



SPIRE
INTERFACE DOCUMENT.

Doc #: SPIRE-RAL-DWG-001409
Issue: 9
Date: January 2004
Page 1 of 21

Forms Annex 1 to SCI-PT-IIDB/SPIRE-02124

Subject: **SPIRE MECHANICAL INTERFACE DRAWINGS**

PREPARED BY: J. DELDERFIELD **Date:**

APPROVED BY: ERIC SAWYER pp M.GRIFFIN..... **Date:**



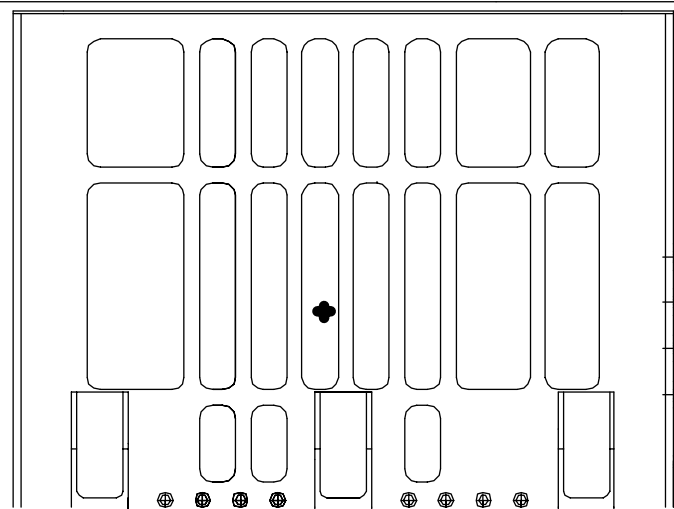
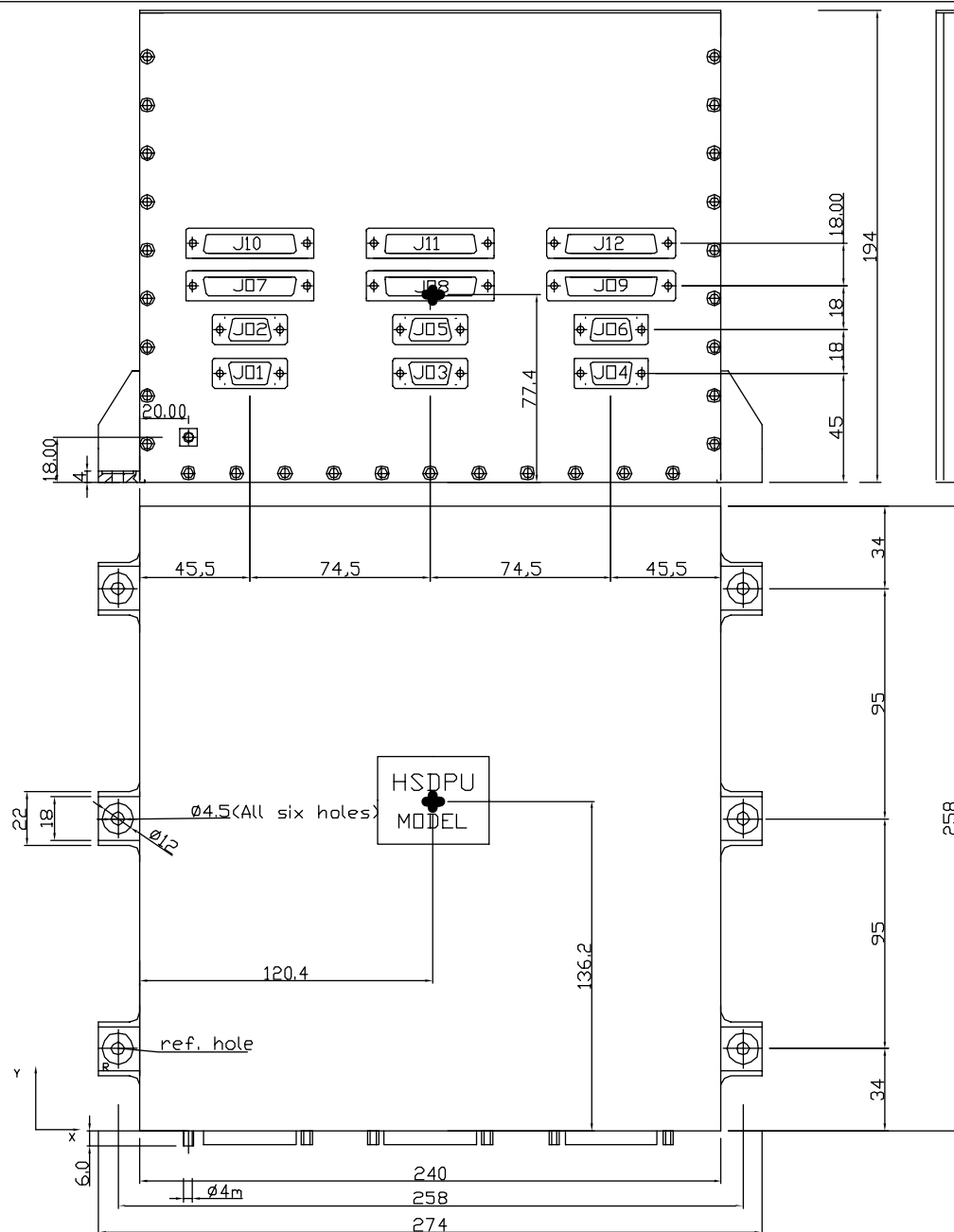
SPIRE
INTERFACE DOCUMENT.

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Page 2 of 21

Issue Drawing Change List

The detailed changes for each drawing are shown just before the drawing.

- Issue 2. Update to status as of 8th October 2002
- Issue 3. Update to status as of 1st November 2002
FCU, DCU & Cryogenic ICDs changed, see changelists where provided
- Issue 4. Update to status as of 24/2/03. JFET drawing versions raised.
- Issue 5. Updated as to status of 27th March 2003. Non-AVM DPU ICD included. JFET ICDs updated.
- Issue 6. Small errors on JFET ICDs fixed.
- Issue 7. New versions of FPU and JFET ICDs, see their individual changelists.
- Issue 8. DRCU "QM1" I/F drawings added, red-lined with NCR information. 2Module JFET updated
but changes are all internal to unit.
- Issue 9. Incorporate updated FM FCU and DCU drawings, including their change control sheets.
DRCU QM1 drawings amended to be like the hardware.






GENERAL TOLERANCE $\pm 1\text{mm}$
 WEIGHT 7.177 Kg $\pm 200\text{g}$
 DIMENSION 274 X 258 X 194mm
 CENTRE OF GRAVITY (E): X=120,4; Y=136,2;
 Z=77,4
 MOMENT OF INERTIA (E): Jx=6,23X10⁻² Kg^{m2}
 Jy=5,73X10⁻² Kg^{m2}
 Jz=7,70X10⁻² Kg^{m2}

CASING MATERIAL: ANTICORDDAL 6082
 SURFACE TREATMENT: ALODINE 1200:
 alfa solar = 0,604
 R-solar = 0,396
 epsilon IR = 0,172
 R-IR = 0,828

THERMAL CAPACITANCE: 7.177J/°C (E)
 CONTACT AREA OF BASEPLATE PLUS FEET 64428mm²
 FLATNESS OF MOUNTING AREA: 0.1mm/100mm
 CONNECTORS:
 J01= DEMA-9P From DPU Prime to PDU Prime
 J02= DEMA-9P From DPU Red. to PDU Red.
 J03= DEMA-9S From DPU Prime to Bus A Prime
 J04= DEMA-9S From DPU Prime to Bus B Prime
 J05= DEMA-9S From DPU Red. to Bus A Red.
 J06= DEMA-9S From DPU Red. to Bus B Red.
 J07= DBMA-25P From DPU Prime to DCE Prime
 J10= DBMA-25P From DPU Red. to DCE Red.
 J08= DBMA-25P From DPU Prime to MCE Prime
 J11= DBMA-25P From DPU Red. to MCE Red.
 J09= DBMA-25P From DPU Prime to SCE Prime
 J12= DBMA-25P From DPU Red. to SCE Red.

UPDATED: 23/02/2003 P. Baldetti (rev. 4)
 UPDATED: 10/02/2002 P. Baldetti (rev. 3)
 UPDATED: 16/01/2002 P. Baldetti UPDATED: 29/01/2002 P. Baldetti

Consiglio Nazionale delle Ricerche Istituto di Fisica dello Spazio Interplanetario Via del Fosso del Mulino n. 100 tel. 06/4993 per 06/4993333	data 5/04/2001 	prog. Baldetti scala	dis. materiale	
		tratt.		
	rev. 4 data 23/02/03	toll.	Progetto: HERSCHEL- HSDPU	
			titolo: HSDPU	N. dis. HER S005/03

	List of changes SPIR-MX-5100 000 Rev. D to Rev E	  DSM-DAPNIA SAp-SPIRE-QA-0153-04 Date : 14/01/2004 Page: 1/1
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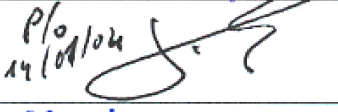
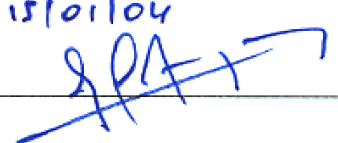
List of changes

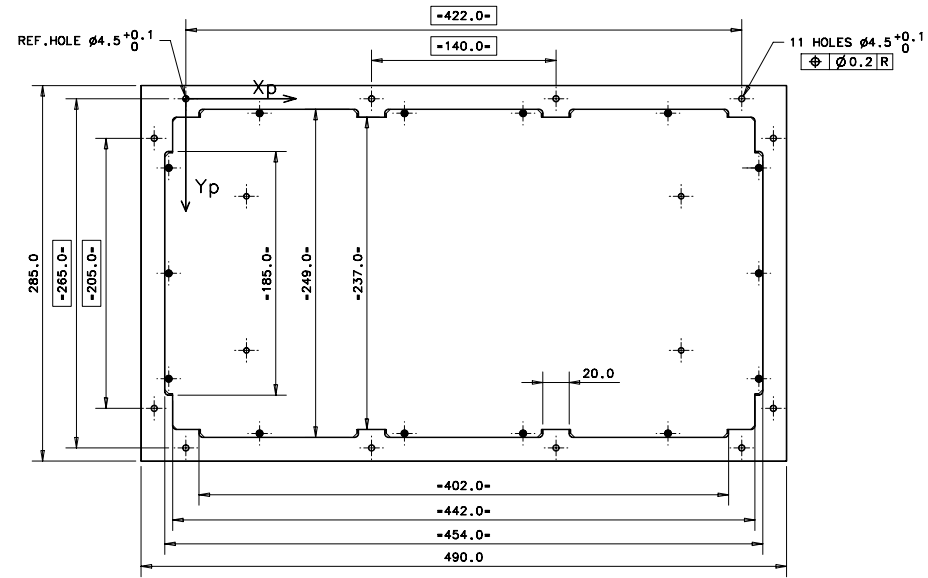
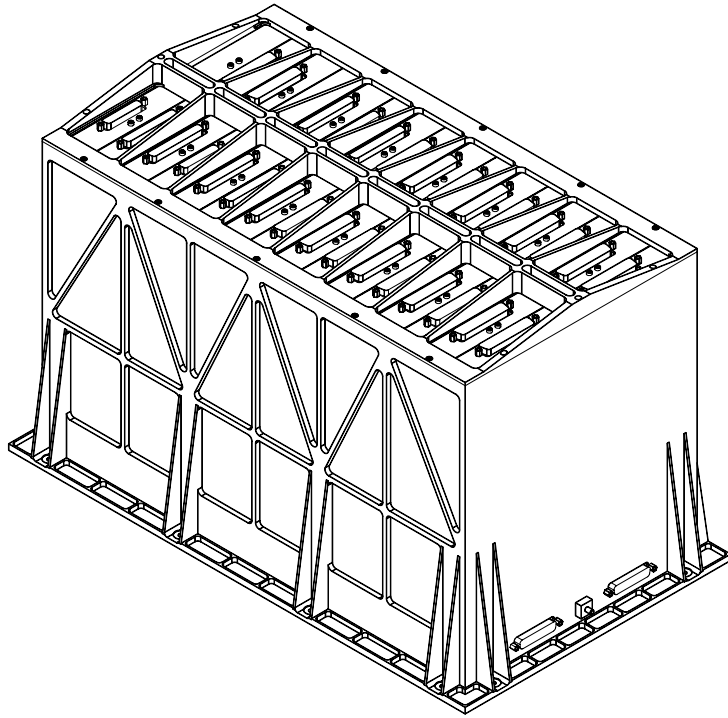
Document identification

Document n°	SPIR-MX-5100 000	
Title of document	SPIRE DCU Electronic box mechanical i/f drawing	
Changes	From rev.	Rev. D (10/2002)
	To rev.	Rev. E (01/2004)

Detail of changes

Description	Associated RFD / ECR (if any)	Status
Change of units for MOI	--	--
Change of estimated mass	--	--

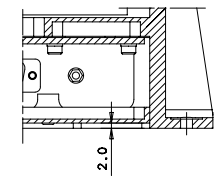
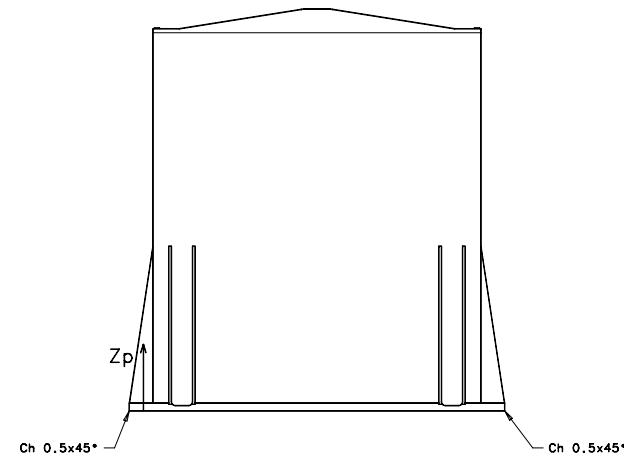
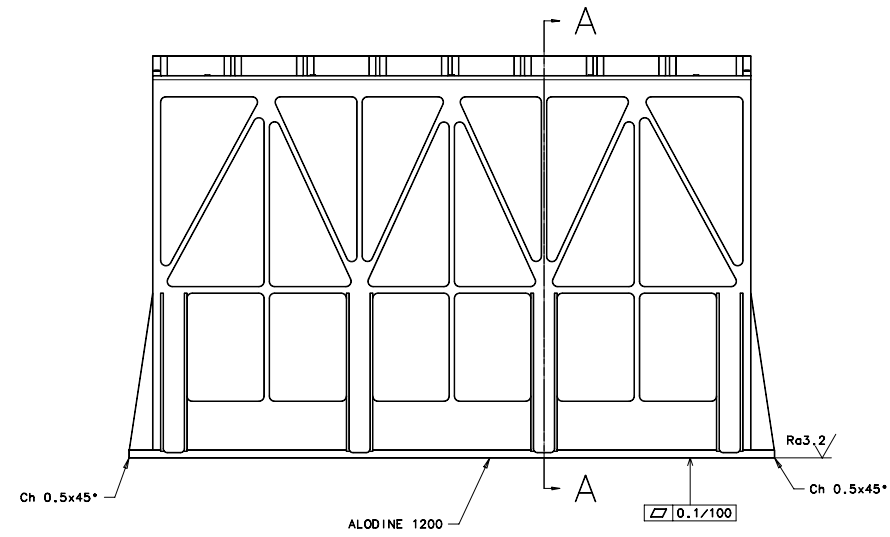
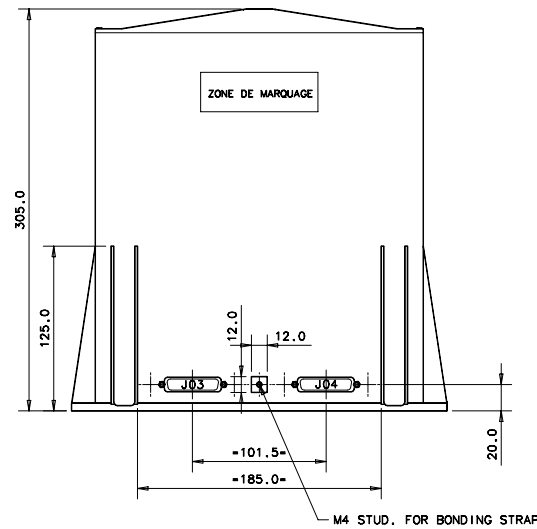
	Position	Name	Signature
Prepared by	PA electronics	J. Fontignie	 14.01.04
Approved by	PA mechanics	I. Le Mer	 14/01/04
Approved by	PA	P. Dupont	 P/0 14/01/04
Approved by	Project manager	J.L. Augères	 15/01/04 JPA



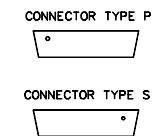
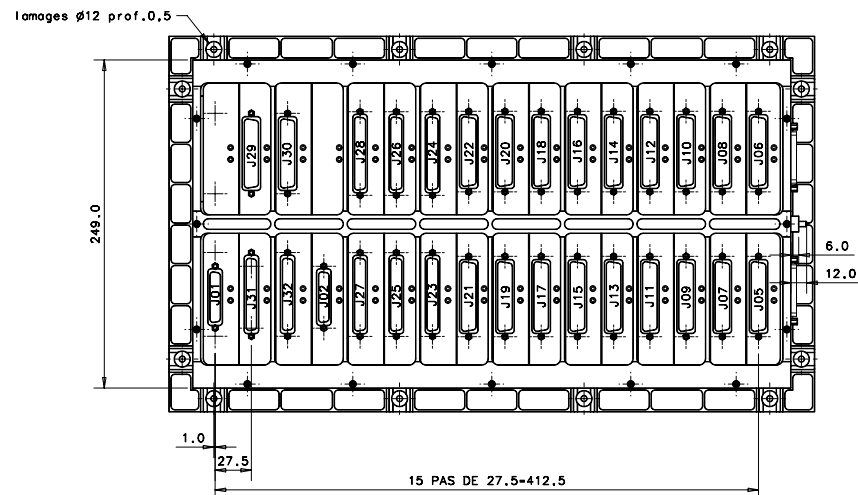
CONNECTORS					
IDENT	TYPE	FUNCTIONS	IDENT	TYPE	FUNCTIONS
J01	DBMA 25S	DAQ_IF_M/DPU_M	J17	DDMA 50P	LIA_P_7/FPU
J02	DBMA 25S	DAQ_IF_R/DPU_R	J18	DDMA 50P	LIA_P_7/FPU
J03	DBMA 25P	DCU/PSU_M	J19	DDMA 50P	LIA_P_8/FPU
J04	DBMA 25P	DCU/PSU_R	J20	DDMA 50P	LIA_P_8/FPU
J05	DDMA 50P	LIA_P_1/FPU	J21	DDMA 50P	LIA_P_9/FPU
J06	DDMA 50P	LIA_P_1/FPU	J22	DDMA 50P	LIA_P_9/FPU
J07	DDMA 50P	LIA_P_2/FPU	J23	DCMA 37P	LIA_S_1/FPU
J08	DDMA 50P	LIA_P_2/FPU	J24	DCMA 37P	LIA_S_1/FPU
J09	DDMA 50P	LIA_P_3/FPU	J25	DCMA 37P	LIA_S_2/FPU
J10	DDMA 50P	LIA_P_3/FPU	J26	DCMA 37P	LIA_S_2/FPU
J11	DDMA 50P	LIA_P_4/FPU	J27	DCMA 37P	LIA_S_3/FPU
J12	DDMA 50P	LIA_P_4/FPU	J28	DCMA 37P	LIA_S_3/FPU
J13	DDMA 50P	LIA_P_5/FPU	J29	DDMA 78S	BIAS_M/FPU
J14	DDMA 50P	LIA_P_5/FPU	J30	DDMA 78S	BIAS_R/FPU
J15	DDMA 50P	LIA_P_6/FPU	J31	DCMA 37S	BIAS_M/FPU
J16	DDMA 50P	LIA_P_6/FPU	J32	DCMA 37S	BIAS_R/FPU

NOTES

MATERIAL AL 6082
 CENTRE OF GRAVITY REFERRED TO REFERENCE HOLE
 X=213.2mm Y=132.4mm Z=157.9mm
 MOMENTS OF INERTIA REFERRED TO CENTRE OF GRAVITY
 Jxp=0.471 Kg.m2 Jyp=0.250 Kg.m2 Jzp=0.444 Kg.m2
 CONTACT AREA MOUNTING FEET=28180mm2
 THERMAL COATING AND BLACK ANODISING ESA.PSS.703
 SURFACE EMISSIVITY >0.85
 TORQUE VALUE FOR CONNECTOR FIXATION SCREWS=
 - MALE=0.3mN
 - FEMALE=0.45mN
 SPECIFIC HEAT 1170 J/Kg.*K
 ESTIMATED MASS=14442g



COUPE PARTIELLE A-A
 ECHELLE: 1/1



Indice	Modifications	Date	Dessiné par	Vérifié par	Approuvé par
E	Mise à jour	01/04	DHENAIN		
D	Ajout coupe A-A	10/02	DHENAIN		
C	Mise à jour	09/02	DHENAIN		
B	Mise à jour	06/02	DHENAIN		
A	Origine	11/01	DHENAIN		

Spécifications particulières			
Symboles généralistes		Indice de rugosité général XXXX	SOUS-TRAITANT
		Tol.ang.:xxx°	
		Casser les angles vifs	
Matière:		Protection	
Traitement thermique:		Echelle	Poids Niveau qualité
		1/2	

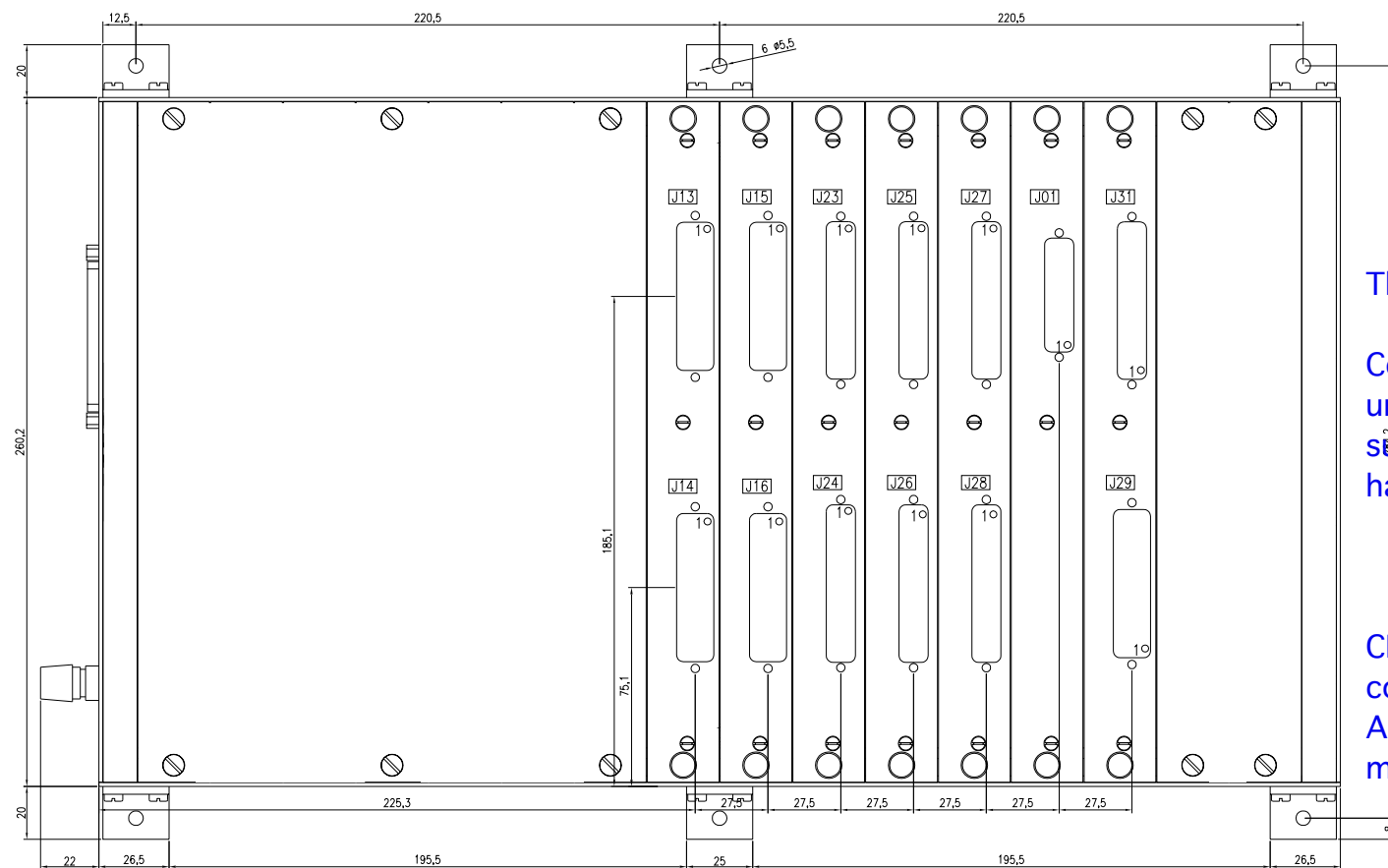
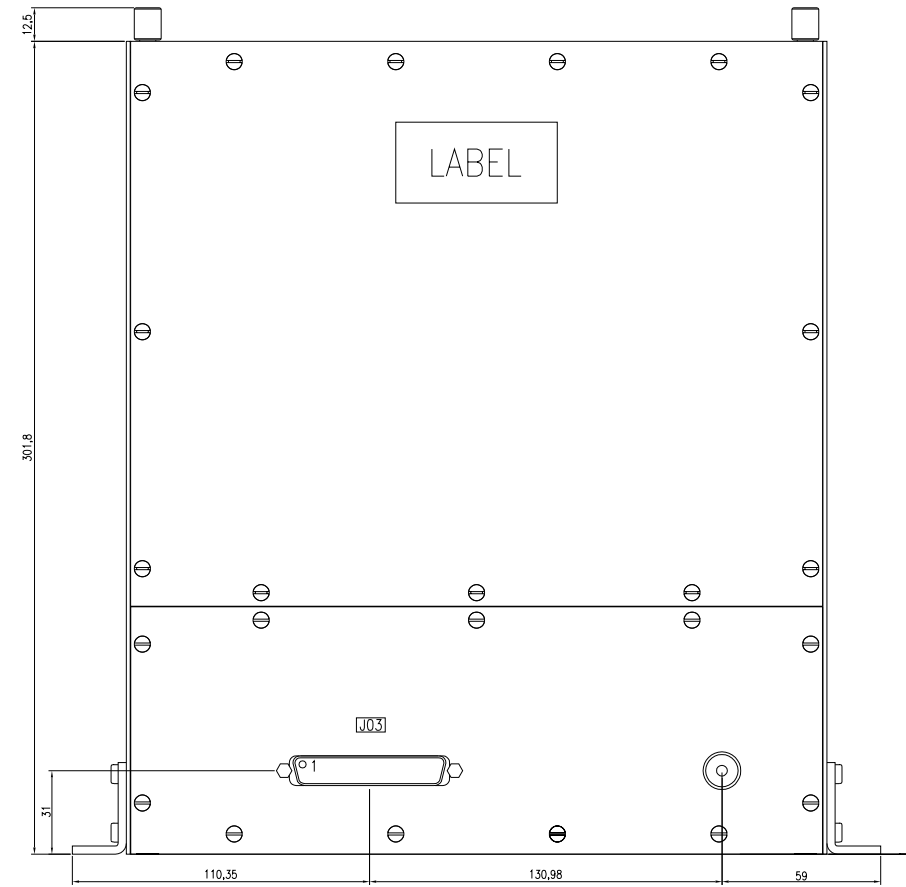
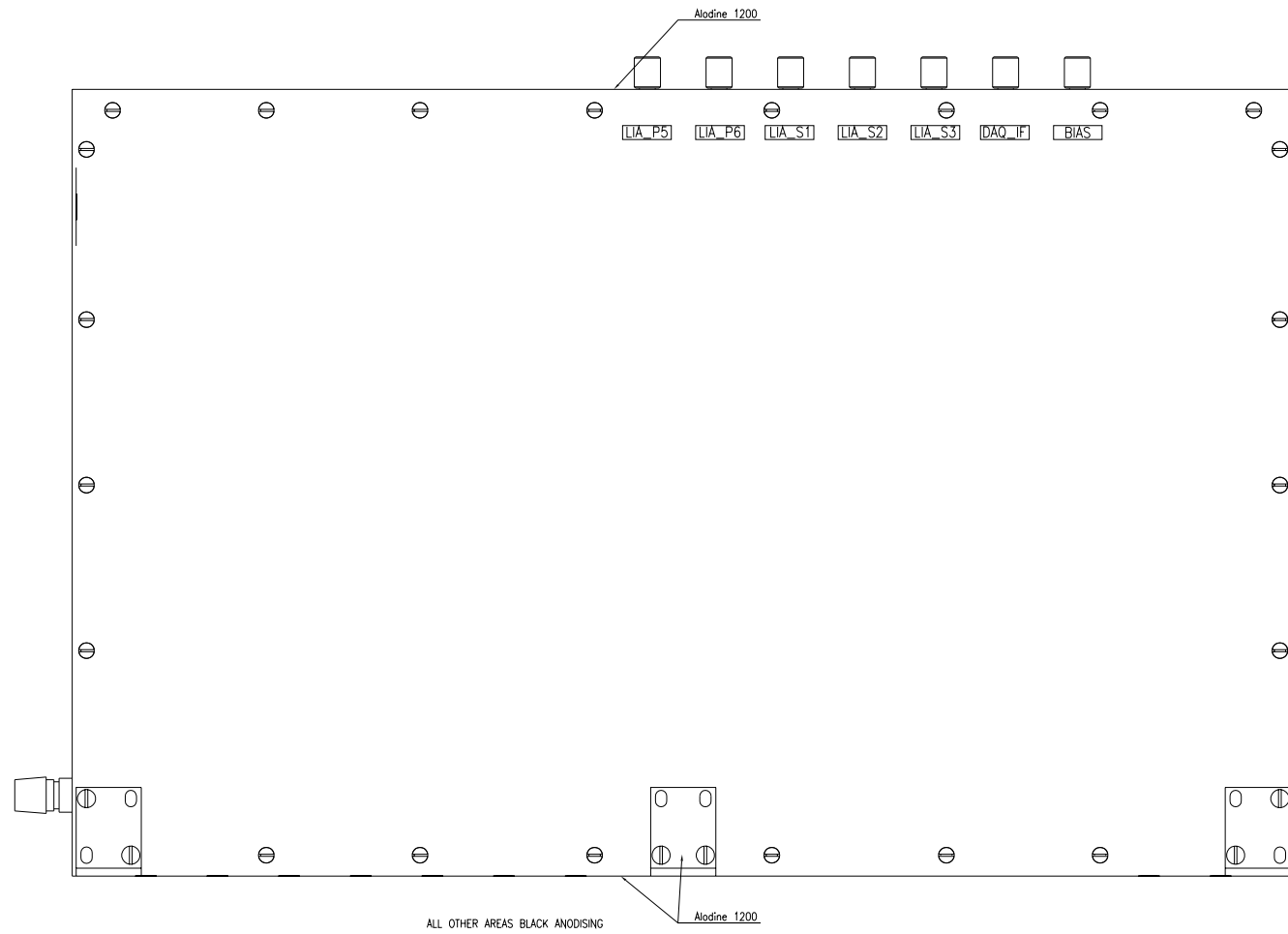
SPIRE
 HSDCU ELECTRONIC BOX
 MECHANICAL INTERFACE CONTROL DRAWING

Il n'est permis d'utiliser ce dessin qu'avec l'licence spéciale de l'autorisation expresse - loi du 11 mars 1957

SAP/GERES COMMISSARIAT A L'ENERGIE ATOMIQUE C.E.N. SACLAY

Tel: 01.69.08.78.25
 01.69.08.59.78
 Fax: 01.69.08.79.96

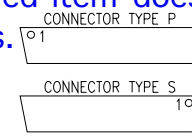
AO SPIR-MX-5100 000 E



CONNECTORS					
IDENT	TYPE	FUNCTION	IDENT	TYPE	FUNCTION
J01	DBMA 25S	DAO_IF_M/DPU	J24	DCMA 37P	LIA_S_1/FPU
J03	DBMA 25P	DCU/PSU_M	J25	DCMA 37P	LIA_S_2/FPU
J13	DDMA 50P	LIA_P_5/FPU	J26	DCMA 37P	LIA_S_2/FPU
J14	DDMA 50P	LIA_P_5/FPU	J27	DCMA 37P	LIA_S_3/FPU
J15	DDMA 50P	LIA_P_6/FPU	J28	DCMA 37P	LIA_S_3/FPU
J16	DDMA 50P	LIA_P_6/FPU	J29	DDMA 78S	BIAS_M/FPU
J23	DCMA 37P	LIA_S_1/FPU	J31	DCMA 37S	BIAS_M/FPU

This QM drawing was introduced in pack 8.



Compared to pack 8 it has some divisions in unused parts of its main connector face suppressed because the delivered item does not have these as separate plates.



CEA have been requested to include all I/F connectors on this model, not least so the Astrium harness is safely mated, but the matter is open at the time of pack 9's issue.

ONLY FOR QM1

CEA /SAP 91191 GIF/YVETTE Cedex	MATIERE : Alu 2017A	PROTECTION :
	TRAITEMENT : Alodine 1200	DESSINE : SREE DATE : 02/12/02 VERIFIE : VISA :
CE DOCUMENT EST LA PROPRIETE DE LA SOCIETE C.E.A. ET NE PEUT ETRE REPRODUIT OU COMMUNIQUE SANS AUTORISATION ECRITE		
ECHELLE : 3/4	TOLERANCES GENERALES : ±0.2	Ro1,6
DESIGNATION ICD HS DCU/QM1	SRIR-MX-5101 000 A	0 A1

	List of changes SPIR-MX-5200 000 Rev. F to Rev J	 DSM - DAPNIA SAp-SPIRE-QA-0152-04 Date : 14/01/2004 Page: 1/1
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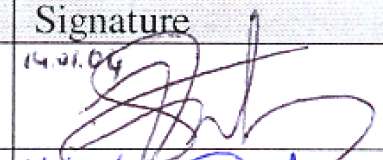
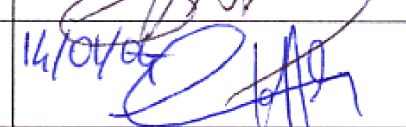

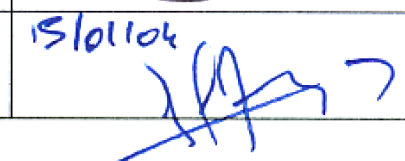
List of changes

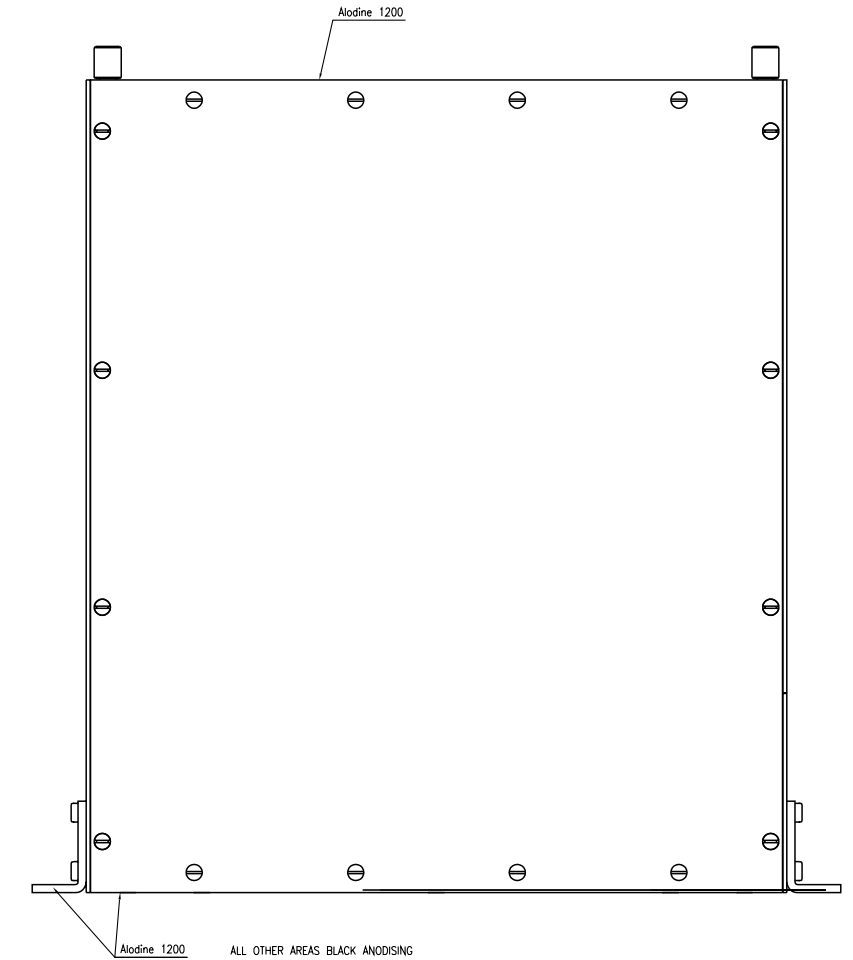
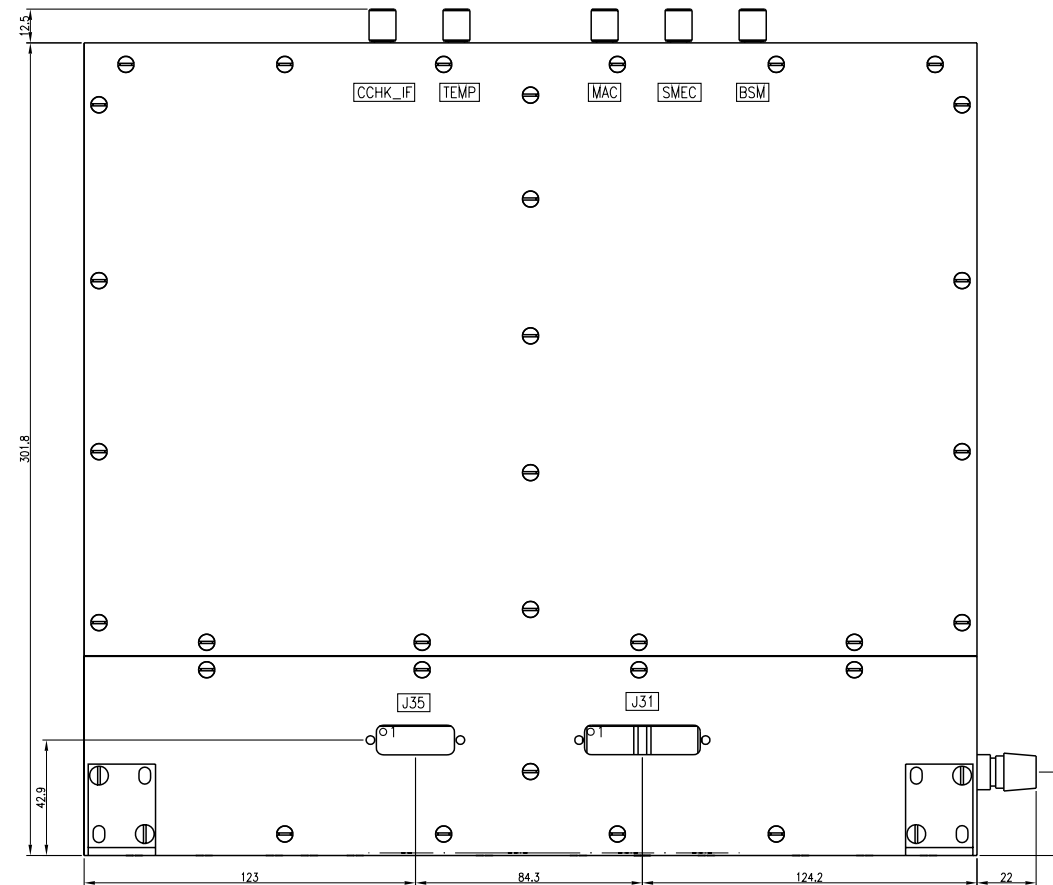
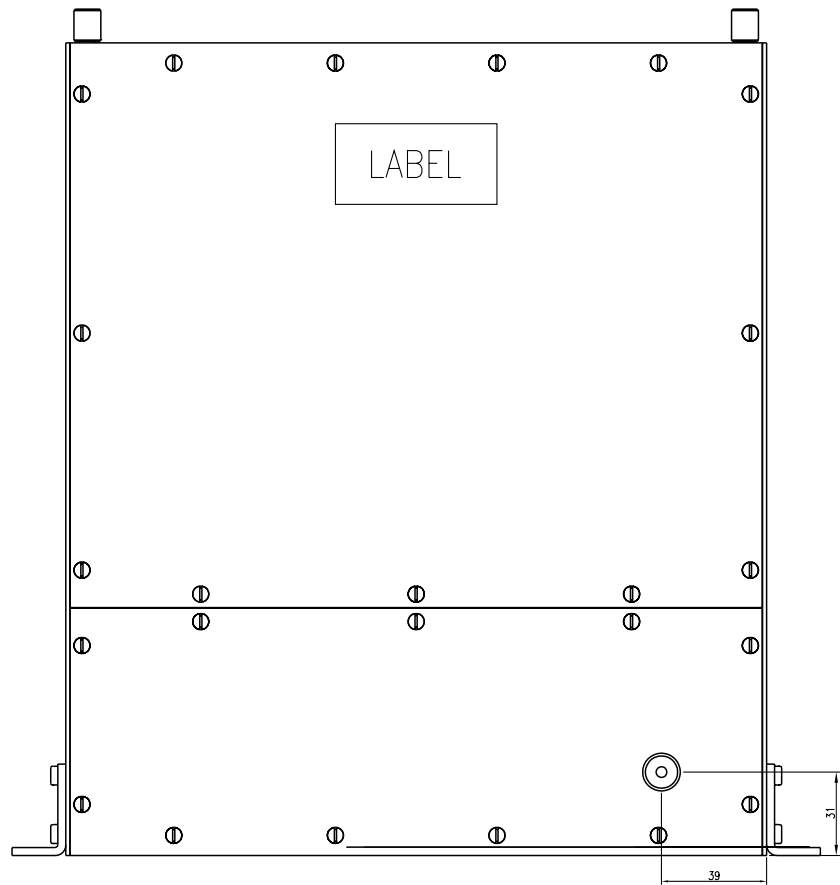
Document identification

Document n°	SPIR-MX-5200 000	
Title of document	SPIRE FCU Electronic box mechanical i/f drawing	
Changes	From rev.	Rev. F (10/2002)
	To rev.	Rev. J (01/2004)

Detail of changes

Description	Associated RFD / ECR (if any)	Status
Change of base plate, with cross section view	RFD_CEA_SPIRE_FCU_n9	approved
Change of hole size for fixing screws to SVM	RFD_CEA_SPIRE_FCU_n10	approved
Change of position (z axis) for connectors	ECR ref. SAp-SPIRE-JF-0151-04	pending
Change of position (y axis) for bonding stud	ECR ref. SAp-SPIRE-JF-0151-04	pending
Refined values for MOI, refined position for COG	--	--
Change of estimated mass	--	--

	Position	Name	Signature
Prepared by	PA electronics	J. Fontignie	 14.01.04
Approved by	PA mechanics	I. Le Mer	 14/01/04
Approved by	PA	P. Dupont	 v/o 14/01/04
Approved by	Project manager	J.L. Auguères	 15/01/04

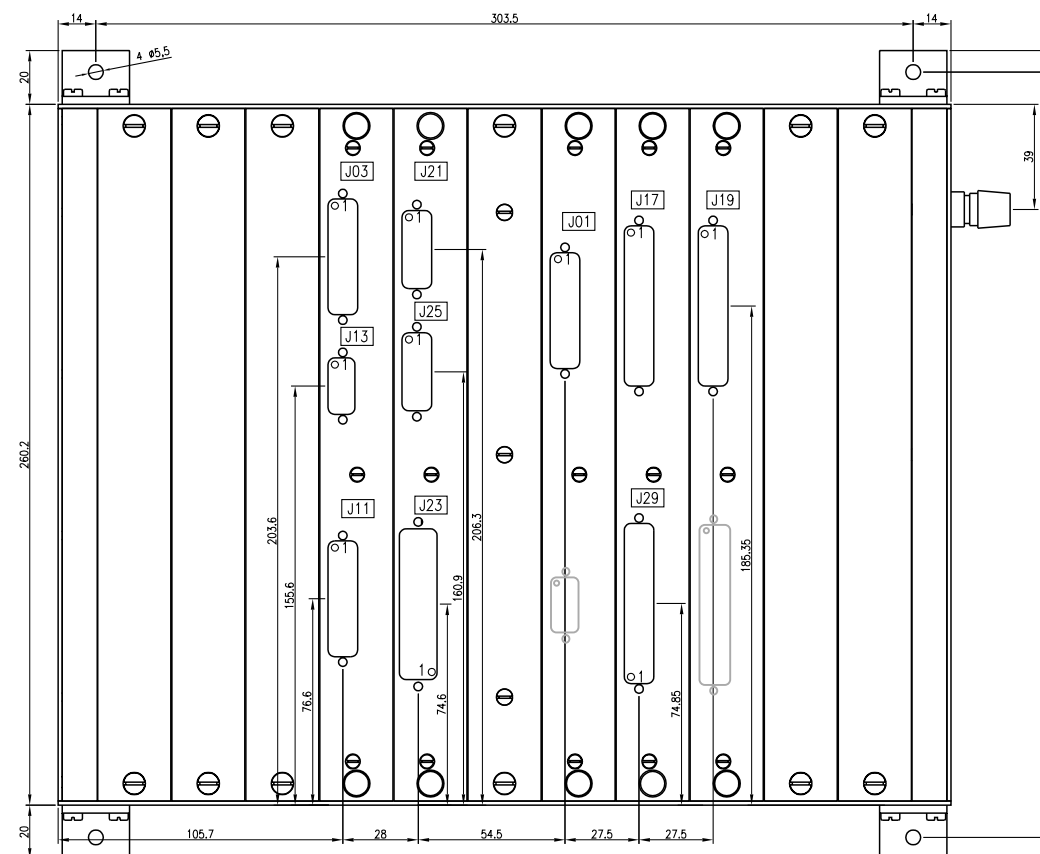


This QM drawing was introduced in pack 8.

Compared to pack 8, the red markup of J01 into J39's position according to NCR_MCU_#105.pdf has been removed as the delivered unit is to this drawing, not the NCR.

The grey connector positions are blanked in the faceplates.

CEA has been requested to include all I/F connectors on this model, not least so the Astrium cryoharness is safely mated, but the matter is open at the time of pack 9's issue.



CONNECTORS					
IDENT	TYPE	FUNCTION	IDENT	TYPE	FUNCTION
J01	DBMA 25S	MAC/DPU	J21	DAMA 15S	TEMP/FPU-TS-1
J03	DBMA 25S	CCHK-IF/DPU	J23	DDMA 50S	TEMP/FPU-TS-2
J11	DBMA 25S	CCHK-IF/FPU-COOL-CAL	J25	DAMA 15S	TEMP/FPU-MEC-TS
J13	DEMA 9S	CCHK-IF/FPU-PH-STIM	J29	DCMA 37P	SMEC/FPU-SMECm-2
J17	DCMA 37S	SMEC/FPU-SMECm-1	J31	DBMA 25P	MCU/PSU
J19	DCMA 37S	BSM/FPU-BSM	J35	DAMA 15P	SCU/PSU

CEA /SAP 91191 GIF/YVETTE Cedex		MATIERE : Alu 2017A	PROTECTION :
TRAITEMENT : ALODINE 1200		DESSINE : SREE	DATE : 08/09/03
DESIGNATION ICD HS FCU/QM1		VERIFIE : VISA :	
ECHELLE : 3/4		TOLERANCES GENERALES : ±0.2	Ra1.6
DESIGNATION ICD HS FCU/QM1		SPIR-MX-5201 000 C	

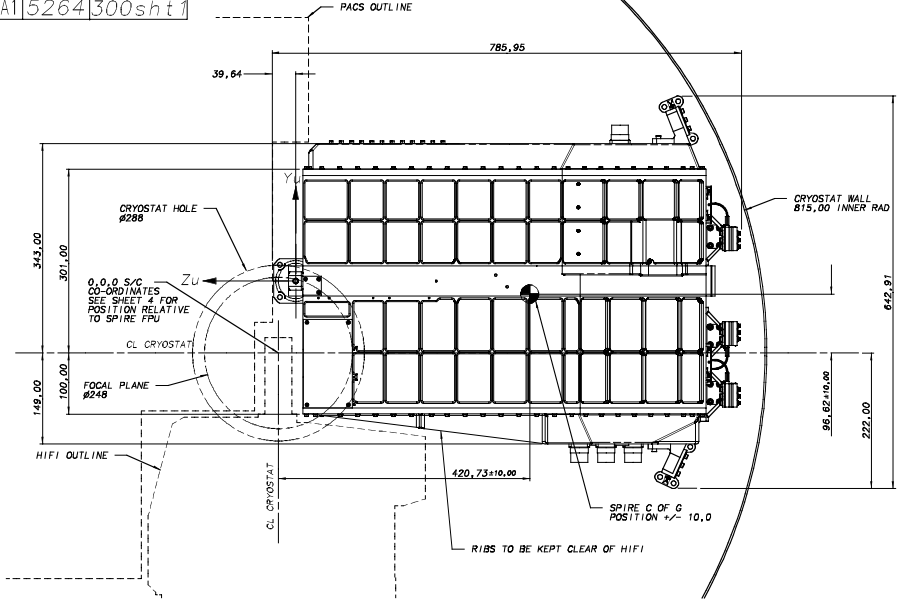
USED ON
HERSCHEL

DRAWING No.

A1 5264 300sht1

THIRD ANGLE PROJECTION

DO NOT SCALE

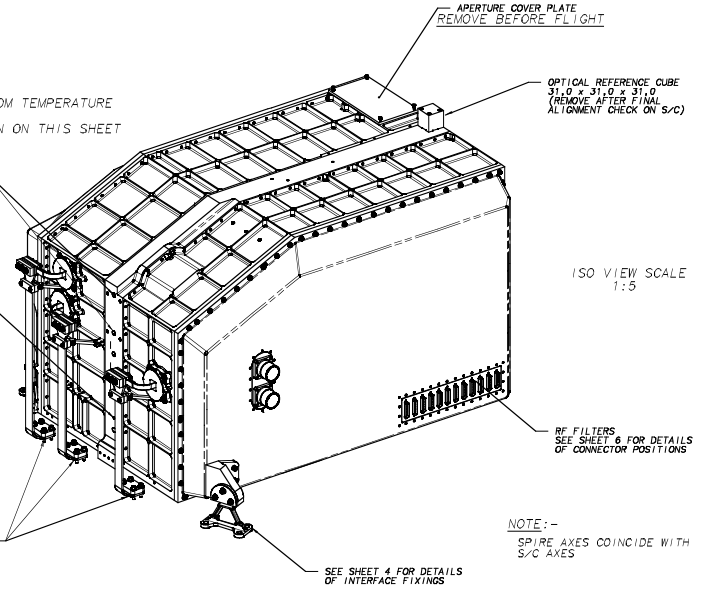


- NOTE:-
1. ALL DIMENSIONS AT ROOM TEMPERATURE
 2. J-FET BOXES NOT SHOWN ON THIS SHEET

S/C, LEVEL 11* STRAP TO SPIRE OPTICAL BENCH ATTACHMENT POINTS (ALOCROM 1200 SURFACE) SEE SHEET 5

SPIRE GROUNDING STRAP ATTACHES HERE (ALOCROM 1200 SURFACE) SEE SHEET 6

LEVEL 10* STRAP FIXINGS (GOLD SURFACES) SEE SHEET 5 FOR FIXING DETAILS



MOMENTS OF INERTIA ABOUT CG:-

(NOTE:- ALL MASS PROPERTIES EXCLUDE JFETS, AND EXTERNAL FPU HARNESSSES)

- 1xx = 2,929 kg m²
- 1yy = 2,878 kg m²
- 1zz = 1,348 kg m²

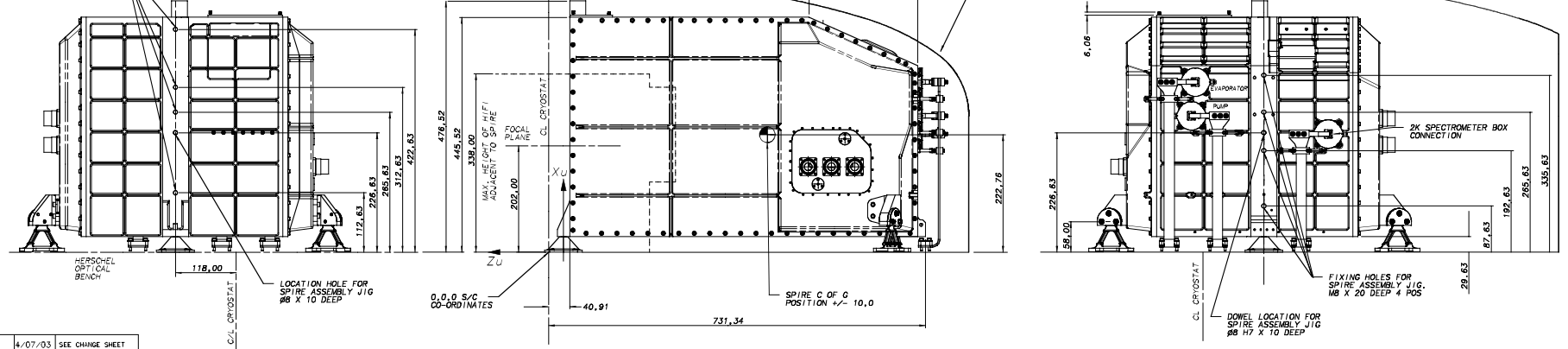
(MASS 45.63 kg)

FIXING HOLES FOR SPIRE ASSEMBLY JIG, M8 X 20 DEEP 4 POS

IMPORTANT :-

MINIMUM CLEARANCE BETWEEN ANY PART OF SPIRE FPU AND CRYOSTAT INNER SHIELD TO BE 10mm (8.5mm ACCEPTED AT -Z/+Y FPU CORNER ONLY)

NOTE:- ONLY CRYOSTAT SECTIONED ON CL (SIDE AND END VIEWS)



18	4/07/03	SEE CHANGE SHEET	
17	16/10/02	SEE CHANGE SHEET	
16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.	
15	27/04/01	THERMAL STRAP INTERFACE MODIFIED, LEVEL 1 STRAP FIXING HOLES MOVED.	
14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1, J-FET DESIGN UPDATED, STAY-OUT HOLES REMOVED.	
13	19/11/01	UPDATED RF1 FILTER & PHOT CONNECTORS ADDED, FOCAL PLANE & "A" FRAME MOUNT DIM ADDED, SHEET 7 ADDED.	
DRAWN	ISSUE	DATE	AMENDMENT
AJC	1	24/11/01	SPIRE Flight Assemblies COMPUTER FILE

NOTE:- SEE CHANGE SHEET FOR DETAILS OF CHANGES MADE FROM ISSUE 16 ONWARDS

PROTECTIVE FINISH	MATERIAL & SPEC.	TOLERANCES UNLESS OTHERWISE STATED -	DEPARTMENT OF SPACE AND CLIMATE PHYSICS
ALOCROM 1200 (ST. STEEL PARTS NATURAL)	AS LISTED	LINEAR +/- 1.0	UNIVERSITY COLLEGE LONDON
ESTD WT. 45.63kg (NO CONT'S SEE NOTE SMT.1)		ANGULAR +/- 0*15'	MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, BORKING, SURREY.
ACTL WT.	DIMENSIONS IN mm	SCALE 1:4	TITLE
			SPIRE INTERFACE (GENERAL DIMENSIONS)

DRAWING No	A1 5264 300sht1
SHEET 1 OF 7	

USED ON
HERSCHEL

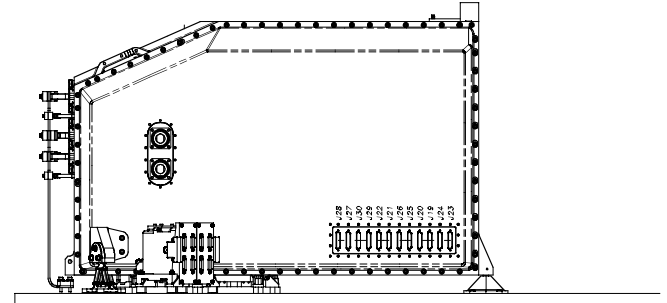
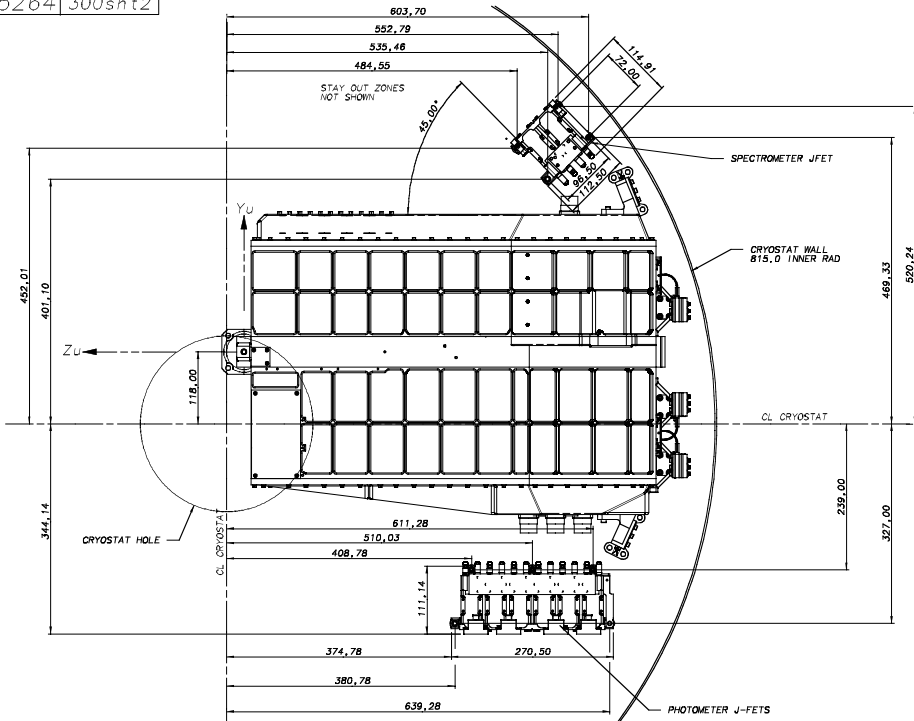
DRAWING No.
A1 5264 300sht2

THIRD ANGLE PROJECTION

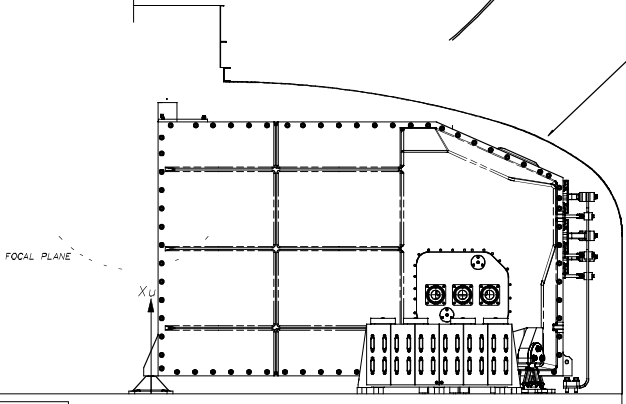
DO NOT SCALE

NOTE:-

1. ALL DIMENSIONS AT ROOM TEMPERATURE



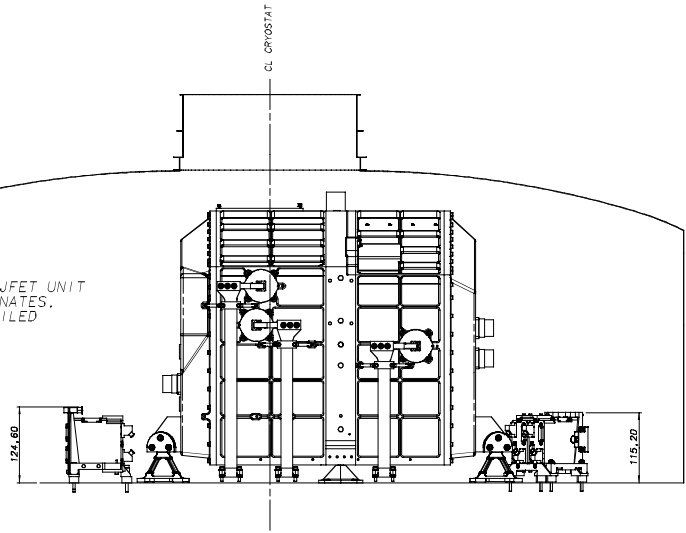
SPECTROMETER SIDE
(VIEWED IN -Y_u DIRECTION)



PHOTOMETER SIDE

ONLY CVV INSTRUMENT SHIELD SECTIONED
ON CL (SIDE AND END VIEWS)

NOTE:
THIS DRAWING REFERENCES THE JFET UNIT
MOUNTINGS TO HOB S/C CO-ORDINATES.
THE JFETS HAVE SEPARATE DETAILED
INTERFACE DRAWINGS.



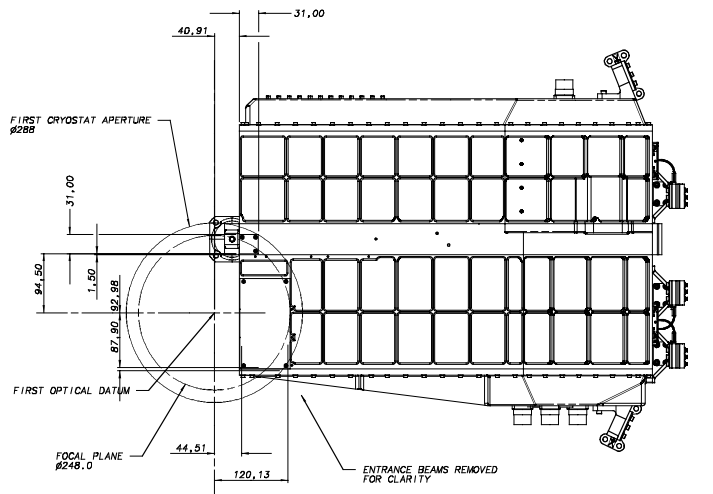
CHECKED	18	4/07/03	SEE CHANGE SHEET
	17	16/10/02	SEE CHANGE SHEET
	16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED, LEVEL 1 STRAP FIXING HOLES MOVED.
TRACED	14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1, J-FET DESIGN UPDATED, STAY OUT HOLES REMOVED
PBG	13	19/11/01	UPDATED RF1 FILTER & PHOT CONNECTORS ADDED, FOCAL PLANE & ** FRAME MOUNT DIM ADDED, SHEET 7 ADDED.
DRAWN	ISSUE	DATE	AMENDMENT
AJC	1	24/11/01	

NOTE:- SEE CHANGE SHEET FOR DETAILS OF CHANGES MADE FROM ISSUE 16 ONWARDS	SPiRE Flight Assemblies
	COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONTY) SEE NOTE SHT. 1	DIMENSIONS IN mm	SCALE 1:4
ACTL WT.		

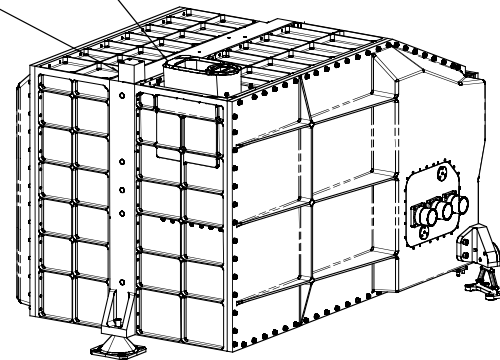
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.		DRAWING No A1 5264 300sht2
TITLE SPiRE INTERFACE (J-FET POSITIONS)		SHEET 2 OF 7

USED ON
HERSCHEL

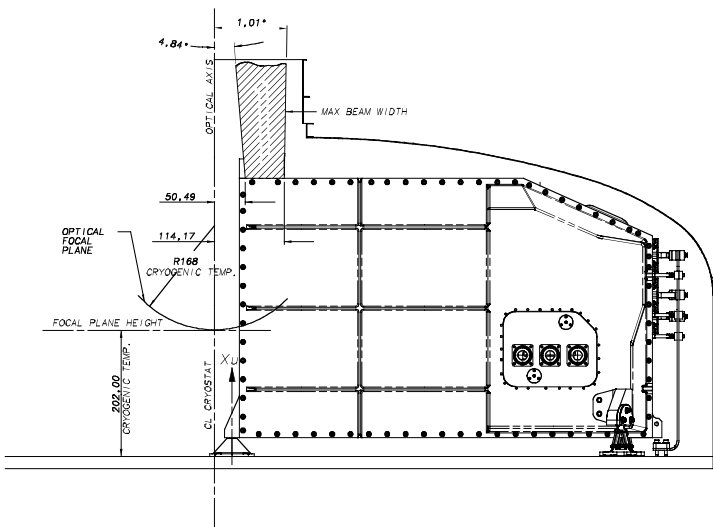


ANGULAR ACCURACY OF OPTICAL CUBE POSITION
 0.05° (3 ARC MIN)
 ANGULAR ACCURACY TO Xu, Yu, Zu CO-ORDINATES
 0.05° +/- OPTICAL CUBE ANGULAR TOL. (TBD.)
 REFER TO OPTICAL CUBE DRAWING No. A3/5264/305-16

ENTRANCE BEAMS

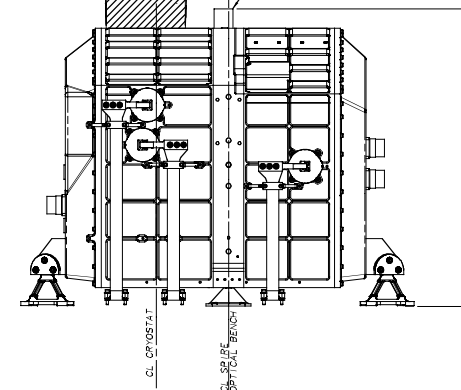


ONLY PRIMARY DIMENSIONS FOR THE OPTICAL BEAMS
 WHICH SHALL REMAIN FREE FROM OBSTRUCTION ARE SHOWN.
 REFER TO 110-B FOR MORE DETAILED INFORMATION.



1.65° - 2.47°
 81.99 42.10

OPTICAL REFERENCE CUBE
 31.0 X 37.0 X 31.0



NOTE:-

1. ALL DIMENSIONS AT ROOM TEMPERATURE
 UNLESS OTHERWISE SPECIFIED

18	4/07/03	SEE CHANGE SHEET	
17	16/10/02	SEE CHANGE SHEET	
16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 18 THEREON.	
15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED.	
14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED.	
13	19/11/01	UPDATED RF1 FILTER & PHOTO CONNECTORS ADDED. FOCAL PLANE & X-Y FRAME HEIGHT DIM ADDED. SHEET 7 ADDED.	
DRAWN	ISSUE	DATE	AMENDMENT
AJC	1	24/11/01	

NOTE:-
 SEE CHANGE SHEET FOR DETAILS OF CHANGES
 MADE FROM ISSUE 16 ONWARDS

SPiRE Flight
 Assemblies
 COMPUTER FILE

PROTECTIVE FINISH
 ALOCROM 1200
 (ST. STEEL PARTS
 NATURAL)

MATERIAL & SPEC.
 AS LISTED

TOLERANCES UNLESS
 OTHERWISE STATED -
 LINEAR +/- 1.0
 ANGULAR +/- 0°15'

ESTD WT. 45.63kg (NO CONT)
 SEE NOTE SHT. 1
 ACTL WT.

DIMENSIONS IN mm

SCALE 1:1

TITLE

DEPARTMENT OF SPACE AND CLIMATE PHYSICS
 UNIVERSITY COLLEGE LONDON
 MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
 DORKING, SURREY.

SPiRE INTERFACE
 (OPTICAL DETAILS)

DRAWING No

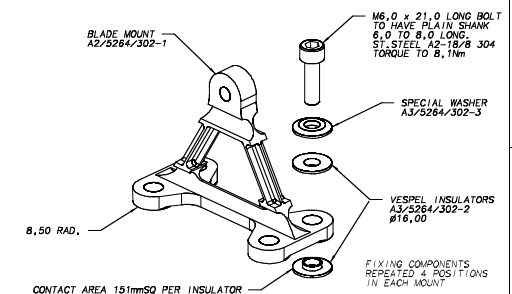
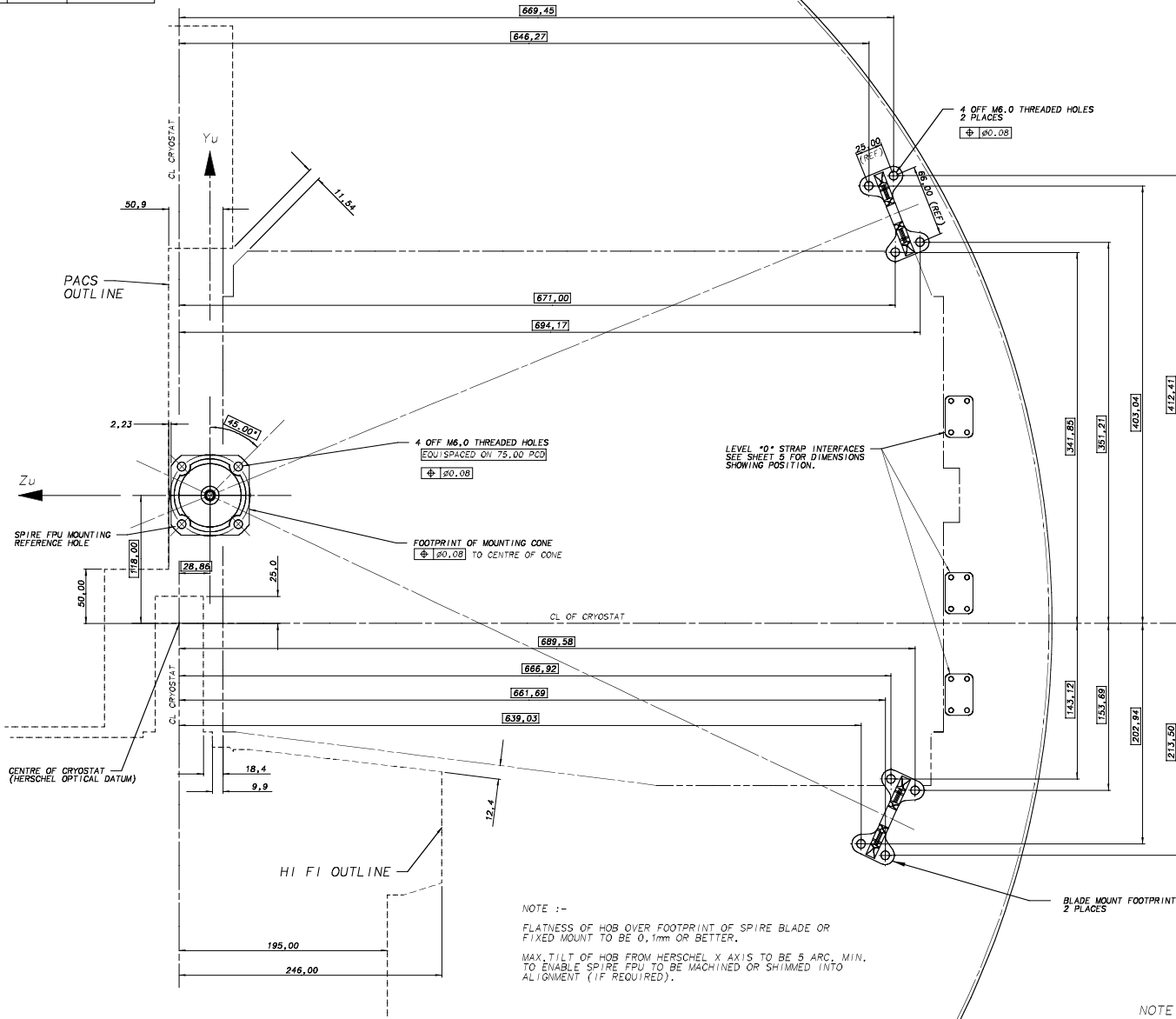
A1 5264 300sht.3

DRAWING No.

A1 5264 300sht 4

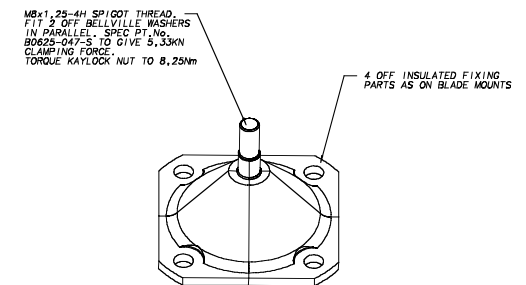
THIRD ANGLE PROJECTION

DO NOT SCALE



DETAIL OF BLADE MOUNT FIXINGS

SCALE 1 : 1



DETAIL OF FIXED MOUNTING

SCALE 1 : 1

NOTE :-

1. ALL DIMENSIONS AT ROOM TEMPERATURE

	18	4/07/03	SEE CHANGE SHEET
	17	16/10/02	SEE CHANGE SHEET
CHECKED	16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED.
TRACED	14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1. J-FET DESIGN UPDATED. STRAP OUT HOLES REMOVED.
PBG	13	19/11/01	UPDATED RFI FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & "A" FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
DRAWN	ISSUE	DATE	AMENDMENT
AJC	1	24/11/01	

NOTE :-
SEE CHANGE SHEET FOR DETAILS OF CHANGES
MADE FROM ISSUE 16 ONWARDS

SPIRE Flight
Assemblies
COMPUTER FILE

PROTECTIVE FINISH
ALOCROM 1200
(ST. STEEL PARTS
NATURAL)

MATERIAL & SPEC.
AS LISTED

TOLERANCES UNLESS
OTHERWISE STATED -
LINEAR +/- 1,0
ANGULAR +/- 0°15'

ESTD WT. 45,63kg (NO CONT.)
SEE NOTE SHT. 1
ACTL WT.

DIMENSIONS IN mm

SCALE SCALE 1:2 & 1:1

DEPARTMENT OF SPACE AND CLIMATE PHYSICS
UNIVERSITY COLLEGE LONDON
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
DORKING, SURREY.

TITLE

SPIRE INTERFACE
(INTERFACE FIXING DETAILS)

DRAWING No

A1 5264 300sht 4

SHEET 4 OF 7

DRAWING No.

A1 5264 300sht5

THIRD ANGLE PROJECTION

DO NOT SCALE

2 X BELLEVILLE WASHERS
STACKED IN PARALLEL
PROVIDING 978N CLAMP
FORCE PER SCREW.
ST. STEEL SPEC PT.No.
B0375-020-S

15.00

LEVEL *O* STRAP
COPPER
GOLD PLATEST. STEEL
CLAMP PLATE

4 OFF M4 X 20.0 LONG
SKT. HD. CAP. SCREWS
ST. STEEL A2-18/8 304
TORQUE TO 1.5NM MAX.

HERSCHEL OPTICAL BENCH

DETAIL "B" OF LEVEL "O" TO S/C INTERFACE

SCALE 2:1

Re 0.4 MICRON OR BETTER.
(BY VISUAL INSPECTION ONLY)
GOLD PLATED SURFACE

HSFPU EXTERNAL FINISHES:-

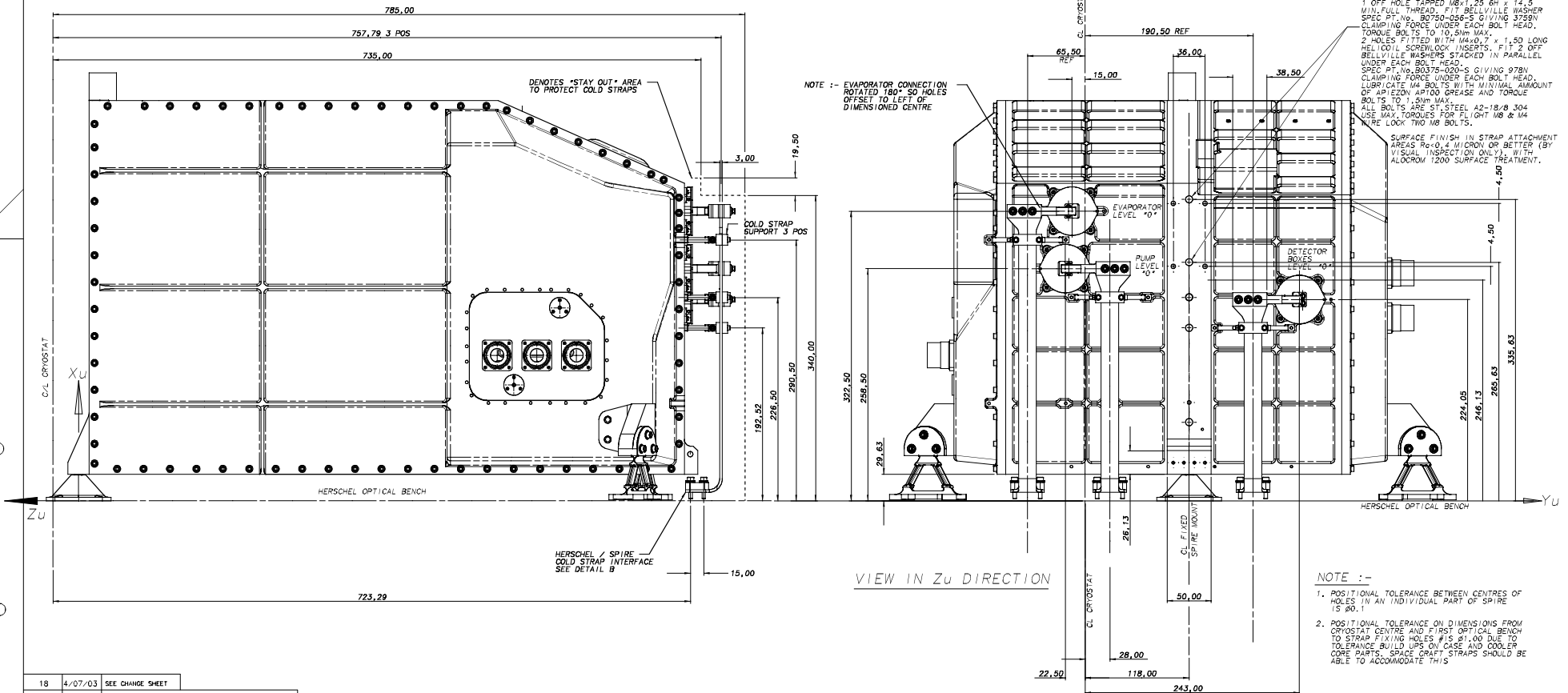
INSTRUMENT CASE AND EXTERNAL COVERS.
BLADE AND FIXED MOUNTING, EXTERNAL
FIXINGS.
COLD STRAPS.

ALOCROM 1200

NATURAL ST. STEEL
GOLD PLATED

NOTE:-

ANY THERMAL INTERFACE PROVISIONS NEEDED FOR THE JFET
UNITS ARE SHOWN ON INTERFACE DRAWINGS RELATING TO THOSE
UNITS.



LEVEL *1* STRAP FIXING HOLES IN 2
POSITIONS. EACH POSITION CONSISTS OF
1 OFF HOLE TAPPED M8x1.25 6H x 14.5
MIN. FULL THREAD. 171 BELLEVILLE WASHER
SPEC PT.No. B0750-056-S GIVING 3758N
CLAMPING FORCE UNDER EACH BOLT HEAD.
TORQUE BOLTS TO 10.5NM MAX.
2 HOLES FITTED WITH M4x0.7 x 1.50 LONG
HELICOIL SCREWLOCK INSERTS. FIT 2 OFF
BELLEVILLE WASHERS STACKED IN PARALLEL
UNDER EACH BOLT HEAD.
SPEC PT.No. B0375-020-S GIVING 978N
CLAMPING FORCE UNDER EACH BOLT HEAD.
LUBRICATE M8 BOLTS WITH MINIMAL AMOUNT
OF APIEZON AP100 GREASE AND TORQUE
BOLTS TO 1.5NM MAX.
ALL BOLTS ARE ST. STEEL A2-18/8 304
USE MAX. TORQUES FOR FLIGHT M8 & M4
WIRE LOCK TWO M8 BOLTS.

SURFACE FINISH IN STRAP ATTACHMENT
AREAS Re 0.4 MICRON OR BETTER (BY
VISUAL INSPECTION ONLY). WITH
ALOCROM 1200 SURFACE TREATMENT.

NOTE :- EVAPORATOR CONNECTION
ROTATED 180° SO HOLES
OFFSET TO LEFT OF
DIMENSIONED CENTRE

NOTE :-

1. POSITIONAL TOLERANCE BETWEEN CENTRES OF
HOLES IN AN INDIVIDUAL PART OF SPIRE
IS 80.1
2. POSITIONAL TOLERANCE ON DIMENSIONS FROM
CRYOSTAT CENTRE AND FIRST OPTICAL BENCH
TO STRAP FIXING HOLES IS 81.00 DUE TO
TOLERANCE BUILD UPS ON CASE AND COOLER
CORE PARTS. SPACE CRAFT STRAPS SHOULD BE
ABLE TO ACCOMMODATE THIS

18 4/07/03 SEE CHANGE SHEET

17 16/10/02 SEE CHANGE SHEET

CHECKED 16 28/08/02 MODIFICATIONS AND CHANGE SHEET CREATED.
DRAWING UPDATED TO ISSUE 16 THERE-ON.

15 27/04/01 THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP
FIXING HOLES MOVED.

TRACED 14 23/11/01 CENTRE OF GRAVITY MOVED TO SHT 1. J-FET DESIGN
PBG UPDATED. STAY OUT HOLES REMOVED.

13 19/11/01 UPDATED RFI FILTER & PHOT CONNECTIONS ADDED. FOCAL
PLANE & T.V. FRAME MOUNT DIM. ADDED. SHEET 7 ADDED.

DRAWN ISSUE DATE AMENDMENT

AJC 1 24/11/01

NOTE :-
SEE CHANGE SHEET FOR DETAILS OF CHANGES
MADE FROM ISSUE 16 ONWARDS

NOTE :-

ALL DIMENSIONS AT ROOM TEMPERATURE

SPIRE FILE #1

44880105

COMPUTER FILE

PROTECTIVE FINISH
ALOCROM 1200
(ST. STEEL PARTS
NATURAL)

ESTD WT. 45.63kg (NO CONT)

SEE NOTE SHT. 1

ACTL WT.

MATERIAL & SPEC.
AS LISTED

DIMENSIONS IN mm

TOLERANCES UNLESS
OTHERWISE STATED -
LINEAR +/- 1.0
ANGULAR +/- 0°15'

SCALE 1:2 & 1:1

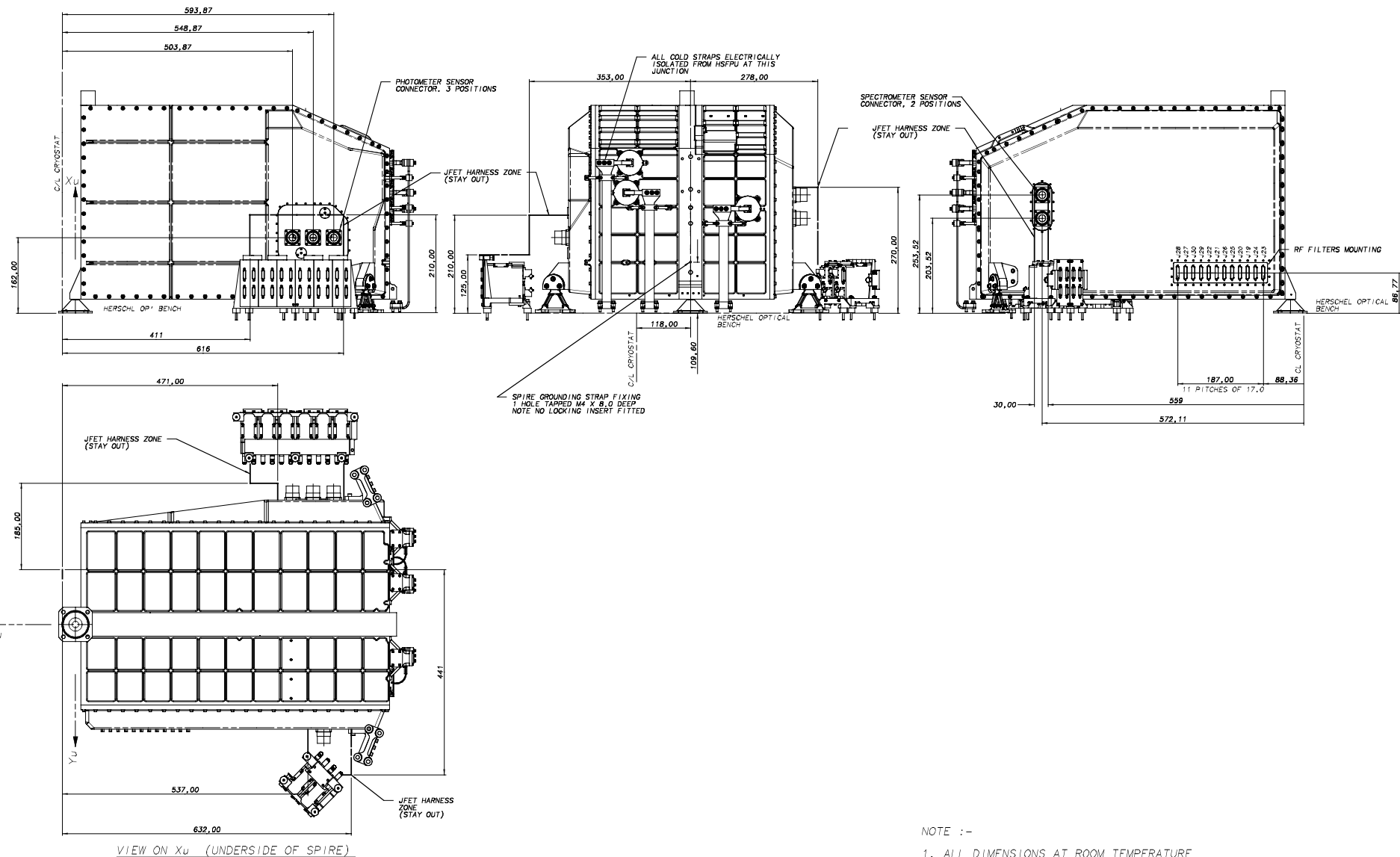
DEPARTMENT OF SPACE AND CLIMATE PHYSICS
UNIVERSITY COLLEGE LONDON
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
DORKING, SURREY.

TITLE
SPIRE INTERFACE
(THERMAL STRAP CONNECTIONS)

DRAWING No

A1 5264 300sht5

SHEET 5 OF 7



NOTE :-

1. ALL DIMENSIONS AT ROOM TEMPERATURE

18	4/07/03	SEE CHANGE SHEET	
17	16/10/02	SEE CHANGE SHEET	
16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED, DRAWING UPDATED TO ISSUE 16 THERE-ON.	
15	27/04/01	THERMAL STRAP INTERFACE MODIFIED, LEVEL 1 STRAP FIXING HOLES MOVED.	
14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1, J-FET DESIGN UPDATED, STAY OUT HOLES REMOVED.	
13	19/11/01	UPDATED RF FILTER & PHOT CONNECTORS ADDED, FOCAL PLANE & *1 FRAME MOUNT DIM ADDED, SHEET 7 ADDED.	
DRAWN	ISSUE	DATE	AMENDMENT
AJC	1	24/11/01	

NOTE :-
SEE CHANGE SHEET FOR DETAILS OF CHANGES
MADE FROM ISSUE 16 ONWARDS

SPIRE P1 (g1)
SERIAL 122
COMPUTER FILE

PROTECTIVE FINISH
ALCOFORM 1200
(ST. STEEL PARTS
NATURAL)

MATERIAL & SPEC.
AS LISTED

TOLERANCES UNLESS
OTHERWISE STATED -
LINEAR +/- 1.0
ANGULAR +/- 0°15'

ESTD WT. 48.63kg (NO CONT)
*SEE NOTE SHT. 1
ACTL WT.

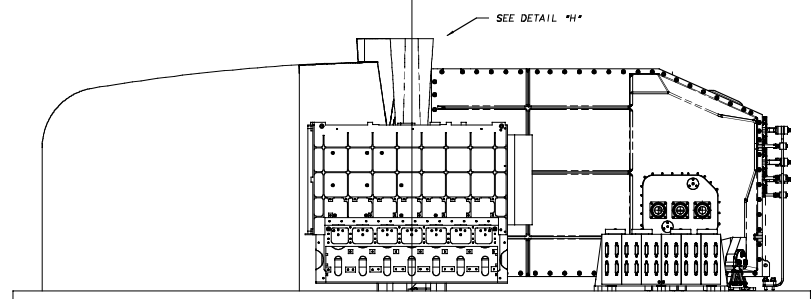
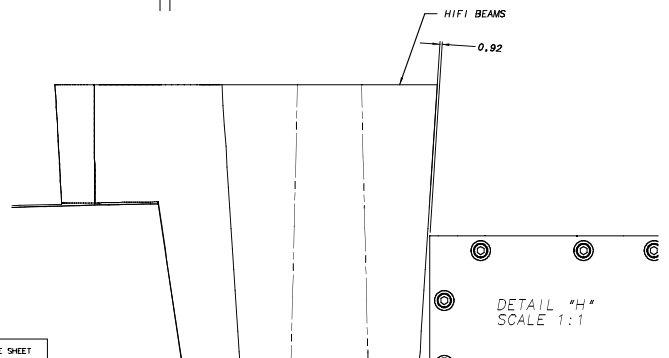
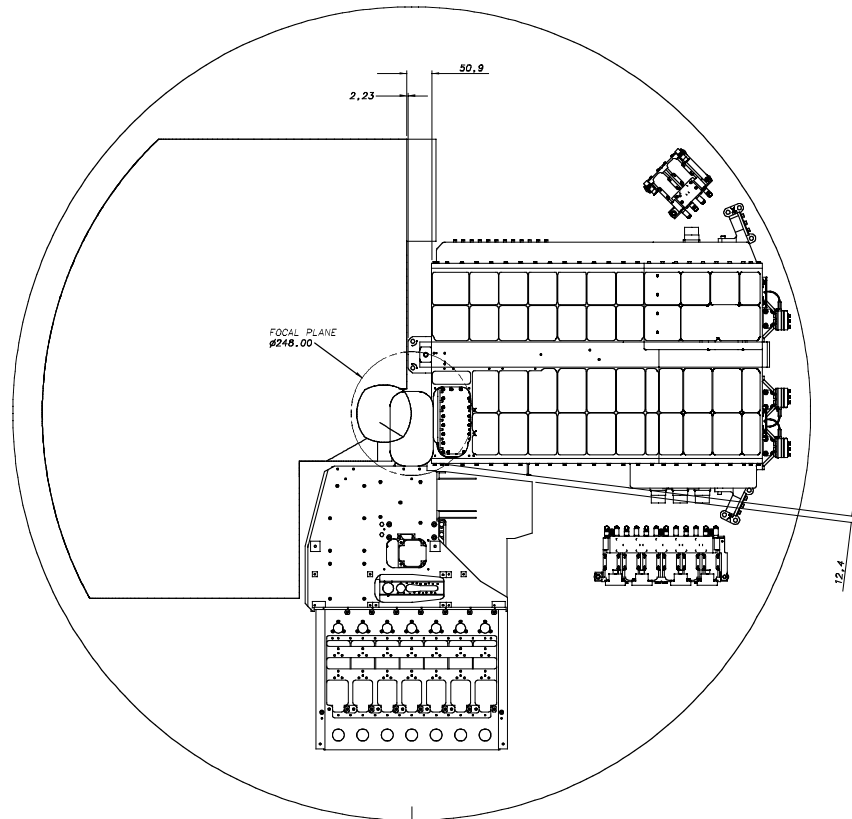
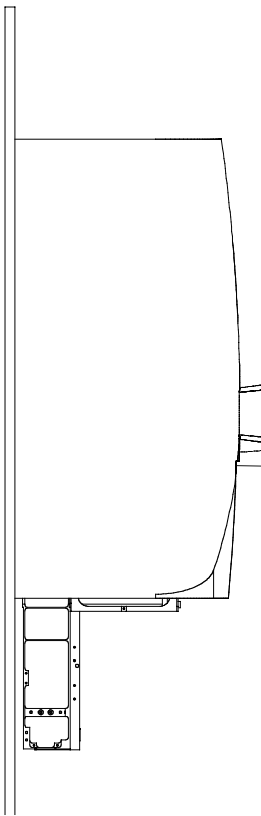
DIMENSIONS IN mm

SCALE 1:4

DEPARTMENT OF SPACE AND CLIMATE PHYSICS
UNIVERSITY COLLEGE LONDON
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
DORKING, SURREY.

TITLE	SPIRE INTERFACE (ELECTRICAL)	DRAWING No	A1 5264 300 sht 6
		SHEET 6 OF 7	

USED ON
HERSCHEL



18	4/07/03	SEE CHANGE SHEET
17	16/10/02	SEE CHANGE SHEET
16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.
15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED.
14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED.
13	19/11/01	UPDATED RFI FILTER & PHOTO CONNECTORS ADDED. FOCAL PLANE & *H* FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
DRAWN	DATE	AMENDMENT
AJC	1	24/11/01

NOTE:-
SEE CHANGE SHEET FOR DETAILS OF CHANGES MADE FROM ISSUE 16 ONWARDS

SPIRE Flight
SERIES 122
COMPUTER FILE

PROTECTIVE FINISH
ALOCROM 1200
(ST. STEEL PARTS
NATURAL)

ESTD WT. ±5.63kg (NO CONT)
SEE NOTE SHT-1

ACTL WT.

MATERIAL & SPEC.
AS LISTED

DIMENSIONS IN mm

TOLERANCES UNLESS OTHERWISE STATED -
LINEAR +/- 1.0
ANGULAR +/- 0°15'

SCALE

DEPARTMENT OF SPACE AND CLIMATE PHYSICS
UNIVERSITY COLLEGE LONDON
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
DORKING, SURREY.

TITLE
SPIRE INTERFACE
PACS AND HIFI OPTICAL & CLEARANCES

DRAWING No
A1 5264 300sht7

SHEET 7 OF 7

SSTD Rutherford Appleton Laboratory		Space Product Assurance Form <i>Mechanical Design Office</i>		Doc.No. : JS09FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 1 of 6	
KE-2952	MODIFICATION SHEET				
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY				
	DRAWING NUMBER: KE-0104-360				
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING				
Date: 12-Jun-2002					
NCR/ECR:					
Modification Description: Connector identification markings updated. J15, J12, J17, J14 reversed with J11, J16, J13, J18. Connector Table updated accordingly RAISED ISSUE TO B 21-Jun-2002 K.Burke					
Connector Table, 2 nd Label J2 corrected to read J3 Note showing position of REF HOLE added RAISED ISSUE TO C 21-Jun-2002 K.Burke					
Parts table modified to read "JPL Supply" as a Remark in the JFET Module entry. Parts table modified to read "Backshell" rather than "Backplate" in the 15-way connector entry Parts table modified to read "Phosphor" rather than "Phosphur" Note 4 modified to read "J9-10 & J15-18" rather than "J9-14" RAISED ISSUE TO D 24-Jun-2002 M. Whalley					
CoG added, M0I table added, Note modified for warm testing torque, bolt material added, pin1 indicated for connectors. Raised to issue E 4/7/02 T.Froud					
Issue raised to:		E	By:		
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED					
KE-2952					

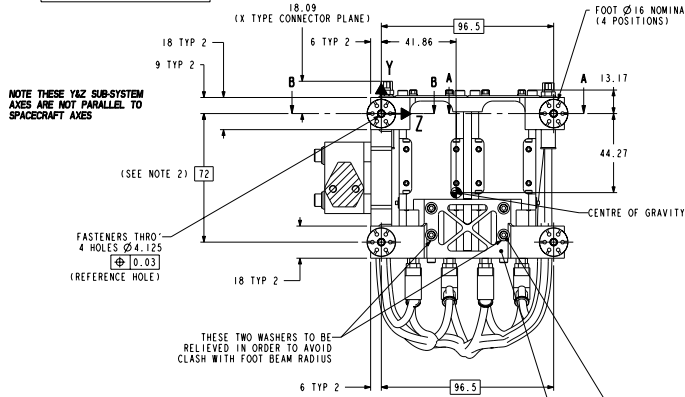
SSTD Rutherford Appleton Laboratory		Space Product Assurance Form <i>Mechanical Design Office</i>		Doc.No. : JS09FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 2 of 6	
KE-2952	MODIFICATION SHEET				
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY				
	DRAWING NUMBER: KE-0104-360				
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING				
Date: 07-Feb-2003					
NCR/ECR:					
Modification Description: 1. Swap connector pairs (MSW) 2. move connector labels (MSW) 3. make back harness into parts (MSW) 4. Dimension and label thread lengths 5. add column to parts list showing drawing numbers (also create repeat region BOM table) 6. replace thermal strap part as an assembly 7. change note 2 to "...dimension and to compensate for actual Jfet module sizes..." and append note 2 with "pads on item 3 will also need machining if trial assembly of rack on flat surface shows gaps before fasteners are tightened" 8. add note 5 " Heat capacity = {0.9 x mass} joules / Kelvin 9. show insulation additions to feet (kapton tape washers) 10. add note to section view showing that fasteners are coated with parylene C 11. put m2.5 washers under various screws 12. change note 3 to say "items 8 to be torqued to 2.1Nm above locking insert turning torque 13. add note 6 " fitted back harness to afford open access to 51 ways as shown" 14. add note 7 " kapton tape insulators shall be cut to fit annuls of thermal standoff to within +/- 1"					
Issue raised to:		F	By:		IPG
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED					
KE-2952					

SSTD Rutherford Appleton Laboratory		Space Product Assurance Form <i>Mechanical Design Office</i>		Doc.No. : JS09FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 3 of 6	
KE-2952	MODIFICATION SHEET				
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY				
	DRAWING NUMBER: KE-0104-360				
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING				
Date: 12-Mar-2003					
NCR/ECR:					
Modification Description: 1. Thermal standoff positional dimensions changed to basic dimensions. 2. Thermal strap interface dimensions added 3. Note 3 modified to clarify that stud is set to depth then nut is torqued to 2.1Nm. 4. Height of JFET rack dimension added. 5. Note 8 added regarding the protrusion and trimming of the parylene coating 6. Annotation moved (next to balloon) stating that the KE-0104-357 and 358 should not be confused (as they have different lengths of parylene coating). 7. Typos fixed 8. Unit mounting hole size and positional accuracy added					
Issue raised to:		G	By:		Iain Gilmour
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED					
KE-2952					

SSTD Rutherford Appleton Laboratory		Space Product Assurance Form <i>Mechanical Design Office</i>		Doc.No. : JS09FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 4 of 6	
KE-2952	MODIFICATION SHEET				
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY				
	DRAWING NUMBER: KE-0104-360				
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING				
Date: 20-May-2003					
NCR/ECR:					
Modification Description: Added note to size of tapped holes for attachment of cooling strap (1.1-12) 2 HOLES M4x0.71.5D 1.G HELICOIL FASTENER TO ENGAGE 1.5d TORQUE NOT TO EXCEED 2.5Nm					
Issue raised to:		H	By:		Kevin Burke
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED					
KE-2952					

SSTD Rutherford Appleton Laboratory		Space Product Assurance Form <i>Mechanical Design Office</i>		Doc.No. : JS09FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 5 of 6	
KE-2952	MODIFICATION SHEET				
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY				
	DRAWING NUMBER: KE-0104-360				
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING				
Date: 13-Oct-2003					
NCR/ECR:					
Modification Description: 1. Reflects new thermal standoff design with additional bush and upper and lower feet washers. Subsequent dimensions in X direction updated to new interface plane. New parts added to Parts List. 2. Reflects new harness layout which simulates actual physical layout. Micro-D 15 way connector added to harness representation. Micro-D 37 way elliptical entry backshells replace standard circular entry versions. Mass of harness increased from 110g to 205g. 3. L3 strap and interface assembly added. Views updated to show interface details and L3 strap hole definition. 4. Mass of JFET modules reduced from 305g to 260g. 5. Kapton tape removed from fastener and stand-off interfaces (note 7 deleted). 6. Moments of inertia updated along with C of G position. 7. Kapton tape note removed from L3 interface area. 8. Incorrectly specified M2.5 x 8 long fasteners used to fasten JFET modules to front plate replaced with M3 x 8 long. 9. Temperature sensor interface shown on both sides of the L3 interface sub-assembly. 10. Distance between S/C connector 1/F and rear of JFET harness increased due to addition of 15-way connectors to JFET harness. 11. New dimensions applied to L3 interface area. 12. Connector fasteners and nuts added to spacecraft connectors.					
Issue raised to:		I	By:		Dave Smart
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED					
KE-2952					

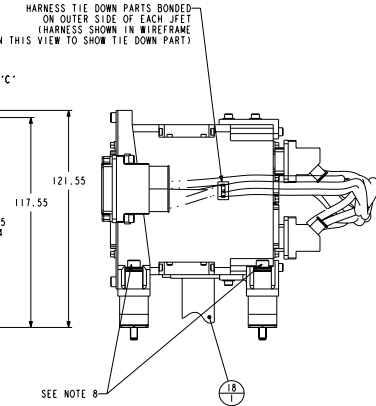
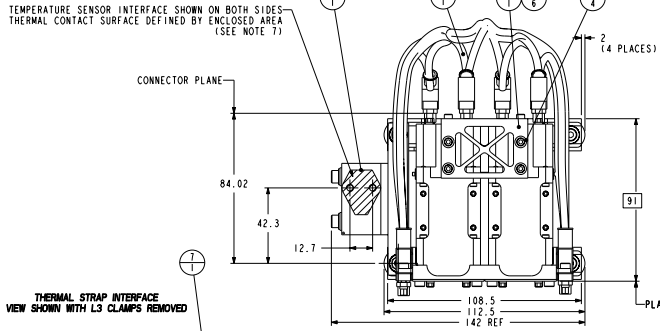
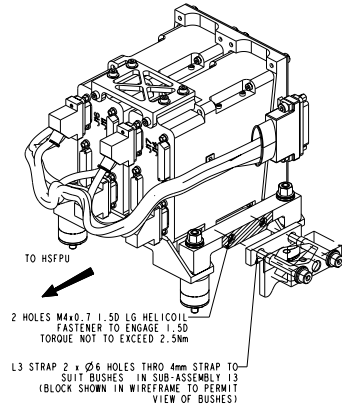
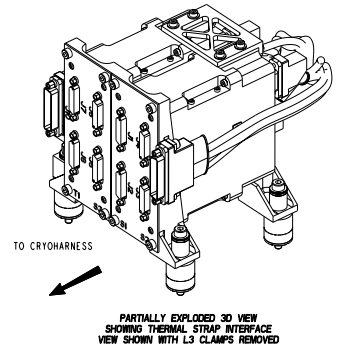
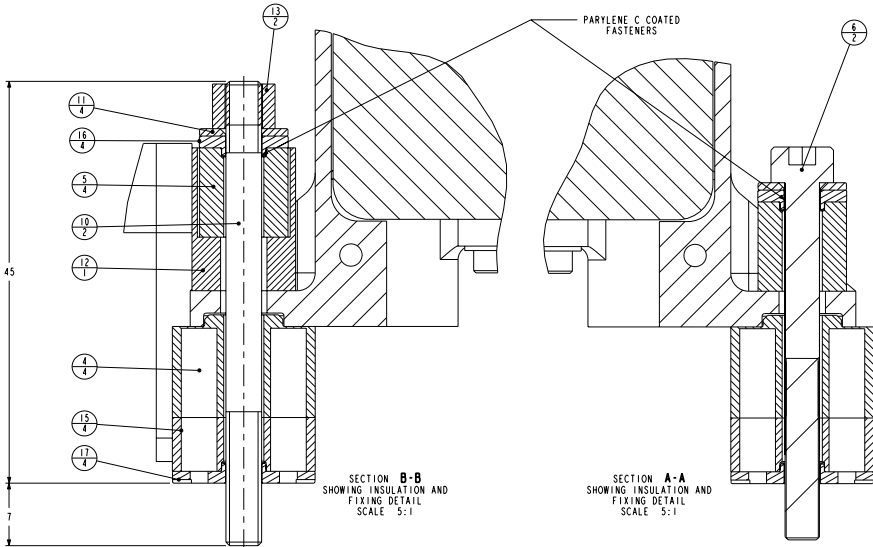
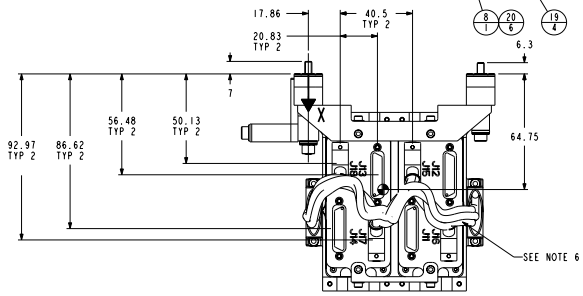
SSTD Rutherford Appleton Laboratory		Space Product Assurance Form <i>Mechanical Design Office</i>		Doc.No. : JS09FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 6 of 6	
KE-2952	MODIFICATION SHEET				
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY				
	DRAWING NUMBER: KE-0104-360				
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING				
Date: 12-Nov-2003					
NCR/ECR:					
Modification Description: 1. Harness re-routed to show clearance required to access connectors on the rear of the JFETS. Reference to note 6 added. 2. Harness tie down points added. 3. Note 8 added concerning the pre-fitting of the M4 fasteners prior to the assembly of the harness.					
Issue raised to:		J	By:		Dave Smart
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED					
KE-2952					



CONNECTOR TABLE		
LABEL	TYPE	FUNCTION
J1	ALL MODSP	ALL SIGNAL FEEDS TO CRYOHARNESS
J2		
J3		
J4		
J5		
J6		
J8		
J9		
J10		
J11		
J12	ALL MODSP	SIGNALS IN FROM DETECTORS
J13		
J14		
J15		
J16	ALL MODSP	BIAS FEEDS INTO MODULES
J17		
J18		

MOMENTS OF INERTIA (kg.m ²) WITH RESPECT TO C OF G	
I _{xx}	1.71e+03
I _{yy}	1.94e+03
I _{zz}	2.31e+03

ITEM	PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS	COMMENTS
1	23836-10209722	JFET MODULE	2	260.00	520.00	JPL SUPPLY
2	2JFET_HARNESS	BACKHARNESS (10209784.1)	1	216.95	216.95	JPL SUPPLY
3	HARNESS_CLIP		2			
4	KE-0104-354	STEPPED THERMAL STANDOFF	4	1.70	6.80	
5	KE-0104-355	TOP THERMAL STANDOFF	4	0.87	3.47	
6	KE-0104-358	M6 BOLT (PARYLENE C COATED 26.5mm)	2	4.70	9.39	
7	KE-0104-361	FRONT PLATE - 2 JFET	1	48.01	48.01	
8	KE-0104-362	REAR FOOT BEAM - 2 JFET	1	33.50	33.50	
9	KE-0104-363	REAR TOP BEAM - 2 JFET	1	8.53	8.53	
10	KE-0104-365	M4 STUD (PARYLENE C COATED)	2	5.08	10.16	
11	KE-0104-367	THERMAL STANDOFF WASHER	4	0.39	1.55	
12	KE-0104-368	THERMAL STRAP ASST - 2 JFET	1	23.28	23.28	
13	KE-0104-386	M6 NUT (5mm LONG)	2	1.31	2.62	
14	KE-0104-393	L3 INTERFACE ASST	1	64.18	64.18	
15	KE-0104-397	THERMAL STANDOFF BUSH	4	0.94	3.76	
16	KE-0104-398	FOOT UPPER WASHER	4	0.14	0.55	
17	KE-0104-399	FOOT LOWER WASHER	4	0.34	1.35	
18	L3_STRAP_A	L3 STRAP	1	N/A		HERSCHEL SUPPLY
19	M2-5_WASHER	WASHER	8	0.11	0.86	S/STEEL BS970/1501 304S 11/15/31
20	M2-5_X_BLG_CPHD_SKT_SS	FASTENER	12	0.58	6.93	S/STEEL BS3506-1:1998 A2-70
21	M3_X_BLG_CPHD_SKT_SS	FASTENER	8	0.74	5.95	S/STEEL BS3506-1:1998 A2-70
			ASSEMBLY MASS		967.84 GRAMS	



- NOTES:-
- BOND ITEM 15 TO 4 PRIOR TO ASSEMBLY. BOND ITEMS 16 & 14 TO 3 PRIOR TO ASSEMBLY. ITEMS 3 & 4 TO BE PERMANENTLY GLUED TO MATING SURFACES.
 - TO ATTAIN THE CORRECT MOUNTING INTERFERENCE DIMENSION, AND TO COMPENSATE FOR ACTUAL JFET MODULE SIZES, THE FOLLOWING PROCEDURE MUST BE FOLLOWED: PARTS 1 ARE TO BE MOUNTED TO PART 6. MEASURE FROM THE TOP OF PARTS 1 SHOWN AS PLANE 'C' TO THE TAIL END OF PARTS 6, NOTING THE TWO VALUES. MACHINE RAISED PADS ON PART 7 TO REMOVE (VALUE - 87.7) - PADS ON ITEM 8 WILL ALSO NEED MACHINING IF TRIAL ASSEMBLY OF RACK ON FLAT SURFACE SHOWS GAPS BEFORE FASTENERS ARE TIGHTENED.
 - ITEMS 6 TO BE TORQUED TO 2.1 Nm ABOVE LOCKING INSERT RUNNING TORQUE. ITEMS 13 TO BE TORQUED TO 2.1 Nm WITH STUD SET TO DEPTH SHOWN IN HOE LOCKING INSERT.
 - UNIT SHOWN FITTED WITH BACK-HARNESS MATING TO J9 - J10 & J15 - J18 BECAUSE THIS WILL BE FITTED BEFORE ITEM 15 IS INTEGRATED TO HB.
 - HEAT CAPACITY AT RT = 700 JOULES / KELVIN.
 - FITTED BACKHARNESS TO AFFORD OPEN ACCESS TO 51 WAYS AS SHOWN.
 - AFFIX ONE SENSOR WITH LONG BOLTS AND THEN THE OTHER ON THE REVERSE WITH NUTS
 - ITEMS 6 AND 11 TO BE PRE-FITTED BEFORE ITEM 2 IS FITTED

SPIRE MASTER DRAWING	
PROJECT MEMBER	APPROVED
PROJECT MANAGER	
SYSTEM ENG	
ELECTRONICS ENG	
PA GROUP	
STRESS ENG	
OPTICAL ENG	
THERMAL ENG	
MECHANICAL ENG	

ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
J	12-Nov-03	KE-2952.	D. SMART			ISSUED
TOLERANCES UNLESS STATED						FINISH CLEAN REMOVE ALL BURRS
MATERIAL & SPEC. SEE DETAILS						SURFACE TEXTURE µm SEE DETAILS UNLESS STATED
USED ON						©CLRC 2003
CENTRAL LABORATORY OF THE RESEARCH COUNCILS						
TITLE						
2 JFET RACK						
INTERFACE DRAWING						
SPIRE						
A 0-KE-0104-360-J						1 of 1

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 2 of 5
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

Date:	7-Feb-2003
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> Swop connector pairs (MSW) move connector labels (MSW) make back harness into parts (MSW) Dimension and label thread lengths add column to parts list showing drawing numbers (also create repeat region BOM table) replace thermal strap part as an assembly change note 2 – "... dimension and to compensate for actual jfet module sizes, ..." and append note 2 with "pads on item 3 will also need machining if trial assembly of rack on flat surface shows gaps before fasteners are tightened" add note 5 " Heat capacity = {0.9 x mass} joules / Kelvin" show insulation additions to feet (kapton tape washers) add note to section view showing that fasteners are coated with parylene C put m2.5 washers under various screws change note 3 to say "items 8 to be torqued to 2.1Nm above locking insert running torque add note 6 " fitted back harness to afford open access to to 51 ways as shown" add note 7 " kapton tape insulators shall be cut to fit annuls of thermal standoff to within +/- 1"
Issue raised to:	D
By:	Iain Gilmour

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2953

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 3 of 5
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

Date:	12-Mar-2003
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> Thermal standoff positional dimensions changed to basic dimensions. Thermal strap interface dimensions added Note 8 added regarding the protrusion and trimming of the parylene coating Typos fixed 2 off thermal strap standard washers replaced with Belleville washers, BOM updated to this effect. Unit mounting hole size and positional accuracy added
Issue raised to:	E
By:	Iain Gilmour

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2953

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 4 of 5
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

Date:	20-May-2003
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> Note Associated with tapped holes in the Thermal Strap Interface, first line modified for clarity to read. 2 HOLES M4x0.7 1.5D LG HELICOIL
Issue raised to:	F
By:	Kevin Burke

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2953

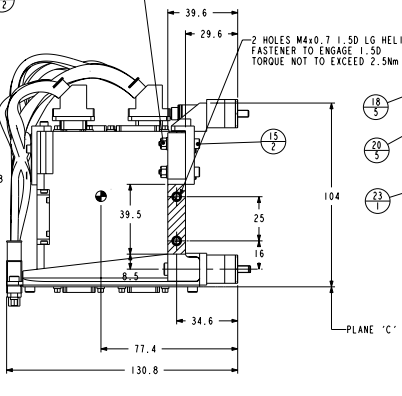
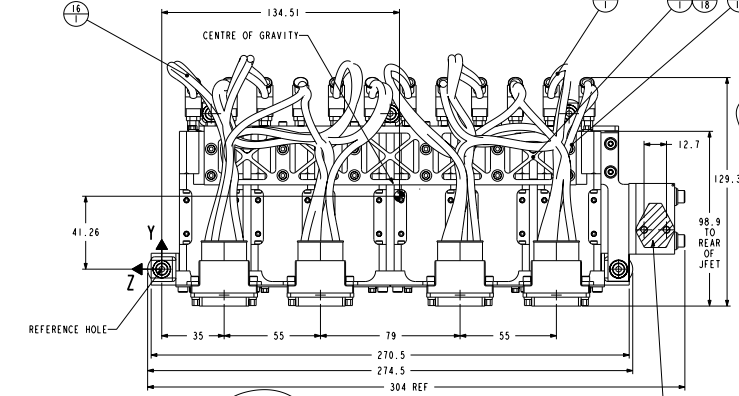
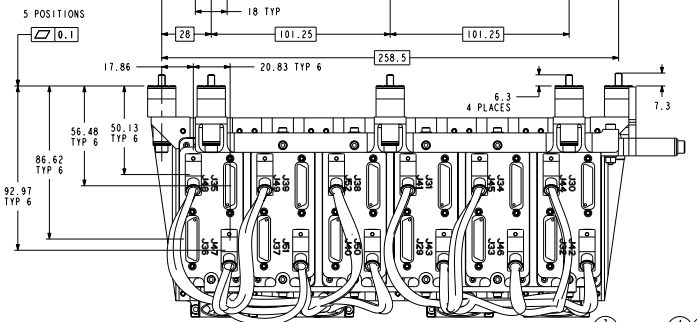
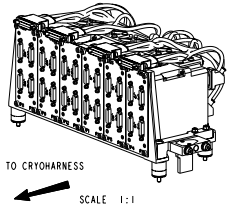
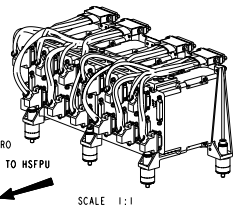
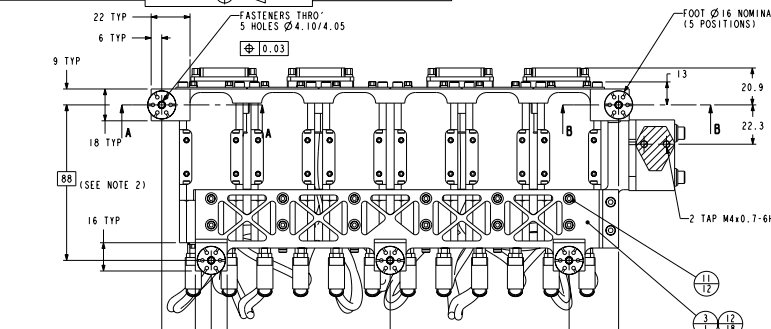
SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 5 of 5
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

Date:	13-Oct-2003
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> Reflects new thermal standoff design with additional bush and upper and lower feet washers. Subsequent dimensions in X direction updated to new interface plane. New parts added to Parts List. Reflects new harness layout which simulates actual physical layout. Micro-D 15 way connector added to harness representation. Micro-D 37 way elliptical entry backshells replace standard circular entry versions. Mass of harnesses increased from 165g to 270g. L3 strap and interface assembly added. Views updated and added to show interface details and L3 strap hole definition. Mass of JFET modules reduced from 305g to 260g. Kapton tape removed from fastener and stand-off interfaces (note 7 deleted). Moments of inertia updated along with C of G position. Fastener for thermal strap assembly changed to non parylene coated M4 x 45mm long. Kapton tape note removed from L3 interface area. Incorrectly specified M2.5 x 8 long fasteners used to fasten JFET modules to front plate replaced with M3 x 8 long. Temperature sensor interface shown on both sides of the L3 interface sub-assembly. Distance between S/C connector I/F and rear of JFET harness increased due to addition of 15-way connectors to JFET harness. Dimension between S/C connector plane and rear face of JFET module added. New dimensions applied to L3 interface area. Connector fasteners and nuts added to spacecraft connectors.
Issue raised to:	G
By:	Dave Smart

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

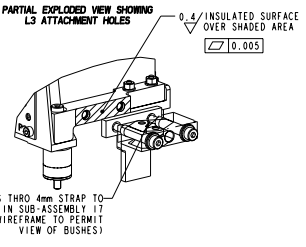
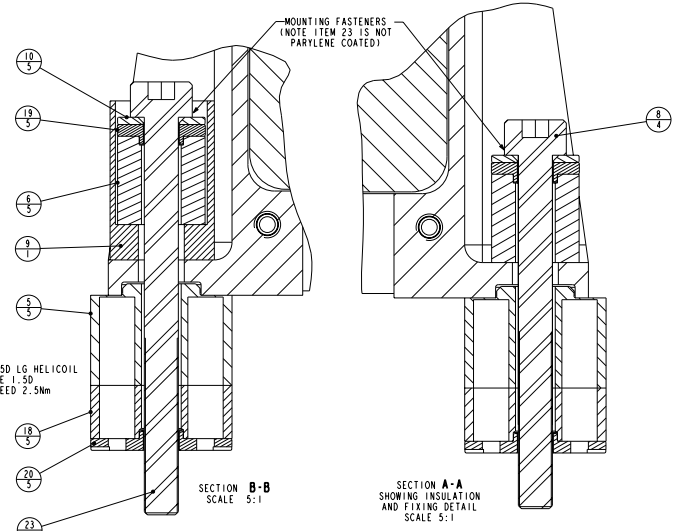
KE-2953

? John Decker Field 2003.11.05 15:12:23 Z

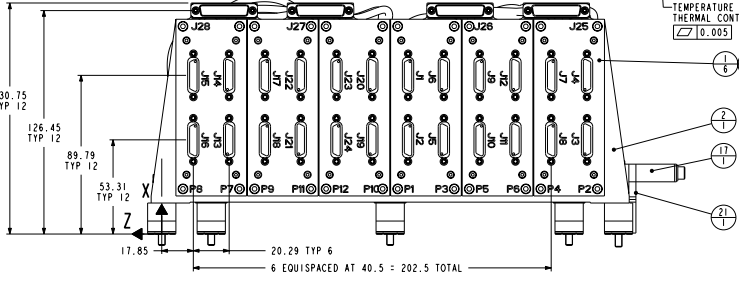


MOMENTS OF INERTIA (kg mm ²) WITH RESPECT TO C OF G	I _{xx}	I _{yy}	I _{zz}
	1.70e+04	1.66e+04	4.73e+03

ITEM PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS	COMMENTS
1 23836-10209722	JFET MODULE	6	260.00	1560.00	JPL SUPPLY
2 KE-0104-351	FRONT PLATE 6 JFET	1	128.66	128.66	
3 KE-0104-352	REAR FOOT BEAM - 6 JFET	1	68.55	68.55	
4 KE-0104-353	REAR TOP BEAM - 6 JFET	1	32.56	32.56	
5 KE-0104-354	STEPPED THERMAL STANDOFF	5	1.70	8.50	
6 KE-0104-355	TOP THERMAL STANDOFF	5	0.87	4.34	
7 10209785.1	BACKHARNES (10209785.1)	1	265.65	265.65	JPL SUPPLY
8 KE-0104-358	M4 BOLT (PARYLENE C COATED 26.5mm)	4	4.70	18.78	
9 KE-0104-359	THERMAL STRAP ASSY - 6 JFET	1	23.76	23.76	
10 KE-0104-367	THERMAL STANDOFF WASHER	5	0.39	1.94	
11 M2-S WASHER	WASHER	24	0.11	2.57	S/STEEL BS370/1501 304S 11/15/31
12 M2-S X.BLG.CPHD_SKT_SS	FASTENER	36	0.58	20.79	S/STEEL BS3506-1:1998 A2-70
13 M3_NUT	NUT	2	0.48	0.97	S/STEEL BS6105 A2-50 DIN 912
14 58-3205	BELLEVILLE WASHER	2	0.17	0.33	BELLEVILLE SPRINGS LTD. BATCH 174745
15 M3_X.20LG.CPHD_SKT_SS	FASTENER	2	1.26	2.52	S/STEEL BS3506-1:1998 A2-70
16 10209786.1	BACKHARNES (10209786.1)	1	267.70	267.70	JPL SUPPLY
17 KE-0104-393	L3 INTERFACE ASSY	1	64.18	64.18	
18 KE-0104-397	THERMAL STANDOFF BUSH	5	0.94	4.70	
19 KE-0104-398	FOOT UPPER WASHER	5	0.14	0.69	
20 KE-0104-399	FOOT LOWER WASHER	5	0.34	1.69	
21 L3_STRAP_B	L3 STRAP	1	N/A		HERSCHEL SUPPLY
22 M3_X.BLG.CPHD_SKT_SS	FASTENER	24	0.74	17.86	S/STEEL BS3506-1:1998 A2-70
23 M4_X.45LG.CPHD_SKT_SS	FASTENER	1	5.15	5.15	S/STEEL BS3506-1:1998 A2-70
ASSEMBLY MASS				2502.88 GRAMS	



LABEL	TYPE	FUNCTION
J1	ALL BUSHES	ALL SIGNAL FEEDS TO CRYOHARNES
J2		
J3		
J4		
J5		
J6		
J7		
J8		
J9		
J10		
J11	ALL BUSHES	ALL SIGNALS IN FROM DETECTORS
J12		
J13		
J14		
J15		
J16		
J17		
J18		
J19		
J20		
J21	ALL BUSHES	BIAS WIRES FROM CRYOHARNES
J22		
J23		
J24		
J25		
J26		
J27		
J28		
J29		
J30		
J31	ALL BUSHES	BIAS FEEDS INTO MODULES
J32		
J33		
J34		
J35		
J36		
J37		
J38		
J39		
J40		
J41		
J42		
J43		
J44		
J45		
J46		
J47		
J48		
J49		
J50		
J51		
J52		



- ITEM 19 TO BE BONDED TO ITEM 6 PRIOR TO ASSEMBLY. ITEMS 20 & 18 TO BE BONDED TO ITEM 5 PRIOR TO ASSEMBLY. ITEMS 5 & 6 TO BE PERMANENTLY GLUED TO MATING SURFACES.
- TO ATTAIN THE CORRECT MOUNTING INTERFACE DIMENSION, AND TO COMPENSATE FOR ACTUAL JFET MODULE SIZES, THE FOLLOWING PROCEDURE MUST BE FOLLOWED: PARTS 1 ARE TO BE MOUNTED TO PART 2, MEASURE FROM THE TOP OF PARTS 1 SHOWN AS PLANE 'C' TO THE TAIL END FACE OF PARTS 2, NOTING THE SIX VALUES MACHINE RAISED PADS ON PART 3 TO REMOVE (VALUE = 87.7). PADS ON ITEM 4 WILL ALSO NEED MACHINING IF TRIAL ASSEMBLY OF RACK ON FLAT SURFACE SHOWS GAPS BEFORE FASTENERS ARE TIGHTENED.
- ITEMS 22 AND 8 TO BE TORQUED TO 2.1 Nm ABOVE LOCKING INSERT RUNNING TORQUE.
- UNIT SHOWN FITTED WITH BACK-HARNES MATING TO J25-28 & J41-52 BECAUSE THIS WILL BE FITTED BEFORE ITEM IS INTEGRATED TO HOB.
- HEAT CAPACITY AT RT = 2100 JOULES / KELVIN.
- FITTED BACKHARNES TO AFFORD OPEN ACCESS TO 51 WAYS AS SHOWN.
- AFFIX ONE SENSOR WITH LONG BOLTS AND THEN THE OTHER ON THE REVERSE WITH NUTS

SPIRE MASTER DRAWING	
PROJECT MEMBER	APPROVED
PROJECT MANAGER	
SYSTEM ENG	
ELECTRONICS ENG	
PA GROUP	
STRESS ENG	
OPTICAL ENG	
THERMAL ENG	
MECHANICAL ENG	

G	13-OCT-03	KE-2953	D. SMART	DRN	BY	CHKD.	APPD.	ISSUED
ISSUE DATE	MOD. No.	DRN <td>BY</td> <td>CHKD.</td> <td>APPD.</td> <td>STATUS</td> <td colspan="2">TOLERANCES UNLESS STATED ±0.3 mm ±0.3</td>	BY	CHKD.	APPD.	STATUS	TOLERANCES UNLESS STATED ±0.3 mm ±0.3	
MATERIAL & SPEC. SEE DETAILS						FINISH CLEAN REMOVE ALL BURRS SURFACE TEXTURE RW SEE DETAILS UNLESS STATED		ORIGINAL SCALE 1:1 DO NOT SCALE
USED ON								© CLRC 2003
CENTRAL LABORATORY OF THE RESEARCH COUNCILS								
TITLE 6 JFET RACK INTERFACE DRAWING								
SPIRE								
A 0-KE-0104-350-G 1 of 1								