



27th March 2001

To: Doug Griffin

From: John Delderfield

cc: See Page 3.

SPIRE-RAL-PRJ-000608 27/3/01 Draft 0.1

## **re: SPIRE HARNESS**

You will recall that on going through the SPIRE Configurable Documents' Tree we noted that one of the IIDB supporting documents is the SPIRE Harness Definition.

This document is attached is an outline draft form.

I've assigned numbers/labels to various items on the Instrument Block diagram which follows. This has now got too much detail on it to be easily used at A4 document so I've extracted the harness information in outline in two separate A4 diagrams which are in the document draft.

The SPIRE Harness Definition, SPIRE-RAL-PRJ-000608, will be called up as an applicable document in the IIDB and is one of the ways to keep the IIDB at a manageable size.

Many of the harness definitions that need to go in can be cut and pasted from existing documents. So if you can work on this document as and when, and I will now get on with updating the IIDB.

Cheers

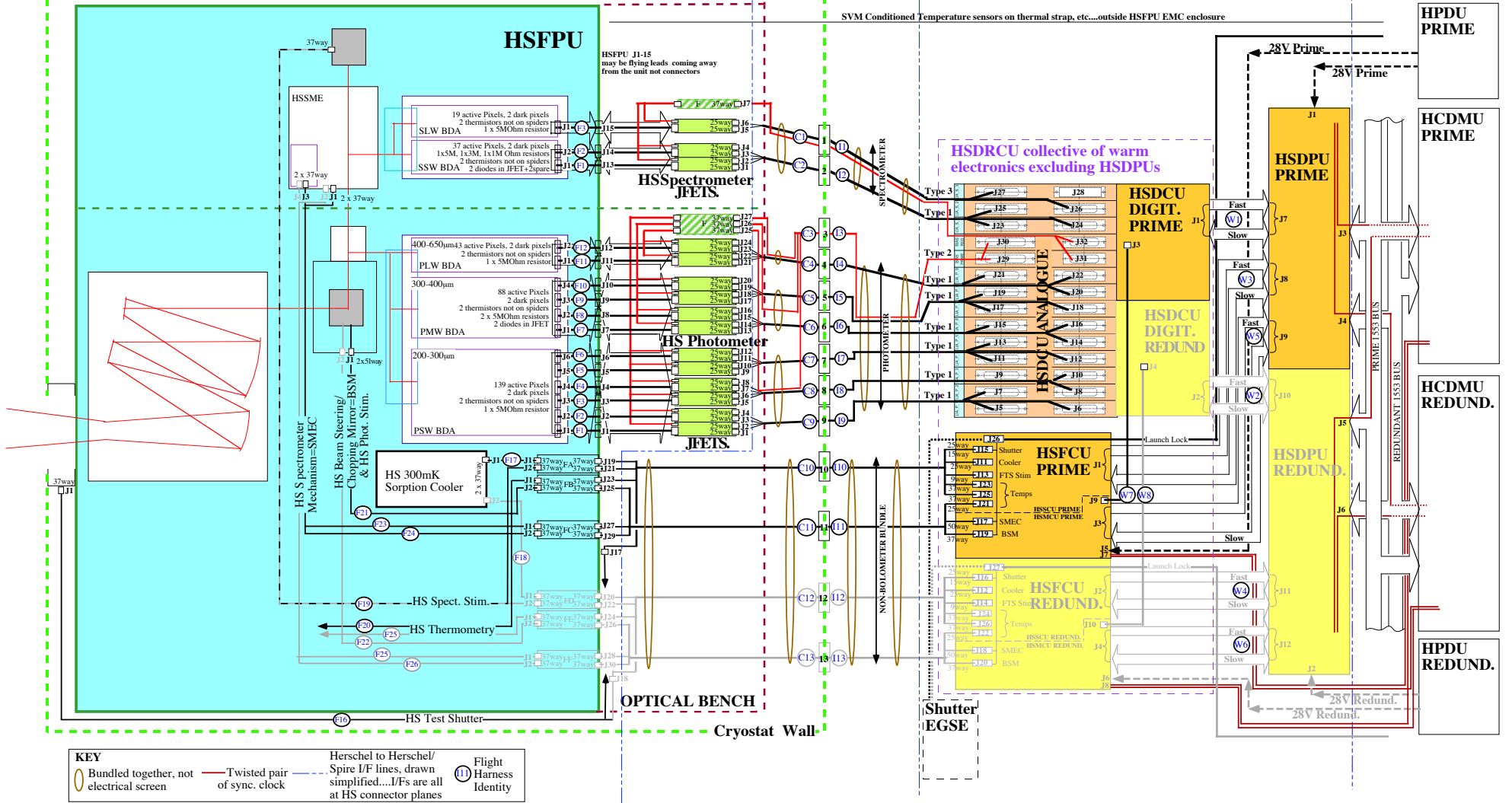
John

### HERSCHEL-SPIRE(HS)

### HERSCHEL

### HERSCHEL-SPIRE(HS)

### HERSCHEL



Shutter wiring outside RF enclosure and Filter number reduced

F Harness numbers and Filter Numbers Added

Fix duplicate 25/26 connectors.



**SPIRE  
HARNESS DEFINITION**

Doc #: SPIRE-RAL-PRJ-000608  
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Subject: **SPIRE HARNESS DEFINITION**

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

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

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



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## CHANGE RECORD

ISSUE	DATE	SECTION	CHANGE(S) MADE
Draft 0.1	28/3/01	All	First Issue

## ACRONYM LIST

To be inserted





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## 1 SCOPE

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

It is an applicable document in the SPIRE IIDB, and as such is called up, and 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 all 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



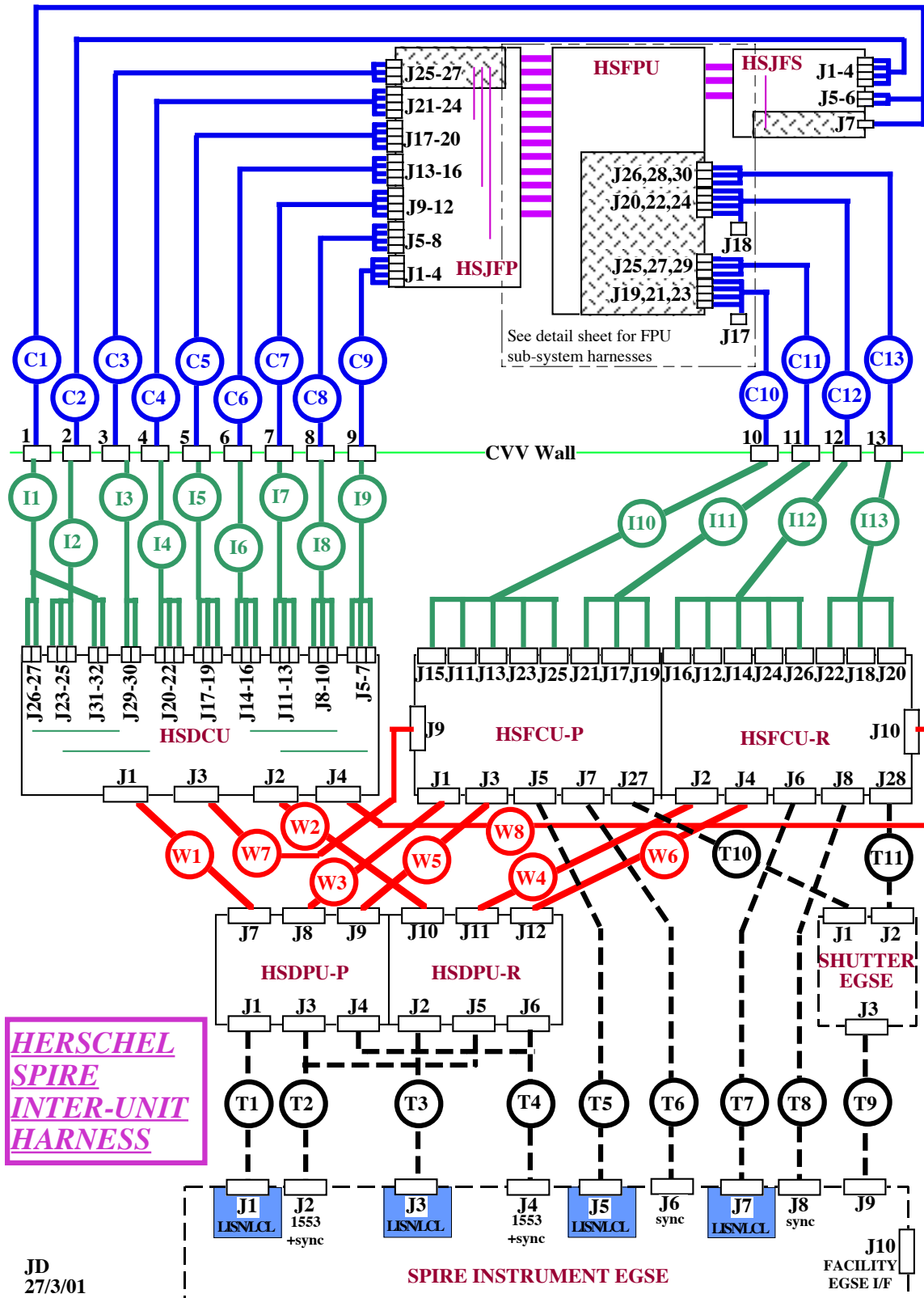


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## 3 INTRODUCTION

The overall HERSCHEL SPIRE harnesses are configured as shown:



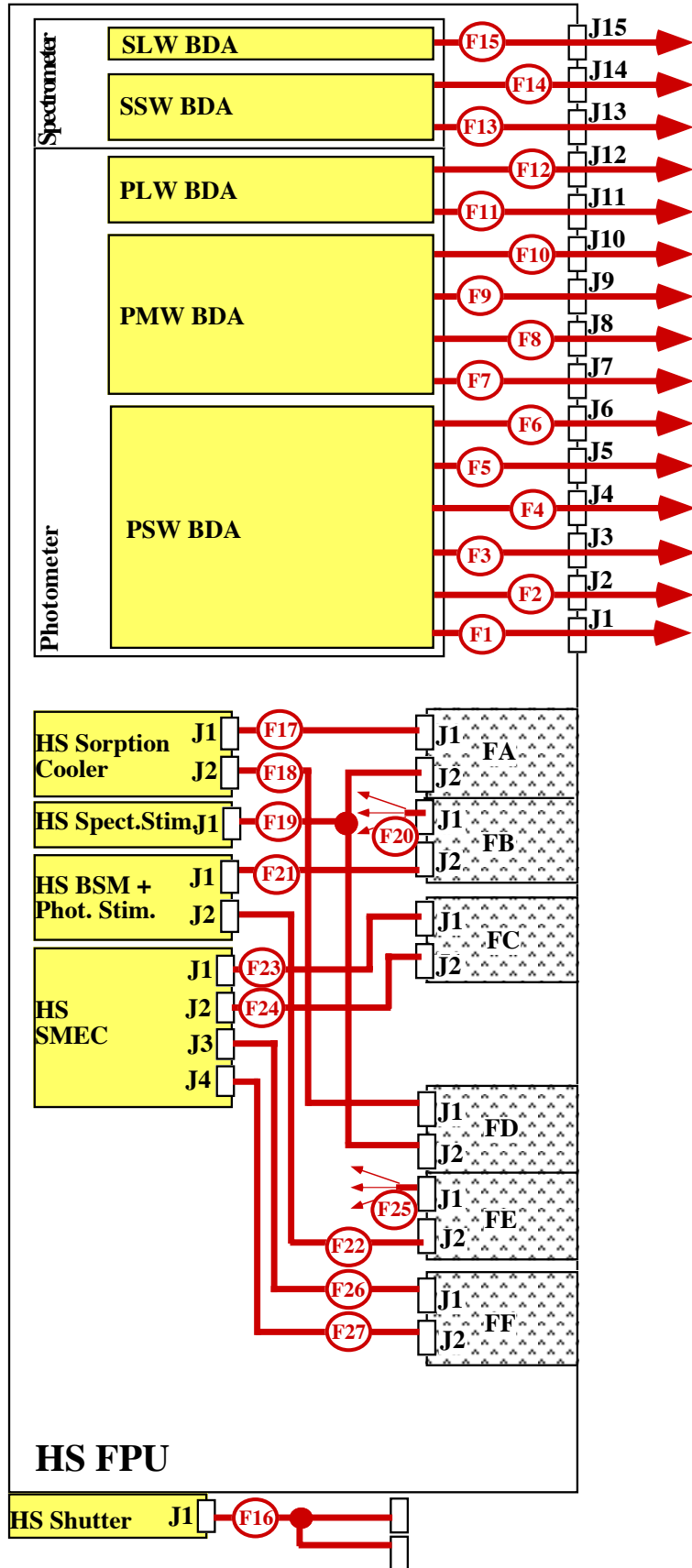


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The detail in the HSFPU are as follows:

**Note:**  
J1-J15 FPU connectors  
are baselined as being  
replaced with cable to  
wall feedthrough via  
two interface plates.



**HERSCHEL  
SPIRE  
FPU  
INTER-SUBSYSTEM  
HARNESS**

JD  
28/3/01

HS FPU



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## Notes:

There are some "loop" harnesses that terminate within a given unit, such as on the HS DCU and the HSJFS + HSJFB "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 as well as functioning electrically as harnesses.



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## 4 HARNESS DETAILS

### 4.1 Warm Harnesses

#### 4.1.1 W1 HSDPU-P to HSDCU-P

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.1.2 W2 HSDPU-R to HSDCU-R

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.1.3 W3 HSDPU-P to HSSCU-P

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.1.4 W4 HSDPU-R to HSSCU-R

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.1.5 W5 HSDPU-P to HSMCU-P

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details





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## 4.1.6 W6 HSDPU-R to HSMCU-R

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.2 Intermediate Harnesses

### 4.2.1 I1 HSDCU to CVV1 Type3

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



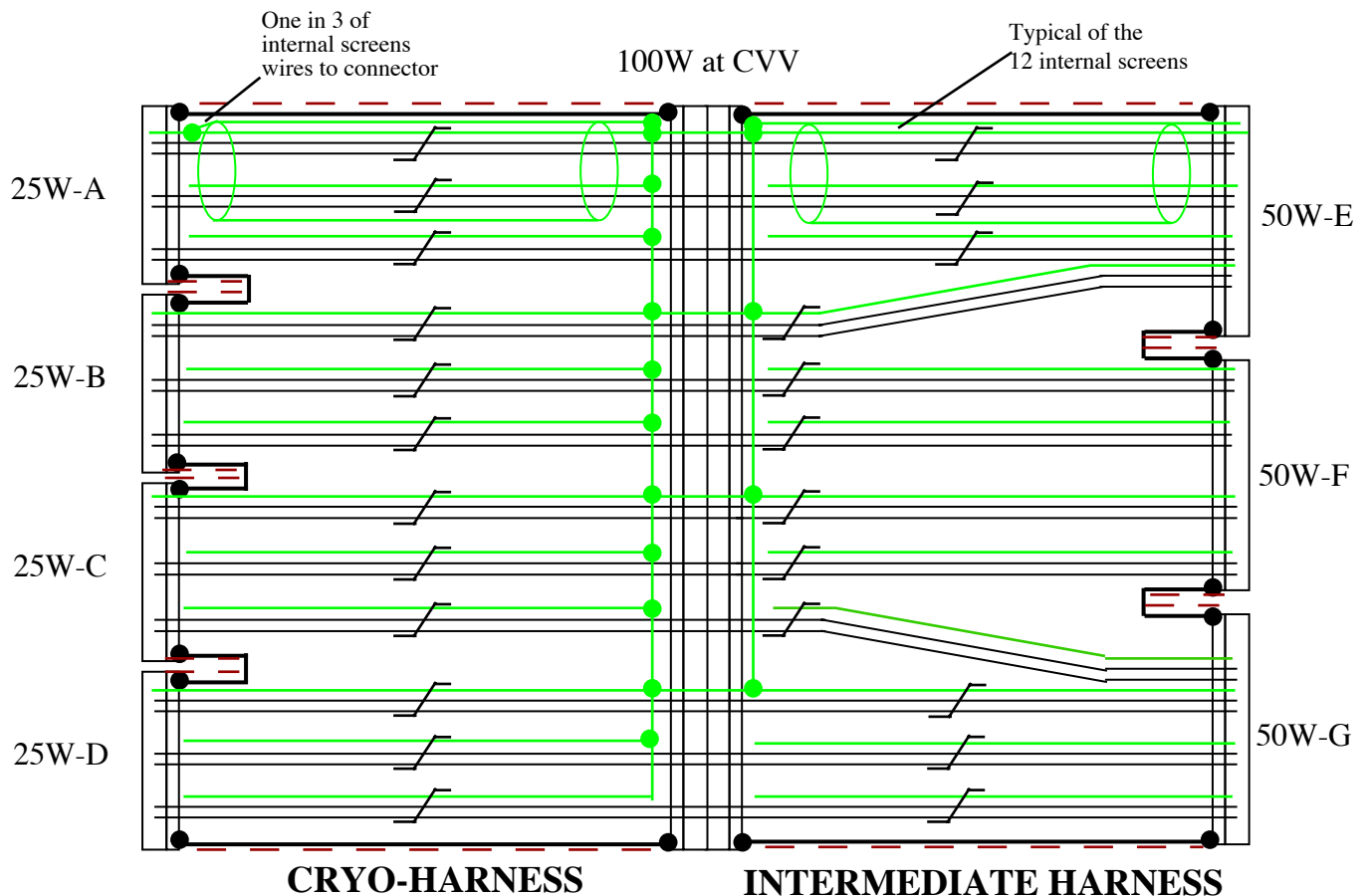
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## 4.2.2 I2 HSDCU to CVV2 Type1

Mechanical Drwg.

### Connector/Backshell Details



48 channels as twisted triples, grouped in fours as "12-ax", each with its own insulated screen. So there are three 12-ax to each 25 way changing to four for each 50way connector.

All of the signal grounds in the triples pass through the 50 way connectors, but only 4 can pass through the 100 ways, the rest being NC at that point. The four that pass shall correspond to the 4 single grounds that pass the 25 way connectors. A signal ground wire ring on each side of the 100 way shall be supported on the 4 ground contacts that pass through it. The signal grounds in triples in the cold harness shall be NC at the JFET end and made-off to one of these rings.

All 12 internal screens in both the warm and cold harnesses shall be made off to these rings. The four at each 50way shall pass doubled-up on the 2 spare pins through each. If it is practical, because the braid is much lower impedance than the cores, one should be spliced on to the ground contact though each 25W, leaving the other two NC.

All of this harness is enclosed in outer r.f. screen, EMC sealed to connector boots, overwrapped with double-wound insulation.



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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	50way E	50wayF	50way G
Channel 1 +	1				TBD	1		
Channel 1 -	14				TBD	18		
Channel 1gnd	NC				XXX	34		
Channel 2 +	2				TBD	2		
Channel 2 -	15				TBD	19		
Channel 2gnd	NC				XXX	35		
Channel 3 +	3				TBD	3		
Channel 3 -	16				TBD	20		
Channel 3gnd	NC				XXX	36		
Channel 4 +	4				TBD	4		
Channel 4 -	17				TBD	21		
Channel 4gnd	NC				XXX	37		
Channel 5 +	5				TBD	5		
Channel 5 -	18				TBD	22		
Channel 5gnd	NC				XXX	38		
Channel 6 +	6				TBD	6		
Channel 6 -	19				TBD	23		
Channel 6gnd	NC				XXX	39		
Channel 7 +	7				TBD	7		
Channel 7 -	20				TBD	24		
Channel 7gnd	NC				XXX	40		
Channel 8 +	8				TBD	8		
Channel 8 -	21				TBD	25		
Channel 8gnd	NC				XXX	41		
12ax braid ch1-4	NC				On Bars	9		
12ax braid ch5-8	NC				On Bars	9		
12ax braid ch9-12	13				On Bars	42		
12ax braid ch13-16		NC			On Bars	42		
Channel 9 +	9				TBD	10		
Channel 9 -	22				TBD	26		
Channel 9gnd	NC				XXX	43		
Channel 10 +	10				TBD	11		
Channel 10 -	23				TBD	27		
Channel 10gnd	NC				XXX	44		
Channel 11 +	11				TBD	12		
Channel 11 -	24				TBD	28		
Channel 11gnd	NC				XXX	45		
Channel 12 +	12				TBD	13		
Channel 12 -	25				TBD	29		
Channel 12gnd	13				TBD	46		
Channel 13 +		1			TBD	14		
Channel 13 -		14			TBD	30		
Channel 1gnd		NC			XXX	47		
Channel 14 +		2			TBD	15		
Channel 14 -		15			TBD	31		
Channel 1gnd		NC			XXX	48		
Channel 15 +		3			TBD	16		
Channel 15 -		16			TBD	32		
Channel 15gnd		NC			XXX	49		
Channel 16 +		4			TBD	17		
Channel 16 -		17			TBD	33		
Channel 16gnd		NC			XXX	50		
Channel 17 +		5			TBD		1	



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Name	25way A	25wayB	25Way C	25way D	100Way	50way E	50wayF	50way G
Channel 17 -		18			TBD		18	
Channel 17gnd		NC			XXX		34	
Channel 18 +		6			TBD		2	
Channel 18 -		19			TBD		19	
Channel 18gnd		NC			XXX		35	
Channel 19 +		7			TBD		3	
Channel 19 -		20			TBD		20	
Channel 19gnd		NC			XXX		36	
Channel 20 +		8			TBD		4	
Channel 20 -		21			TBD		21	
Channel 1gnd		NC			XXX		37	
Channel 21 +		9			TBD		5	
Channel 21 -		22			TBD		22	
Channel 21gnd		NC			XXX		38	
Channel 22 +		10			TBD		6	
Channel 22 -		23			TBD		23	
Channel 22gnd		NC			XXX		39	
Channel 23 +		11			TBD		7	
Channel 23 -		24			TBD		24	
Channel 23gnd		NC			XXX		40	
Channel 24 +		12			TBD		8	
Channel 24 -		25			TBD		25	
Channel 24gnd		13			TBD		41	
12ax braid ch17-20		NC			On Bars		9	
12ax braid ch21-24		13			On Bars		9	
12ax braid ch25-28			NC		On Bars		42	
12ax braid ch29-32			NC		On Bars		42	
Channel 25 +			1		TBD		10	
Channel 25 -			14		TBD		26	
Channel 25gnd			NC		XXX		43	
Channel 26 +			2		TBD		11	
Channel 26 -			15		TBD		27	
Channel 26gnd			NC		XXX		44	
Channel 27 +			3		TBD		12	
Channel 27 -			16		TBD		28	
Channel 27gnd			NC		XXX		45	
Channel 28 +			4		TBD		13	
Channel 28 -			17		TBD		29	
Channel 28gnd			NC		XXX		46	
Channel 29 +			5		TBD		14	
Channel 29 -			18		TBD		30	
Channel 29gnd			NC		XXX		47	
Channel 30 +			6		TBD		15	
Channel 30 -			19		TBD		31	
Channel 30gnd			NC		XXX		48	
Channel 31 +			7		TBD		16	
Channel 31 -			20		TBD		32	
Channel 31gnd			NC		XXX		49	
Channel 32 +			8		TBD		17	
Channel 32 -			21		TBD		33	
Channel 32gnd			NC		XXX		50	
Channel 33 +			9		TBD			1
Channel 33 -			22		TBD			18
Channel 33gnd			NC		XXX			34
Channel 34 +			10		TBD			2



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Name	25way A	25wayB	25Way C	25way D	100Way	50way E	50wayF	50way G
Channel 34 -			23		TBD			19
Channel 34gnd			NC		XXX			35
Channel 35 +			11		TBD			3
Channel 35 -			24		TBD			20
Channel 35gnd			NC		XXX			36
Channel 36 +			12		TBD			4
Channel 36 -			25		TBD			21
Channel 36gnd			13		TBD			37
Channel 37 +				1	TBD			5
Channel 37 -				14	TBD			22
Channel 37gnd				NC	XXX			38
Channel 38 +				2	TBD			6
Channel 38 -				15	TBD			23
Channel 38gnd				NC	XXX			39
Channel 39 +				3	TBD			7
Channel 39 -				16	TBD			24
Channel 39gnd				NC	XXX			40
Channel 40 +				4	TBD			8
Channel 40 -				17	TBD			25
Channel 40gnd				NC	XXX			41
12ax braid ch33-36			13		On Bars			9
12ax braid ch37-40				NC	On Bars			9
12ax braid ch41-44				NC	On Bars			42
12ax braid ch44-48				13	On Bars			42
Channel 41 +				5	TBD			10
Channel 41 -				18	TBD			26
Channel 41gnd				NC	XXX			43
Channel 42 +				6	TBD			11
Channel 42 -				19	TBD			27
Channel 42gnd					XXX			44
Channel 43 +				7	TBD			12
Channel 43 -				20	TBD			28
Channel 43gnd					XXX			45
Channel 44 +				8	TBD			13
Channel 44 -				21	TBD			29
Channel 44gnd				NC	XXX			46
Channel 45 +				9	TBD			14
Channel 45 -				22	TBD			30
Channel 45gnd				NC	XXX			47
Channel 46 +				10	TBD			15
Channel 46 -				23	TBD			31
Channel 46gnd				NC	XXX			48
Channel 47 +				11	TBD			16
Channel 47 -				24	TBD			32
Channel 47gnd				NC	XXX			49
Channel 48 +				12	TBD			17
Channel 48 -				25	TBD			33
Channel 48gnd				13	TBD			50

XXX= on bar cold side. NC intermediate side.



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## 4.2.3 I3 HSDCU to CVV3 Type2

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.2.4 I4 HSDCU to CVV4 Type1

Mechanical Drwg.

Format as I 2, maybe differing lengths.

Connector/Backshell Details

As I 2.

Contact/Build Details

As I 2.





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## 4.2.5 I5 HSDCU to CVV5 Type1

Mechanical Drwg.

Format as I 2, maybe differing lengths.

Connector/Backshell Details

As I 2.

Contact/Build Details

As I 2.



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## 4.2.6 I6 HSDCU to CVV6 Type1

Mechanical Drwg.

Format as I 2, maybe differing lengths.

Connector/Backshell Details

As I 2.

Contact/Build Details

As I 2.



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## 4.2.7 I7 HSDCU to CVV7 Type1

Mechanical Drwg.

Format as I 2, maybe differing lengths.

Connector/Backshell Details

As I 2.

Contact/Build Details

As I 2.



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## 4.2.8 I8 HSDCU to CVV8 Type1

Mechanical Drwg.

Format as I 2, maybe differing lengths.

Connector/Backshell Details

As I 2.

Contact/Build Details

As I 2.



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## 4.2.9 I9 HSDCU to CVV9 Type1

Mechanical Drwg.

Format as I 2, maybe differing lengths.

Connector/Backshell Details

As I 2.

Contact/Build Details

As I 2.



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## 4.2.10 I10 HSDCU to CVV10 AUX-P

Mechanical Drwg.

Connector/Backshell Details

	No. of Cond. Pins	No. of shield pins	Max.allowed Conductor Res.(Ohms)	Mean Current (A)/condt.	Peak Current (A)/condt.	Remarks	Cernox Type or Connect.ID	
<b><i>AUXILIARY PRIME 10</i></b> <span style="float: right;"><b><i>CVV 100way Pins in use= 100</i></b></span>								
Shutter Actuator	2	1	10			Scr. Tw. Quad* with*	FCU J15	
Shutter Launch latch drive	1	0	10				FCU J15	
Shutter launch latch confirm	2	0	1000	2.50E-09	2.50E-09	Twisted Pair	FCU J15	
Shutter Heater	1	0	10			with*	FCU J15	
Shutter Sensor Activation	2	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Pair	FCU J15	
Shutter Vane Therm A	2	0	1000	2.50E-09	2.50E-09	With activation	FCU J15	
Shutter Vane Position	3	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Tripl	FCU J15	
15	13	2	FPU J17 37 way connector					
300mK Pump heater	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J11	
300mK Pump heater(rob.)	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J11	
300mK Pump therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050	
300mK Evap. diag. heater	2	0	10	0.00E+00	0.00E+00	Twisted Pair	FCU J11	
300mK Evap. therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030	
300mK Shunt therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030	
300mK Pump heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Evap. heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Pump heat SW heater(rob.)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Evap. heat SW heater(rob.)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Pump heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050	
300mK Evap. heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050	
35	34	1	FPU J19 37 way connector				21therm+14	therm=FCU J25
FTS BB Flood Heater	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21	
FTS BB Flood Heater(rob.)	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21	
FTS BB Flood Therm.	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	
FTS BB case nr. SOB I/F therm	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	
FTS BB Point Stimulus	2	0	30			Twisted Pair	FCU J21	
15	14	1	FPU J21 37 way connector				9therm+6	therm=FCU J25
Spect JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	
Phot JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	



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FSFPU chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
Photometer 2K box	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
Spectrometer 2K box	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
M3,5,7 Optical Subench	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
Input Baffle Therm	4	0.34	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
BSM/SOB I/F therm	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
35	32	3	FPU J23 37 way connector			All 35 therm	FCU J23



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## 4.2.11 I11 HSDCU to CVV11 DRV-P

Mechanical Drwg.

Connector/Backshell Details

	No. of Cond. Pins	No. of shield pins	Max.allowed Conductor Res.(Ohms)	Mean Current (A)/condt.	Peak Current (A)/condt.	Remarks	Cernox Type or Connect.ID
<b>DRIVES PRIME 11</b>	<b>CVV 100way Pins in use=</b>			<b>96</b>			
BSM chop drive coil	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM jiggle drive coil	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM chop drive coil(rob.)	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM jiggle drive coil(rob.)	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM chop posn. Sense	5	1	100	1.00E-04	1.00E-04	STP+ STT	FCU J25
BSM jiggle posn. Sense	5	1	100	1.00E-04	1.00E-04	STP+ STT	FCU J25
BSM therm	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
BSM Launch Latch	2	0	10			Twisted Pair	FCU J25
BSM Launch Latch sensor	2	0	1000			Twisted Pair	FCU J25
Phot. BB Point Stimulus	2	1	30			Twisted Pair	FCU J25
34	28		6 FPU J25 37 way connector			5 therm+28	therm=FCU J21
SMEC drive coil	2	1	10	8.00E-03	8.00E-03	Scr. Tw. Pair	FCU J27
SMEC drive coil(rob.)	2	1	10	8.00E-03	8.00E-03	Scr. Tw. Pair	FCU J27
SMEC drive coil volts	2	1	1000	2.50E-09	2.50E-09	Scr. Tw. Pair	FCU J27
SMEC posn sensors	19	1	1000	1.00E-04	1.00E-04	TBD	FCU J29
SMEC home/limit switches	18	1	1000	1.00E-03	1.00E-03	TBD	FCU J29
SMEC Mechanism Temp	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
SMEC Launch Latch	2	0	10			Scr. Tw. Pair	FCU J27
BSM Launch Latch sensor	2	0	1000			Twisted Pair	FCU J27
SMEC/SOB I/F therm	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
62	55	7	FPU J27&29 37 way connectors			10thm+20+19+13	therm=FCU J21





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## 4.2.12 I12 HSDCU to CVV12 AUX-R

Mechanical Drwg.

Connector/Backshell Details

	No. of Cond. Pins	No. of shield pins	Max.allowed Conductor Res.(Ohms)	Mean Current (A)/condt.	Peak Current (A)/condt.	Remarks	Cernox Type or Connect.ID
<b><i>AUXILIARY REDUNDANT 12 CVV 100way Pins in use = 100</i></b>							
Shutter Actuator(rob)	2	1	10			Scr. Tw. Quad*	FCU J16
Shutter Launch latch drive(rob)	1	0	10			with*	FCU J16
Shutter launch latch confirm	2	0	1000	2.50E-09	2.50E-09	Twisted Pair	FCU J16
Shutter Heater(rob)	1	0	10			with*	FCU J16
Shutter Sensor Activation	2	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	FCU J16
Shutter Vane Therm B	2	1	1000	2.50E-09	2.50E-09	Scr. Tw. Pair	FCU J16
Shutter Actuator Therm	2	0	1000	2.50E-09	2.50E-09	With activation	FCU J16
15	12	3	FPU J18 37 way connector				
300mK Pump heater	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J12
300mK Pump heater(rob.)	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J12
300mK Pump therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
300mK Evap. diag. heater	2	0	10	0.00E+00	0.00E+00	Twisted Pair	FCU J12
300mK Evap. therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030
300mK Shunt therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030
300mK Pump heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Evap. heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Pump heat SW heater(rob)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Evap. heat SW heater(rob)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Pump heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
300mK Evap. heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
35	34	1	FPU J20 37 way connector			21therm+14	therm=FCU J26
FTS BB Flood Heater	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21
FTS BB Flood Heater (rob.)	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21
FTS BB Flood Therm.	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
FTS BB case nr. SOB I/F therm	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
FTS BB Point Stimulus	2	0	30			Twisted Pair	FCU J21
15	14	1	FPU J21 37 way connector			9therm+6	therm=FCU J25
Spect JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
Phot JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
FSFPU chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
Photometer 2K box	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050



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Spectrometer 2K box	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
M3,5,7 Optical Sub-bench	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
Input Baffle Therm	4	0.34	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
BSM/SOB I/F therm	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
35	32	3	FPU J24 37 way connector			All 35 therm	FCU J24



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## 4.2.13 I13 HSDCU to CVV13 DRV-R

Mechanical Drwg.

Format as I11, maybe differing lengths.

Connector/Backshell Details

As I11.

Contact/Build Details

As I11.

For Redundant Drives on Harness C/I 13, add one to all the FCU connector numbers.



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## 4.3 Cryogenic Harnesses

### 4.3.1 C1 CVV1 to HSJFS Type3

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



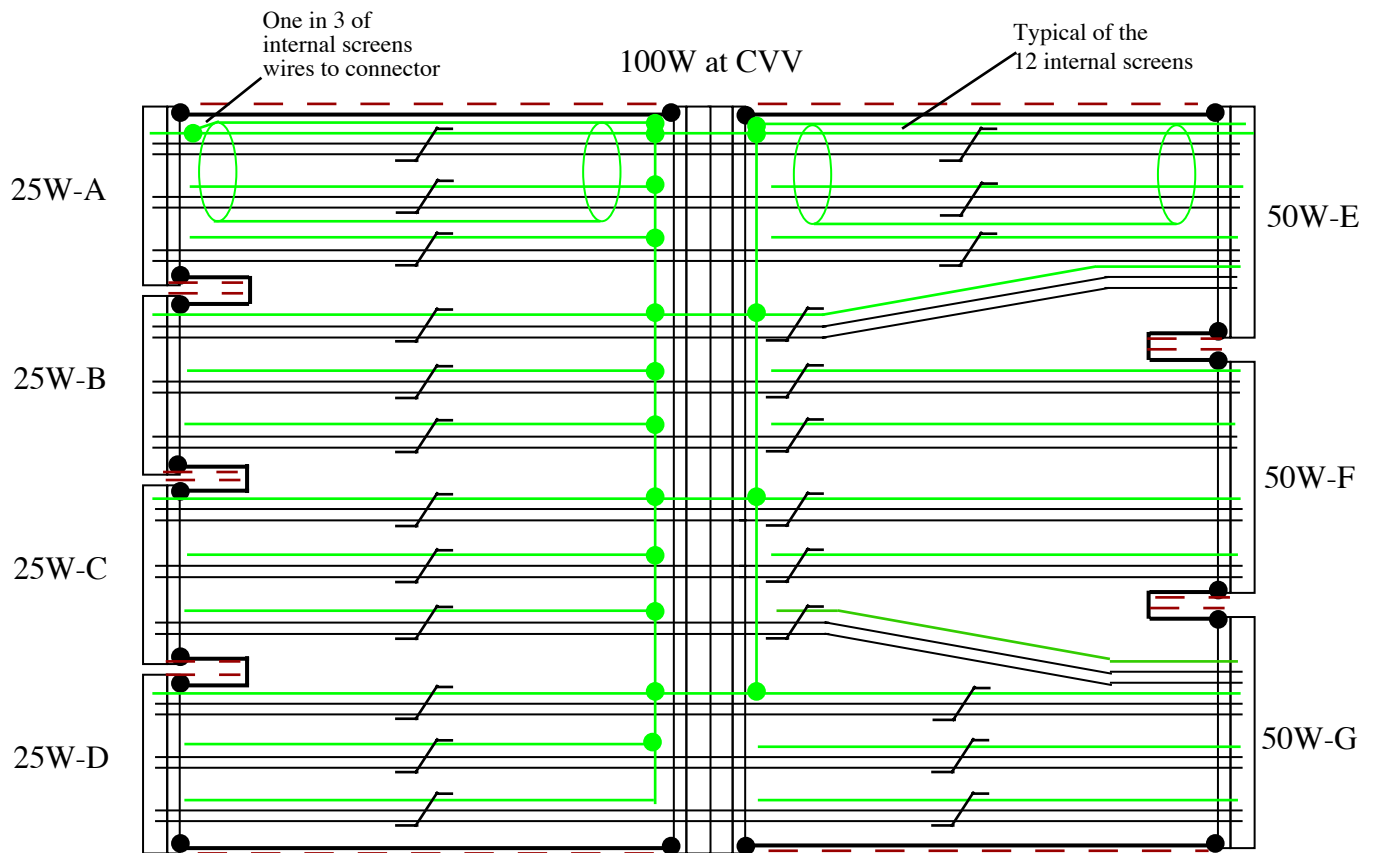
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## 4.3.2 C2 CVV2 to HSJFS Type1

Mechanical Drwg.

### Connector/Backshell Details



#### CRYO-HARNESS

#### INTERMEDIATE HARNESS

48 channels as twisted triples, grouped in fours as "12-ax", each with its own insulated screen. So there are three 12-ax to each 25 way changing to four for each 50way connector.

All of the signal grounds in the triples pass through the 50 way connectors, but only 4 can pass through the 100 ways, the rest being NC at that point. The four that pass shall correspond to the 4 single grounds that pass the 25 way connectors. A signal ground wire ring on each side of the 100 way shall be supported on the 4 ground contacts that pass through it. The signal grounds in triples in the cold harness shall be NC at the JFET end and made-off to one of these rings.

All 12 internal screens in both the warm and cold harnesses shall be made off to these rings. The four at each 50way shall pass doubled-up on the 2 spare pins through each. If it is practical, because the braid is much lower impedance than the cores, one should be spliced on to the ground contact though each 25W, leaving the other two NC.

All of this harness is enclosed in outer r.f. screen, EMC sealed to connector boots, overwrapped with double-wound insulation.



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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	50way E	50wayF	50way G
Channel 1 +	1				TBD	1		
Channel 1 -	14				TBD	18		
Channel 1gnd	NC				XXX	34		
Channel 2 +	2				TBD	2		
Channel 2 -	15				TBD	19		
Channel 2gnd	NC				XXX	35		
Channel 3 +	3				TBD	3		
Channel 3 -	16				TBD	20		
Channel 3gnd	NC				XXX	36		
Channel 4 +	4				TBD	4		
Channel 4 -	17				TBD	21		
Channel 4gnd	NC				XXX	37		
Channel 5 +	5				TBD	5		
Channel 5 -	18				TBD	22		
Channel 5gnd	NC				XXX	38		
Channel 6 +	6				TBD	6		
Channel 6 -	19				TBD	23		
Channel 6gnd	NC				XXX	39		
Channel 7 +	7				TBD	7		
Channel 7 -	20				TBD	24		
Channel 7gnd	NC				XXX	40		
Channel 8 +	8				TBD	8		
Channel 8 -	21				TBD	25		
Channel 8gnd	NC				XXX	41		
12ax braid ch1-4	NC				On Bars	9		
12ax braid ch5-8	NC				On Bars	9		
12ax braid ch9-12	13				On Bars	42		
12ax braid ch13-16		NC			On Bars	42		
Channel 9 +	9				TBD	10		
Channel 9 -	22				TBD	26		
Channel 9gnd	NC				XXX	43		
Channel 10 +	10				TBD	11		
Channel 10 -	23				TBD	27		
Channel 10gnd	NC				XXX	44		
Channel 11 +	11				TBD	12		
Channel 11 -	24				TBD	28		
Channel 11gnd	NC				XXX	45		
Channel 12 +	12				TBD	13		
Channel 12 -	25				TBD	29		
Channel 12gnd	13				TBD	46		
Channel 13 +		1			TBD	14		
Channel 13 -		14			TBD	30		
Channel 1gnd		NC			XXX	47		
Channel 14 +		2			TBD	15		
Channel 14 -		15			TBD	31		
Channel 1gnd		NC			XXX	48		
Channel 15 +		3			TBD	16		
Channel 15 -		16			TBD	32		
Channel 15gnd		NC			XXX	49		
Channel 16 +		4			TBD	17		
Channel 16 -		17			TBD	33		
Channel 16gnd		NC			XXX	50		



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Name	25way A	25wayB	25Way C	25way D	100Way	50way E	50wayF	50way G
Channel 17 +		5			TBD		1	
Channel 17 -		18			TBD		18	
Channel 17gnd		NC			XXX		34	
Channel 18 +		6			TBD		2	
Channel 18 -		19			TBD		19	
Channel 18gnd		NC			XXX		35	
Channel 19 +		7			TBD		3	
Channel 19 -		20			TBD		20	
Channel 19gnd		NC			XXX		36	
Channel 20 +		8			TBD		4	
Channel 20 -		21			TBD		21	
Channel 1gnd		NC			XXX		37	
Channel 21 +		9			TBD		5	
Channel 21 -		22			TBD		22	
Channel 21gnd		NC			XXX		38	
Channel 22 +		10			TBD		6	
Channel 22 -		23			TBD		23	
Channel 22gnd		NC			XXX		39	
Channel 23 +		11			TBD		7	
Channel 23 -		24			TBD		24	
Channel 23gnd		NC			XXX		40	
Channel 24 +		12			TBD		8	
Channel 24 -		25			TBD		25	
Channel 24gnd		13			TBD		41	
12ax braid ch17-20		NC			On Bars		9	
12ax braid ch21-24		13			On Bars		9	
12ax braid ch25-28			NC		On Bars		42	
12ax braid ch29-32			NC		On Bars		42	
Channel 25 +			1		TBD		10	
Channel 25 -			14		TBD		26	
Channel 25gnd			NC		XXX		43	
Channel 26 +			2		TBD		11	
Channel 26 -			15		TBD		27	
Channel 26gnd			NC		XXX		44	
Channel 27 +			3		TBD		12	
Channel 27 -			16		TBD		28	
Channel 27gnd			NC		XXX		45	
Channel 28 +			4		TBD		13	
Channel 28 -			17		TBD		29	
Channel 28gnd			NC		XXX		46	
Channel 29 +			5		TBD		14	
Channel 29 -			18		TBD		30	
Channel 29gnd			NC		XXX		47	
Channel 30 +			6		TBD		15	
Channel 30 -			19		TBD		31	
Channel 30gnd			NC		XXX		48	
Channel 31 +			7		TBD		16	
Channel 31 -			20		TBD		32	
Channel 31gnd			NC		XXX		49	
Channel 32 +			8		TBD		17	
Channel 32 -			21		TBD		33	
Channel 32gnd			NC		XXX		50	
Channel 33 +			9		TBD			1
Channel 33 -			22		TBD			18
Channel 33gnd			NC		XXX			34



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Name	25way A	25wayB	25Way C	25way D	100Way	50way E	50wayF	50way G
Channel 34 +			10		TBD			2
Channel 34 -			23		TBD			19
Channel 34gnd			NC		XXX			35
Channel 35 +			11		TBD			3
Channel 35 -			24		TBD			20
Channel 35gnd			NC		XXX			36
Channel 36 +			12		TBD			4
Channel 36 -			25		TBD			21
Channel 36gnd			13		TBD			37
Channel 37 +				1	TBD			5
Channel 37 -				14	TBD			22
Channel 37gnd				NC	XXX			38
Channel 38 +				2	TBD			6
Channel 38 -				15	TBD			23
Channel 38gnd				NC	XXX			39
Channel 39 +				3	TBD			7
Channel 39 -				16	TBD			24
Channel 39gnd				NC	XXX			40
Channel 40 +				4	TBD			8
Channel 40 -				17	TBD			25
Channel 40gnd				NC	XXX			41
12ax braid ch33-36			13		On Bars			9
12ax braid ch37-40				NC	On Bars			9
12ax braid ch41-44				NC	On Bars			42
12ax braid ch44-48				13	On Bars			42
Channel 41 +				5	TBD			10
Channel 41 -				18	TBD			26
Channel 41gnd				NC	XXX			43
Channel 42 +				6	TBD			11
Channel 42 -				19	TBD			27
Channel 42gnd					XXX			44
Channel 43 +				7	TBD			12
Channel 43 -				20	TBD			28
Channel 43gnd					XXX			45
Channel 44 +				8	TBD			13
Channel 44 -				21	TBD			29
Channel 44gnd				NC	XXX			46
Channel 45 +				9	TBD			14
Channel 45 -				22	TBD			30
Channel 45gnd				NC	XXX			47
Channel 46 +				10	TBD			15
Channel 46 -				23	TBD			31
Channel 46gnd				NC	XXX			48
Channel 47 +				11	TBD			16
Channel 47 -				24	TBD			32
Channel 47gnd				NC	XXX			49
Channel 48 +				12	TBD			17
Channel 48 -				25	TBD			33
Channel 48gnd				13	TBD			50

XXX= on bar cold side. NC intermediate side.





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## 4.3.3 C3 CVV3 to HSJFP Type2

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.3.4 C4 CVV4 to HSJFP Type1

Mechanical Drwg.

Format as C2, maybe differing lengths.

Connector/Backshell Details

As C2.

Contact/Build Details

As C2.



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## 4.3.5 C5 CVV5 to HSJFP Type1

Mechanical Drwg.

Format as C2, maybe differing lengths.

Connector/Backshell Details

As C2.

Contact/Build Details

As C2.



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## 4.3.6 C6 CVV6 to HSJFP Type1

Mechanical Drwg.

Format as C2, maybe differing lengths.

Connector/Backshell Details

As C2.

Contact/Build Details

As C2.



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## 4.3.7 C7 CVV7 to HSJFP Type1

Mechanical Drwg.

Format as C2, maybe differing lengths.

Connector/Backshell Details

As C2.

Contact/Build Details

As C2.



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## 4.3.8 C8 CVV8 to HSJFP Type1

Mechanical Drwg.

Format as C2, maybe differing lengths.

Connector/Backshell Details

As C2.

Contact/Build Details

As C2.



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## 4.3.9 C9 CVV9 to HSJFP Type1

Mechanical Drwg.

Format as C2, maybe differing lengths.

Connector/Backshell Details

As C2.

Contact/Build Details

As C2.



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## 4.3.10 C10 CVV10 to HSFPU AUX-P

Mechanical Drwg.

Connector/Backshell Details

	No. of Cond. Pins	No. of shield pins	Max.allowed Conductor Res.(Ohms)	Mean Current (A)/condt.	Peak Current (A)/condt.	Remarks	Cernox Type or Connect.ID	
<b><i>AUXILIARY PRIME 10</i></b> <i>CVV 100way Pins in use= 100</i>								
Shutter Actuator	2	1	10			Scr. Tw. Quad* with*	FCU J15	
Shutter Launch latch drive	1	0	10				FCU J15	
Shutter launch latch confirm	2	0	1000	2.50E-09	2.50E-09	Twisted Pair	FCU J15	
Shutter Heater	1	0	10			with*	FCU J15	
Shutter Sensor Activation	2	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Pair	FCU J15	
Shutter Vane Therm A	2	0	1000	2.50E-09	2.50E-09	With activation	FCU J15	
Shutter Vane Position	3	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Tripl	FCU J15	
15	13	2	FPU J17 37 way connector					
300mK Pump heater	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J11	
300mK Pump heater(rob.)	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J11	
300mK Pump therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050	
300mK Evap. diag. heater	2	0	10	0.00E+00	0.00E+00	Twisted Pair	FCU J11	
300mK Evap. therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030	
300mK Shunt therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030	
300mK Pump heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Evap. heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Pump heat SW heater(rob.)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Evap. heat SW heater(rob.)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J11	
300mK Pump heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050	
300mK Evap. heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050	
35	34	1	FPU J19 37 way connector				21therm+14	therm=FCU J25
FTS BB Flood Heater	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21	
FTS BB Flood Heater(rob.)	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21	
FTS BB Flood Therm.	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	
FTS BB case nr. SOB I/F therm	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	
FTS BB Point Stimulus	2	0	30			Twisted Pair	FCU J21	
15	14	1	FPU J21 37 way connector				9therm+6	therm=FCU J25
Spect JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	
Phot JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070	





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FSFPU chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
Photometer 2K box	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
Spectrometer 2K box	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
M3,5,7 Optical Subench	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
Input Baffle Therm	4	0.34	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
BSM/SOB I/F therm	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
35	32	3	FPU J23 37 way connector			All 35 therm	FCU J23



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## 4.3.11 C11 CVV11 to HSFPU DRV-P

Mechanical Drwg.

Connector/Backshell Details

	No. of Cond. Pins	No. of shield pins	Max.allowed Conductor Res.(Ohms)	Mean Current (A)/condt.	Peak Current (A)/condt.	Remarks	Cernox Type or Connect.ID
<b><i>DRIVES PRIME 11</i></b>	<b><i>CVV 100way Pins in use=</i></b>			<b><i>96</i></b>			
BSM chop drive coil	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM jiggle drive coil	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM chop drive coil(rob.)	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM jiggle drive coil(rob.)	2	0.5	10	0.010	0.050	Scr. Tw. Pair	FCU J25
BSM chop posn. Sense	5	1	100	1.00E-04	1.00E-04	STP+ STT	FCU J25
BSM jiggle posn. Sense	5	1	100	1.00E-04	1.00E-04	STP+ STT	FCU J25
<b>BSM therm</b>	<b>4</b>	<b>1</b>	<b>1000</b>	<b>2.50E-09</b>	<b>2.50E-09</b>	<b>Scr. Tw. Quad</b>	<b>CX-1050</b>
BSM Launch Latch	2	0	10			Twisted Pair	FCU J25
BSM Launch Latch sensor	2	0	1000			Twisted Pair	FCU J25
Phot. BB Point Stimulus	2	1	30			Twisted Pair	FCU J25
34	28		6 FPU J25 37 way connector			5 therm+28	therm=FCU J21
SMEC drive coil	2	1	10	8.00E-03	8.00E-03	Scr. Tw. Pair	FCU J27
SMEC drive coil(rob.)	2	1	10	8.00E-03	8.00E-03	Scr. Tw. Pair	FCU J27
SMEC drive coil volts	2	1	1000	2.50E-09	2.50E-09	Scr. Tw. Pair	FCU J27
SMEC posn sensors	19	1	1000	1.00E-04	1.00E-04	TBD	FCU J29
SMEC home/limit switches	18	1	1000	1.00E-03	1.00E-03	TBD	FCU J29
<b>SMEC Mechanism Temp</b>	<b>4</b>	<b>1</b>	<b>1000</b>	<b>2.50E-09</b>	<b>2.50E-09</b>	<b>Scr. Tw. Quad</b>	<b>CX-1050</b>
SMEC Launch Latch	2	0	10			Scr. Tw. Pair	FCU J27
BSM Launch Latch sensor	2	0	1000			Twisted Pair	FCU J27
<b>SMEC/SOB I/F therm</b>	<b>4</b>	<b>1</b>	<b>1000</b>	<b>2.50E-09</b>	<b>2.50E-09</b>	<b>Scr. Tw. Quad</b>	<b>CX-1070</b>
62	55	7	FPU J27&29 37 way connectors			10thm+20+19+13	therm=FCU J21



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## 4.3.12 C12 CVV12 to HSFPU AUX-R

Mechanical Drwg.

Connector/Backshell Details

	No. of Cond. Pins	No. of shield pins	Max.allowed Conductor Res.(Ohms)	Mean Current (A)/condt.	Peak Current (A)/condt.	Remarks	Cernox Type or Connect.ID
<b><i>AUXILIARY REDUNDANT 12 CVV 100way Pins in use = 100</i></b>							
Shutter Actuator(rob)	2	1	10			Scr. Tw. Quad*	FCU J16
Shutter Launch latch drive(rob)	1	0	10			with*	FCU J16
Shutter launch latch confirm	2	0	1000	2.50E-09	2.50E-09	Twisted Pair	FCU J16
Shutter Heater(rob)	1	0	10			with*	FCU J16
Shutter Sensor Activation	2	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	FCU J16
Shutter Vane Therm B	2	1	1000	2.50E-09	2.50E-09	Scr. Tw. Pair	FCU J16
Shutter Actuator Therm	2	0	1000	2.50E-09	2.50E-09	With activation	FCU J16
15	12	3	FPU J18 37 way connector				
300mK Pump heater	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J12
300mK Pump heater(rob.)	2	0	10	3.00E-02	3.00E-02	Twisted Pair	FCU J12
300mK Pump therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
300mK Evap. diag. heater	2	0	10	0.00E+00	0.00E+00	Twisted Pair	FCU J12
300mK Evap. therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030
300mK Shunt therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1030
300mK Pump heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Evap. heat SW heater	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Pump heat SW heater(rob)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Evap. heat SW heater(rob)	2	0	10	1.60E-03	1.60E-03	Twisted Pair	FCU J12
300mK Pump heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
300mK Evap. heat SW therm.	4	0.2	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
35	34	1	FPU J20 37 way connector			21therm+14	therm=FCU J26
FTS BB Flood Heater	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21
FTS BB Flood Heater (rob.)	2	0	30	3.00E-03	3.00E-03	Twisted Pair	FCU J21
FTS BB Flood Therm.	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
FTS BB case nr. SOB I/F therm	4	0.5	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
FTS BB Point Stimulus	2	0	30			Twisted Pair	FCU J21
15	14	1	FPU J21 37 way connector			9therm+6	therm=FCU J25
Spect JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
Phot JFET chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
FSFPU chassis therm.	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
Photometer 2K box	4	0.25	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050



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Spectrometer 2K box	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
M3,5,7 Optical Sub-bench	4	0.33	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
Input Baffle Therm	4	0.34	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1050
BSM/SOB I/F therm	4	1	1000	2.50E-09	2.50E-09	Scr. Tw. Quad	CX-1070
35	32	3	FPU J24 37 way connector			All 35 therm	FCU J24



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## 4.3.13 C13 CVV13 to HSFPV DRV-R

Mechanical Drwg.

Format as C11, maybe differing lengths.

Connector/Backshell Details

As C11.

Contact/Build Details

As C11.

For Redundant Drives on Harness C/I 13, add one to all the FCU connector numbers.



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## 4.4 FPU Harnesses

### 4.4.1 F1 PSW-A BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.2 F2 PSW-B BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.3 F3 PSW-C BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details





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## 4.4.4 F4 PSW-D BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.5 F5 PSW-E BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.6 F6 PSW-F BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.7 F7 PMW-A BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.8 F8 PMW-B BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.9 F9 PMW-D BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.10 F10 PMW-D BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.11 F11 PLW-A BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details





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## 4.4.12 F12 PLW-B BDA to HSJFP

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.13 F13 SSW-A BDA to HSJFS

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.14 F14 SSW-B BDA to HSJFS

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.15 F15 SLW-A BDA to HSJFS

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.16 F16 SHT-FPU-EXT

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.17 F17 COOLER-P to FA

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.18 F18 COOLER-R to FA

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.19 F19 SPECTSTIM to FA/FD

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details





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## 4.4.20 F20 THERM-P from FA

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.21 F21 BSM-P to FB

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.22 F22 BSM-R to FE

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.23 F23 SMECSIG-P to FC

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.24 F24 SCECDRV-P to FC

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.25 F25 THERM-R from FE

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.26 F26 SMECSIG-R to FF

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.4.27 F27 SMECDRV-P to FF

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details





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## 4.5 Test Harnesses

### 4.5.1 T1 DPU-P Power

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.2 T2 DPU to (1553+SYNC)-P

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.3 T3 DPU-R Power

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.4 T4 DPU to (1553+SYNC)-R

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.5 T5 FCU-P Power

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.6 T6 FCU-P SYNC

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.7 T7 FCU-R Power

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.8 T8 FCU-R SYNC

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details





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## 4.5.9 T9 SHT-EGSE-LNK

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



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## 4.5.10 T10 SHT via FCU-P

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details



# SPIRE HARNESS DEFINITION

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## 4.5.11 T11 SHT via FCU-R

Mechanical Drwg.

Connector/Backshell Details

Contact/Build Details

End of Doc.