50

XXX= on ground wire ring, supported by the 4 otherwise unused contacts.

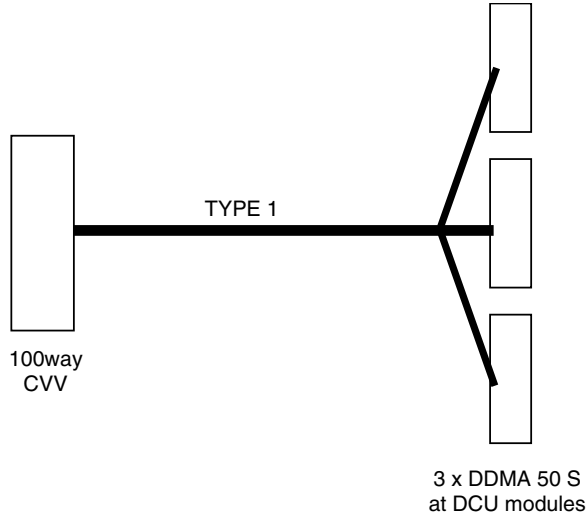


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 37 of 124

4.2.5 I5 HSDCU to CVV5 Type1

Overall Mechanical Drwg.



Connector/Backshell Details

DDMA 50 S + XXXX: interface to HFDCU J17 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J18 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J19 16ch. bolometer

Harness Layup

As I 4.

Contact Details

As I 4.

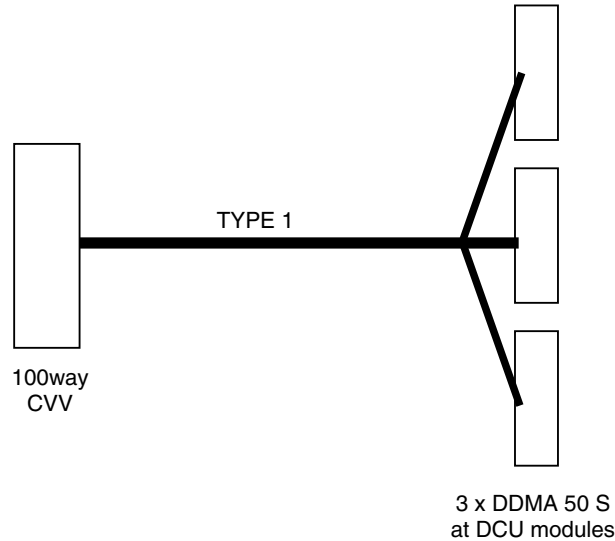


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 38 of 124

4.2.6 I6 HSDCU to CVV6 Type1

Overall Mechanical Drwg.



Connector/Backshell Details

DDMA 50 S + XXXX: interface to HFDCU J14 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J15 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J16 16ch. bolometer

Harness Layup

As I 4.

Contact Details

As I 4.

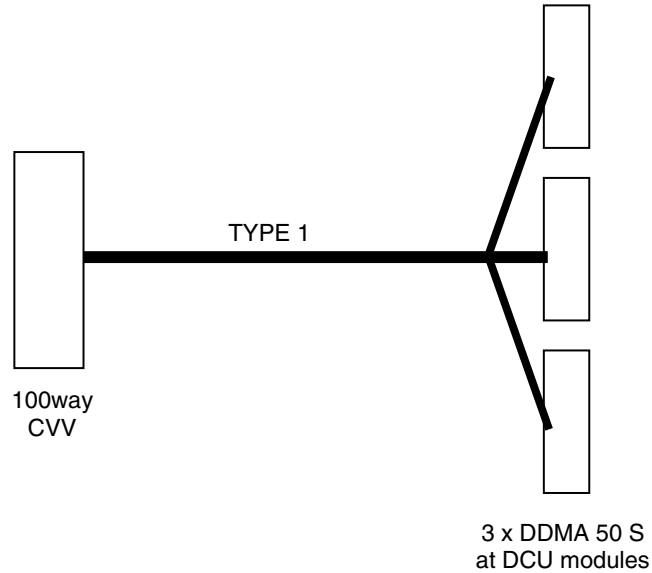


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 39 of 124

4.2.7 I7 HSDCU to CVV7 Type1

Overall Mechanical Drwg.



Connector/Backshell Details

DDMA 50 S + XXXX: interface to HFDCU J11 16ch. bolometer

DDMA 50 S + XXXX: interface to HFDCU J12 16ch. bolometer

DDMA 50 S + XXXX: interface to HFDCU J13 16ch. bolometer

Harness Layup

As I 4.

Contact Details

As I 4.

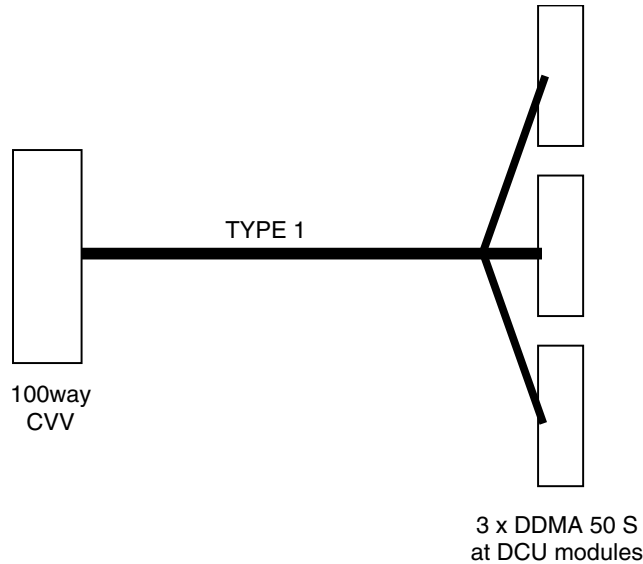


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 40 of 124

4.2.8 I8 HSDCU to CVV8 Type1

Overall Mechanical Drwg.



Connector/Backshell Details

DDMA 50 S + XXXX: interface to HFDCU J8 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J9 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J10 16ch. bolometer

Harness Layup

As I 4.

Contact Details

As I 4.

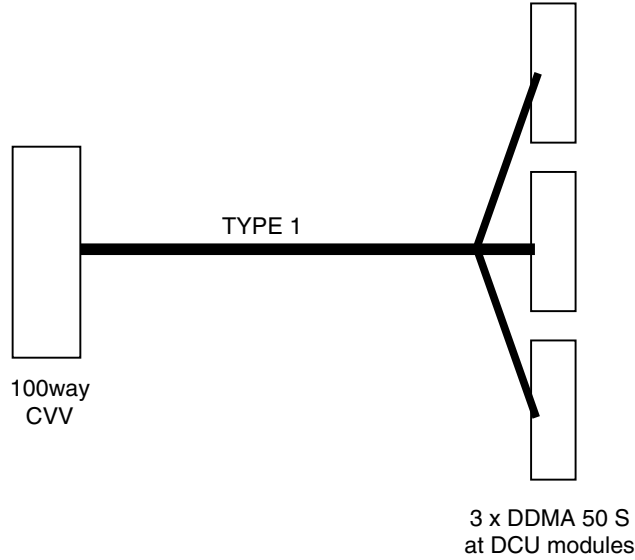


SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 41 of 124

4.2.9 I9 HSDCU to CVV9 Type1

Overall Mechanical Drwg.



Connector/Backshell Details

DDMA 50 S + XXXX: interface to HFDCU J516ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J6 16ch. bolometer
DDMA 50 S + XXXX: interface to HFDCU J7 16ch. bolometer

Harness Layup

As I 4.

Contact Details

As I 4.

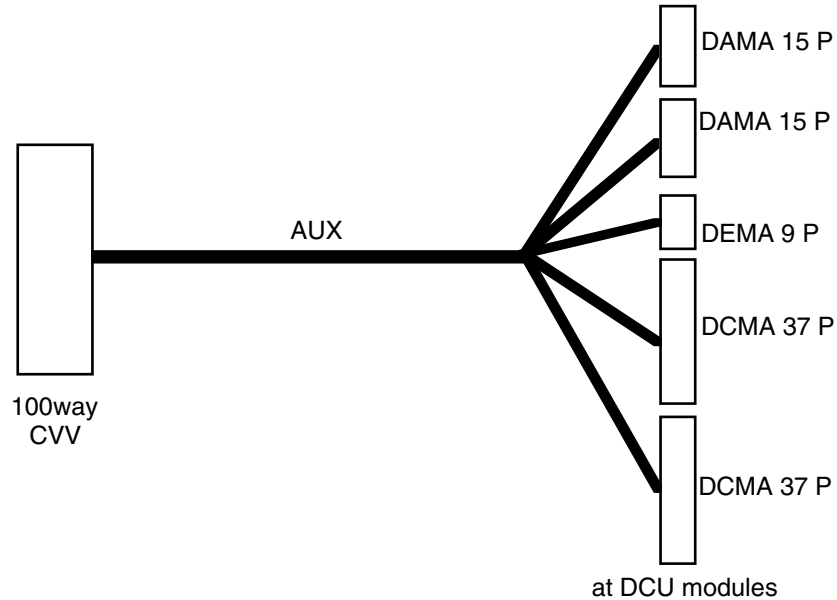


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 42 of 124

4.2.10 I10 HSDCU to CVV10 AUX-P

Overall Mechanical Drwg.



Connector/Backshell Details

Prime side harness

DAMA 15 P + XXXX: interface to HFFCU J15 Shutter

DAMA 15 P + XXXX: interface to HFFCU J11 Cooler

DMA 9 P + XXXX: interface to HFFCU J13 FTS Stimulus

DCMA 37 P + XXXX: interface to HFFCU J23 Temperature sensors

DCMA 37 P + XXXX: interface to HFFCU J25 Temperature sensors

Harness Layup

Shutter



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 43 of 124

Shutter tail listing

Function	Pin # on J15	Max Current	Wire lay-up	Max Ohms*
Actuator Position Sensor +	1		Insulated screened twisted quad	1000
Actuator Position Sensor -	9			1000
Latch Sense +	2			1000
Latch Sense -	10			1000
Sense Shld	3			1000
Latch Drive +	11		Insulated screened twisted quad	10
Vane Heater+	4			10
Stepper Drive Phase A +	12			10
Stepper Drive Phase B +	5			10
Power Ground / Rtn. as shld	13			10
Temp Sensor Bias+	6		Insulated screened twisted quad	1000
Vane Temp V+	14			1000
Common Temp V	7			1000
Actuator Temp V-	15			1000
Temp Sensor Bias -/Shld	8			1000

Cooler Tail Listing

Function	15way J11	Max. current	Wire lay-up	Max Ohms	100way #10
Sorption Pump heater I+_A		25 mA	twisted quad	10	
Sorption Pump heater I+_B		25 mA		10	
Sorption Pump heater I-_A		25 mA		10	
Sorption Pump heater I-_B		25 mA		10	
Sorption Pump Heat Switch heater I+_A		1.5 mA	twisted quad	50	
Sorption Pump Heat Switch heater I+_B		1.5 mA		50	
Sorption Pump Heat Switch heater I-_A		1.5 mA		50	
Sorption Pump Heat Switch heater I-_B		1.5 mA		50	
Evaporator Heat Switch heater I+_A		1.5 mA	twisted quad	50	
Evaporator Heat Switch heater I+_B		1.5 mA		50	
Evaporator Heat Switch heater I-_A		1.5 mA		50	
Evaporator Heat Switch heater I-_B		1.5 mA		50	

12 ways used. Could add 3 screens that do not go through the 100way?

Spectrometer Stimulus Tail Listing

Function	9way J13	Max. current	Wire lay-up	Max Ohms	100way #10
HS Spect. Flood heater I+_A	12	9 mA	twisted quad	30	
HS Spect. Flood heater I+_B	32	9 mA		30	
HS Spect. Flood heater I-_A	32	9 mA		30	
HS Spect. Flood heater I-_B	32	9 mA		30	
HS Spect. Point heater I+_A	15	7 mA	twisted quad	30	
HS Spect. Point heater I+_B	34	7 mA		30	
HS Spect. Point heater I-_A	16	7 mA		30	
HS Spect. Point heater I-_B	35	7 mA		30	

8 ways used



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 44 of 124

FPU Thermometry Listing A

Function	37way J23	Max. current	Wire lay-up	Max Ohms	100way #10
Spect JFET chassis temperature I+		1 μ A	Insulated screened twisted quad	1000	
Spect JFET chassis temperature V+		N/A		1000	
Spect JFET chassis temperature V-		N/A		1000	
Spect JFET chassis temperature I-		1 μ A		1000	
Spect JFET chassis temperature shld*A		N/A		N/A	
Phot JFET chassis temperature I+		1 μ A	Insulated screened twisted quad	1000	
Phot JFET chassis temperature V+		N/A		1000	
Phot JFET chassis temperature V-		N/A		1000	
Phot JFET chassis r temperature I-		1 μ A		1000	
Phot JFET chassis temperature shld*		N/A		N/A	linkedA
HSFPU Opt. Bench temperature I+		1 μ A	Insulated screened twisted quad	1000	
HSFPU Opt. Bench temperature V+		N/A		1000	
HSFPU Opt. Bench temperature V-		N/A		1000	
HSFPU Opt. Bench temperature I-		1 μ A		1000	
HSFPU Opt. Bench temperature shld*B		N/A		N/A	
Spectrometer 2K box temperature I+		1 μ A	Insulated screened twisted quad	1000	
Spectrometer 2K box temperature V+		N/A		1000	
Spectrometer 2K box temperature V-		N/A		1000	
Spectrometer 2K box temperature I-		1 μ A		1000	
Spectrometer 2K box temperature shld*		N/A		N/A	linkedB
Photometer 2K box temperature I+		1 μ A	Insulated screened twisted quad	1000	
Photometer 2K box temperature V+		N/A		1000	
Photometer 2K box temperature V-		N/A		1000	
Photometer 2K box temperature I-		1 μ A		1000	
Photometer 2K box temperature shld*C		N/A		N/A	
M3,5,7 Optical Subench temperature I+		1 μ A	Insulated screened twisted quad	1000	
M3,5,7 Optical Subench temperature V+		N/A		1000	
M3,5,7 Optical Subench temperature V-		N/A		1000	
M3,5,7 Optical Subench temperature I-		1 μ A		1000	
M3,5,7 Optical Subench temperature shld*		N/A		N/A	linkedC
HSFPU Input Baffle temperature I+		1 μ A	Insulated screened twisted quad	1000	
HSFPU Input Baffle temperature V+		N/A		1000	
HSFPU Input Baffle temperature V-		N/A		1000	
HSFPU Input Baffle temperature I-		1 μ A		1000	
HSFPU Input Baffle temperature shld*		N/A		N/A	
BSM/SOB I/F temperature I+		1 μ A	Insulated screened twisted quad	1000	
BSM/SOB I/F temperature V+		N/A		1000	
BSM/SOB I/F temperature V-		N/A		1000	
BSM/SOB I/F temperature I-		1 μ A		1000	
BSM/SOB I/F temperature shld*		N/A		N/A	

*Nominally 40 ways on a 37, so common out 3 shields into pairs.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 45 of 124

FPU Thermometry Listing B

Function	37way J23	Max. current	Wire lay-up	Max Ohms	100way #10
Sorption Pump temperature I+	20	1 μ A	Insulated screened twisted quad	1000	
Sorption Pump temperature V+	1	N/A		1000	
Sorption Pump temperature V-	2	N/A		1000	
Sorption Pump temperature I-	21	1 μ A		1000	
Sorption Pump temperature shld	3	N/A		N/A	
Evaporator temperature I+	22	250 nA	Insulated screened twisted quad	1000	
Evaporator temperature V+	4	N/A		1000	
Evaporator temperature V-	5	N/A		1000	
Evaporator temperature I-	23	250 nA		1000	
Evaporator temperature shld	24	N/A		N/A	
Sorption Pump Heat Switch temperature I+	25	1 μ A	Insulated screened twisted quad	1000	
Sorption Pump Heat Switch temperature V+	6	N/A		1000	
Sorption Pump Heat Switch temperature V-	7	N/A		1000	
Sorption Pump Heat Switch temperature I-	26	1 μ A		1000	
Sorption Pump Heat Switch temperature shld	8	N/A		N/A	
Evaporator Heat Switch temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
Evaporator Heat Switch temperature V+	9	N/A		1000	
Evaporator Heat Switch temperature V-	10	N/A		1000	
Evaporator Heat Switch temperature I-	28	1 μ A		1000	
Evaporator Heat Switch temperature shld	29	N/A		N/A	
Thermal Shunt temperature I+_A	30	1 μ A	Insulated screened twisted quad	1000	
Thermal Shunt temperature V+_B	11	N/A		1000	
Thermal Shunt temperature V-_A	12	N/A		1000	
Thermal Shunt temperature I-_B	31	1 μ A		1000	
Thermal Shunt temperature shld	13	N/A		N/A	
HS Spect. Flood Stimulus temperature I+	5	1 μ A	Insulated screened twisted quad	1000	
HS Spect. Flood Stimulus ttemperature V+	24	N/A		1000	
HS Spect. Flood Stimulus t temperature V-	6	N/A		1000	
HS Spect. Flood Stimulus t temperature I-	25	1 μ A		1000	
HS Spect. Flood Stimulus ttemperature shld	23	N/A		N/A	
HS Spect. Stimulus nr. SOB temperature I+	7	1 μ A	Insulated screened twisted quad	1000	
HS Spect. Stimulus nr. SOB temperature V+	26	N/A		1000	
HS Spect. Stimulus nr. SOB temperature V-	8	N/A		1000	
HS Spect. Stimulus nr. SOB temperature I-	27	1 μ A		1000	
HS Spect. Stimulus nr. SOB temperature shld	9	N/A		N/A	

35 out of 37 ways in use.

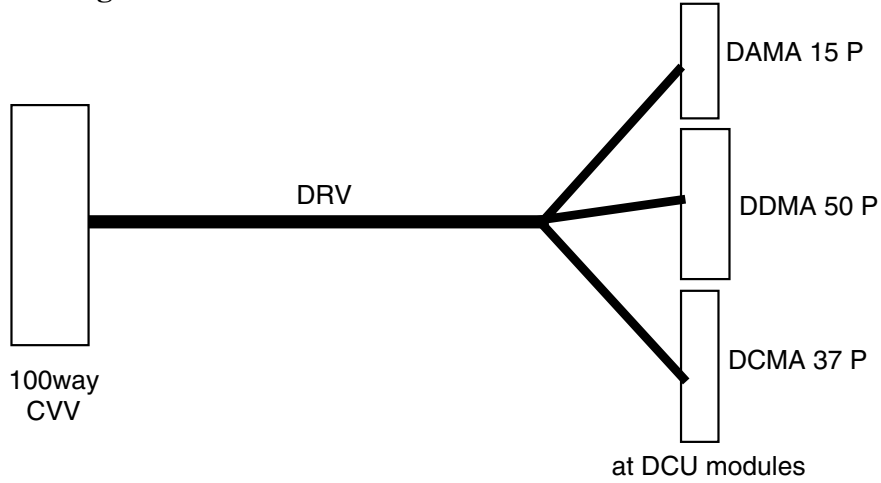


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 46 of 124

4.2.11 I11 HSDCU to CVV11 DRV-P

Overall Mechanical Drwg.

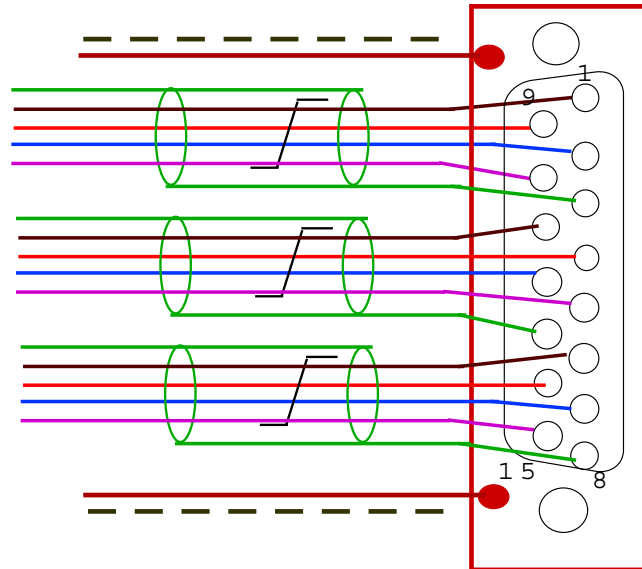


Connector/Backshell Details

Redundant side harness
DAMA15 P + XXXX: interface to HFFCU J21 Temperatures
DQMA 50 P + XXXX: interface to HFFCU J17 SMEC
DCMA 37 P + XXXX: interface to HFFCU J19 BSM

Harness Layup

Temperatures





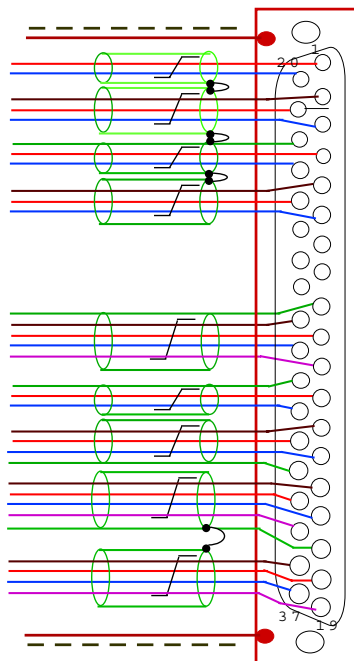
SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 47 of 124

SMEC

TBD

BSM Tail





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 48 of 124

Temperature Tail Listing

Function	15way J21	Max. current	Wire lay-up	Max Ohms	100way #11
BSM temperature I+	1	1 μ A	Insulated screened twisted quad	1000	
BSM temperature V+	9	N/A		1000	
BSM temperature V-	10	N/A		1000	
BSM temperature I-	2	1 μ A		1000	
BSM temperature shld	3	N/A		N/A	
SMEC temperature I+	11	10 μ A	Insulated screened twisted quad	1000	
SMEC temperature V+	4	N/A		1000	
SMEC temperature V-	5	N/A		1000	
SMEC temperature I-	12	10 μ A		1000	
SMEC temperature shld	13	N/A		N/A	
SMEC/SOB I/F temperature I+	6	10 μ A	Insulated screened twisted quad	1000	
SMEC/SOB I/F temperature V+	14	N/A		1000	
SMEC/SOB I/F temperature V-	15	N/A		1000	
SMEC/SOB I/F temperature I-	7	10 μ A		1000	
SMEC/SOB I/F temperature shld	8	N/A		N/A	

15 contacts used.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 49 of 124

SMEC Tail Listing

Function	50way J23	Max. current	Wire lay-up	Max Ohms	100way #11
FTS pos. sensor1		1mA		1000	
FTS pos. sensor2		1mA		1000	
FTS pos. sensor3		1mA		1000	
FTS pos. sensor4		1mA		1000	
FTS pos. sensor5		1mA		1000	
FTS pos. sensor6		1mA	M	1000	
FTS pos. sensor7		1mA		1000	
FTS pos. sensor8		1mA	A	1000	
FTS pos. sensor9		1mA		1000	
FTS pos. sensor10		1mA	Y	1000	
FTS pos. sensor11		1mA		1000	
FTS pos. sensor12		1mA	B	1000	
FTS pos. sensor13		1mA		1000	
FTS pos. sensor14		1mA	E	1000	
FTS pos. sensor15		1mA		1000	
FTS pos. sensor16		1mA		1000	
FTS pos. sensor17		1mA		1000	
FTS pos. sensor18		1mA		1000	
FTS pos. sensor19		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
SMEC Drive Coil I+		100mA	Insulated screened twisted pair	5	
SMEC Drive Coil I-		100mA		5	
SMEC Drive Coil shld		N/A		N/A	
SMEC Drive Coil (Rob) I+		100mA	Insulated screened twisted pair	5	
SMEC Drive Coil (Rob) I-		100mA		5	
SMEC Drive Coil (Rob) shld		N/A		N/A	
SMEC Drive Coil V+		10 µA	Insulated screened twisted pair	500	
SMEC Drive Coil V-		10 µA		500	
SMEC Drive Coil shld		N/A		N/A	
SMEC LVDT Coil 1		10 µA	Insulated screened twisted pair	500	
SMEC LVDT Coil 1		10 µA		500	
SMEC LVDT Coil 1 shld*		N/A		N/A	linked
SMEC LVDT Coil 2		10 µA	Insulated screened twisted pair	500	
SMEC LVDT Coil 2		10 µA		500	
SMEC LVDT Coil 2 shld*		N/A		N/A	
SMEC LVDT Coil 3		10 µA	Insulated screened twisted pair	500	
SMEC LVDT Coil 3		10 µA		500	
SMEC LVDT Coil 3 shld*		N/A		N/A	linked
SMEC Launch latch confirmation 1		1mA	Insulated screened twisted pair	100	
SMEC Launch latch confirmation 2		1mA		100	
Launch latch confirmation shld to platform gnd		N/A		N/A	
SMEC Launch latch drive 1		35mA	Insulated screened twisted pair	10	
SMEC Launch latch drive 2		35mA		10	
SMEC Launch latch drive shld		N/A		N/A	

50 ways used



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 50 of 124

BSM Tail Listing

Function	37way J25	Max. current	Wire lay-up	Max Ohms	100way #11
Chop Position Sensor 1	1	1 μ A	Insulated screened twisted pair	1000	
Chop Position Sensor 2	20	N/A		1000	
Chop Position Sensor shld1	to A	N/A		N/A	linked
Chop Position Sensor 3	2	250 nA	Insulated screened twisted triple	1000	
Chop Position Sensor 4	21	N/A		1000	
Chop Position Sensor 5	3	N/A		1000	
Chop Position Sensor shld2=A	22	N/A		N/A	
Jiggle Position Sensor 1	4	1 μ A		Insulated screened twisted pair	1000
Jiggle Position Sensor 2	23	N/A	1000		
Jiggle Position Sensor shld1	to B	N/A	N/A		linked
Jiggle Position Sensor 3	5	250 nA	Insulated screened twisted triple	1000	
Jiggle Position Sensor 4	24	N/A		1000	
Jiggle Position Sensor 5	6	N/A		1000	
Jiggle Position Sensor shld2=B	22	N/A		N/A	
BSM temperature I+	7	1 μ A		Insulated screened twisted quad	1000
BSM temperature V+	26	N/A	1000		
BSM temperature V-	8	N/A	1000		
BSM temperature I-	27	1 μ A	1000		
BSM temperature shld	25	N/A	N/A		
BSM Launch latch confirmation 1	30	1mA	Insulated screened twisted pair	1000	
BSM Launch latch confirmation 2	12	1mA		1000	
Launch latch confirmation shld to platform gnd	31	N/A		N/A	
BSM Launch latch drive 1	13	35mA	Insulated screened twisted triple	100	
BSM Launch latch drive 2	32	35mA		100	
Launch latch drive 3..remove if toggles*.	14	35mA		100	
BSM Launch latch drive shld	33	N/A		N/A	
Chop Motor Drive 1	15	40 mA	Insulated screened twisted quad	10	
Chop Motor Drive 2	34	40 mA		10	
Chop Motor Drive 3	16	40 mA		10	
Chop Motor Drive 4	35	40 mA		10	
Chop Motor Drive shld	17	N/A		N/A	
Chop Motor Drive 1	36	40 mA	Insulated screened twisted quad	10	
Chop Motor Drive 2	18	40 mA		10	
Chop Motor Drive 3	37	40 mA		10	
Chop Motor Drive 4	19	40 mA		10	
Chop Motor Drive shld	17	N/A		N/A	linked

32 ways used, so could spread out a bit?



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 51 of 124

4.2.12 I12 HSDCU to CVV12 AUX-R

Overall Mechanical Drwg.

Redundant version of I10, and the same as it

Connector/Backshell Details

Prime side harness

DAMA 15 P + XXXX: interface to HFFCU J16 Shutter

DAMA 15 P + XXXX: interface to HFFCU J12 Cooler

DMA 9 P + XXXX: interface to HFFCU J14 FTS Stimulus

DCMA 37 P + XXXX: interface to HFFCU J24 Temperature sensors

DCMA 37 P + XXXX: interface to HFFCU J26 Temperature sensors

Harness Layup

TBD after another run-through of sub-system requirements.

Redundant version of I10, and the same as it, although note that the shutter wiring layup may be slightly different from I10 as it is only used for ground test and is not required to be Prime/Redundant except for its launch-latch confirmation.



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 52 of 124

4.2.13 I13 HSDCU to CVV13 DRV-R

Overall Mechanical Drwg.

Format as I11, maybe differing lengths.

Connector/Backshell Details

Redundant side harness

DAMA 15 P + XXXX: interface to HFFCU J22 Temperatures

DQMA 50 P + XXXX: interface to HFFCU J18 SMEC

DCMA 37 P + XXXX: interface to HFFCU J20 BSM

Harness Layup

As I11.

Contact Details

TBD after another run-through of sub-system requirements.

As I11, but add one to all the FCU connector numbers compared to I11.



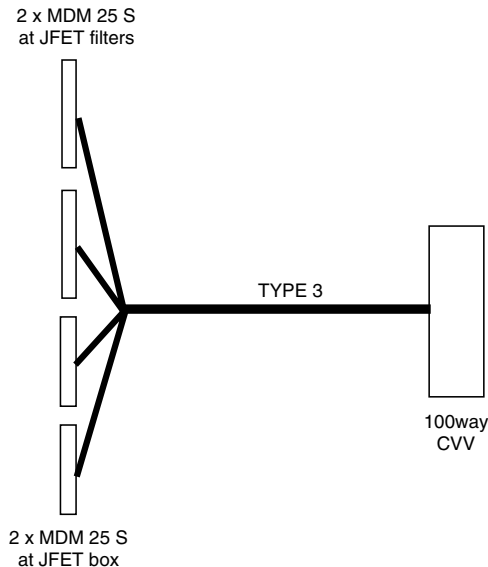
SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 53 of 124

4.3 Cryogenic Harnesses

4.3.1 C1 CVV1 to HSJFS Type3

Overall Mechanical Drwg.

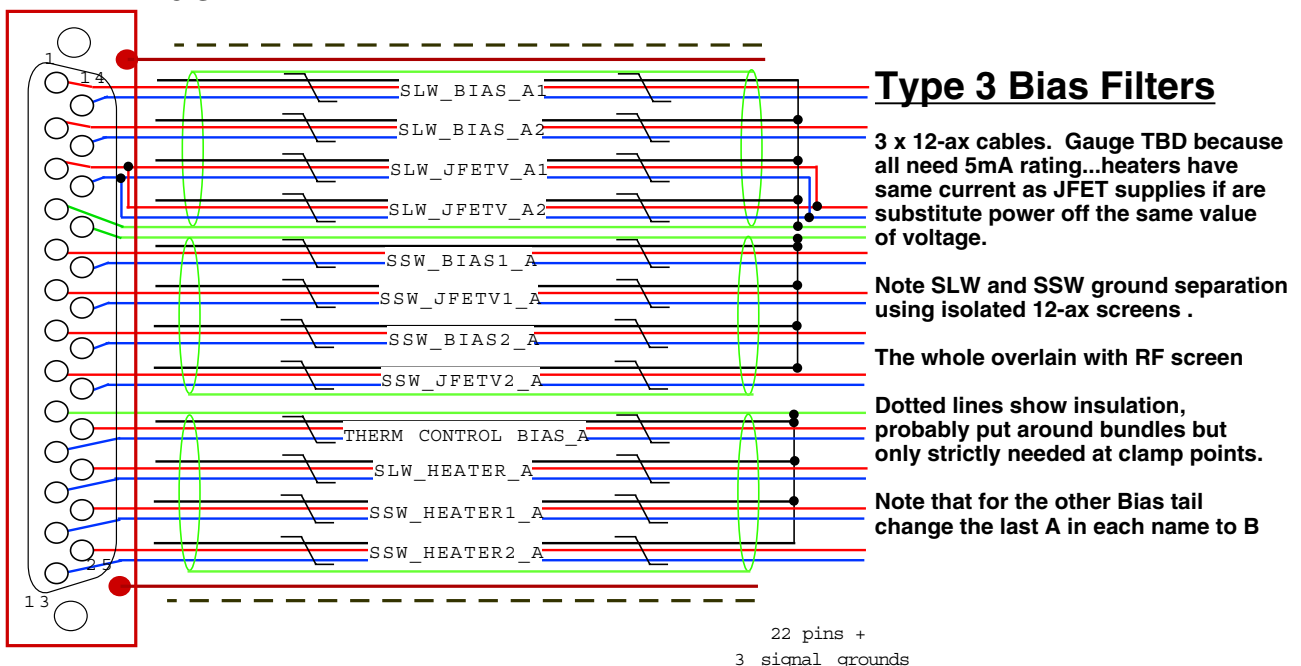


Connector/Backshell Details:

MDM 25 S + XXXX: interface to HFJFS3 J5
 MDM 25 S + XXXX: interface to HFJFS3 J6
 MDM 37 S + XXXX: interface to HFJFSF J7 bias A
 MDM 37 S + XXXX: interface to HFJFSF J8 bias B

Harness Layup

Two 25way JFET tails, each as those in C4.
 Two 25 way Spectrometer JFET Filter tails, each as follows:
 MDM 25 S



Because the small SLW has no subgroups that might fail, EACH of the two JFET membrane leads is double-wired in this cryoharness, requiring some extra wire-bonds for the bias lines in the filters.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 54 of 124

Contact details

Name	25way A	25wayB	25way C	25way D	100Way #1
Channel 1 +	1				TBD
Channel 1 -	14				TBD
Channel 1gnd shld	NC				XXX
Channel 2 +	2				TBD
Channel 2 -	15				TBD
Channel 2gnd shld	NC				XXX
Channel 3 +	3				TBD
Channel 3 -	16				TBD
Channel 3gnd shld	NC				XXX
Channel 4 +	4				TBD
Channel 4 -	17				TBD
Channel 4gnd shld	NC				XXX
Channel 5 +	5				TBD
Channel 5 -	18				TBD
Channel 5gnd shld	NC				XXX
Channel 6 +	6				TBD
Channel 6 -	19				TBD
Channel 6gnd shld	NC				XXX
Channel 7 +	20				TBD
Channel 7 -	7				TBD
Channel 7gnd shld	NC				XXX
Channel 8 +	21				TBD
Channel 8 -	8				TBD
Channel 8gnd shld	NC				XXX
Channel 9 +	22				TBD
Channel 9 -	9				TBD
Channel 9gnd shld	NC				XXX
Channel 10 +	23				TBD
Channel 10 -	10				TBD
Channel 10gnd shld	NC				XXX
Channel 11 +	24				TBD
Channel 11 -	11				TBD
Channel 11gnd shld	NC				XXX
Channel 12 +	25				TBD
Channel 12 -	12				TBD
Channel 12gnd shld	NC				TBD
SSW GND WIRE	13				XXX
Channel 13 +		1			TBD
Channel 13 -		14			TBD
Channel 13gnd shld		NC			XXX
Channel 14 +		2			TBD
Channel 14 -		15			TBD
Channel 14gnd shld		NC			XXX
Channel 15 +		3			TBD
Channel 15 -		16			TBD
Channel 15gnd shld		NC			XXX
Channel 16 +		4			TBD
Channel 16 -		17			TBD
Channel 16gnd shld		NC			XXX
Channel 17 +		5			TBD
Channel 17 -		18			TBD
Channel 17gnd shld		NC			XXX
Channel 18 +		6			TBD
Channel 18 -		19			TBD
Channel 18gnd shld		NC			XXX



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 55 of 124

Name	25way A	25wayB	25way C	25way D	100Way #1
Channel 19 +		20			TBD
Channel 19 -		7			TBD
Channel 19gnd shld		NC			XXX
Channel 20 +		21			TBD
Channel 20 -		8			TBD
Channel 1gnd shld		NC			XXX
Channel 21 +		22			TBD
Channel 21 -		9			TBD
Channel 21gnd shld		NC			XXX
Channel 22 +		23			TBD
Channel 22 -		10			TBD
Channel 22gnd shld		NC			XXX
Channel 23 +		24			TBD
Channel 23 -		11			TBD
Channel 23gnd shld		NC			XXX
Channel 24 +		25			TBD
Channel 24 -		12			TBD
Channel 24gnd shld		NC			TBD
SSW GND WIRE		13			XXX
SLW_BIAS_B1+ve			1		TBD
SLW_BIAS_B1-ve			14		TBD
SLW_BIAS_B1Eshld			NC		XXX
SLW_BIAS_B2 +ve			2		TBD
SLW_BIAS_B2 -ve			15		TBD
SLW_BIAS_B2 shld			NC		XXX
SLW_JFETV_B1 +ve			3a		TBD
SLW_JFETV_B1 -ve			16a		TBD
SLW_JFETV_B1 shld			NC		XXX
SLW_JFETV_B2 +ve			3b		TBD
SLW_JFETV_B2 -ve			16b		TBD
SLW_JFETV_B2 shld			NC		XXX
SLW_GND_WIRE_B			4		TBD
SSW_GND_WIRE_B			17		TBD
SSW_BIAS1_B +ve			5		XXX
SSW_BIAS1_B -ve			18		TBD
SSW_BIAS1_B shld			NC		TBD
SSW_JFETV1_B +ve			6		XXX
SSW_JFETV1_B -ve			19		XXX
SSW_JFETV1_B shld			NC		TBD
SSW_BIAS2_B +ve			7		XXX
SSW_BIAS2_B -ve			20		TBD
SSW_BIAS2_B shld			NC		TBD
SSW_JFETV2_B +ve			8		XXX
SSW_JFETV2_B -ve			21		XXX
SSW_JFETV2_B shld			NC		TBD
THERM. CONTROL GROUND WIRE_B			9		TBD
THERM CONTROL BIAS_B +ve			22		XXX
THERM CONTROL BIAS_B -ve			10		TBD
THERM CONTROL BIAS_B shld			NC		TBD
SLW_HEATER_B +ve			23		XXX
SLW_HEATER_B -ve			11		TBD
SLW_HEATER_B shld			NC		TBD
SSW_HEATER1_B +ve			24		XXX
SSW_HEATER1_B -ve			12		TBD
SSW_HEATER1_B shld			NC		TBD
SSW_HEATER2_B +ve			25		XXX
SSW_HEATER2_B -ve			13		TBD



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 56 of 124

Name	25way A	25wayB	25way C	25way D	100Way #1
SSW_HEATER2_B shld			NC		TBD
SLW_BIAS_B1+ve				1	TBD
SLW_BIAS_B1-ve				14	TBD
SLW_BIAS_B1Eshld				NC	XXX
SLW_BIAS_B2 +ve				2	TBD
SLW_BIAS_B2 -ve				15	TBD
SLW_BIAS_B2 shld				NC	XXX
SLW_JFETV_B1 +ve				3a	TBD
SLW_JFETV_B1 -ve				16a	TBD
SLW_JFETV_B1 shld				NC	XXX
SLW_JFETV_B2 +ve				3b	TBD
SLW_JFETV_B2 -ve				16b	TBD
SLW_JFETV_B2 shld				NC	XXX
SLW_GND WIRE_B				4	TBD
SSW_GND WIRE_B				17	TBD
SSW_BIAS1_B +ve				5	XXX
SSW_BIAS1_B -ve				18	TBD
SSW_BIAS1_B shld				NC	TBD
SSW_JFETV1_B +ve				6	XXX
SSW_JFETV1_B -ve				19	XXX
SSW_JFETV1_B shld				NC	TBD
SSW_BIAS2_B +ve				7	XXX
SSW_BIAS2_B -ve				20	TBD
SSW_BIAS2_B shld				NC	TBD
SSW_JFETV2_B +ve				8	XXX
SSW_JFETV2_B -ve				21	XXX
SSW_JFETV2_B shld				NC	TBD
THERM. CONTROL GROUND WIRE_B				9	TBD
THERM CONTROL BIAS_B +ve				22	XXX
THERM CONTROL BIAS_B -ve				10	TBD
THERM CONTROL BIAS_B shld				NC	TBD
SLW_HEATER_B +ve				23	XXX
SLW_HEATER_B -ve				11	TBD
SLW_HEATER_B shld				NC	TBD
SSW_HEATER1_B +ve				24	XXX
SSW_HEATER1_B -ve				12	TBD
SSW_HEATER1_B shld				NC	TBD
SSW_HEATER2_B +ve				25	XXX
SSW_HEATER2_B -ve				13	TBD
SSW_HEATER2_B shld				NC	TBD

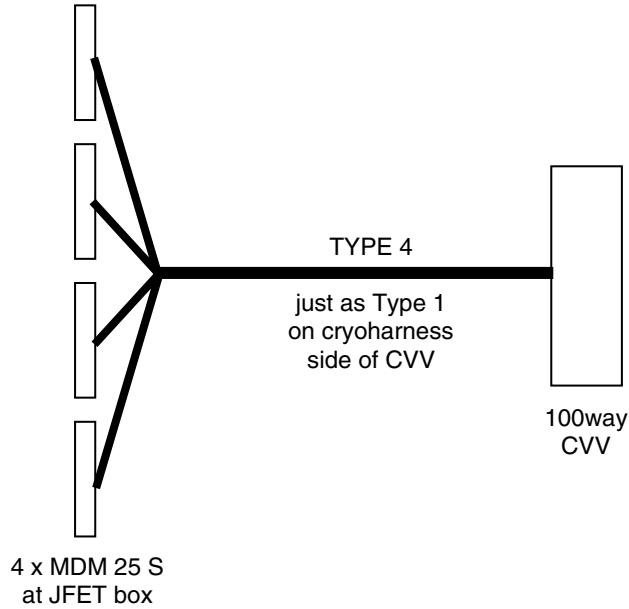


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 57 of 124

4.3.2 C2 CVV2 to HSJFS Type4

Overall Mechanical Drwg.



Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFS1 J1
MDM 25 S +xxxx: interface to HFJFS1 J2
MDM 25 S +xxxx: interface to HFJFS2 J3
MDM 25 S +xxxx: interface to HFJFS2 J4

Harness Layup

As C4, Type 1, except maybe for length.

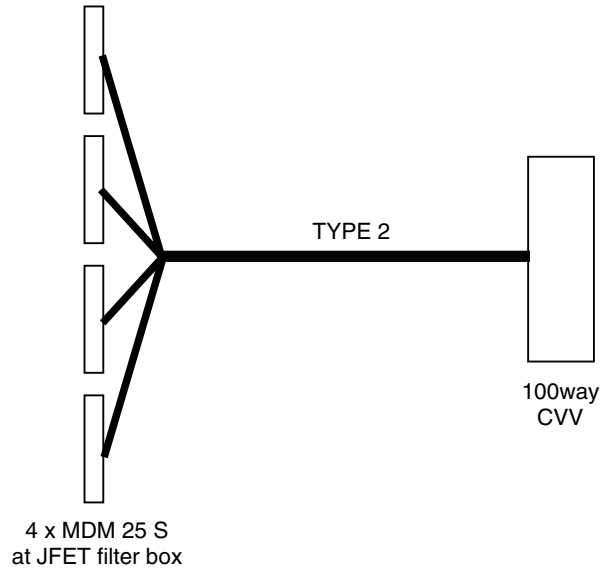


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 58 of 124

4.3.3 C3 CVV3 to HSJFP Type2

Overall Mechanical Drwg.



Connector/Backshell Details

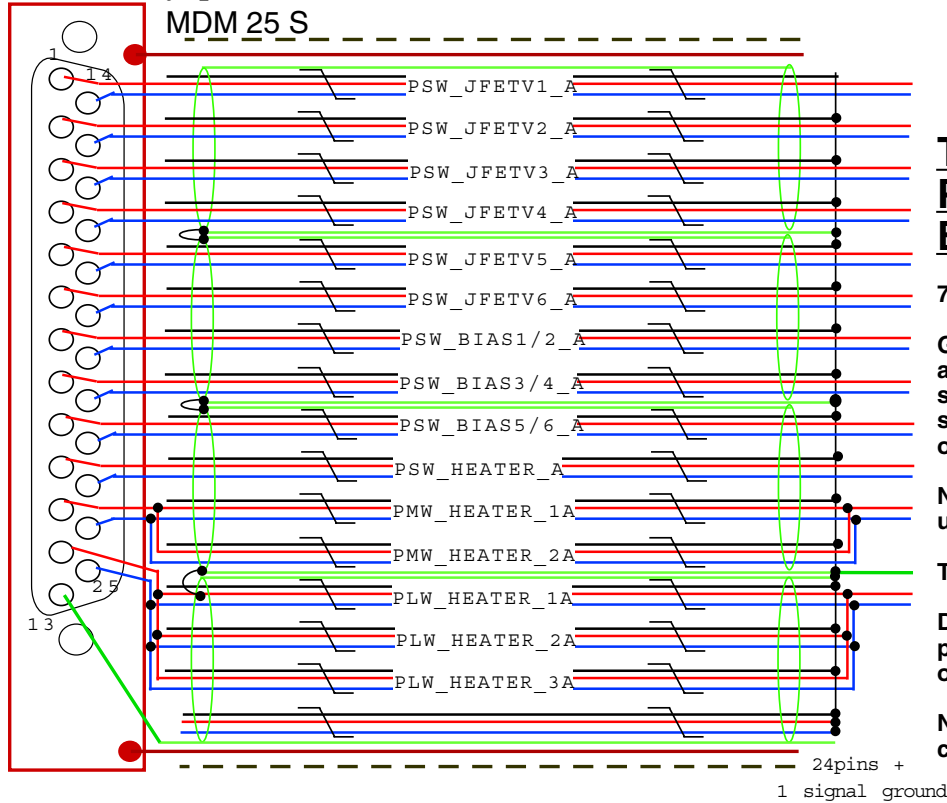
MDM 25 S +xxxx: interface to HFFP1 J25
MDM 25 S +xxxx: interface to HFFP1 J27
MDM 25 S +xxxx: interface to HFFP2 J26
MDM 25 S +xxxx: interface to HFFP2 J28



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 59 of 124

Harness Layup



Type 2A Side Photometer Bias/Supply Filters

7 x 12-ax cables spread over 2 x 25way.

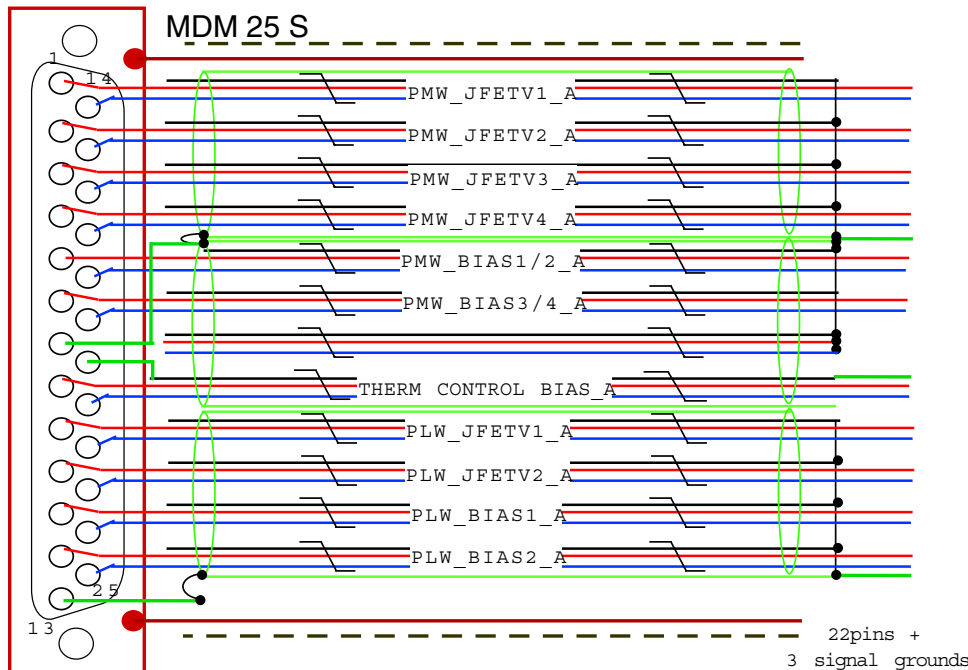
Gauge TBD because they all need 5mA rating...heaters have same current as JFET supplies if are substitute power off the same value of voltage.

Note ground separation on 2nd tail using isolated 12-ax screens .

The whole overlain with RF screen

Dotted lines show insulation, probably put around bundles but only strictly needed at clamp points.

Note that for the other Bias tails change the last A in each name to B





SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 60 of 124

Contact Details

Name	25way J25	25way J27	25Way J26	25way J28	100Way #3
PSW_JFETV1_B +	1				
PSW_JFETV1_B -	14				
PSW_JFETV1_B shld	NC				
PSW_JFETV2_B +	2				
PSW_JFETV2_B -	15				
PSW_JFETV2_B shld	NC				
PSW_JFETV3_B +	3				
PSW_JFETV3_B -	16				
PSW_JFETV3_B shld	NC				
PSW_JFETV4_B +	4				
PSW_JFETV4_B -	17				
PSW_JFETV4_B shld	NC				
PSW_JFETV5_B +	5				
PSW_JFETV5_B -	18				
PSW_JFETV5_B shld	NC				
PSW_JFETV6_B +	6				
PSW_JFETV6_B -	19				
PSW_JFETV6_B shld	NC				
PSW_BIAS1/2_B +	20				
PSW_BIAS1/2_B -	7				
PSW_BIAS1/2_B shld	NC				
PSW_BIAS3/4_B +	21				
PSW_BIAS3/4_B -	8				
PSW_BIAS3/4_B shld	NC				
PSW_BIAS5/6_B +	22				
PSW_BIAS5/6_B -	9				
PSW_BIAS5/6_B shld	NC				
PSW_HEATER_B +	23				
PSW_HEATER_B -	10				
PSW_HEATER_B shld	NC				
PMW_HEATER_B +	24				
PMW_HEATER_B -	11				
PMW_HEATER_B shld	NC				
PLW_HEATER_B +	25				
PLW_HEATER_B -	12				
PLW_HEATER_B shld	NC				
PSW_BGND WIRE	13				
PMW_JFETV1_B +		1			
PMW_JFETV1_B -		14			
PMW_JFETV1_B shld		NC			
PMW_JFETV2_B +		2			
PMW_JFETV2_B -		15			
PMW_JFETV2_B shld		NC			
PMW_JFETV3_B +		3			
PMW_JFETV3_B -		16			
PMW_JFETV3_B shld		NC			
PMW_JFETV4_B +		4			
PMW_JFETV4_B -		17			
PMW_JFETV4_B shld		NC			
PMW_BIAS1/2_B +		5			
PMW_BIAS1/2_B -		18			
PMW_BIAS1/2_B shld		NC			
PMW_BIAS3/4_B +		6			
PMW_BIAS3/4_B -		19			
PMW_BIAS3/4_B shld		NC			



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 61 of 124

Name	25way J25	25way J27	25Way J26	25way J28	100Way #3
PMW_BGND WIRE		7			
THERM CONTROL BIAS_B RTN		20			
THERM CONTROL BIAS_B +		8			
THERM CONTROL BIAS_B -		21			
PLW_JFETV1_B +		9			
PLW_JFETV1_B -		22			
PLW_JFETV1_B shld		NC			
PLW_JFETV2_B +		9			
PLW_JFETV2_B -		23			
PLW_JFETV2_B shld		NC			
PLW_BIAS1/2_B +		11			
PLW_BIAS1/2_B -		24			
PLW_BIAS1/2_B shld		NC			
PLW_BIAS3/4_B +		12			
PLW_BIAS3/4_B -		25			
PLW_BIAS3/4_B shld		NC			
PLW_B GND WIRE		13			
PSW_JFETV1_B +			1		
PSW_JFETV1_B -			14		
PSW_JFETV1_B shld			NC		
PSW_JFETV2_B +			2		
PSW_JFETV2_B -			15		
PSW_JFETV2_B shld			NC		
PSW_JFETV3_B +			3		
PSW_JFETV3_B -			16		
PSW_JFETV3_B shld			NC		
PSW_JFETV4_B +			4		
PSW_JFETV4_B -			17		
PSW_JFETV4_B shld			NC		
PSW_JFETV5_B +			5		
PSW_JFETV5_B -			18		
PSW_JFETV5_B shld			NC		
PSW_JFETV6_B +			6		
PSW_JFETV6_B -			19		
PSW_JFETV6_B shld			NC		
PSW_BIAS1/2_B +			20		
PSW_BIAS1/2_B -			7		
PSW_BIAS1/2_B shld			NC		
PSW_BIAS3/4_B +			21		
PSW_BIAS3/4_B -			8		
PSW_BIAS3/4_B shld			NC		
PSW_BIAS5/6_B +			22		
PSW_BIAS5/6_B -			9		
PSW_BIAS5/6_B shld			NC		
PSW_HEATER_B +			23		
PSW_HEATER_B -			10		
PSW_HEATER_B shld			NC		
PMW_HEATER_B +			24		
PMW_HEATER_B -			11		
PMW_HEATER_B shld			NC		
PLW_HEATER_B +			25		
PLW_HEATER_B -			12		
PLW_HEATER_B shld			NC		
PSW_B_BGND WIRE			13		
PMW_JFETV1_B +				1	
PMW_JFETV1_B -				14	
PMW_JFETV1_B shld				NC	



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 62 of 124

Name	25way J25	25way J27	25Way J26	25way J28	100Way #3
PMW_JFETV2_B +				2	
PMW_JFETV2_B -				15	
PMW_JFETV2_B shld				NC	
PMW_JFETV3_B +				3	
PMW_JFETV3_B -				16	
PMW_JFETV3_B shld				NC	
PMW_JFETV4_B +				4	
PMW_JFETV4_B -				17	
PMW_JFETV4_B shld				NC	
PMW_BIAS1/2_B +				5	
PMW_BIAS1/2_B -				18	
PMW_BIAS1/2_B shld				NC	
PMW_BIAS3/4_B +				6	
PMW_BIAS3/4_B -				19	
PMW_BIAS3/4_B shld				NC	
PMW_BGND WIRE				7	
THERM CONTROL BIAS_B RTN				20	
THERM CONTROL BIAS_B +				8	
THERM CONTROL BIAS_B -				21	
PLW_JFETV1_B +				9	
PLW_JFETV1_B -				22	
PLW_JFETV1_B shld				NC	
PLW_JFETV2_B +				9	
PLW_JFETV2_B -				23	
PLW_JFETV2_B shld				NC	
PLW_BIAS1/2_B +				11	
PLW_BIAS1/2_B -				24	
PLW_BIAS1/2_B shld				NC	
PLW_BIAS3/4_B +				12	
PLW_BIAS3/4_B -				25	
PLW_BIAS3/4_B shld				NC	
PLW_B GND WIRE				13	

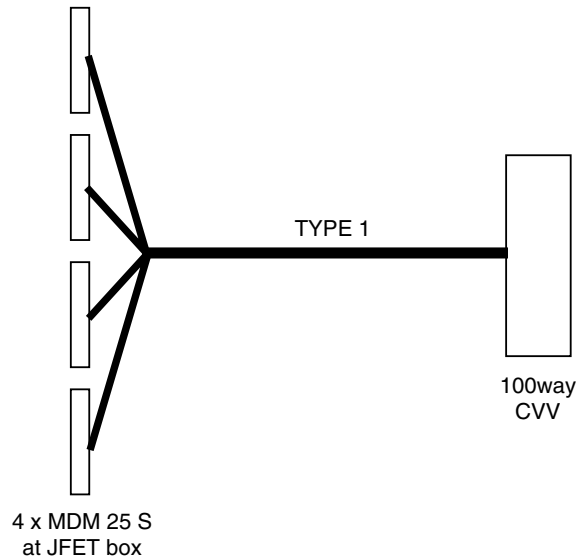


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 63 of 124

4.3.4 C4 CVV4 to HSJFP Type1

Overall Mechanical Drwg.

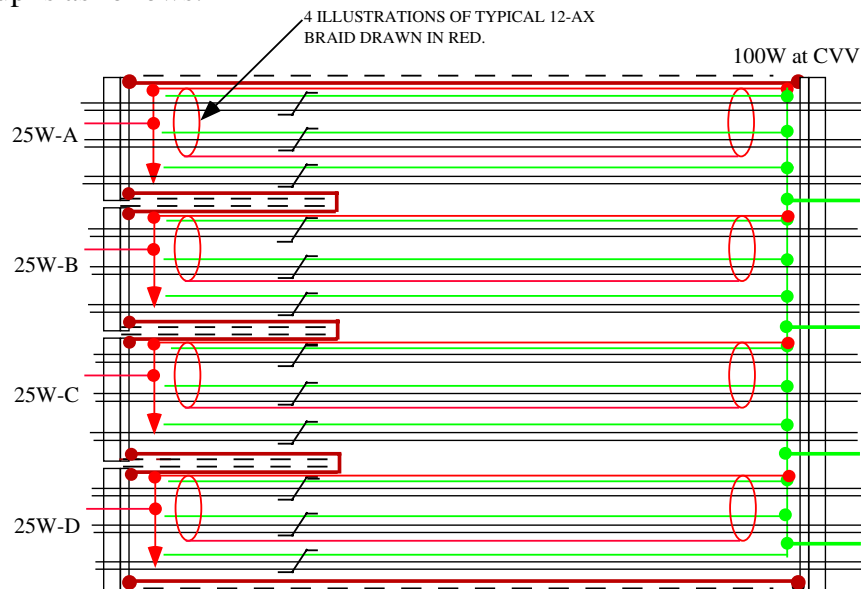


Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFP11 J21
 MDM 25 S +xxxx: interface to HFJFP11 J22
 MDM 25 S +xxxx: interface to HFJFP12 J23
 MDM 25 S +xxxx: interface to HFJFP12 J24

Harness Layup

The total harness layup is as follows:



There are 48 channels each carried as a twisted triple, grouped in fours as "12-ax", each with its own insulated screen. So there are 12 x 12-ax in all with three 12-ax to each 25 way MDM. The use of a third wire twisted with each channel's + & - signal wires minimises interchannel cross-talk inside each 12-ax.

As for the intermediate harness, 4 pins carry ground through the 100 way and carry an isolated ground ring. All the third wires are made off to this, as are all the 12-ax screens.

At the 25way MDMs, the three 12-ax braids (which have a much higher conductivity than that of the sum of all the third twisted wires) are joined and pass through pin7. The third wires are shown as left open here as physically joining them all at MDM geometry seems unfeasible and uncondicive to a neat layup.

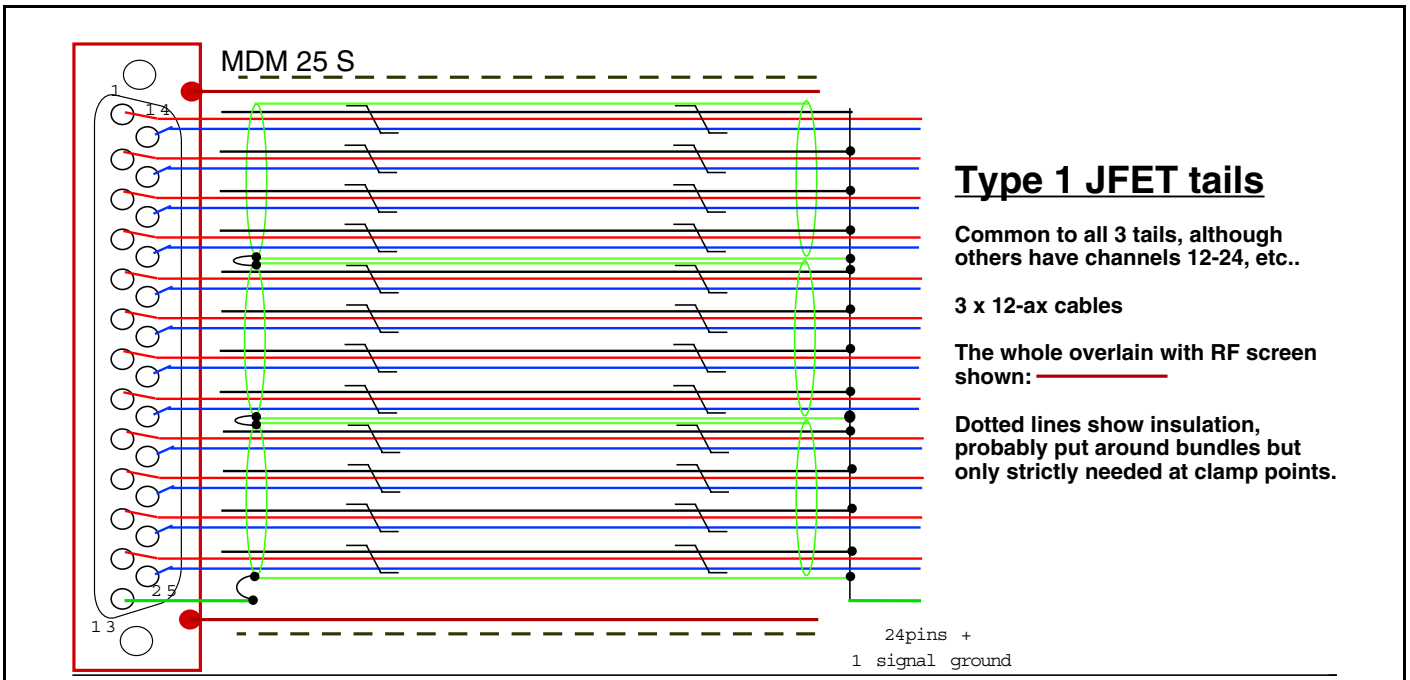
To keep RF screening distinct from low noisr bolometer grounds, all of this harness is enclosed in separate outer r.f. screen, EMC sealed to connector boots, overwrapped with insulation.

Any one MDM tail, as drawn for the other harnesses, looks like:-



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 64 of 124



Contact Details....this assumes JPL re-pin PCB connectors, see note at end.

Note the contacts are named as "channels 1-48" end-end, and mapping to specific detector position is only maintained internal to the instrument.

Name	25way A	25wayB	25Way C	25way D	100Way #4
Channel 1 +	1				TBD
Channel 1 -	14				TBD
Channel 1gnd	NC				XXX
Channel 2 +	2				TBD
Channel 2 -	15				TBD
Channel 2gnd	NC				XXX
Channel 3 +	3				TBD
Channel 3 -	16				TBD
Channel 3gnd	NC				XXX
Channel 4 +	4				TBD
Channel 4 -	17				TBD
Channel 4gnd	NC				XXX
Channel 5 +	5				TBD
Channel 5 -	18				TBD
Channel 5gnd	NC				XXX
Channel 6 +	6				TBD
Channel 6 -	19				TBD
Channel 6gnd	NC				XXX
Channel 7 +	20				TBD
Channel 7 -	7				TBD
Channel 7gnd	NC				XXX
Channel 8 +	21				TBD
Channel 8 -	8				TBD
Channel 8gnd	NC				XXX
Channel 9 +	22				TBD
Channel 9 -	9				TBD
Channel 9gnd	NC				XXX
Channel 10 +	23				TBD
Channel 10 -	10				TBD
Channel 10gnd	NC				XXX
Channel 11 +	24				TBD



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 65 of 124

Name	25way A	25wayB	25Way C	25way D	100Way #4
Channel 11 -	11				TBD
Channel 11gnd	NC				XXX
Channel 12 +	25				TBD
Channel 12 -	12				TBD
Channel 12gnd	NC				TBD
GND WIRE	13				XXX
Channel 13 +		1			TBD
Channel 13 -		14			TBD
Channel 1gnd		NC			XXX
Channel 14 +		2			TBD
Channel 14 -		15			TBD
Channel 1gnd		NC			XXX
Channel 15 +		3			TBD
Channel 15 -		16			TBD
Channel 15gnd		NC			XXX
Channel 16 +		4			TBD
Channel 16 -		17			TBD
Channel 16gnd		NC			XXX
Channel 17 +		5			TBD
Channel 17 -		18			TBD
Channel 17gnd		NC			XXX
Channel 18 +		6			TBD
Channel 18 -		19			TBD
Channel 18gnd		NC			XXX
Channel 19 +		20			TBD
Channel 19 -		7			TBD
Channel 19gnd		NC			XXX
Channel 20 +		21			TBD
Channel 20 -		8			TBD
Channel 1gnd		NC			XXX
Channel 21 +		22			TBD
Channel 21 -		9			TBD
Channel 21gnd		NC			XXX
Channel 22 +		23			TBD
Channel 22 -		10			TBD
Channel 22gnd		NC			XXX
Channel 23 +		24			TBD
Channel 23 -		11			TBD
Channel 23gnd		NC			XXX
Channel 24 +		25			TBD
Channel 24 -		12			TBD
Channel 24gnd		NC			TBD
GND WIRE		13			XXX
Channel 25 +			1		TBD
Channel 25 -			14		TBD
Channel 25gnd			NC		XXX
Channel 26 +			2		TBD
Channel 26 -			15		TBD
Channel 26gnd			NC		XXX
Channel 27 +			3		TBD
Channel 27 -			16		TBD
Channel 27gnd			NC		XXX
Channel 28 +			4		TBD
Channel 28 -			17		TBD
Channel 28gnd			NC		XXX
Channel 29 +			5		TBD
Channel 29 -			18		TBD



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 66 of 124

Name	25way A	25wayB	25Way C	25way D	100Way #4
Channel 29gnd			NC		XXX
Channel 30 +			6		TBD
Channel 30 -			19		TBD
Channel 30gnd			NC		XXX
Channel 31 +			20		TBD
Channel 31 -			7		TBD
Channel 31gnd			NC		XXX
Channel 32 +			21		TBD
Channel 32 -			8		TBD
Channel 32gnd			NC		XXX
Channel 33 +			22		TBD
Channel 33 -			9		TBD
Channel 33gnd			NC		XXX
Channel 34 +			23		TBD
Channel 34 -			10		TBD
Channel 34gnd			NC		XXX
Channel 35 +			24		TBD
Channel 35 -			11		TBD
Channel 35gnd			NC		XXX
Channel 36 +			25		TBD
Channel 36 -			12		TBD
Channel 36gnd			NC		TBD
GND WIRE			13		XXX
Channel 37 +				1	TBD
Channel 37 -				14	TBD
Channel 37gnd				NC	XXX
Channel 38 +				2	TBD
Channel 38 -				15	TBD
Channel 38gnd				NC	XXX
Channel 39 +				3	TBD
Channel 39 -				16	TBD
Channel 39gnd				NC	XXX
Channel 40 +				4	TBD
Channel 40 -				17	TBD
Channel 40gnd				NC	XXX
Channel 41 +				5	TBD
Channel 41 -				18	TBD
Channel 41gnd				NC	XXX
Channel 42 +				6	TBD
Channel 42 -				19	TBD
Channel 42gnd				NC	XXX
Channel 43 +				20	TBD
Channel 43 -				7	TBD
Channel 43gnd				NC	XXX
Channel 44 +				21	TBD
Channel 44 -				8	TBD
Channel 44gnd				NC	XXX
Channel 45 +				22	TBD
Channel 45 -				9	TBD
Channel 45gnd				NC	XXX
Channel 46 +				23	TBD
Channel 46 -				10	TBD
Channel 46gnd				NC	XXX
Channel 47 +				24	TBD
Channel 47 -				11	TBD
Channel 47gnd				NC	XXX
Channel 48 +				25	TBD



SPIRE HARNESS DEFINITION

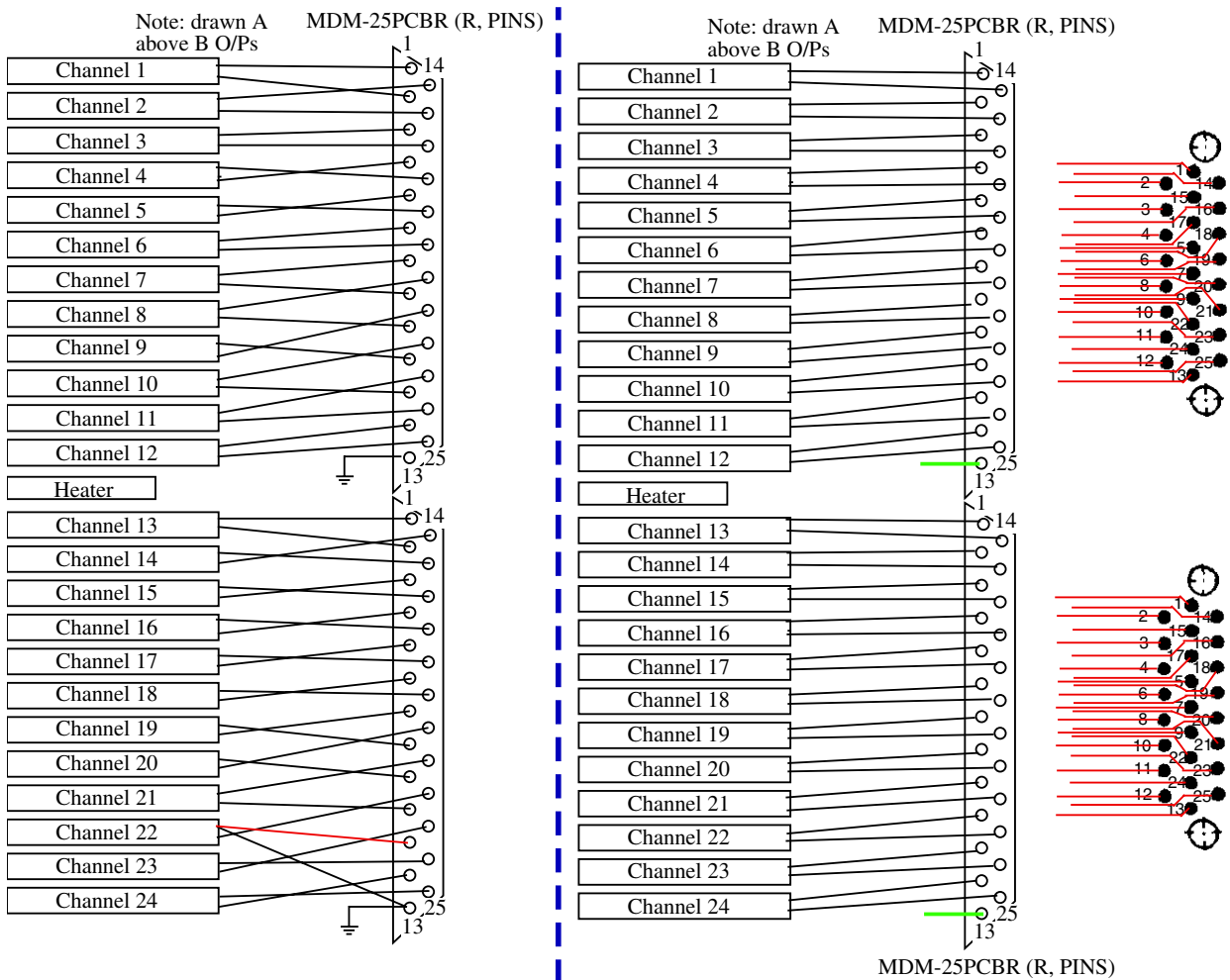
Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 67 of 124

Name	25way A	25wayB	25Way C	25way D	100Way #4
Channel 48 -				12	TBD
Channel 48gnd				NC	TBD
GND WIRE				13	XXX

XXX= on ground wire ring, supported by the 4 otherwise unused contacts.

Note on tail lay-up:

To the left-hand side of the dotted blue line is a JPL proposal that was queried on 30th March. It has a seemingly awkward layout of contacts.



To the right of the dotted blue line is as specified in this document. It was noted at a recent meeting that the initial JPL proposal came from neatly routing tracks from a condensed MDM series PCB connector and with many of the tracks going to one side of the connector. Clearly this unhelpful MDM pin-pattern arises from wires preformed behind a more standard connector and so they indeed can be resequenced back to "standard" without cross-overs as is shown. Several tracking options exist: use uncondensed MDM series PCB connector which would use space presently taken by tracking pattern but may still not fit; use multilayer PCB and tracks as drawn. NOTE: MDM must be supported on panel not PCB for physical and e.m.c. reasons which almost certainly means lugs on back of panel if PCB MDM series are used because looking at the connector details their mating fasteners do not seem suitable for this function.

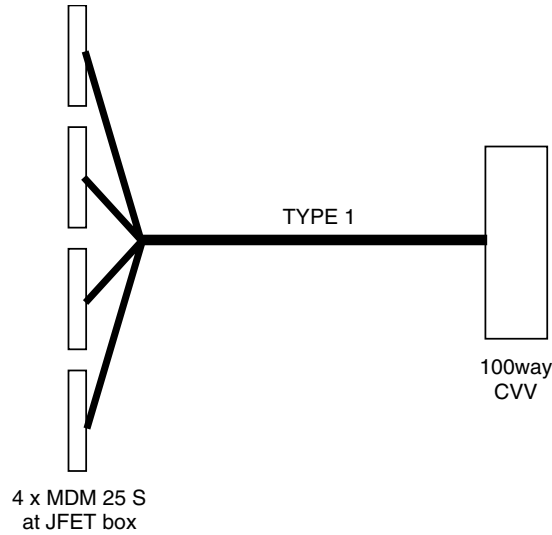


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 68 of 124

4.3.5 C5 CVV5 to HSJFP Type1

Overall Mechanical Drwg.



Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFP9 J17
MDM 25 S +xxxx: interface to HFJFP9 J18
MDM 25 S +xxxx: interface to HFJFP10 J19
MDM 25 S +xxxx: interface to HFJFP10 J20

Harness Layup

As C4.

Contact Details

As C4.

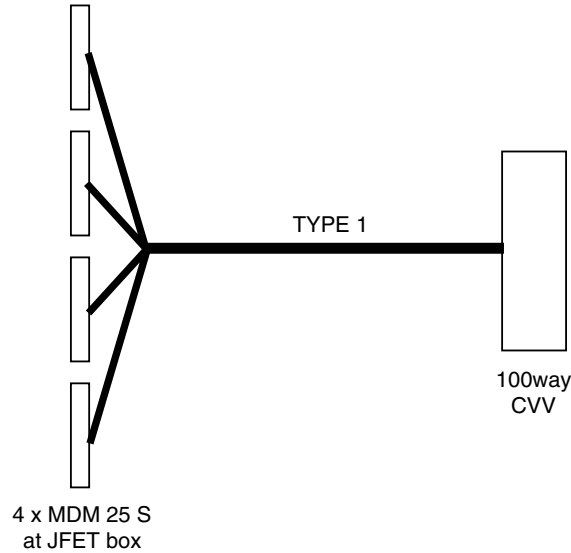


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 69 of 124

4.3.6 C6 CVV6 to HSJFP Type1

Overall Mechanical Drwg.



Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFP7 J13
MDM 25 S +xxxx: interface to HFJFP7 J14
MDM 25 S +xxxx: interface to HFJFP8 J15
MDM 25 S +xxxx: interface to HFJFP8 J16

Harness Layup

As C4.

Contact Details

As C4.

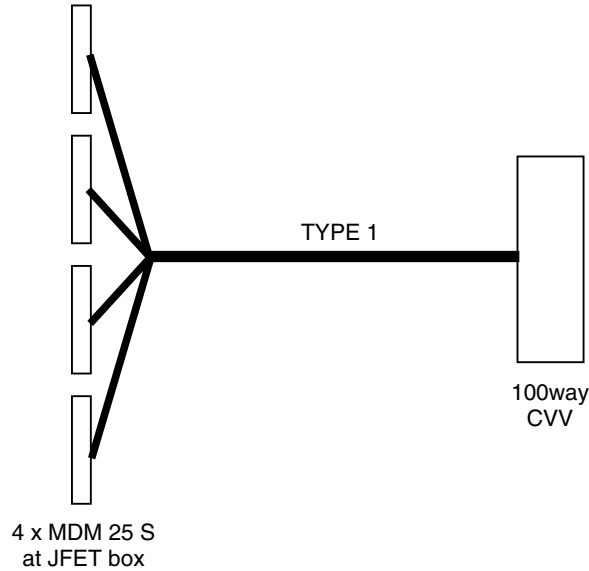


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 70 of 124

4.3.7 C7 CVV7 to HSJFP Type1

Overall Mechanical Drwg.



Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFP5 J9
MDM 25 S +xxxx: interface to HFJFP5 J10
MDM 25 S +xxxx: interface to HFJFP6 J11
MDM 25 S +xxxx: interface to HFJFP6 J12

Harness Layup

As C4.

Contact Details

As C4.

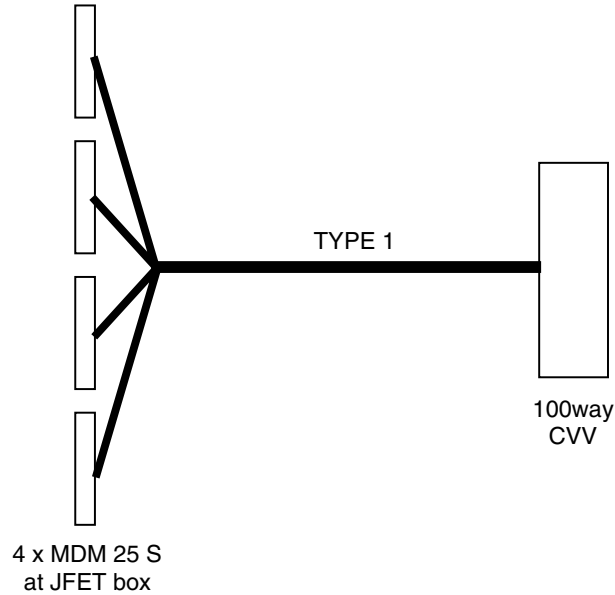


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 71 of 124

4.3.8 C8 CVV8 to HSJFP Type1

Overall Mechanical Drwg.



Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFP3 J5
MDM 25 S +xxxx: interface to HFJFP3 J6
MDM 25 S +xxxx: interface to HFJFP4 J7
MDM 25 S +xxxx: interface to HFJFP4 J8

Harness Layup

As C4.

Contact Details

As C2

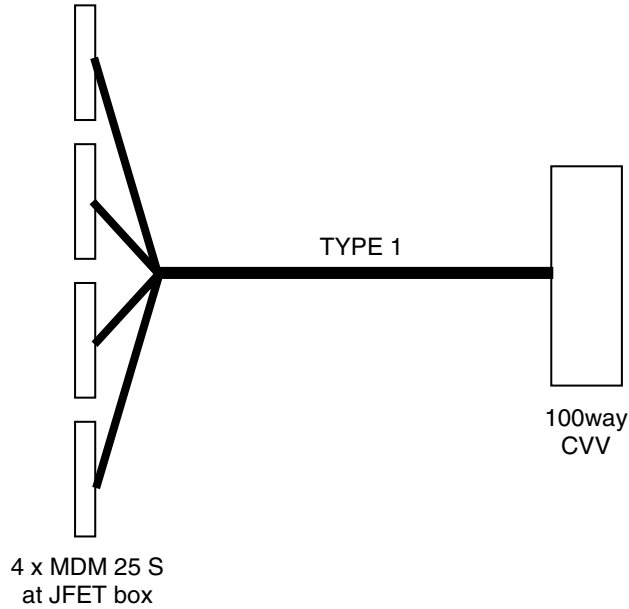


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 72 of 124

4.3.9 C9 CVV9 to HSJFP Type1

Overall Mechanical Drwg.



Connector/Backshell Details

MDM 25 S +xxxx: interface to HFJFP1 J1
MDM 25 S +xxxx: interface to HFJFP1 J2
MDM 25 S +xxxx: interface to HFJFP2 J3
MDM 25 S +xxxx: interface to HFJFP2 J4

Harness Layup

As C4.

Contact Details

As C4.

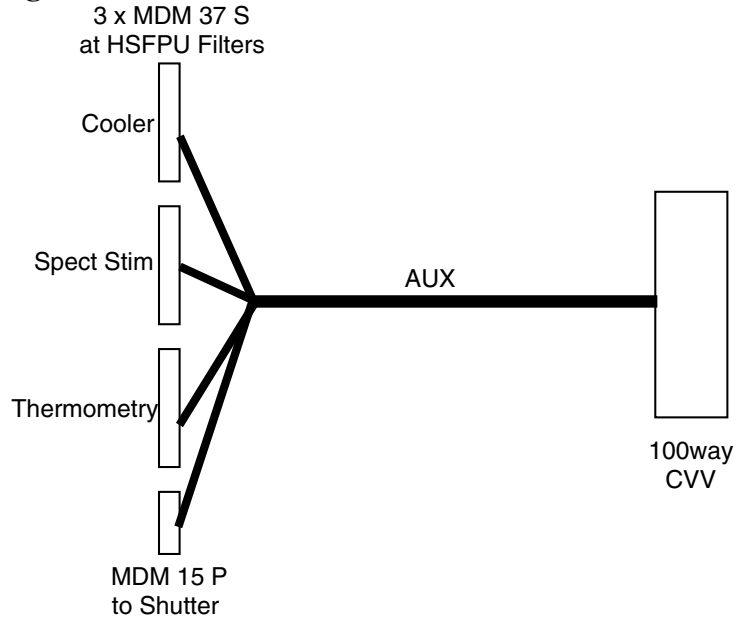


SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 73 of 124

4.3.10 C10 CVV10 to HSFPU AUX-P

Overall Mechanical Drwg.



Connector/Backshell Details

Prime side harness

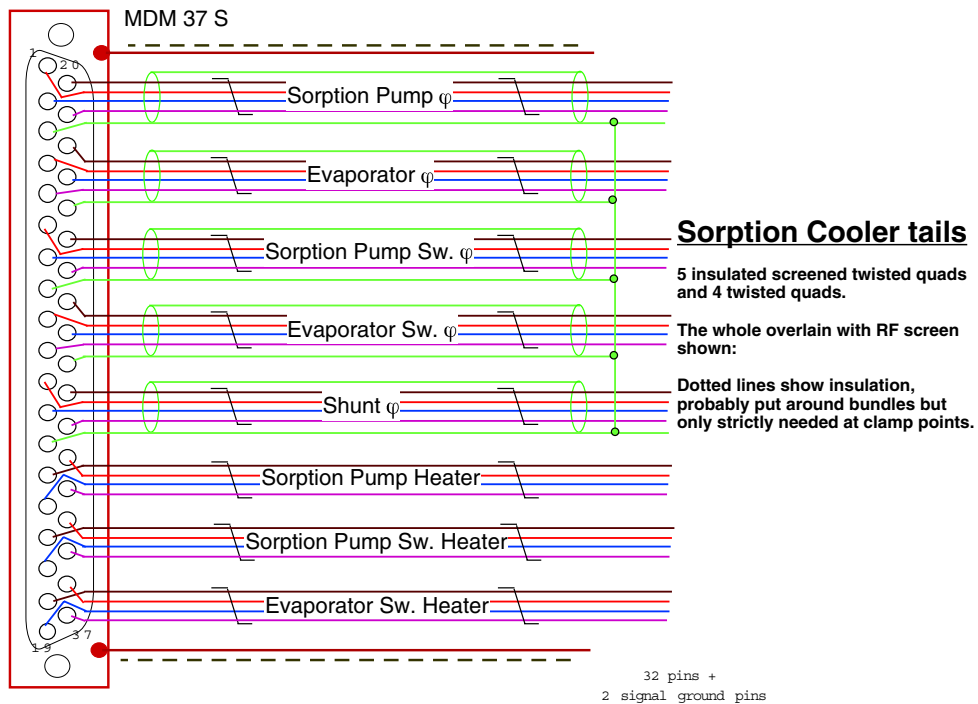
MDM 37 S + XXXX: interface to HFFPU Filter FA J19

MDM 37 S + XXXX: interface to HFFPU Filter FA J21

MDM 37 S + XXXX: interface to HFFPU Filter FB J23

MDM 15 P + XXXX: interface to HFJFS J17 Shutter

Harness Layup Cooler Tail

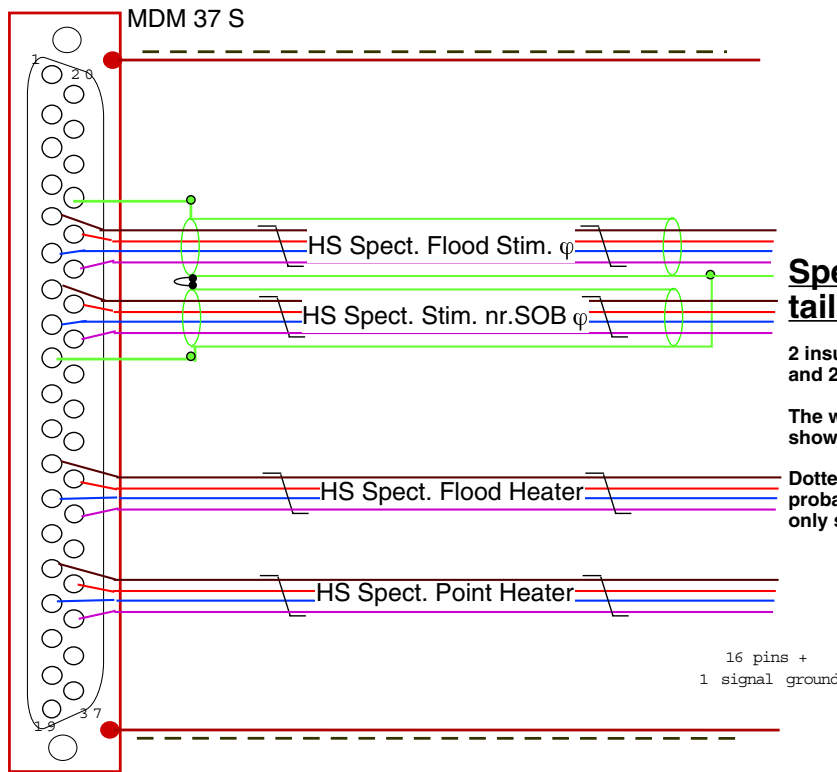




SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 74 of 124

Spect. Stimulus Tail



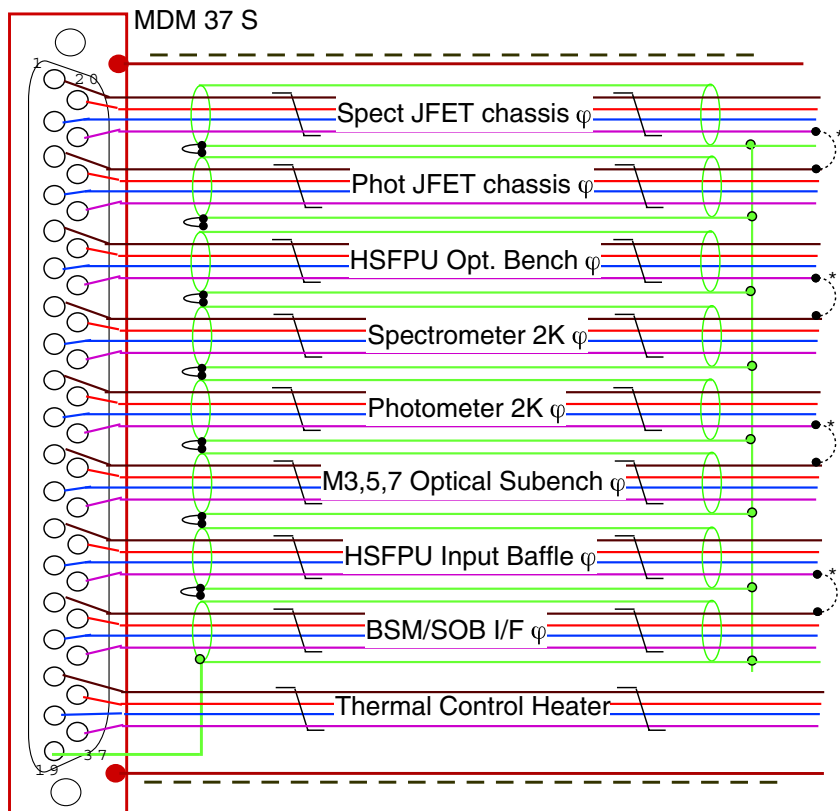
Spectrometer Stimulus tails...PCAL.

2 insulated screened twisted quads and 2 twisted quads.

The whole overlain with RF screen shown:

Dotted lines show insulation, probably put around bundles but only strictly needed at clamp points.

HSFPU Thermometry Tail



Thermometry tails

8 insulated screened twisted quads.

The whole overlain with RF screen shown:

Dotted lines show insulation, probably put around bundles but only strictly needed at clamp points.

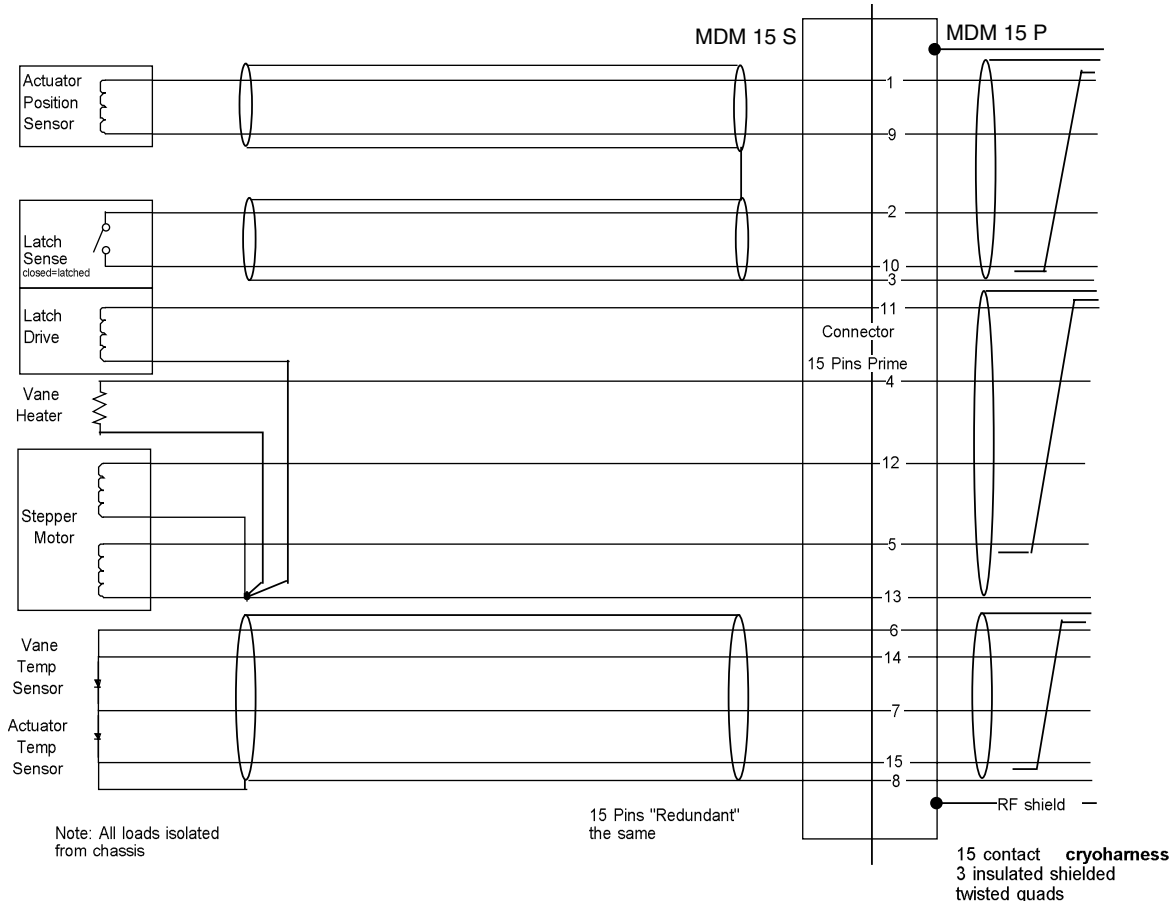


SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 75 of 124

Shutter Tail

This is a longer tail than those that terminate into HSFPU filters because it is routed outside HSFPU to the shutter unit itself.



The number of wires to pass through the 100 way accumulates as follows:

Tail Source	"Signals"	Shields etc.	
Cooler	32	2	
Spectrometer Stimulus	16	1	
Thermometry	32	2	
Shutter	12	3	
Total	92	8	100 in all!

The C10 harness contacts are tabulated on the following pages. Note that C10 is a PRIME harness and all wires herein (excepting the shutter function) are PRIME, although this is not explicitly written ad nauseam.

The above layouts show one further feature, It is in the Thermometry Tail. The number of wires do not appear to add up correctly! The cryoharness permits implementing an option that cannot yet be determined. There are 4 wires harnessed to run a 300mK thermostating heater. They fit OK on the 37way. If system is implemented, harness F20 will include the links on thermometer sensor current feeds shown dotted. The sensors are then conditioned in 4 pairs. Four of the 8 wires thus saved on the 100way CVV are used to power the 300mK heater. (System duplicated via C12 and F21).



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 76 of 124

Cooler Tail Listing

Function	37way J19	Max. current	Wire lay-up	Max Ohms	100way #10
Sorption Pump temperature I+	20	1 μ A	Insulated screened twisted quad	1000	
Sorption Pump temperature V+	1	N/A		1000	
Sorption Pump temperature V-	2	N/A		1000	
Sorption Pump temperature I-	21	1 μ A		1000	
Sorption Pump temperature shld*	3	N/A		N/A	
Evaporator temperature I+	22	250 nA	Insulated screened twisted quad	1000	
Evaporator temperature V+	4	N/A		1000	
Evaporator temperature V-	5	N/A		1000	
Evaporator temperature I-	23	250 nA		1000	
Evaporator temperature shld*	24	N/A		N/A	linked
Sorption Pump Heat Switch temperature I+	25	1 μ A	Insulated screened twisted quad	1000	
Sorption Pump Heat Switch temperature V+	6	N/A		1000	
Sorption Pump Heat Switch temperature V-	7	N/A		1000	
Sorption Pump Heat Switch temperature I-	26	1 μ A		1000	
Sorption Pump Heat Switch temperature shld*	8	N/A		N/A	linked
Evaporator Heat Switch temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
Evaporator Heat Switch temperature V+	9	N/A		1000	
Evaporator Heat Switch temperature V-	10	N/A		1000	
Evaporator Heat Switch temperature I-	28	1 μ A		1000	
Evaporator Heat Switch temperature shld*	29	N/A		N/A	linked
Thermal Shunt temperature I+_A	30	1 μ A	Insulated screened twisted quad	1000	
Thermal Shunt temperature V+_B	11	N/A		1000	
Thermal Shunt temperature V-_A	12	N/A		1000	
Thermal Shunt temperature I-_B	31	1 μ A		1000	
Thermal Shunt temperature shld*	13	N/A		N/A	
Sorption Pump heater I+_A	14	25 mA	twisted quad	10	
Sorption Pump heater I+_B	32	25 mA		10	
Sorption Pump heater I-_A	15	25 mA		10	
Sorption Pump heater I-_B	33	25 mA		10	
Sorption Pump Heat Switch heater I+_A	16	1.5 mA	twisted quad	50	
Sorption Pump Heat Switch heater I+_B	34	1.5 mA		50	
Sorption Pump Heat Switch heater I-_A	17	1.5 mA		50	
Sorption Pump Heat Switch heater I-_B	35	1.5 mA		50	
Evaporator Heat Switch heater I+_A	18	1.5 mA	twisted quad	50	
Evaporator Heat Switch heater I+_B	36	1.5 mA		50	
Evaporator Heat Switch heater I-_A	19	1.5 mA		50	
Evaporator Heat Switch heater I-_B	37	1.5 mA		50	

*= 5 temperature sensor shields, at 100-way put on wire loop supported by 2 contacts. Total contacts at CVV 100-way thus = 32+2 = 34ways.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 77 of 124

Spectrometer Stimulus Tail Listing

Function	37way J21	Max. current	Wire lay-up	Max Ohms	100way #10
HS Spect. Flood Stimulus temperature I+	5	1 μ A	Insulated screened twisted quad	1000	
HS Spect. Flood Stimulus ttemperature V+	24	N/A		1000	
HS Spect. Flood Stimulus t temperature V-	6	N/A		1000	
HS Spect. Flood Stimulus t temperature I-	25	1 μ A		1000	
HS Spect. Flood Stimulus ttemperature shld*	23	N/A		N/A	
HS Spect. Stimulus nr. SOB temperature I+	7	1 μ A	Insulated screened twisted quad	1000	
HS Spect. Stimulus nr. SOB temperature V+	26	N/A		1000	
HS Spect. Stimulus nr. SOB temperature V-	8	N/A		1000	
HS Spect. Stimulus nr. SOB temperature I-	27	1 μ A		1000	
HS Spect. Stimulus nr. SOB temperature shld*	9	N/A		N/A	linked
HS Spect. Flood heater I+ _A	12	9 mA	twisted quad	30	
HS Spect. Flood heater I+ _B	32	9 mA		30	
HS Spect. Flood heater I- _A	32	9 mA		30	
HS Spect. Flood heater I- _B	32	9 mA		30	
HS Spect. Point heater I+ _A	15	7 mA	twisted quad	30	
HS Spect. Point heater I+ _B	34	7 mA		30	
HS Spect. Point heater I- _A	16	7 mA		30	
HS Spect. Point heater I- _B	35	7 mA		30	



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 78 of 124

FPU Thermometry Listing

Function	37way J23	Max. current	Wire lay-up	Max Ohms	100way #10
Spect JFET chassis temperature I+	20	1 μ A	Insulated screened twisted quad	1000	
Spect JFET chassis temperature V+	1	N/A		1000	
Spect JFET chassis temperature V-	2	N/A		1000	
Spect JFET chassis temperature I-	21	1 μ A		1000	
Spect JFET chassis temperature shld*	3	N/A		N/A	
Phot JFET chassis temperature I+	22	1 μ A	Insulated screened twisted quad	1000	
Phot JFET chassis temperature V+	4	N/A		1000	
Phot JFET chassis temperature V-	5	N/A		1000	
Phot JFET chassis r temperature I-	23	1 μ A		1000	
Phot JFET chassis temperature shld*	24	N/A		N/A	linked
HSFPU Opt. Bench temperature I+	25	1 μ A	Insulated screened twisted quad	1000	
HSFPU Opt. Bench temperature V+	6	N/A		1000	
HSFPU Opt. Bench temperature V-	7	N/A		1000	
HSFPU Opt. Bench temperature I-	26	1 μ A		1000	
HSFPU Opt. Bench temperature shld*	8	N/A		N/A	linked
Spectrometer 2K box temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
Spectrometer 2K box temperature V+	9	N/A		1000	
Spectrometer 2K box temperature V-	10	N/A		1000	
Spectrometer 2K box temperature I-	28	1 μ A		1000	
Spectrometer 2K box temperature shld*	29	N/A		N/A	linked
Photometer 2K box temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
Photometer 2K box temperature V+	9	N/A		1000	
Photometer 2K box temperature V-	10	N/A		1000	
Photometer 2K box temperature I-	28	1 μ A		1000	
Photometer 2K box temperature shld*	29	N/A		N/A	linked
M3,5,7 Optical Subench temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
M3,5,7 Optical Subench temperature V+	9	N/A		1000	
M3,5,7 Optical Subench temperature V-	10	N/A		1000	
M3,5,7 Optical Subench temperature I-	28	1 μ A		1000	
M3,5,7 Optical Subench temperature shld*	29	N/A		N/A	linked
HSFPU Input Baffle temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
HSFPU Input Baffle temperature V+	9	N/A		1000	
HSFPU Input Baffle temperature V-	10	N/A		1000	
HSFPU Input Baffle temperature I-	28	1 μ A		1000	
HSFPU Input Baffle temperature shld*	29	N/A		N/A	linked
BSM/SOB I/F temperature I+	27	1 μ A	Insulated screened twisted quad	1000	
BSM/SOB I/F temperature V+	9	N/A		1000	
BSM/SOB I/F temperature V-	10	N/A		1000	
BSM/SOB I/F temperature I-	28	1 μ A		1000	
BSM/SOB I/F temperature shld*	29	N/A		N/A	

*= 8 temperature sensor shields, at 100-way put on wire loop supported by 2 contacts. Total contacts at CVV 100-way thus = 32+2 = 34ways.

Note: we can potentially get one more temperature sensor through this 37way, but it then cannot feed through the 100way.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 79 of 124

Shutter tail

Function	Pin # on J17	Max Current	Wire lay-up	Max Ohms*
Actuator Position Sensor +	1		Insulated screened twisted quad	1000
Actuator Position Sensor -	9			1000
Latch Sense +	2			1000
Latch Sense -	10			1000
Sense Shld	3			1000
Latch Drive +	11		Insulated screened twisted quad	10
Vane Heater+	4			10
Stepper Drive Phase A +	12			10
Stepper Drive Phase B +	5			10
Power Ground / Rtn. as shld	13			10
Temp Sensor Bias+	6		Insulated screened twisted quad	1000
Vane Temp V+	14			1000
Common Temp V	7			1000
Actuator Temp V-	15			1000
Temp Sensor Bias -/Shld	8			1000

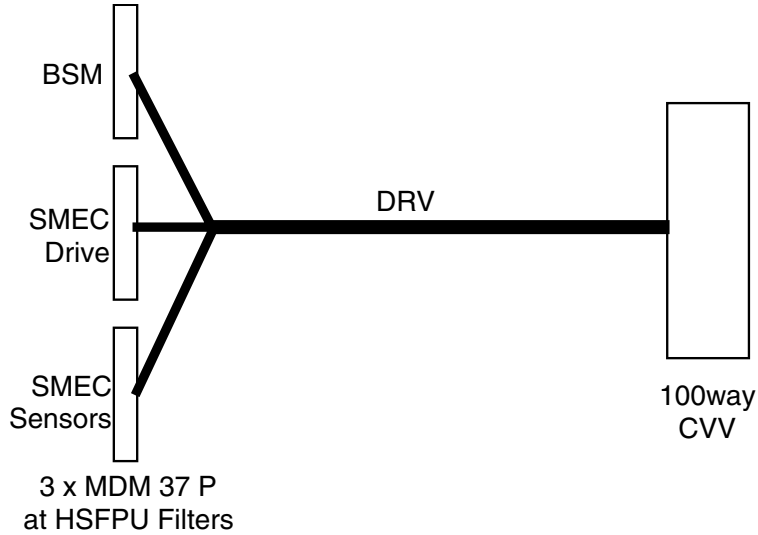


SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 80 of 124

4.3.11 C11 CVV11 to HSFPU DRV-P

Overall Mechanical Drwg.



Connector/Backshell Details

Redundant side harness

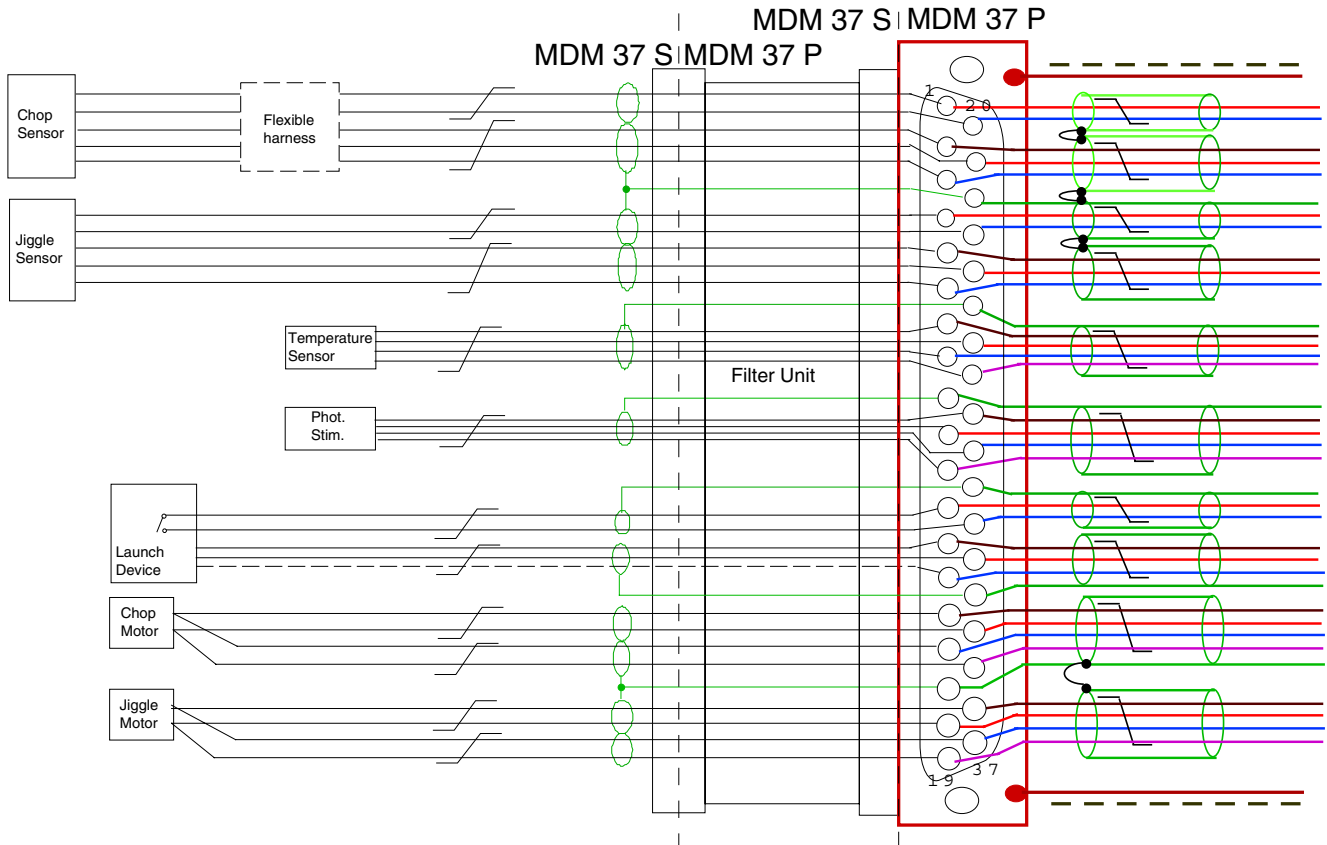
MDM 37 P + XXXX: interface to HFFPU Filter FB J25

MDM 37 P + XXXX: interface to HFFPU Filter FC J27

MDM 37 P + XXXX: interface to HFFPU Filter FC J29

Harness Layup

BSM Tail





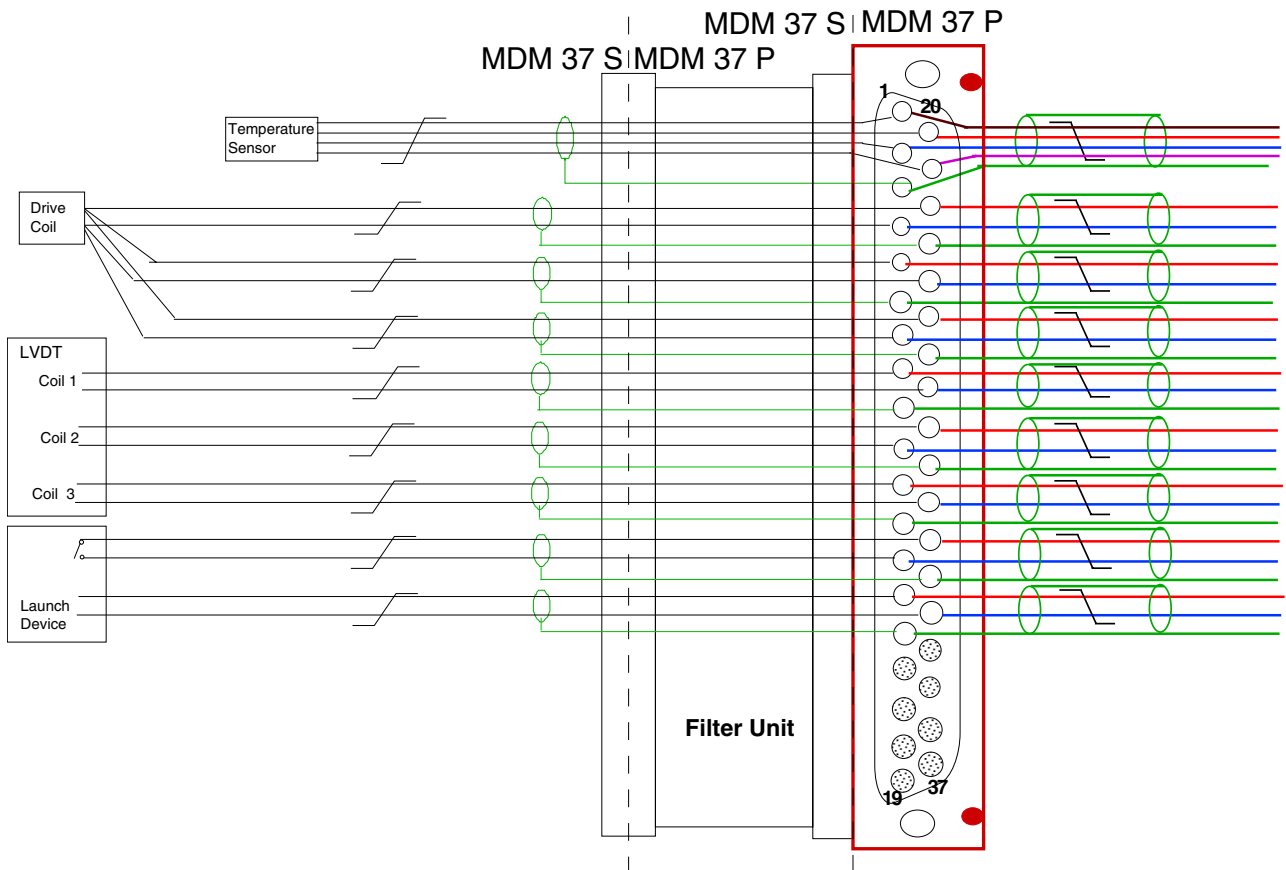
SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 81 of 124

SMEC Sensors' Tail

Maybe

SMEC Drives' Tail





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 82 of 124

BSM Tail Listing

Function	37way J25	Max. current	Wire lay-up	Max Ohms	100way #11
Chop Position Sensor 1	1	1 μ A	Insulated screened twisted pair	1000	
Chop Position Sensor 2	20	N/A		1000	
Chop Position Sensor shld1	to A	N/A		N/A	linked
Chop Position Sensor 3	2	250 nA	Insulated screened twisted triple	1000	
Chop Position Sensor 4	21	N/A		1000	
Chop Position Sensor 5	3	N/A		1000	
Chop Position Sensor shld2=A	22	N/A		N/A	
Jiggle Position Sensor 1	4	1 μ A	Insulated screened twisted pair	1000	
Jiggle Position Sensor 2	23	N/A		1000	
Jiggle Position Sensor shld1	to B	N/A		N/A	linked
Jiggle Position Sensor 3	5	250 nA	Insulated screened twisted triple	1000	
Jiggle Position Sensor 4	24	N/A		1000	
Jiggle Position Sensor 5	6	N/A		1000	
Jiggle Position Sensor shld2=B	22	N/A		N/A	
BSM temperature I+	7	1 μ A	Insulated screened twisted quad	1000	
BSM temperature V+	26	N/A		1000	
BSM temperature V-	8	N/A		1000	
BSM temperature I-	27	1 μ A		1000	
BSM temperature shld	25	N/A		N/A	
Photometer Point Stim. heater I+ _A	28	7 mA	Insulated screened twisted quad	10	
Photometer Point Stim.heater I+ _B	10	7 mA		10	
Photometer Point Stim.heater I- _A	29	7 mA		10	
Photometer Point Stim.heater I- _B	11	7 mA		10	
Photometer Point Stim.heater shld	9	N/A		N/A	
BSM Launch latch confirmation 1	30	1mA	Insulated screened twisted pair	1000	
BSM Launch latch confirmation 2	12	1mA		1000	
Launch latch confirmation shld to platform_gnd	31	N/A		N/A	
BSM Launch latch drive 1	13	35mA	Insulated screened twisted triple	100	
BSM Launch latch drive 2	32	35mA		100	
Launch latch drive 3..remove if toggles*.	14	35mA		100	
BSM Launch latch drive shld	33	N/A		N/A	
Chop Motor Drive 1	15	40 mA	Insulated screened twisted quad	10	
Chop Motor Drive 2	34	40 mA		10	
Chop Motor Drive 3	16	40 mA		10	
Chop Motor Drive 4	35	40 mA		10	
Chop Motor Drive shld	17	N/A		N/A	
Chop Motor Drive 1	36	40 mA	Insulated screened twisted quad	10	
Chop Motor Drive 2	18	40 mA		10	
Chop Motor Drive 3	37	40 mA		10	
Chop Motor Drive 4	19	40 mA		10	
Chop Motor Drive shld	17	N/A		N/A	linked

This 37way connector is fully populated, and 37 of the CVV 100way contacts are used by the BSM.

Commoning the Launch Latch Drive shield with that of the motor drives and reassigning launch latch drive 3 would give the BSM a slightly messy 2 wire cryoharness "contingency".

The photometer point stimulus heater shield may be denied a contact on the 100way depending on demand by the SMEC tails, TBC. In which case, and only this case, it would be grounded in the BSM.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 83 of 124

SMEC Sensors Tail Listing

Function	37way J27	Max. current	Wire lay-up	Max Ohms	100way #11
SMEC temperature I+		10 μ A	Insulated screened twisted quad	1000	
SMEC temperature V+		N/A		1000	
SMEC temperature V-		N/A		1000	
SMEC temperature I-		10 μ A		1000	
SMEC temperature shld		N/A		N/A	
FTS pos. sensor1		1mA		1000	
FTS pos. sensor2		1mA		1000	
FTS pos. sensor3		1mA		1000	
FTS pos. sensor4		1mA		1000	
FTS pos. sensor5		1mA		1000	
FTS pos. sensor6		1mA	M	1000	
FTS pos. sensor7		1mA		1000	
FTS pos. sensor8		1mA	A	1000	
FTS pos. sensor9		1mA		1000	
FTS pos. sensor10		1mA	Y	1000	
FTS pos. sensor11		1mA		1000	
FTS pos. sensor12		1mA	B	1000	
FTS pos. sensor13		1mA		1000	
FTS pos. sensor14		1mA	E	1000	
FTS pos. sensor15		1mA		1000	
FTS pos. sensor16		1mA		1000	
FTS pos. sensor17		1mA		1000	
FTS pos. sensor18		1mA		1000	
FTS pos. sensor19		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	
FTS pos. sensor shld		1mA		1000	

33 contacts used



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
 Issue: 0.3
 Date: 30/5/01 5:34 PM
 Page 84 of 124

SMEC Drive Tail Listing

Function	37way J29	Max. current	Wire lay-up	Max Ohms	100way #11
SMEC/SOB I/F temperature I+	1	10 μ A	Insulated screened twisted quad	1000	
SMEC/SOB I/F temperature V+	20	N/A		1000	
SMEC/SOB I/F temperature V-	21	N/A		1000	
SMEC/SOB I/F temperature I-	2	10 μ A		1000	
SMEC/SOB I/F temperature shld	3	N/A		N/A	
SMEC Drive Coil I+	22	100mA	Insulated screened twisted pair	5	
SMEC Drive Coil I-	4	100mA		5	
SMEC Drive Coil shld	23	N/A		N/A	
SMEC Drive Coil (Rob) I+	5	100mA	Insulated screened twisted pair	5	
SMEC Drive Coil (Rob) I-	24	100mA		5	
SMEC Drive Coil (Rob) shld	6	N/A		N/A	
SMEC Drive Coil V+	25	10 μ A	Insulated screened twisted pair	500	
SMEC Drive Coil V-	7	10 μ A		500	
SMEC Drive Coil shld	26	N/A		N/A	
SMEC LVDT Coil 1	8	10 μ A	Insulated screened twisted pair	500	
SMEC LVDT Coil 1	27	10 μ A		500	
SMEC LVDT Coil 1 shld	9	N/A		N/A	
SMEC LVDT Coil 2	28	10 μ A	Insulated screened twisted pair	500	
SMEC LVDT Coil 2	10	10 μ A		500	
SMEC LVDT Coil 2 shld	29	N/A		N/A	
SMEC LVDT Coil 3	11	10 μ A	Insulated screened twisted pair	500	
SMEC LVDT Coil 3	30	10 μ A		500	
SMEC LVDT Coil 3 shld	12	N/A		N/A	
SMEC Launch latch confirmation 1	31	1mA	Insulated screened twisted pair	100	
SMEC Launch latch confirmation 2	13	1mA		100	
Launch latch confirmation shld to platform gnd	32	N/A		N/A	
SMEC Launch latch drive 1	14	35mA	Insulated screened twisted pair	10	
SMEC Launch latch drive 2	33	35mA		10	
SMEC Launch latch drive shld	15	N/A		N/A	

29 contacts used.

Total used through 100 way = 37 + 33 + 29 = 99.

Above based on "Cryo_harness_010425.doc" with blue items to be added please, noting also need for prime and redundant temperature sensors.



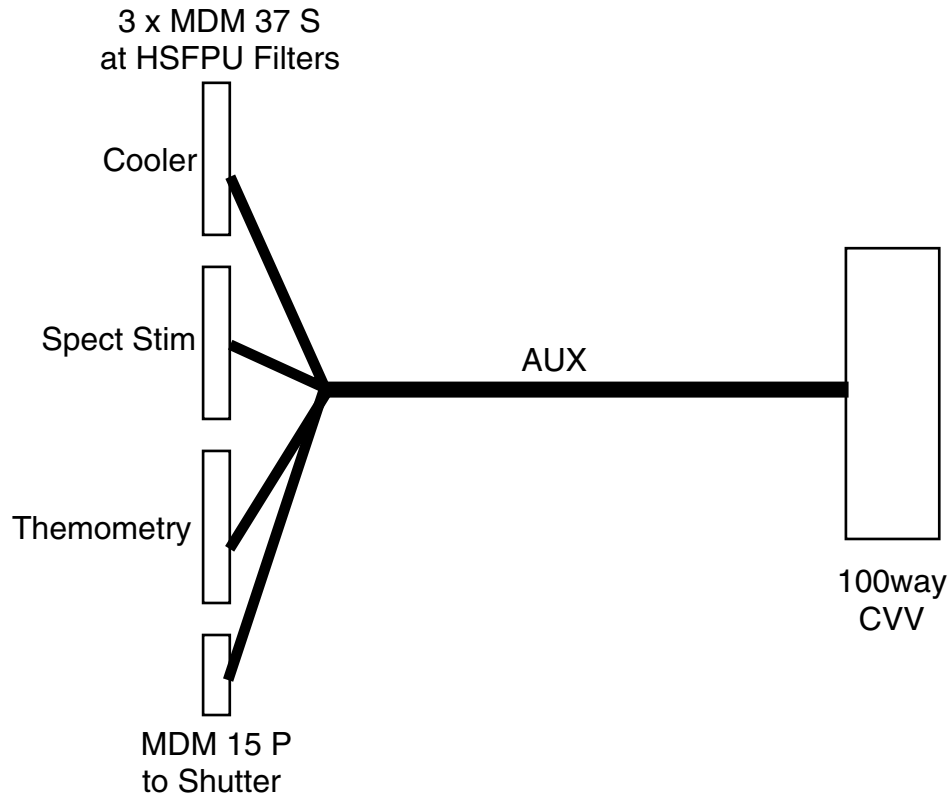
SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 85 of 124

4.3.12 C12 CVV12 to HSFPU AUX-R

Overall Mechanical Drwg.

Redundant version of C10, and the same as it



Connector/Backshell Details

Prime side harness

MDM 37 S + XXXX: interface to HFFPU Filter FD J20

MDM 37 S + XXXX: interface to HFFPU Filter FD J22

MDM 37 S + XXXX: interface to HFFPU Filter FE J24

MDM 15 P + XXXX: interface to HFJFS J18 Shutter

Harness Layup

Redundant version of C10, and the same as it.

Add one to all the connector numbers compared to C10.



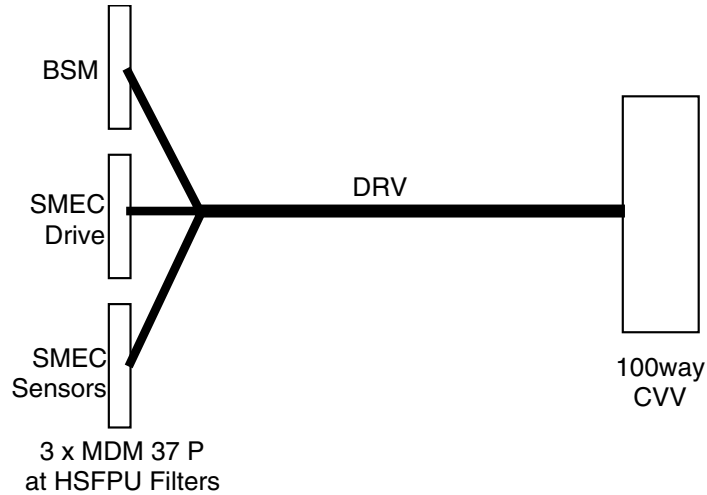
SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 86 of 124

4.3.13 C13 CVV13 to HSFPU DRV-R

Overall Mechanical Drwg.

Format as C11, maybe differing lengths.



Connector/Backshell Details

Redundant side harness

MDM 37 P + XXXX: interface to HFFPU Filter FE J26

MDM 37 P + XXXX: interface to HFFPU Filter FF J28

MDM 37 P + XXXX: interface to HFFPU Filter FF J30

Harness Layup

As C11.

Contact Details

As C11, but add one to all the connector numbers compared to C11.



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 87 of 124

4.4 FPU Harnesses

4.4.1 F1 PSW-A BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 88 of 124

4.4.2 F2 PSW-B BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 89 of 124

4.4.3 F3 PSW-C BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 90 of 124

4.4.4 F4 PSW-D BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 91 of 124

4.4.5 F5 PSW-E BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 92 of 124

4.4.6 F6 PSW-F BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 93 of 124

4.4.7 F7 PMW-A BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 94 of 124

4.4.8 F8 PMW-B BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 95 of 124

4.4.9 F9 PMW-D BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 96 of 124

4.4.10 F10 PMW-D BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 97 of 124

4.4.11 F11 PLW-A BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 98 of 124

4.4.12 F12 PLW-B BDA to HSJFP

Overall Mechanical Drwg.

JPL configured Photometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 99 of 124

4.4.13 F13 SSW-A BDA to HSJFS

Overall Mechanical Drwg.

JPL configured Spectrometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 100 of 124

4.4.14 F14 SSW-B BDA to HSJFS

Overall Mechanical Drwg.

JPL configured Spectrometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 101 of 124

4.4.15 F15 SLW-A BDA to HSJFS

Overall Mechanical Drwg.

JPL configured Spectrometer BDA lead, maintaining Faraday cage HSJFP to FPU, and keeping signal ground separate from chassis ground.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNES DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 102 of 124

4.4.16 F16 COOLER-P to FA

Overall Mechanical Drwg.

37 way MDMto Cooler prime to 37 way MDMon HSFPU Filter FA J1

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 103 of 124

4.4.17 F17 COOLER-R to FA

Overall Mechanical Drwg.

37 MDMway to Cooler redundant to 37 MDMway on HSFPU Filter FD J1

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 104 of 124

4.4.18 F18 SPECT_STIM-P to FA

Overall Mechanical Drwg.

21way MDM to J1 Spectrometer Stim to 37way MDM at J2 on HSFPU Filter FA

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 105 of 124

4.4.19 F19 SPECT_STIM-R to FD

Overall Mechanical Drwg.

21way MDM to J2 Spectrometer Stim to 37way MDM at J2 on HSFPU Filter FD

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 106 of 124

4.4.20 F20 THERM-P from FA

Overall Mechanical Drwg.

Multiple TBD to 37way MDM at J1 on HSFPU Filter FB

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 107 of 124

4.4.21 F21 THERM-R from FE

Overall Mechanical Drwg.

Multiple TBD to 37way MDM at J1 on HSFPU Filter FE

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 108 of 124

4.4.22 F22 BSM-P to FB

Overall Mechanical Drwg.

Connector/Backshell Details

51 MDMway to BSM Prime to 37 MDMway on HSFPU Filter FB J2

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 109 of 124

4.4.23 F23 BSM-R to FE

Overall Mechanical Drwg.

Connector/Backshell Details

51 MDMway to BSM Redundant to 37 MDMway on HSFPU Filter FE J2

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 110 of 124

4.4.24 F24 SMECSIG-P to FC

Overall Mechanical Drwg.

Connector/Backshell Details

37 MDMway to SMEC Signal Prime to 37 MDMway on HSFPU Filter FC J1

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 111 of 124

4.4.25 F25 SCECDRV-P to FC

Overall Mechanical Drwg.

Connector/Backshell Details

37 MDMway to SMEC Drive Prime to 37 MDMway on HSFPU Filter FC J2

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 112 of 124

4.4.26 F26 SMECSIG-R to FF

Overall Mechanical Drwg.

Connector/Backshell Details

37 MDMway to SMEC Signal Redundant to 37 MDMway on HSFPU Filter FF J1

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 113 of 124

4.4.27 F27 SMECDRV-P to FF

Overall Mechanical Drwg.

Connector/Backshell Details

37 MDMway to SMEC Drive Prime to 37 MDMway on HSFPU Filter FF J2

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 114 of 124

4.5 Test Harnesses

4.5.1 T1 DPU-P Power

Overall Mechanical Drwg.

1:1

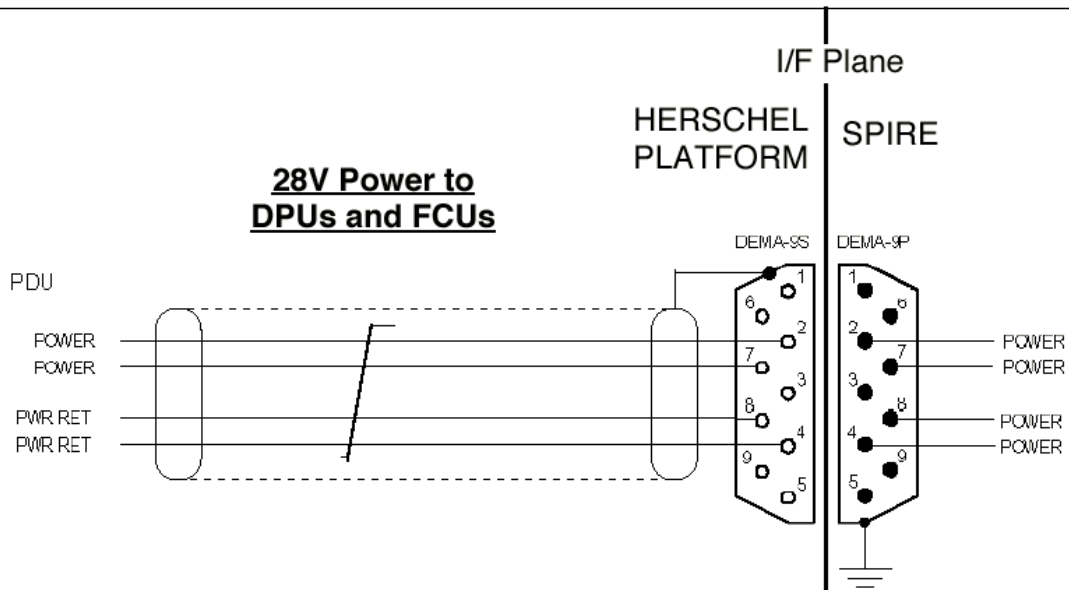
Connector/Backshell Details

To HSDPU J1

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 115 of 124

4.5.2 T2 DPU to (1553+SYNC)-P

Overall Mechanical Drwg.

1:2

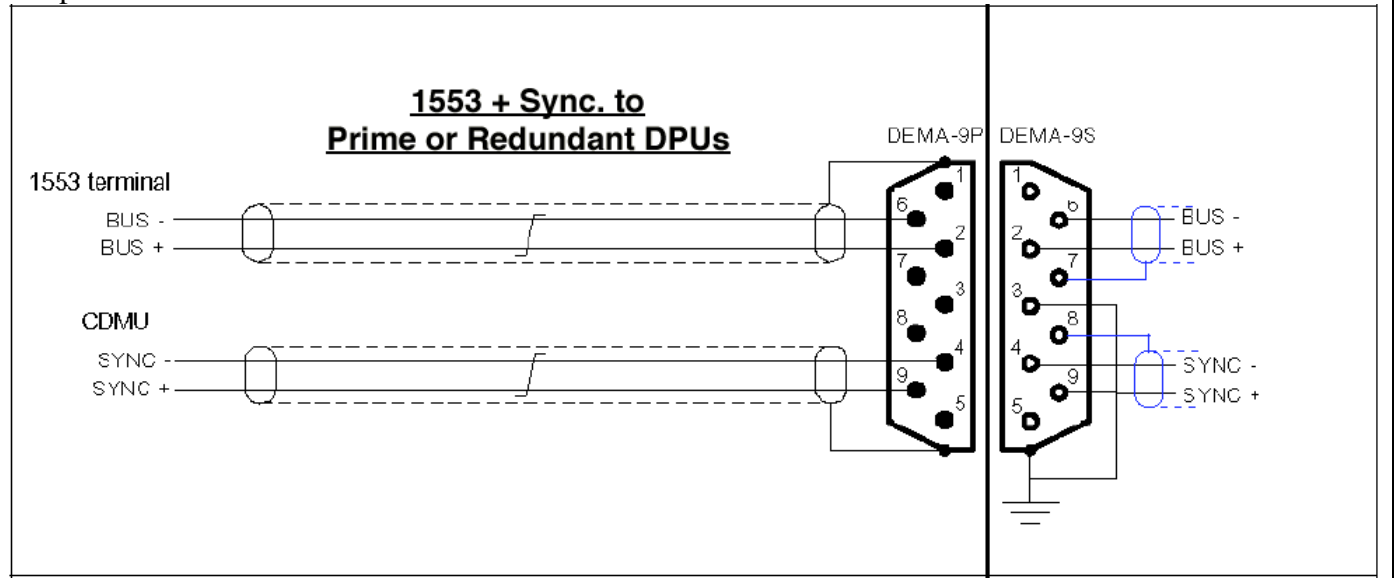
Connector/Backshell Details

To HSDPU J3 and J5

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 116 of 124

4.5.3 T3 DPU-R Power

Overall Mechanical Drwg.

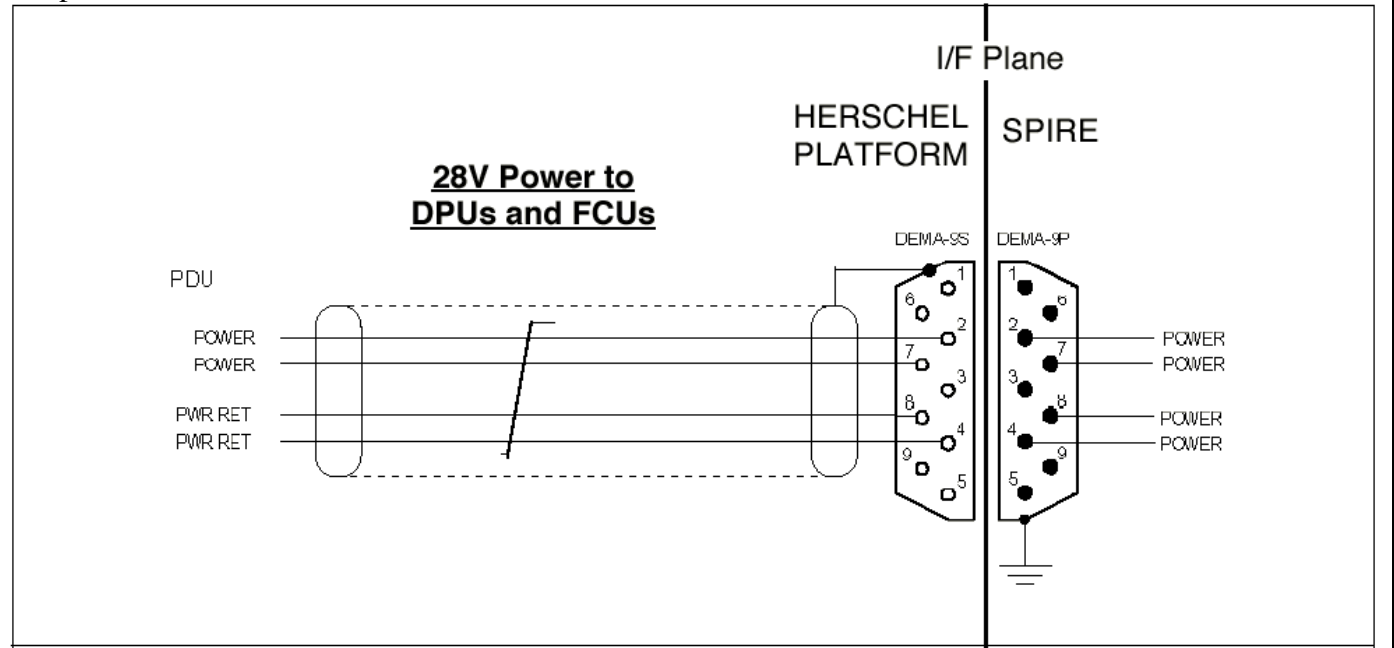
Connector/Backshell Details

To HSDPU J2

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 117 of 124

4.5.4 T4 DPU to (1553+SYNC)-R

Overall Mechanical Drwg.

1:2

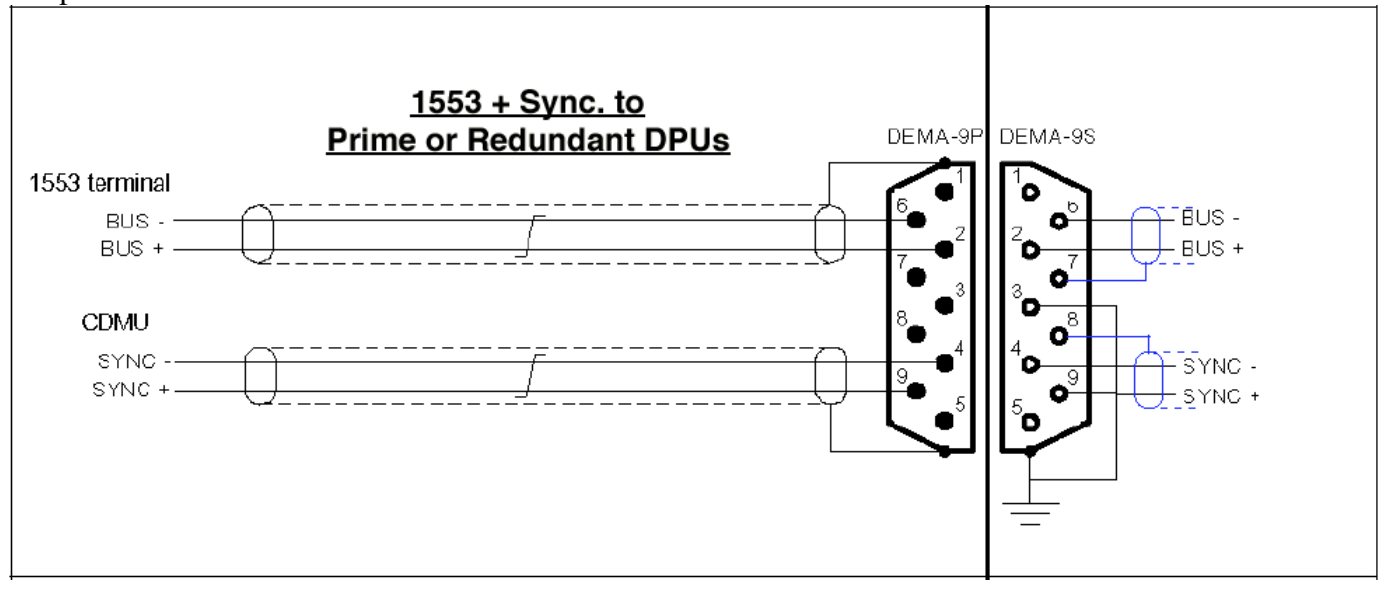
Connector/Backshell Details

To HSDPU J4 & J6

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 118 of 124

4.5.5 T5 FCU-P Power

Overall Mechanical Drwg.

1:1

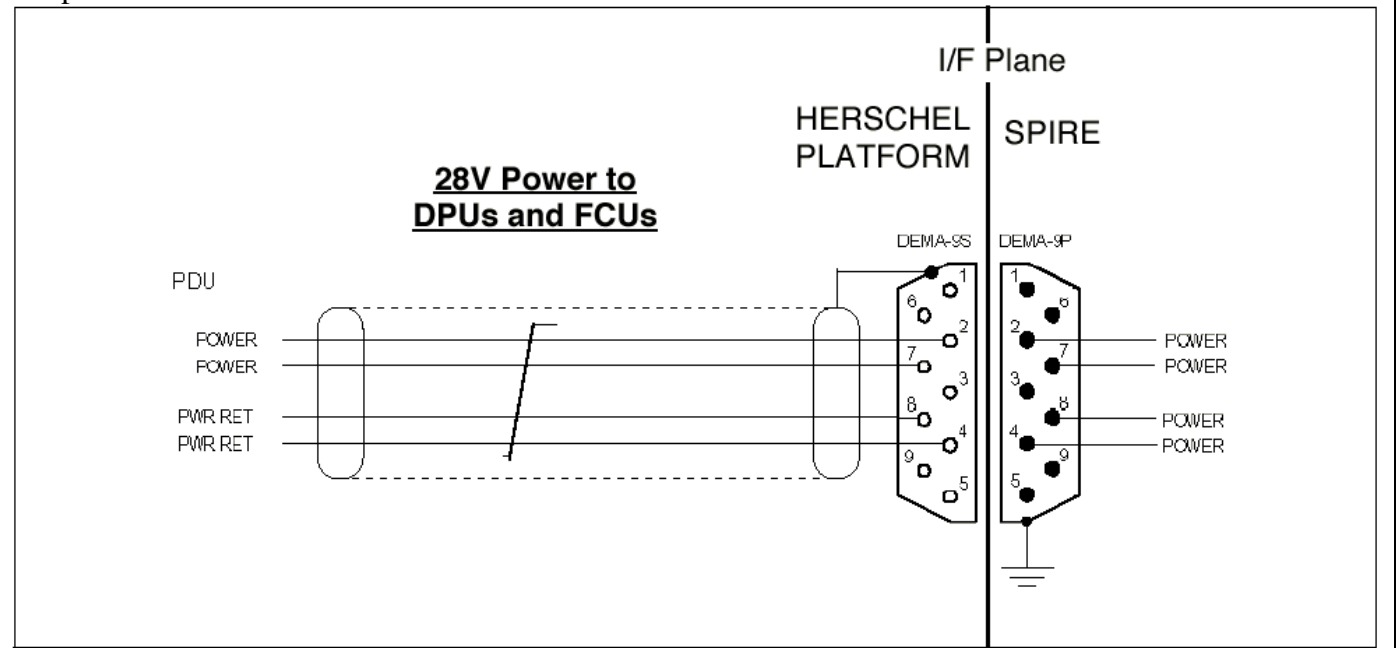
Connector/Backshell Details

To HSFCU J5

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 119 of 124

4.5.6 T6 FCU-P SYNC

Overall Mechanical Drwg.

1:1

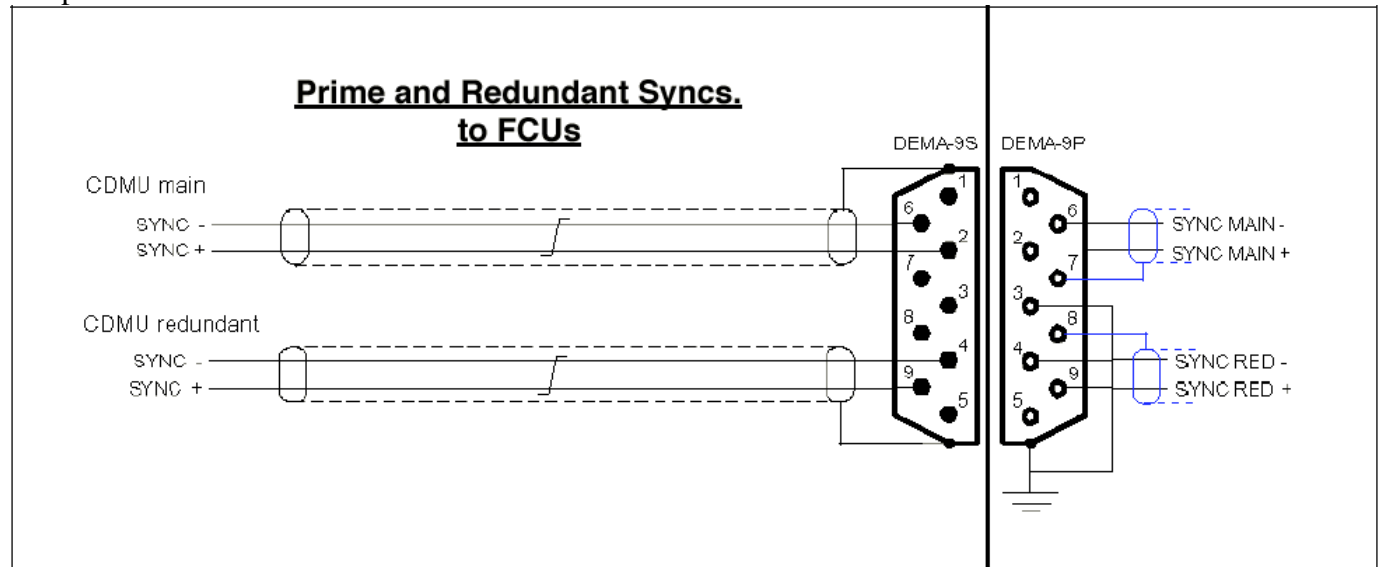
Connector/Backshell Details

To HSFCU J7

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 120 of 124

4.5.7 T7 FCU-R Power

Overall Mechanical Drwg.

1:1

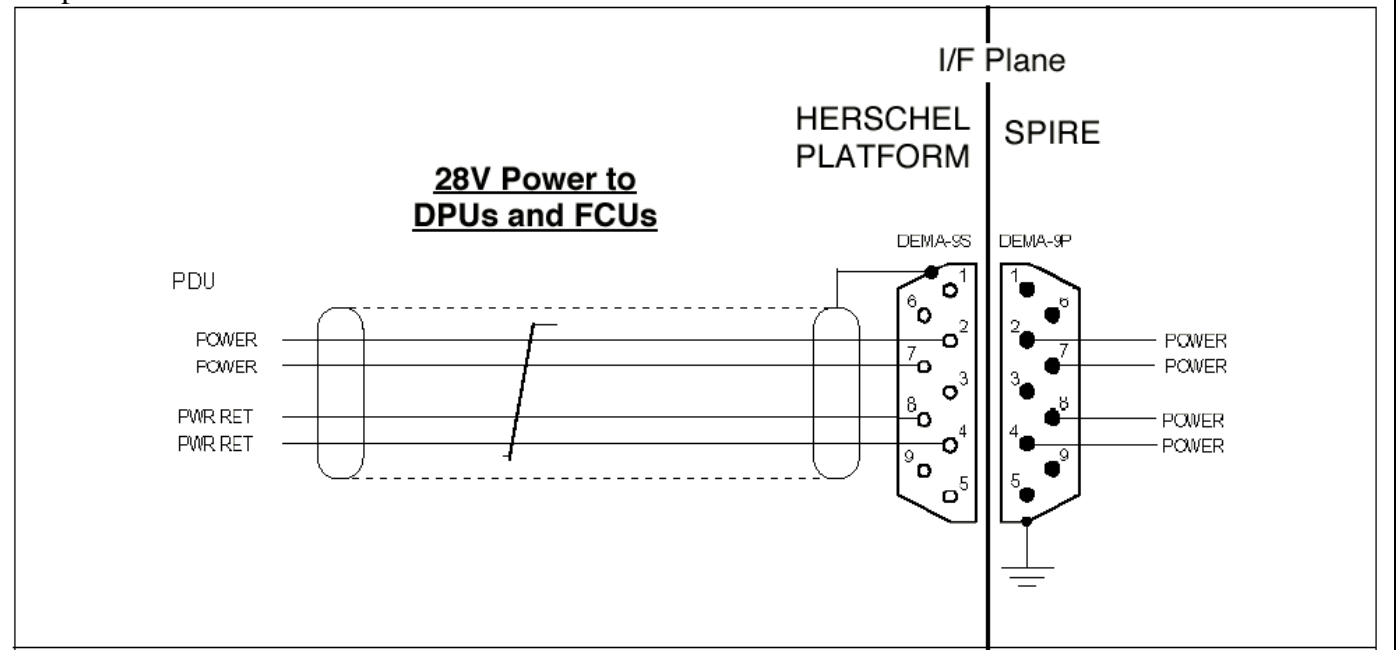
Connector/Backshell Details

To HSFCU J6

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 121 of 124

4.5.8 T8 FCU-R SYNC

Overall Mechanical Drwg.

1:1

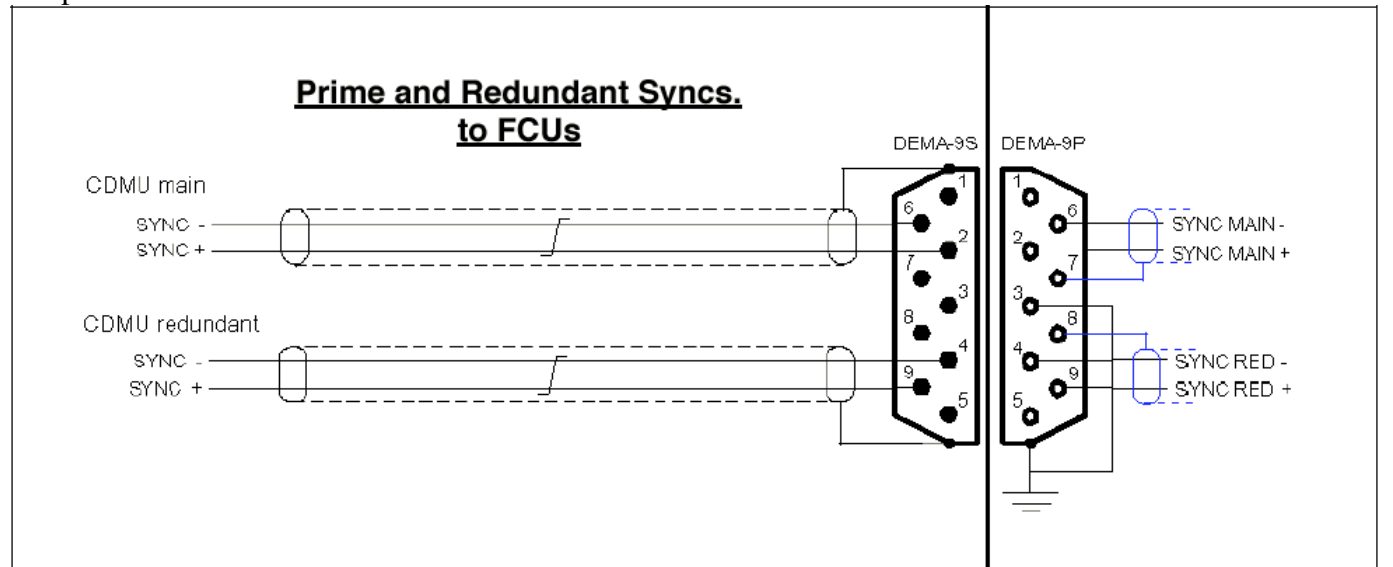
Connector/Backshell Details

To HSFCU J8

Harness Layup

Contact Details

As per SPIRE-RAL-COM-000562 Iss2





SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 122 of 124

4.5.9 T9 SHT-EGSE-LNK

Overall Mechanical Drwg.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 123 of 124

4.5.10 T10 SHT via FCU-P

Overall Mechanical Drwg.

Connector/Backshell Details

Harness Layup

Contact Details



SPIRE HARNESS DEFINITION

Doc #: SPIRE-RAL-PRJ-000608
Issue: 0.3
Date: 30/5/01 5:34 PM
Page 124 of 124

4.5.11 T11 SHT via FCU-R

Overall Mechanical Drwg.

Connector/Backshell Details

Harness Layup

Contact Details

End of Doc.