

Solar B – EIS

MULLARD SPACE SCIENCE LABORATORY

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EIS Flight Harness Definition

Document Number: MSSL/SLB-EIS/DD020.08MSSL/SLB-EIS/DD020.07

Distribution:

EIS Science
EIS Tech

Author:

Date:

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Distributed:

Date:

CHANGE RECORD

ISSUE	DATE	PAGES CHANGED	COMMENTS
01	15 April 2002	All new	
02	13 November 2002	All updated	Added updated info. Note: Temp monitor name changes
03	18 February 2003	Most	Many changes - see changes bars.
04	21 February 2003	Most	Corrections to version 3
05	14 March 2003	Most	Corrections to version 4
06	14 March 2003	6,10,11,12,16,22,31,34,37,38,40,41,42	Minor corrections to version 5
07	17 September 2003	6,7,8,9,11,12,13,14,19,20,21,22,23,25,26,27,30,31,32	Minor corrections to version 6
08	5 November 2003	6,9,12,13,14,24,27,40	ECR updates

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Special Notes

- **SGND** Structure Ground (connection to sub-system box).
- **SCN** cable screen.
- **n/c** no connection on pin.
- **-** no action.
- all wire gauge is AWG24 unless otherwise stated.
- items in BLUE refer to BLUE harness (see AD3) connections when they appear with another harness colour.
- items in GOLD refer to GOLD harness (see AD3) connections when they appear with another harness colour.
- any items in RED needs to be confirmed by the appropriate design engineer.

1 Applicable Documents

AD1:	MSSL/SLB-EIS/SP003	Solar- B - EIS ICD Document
AD2:	MSSL/SLB-EIS/TN024	FPA Wiring Document
AD3:	MSSL/SLB-EIS/DD08	EIS Cables & Connectors Diagram
AD4:	MSSL/SLB-EIS/TN023	FM heaters and temperature sensors

2 Dark Blue Harness 1/1: EIS-MIR1:D37F

EIS-MIR1: D37F			SOURCE		DESTINATION	
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	MP4R	2,3,20,21	4	EIS-MHC4: D15M	MP4R	size for 1A – all AWG24
2	MP3R	1,3,20,21	3	“	MP3R	“
3	MP1R	1,2,20,21	1	“	MP1R	“
4	ETS17RTN	5	22	EIS-MHC8: D25M	TMONRTN	Floating Return – DO NOT GROUND
5	ETS17_GO	4	9	“	T0MON7	Thermistor
6	ETS18RTN	7	23	“	TMONRTN	Floating Return – DO NOT GROUND
7	ETS18_GO	6	10	“	T0MON8	Thermistor
8	SG+	9,10	1	“	SG+	AWG24
9	QGND	8,10	14	“	QGND	AWG24
10	SGREF	8,9	2	“	SGREF	AWG24
11	SHLD	-	15	“	SHLD	Wire for Shield
12	SGRTN	13,14	16	EIS-MHC8: D25M	SGRTN	AWG24
13	GNDA	12,14	19	“	GNDA	AWG24
14	SGSRC	12,13	3	“	SGSRC	AWG24
15	Pin15n/e	-				daisy chain 16,22,32,33,34,35 & 19
16	Pin16n/e	-				daisy chain 15,22,32,33,34,35 & 19
17	ETS19RTN	18	24	EIS-MHC8: D25M	TMONRTN	Floating Return – DO NOT GROUND
18	ETS19_GO	17	11	“	T0MON9	Thermistor
19	SGND	-	13	EIS-MHC8:D25M	SGND	Overall Foil
19	SGND	-	5	EIS-MHC4: D15M	SGND	Overall Foil
20	MIRCSRC	1,2,3,21	8	EIS-MHC4: D15M	MIRCSRC	
21	MP2R	1,2,3,20	2	“	MP2R	
22	Pin22n/e					daisy chain 15,16,32,33,34,35 & 19
23	RSHLD_A	-	-	-	nc	
24	S3_B	25,27,28,30,31	7	EIS-MHC8: D25M	S4_B	M27500C24RC6509
25	S1_B	24,27,28,30,31	5	“	S3_B	M27500C24RC6509
26	RSHLD_B	-	-	-	nc	
27	S4_B	24,25,28,30,31	8	EIS-MHC8: D25M	S2_B	M27500C24RC6509
28	S2_B	24,25,27,30,31	6	“	S1_B	M27500C24RC6509
29	RSHLD_C	-	17	EIS-MHC8: D25M	SHLD	Shield over 24,25,27,28,30,31
30	RREF+	24,25,27,28,31	4	EIS-MHC8: D25M	R_REF+	Resolver ref from MHC M27500C24RC6509v
31	RREF-	24,25,27,28,30	19	“	GNDA	Resolver return, and pin 13 M27500C24RC6509
32	Pin32n/e					daisy chain 15,16,33,34,35 & 19
33	Pin33n/e					daisy chain 15,16,32,34,35 & 19
34	Pin34n/e					daisy chain 15,16,32,33,35 & 19
35	Pin35n/e					daisy chain 15,16,32,33,34 & 19
36	PZTRTN	-	25	EIS-MHC8: D25M	PZTRTN	CSSH 24 AWG – shield over 37
37	PZTRV	-	12	“	PZTRV	CSSH 24 AWG

3 DARK GREEN Harness

3.1 Dark Green – 1/2: EIS-FPA1:D25F

EIS-FPA1: D25F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STRGND	-	-	CNP1-STUD2	SGND	Structure Ground Stud
2	STRGND	-	-	CNP1-STUD2	SCN	Structure Ground Stud
3	STR-4	4	8	EIS-CNP5: D15M	Sensor_4	Blue harness
4	STR-4_Ret	3	15	"	Sensor_4_Ret	Blue harness
5	STR-5	6	9	"	Sensor_5	Blue harness
6	STR-5_Ret	5	10	"	Sensor_5_Ret	Blue harness
7	CTH1	8	2	EIS-CNP4: D15M	CCD A Heater	AWG24 – via D9-way connector
8	CTH1_Ret	7	3	"	CCD A Heater Ret	AWG24 – via D9-way connector
9	CTH2	10	10	"	CCD B Heater	AWG24 – via D9-way connector
10	CTH2_Ret	9	11	"	CCD B Heater Ret	AWG24 – via D9-way connector
11	CAL1SRC	12	10	EIS-MHC10: D25F	CAL1SRC	AWG24
12	CAL1RTN	11	23	"	CAL1RTN	AWG24
13	SGND	-	13	EIS-MHC10: D25F	SGND	Overall Foil
13	SGND	-	QCM	EIS-QCM1:BJ02H-10-13S	SGND	QCM1 body
13	SGND	-	QCM	EIS-QCM2:BJ02H-10-13S	SGND	QCM2 body
14	STRGND	-	-	CNP1-STUD2		Structure Ground Stud
15	STR-6	16	11	EIS-CNP5: D15M	Sensor_6	Blue harness
16	STR-6 return	15	12	"	Sensor_6_Ret	Blue harness
17	SUH3_A	18	6	EIS-CNP6: D25M	SUH3	AWG24 – common at CNP6, connect in parallel with SUH3_BC near MIR
17	SUH3_B	18	1	Near MIR1	SUH3_B	AWG24 – near MIR1 – see AD4
18	SUH3_ARet	17	7	EIS-CNP6: D25M	SUH3Ret	AWG24 – common at CNP6, connect in parallel with SUH3_BC near MIR
18	SUH3_CRet	17	2	Near MIR1	SUH3_CRet	AWG24 – near MIR1 – see AD4
19	CTS2	20	13	EIS-CNP4: D15M	CCD_B Sensor	AWG24 – via D9-way connector
20	CTS2_Ret	19	14	"	CCD_B Sensor Ret	AWG24 – via D9-way connector
21	CTS1	22	5	EIS-CNP4: D15M	CCD_A Sensor	AWG24 – via D9-way connector
22	CTS1_Ret	21	6	"	CCD_A Sensor Ret	AWG24 – via D9-way connector
23	CAL2SRC	24	11	EIS-MHC10: D25F	CAL2SRC	AWG24
24	CAL2RTN	23	24	"	CAL2RTN	AWG24
25	STRGND	-	-	CNP1-STUD2		Structure Ground Stud

Note: entries in BLUE are for LIGHT BLUE-HARNESS (page 19) connections

17 + 18 double wires in crimp will be used at CNP6

See diagram on page #45

3.2 Dark Green – 2/2: EIS-MHC10:D25F

EIS-MHC10: D25F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	QCM1	14	2	EIS-QMC1: BJT02H-10-13S	QCM1	
2	Q1HTR	15	12	"	Q1HTR	
3	Q1RTD+	17	3	"	Q1RTD+	3&9 only connect at QCM1
4	Q1 +15V	-	6	"	Q1 +15V	
5	QCM2	18	2	EIS-QMC2: BJT02H-10-S	QCM2	
6	Q2HTR	19	12	"	Q2HTR	
7	Q2RTD+	21	3	"	Q2RTD+	7&12 only connect at QCM2
8	Q2 +15V	-	6	"	Q2 +15V	
9	Q1RTDSRC	22	3	EIS-QMC1: BJT02H-10-13S	Q1RTD+	3&9 only connect at QCM1
10	CAL1SRC	23	11	EIS-FPA1: D25F	CAL1SRC	
11	CAL2SRC	24	23	"	CAL2SRC	
12	Q2RTDSRC	25	3	EIS-QMC2: BJT02H-10-S	Q2RTD+	7&12 only connect at QCM2
13	SGND	-	13	EIS-FPA1: D25F	SGND	Overall Foil
13	SGND	-	QCM1	EIS-QCM1:BJ02H-10-13S	SGND	QCM1 body
13	SGND	-	QCM2	EIS-QCM2:BJ02H-10-13S	SGND	QCM2 body
14	Q1RTN	1	5	EIS-QMC1: BJT02H-10-13S	Q1RTN	
15	Q1HRTN	2	8	"	Q1HRTN	
16	Q1RTDGD		-	"	nc	
17	Q1RTD-	3	4	"	Q1RTD-	17&22 only connect at QCM1
18	Q2RTN	5	5	EIS-QMC2: BJT02H-10-13S	Q2RTN	
19	Q2HRTN	6	8	"	Q2HRTN	
20	Q2RTDGD		-	"	nc	
21	Q2RTD-	7	4	"	Q2RTD-	21&25 only connect at QCM2
22	Q1RTDRTN	9	4	EIS-QMC1: BJT02H-10-13S	Q1RTD-	17&22 only connect at QCM1
23	CAL1RTN	10	12	EIS-FPA1: D25F	CAL1RTN	
24	CAL2RTN	11	24	"	CAL2RTN	
25	Q2RTDRTN	12	4	EIS-QMC2: BJT02H-10-13S	Q2RTD-	21&25 only connect at QCM2

4 LIGHT GREEN Harness 1/1: EIS-GRA1:D25F

EIS-GRA1: D25F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	GP4R	2,3,14,15	4	EIS-MHC3: D15M	GP4R	AWG 24 –size for 1A
2	GP3R	1,3,14,15	3	"	GP3R	AWG24
3	GP1R	1,2,14,15	1	"	GP1R	AWG24
4	ETS20RTN	5	36	EIS-MHC5: D25M	TMONRTN	AWG24 – Gold Harness – Flying leads
5	ETS20_GO	4	17	"	T0MON10	AWG24 – Gold Harness – Flying leads
6	ETS21RTN	7	37	"	TMONRTN	AWG24 – Gold Harness – Flying leads
7	ETS21_GO	6	18	"	T0MON11	AWG24 – Gold Harness – Flying leads
8	Pin8n/e					daisy chain 8,10,11,12,22,23,24,25 & 13
9	Pin9n/e					daisy chain 10,11,12,22,23,24,25 & 13
10	Pin10n/e					daisy chain 9,11,12,22,23,24,25 & 13
11	Pin11n/e					daisy chain 9,10,12,22,23,24,25 & 13
12	Pin12n/e					daisy chain 9,10,11,22,23,24,25 & 13
13	SGND	-	5	EIS-MHC3: D15M	SGND	Overall Foil
14	GRASRC	1,2,3,15	8	"	GRASRC	AWG24
15	GP2R	1,2,3,14	2	"	GP2R	AWG24
16	GRAERTN	17	6	"	GRAERTN	AWG24
17	GRAESRC	16	7	"	GRAESRC	AWG24
18	GRAPSR	19,20,21	12	"	GRAPSR	AWG24
19	GRA1ENC	18,20,21	9	"	GRA1ENC	AWG24
20	GRA3ENC	18,19,21	11	"	GRA3ENC	AWG24
21	GRA2ENC	18,19,20	10	"	GRA2ENC	AWG24
22	Pin22n/e					daisy chain 9,10,11,12,23,24,25 & 13
23	Pin23n/e					daisy chain 9,10,11,12,22,24,25 & 13
24	Pin24n/e					daisy chain 9,10,11,12,22,23,25 & 13
25	Pin25n/e					daisy chain 9,10,11,12,22,23,24 & 13

Note: entries in “GOLD” are for GOLD-HARNESS (page 17) connections

5 RED Harness 1/1: EIS-MHC11:D50M

EIS-MHC11: D50M			SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes	
1	PAR0A	18	1	EIS-CNP7:D15F	PAR0A	Rear – 0.5A Arming Plug	
2	PAR1A	n/c				not used	
3	PAR2A	20	4	EIS-CNP7:D15F	PAR2A	Front – 0.5A Arming Plug	
4	PAR3A	n/c				not used	
5	PAR0B	22	8	EIS-CNP7:D15F	PAR0B	Rear – 0.5A Arming Plug	
6	PAR1B	n/c				not used	
7	PAR2B	24	11	EIS-CNP7:D15F	PAR2B	Front – 0.5A Arming Plug	
8	PAR3B	n/c				not used	
9	n/c						
10	n/c						
11	n/c						
12	n/c						
13	ENC01SRC	30	9	EIS-CLM1:D37	+Supply_LED(Enc_Inner)	0.5A	
14	ENC23SRC	31	16	"	+Supply_LED(Enc_SunSide)	0.5A	
15	n/c						
16	n/c						
17	SGND	-	1	EIS-CLM1: D37M	SGND	Overall Foil	
17	SGND	-	15	EIS-CNP7: D15F	SGND	Overall Foil	
18	PAR0ARTN	1	20	EIS-CLM1:D37	Ret_Hop(inner)_htr1	Route via Arming Plug	
19	PAR1ARTN	n/c				not used	
20	PAR2ARTN	3	23	EIS-CLM1:D37	Ret_Hop(sun_side)_htr1	Route via Arming Plug	
21	PAR3ARTN	n/c				not used	
22	PAR0BRTN	5	21	EIS-CLM1:D37	Ret_Hop(inner)_htr2	Route via Arming Plug	
23	PAR1BRTN	n/c				not used	
24	PAR2BRTN	7	24	EIS-CLM1:D37	Ret_Hop(sun_side)_htr2	Route via Arming Plug	
25	PAR3BRTN	n/c				not used	
26	n/c						
27	n/c						
28	n/c						
29	n/c						
30	ENC01RTN	13	30	EIS-CLM1:D37	Ret_LED(Enc_inner)		
31	ENC23RTN	14	34	"	Ret_LED(Enc_SunSide)		
32	n/c						
33	n/c						
34	ENC0A	35,37	7	EIS-CLM1:D37	Clamshell_open(Enc_Inner)	open –rear	
35	ENC0B	34,37	28	"	Clamshell_closed(Enc_Inner)	closed – rear	
36	ENC0C	n/c				not used	
37	PS0RTN	34,35	29	EIS-CLM1:D37	Ret(Enc_inner)	RTN for 34,35	
38	ENC1A	n/c				not used	
39	ENC1B	n/c				not used	
40	ENC1C	n/c				not used	
41	PS1RTN	n/c				not used	
42	ENC2A	43,45	18	EIS-CLM1:D37	Clamshell_open(Enc_SunSide)	open –front	
43	ENC2B	42,45	36	"	Clamshell_closed(Enc_SunSide)	closed – front	
44	ENC2C	n/c				not used	
45	PS2RTN	42,43	35	EIS-CLM1:D37	Ret(Enc_SunSide)	RTN for 43,45	
46	ENC3A	n/c				not used	
47	ENC3B	n/c				not used	
48	ENC3C	n/c				not used	
49	PS3RTN	n/c				not used	
50	n/c						

6 RED/GREEN Harness

6.1 Red/Green - 1/2: EIS-MHC6:D25M

EIS-MHC6:D25M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	VG+	-	3	EIS-CLM2:LEMO	VG+	M27500C28RC6509 Vacuum gauge (+) I/P at MHC - BK
2	VG-	-	4	"	VG-	M27500C28RC6509 Vacuum gauge (-) I/P at MHC - OR
3	VGSRC	-	1	"	VGSRC	M27500C28RC6509 Vacuum gauge excitation (+) - RD
4	R_REF+		30	EIS-SLA1: D37F	R_REF+	Resolver ref excitation (+) (M27500C24RC6509) - BK
5	R_REF-		31	"	R_REF-	Resolver ref excitation (-) AGND (M27500C24RC6509) - OR
6	S1_A		28	"	S1_A	Resolver "A" S1 O/P to MHC (M27500C24RC6509) - RD
7	S2_A		27	"	S2_A	Resolver "A" S2 O/P to MHC (M27500C24RC6509) - GN
8	S3_A		25	"	S3_A	Resolver "A" S3 O/P to MHC (M27500C24RC6509) - BL
9	S4_A		24	"	S4_A	Resolver "A" S4 O/P to MHC (M27500C24RC6509) - WH
10	T0MON4	23	5	EIS-SLA1: D37F	ETS22	
11	T0MON5	24	7	"	ETS23	
12	T0MON6	-	25	EIS-MHC6:D25M	T0MON6	Thermistor- S311P18-O1S7R6 on 10-15cm of wire
13	SGND		5	EIS-MHC2:D15M	SGND	Overall Foil – CONNECTION VIA SLA1 to MHC2
13	SGND		19	EIS-SLA1: D37F	SGND	Overall Foil
14	n/c					
15	VGGUARD		n/c	EIS-CLM2:LEMO		shield over 1,2,3,16 tie to 15
16	VGRTN	-	2	"	VGRTN	M27500C28RC6509 Vacuum Gauge excitation (-) AGND-GN
17	RSHLD	-	23	EIS-SLA1: D37F	-RSHLD	Shield Over 4,5,6,7,8,9 – connected to 18,20,22 on pcb
18	RSHLD	-	-	-	nc	connected to 17,20,22 on pcb
19	n/c					
20	RSHLD	-	-	-	nc	connected to 17,18,22 on pcb
21	n/c					
22	RSHLD	-	-	-	nc	connected to 17,18,20 on pcb
23	TMON0RTN	10	4	"	ETS22RTN	Thermistor return Not GND
24	TMON0RTN	11	6	"	ETS23RTN	Thermistor return Not GND
25	TMON0RTN	-	12	EIS-MHC6:D25M	T0MON6RTN	Thermistor- S311P18-O1S7R6 on 10-15cm of wire

NOTE: Resolver-A for slit/slot
Resolver-B for coarse mirror

6.2 Red/Green - 2/2: EIS-SLA1:D37F

EIS-SLA1: D37F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SP4R	2,3,20,21	4	EIS-MHC2:D15M	SP4R	SLA stepper phase 4 return
2	SP3R	1,3,20,21	3	“	SP3R	SLA stepper phase 3 return
3	SP1R	1,2,20,21	1	“	SP1R	SLA stepper phase 1 return
4	ETS22RTN	5	23	EIS-MHC6:D25M	TMON0RTN	Temperature monitor return
5	ETS22	4	10	“	T0MON4	Group 0 temperature monitor 4
6	ETS23RTN	7	24	“	TMON0RTN	Temperature monitor return
7	ETS23	6	11	“	T0MON5	Group 0 temperature monitor
8	SLA3	9,10	15	EIS-MHC2:D15M	SLA3	Shutter Drive 3
9	SLA2	8,10	13	“	SLA2	Shutter Drive 2
10	SLA1	8,9	14	“	SLA1	Shutter Drive 1
11	n/cPin11					daisy chain 12,13,14,15,16,17,18,22 & 19
12	Pin11/c12					daisy chain 11,13,14,15,16,17,18,22 & 19
13	Pin11/c13					daisy chain 11,12,14,15,16,17,18,22 & 19
14	Pin11/c14					daisy chain 11,12,13,15,16,17,18,22 & 19
15	Pin11/c15					daisy chain 11,12,13,14,16,17,18,22 & 19
16	Pin11/c16					daisy chain 11,12,13,14,15,17,18,22 & 19
17	Pin11/c17					daisy chain 11,12,13,14,15,16,18,22 & 19
18	Pin11/c18					daisy chain 11,12,13,14,15,16,17,22 & 19
19	SGND	-	13	EIS-MHC6:D25M	SGND	Overall Foil
19	SGND	-	5	EIS-MHC2:D15M	SGND	Overall Foil
20	SLASRC	1,2,3,21	8	EIS-MHC2:D15M	SLASRC	SLA stepper motor source
21	SP2R	1,2,3,20	2	“	SP2R	SLA stepper phase 2 return
22	Pin11/c22					daisy chain 11,12,13,14,15,16,17,18 & 19
23	RSHLD	-	17	EIS-MHC6:D25M	RSHLD	Shield over 24,25,27,28,30,31
24	S4_A	25,27,28,30,31	9	EIS-MHC6:D25M	S4_A	Resolver A – Slit/Slot (M27500C24RC6509) -WH
25	S3_A	24,27,28,30,31	8	“	S3_A	Resolver A – Slit/Slot (M27500C24RC6509) -BL
26	RSHLD	-				n/c
27	S2_A	24,25,28,30,31	7	“	S2_A	Resolver A – Slit/Slot (M27500C24RC6509) -GN
28	S1_A	24,25,27,30,31	6	“	S1_A	Resolver A – Slit/Slot (M27500C24RC6509) -RD
29	RSHLD	-				n/c
30	R_REF+	24,25,27,28,31	4	“	R_REF+	Resolver Reference + (M27500C24RC6509) -BK
31	R_REF-	24,25,27,28,30	5	“	R_REF-	Resolver Reference - (M27500C24RC6509) -OR
32	SLAERTN	33	6	EIS-MHC2:D15M	SLAERTN	Shutter encoder return
33	SENC SRC	32	7	“	SENC SRC	Shutter encoder source
34	SLA1ENC	35,36,37	9	“	SLA1ENC	Shutter encoder sense 1
35	SLA3ENC	34,36,37	11	“	SLA2ENC	Shutter encoder sense 2
36	SLA2ENC	34,35,37	10	“	SLA3ENC	Shutter encoder sense 3
37	SLAPSR	34,35,36	12	“	SLAPSR	Shutter encoder photo-sensor return

7 RED/BLUE Harness 1/1: EIS-CNP3:D37M

EIS-CNP3: D37M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Overall_Scn	-	1	EIS-MHC12:D15F	SGND	Wire for Shield
2	n/c					
3	28V_MHC2_Switch	4	3	EIS-MHC12:D15F	M+28V	2xAWG24 - Mechanisms 28V – foil over 3,4,5,6,10,11,12,13 to 19
4	28V_MHC2_Ret	3	11	“	M+28VRTN	2xAWG24 - Mechanisms return – foil over 3,4,5,6,10,11,12,13 to 19
5	28V_OpHtr_Switch	6	4	“	H+28V	AWG20 – Heaters – foil over 3,4,5,6,10,11,12,13 to 19
6	28V_OpHtr_Ret	5	12	“	H+28VRTN	AWG20 - Heaters return – foil over 3,4,5,6,10,11,12,13 to 19
7	n/c					
8	n/c					
9	n/c					
10	28V_MHC1_Switch	11	2	EIS-MHC12:D15F	E+28V	AWG24 - Electronics 28V – foil over 3,4,5,6,10,11,12,13 to 19
11	28V_MHC1_Ret	10	10	“	E+28VRTN	AWG24 - Electronics return – foil over 3,4,5,6,10,11,12,13 to 19
12	28V_MHC_Mkup_Switch	13	7	“	MU+28V	AWG24 - Make up heater – foil over 3,4,5,6,10,11,12,13 to 19
13	28V_MHC_Mkup_Ret	12	15	“	MU+28VRTN	AWG24 - Make up heater ret – foil over 3,4,5,6,10,11,12,13 to 19
14	n/c					
15	n/c					
16	28V_CAM_Mkup_Switch	17	-	In line socket	ROE_MKUP_HTR	AWG24 – heater mounted on ROE front panel - foil over 16,17 to 19
17	28V_CAM_Mkup_Ret	16	-	In line socket	ROE_MKUP_HTR_RET	AWG24 – heater mounted on ROE front panel - foil over 16,17 to 19
18	n/c					
19	Overall_Scn	-	1	EIS-ROE5:D15F	SGND	

20	n/c					
21	n/c					
22	n/c					
23	n/c					
24	n/c					
25	n/c					
26	n/c					
27	n/c					
28	P_13V_CAM_Switch_D	29	5	EIS-ROE5:D15F	P_13V_CAM_D	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
29	Ground_D	28	13	“	GND_D	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
30	P_8V_CAM_Switch_C	31,34,35	2	“	P_8V_CAM_C	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
31	Ground_C	30,34,35	9	“	GND_C	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
32	P_7V_CAM_Switch_B	33	6	“	P_7V_CAM_B	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
33	Ground_B	32	14	“	GND_B	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
34	N_8V_CAM_Switch_C	30,31,35	3	“	N_8V_CAM_C	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
35	P_39V_CAM_Switch_C	30,31,34	4	“	P_39V_CAM_C	AWG20 – foil over 28,29,30,31,32,33,34,35 to 19
36	n/c					
37	n/c					

8 BROWN Harness 1/1: EIS-CNP1:D15M

EIS-CNP1:D15M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	MHC_CMD+	2	2	EIS-MHC1:D9M	RXDB	Data to MHC (+) - NDBC-TFE-24S2SJ-75
2	MHC_CMD-	1	1	“	RXDA	Data to MHC (-) - NDBC-TFE-24S2SJ-75
3	MHC_HK+	4	7	“	TXDB	Data from MHC (+) - NDBC-TFE-24S2SJ-75
4	MHC_HK-	3	3	“	TXDA	Data from MHC (-) - NDBC-TFE-24S2SJ-75
5	ROE_CMD+	6	2	EIS-ROE4:D9F	ROE_CMD+	NDBC-TFE-24S2SJ-75
6	ROE_CMD-	5	1	“	ROE_CMD-	NDBC-TFE-24S2SJ-75
7	ROE_HK+	8	7	“	ROE_HK+	NDBC-TFE-24S2SJ-75
8	ROE_HK-	7	3	“	ROE_HK-	NDBC-TFE-24S2SJ-75
9	MHC_CMD_SCN	-				Screen not connected at MHC
10	n/c					
11	MHC_HK_SCN	-	5	EIS-MHC1:D9M	DGND	Screen connected at MHC
12	n/c					
13	ROE_CMD_SCN	-		EIS-ROE4:D9F	ROE_CMD_SCN	Screen not connected at ROE
14	COMMON	-	9	EIS-MHC1:D9M	DGND	AWG24 – Digital Ground
15	ROE_HK_SCN	-	5	EIS-ROE4:D9F	ROE_HK_SCN	Screen connected at ROE

9 PURPLE Harness 1/1: EIS-CNP2:D9F

EIS-CNP2:D9F			DESTINATION			
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SC_STB_SCN	-	1	EIS-ROE3:D9M	SC_STB_SCN	22 AWG 100 ohm – NDBC-TFE-22-2SJ-100
2	SC_STB+	6	2	“	SC_STB+	22 AWG 100 ohm – NDBC-TFE-22-2SJ-100
3	Digital Ground	-	3	“	Digital Ground	n/c
4	SC_DAT+	9	4	“	SC_DAT+	22 AWG 100 ohm – NDBC-TFE-22-2SJ-100
5	SC_DAT_SCN	-	5	“	SC_DAT_SCN	22 AWG 100 ohm – NDBC-TFE-22-2SJ-100
6	SC_STB-	2	6	“	SC_STB-	22 AWG 100 ohm – NDBC-TFE-22-2SJ-100
7	n/c					
8	n/c					
9	SC_DAT-	4	9	EIS-ROE3:D9M	SC_DAT-	22 AWG 100 ohm – NDBC-TFE-22-2SJ-100

10 GOLD Harness

10.1 Gold - 1/2: EIS-MHC5:D37M

EIS-MHC5: D37M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	T1MON0	20	1	ETS16	ETS16_GO	Side structure sensor
2	T1MON1	21	1	ETS1	ETS1_GO	Heaters sensor (base)
3	T1MON2	22	1	ETS2	ETS2_GO	Heaters sensor (base)
4	T1MON3	23	1	ETS3	ETS3_GO	Heaters sensor (base)
5	T1MON4	24	1	ETS4	ETS4_GO	Heaters sensor (base)
6	T1MON5	25	1	ETS5	ETS5_GO	Heaters sensor (base)
7	T1MON6	26	1	ETS6	ETS6_GO	Heaters sensor (base)
8	T1MON7	27	1	ETS7	ETS7_GO	Heaters sensor (base)
9	T1MON8	28	1	ETS8	ETS8_GO	Heaters sensor (back end structure - P7 heater)
10	T1MON9	29	1	ETS9	ETS9_GO	Heaters sensor (front end structure P8 heater)
11	T1MON10	30	1	ETS10	ETS10_GO	Heaters sensor (base)
12	T1MON11	31	1	ETS11	ETS11_GO	Heaters sensor (base)
13	T1MON12	32	1	ETS12	ETS12_GO	Heaters sensor (base)
14	T1MON13	33	1	ETS13	ETS13_GO	Side structure sensor
15	T1MON14	34	1	ETS14	ETS14_GO	Side structure sensor
16	T1MON15	35	1	ETS15	ETS15_GO	Side structure sensor
17	T0MON20	36	5	EIS-GRA1:D25M	ETS20_GO	Temp monitors – Group 0
18	T0MON21	37	7	“	ETS21_GO	“
19	SGND	-			-	Overall Foil
20	TMONRTN	1	2	ETS16	ETS16RTN	Temp monitors – Group 1
21	TMONRTN	2	2	ETS1	ETS1RTN	“
22	TMONRTN	3	2	ETS2	ETS2RTN	“
23	TMONRTN	4	2	ETS3	ETS3RTN	“
24	TMONRTN	5	2	ETS4	ETS4RTN	“
25	TMONRTN	6	2	ETS5	ETS5RTN	“
26	TMONRTN	7	2	ETS6	ETS6RTN	“
27	TMONRTN	8	2	ETS7	ETS7RTN	“
28	TMONRTN	9	2	ETS8	ETS8RTN	“
29	TMONRTN	10	2	ETS9	ETS9RTN	“
30	TMONRTN	11	2	ETS10	ETS10RTN	“
31	TMONRTN	12	2	ETS11	ETS11RTN	“
32	TMONRTN	13	2	ETS12	ETS12RTN	“
33	TMONRTN	14	2	ETS13	ETS13RTN	“
34	TMONRTN	15	2	ETS14	ETS14RTN	“
35	TMONRTN	16	2	ETS15	ETS15RTN	“
36	TMONRTN	17	4	EIS-GRA1:D25M	ETS20RTN	Temp monitors – Group 0
37	TMONRTN	18	6	“	ETS21RTN	“

10.2 Gold - 2/2: EIS-MHC9:D50M

EIS-MHC9: D50M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	H0	18	1	ETH1	Heater 0	all size for 1A – AWG24
2	H1	19	1	ETH2	Heater 1	AWG24
3	H2	20	1	ETH3	Heater 2	AWG24
4	H3	21	1	ETH4	Heater 3	AWG24
5	H4	22	1	ETH5	Heater 4	AWG24
6	H5	23	1	ETH6	Heater 5	AWG24
7	H6	24	1	ETH7	Heater 6	AWG24
8	H7	25	1	ETH8	Heater 7	AWG24
9	H8	26	1	ETH9	Heater 8	AWG24
10	H9	27	1	ETH10	Heater 9	AWG24
11	H10	28	1	ETH11	Heater 10	AWG24
12	H11	29	1	ETH12	Heater 11	AWG24
13	n/c					
14	n/c					
15	n/c					
16	n/c					
17	SGND					Overall Foil
18	+28VHRTN	1	2	ETH1	Heater 0_Ret	AWG24
19	+28VHRTN	2	2	ETH2	Heater 1_Ret	AWG24
20	+28VHRTN	3	2	ETH3	Heater 2_Ret	AWG24
21	+28VHRTN	4	2	ETH4	Heater 3_Ret	AWG24
22	+28VHRTN	5	2	ETH5	Heater 4_Ret	AWG24
23	+28VHRTN	6	2	ETH6	Heater 5_Ret	AWG24
24	+28VHRTN	7	2	ETH7	Heater 6_Ret	AWG24
25	+28VHRTN	8	2	ETH8	Heater 7_Ret	AWG24
26	+28VHRTN	9	2	ETH9	Heater 8_Ret	AWG24
27	+28VHRTN	10	2	ETH10	Heater 9_Ret	AWG24
28	+28VHRTN	11	2	ETH11	Heater 10_Ret	AWG24
29	+28VHRTN	12	2	ETH12	Heater 11_Ret	AWG24
30	n/c					
31	n/c					
32	n/c					
33	n/c					
34	n/c					
35	n/c					
36	n/c					
37	n/c					
38	n/c					
39	n/c					
40	n/c					
42	n/c					
43	n/c					
44	n/c					
45	n/c					
46	n/c					
47	n/c					
48	n/c					
49	n/c					
50	n/c					

11 LIGHT BLUE Harness 1/1: EIS-CNP5:D15M

EIS-CNP5:D15M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Overall_Scn	-				Overall Foil
2	Sensor1	3	14	EIS-CLM1:D37F	STR-1	AWG24 – sun_side +ve
3	Sensor1_Ret	2	33	“	STR-1_Ret	AWG24 - (sun_side)-ve
4	Sensor2	5	11	“	STR-2	AWG24 - (inner)+ve
5	Sensor2_Ret	4	31	“	STR-2_Ret	AWG24 - (inner)-ve
6	Sensor3	7	13	“	STR-3	AWG24 - (bulkhead)+ve
7	Sensor3_Ret	6	32	“	STR-3_Ret	AWG24 - (bulkhead)-ve
8	Sensor4	15	3	EIS-FPA1:D25F	STR-4	AWG24 - HKU Thermistor
9	Sensor5	10	5	“	STR-5	AWG24 - HKU Thermistor
10	Sensor5_Ret	9	6	“	STR-5_Ret	AWG24 - HKU Thermistor
11	Sensor6	12	15	“	STR-6	AWG24 - HKU Thermistor
12	Sensor6_Ret	11	16	“	STR-6_Ret	AWG24 - HKU Thermistor
13	Sensor7	14	1	STR-7	STR-7	AWG24 – on structure, by MHC ref. foot
14	Sensor7_Ret	13	2	STR-7_Ret	STR-7_Ret	AWG24 – on structure, by MHC ref. foot
15	Sensor4_Ret	8	4	EIS-FPA1:D25F	STR-4_Ret	AWG24 - HKU Thermistor

12 MHC Pinout Checks

12.1 MHC RS422 I/F: EIS-MHC1:D9F

EIS-MHC1:D9F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	RXDA	2	2	EIS-CNP1:D15M	MHC_CMD-	Data to MHC (-) - NDBC-TFE-24S2SJ-75, (screen not connected at MHC)
2	RXDB	1	1	"	MHC_CMD+	Data to MHC (+) - NDBC-TFE-24S2SJ-75, (screen not connected at MHC)
3	TXDA	7	4	"	MHC_HK-	Data from MHC (-) - NDBC-TFE-24S2SJ-75
4	n/c					
5	SGND	-	11	EIS-CNP1:D15M	MHC_HK_SCN	Structure Ground - screen for TX line: pins 3 & 7
6	n/c					
7	TXDB	3	3	EIS-CNP1:D15M	MHC_HK+	Data from MHC (+) - NDBC-TFE-24S2SJ-75
8	n/c					
9	DGND		14	EIS-CNP1:D15M	COMMON	AWG24 - Digital ground

12.2 MHC Slit/Slot/Shutter I/F: EIS-MHC2:D15M

EIS-MHC2:D15M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SP1R	2,3,4,8	3	EIS-SLA1: D37F	SP1R	Slit / Slot stepper phase 1 return
2	SP2R	1,3,4,8	21	"	SP2R	Slit / Slot stepper phase 2 return
3	SP3R	1,2,4,8	2	"	SP3R	Slit / Slot stepper phase 3 return
4	SP4R	1,2,3,8	1	"	SP4R	Slit / Slot stepper phase 4 return
5	SGND	-	13	EIS-MHC6:D15M	SGND	Structure Ground – CONNECTION VIA SLA1 TO MHC6
5	SGND	-	19	EIS-SLA1: D37F	SGND	Structure Ground
6	SLAERTN	7	32	"	SLAERTN	Shutter Encoder LED return
7	SENC SRC	6	33	"	SENC SRC	Shutter Encoder LED source
8	SLASRC	1,2,3,4	20	"	SLASRC	Slit/slot stepper source
9	SLA1ENC	10,11,12	34	"	SLA1ENC	Shutter photo-sensor 1
10	SLA2ENC	9,11,12	36	"	SLA2ENC	Shutter photo-sensor 2
11	SLA3ENC	9,10,12	35	"	SLA3ENC	Shutter photo-sensor 3
12	SLAPSR	9,10,11	37	"	SLAPSR	Shutter photo-sensor return
13	SLA2	14,15	9	"	SLA2	Shutter motor phase 2
14	SLA1	13,15	10	"	SLA1	Shutter motor phase 1
15	SLA3	13,14	8	"	SLA3	Shutter motor phase 3

12.3 MHC GRATING I/F: EIS-MHC3:D15M

EIS-MHC3:D15M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	GP1R	2,3,4,8	3	EIS-GRA1: D25F	GP1R	Stepper phase 1 return
2	GP2R	1,3,4,8	15	"	GP2R	Stepper phase 2 return
3	GP3R	1,2,4,8	2	"	GP3R	Stepper phase 3 return
4	GP4R	1,2,3,8	1	"	GP4R	Stepper phase 4 return
5	SGND	-	13	"	SGND	Structure Ground
6	GRAERTN	7	16	"	GRAERTN	Encoder LED return
7	GRAESRC	6	17	"	GRAESRC	Encoder LED source
8	GRASRC	1,2,3,4	14		GRASRC	Grating stepper source
9	GRA1ENC	10,11,12	19		GRA1ENC	Grating photo-sensor 1
10	GRA2ENC	9,11,12	21		GRA2ENC	Grating photo-sensor 2
11	GRA3ENC	9,10,12	20		GRA3ENC	Grating photo-sensor 3
12	GRAPSR	9,10,11	18		GRAPSR	Grating photo-sensor return
13	n/c					
14	n/c					
15	n/c					

12.4 MHC Coarse Mirror I/F: EIS-MHC4:D15M

EIS-MHC4:D15M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	MP1R	2,3,4,8	3	EIS-MIR1:D37F	MP1R	Stepper Phase 1 Return
2	MP2R	1,3,4,8	21	"	MP2R	Stepper Phase 2 Return
3	MP3R	1,2,4,8	2	"	MP3R	Stepper Phase 3 Return
4	MP4R	1,2,3,8	1	"	MP4R	Stepper Phase 4 Return
5	SGND	-	13	EIS-MHC8:D25M	SGND	Structure Ground –CONNECTION VIA MIR1
5	SGND	-	19	EIS-MIR1:D37F	SGND	Structure Ground
6	n/c					RESERVED - DO NOT USE
7	n/c					RESERVED - DO NOT USE
8	MIRCSRC	1,2,3,4	20	EIS-MIR1:D37F	MIRCSRC	Coarse Mirror Stepper Source
9	n/c					
10	n/c					
11	n/c					
12	n/c					RESERVED - DO NOT USE
13	n/c					
14	n/c					
15	n/c					

12.5 MHC Thermal Monitors: EIS-MHC5:D37F – see page 17

See section 10.1 “Gold – 1/2: EIS-MHC5:D37F”

12.6 MHC Slit/Slot Resolver: EIS-MHC6:D25F – see page 11

See section 6.1 “Red/Green – 1/2: EIS-MHC6:D25F”

12.7 EIS-MHC7 – see page 23

Connector deleted – see EIS-MHC8:D25F

12.8 MHC Primary Mirror I/F : EIS-MHC8:D25F

EIS-MHC8:D25F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SG+	2,14	8	EIS-MIR1: D37F	SG+	AWG 24
2	SGREF	1,14	10	"	SGREF	AWG 24
3	SGSRC	16,19	14	"	SGSRC	AWG 24
4	R_REF+	-	30	"	R_REF+	Resolver ref from MHC (M27500C24RC6509) -BL
5	S1_B	6	25	"	S1_B	Resolver O/P to MHC (M27500C24RC6509) -OR
6	S2_B	5	28	"	S2_B	Resolver O/P to MHC (M27500C24RC6509) -RD
7	S3_B	8	24	"	S3_B	Resolver O/P to MHC (M27500C24RC6509) -GN
8	S4_B	7	27	"	S4_B	Resolver O/P to MHC (M27500C24RC6509) -WH
9	T0MON7	22	5	"	ETS17	
10	T0MON8	23	7	"	ETS18	
11	T0MON9	24	18	"	ETS19	
12	PZTDRV	-	37	"	PZTDRV	PZT high voltage drive - CSSH 24 AWG
13	SGND	-	5	EIS-MHC4:D15M	SGND	Structure ground - CONNECTION VIA MIR1
13	SGND	-	19	EIS-MIR1: D37F	SGND	Structure ground
14	QGND	1,2	9	"	QGND	AWG 24
15	SHLD	-	-	-	nc	
16	SGRTN	3,19	12	"	SGRTN	AWG 24
17	SHLD		29	EIS-MIR1:D37F	RSHLD_C	Shield over 1,2,3,14,16,19
18	SHLD	-	-	-	nc	
19	GNDA	3,16	13	"	GNDA	AWG 24
19	GNDA		31	"	R_REF-	M27500C24RC6509 -BK
20	SHLD	-	-	-	nc	
21	SHLD	-	-	-	nc	
22	TMONRTN	9	4	EIS-MIR1: D37F	ETS17RTN	
23	TMONRTN	10	6	"	ETS18RTN	
24	TMONRTN	11	17	"	ETS19RTN	
25	PZTRTN	12	36	"	PZTRTN	PZT high voltage return – CSSH 24 AWG

12.9 MHC Heaters: EIS-MHC9:D50F- see page 17

See section 10.2 “Gold – 2/2: EIS-MHC9:D50F”

12.10 MHC QCM & Cal LED's: EIS-MHC10:D25M – see page 8

See section 3.2 “Dark Green – 2/2: EIS-MHC10:D25M”

12.11 MHC Actuators & Encoders: EIS-MHC11:D50M – see page 10

See section 5 “RED Harness – 1/1: EIS-MHC11:D50M”

12.12 MHC Power Connector: EIS-MHC12:D15F

EIS-MHC12:D15F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SGND	-		EIS-CNP3:D37P	Overall_Scn	Wire for Shield
2	E+28V	10	10		28V_MHC1_Switch	AWG24 – foil over 2,3,4,7,10,11,12,15
3	M+28V	11	3	“	28V_MHC2_Switch	2xAWG24 – foil over 2,3,4,7,10,11,12,15
4	H+28V	12	5	“	28V_OpHtr_Switch	AWG20 – foil over 2,3,4,7,10,11,12,15
5	n/c					
6	n/c					
7	MU+28V	15	12	EIS-CNP3:D37P	28V_MHC_Mkup_Switch	AWG24 – foil over 2,3,4,7,10,11,12,15
8	SGND					
9	n/c					
10	E+28VRTN	2	11	EIS-CNP3:D37P	28V_MHC1_Ret	AWG24 – foil over 2,3,4,7,10,11,12,15
11	M+28VRTN	3	4	“	28V_MHC2_Ret	2xAWG24 – foil over 2,3,4,7,10,11,12,15
12	H+28VRTN	4	6		28V_OpHtr_Ret	AWG20 – foil over 2,3,4,7,10,11,12,15
13	n/c					
14	n/c					
15	MU+28VRTN	7	13		28V_MHC_Mkup_Ret	AWG24 – foil over 2,3,4,7,10,11,12,15

13 ROE Pinout Checks – Information Only

13.1 ROE CCDA Ann: EIS-ROE1:DCDM25M – Information Only

EIS-ROE1: DCDM25M		
Pin	Signal	Notes
1	A_GND	This is a flexible cable
2	A_OS_L	No twists
3	A_VRD	
4	A_VOG1	
5	A_ØR	
6	A_RØ1_L	
7	A_RØ1_R	
8	A_IØ1	
9	A_IØ3	
10	A_Ø_SW_R	
11	A_VDD	
12	A_OS_R	
13	A_GND	
14	A_VSS	
15	A_VOD	
16	A_VOG2	
17	A_ØSW_L	
18	A_RØ2_L	
19	A_RØ3	
20	A_RØ2R	
21	A_IØ2	
22	A_DG	
23	A_VRD	
24	A_VOD	
25	A_VSS	

13.2 ROE CCDB Ann: EIS-ROE2:DCDM25M – Information Only

EIS-ROE2: DCDM25M		
Pin	Signal	Notes
1	B_GND	This is a flexible cable
2	B_OS_L	No twists
3	B_VRD	
4	B_VOG1	
5	B_ØR	
6	B_RØ1_L	
7	B_RØ1_R	
8	B_IØ1	
9	B_IØ3	
10	B_Ø_SW_R	
11	B_VDD	
12	B_OS_R	
13	B_GND	
14	B_VSS	
15	B_VOD	
16	B_VOG2	
17	B_ØSW_L	
18	B_RØ2_L	
19	B_RØ3	
20	B_RØ2R	
21	B_IØ2	
22	B_DG	
23	B_VRD	
24	B_VOD	
25	B_VSS	

13.3 ROE Science Data: EIS-ROE3:D9M

EIS-ROE3:D9M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SC_STB_SCN	-	1	EIS-CNP2:D9F	SC_STB_SCN	Connected to chassis at ROE - NDBC-TFE-22-2SJ-100
2	SC_STB+	6	2	"	SC_STB+	NDBC-TFE-22-2SJ-100
3	0V	-	3	"	Digital Ground	Connected to ROE digital secondary 0V
4	SC_DAT+	9	4	"	SC_DAT+	NDBC-TFE-22-2SJ-100
5	SC_DAT_SCN	-	5	"	SC_DAT_SCN	Connected to chassis at ROE – NDBC-TFE-22-2SJ-100
6	SC_STB-	2	6	"	SC_STB-	NDBC-TFE-22-2SJ-100
7	OVER_ALL_SCN	-	-	-	nc	
8	N/C	-	-	-	n/c	
9	SC_DAT-	4	9	EIS-CNP2:D9F	SC_DAT-	NDBC-TFE-22-2SJ-100

13.4 ROE Command & Telemetry: EIS-ROE4:D9F

EIS-ROE4:D9F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ROE_CMD-	2	6	EIS-CNP1:D15M	ROE_CMD-	NDBC-TFE-24S2SJ-75
2	ROE_CMD+	1	5	"	ROE_CMD+	NDBC-TFE-24S2SJ-75
3	ROE_HK-	7	8	"	ROE_HK-	NDBC-TFE-24S2SJ-75
4	n/c	-				
5	ROE_HK_SCRN	-	15		-	Screen connected at ROE
6	N/c	-	-			
7	ROE_HK+	3	7	EIS-CNP1:D15M	ROE_HK+	NDBC-TFE-24S2SJ-75
8	n/c	-	-			
9	DGND	-	-	-	nc	"COMMON" not used

13.5 ROE Power: EIS-ROE5:D15F

EIS-ROE5:D15F		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SGND	-	19	EIS-CNP3: D37M	Overall_Scn	Wire for Shield
2	P_8V_CAM_C	3,4,9	30	EIS-CNP3: D37M	P_8V_CAM_Switch_C	20 AWG – fol over 2,3,4,5,6,9,13,14
3	N_8V_CAM_C	2,4,9	34	"	N_8V_CAM_Switch_C	20 AWG – fol over 2,3,4,5,6,9,13,14
4	P_39V_CAM_C	2,3,9	35	"	P_39V_CAM_Switch_C	20 AWG – fol over 2,3,4,5,6,9,13,14
5	P_13V_CAM_D	13	28	"	P_13V_CAM_Switch_D	20 AWG – fol over 2,3,4,5,6,9,13,14
6	P_7V_CAM_B	14	32	"	P_7V_CAM_Switch_B	20 AWG – fol over 2,3,4,5,6,9,13,14
7		-				
8	Struct	-	12	EIS-ROE5:D15F	AGND	Link pin 8 to pin 12 - secondary ground link to chassis - AWG20
9	GND_C	2,3,4	31	EIS-CNP3: D37M	Ground_C	20 AWG – fol over 2,3,4,5,6,9,13,14
10	n/c					
11	n/c					
12	AGND		8	EIS-ROE5:D15F	Struct	Link pin 12 to pin 8 - secondary ground link to chassis - AWG20
13	GND_D	5	29	EIS-CNP3: D37M	Ground_D	20 AWG – fol over 2,3,4,5,6,9,13,14
14	GND_B	6	33	"	Ground_D	20 AWG – fol over 2,3,4,5,6,9,13,14
15						

14 Connector Panel Pinout Checks

14.1 EIS-CNP1:D15M – see page 15

See section 8 “BROWN Harness 1/1: EIS-CNP1:D15M”

14.2 EIS-CNP2:D9F – see page 16

See section 9 “PURPLE Harness 1/1: EIS-CNP2:D9F”

14.3 EIS-CNP3:D37M –see page 13

See section 7 “RED/BLUE Harness 1/1: EIS-CNP3:D37M”

14.4 EIS-CNP4:D15M

EIS-CNP4:D15M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Overall Scn					Overall Foil
2	CCD A Heater	3	7	EIS-FPA1: D25F	CTH1	AWG24
3	CCD A Heater Ret	2	8	“	CTH1_Ret	AWG24
4	n/c -					
5	CCD A Sensor	6	21	EIS-FPA1: D25F	CTS1	AWG24
6	CCD A Sensor Ret	5	22	“	CTS1_Ret	AWG24
7	n/c					
8	Overall Scn					Overall Foil
9	n/c					
10	CCD_B Heater	11	9	EIS-FPA1: D25F	CTH2	AWG24
11	CCD_B Heater Ret	10	10	“	CTH2_Ret	AWG24
12	n/c					
13	CCD_B Sensor	14	19	EIS-FPA1: D25F	CTS2	AWG24
14	CCD_B Sensor Ret	13	20	“	CTS2_Ret	AWG24
15	n/c					

14.5 EIS-CNP5:D15M – see page 19

See section 11 “LIGHT BLUE Harness 1/1: EIS-CNP5:D15M”

14.6 EIS-CNP6:D25M

EIS-CNP6:D25M		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Overall Scn	-				Overall Foil
2	SUH1	3	1	Near MIR	SUH1_A	Connected in series from GRA to MIR – see appendix & AD4 for diagram
2	SUH1	3	-	Near GRA	SUH1_B	As above
3	SUH1_Ret	2	-	Near MIR	SUH1_ARet	As above
3	SUH1_Ret	2	2	Near GRA	SUH1_BRet	Connected in series from GRA to MIR – see appendix & AD4 for diagram
4	SUH2	5	1	“	SUH2_A	Two heaters in series – both at GRA – see appendix & AD4 for diagram
4	SUH2	5	-	”	SUH2_B	As above
5	SUH2_Ret	4	-	“	SUH2_ARet	As above
5	SUH2_Ret	4	2	“	SUH2_BRet	As above
6	SUH3	7	17	EIS-FPA1:D25F	SUH3_A	SUH3_A, near FPA, connected in parallel with (SUH3_B in series with SUH3_C), near MIR – common at CNP6 – see appendix & AD4 for diagram
6	SUH3	7	1	Near MIR	SUH3_B	As above
6	SUH3	7	-	Near MIR	SUH3_C	As above
7	SUH3_Ret	6	18	EIS-FPA1:D25F	SUH3_ARet	As above
7	SUH3_Ret	6	-	Near MIR	SUH3_BRet	As above
7	SUH3_Ret	6	2	Near MIR	SUH3_CRet	As above
8	n/c					
9	n/c					
10	n/c					
11	n/c					
12	n/c					
13	Overall Scn	-				Overall Foil
14	n/c					
15	SUS1	16	1	Near MIR		
16	SUS1_Ret	15	2	“		
17	SUS2	18	1	Near GRA		
18	SUS2_Ret	17	2	“		
19	SUS3	20	1	Near MIR		
20	SUS3_Ret	19	2	“		
21	n/c					
22	n/c					
23	n/c					
24	n/c					
25	n/c					

14.7 EIS-CNP7:D15F- Arming Plug

EIS-CNP7:D15F			SOURCE		DESTINATION	
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	PAR0A	-	1	EIS-MHC11: D50M	PAR0A	Rear – 0.5A
2	+28Vhop(inner)_htr1	-	2	EIS-CLM1:D37F	+28Vhop(inner)_htr1	Rear – 0.5A
3	n/c					
4	PAR2A	-	3	EIS-MHC11: D50M	PAR2A	Front – 0.5A
5	+28Vhop(sun_side)_htr1	-	4	EIS-CLM1:D37F	+28Vhop(sun_side)_htr1	Front – 0.5A
6	n/c					
7	n/c					
8	PAR0B	-	5	EIS-MHC11: D50M	PAR0B	Rear – 0.5A
9	+28Vhop(inner)_htr2	-	3	EIS-CLM1:D37F	+28Vhop(inner)_htr2	Rear – 0.5A
10	n/c					
11	PAR2B	-	7	EIS-MHC11: D50M	PAR2B	Front – 0.5A
12	+28Vhop(sun_side)_htr2	-	5	EIS-CLM1:D37F	+28Vhop(sun_side)_htr2	Front – 0.5A
13	n/c					
14	n/c					
15	SGND	-		EIS-MHC11:D50M	SGND	Overall Foil
15	SGND	-		EIS-CLM1:D37F	SGND	Overall Foil

14.8 EIS-CNP7:D15M- Arming Plug Detail

EIS-CNP7:D15M		SOURCE	
Pin	Signal	Wire Loop	Notes
1	PAR0A	2	Arming connection via #1 - #2
2	+28Vhop(inner)_htr1	1	Arming connection via #1 - #2
3	n/c		
4	PAR2A	5	Arming connection via #4 - #5
5	+28Vhop(sun_side)_htr1	4	Arming connection via #4 - #5
6	n/c		
7	n/c		
8	PAR0B	9	Arming connection via #8 - #9
9	+28Vhop(inner)_htr2	8	Arming connection via #8 - #9
10	n/c		
11	PAR2B	12	Arming connection via #11 - #12
12	+28Vhop(sun_side)_htr2	11	Arming connection via #11 - #12
13	n/c		
14	n/c		
15	n/c		

15 QCM Pinout Checks

15.1 EIS-QCM1:BJ02H-10-13S

EIS-QCM1:BJ02H-10-13S		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	n/c					
2	QCM1	5	1	EIS-MHC10:D25F	QCM1	
3	Q1RTD+	4	3	"	Q1RTD+	Two separate wires from #3
3	Q1RTD+	4	9	"	Q1RTDSRC	Two separate wires from #3
4	Q1RTD-	3	17	"	Q1RTD-	Two separate wires from #4
4	Q1RTD-	3	22	"	Q1RTDRTN	Two separate wires from #4
5	Q1RTN	2	14	"	Q1RTN	
6	Q1+15V	-	4	"	Q1+15V	
7	Q1HTR	-	-	-	nc	
8	Q1HRTN	7	15	"	Q1HRTN	
9	n/c					
10	n/c					
11	n/c					
12	Q1HTR	13	2	EIS-MHC10:D25F	Q1HTR	
13	Q1HRTN	-	-	-	nc	
BODY	SGND	-	13	"	SGND	
BODY	SGND	-		EIS-QMC2: BJT02H-10-13S	BODY	CONNECTION VIA MHC10

15.2 EIS-QCM2:BJ02H-10-13S

EIS-QCM2:BJ02H-10-13S		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	n/c					
2	QCM2	5	5	EIS-MHC10:D25F	QCM2	
3	Q2RTD+	4	7	"	Q2RTD+	Two separate wires from #3
3	Q2RTD+	4	12	"	Q2RTDSRC	Two separate wires from #3
4	Q2RTD-	3	21	"	Q2RTD-	Two separate wires from #4
4	Q2RTD-	3	25	"	Q1RTDRTN	Two separate wires from #4
5	Q2RTN	2	18	"	Q2RTN	
6	Q2+15V	-	8	"	Q2+15V	
7	Q2HTR	-	-	-	nc	
8	Q2HRTN	7	19	"	Q2HRTN	
9	n/c					
10	n/c					
11	n/c					
12	Q2HTR	13	6	EIS-MHC10:D25F	Q2HTR	
13	Q2HRTN	-	-	-	nc	
BODY	SGND	-	13	"	SGND	
BODY	SGND	-		EIS-QMC2: BJT02H-10-13S	BODY	CONNECTION VIA MHC10

16 Lemo/Clamshell Pinout Checks

16.1 EIS-CLM1:D37F

EIS-CLM1: D37F			SOURCE		DESTINATION	
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SGND	-	17	EIS-MHC11:D50M	SGND	Overall Foil
1	SGND	-	37	EIS-CLM1:D37F	SYS_GND	Link to #37
2	+28Vhop(inner)_htr1	20	2	EIS-CNP7:D15F	+28Vhop(inner)_htr1	Arming Plug
3	+28Vhop(inner)_htr2	21	9	"	+28Vhop(inner)_htr2	Arming Plug
4	+28Vhop(sun_side)_htr1	23	5	"	+28Vhop(sun_side)_htr1	Arming Plug
5	+28Vhop(sun_side)_htr2	24	12	"	+28Vhop(sun_side)_htr2	Arming Plug
6	n/c					
7	Clamshell_open(Enc_Inner)	28,29	34	EIS-MHC11: D50M	ENC0A	
8	n/c					
9	+Supply_LED(Enc_Inner)	30	13	EIS-MHC11: D50M	ENC01SRC	
10	n/c					
11	STR-2	31	4	EIS-CNP5:D15M	Sensor2	Blue harness - (inner)+ve
12	n/c					
13	STR-3	32	6	EIS-CNP5:D15M	Sensor3	Blue harness - (bulkhead)+ve
14	STR-1	33	2	"	Sensor1	Blue harness - (sun_side)+ve
15	n/c					
16	+Supply_LED(Enc_SunSide)	34	14	EIS-MHC11: D50M	ENC23SRC	
17	n/c					
18	Clamshell_open(Enc_SunSide)	36,35	42	EIS-MHC11: D50M	ENC2A	
19	n/c					
20	Ret_Hop(inner)_htr1	2	18	EIS-MHC11: D50M	PAR0ARTN	direct connection
21	Ret_Hop(inner)_htr2	3	22	"	PAR0BRTN	direct connection
22	n/c					
23	Ret_Hop(sun_side)_htr1	4	20	EIS-MHC11: D50M	PAR2ARTN	direct connection
24	Ret_Hop(sun_side)_htr2	5	24	"	PAR2BRTN	direct connection
25	n/c					
26	n/c					
27	n/c					
28	Clamshell_closed(Enc_Inner)	7,29	35	EIS-MHC11: D50M	ENC0B	
29	Ret(Enc_inner)	7,28	37	"	PS0RTN	
30	Ret_LED(Enc_inner)	9	30	"	ENC01RTN	
31	STR-2_Ret	11	5	EIS-CNP5:D15M	Sensor2_Ret	Blue harness - (inner)-ve
32	STR-3_Ret	13	7	"	Sensor3_Ret	Blue harness - (bulkhead)-ve
33	STR-1_Ret	14	3	"	Sensor1_Ret	Blue harness - (sun_side)-ve
34	Ret_LED(Enc_SunSide)	16	31	EIS-MHC11: D50M	ENC23RTN	
35	Ret(Enc_SunSide)	18,36	45	"	PS2RTN	
36	Clamshell_closed(Enc_SunSide)	18,35	43	"	ENC2B	
37	SYS_GND	-	15	EIS-CNP7: D15F	SGND	Overall Foil
37	SYS_GND	-	1	EIS-CLM1:D37F	SGND	Link to #1 – Clamshell metalwork

Note: entries in LIGHT BLUE are for LIGHT BLUE-HARNESS (page 19) connections

16.2 EIS-CLM2:LEMO

EIS-CLM2:LEMO		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	VGSRC	-	3	EIS-MHC6:D25M	VGSRC	M27500C28RC6509 – RD
2	VGRTN	-	16	"	VGRTN	M27500C28RC6509 – GN
3	VG+	4	1	"	VG+	M27500C28RC6509 – BK
4	VG-	3	2	"	VG-	M27500C28RC6509 - OR
5	n/c					
6	n/c					

17 Thermal Shield Pinout Checks

EIS-xxx		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1						Via MLI
2						

18 FM Shrouds Pinout Checks

EIS-xxx		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1						Via MLI
2						

19 Chassis Ground Stud Connections

Note: In-line crimp somewhere

SOURCE	DESTINATION	Notes
EIS-CNP-STUD-1	ICU-STUD1	J-side chassis connections

SOURCE	DESTINATION	Notes
EIS-CNP-STUD-2	MHC-STUD1	Structure internal side connections – 2 x 20 AWG
EIS-CNP-STUD-2	EIS-FPA1:D25F -#1	Structure internal side connections – 24 AWG
EIS-CNP-STUD-2	EIS-FPA1:D25F -#2	Structure internal side connections – 24 AWG
EIS-CNP-STUD-2	EIS-FPA1:D25F -#14	Structure internal side connections – 24 AWG
EIS-CNP-STUD-2	EIS-FPA1:D25F -#25	Structure internal side connections – 24 AWG
EIS-CNP-STUD-2	MLI	Structure external side connections – nn off

20 Heater Mats Pinout Checks

20.1 EIS-Heater Sensors

ETS1		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS1_GO	2	2	EIS-MHC5:D37M	T1MON1	Base structure (heater)
2	ETS1_Ret	1	21	"	TMONRTN	

ETS2		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS2_GO	2	3	EIS-MHC5:D37M	T1MON2	Base structure (heater)
2	ETS2_Ret	1	22	"	TMONRTN	

ETS3		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS3_GO	2	4	EIS-MHC5:D37M	T1MON3	Base structure (heater)
2	ETS3_Ret	1	23	"	TMONRTN	

ETS4		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS4_GO	2	5	EIS-MHC5:D37M	T1MON4	Base structure (heater)
2	ETS4_Ret	1	24	"	TMONRTN	

ETS5		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS5_GO	2	6	EIS-MHC5:D37M	T1MON5	Base structure (heater)
2	ETS5_Ret	1	25	"	TMONRTN	

ETS6		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS6_GO	2	7	EIS-MHC5:D37M	T1MON6	Base structure (heater)
2	ETS6_Ret	1	26	"	TMONRTN	

ETS7		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS7_GO	2	8	EIS-MHC5:D37M	T1MON7	Base structure (heater)
2	ETS7_Ret	1	27	"	TMONRTN	

ETS8		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS8_GO	2	9	EIS-MHC5:D37M	T1MON8	Back end structure (P7 heater)
2	ETS8_Ret	1	28	"	TMONRTN	

ETS9		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS9_GO	2	10	EIS-MHC5:D37M	T1MON9	Front end structure (P8 heater)
2	ETS9_Ret	1	29	"	TMONRTN	

ETS10		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS10_GO	2	11	EIS-MHC5:D37M	T1MON10	Base structure (heater)
2	ETS10_Ret	1	30	"	TMONRTN	

ETS11		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS11_GO	2	12	EIS-MHC5:D37M	T1MON11	Base structure (heater)
2	ETS11_Ret	1	31	"	TMONRTN	

ETS12		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS12_GO	2	13	EIS-MHC5:D37M	T1MON12	Base structure (heater)
2	ETS12_Ret	1	32	"	TMONRTN	

ETS13		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS13_GO	2	14	EIS-MHC5:D37M	T1MON13	Side structure
2	ETS13_Ret	1	33	"	TMONRTN	

ETS14		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS14_GO	2	15	EIS-MHC5:D37M	T1MON14	Side structure
2	ETS14_Ret	1	34	"	TMONRTN	

ETS15		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS15_GO	2	16	EIS-MHC5:D37M	T1MON15	v
2	ETS15_Ret	1	35	"	TMONRTN	

ETS16		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS16_GO	2	1	EIS-MHC5:D37M	T1MON0	Side structure
2	ETS16_Ret	1	20	"	TMONRTN	

ETS17 for information only:

ETS17		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS17_GO	2	5	EIS-MIR1:D37M	ETS17_GO	Base structure (heater) – inside structure near MIR
2	ETS17_Ret	1	4	“	ETS17_Ret	

ETS18 for information only:

ETS18		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS18_GO	2	7	EIS-MIR1:D37M	ETS18_GO	Base structure (heater) – inside structure near MIR
2	ETS18_Ret	1	6	“	ETS18_Ret	

ETS19 for information only:

ETS19		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS19_GO	2	18	EIS-MIR1:D37M	ETS19_GO	Base structure (heater) – inside structure near MIR
2	ETS19_Ret	1	17	“	ETS19_Ret	

ETS20 for information only:

ETS20		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS20_GO	2	5	EIS-GRA1:D25M	ETS20_GO	Inside Structure near GRA
2	ETS20_Ret	1	4	“	ETS20_Ret	Inside Structure near GRA

ETS21 for information only:

ETS21		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS21_GO	2	7	EIS-GRA1:D25M	ETS21_GO	Inside Structure on GRA
2	ETS21_Ret	1	6	“	ETS21_Ret	Inside Structure on GRA

ETS22 for information only:

ETS22		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS22	2	5	EIS-SLA1:D25M	ETS22	Inside Structure on SLA(Slit)
2	ETS22_Ret	1	4	“	ETS22_Ret	Inside Structure on SLA(Slit)

ETS23 for information only:

ETS23		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS23	2	7	EIS-SLA1:D25M	ETS23	Inside Structure on SLA(Shutter)
2	ETS23_Ret	1	6	“	ETS23_Ret	Inside Structure on SLA(Shutter)

ETS24 for information only:

ETS24		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ETS24	2	-	-	-	Connected inside MHC
2	ETS24_Ret	1	-	-	-	Connected inside MHC

CTS1 for information only:

CTS1		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	CTS1	2	21	EIS-FPA1: D25M	CTS1	Inside Structure on FPA – see AD2
2	CTS1_Ret	1	22	"	CTS1_Ret	Inside Structure on FPA – see AD2

CTS2 for information only:

CTS2		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	CTS2	2	19	EIS-FPA1: D25M	CTS2	Inside Structure on FPA – see AD2
2	CTS2_Ret	1	20	"	CTS2_Ret	Inside Structure on FPA – see AD2

SUS1		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUS1	2	15	EIS-CNP6:D25F	SUS1	Near MIR
2	SUS1_Ret	1	16	"	SUS1_Ret	Near MIR

SUS2		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUS2	2	4	EIS-CNP6:D25F	SUS1	Near GRA
2	SUS2_Ret	1	5	"	SUS1_Ret	Near GRA

SUS3		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUS3	2	6	EIS-CNP6:D25F	SUS3	Near MIR
2	SUS3_Ret	1	7	"	SUS3_Ret	Near MIR

20.2 EIS-Heaters

ETH1		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 0	2	1	EIS-MHC9: D50M	H0	Base structure (heater)
2	Heater 0_Ret	1	18	"	+28VHRTN	

ETH2		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 1	2	2	EIS-MHC9: D50M	H1	Base structure (heater)
2	Heater 1_Ret	1	19	"	+28VHRTN	

ETH3		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 2	2	3	EIS-MHC9: D50M	H2	Base structure (heater)
2	Heater 2_Ret	1	20	"	+28VHRTN	

ETH4		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 3	2	4	EIS-MHC9: D50M	H3	Base structure (heater)
2	Heater 3_Ret	1	21	"	+28VHRTN	

ETH5		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 4	2	5	EIS-MHC9: D50M	H4	Base structure (heater)
2	Heater 4_Ret	1	22	"	+28VHRTN	

ETH6		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 5	2	6	EIS-MHC9: D50M	H5	Base structure (heater)
2	Heater 5_Ret	1	23	"	+28VHRTN	

ETH7		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 6	2	7	EIS-MHC9: D50M	H6	Base structure (heater)
2	Heater 6_Ret	1	24	"	+28VHRTN	

ETH8		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 7	2	8	EIS-MHC9: D50M	H7	Back end structure (P7 heater)
2	Heater 7_Ret	1	25	"	+28VHRTN	

ETH9		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 8	2	9	EIS-MHC9: D50M	H8	Front end structure (P8 heater)
2	Heater 8_Ret	1	26	"	+28VHRTN	

ETH10		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 9	2	10	EIS-MHC9: D50M	H9	Base structure (heater)
2	Heater 9_Ret	1	27	"	+28VHRTN	

ETH11		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 10	2	11	EIS-MHC9: D50M	H10	Base structure (heater)
2	Heater 10_Ret	1	28	"	+28VHRTN	

ETH12		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	Heater 11	2	12	EIS-MHC9: D50M	H11	Base structure (heater)
2	Heater 11_Ret	1	29	"	+28VHRTN	

CTH1 for information only:

CTH1		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	CTH1	2	7	EIS-FPA1: D25F	CTH1	Inside Structure on FPA – see AD2
2	CTH1_Ret	1	8	EIS-FPA1: D25F	CTH1_Ret	Inside Structure on FPA – see AD2

CTH2 for information only:

CTH2		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	CTH2	2	9	EIS-FPA1: D25F	CTH2	Inside Structure on FPA – see AD2
2	CTH2_Ret	1	10	EIS-FPA1: D25F	CTH2_Ret	Inside Structure on FPA – see AD2

SUH1_A		SOURCE		DESTINATION		HMS1A
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH1_A	2	2	EIS-CNP6:D25M	SUH1	SUH1_A near MIR connected in series with SUH1_B near GRA – see appendix & AD4 for diagram
2	SUH1_ARet	1	1	SUH1_B	SUH1_B	SUH1_A near MIR connected in series with SUH1_B near GRA – see appendix & AD4 for diagram

SUH1_B		SOURCE		DESTINATION		HMS1B
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH1_B	2	2	SUH1_A	SUH1_A	SUH1_A near MIR connected in series with SUH1_B near GRA – see appendix & AD4 for diagram
2	SUH1_BRet	1	3	EIS-CNP6:D25M	SUH1_Ret	SUH1_A near MIR connected in series with SUH1_B near GRA – see appendix & AD4 for diagram

SUH2_A		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH2_A	2	4	EIS-CNP6:D25M	SUH2	Two heaters SUH2_A & SUH2_B in series near GRA – see appendix & AD4 for diagram
2	SUH2_ARet	1	1	SUH2_B	SUH2_B	Two heaters SUH2_A & SUH2_B in series near GRA – see appendix & AD4 for diagram

SUH2_B		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH2_B	2	2	SUH2_A	SUH2_A	Two heaters SUH2_A & SUH2_B in series near GRA – see appendix & AD4 for diagram
2	SUH2_BRet	1	5	EIS-CNP6:D25M	SUH2_BRet	Two heaters SUH2_A & SUH2_B in series near GRA – see appendix & AD4 for diagram

SUH3_A for information only:

SUH3_A		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH3_A	2	17	EIS-FPA1:D25F	SUH3_A	SUH3_A heater made from two parts at FPA – see appendix & AD4 for diagram
2	SUH3_ARet	1	18	EIS-FPA1:D25F	SUH3_ARet	SUH3_A heater made from two parts at FPA – see appendix & AD4 for diagram

SUH3_B		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH3_B	SUH3_CRet	6	EIS-CNP6:D25M	SUH3	Mounted near MIR1 – see appendix & AD4 for diagram
1	SUH3_B	-	17	EIS-FPA1:D25M	SUH3_A	Connect via CNP6 to FPA1 – see appendix & AD4 for diagram
2	SUH3_BRet	-	1	-	SUH3_C	Mounted near MIR1 – see appendix & AD4 for diagram

SUH3_C		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	SUH3_C	-	2	-	SUH3_B	Mounted near MIR1 – see appendix & AD4 for diagram
2	SUH3_CRet	-	18	EIS-FPA1:D25M	SUH3_ARet	Connect via CNP6 to FPA1 – see appendix & AD4 for diagram
2	SUH3_CRet	SUH3_B	7	EIS-CNP6:D25M	SUH3_Ret	Mounted near MIR1 – see appendix & AD4 for diagram

ROE_MUH		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	ROE_MUH_HTR	2	16	EIS-CNP3: D37M	28V_CAM_Mkup_Switch	Two heaters mounted on ROE front panel – foil over 1,2
2	ROE_MUH_HTR_Ret	1	17	EIS-CNP3: D37M	28V_CAM_Mkup_Ret	Two heaters mounted on ROE front panel – foil over 1,2

Spacecraft (HKU) Thermal Sensors

STR1 for information only:

STR1		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-1	2	14	EIS-CLM1:D37F	STR-1	Outside (forward) HOP
2	STR-1_Ret	1	33	"	STR-1_Ret	

STR2 for information only:

STR2		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-2	2	11	EIS-CLM1:D37F	STR-2	Inside structure on Clamshell door assembly
2	STR-2_Ret	1	31	"	STR-2_Ret	

STR3 for information only:

STR3		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-3	2	13	EIS-CLM1:D37F	STR-3	Outside structure on Clamshell bulkhead (Baffle 1)
2	STR-3_Ret	1	32	"	STR-3_Ret	

STR4 for information only:

STR4		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-4	2	3	EIS-FPA1:D25F	STR-4	Inside structure, particle radiation shield
2	STR-4_Ret	1	4	"	STR-4_Ret	

STR5 for information only:

STR5		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-5	2	5	EIS-FPA1:D25F	STR-5	Inside structure, thermal shield
2	STR-5_Ret	1	6	"	STR-5_Ret	

STR6 for information only:

STR6		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-6	2	15	EIS-FPA1:D25F	STR-6	Inside structure on ROE box
2	STR-6 Ret	1	16	"	STR-6 Ret	

STR7		SOURCE		DESTINATION		
Pin	Signal	Twist with	Pin	Connector	Signal	Notes
1	STR-7	2	6	EIS-CNP5:D15M	Sensor7	Inside structure (base) near MHC reference foot
2	STR-7_Ret	1	7	"	Ssensor7_Ret	

21 Names Translation Tables

21.1 Thermistors

ICD Label		MHC Label	Description
1	ETS1	T1MON1	Base structure
2	ETS2	T1MON2	Base structure
3	ETS3	T1MON3	Base structure
4	ETS4	T1MON4	Base structure
5	ETS5	T1MON5	Base structure
6	ETS6	T1MON6	Base structure
7	ETS7	T1MON7	Base structure
8	ETS8	T1MON8	Back end structure
9	ETS9	T1MON9	Front end structure
10	ETS10	T1MON10	Base structure
11	ETS11	T1MON11	Base structure
12	ETS12	T1MON12	Base structure
13	ETS13	T1MON13	Side structure
14	ETS14	T1MON14	Side structure
15	ETS15	T1MON15	Side structure
16	ETS16	T1MON0	Side structure
17	ETS17	T0MON7	Coarse mirror
18	ETS18	T0MON8	Fine mirror
19	ETS19	T0MON9	Mirror mechanism
11	ETS20	T0MON10	Grating
21	ETS21	T0MON11	Grating mechanism
22	ETS22	T0MON4	Slit assembly
23	ETS23	T0MON5	Shutter
24	ETS24	T0MON1	connected internally on MHC

ICD Label		MHC Label	Description
25	CTS1	CCD_A Sensor	CCD A
26	CTS2	CCD_B Sensor	CCD B
27	SUS1	SUS1	Near MIR
28	SUS2	SUS2	Near GRA
29	SUS3	SUS3	Near MIR
30	STR1	Sensor_1	Outer HOP
31	STR2	Sensor_2	Inner CLM Door
32	STR3	Sensor_3	Outside CLM Bulkhead (Baffle 1)
33	STR4	Sensor_4	Particle Radiation Shield
34	STR5	Sensor_5	ROE Thermal Shield
35	STR6	Sensor_6	ROE box
36	STR7	Sensor_7	Outside structure at MHC base

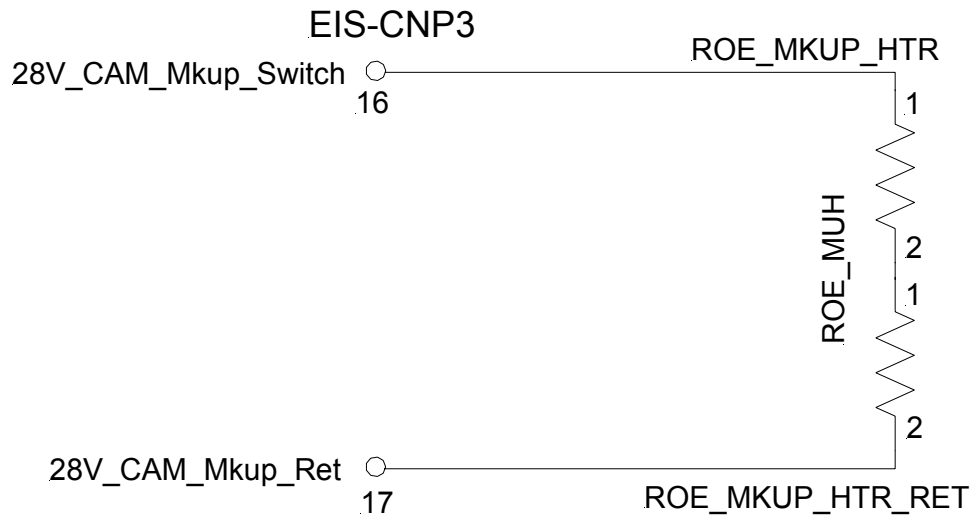
21.2 Heaters

ICD Label		MHC Label	Description
1	ETH1	Heater0	Base structure
2	ETH2	Heater1	Base structure
3	ETH3	Heater2	Base structure
4	ETH4	Heater3	Base structure
5	ETH5	Heater4	Base structure
6	ETH6	Heater5	Base structure
7	ETH7	Heater6	Base structure
8	ETH8	Heater7	Back structure
9	ETH9	Heater8	Front structure
10	ETH10	Heater9	Base structure
11	ETH11	Heater10	Base structure
12	ETH12	Heater11	Base structure

ICD Label		J-side Label	Description
13	CTH1	CCD A Heater	FPA assembly – see appendix & AD4 for diagram
14	CTH2	CCD B Heater	FPA assembly – see appendix & AD4 for diagram
15	SUH1	SUH1	Connected in series from CNP6 to GRA to MIR and return – see appendix & AD4 for diagram
16	SUH2	SUH2	Two heaters in series near GRA – see appendix & AD4 for diagram
17	SUH3	SUH3	Two heaters in series near FPA, two heaters in series near MIR, connected in parallel – see appendix & AD4 for diagram

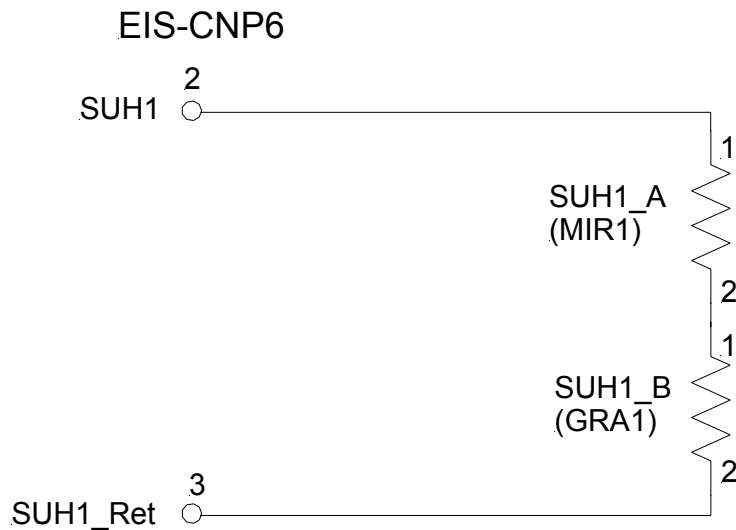
22 Appendix – Heater Connection Diagrams

22.1 ROE Make Up Heaters



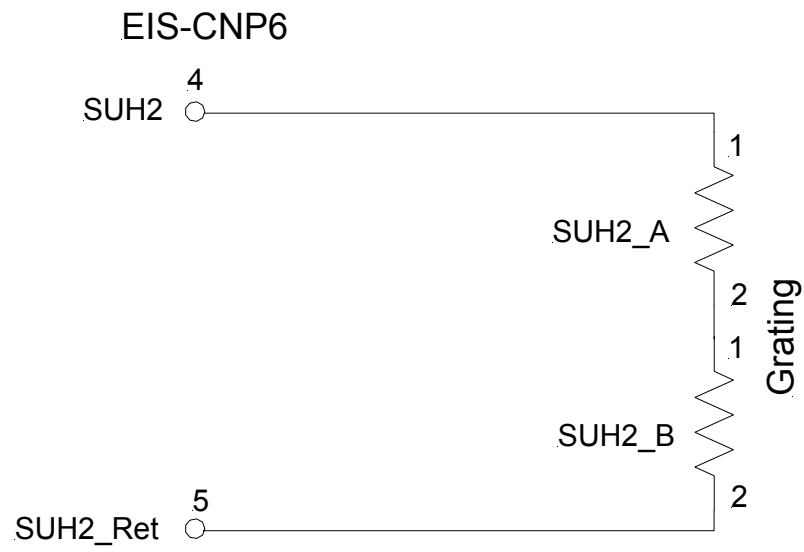
ROE Make Up Heater

22.2 Survival Heater 1



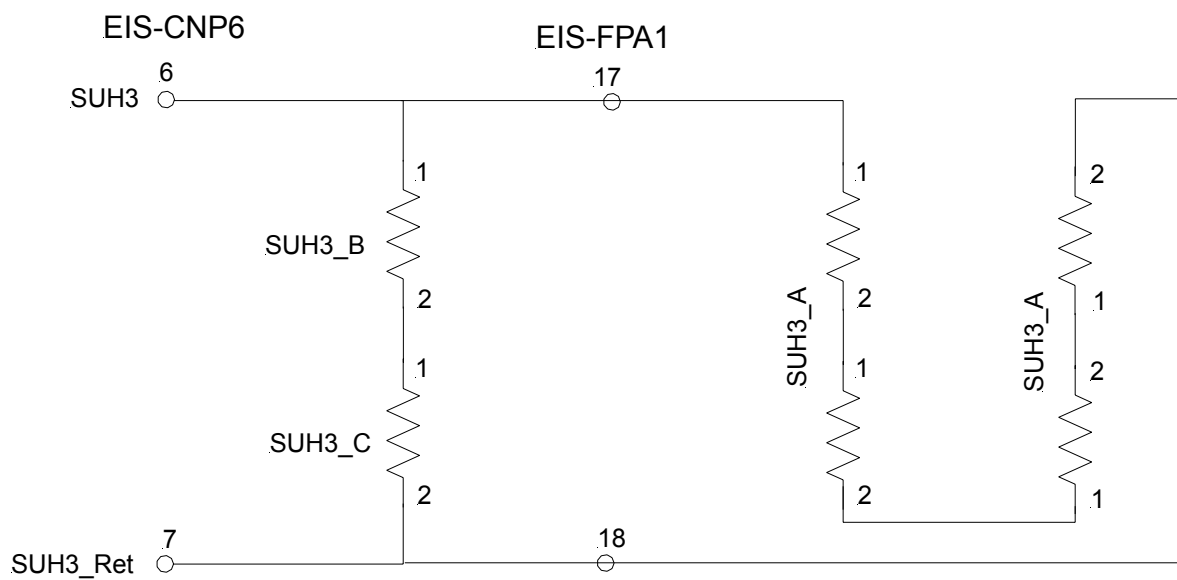
Survival Heater 1

22.3 Survival Heater 2



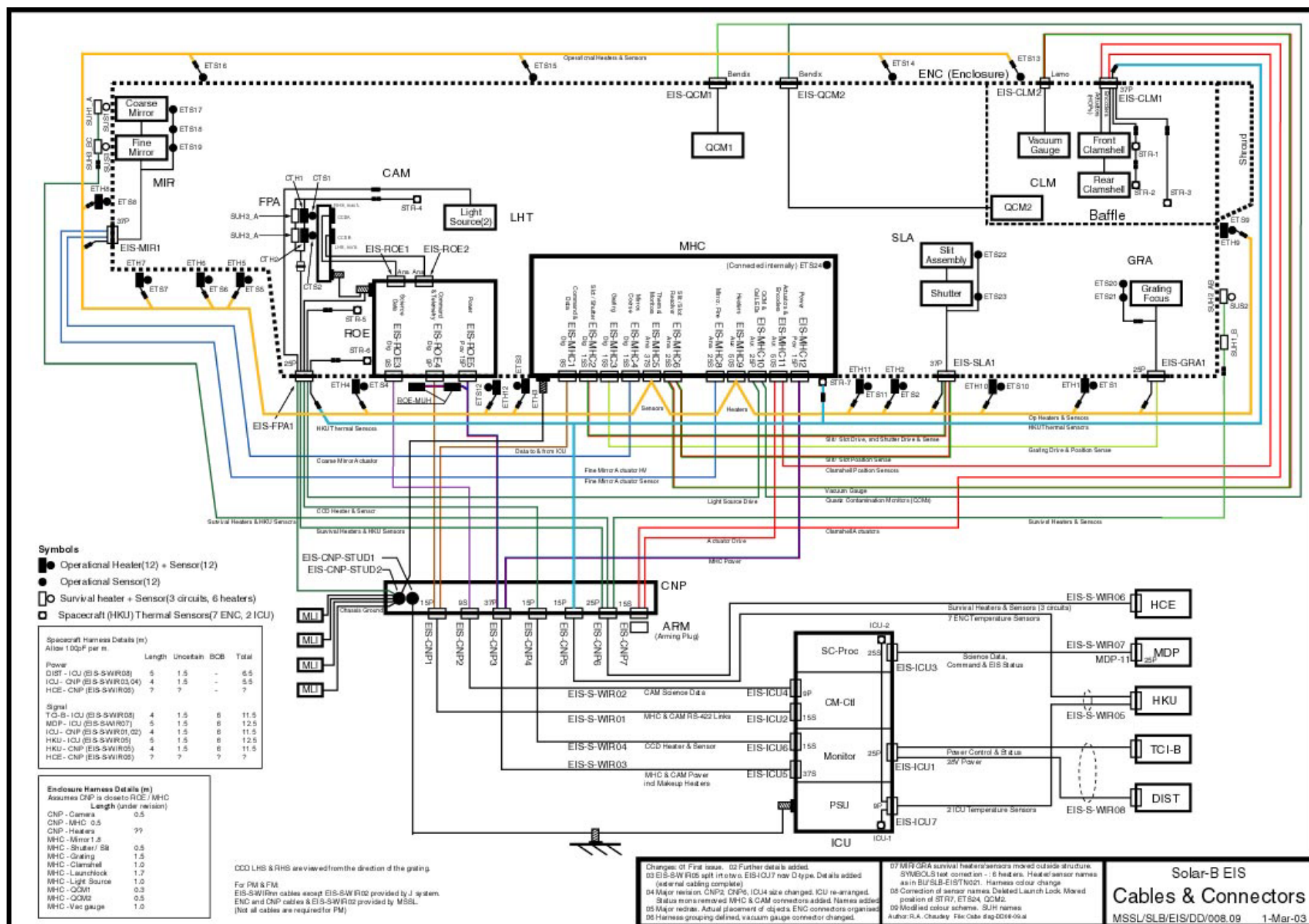
Survival Heater 2

22.4 Survival Heater 3



Survival Heater 3

23 Cables & Connectors Diagram



NOTE: An alternative version of this file is available from the Web (http://www.mssl.ucl.ac.uk/www_detector/solar-b/docs/Official_Harness.html) which has better resolution.