



SPIRE
INTERFACE DOCUMENT.

Doc #: SPIRE-RAL-DWG-001409
Issue: 10
Date: February 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:**



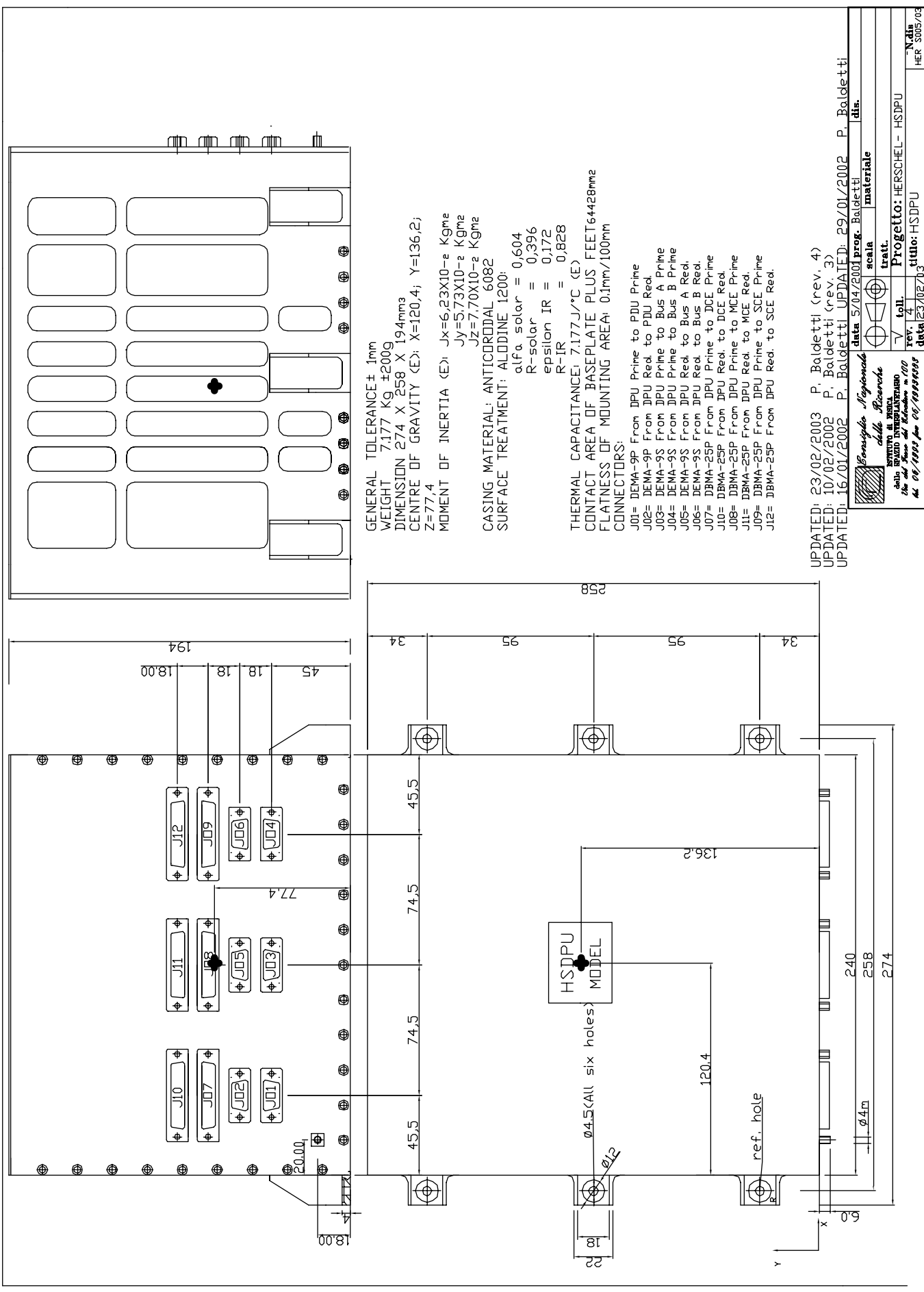
SPIRE
INTERFACE DOCUMENT.

Doc #: SPIRE-RAL-DWG-001409
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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.
- Issue10...Version 19 of Cryogenic unit I/F drawing inserted, implementing latest L0 straps. For detailed
change control see drawing's change listed included herein.






GENERAL TOLERANCE ± .1mm
 WEIGHT 7.177 Kg ±200g
 DIMENSION 274 X 258 X 194mm³
 CENTRE OF GRAVITY (E): X=120.4; Y=136.2;
 Z=77.4
 MOMENT OF INERTIA (E): Jx=6.23X10^{-e} Kgme
 Jy=5.73X10^{-e} Kgme
 Jz=7.70X10^{-e} Kgme
 CASING MATERIAL: ANTICORRIDAL 6082
 SURFACE TREATMENT: ALDINE 1200:
 α(fa solar = 0,604
 R-solar = 0,396
 ε 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 JPU Prime to Bus A Prime
 J04= DEMA-9S From JPU Prime to Bus B Prime
 J05= DEMA-9S From JPU Red. to Bus A Red.
 J06= DEMA-9S From JPU Red. to Bus B Red.
 J07= DBMA-25P From DPU Prime to DCE Prime
 J08= DBMA-25P From DPU Red. to MCE Prime
 J09= DBMA-25P From DPU Prime to SCE Prime
 J10= DBMA-25P From DPU Red. to SCE Red.
 J11= 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 (rev. 2)
 UPDATED: 29/01/2002 P. Baldetti (rev. 1)

		data 5/04/2001 prog. Baldetti	
Bergamo Regione della Riviera		scala	
Istituto di Studi e Ricerche per la Sicurezza del Materiale n. 00		materiale	
del 09/10/03 per 00/000000		dis.	
rev. 4		titolo: HSDPU	
data 23/02/03		HER 3002/03	

	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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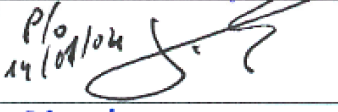
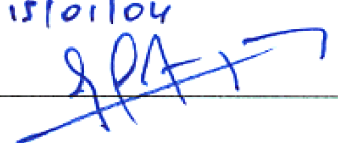
List of changes

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	FUNCTIONS
J01	DBMA 25S	DAQ_IF_M/DPULM	LIA_P_7/FPU
J02	DBMA 25S	DAQ_IF_R/DPULR	LIA_P_7/FPU
J03	DBMA 25P	DCU/PSU_M	LIA_P_8/FPU
J04	DBMA 25P	DCU/PSU_R	LIA_P_8/FPU
J05	DDMA 50P	LIA_P_1/FPU	LIA_P_9/FPU
J06	DDMA 50P	LIA_P_1/FPU	LIA_P_9/FPU
J07	DDMA 50P	LIA_P_2/FPU	LIA_S_1/FPU
J08	DDMA 50P	LIA_P_2/FPU	LIA_S_1/FPU
J09	DDMA 50P	LIA_P_3/FPU	LIA_S_2/FPU
J10	DDMA 50P	LIA_P_3/FPU	LIA_S_2/FPU
J11	DDMA 50P	LIA_P_4/FPU	LIA_S_3/FPU
J12	DDMA 50P	LIA_P_4/FPU	LIA_S_3/FPU
J13	DDMA 50P	LIA_P_5/FPU	BIAS_M/FPU
J14	DDMA 50P	LIA_P_5/FPU	BIAS_R/FPU
J15	DDMA 50P	LIA_P_6/FPU	BIAS_M/FPU
J16	DDMA 50P	LIA_P_6/FPU	BIAS_R/FPU

NOTES

MATERIAL AL 6082

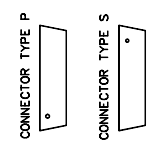
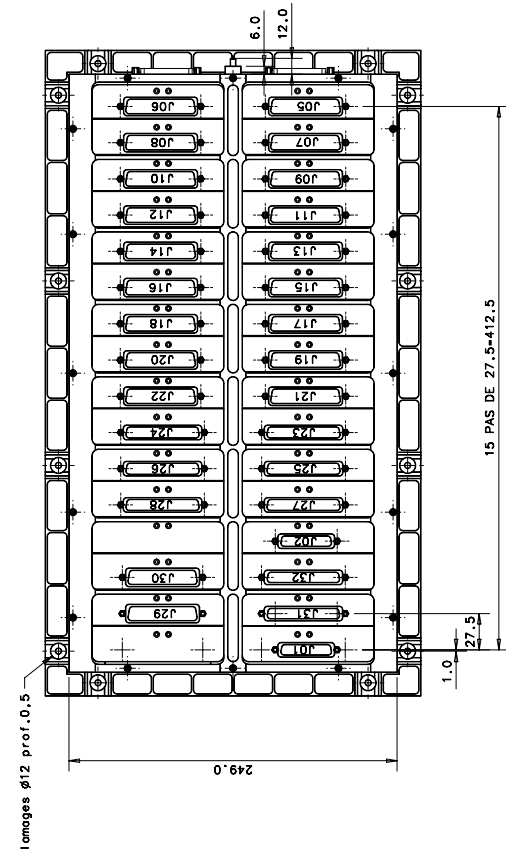
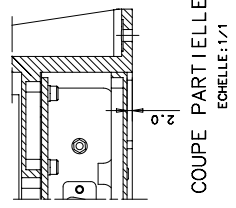
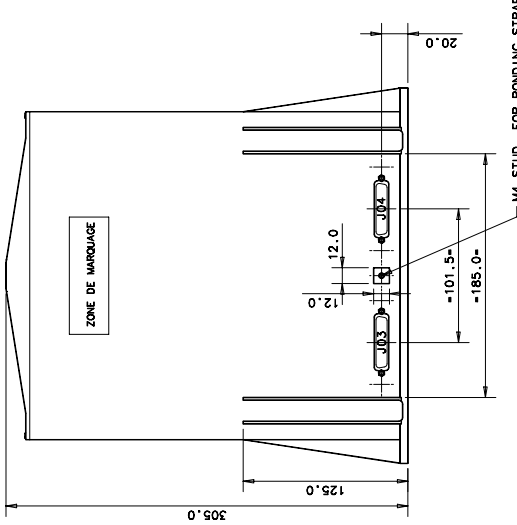
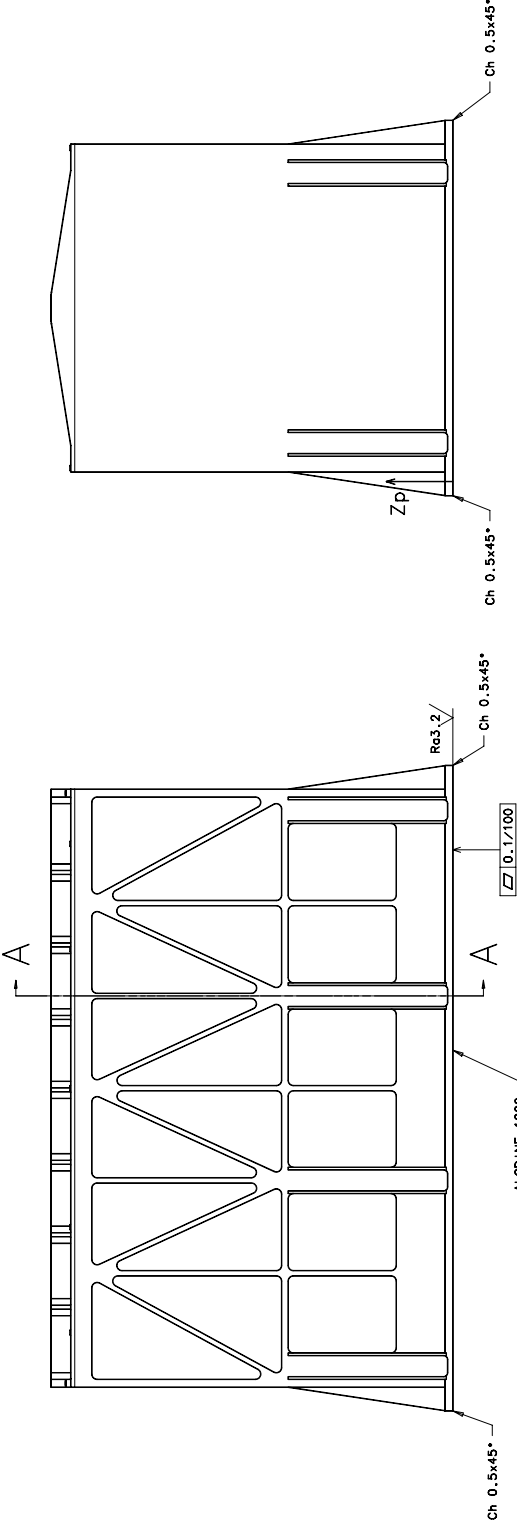
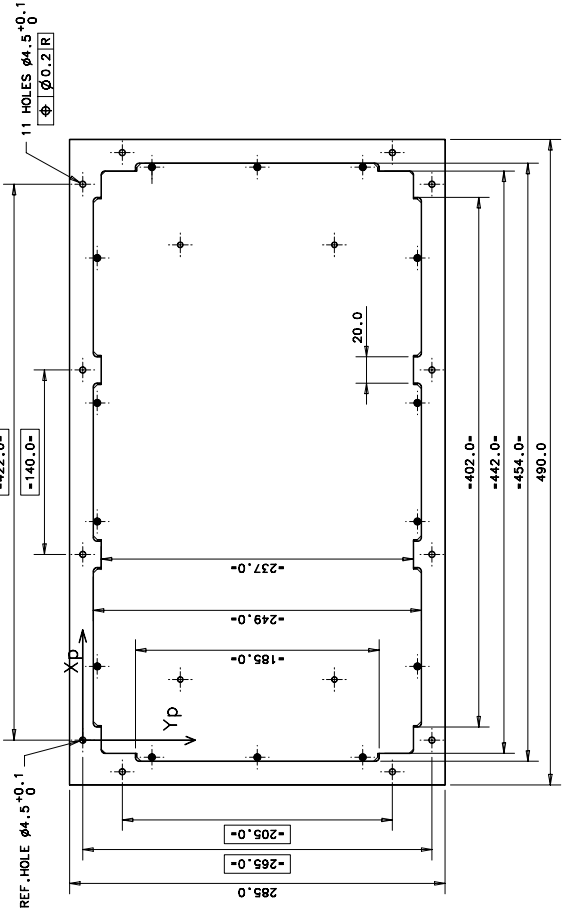
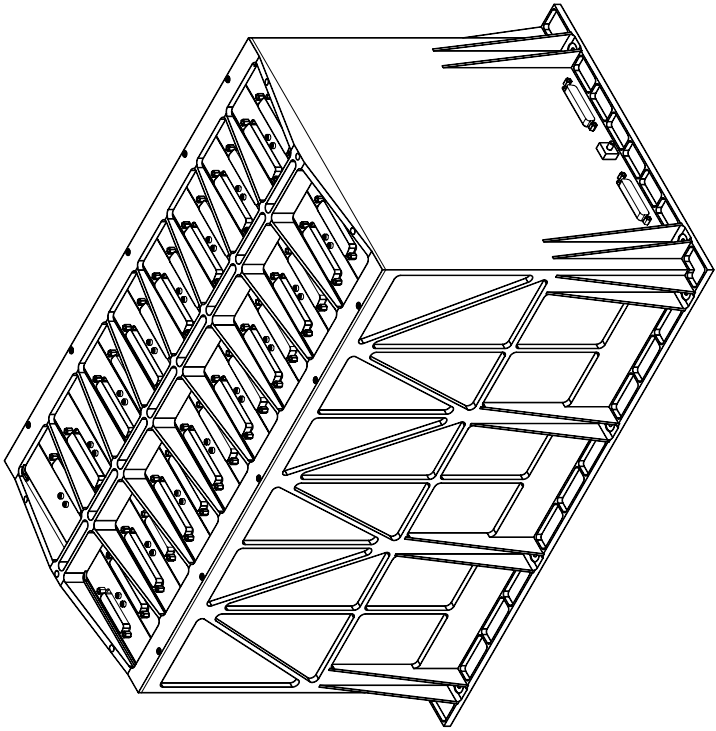
CENTRE OF GRAVITY REFERRED TO REFERENCE HOLE
 X=213.2mm Y=132.4mm Z=157.9mm

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



E	Mise à jour	01/04	DREMIN
D	Ajust coupe A-A	10/03	DREMIN
C	Mise à jour	09/03	DREMIN
B	Mise à jour	06/02	DREMIN
A	Origine	11/01	DREMIN

Spécifications particulières
 Date: Baseline par Verifié par Approuvé par

0	Indice de rugosité général	XXX	SOUS-TRAITANT
1	Tol. ang.	: ±0.1°	
2	Ø	3mm	Casser les angles vifs

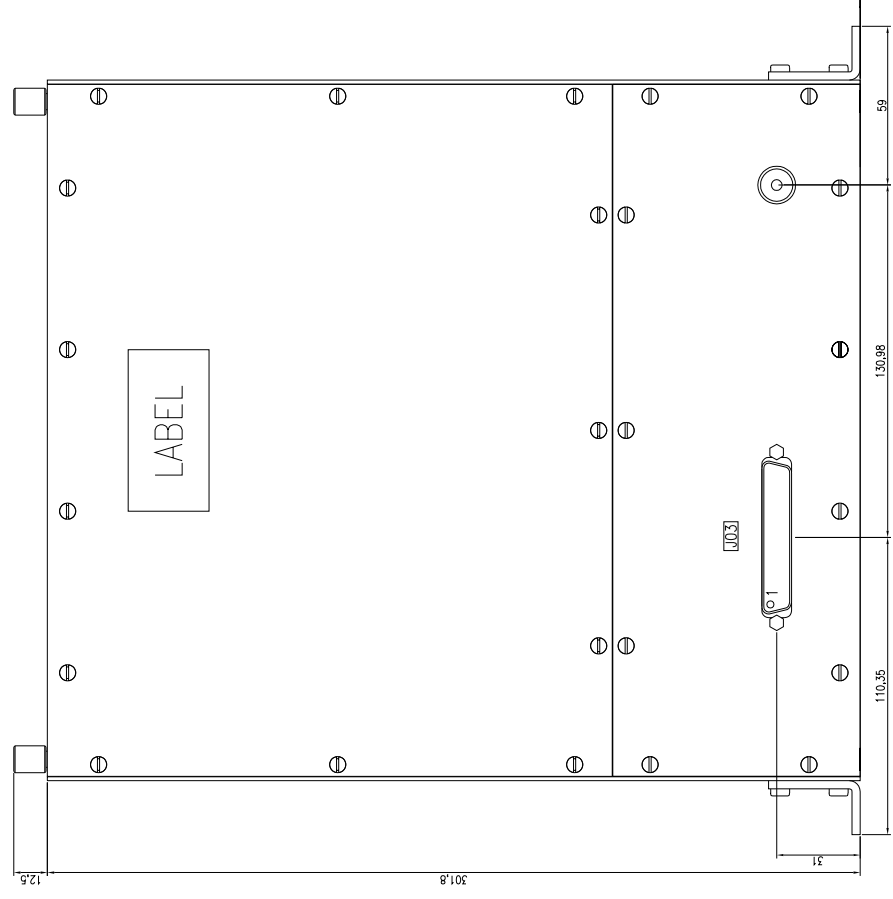
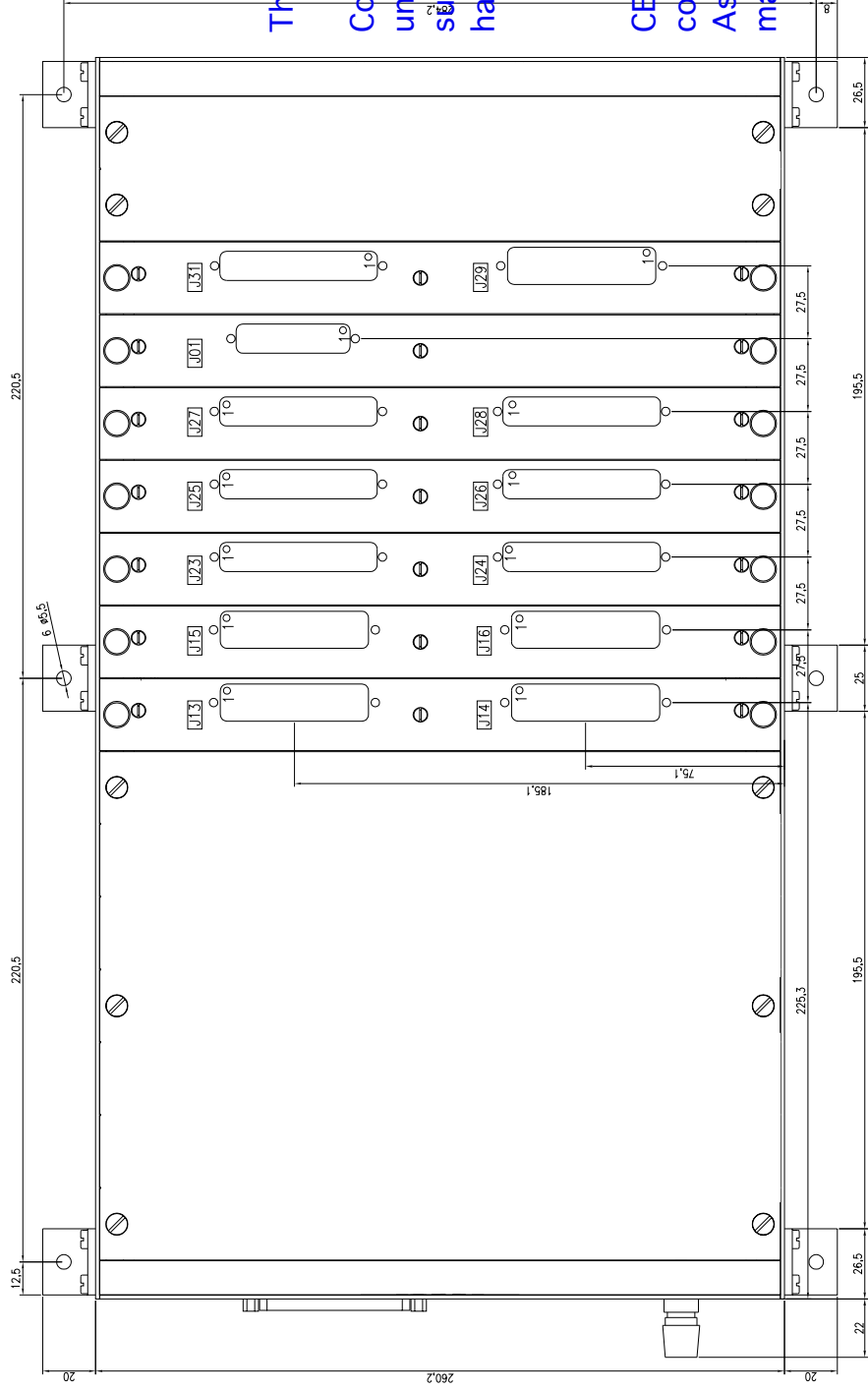
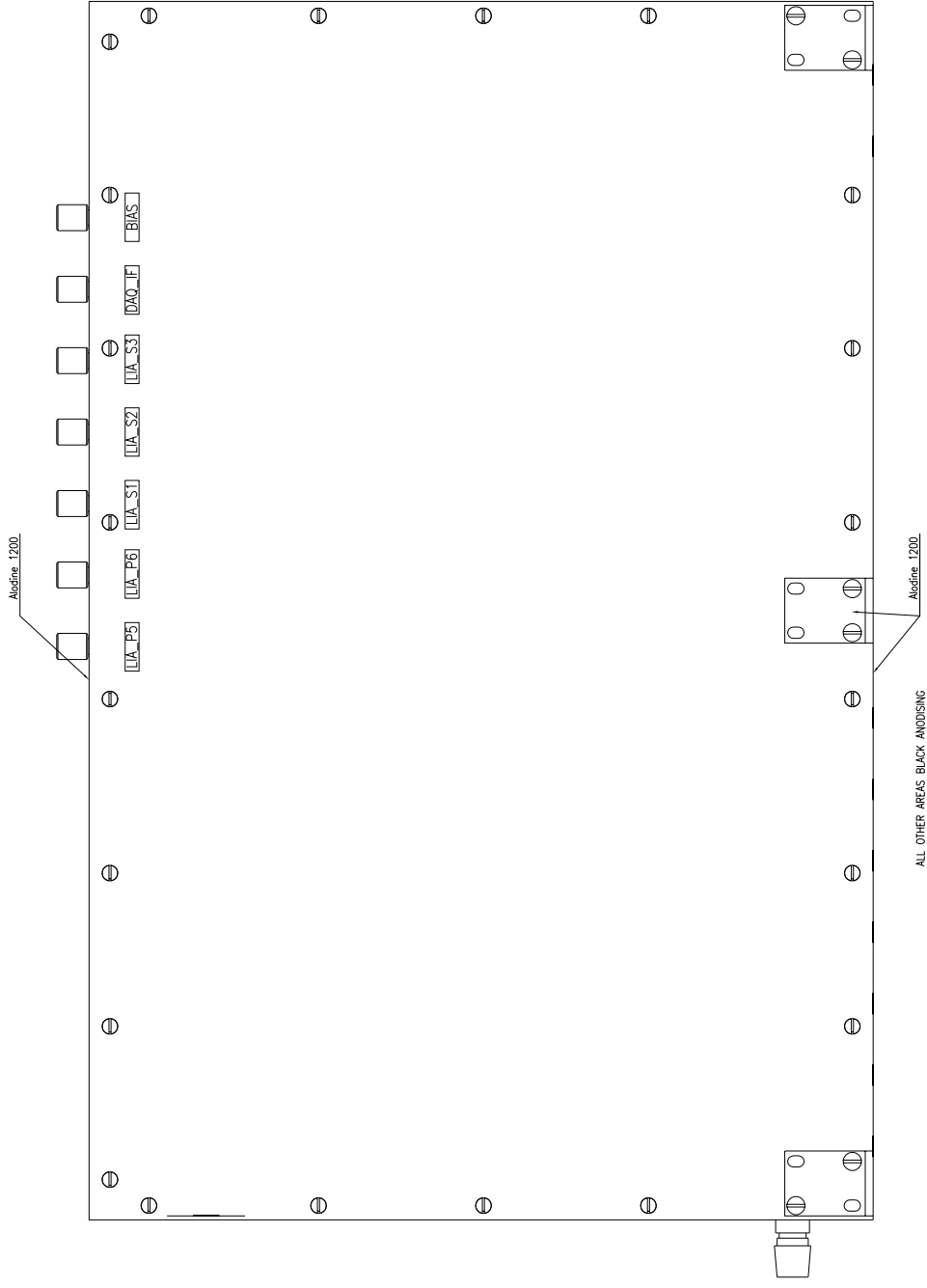
Matériau: Protection
 Echelle Poids Niveau qualité
 1/2

SPIRE
HSDCU ELECTRONIC BOX
MECHANICAL INTERFACE CONTROL DRAWING

SAP/GERES COMMISSARIAT A L'ENERGIE ATOMIQUE C.E.N. SACLAY
 Tel: 01.69.08.78.26
 01.69.08.49.76
 Fax: 01.69.08.79.96

11 PAS DE 27.5-412.5

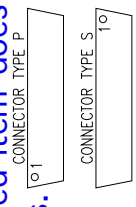
AO SPIR-MX-5100 000 E



CONNECTORS			
IDENT	TYPE	FUNCTION	IDENT
J01	DBMA 25S	DAO_IF_M/DPU	J24
J03	DBMA 25P	DCU/PSU_M	J25
J13	DDMA 50P	LIA_P_5/FPU	J26
J14	DDMA 50P	LIA_P_5/FPU	J27
J15	DDMA 50P	LIA_P_6/FPU	J28
J16	DDMA 50P	LIA_P_6/FPU	J29
J23	DCMA 37P	LIA_S_1/FPU	J31
			J35

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.

FOR OWN

CEA /SAP 91191 GIF/WETTE Codex	MATIERE : Alu 2017A	PROTECTION :
	TRAITEMENT : Anodine 1200	DESSINE : SRIE DATE : 02/12/02
Echelle : 3/4		VERIFE :
TOLERANCES GENERALES : ±0.2		VISA :
DESIGNATION		Ro1,6
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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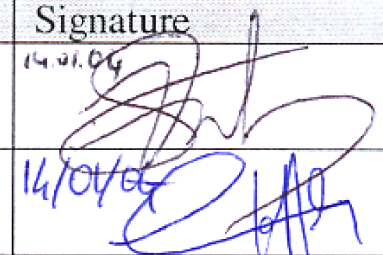
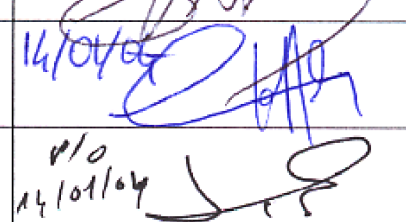
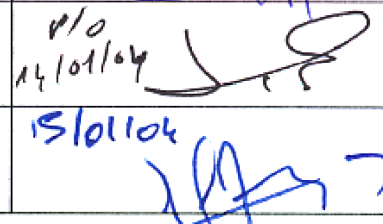
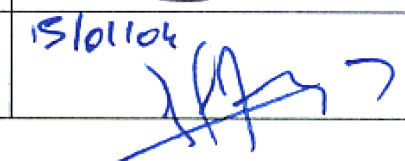
List of changes

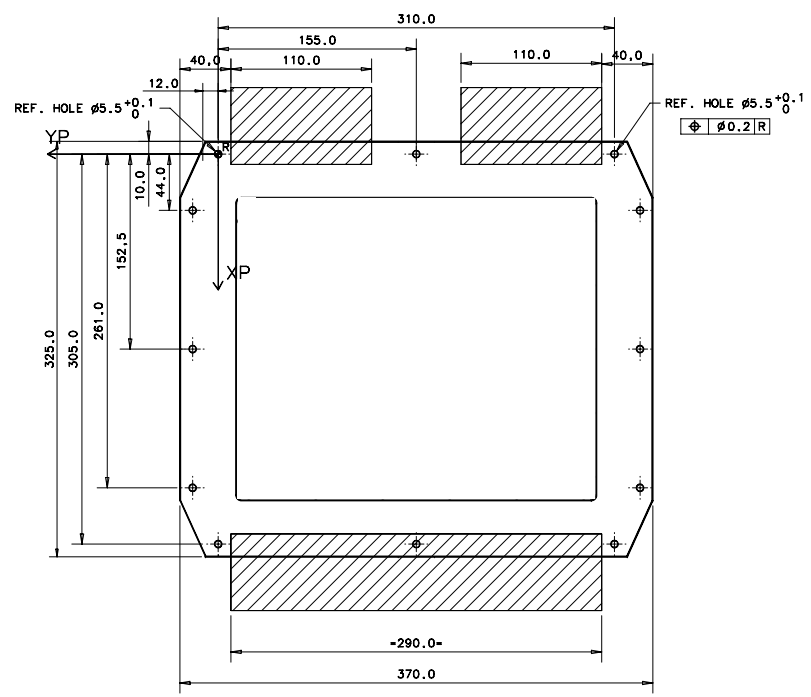
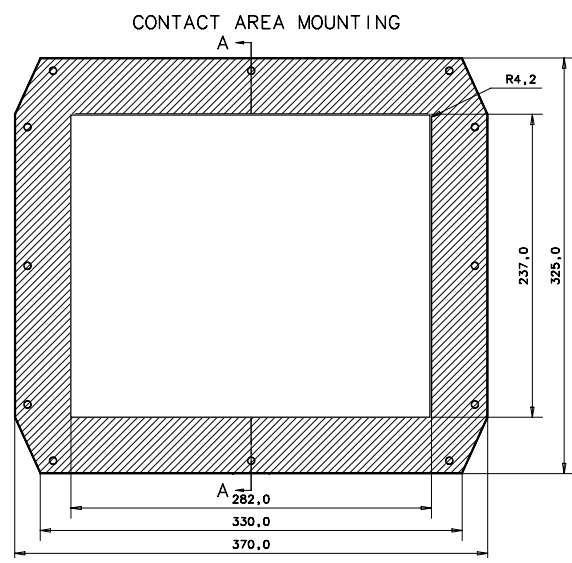
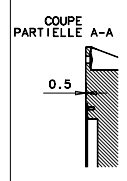
Document identification

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



NOTES

MATERIAL AL 6082

CENTRE OF GRAVITY REFERRED TO REFERENCE HOLE
 $X=148.8\text{mm}$ $Y=-153\text{mm}$ $Z=138.5\text{mm}$

MOMENTS OF INERTIA REFERRED TO CENTRE OF GRAVITY
 $JX=0.338\text{ Kg.m}^2$ $JY=0.318\text{ Kg.m}^2$ $JZ=0.282\text{ Kg.m}^2$

CONTACT AREA MOUNTING FEET=51656mm²

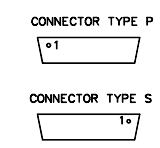
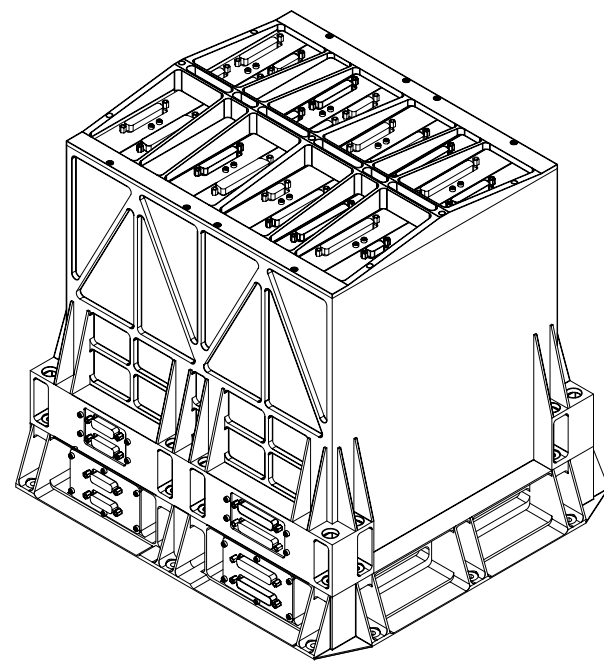
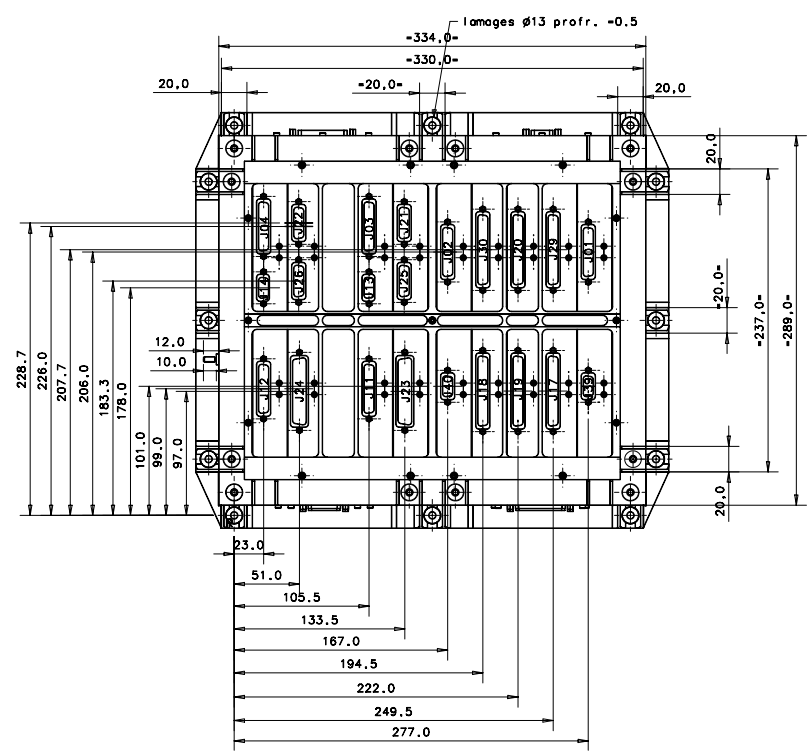
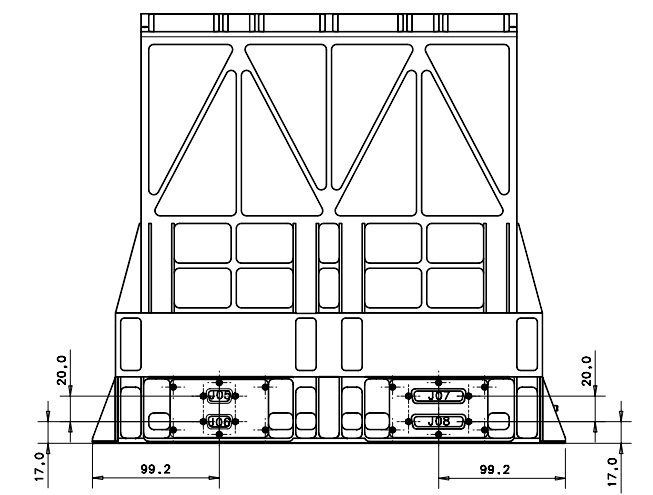
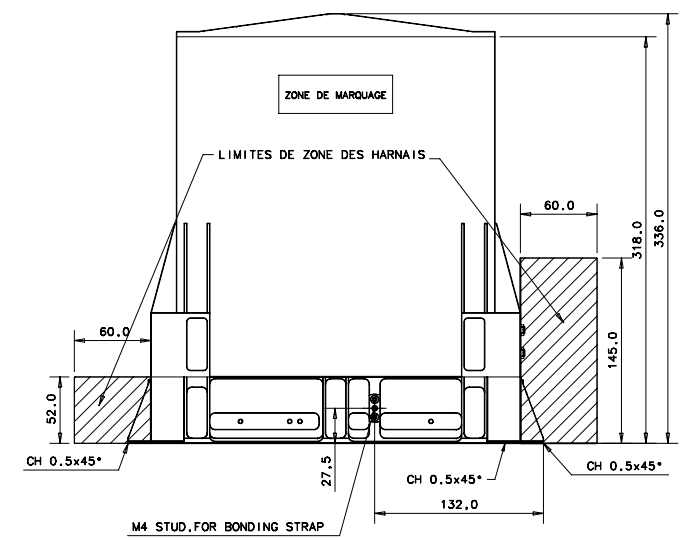
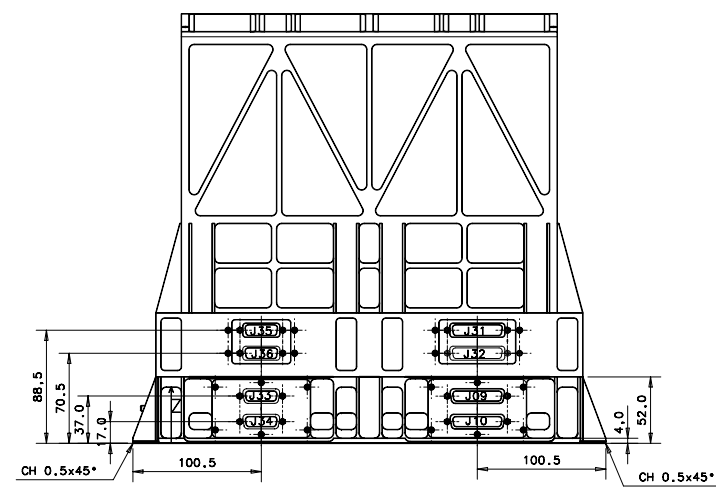
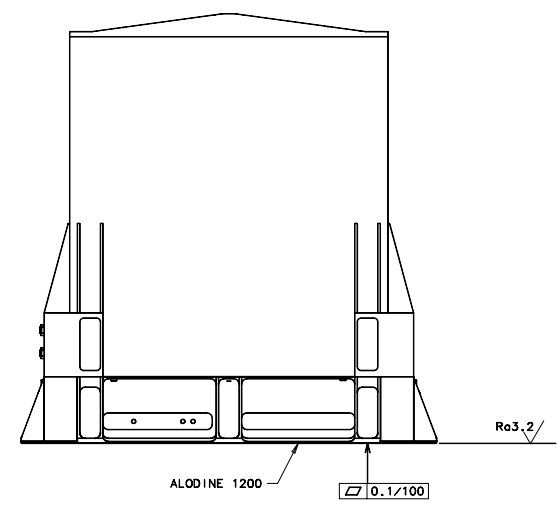
THERMAL COATING AND BLACK ANODISING ESA,PSS,703

SURFACE EMISSIVITY >0.85

TORQUE VALUE FOR CONNECTOR FIXATION SCREWS=
 -MALE=0.3mN
 -FEMALE=0.45mN

ESTIMATED MASS=16254g
 CP=1170j/kg.*K

CONNECTORS					
IDENT	TYPE	INTERFACE NAME	IDENT	TYPE	INTERFACE NAME
J01	DBMA 25S	MAC-M/DPU-M	J21	DAMA 15S	TEMP-M/FPU-TS-1-M
J02	DBMA 25S	MAC-R/DPU-R	J22	DAMA 15S	TEMP-R/FPU-TS-1-R
J03	DBMA 25S	CCHK-IF-M/DPU-M	J23	DDMA 50S	TEMP-M/FPU-TS-2-M
J04	DBMA 25S	CCHK-IF-R/DPU-R	J24	DDMA 50S	TEMP-R/FPU-TS-2-R
J05	DEMA 9P	PSU-M/PCDU-M	J25	DAMA 15S	TEMP-M/FPU-MEC-TS-M
J06	DEMA 9P	PSU-R/PCDU-R	J26	DAMA 15S	TEMP-R/FPU-MEC-TS-R
J07	DBMA 25S	PSU-M/DCU	J27	NA	NA
J08	DBMA 25S	PSU-R/DCU	J28	NA	NA
J09	DBMA 25S	PSU-M/MCU-M	J29	DCMA 37P	SMEC-M/FPU-SMECm-2-M
J10	DBMA 25S	PSU-R/MCU-R	J30	DCMA 37P	SMEC-R/FPU-SMECm-2-R
J11	DBMA 25S	CCHK-IF-M/FPU-COOL-CAL-M	J31	DBMA 25P	MCU-M/PSU-M
J12	DBMA 25S	CCHK-IF-R/FPU-COOL-CAL-R	J32	DBMA 25P	MCU-R/PSU-R
J13	DEMA 9S	CCHK-IF-M/FPU-PH-STIM-M	J33	DAMA 15S	PSU-M/SCU-M
J14	DEMA 9S	CCHK-IF-R/FPU-PH-STIM-R	J34	DAMA 15S	PSU-R/SCU-R
J15	NA	NA	J35	DAMA 15P	SCU-M/PSU-M
J16	NA	NA	J36	DAMA 15P	SCU-R/PSU-R
J17	DCMA 37S	SMEC-M/FPU-SMECm-1-M	J37	NA	NA
J18	DCMA 37S	SMEC-R/FPU-SMECm-1-R	J38	NA	NA
J19	DCMA 37S	BSM-M/FPU-BSM-M	J39	DEMA 9S	MAC-H/JTAG
J20	DCMA 37S	BSM-R/FPU-BSM-R	J40	DEMA 9S	MAC-R/JTAG



Indice	Modifications	Date	Dessiné par	Vérifié par	Approuvé par
J	Mise à jour	01/04	DHENAIN		
I	Modif position CdG	12/03	DHENAIN		
H	Mise à jour	11/03	DHENAIN		
G	Mise à jour	04/03	DHENAIN		
F	Mise à jour	10/02	DHENAIN		
E	Mise à jour connecteurs	09/02	DHENAIN		
D	Mise à jour	07/02	DHENAIN		
C	Mise à jour	06/02	DHENAIN		
B	Mise à jour	05/02	DHENAIN		
A	Origine	12/01	DHENAIN		

Spécifications particulières

Tolérances générales	▨	Indice de rugosité général	SOUS-TRAITANT
	▩	Tol.ang.:	
	◆	Casser les angles vifs	

Matière: Protection

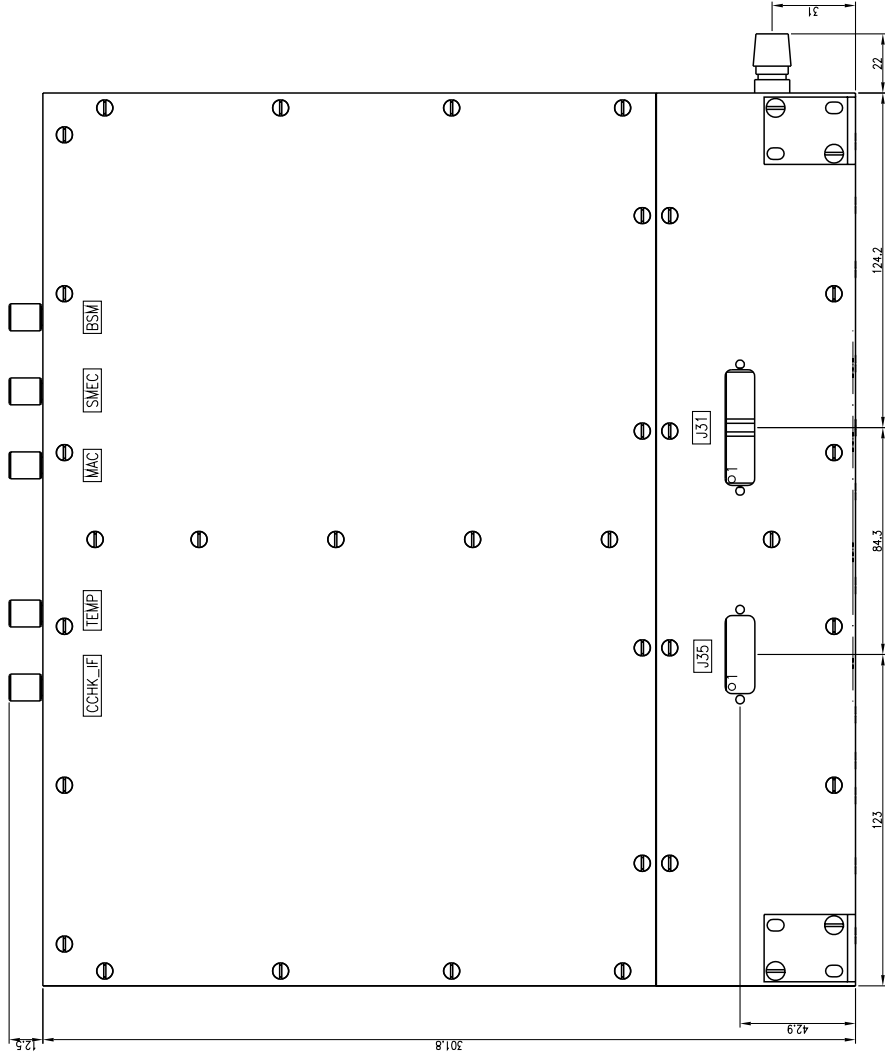
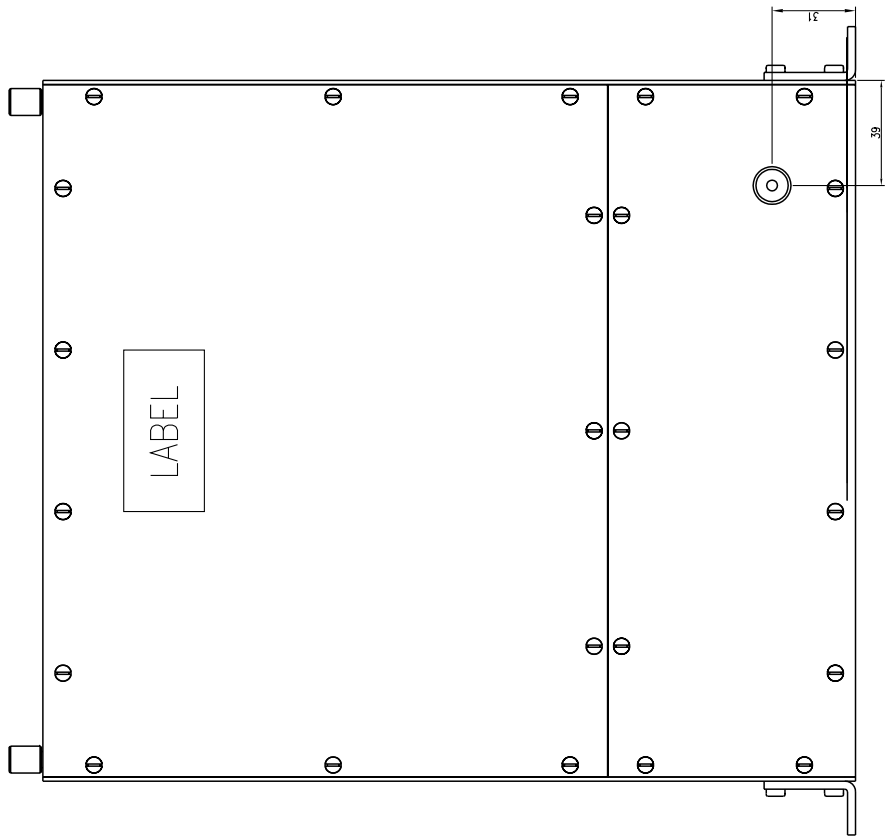
Traitement thermique: Echelle Poids Niveau qualité
1/2

SPIRE
FCU ELECTRONIC BOX
MECHANICAL INTERFACE CONTROL DRAWING

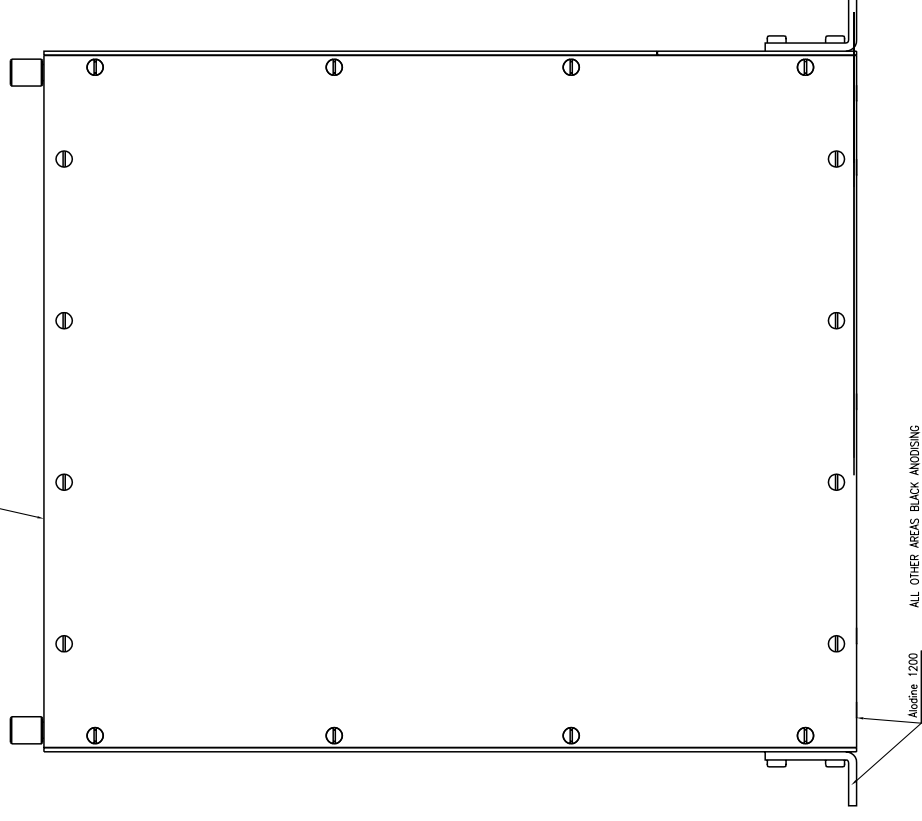
Il n'est permis d'utiliser ce dessin qu'avec l'autorisation expresse - loi du 11 mars 1957

SAP/GERES	COMMISSARIAT A L'ENERGIE ATOMIQUE	C.E.N SACLAY
Tel: 01.69.08.78.25	01.69.08.59.76	
Fax: 01.69.08.79.96		

AO SPIR-MX-5200 000 J



Modèle 1200



ALL OTHER AREAS BLACK ANODISING

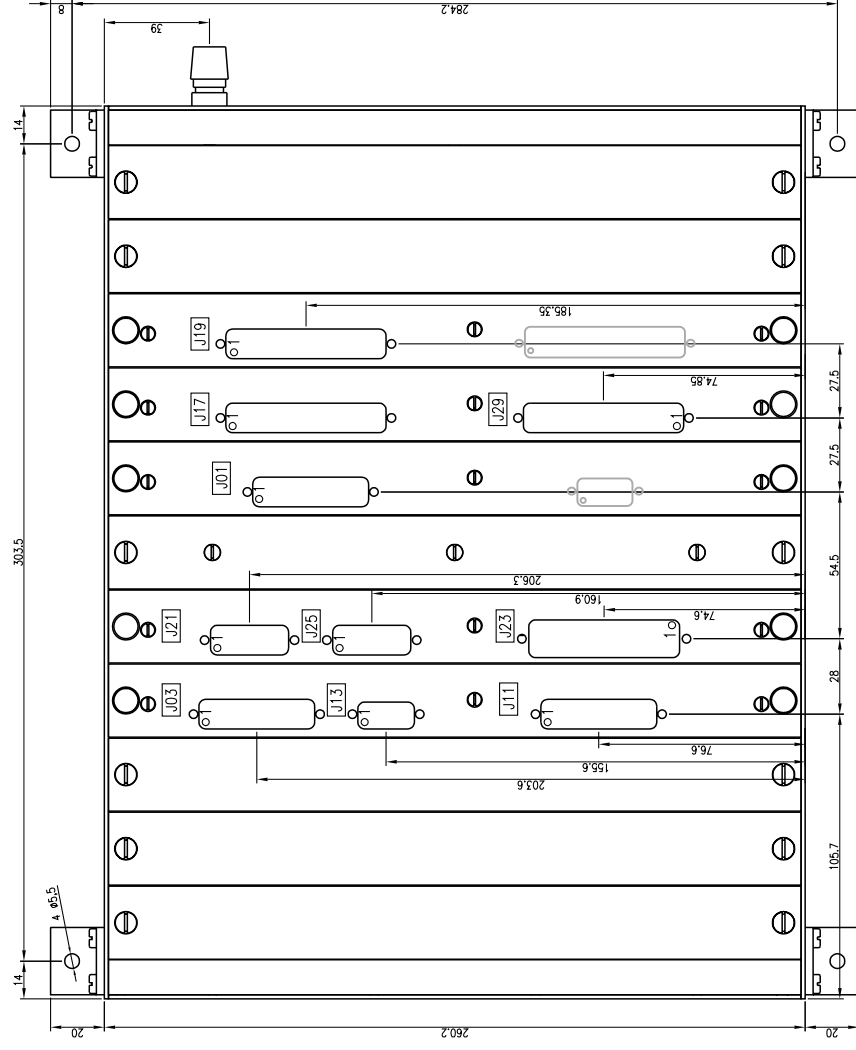
Modèle 1200

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.



IDENT	TYPE	FUNCTION	CONNECTORS	TYPE	FUNCTION
J01	DBMA 25S	MAC/DPU	J21	DAMA 15S	TEMP/FPU-TS-1
J03	DBMA 25S	CCHK-I/F/DPU	J23	DDMA 50S	TEMP/FPU-TS-2
J11	DBMA 25S	CCHK-I/F/FPU-COOL-CAL	J25	DAMA 15S	TEMP/FPU-MEC-TS
J13	DEMA 9S	CCHK-I/F/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/YETTE Cedex

MATIERE : Alu 2017A
PROTECTION :
TRAITEMENT : SREÉ
ALODINE 1200
DATE : 08/09/03

VERIFIE :
VCSA :

CE DOCUMENT EST LA PROPRIETE DE LA SOCIETE CEA ET NE PEUT ETRE REPRODUIT OU COMMUNIQUE SANS AUTORISATION ECRIE

ECHELLE : 3/4
TOLERANCES GENERALES : ±0.2
Ro 1.5

DESIGNATION
ICD HS FCU/QM1

SPIR-MX-5201 000 C 0 A1

Drawing A1-5264-300 Change List

ISSUE 19

SHEET	MODIFICATION
All Sheets	Level '0' Cold Straps and relevant Dimensions updated.
All Sheets	JFETS and relevant dimensions updated.
1	Mass Properties updated.
1	Dim 202.00 (HOB datum to SPIRE focal plane) "CRYOGENIC" added.
1	Note "SPIRE AXES ETC" - word "DIRECTIONS" added.
1	Level '0' Straps - max rads. added.
3	Optical Beams note added.
3	Optical beam dims note "STAY OUT AREA" note modified.
4	"+ RUNNING TORQUES" added to interface torque figures.
4	Temperature sensor holes added.
5	Notes wrt Level '0' interfaces to S/C modified/deleted/added.
5	Torques for Level '0' straps deleted - note "TORQUE AS SPECIFIED BY ASTRUM" added.
5	Level '1' fixings torques - "+ RUNNING TORQUES" added.
5	Temp sensor/Level '0' fixings modified
6	JFET Harness zone dimensions modified.
7	PACS & HIFI labelled.

ISSUE 18

SHEET	MODIFICATION
1	Mass properties updated to the latest sub system estimates/measured masses. No mass received for the harnesses (A guess in the model)
1	No weighed masses for Busbar Supports, Light traps, SCAL (Cardiff), SMEC (LAM) and SOB Harness, Photo BDA, Spectro BDA (Techdata)
1	Notes, "Work in Progress" referring to BDA connector panels deleted
1	Note WRT Aperture cover added
1	Notes WRT surface finish at L0 and L1 interfaces added
1	Aperture cover added
1	BDA connector flanges updated
2	Pictorial changes WRT BDA connector flanges ad aperture cover to reflect sheet 1
3	Pictorial changes WRT BDA connector flanges ad aperture cover to reflect sheet 1
4	Pictorial changes WRT BDA connector flanges ad aperture cover to reflect sheet 1
5	Surface roughness on L0 straps added with "BY VISUAL INSPECTION ONLY" note
5	Gold finish on L0 straps
5	Surface roughness and Achrom 1200 finish note added for L1 straps
5	M4 Torques were 1.26 Nm
6	"Work in progress" notes wrt BDA connector panels deleted
6	Note reminding that M4 grounding hole does not have a locking insert fitted added
6	Dims to BDA connectors added
7	Pictorial changes WRT BDA connector flanges ad aperture cover to reflect sheet 1

ISSUE 17

SHEET	MODIFICATION
1	RF Filter Connector numbers added
1,2,3	Cryostat hole diameter was 270mm
1	Spire axes coincident with Spacecraft axes - note added
1	Reference cube to be dismounted after installation on spacecraft - note added
1	Dimension to 'A' Frame top pin centre added
1,3	Redundant dimensions deleted
1	Level 1 grounding strap positions moved and applicable note modified
1	'Alternative Level 1' note deleted
2	Beams removed bottom LH view
3	Optical reference cube note modified - reference to A3/5264/305-6 added
3	Beam angle added (Bottom LH view)
3	'Cryogenic' added to two dimensions
ALL	'UNLESS OTHERWISE SPECIFIED' added to note wrt. 'ALL DIMENSIONS AT ROOM TEMPERATURE'
3	Dimension to top of reference cube added
3	Note stating U/S of SOB is Yu & Zu Optical Datum Deleted
4	Front mounting cone centre - positional tolerances added
4	SPIRE interface bolt material and torques added
5	Level '0' cold strap interfaces modified. Bolt types, torques and Belleville types added.
7	Beam clearance dimension 0.92 reviewed
1	Note WRT clearance between FPU and Inner Shield Added
1,2,3	Cryostat Inner shield updated
5	"Stay Out" zone around Level '0' straps added

ISSUE 16

SHEET	MODIFICATION
2	JFET note modified.
1	Dimensions over Blade Mounts added.
1	'Zu' axis added. Spacecraft co-ordinates note added.
1	"Optical Datum Pin" note deleted.
4	Mounting referencing hole added (fixed mounting).
2	Section description note changed.
3	10 mm mechanical clearance zone deleted.
3	Shaded optical beams extended.
3	Note wrt. Beam dimensions added.
3	Reference cube angular mounting ad absolute accuracy note added.
4	Floating details removed.
4	Alignment of HOB wrt. Herschel to permit Spire to be aligned.
5	Unit axes added.
5	Cold Straps detail deleted (saved on new drawing A1/5264/300A).
5	JFET thermal Interfaces note added. External to MSSL note added.
5	HSPFU thermal finishes added. Note wrt. JFET thermal interfaces added.
6	Electrical isolation note wrt. Cold straps added.
1	Mass updated. Moments of Inertia added.
4	FPU mounting cone interface holes modified.
4	Contact area of FPU interface Vespel insulators added.
4	Note wrt. HOB flatness and tilt to Herschel X Axis added.
5	Detail of FPU internal Level '0' straps deleted - Now on drawing A1/5264/300A
6	JFET harness "Stay Out" zones added.
7	FPU cone to PACS clearance dimension added.
ALL	BDA- Obsolete harness feedthroughs deleted.
2	Addition of RF Filter connector numbers

DRAWING No.

A15264300sht1

USED ON
HERSCHEL

THIRD ANGLE PROJECTION
PACS OUTLINE

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

CRYSTAT WALL 815.00 INNER RAD

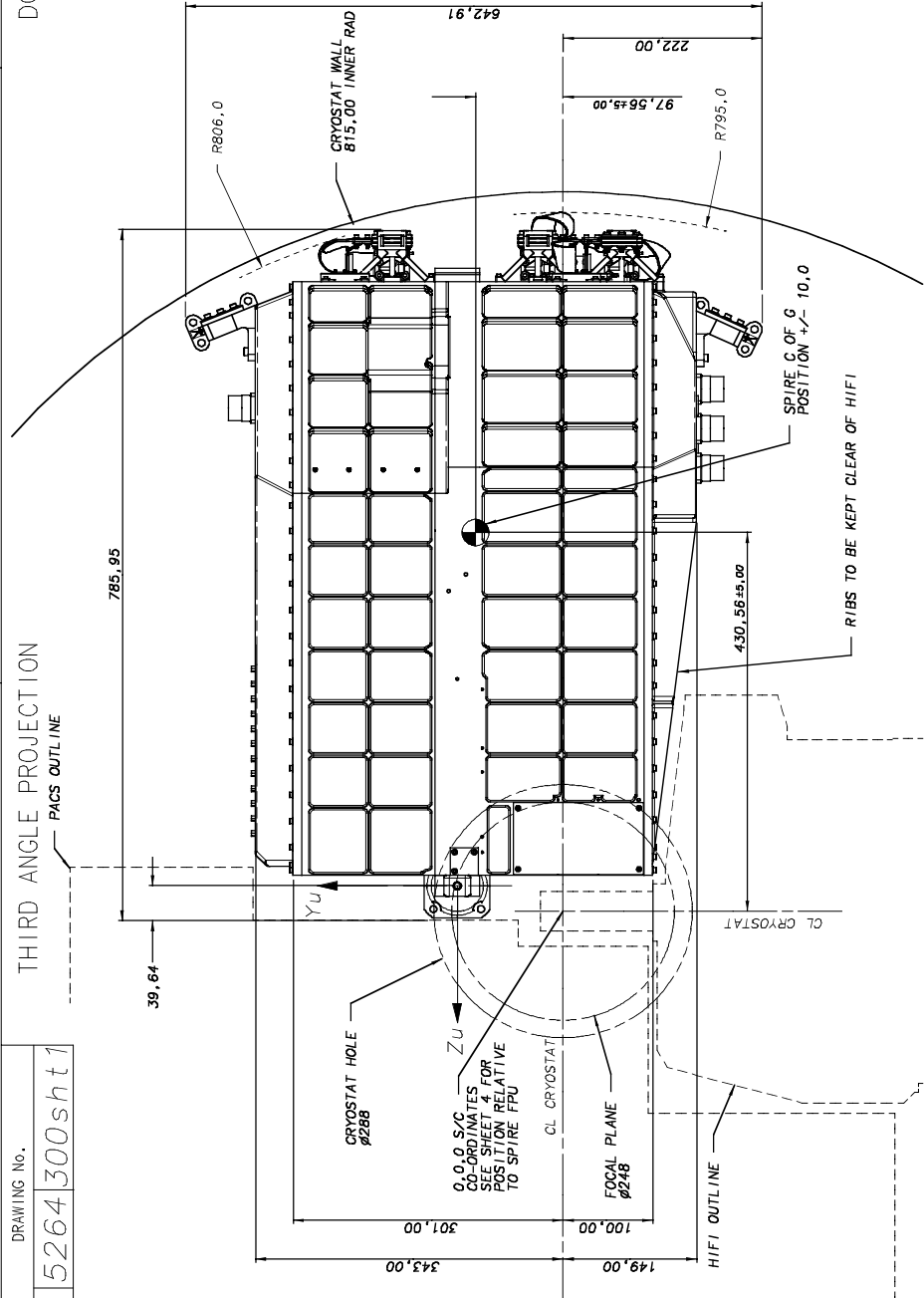
SPIRE GROUNDING STRAP ATTACHES HERE (ALOCROM 1200 SURFACE) SEE SHEET 6

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

NOTE:-

SPIRE AXES DIRECTIONS COINCIDE WITH S/C AXES

SEE SHEET 4 FOR DETAILS OF INTERFACE FIXINGS

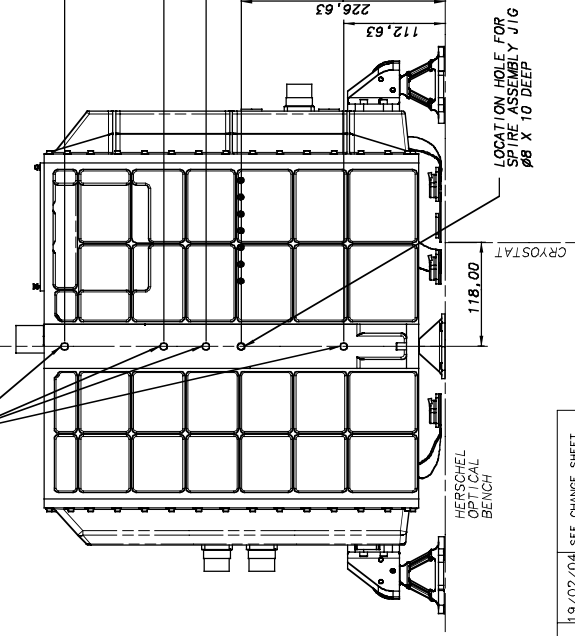


MOMENTS OF INERTIA ABOUT CG:-

(NOTE:- ALL MASS PROPERTIES EXCLUDE WEIGHTS, EXCEPT WHERE SPECIFIED IN SUPPLIED LEVEL 10 INTERFACE PARTS)

$I_{xx} = 3.056 \text{ kg m}^2$
 $I_{yy} = 3.056 \text{ kg m}^2$
 $I_{zz} = 1.559 \text{ kg m}^2$
(MASS 46.18 kg)

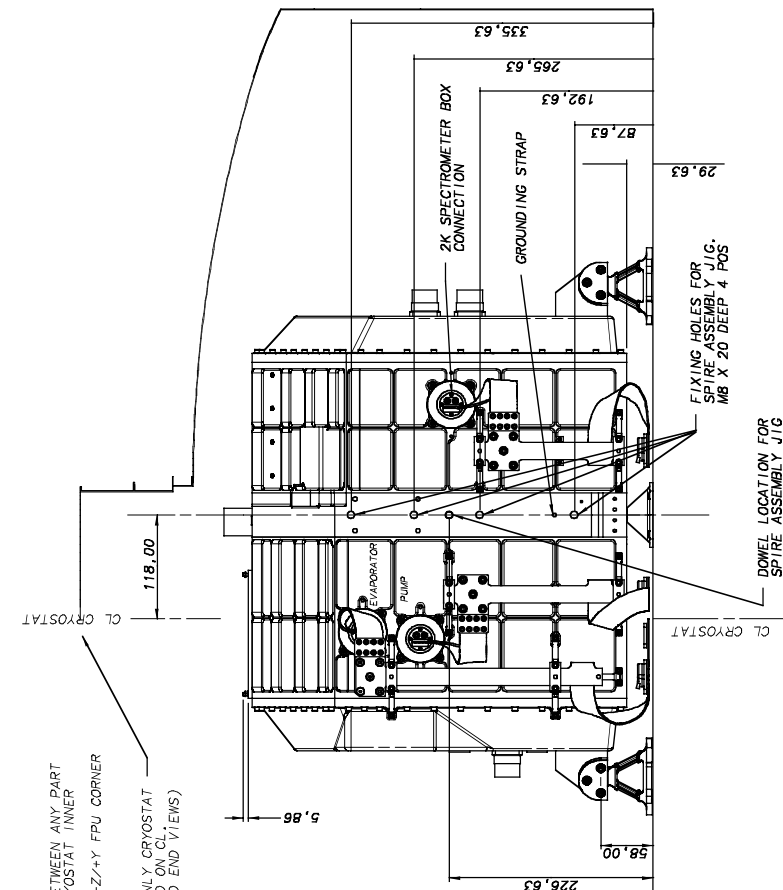
FIXING HOLES FOR SPIRE ASSEMBLY JIG. M8 X 20 DEEP 4 POS



IMPORTANT :-

MINIMUM CLEARANCE BETWEEN ANY PART OF SPIRE FPU AND CRYSTAT INNER SHIELD TO BE 10mm (8.9mm ACCEPTED AT -Z+Y FPU CORNER ONLY)

NOTE:- ONLY CRYSTAT SECTION AND END VIEWS (SIDE AND END VIEWS)



CHECKED

TRACED
PBG

DRAWN
AJC

ISSUE

DATE

AMENDMENT

1

24/11/01

COMPUTER FILE

SPIRE FLIGHT

ASSEMBLY

FILE

NOTE :-

SEE CHANGE SHEET 17
 16/10/02 SEE CHANGE SHEET
 17 16/10/02 SEE CHANGE SHEET
 18 4/07/03 SEE CHANGE SHEET
 19 19/02/04 SEE CHANGE SHEET

SEE CHANGE SHEET

SEE CHANGE SHEET

SEE CHANGE SHEET

SEE CHANGE SHEET

SEE CHANGE SHEET

SEE CHANGE SHEET

SEE CHANGE SHEET

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

PROTECTIVE FINISH
 ALOCROM 1200
 (ST-STEEL PARTS
 NATURAL)

ESTD WT. 45.6kg (NO. COPY)
 ACTL WT. SEE NOTE 16

ACTL WT. SEE NOTE 16

MATERIAL & SPEC.
 AS LISTED

DIMENSIONS IN mm

SCALE 1:4

TOLERANCES UNLESS OTHERWISE STATED -
 LINEAR +/- 1.0
 ANGULAR +/- 0.15

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 DORKING, SURREY.

TITLE
 SPIRE INTERFACE
 (GENERAL DIMENSIONS)

DRAWING No
 A15264300sht1

SHEET 1 OF 7

DRAWING No.

A1 5264 300sht2

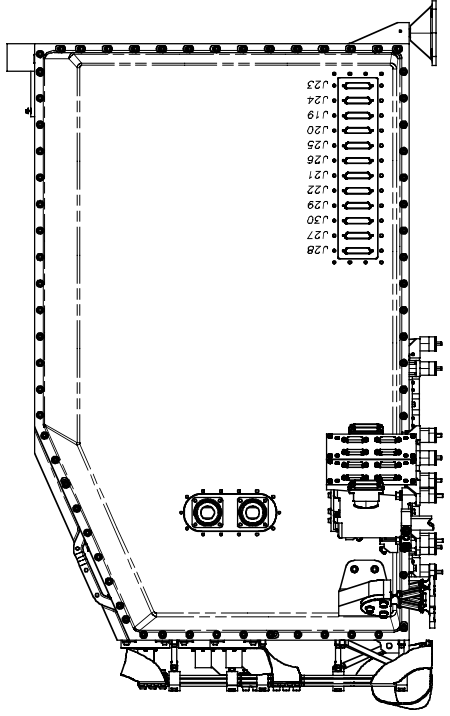
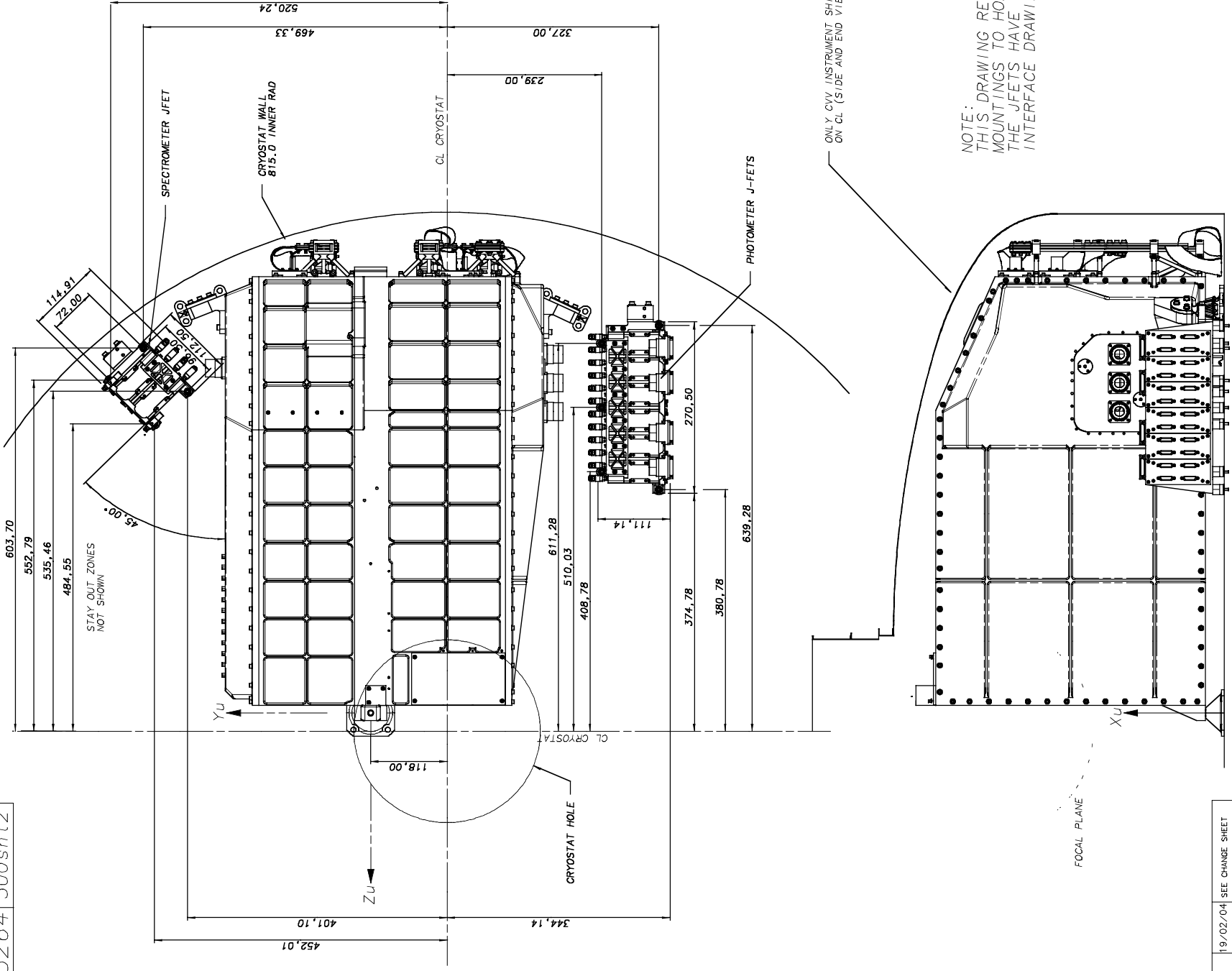
USED ON
HERSCHEL

THIRD ANGLE PROJECTION

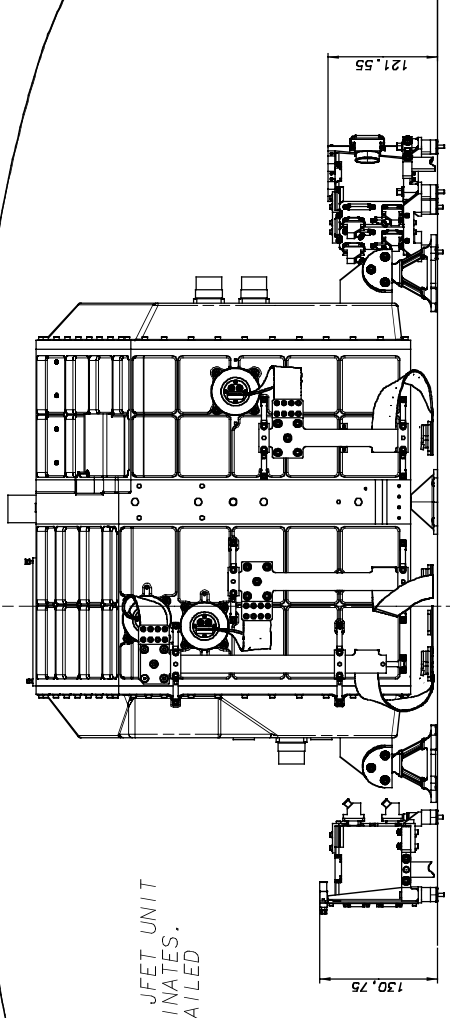
DO NOT SCALE

NOTE: -

1. ALL DIMENSIONS AT ROOM TEMPERATURE



SPECTROMETER SIDE
(VIEWED IN -YU DIRECTION)



PHOTOMETER SIDE

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

19	19/02/04	SEE CHANGE SHEET
18	4/07/03	SEE CHANGE SHEET
17	16/10/02	SEE CHANGE SHEET
16	28/08/02	FIXING HOLES 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 PFT FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & 'A' FRAME MOUNT B/N ADDED. SHEET 7 ADDED.
ISSUE	DATE	AMENDMENT
1	24/11/01	SPiRE FLiGHT Assemb/100 COMPUTER FILE

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

PROTECTIVE FINISH
ALCOOROM 1200
(ST. STEEL PARTS
NATURAL)
ESTD WT. 45.63kg (NO CONV)
ACTL WT. SEE NOTE SHEET 1

MATERIAL & SPEC.
AS LISTED

TOLERANCES UNLESS OTHERWISE STATED -
LINEAR +/- 1.0
ANGULAR +/- 0.15°

DIMENSIONS IN mm
SCALE 1:4

TITLE
SPiRE INTERFACE
(J-FET POSITIONS)

DRAWING No

A1 5264 300sht2

SHEET 2 OF 7

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MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
DORKING, SURREY.

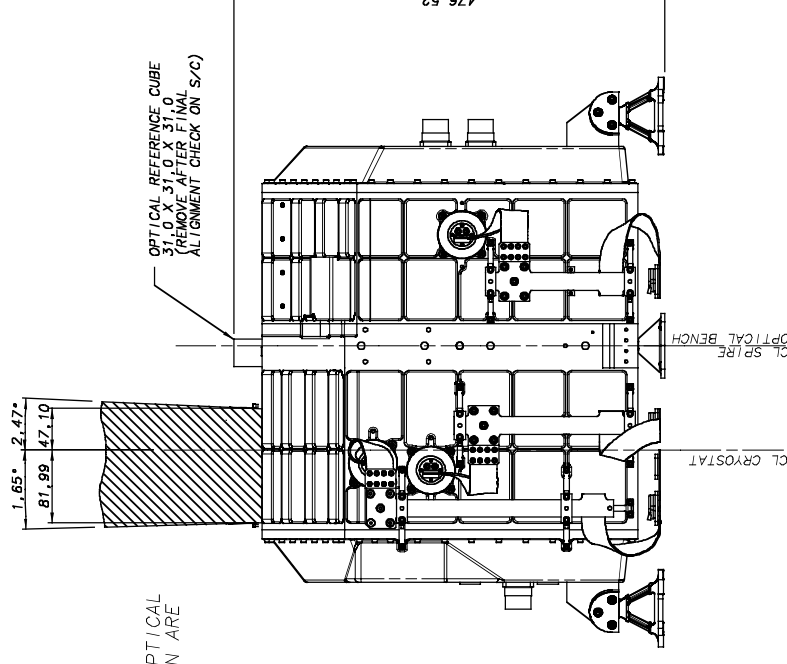
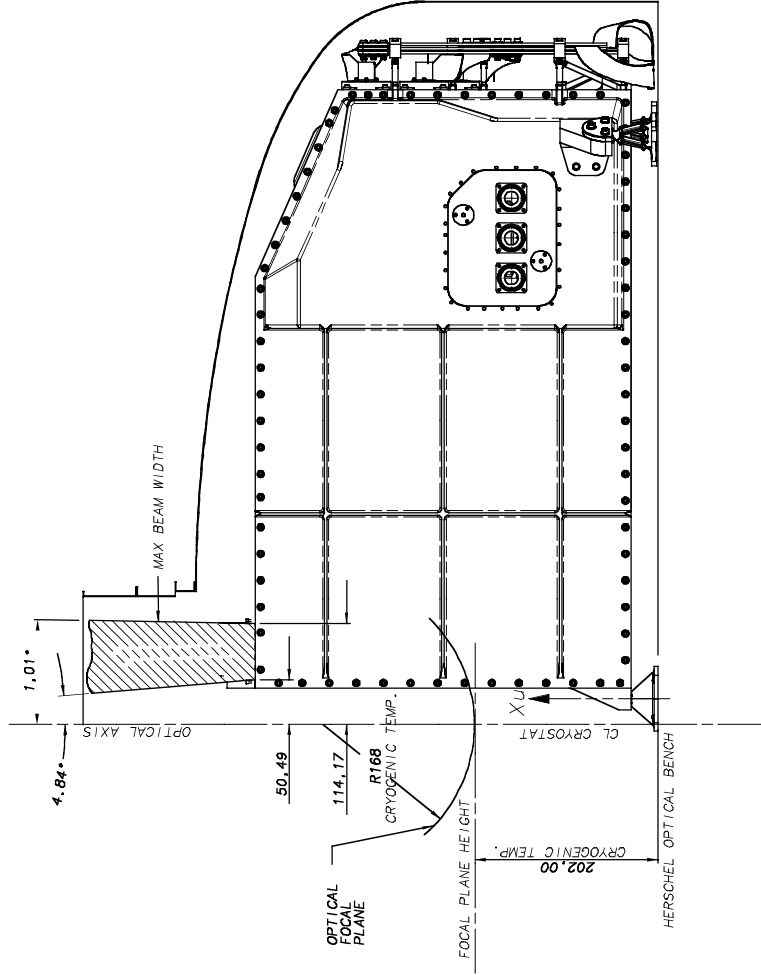
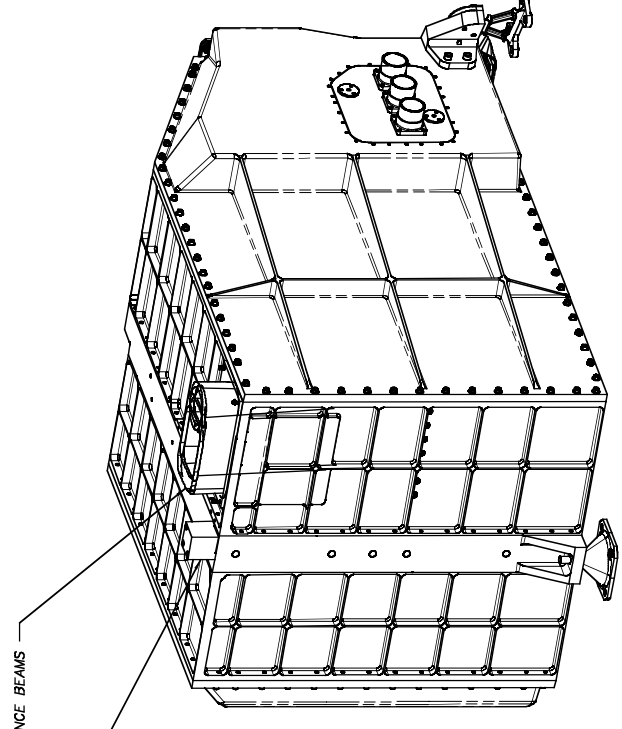
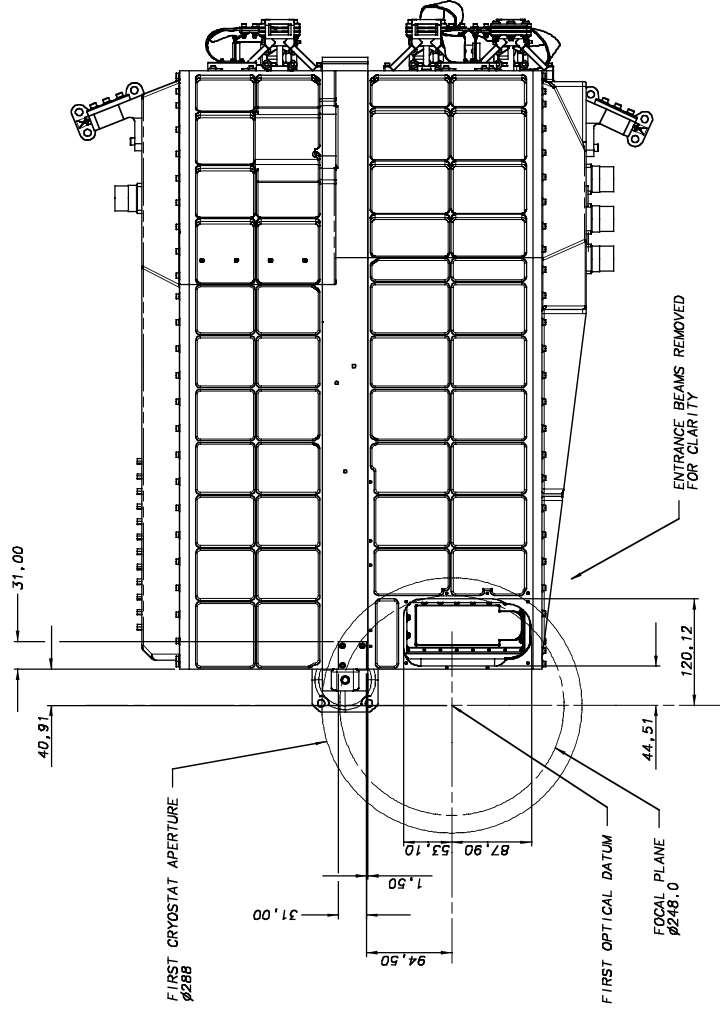
DRAWING No.

A15264 300sht3

THIRD ANGLE PROJECTION

DO NOT SCALE

USED ON
HERSCHEL



OPTICAL BEAM DIMENSIONS :-
ONLY DIMENSIONS DEFINING THE VOLUME FOR THE OPTICAL BEAMS WHICH SHALL REMAIN FREE FROM OBSTRUCTION ARE SHOWN. REFER TO IID-B FOR MORE DETAILED INFORMATION.

NOTE :-

1. ALL DIMENSIONS AT ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED

19	19/02/04	SEE CHANGE SHEET
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.
TRACED	15	27/04/01	FIXING HOLES MODIFIED. LEVEL 1 STRAP CENTRE OF GRAVITY ADDED TO SHIT 1. J-FEET DESIGN UPDATED. STAY OUT HOLES REMOVED.
PBG	14	23/11/01	UPDATED RFI FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & *A* FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
DRAWN	13	19/11/01	AMENDMENT
AJC	1	24/11/01	COMPUTER FILE

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

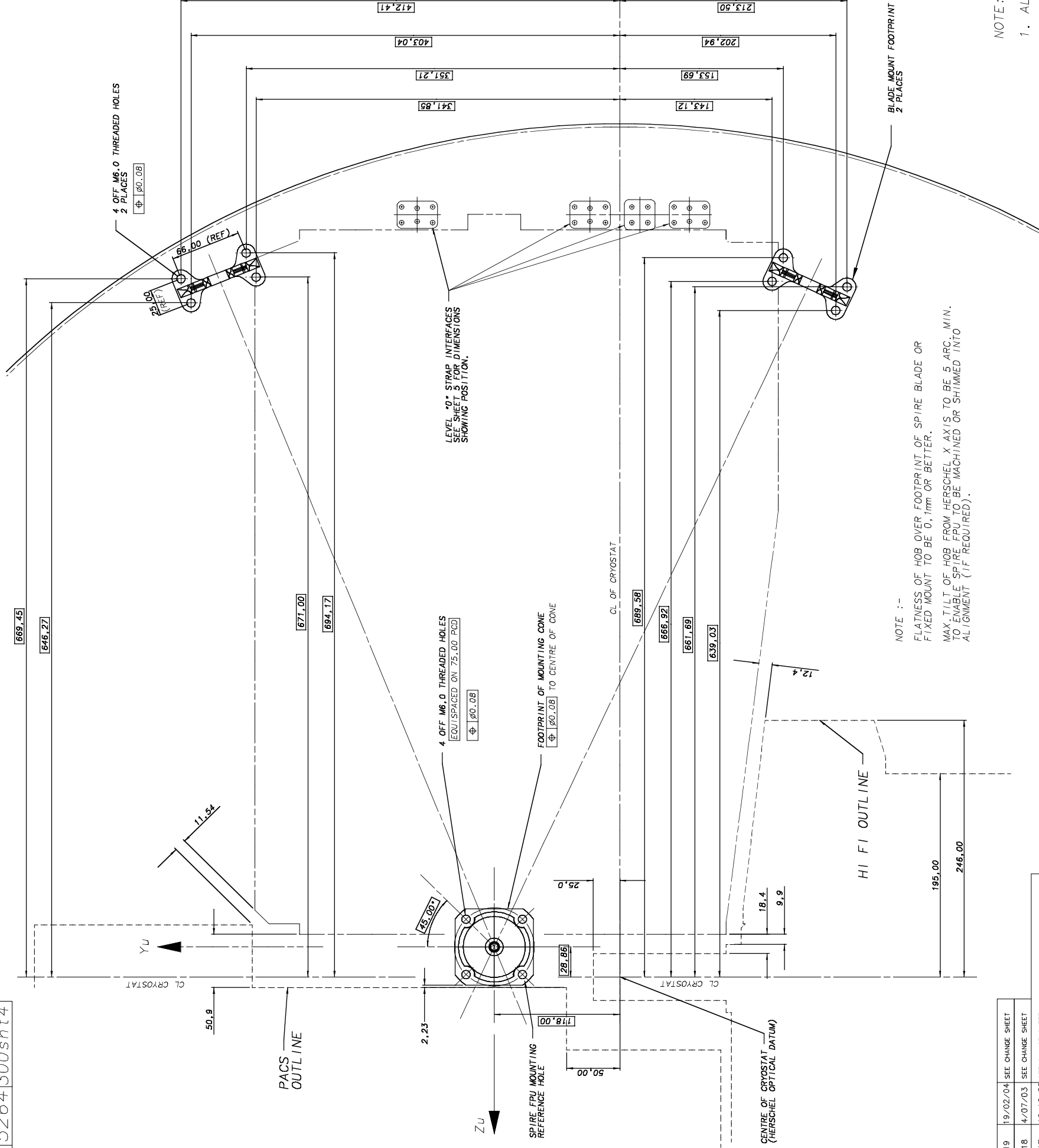
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'	MATERIAL & SPEC. AS LISTED	PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL) ESTD WT. 45.63kg (NO CONT) ACTL WT. (SEE NOTE SHIT.1)	DIMENSIONS IN mm SCALE 1:1	TITLE SPIRE INTERFACE (OPTICAL DETAILS)	DRAWING No A15264 300sht3
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DRAWING No.
A15264300sht4

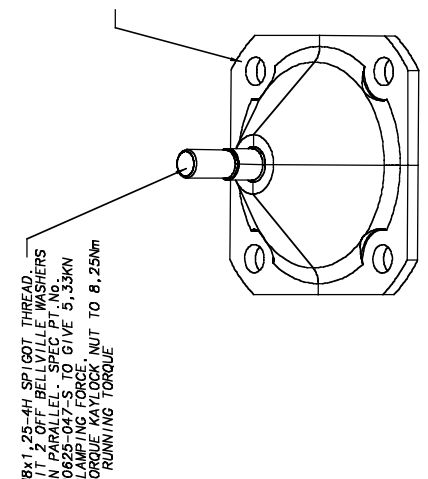
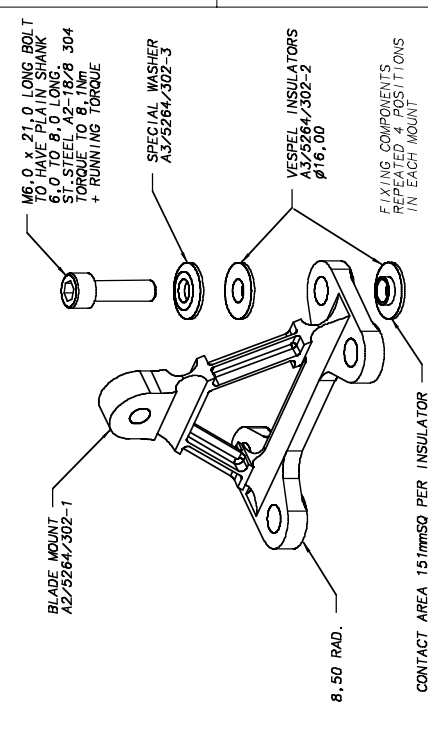
USED ON
HERSCHEL

THIRD ANGLE PROJECTION

DO NOT SCALE



NOTE :-
FLATNESS OF HOB OVER FOOTPRINT OF SPIRE BLADE OR FIXED MOUNT TO BE 0.1mm OR BETTER.
MAX. TILT OF HOB FROM HERSCHEL X AXIS TO BE 5 ARC. MIN. TO ENABLE SPIRE FPJ TO BE MACHINED OR SHIMMED INTO ALIGNMENT (IF REQUIRED).



19	19/02/04	SEE CHANGE SHEET
18	4/07/03	SEE CHANGE SHEET
17	16/10/02	SEE CHANGE SHEET
16	28/08/02	SEE CHANGE SHEET 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 SH.1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED.
13	19/11/01	UPDATED W/1 FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & 14-FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
ISSUE	DATE	AMENDMENT
1	24/11/01	SPIRE FPJ MOUNTING ASSEMBLY
DRAWN		COMPUTER FILE
AJC		

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

PROTECTIVE FINISH
ALOCROM 1200 (ST-STEEL PARTS NATURAL)

ESTD WT. 45.83kg (NO CONT)

ACTL WT.

MATERIAL & SPEC.
AS LISTED

TOLERANCES UNLESS OTHERWISE STATED -
LINEAR +/- 1.0
ANGULAR +/- 0.15

NOTE :-
1. ALL DIMENSIONS AT ROOM TEMPERATURE

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TITLE
SPIRE INTERFACE
(INTERFACE FIXING DETAILS) A15264 300sht4

DRAWING No

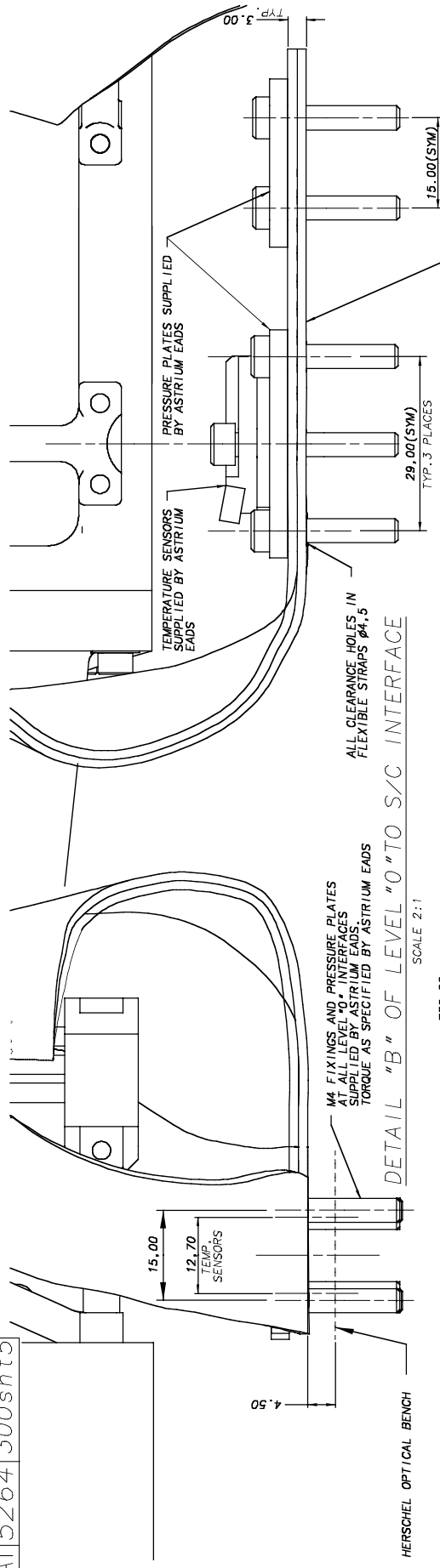
SHEET 4 OF 7

DRAWING No.
A15264 300sht5

USED ON
HERSCHEL

THIRD ANGLE PROJECTION

DO NOT SCALE



HSFPU EXTERNAL FINISHES:-
INSTRUMENT CASE AND EXTERNAL COVERS. BLADE AND FIXED MOUNTING.
EXTERNAL FIXINGS.
COLD STRAPS.

ALOCROM 1200 NATURAL ST. STEEL & CARBON FIBRE NATURAL ST. STEEL COLD PLATED

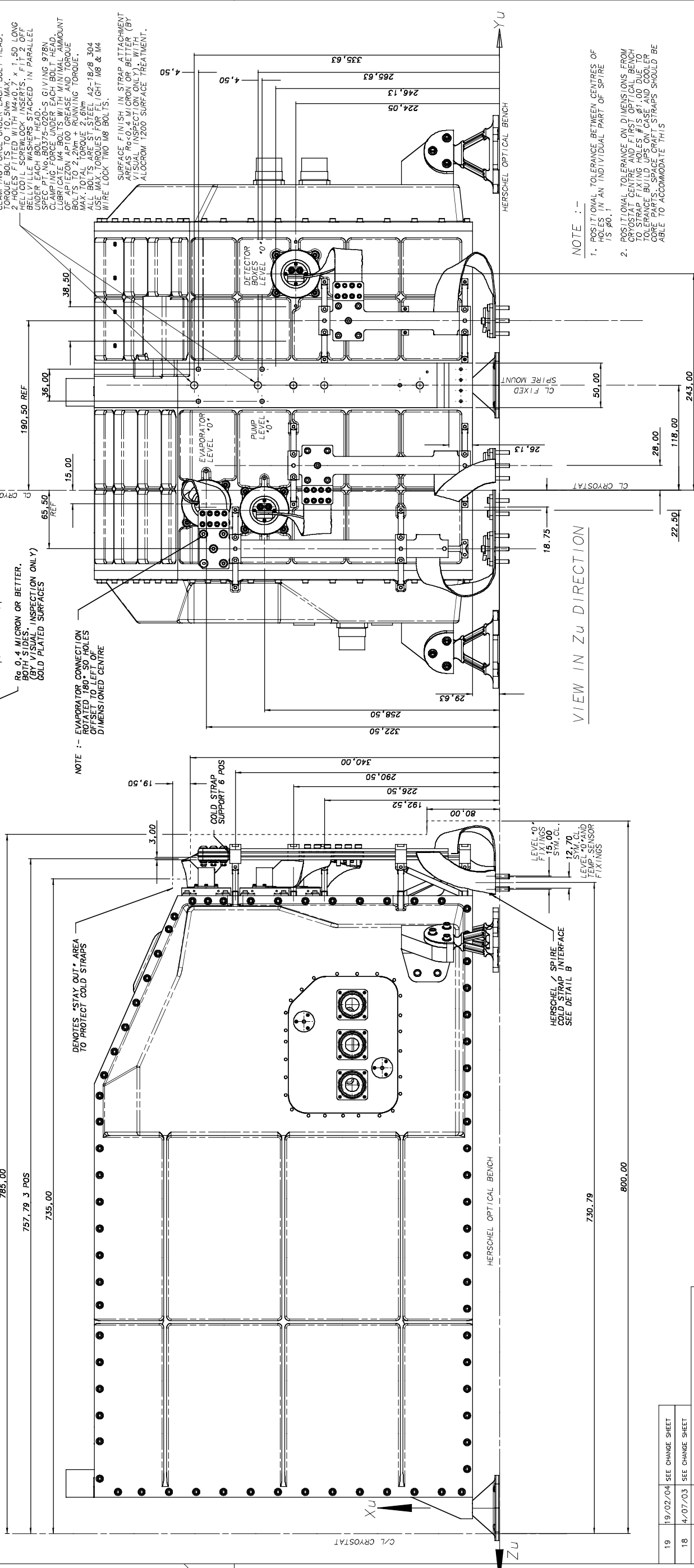
NOTE:-

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 ONE HOLE IN THE MOUNTING PLATE WITH A FULL THREAD. FULLY TIGHTENED WITH WASHER SPEC. PT. No. B0750-056-5 GIVING 3739N CLAMPING FORCE UNDER EACH BOLT HEAD. TORQUE BOLTS TO 10.5NM MAX. 2 HOLES IN SCREW LOCK INSERTS. FIT OFF BELLVILLE WASHERS STACKED IN PARALLEL UNDER EACH BOLT HEAD. SPEC. PT. No. B0375-020-5 GIVING 978N CLAMPING FORCE UNDER EACH BOLT HEAD. CLAMPING M4 BOLTS WITH MINIMAL AMOUNT OF APEIZON APT100 GREASE AND TORQUE BOLTS TO 2.2NM + RUNNING TORQUE. MAX. TOTAL TORQUE 21.0NM. USE MAX. TORQUES FOR FLIGHT M8 & M4 WIRE LOCK TWO M8 BOLTS.

SURFACE FINISH IN STRAP ATTACHMENT AREAS TO BE 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 Ø0.1
2. POSITIONAL TOLERANCE ON DIMENSIONS FROM CRYOSTAT CENTRE AND FIRST OPTICAL BENCH TO STRAP FIXING HOLES IS Ø1.00 DUE TO TOLERANCE BUILD UPS ON CASE AND COOLER MOUNTING. COLD STRAPS SHOULD BE ABLE TO ACCOMMODATE THIS

19	19/02/04	SEE CHANGE SHEET
18	4/07/03	SEE CHANGE SHEET
17	16/10/02	SEE CHANGE SHEET
16	28/08/02	SEE CHANGE SHEET
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 RPT FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & 'A' FRAME MOUNT DIM. ADDED. SHEET 7 ADDED.
ISSUE	DATE	AMENDMENT
1	24/11/01	

NOTE :-
SEE CHANGE SHEET FOR DETAILS OF CHANGES MADE FROM ISSUE 16 ONWARDS
NOTE :-
ALL DIMENSIONS AT ROOM TEMPERATURE

PROTECTIVE FINISH
ALOCROM 1200 (ST. STEEL PARTS NATURAL)

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

ACTL WT.

MATERIAL & SPEC.
AS LISTED

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

SCALE 1:2 & 1:1

DIMENSIONS IN mm

COMPUTER FILE

DEPARTMENT OF SPACE AND CLIMATE PHYSICS
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TITLE
SPIRE INTERFACE
(THERMAL STRAP CONNECTIONS)

DRAWING No
A15264 300sht5

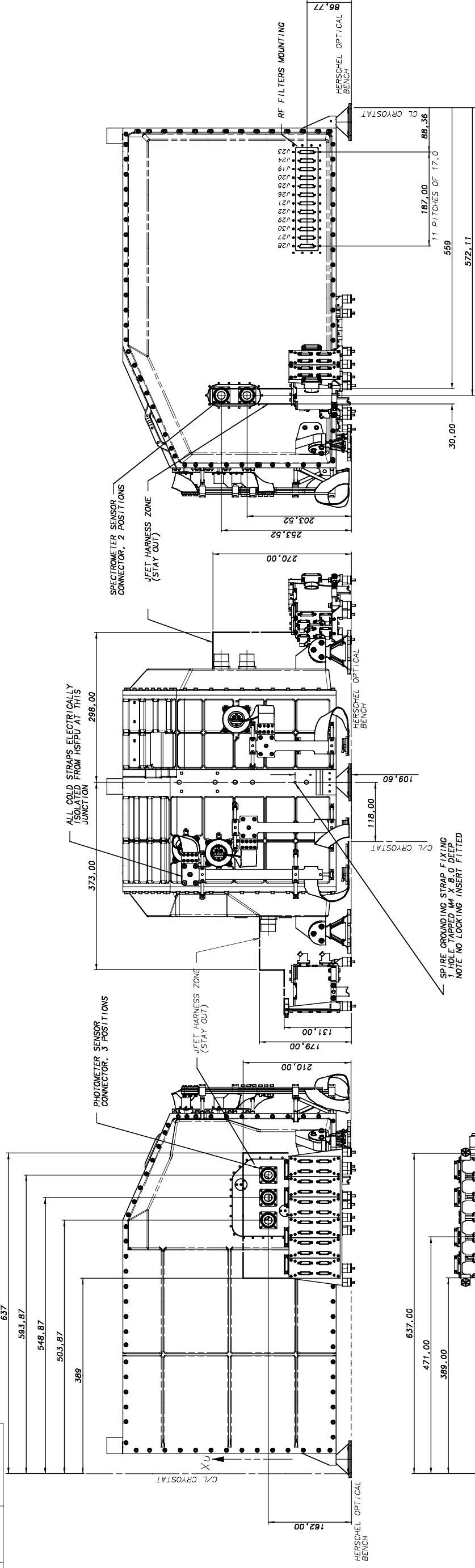
SHEET 5 OF 7

DRAWING No.

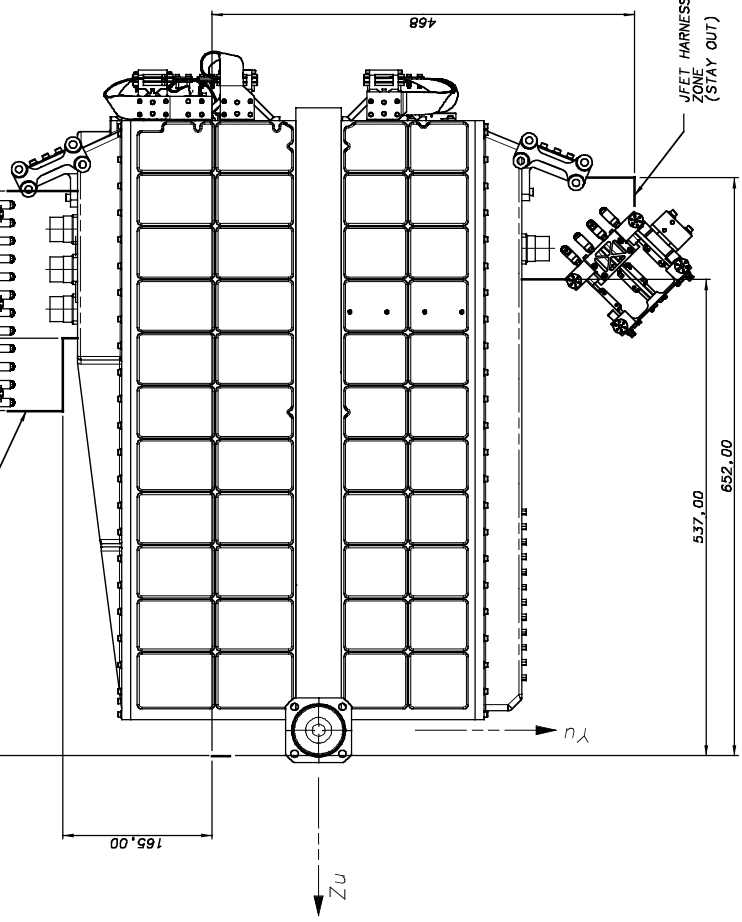
A15264 300 sht6

THIRD ANGLE PROJECTION

DO NOT SCALE



NOTE: -
1. ALL DIMENSIONS AT ROOM TEMPERATURE



VIEW ON Xu (UNDERSIDE OF SPIRE)

ISSUE	DATE	AMENDMENT
1	24/11/01	

19	19/02/04	SEE CHANGE SHEET
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	FIXING HOLES POSITION MODIFIED. LEVEL 1 STRAP CENTRE OF GRAVITY ADDED TO SHIT 1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED.
14	23/11/01	UPDATED RF1 FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & 'A' FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
13	19/11/01	

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

CHECKED	19/02/04	SEE CHANGE SHEET
TRACED	19/02/04 <td>SEE CHANGE SHEET</td>	SEE CHANGE SHEET
PBG	19/02/04 <td>SEE CHANGE SHEET</td>	SEE CHANGE SHEET
DRAWN	19/02/04 <td>SEE CHANGE SHEET</td>	SEE CHANGE SHEET
AJC	19/02/04 <td>SEE CHANGE SHEET</td>	SEE CHANGE SHEET

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

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MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,
DORKING, SURREY.

TITLE	DRAWING No
SPIRE INTERFACE (ELECTRICAL)	A15264 300 sht6

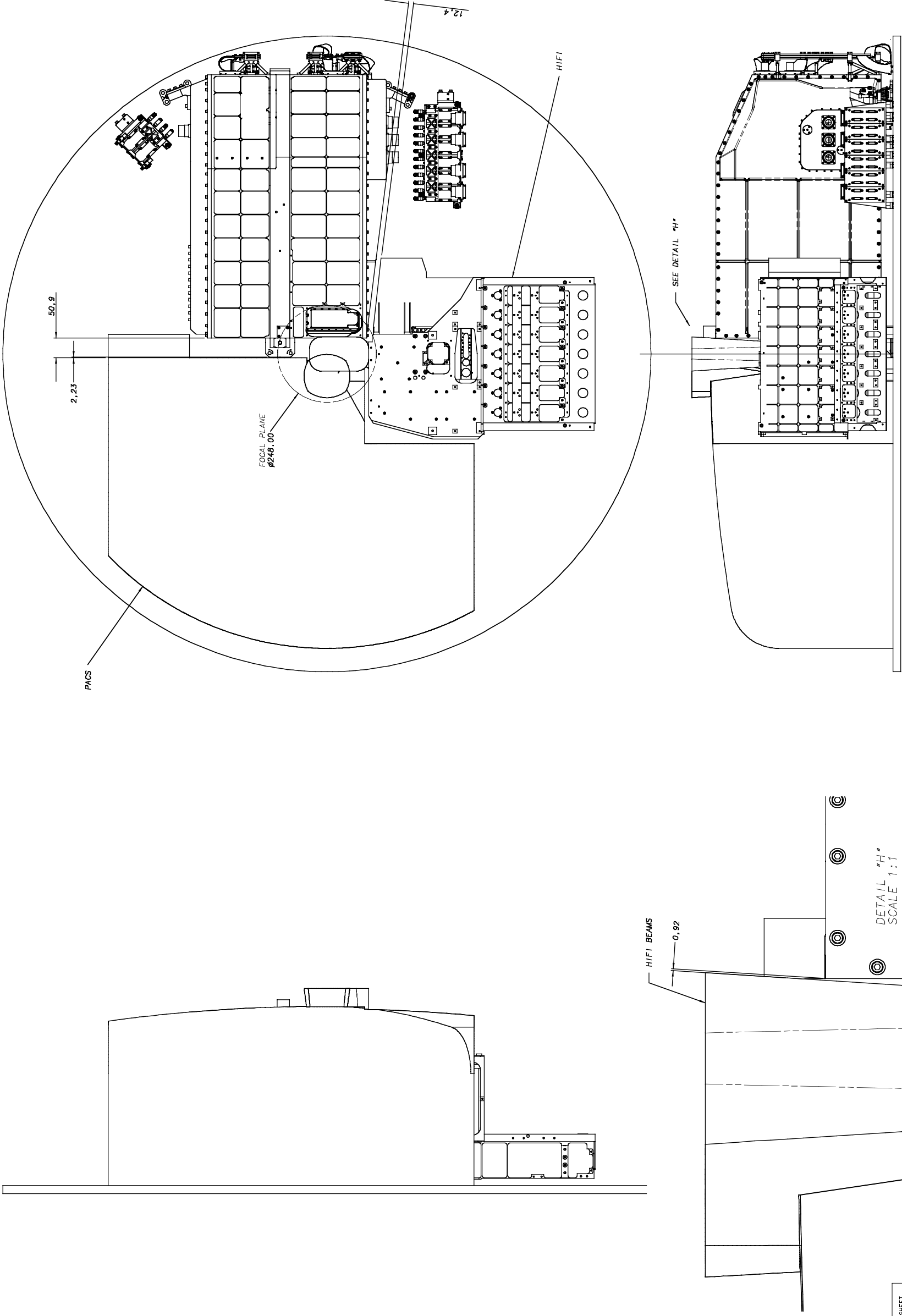
DRAWING No.

A1 5264 300sht7

THIRD ANGLE PROJECTION

DO NOT SCALE

USED ON
HERSCHEL



19	19/02/04	SEE CHANGE SHEET
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.
TRACED	15	27/04/01	FIXING HOLES MODIFIED. LEVEL 1 STRAP CENTRE OF GRAVITY ADDED TO SHIT 1. J-FEET DESIGN UPDATED. STAY OUT HOLES REMOVED.
PBG	14	23/11/01	UPDATED RFI FILTER & PHOTO CONNECTORS ADDED. FOCAL PLANE & "A" FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
DRAWN	13	19/11/01	AMENDMENT
AJC	1	24/11/01	

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

PROTECTIVE FINISH	ALOCROM 1200 (ST. STEEL PARTS NATURAL)
ESTD WT.	45.63kg (NO CONT.)
ACTL WT.	

MATERIAL & SPEC.	AS LISTED
TOLERANCES UNLESS OTHERWISE STATED -	
LINEAR	+/- 1.0
ANGULAR	+/- 0°15'

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.: ISOPFORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 1 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-360		
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		
KE-2952		

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.Barke 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.Barke 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, MOI 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: Kevin Burke
KE-2952	

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.: ISOPFORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 4 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-360		
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		
KE-2952		

Date:	20-May-2003
NCR/ECR:	
Modification Description:	Added note to size of tapped holes for attachment of cooling strap (L-12) 2 HOLES M4x0.7 L5D LG HELICOIL FASTER TO ENGAGE L5d TORQUE NOT TO EXCEED 2.5Nm
Issue raised to:	H By: Kevin Burke
KE-2952	

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.: ISOPFORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 2 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-360		
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		
KE-2952		

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 - "...dimension and to compensate for actual Jfet module sizes..." and append note 2 with "pads on item 3 will also need matching 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 2.1 Nm above locking insert running torque 13. add note 6 " fitted back harness to afford open access to 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
KE-2952	

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.: ISOPFORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 5 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-360		
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		
KE-2952		

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 J/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
KE-2952	

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.: ISOPFORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 3 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-360		
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		
KE-2952		

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
KE-2952	

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.: ISOPFORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 6 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-360		
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		
KE-2952		

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
KE-2952	

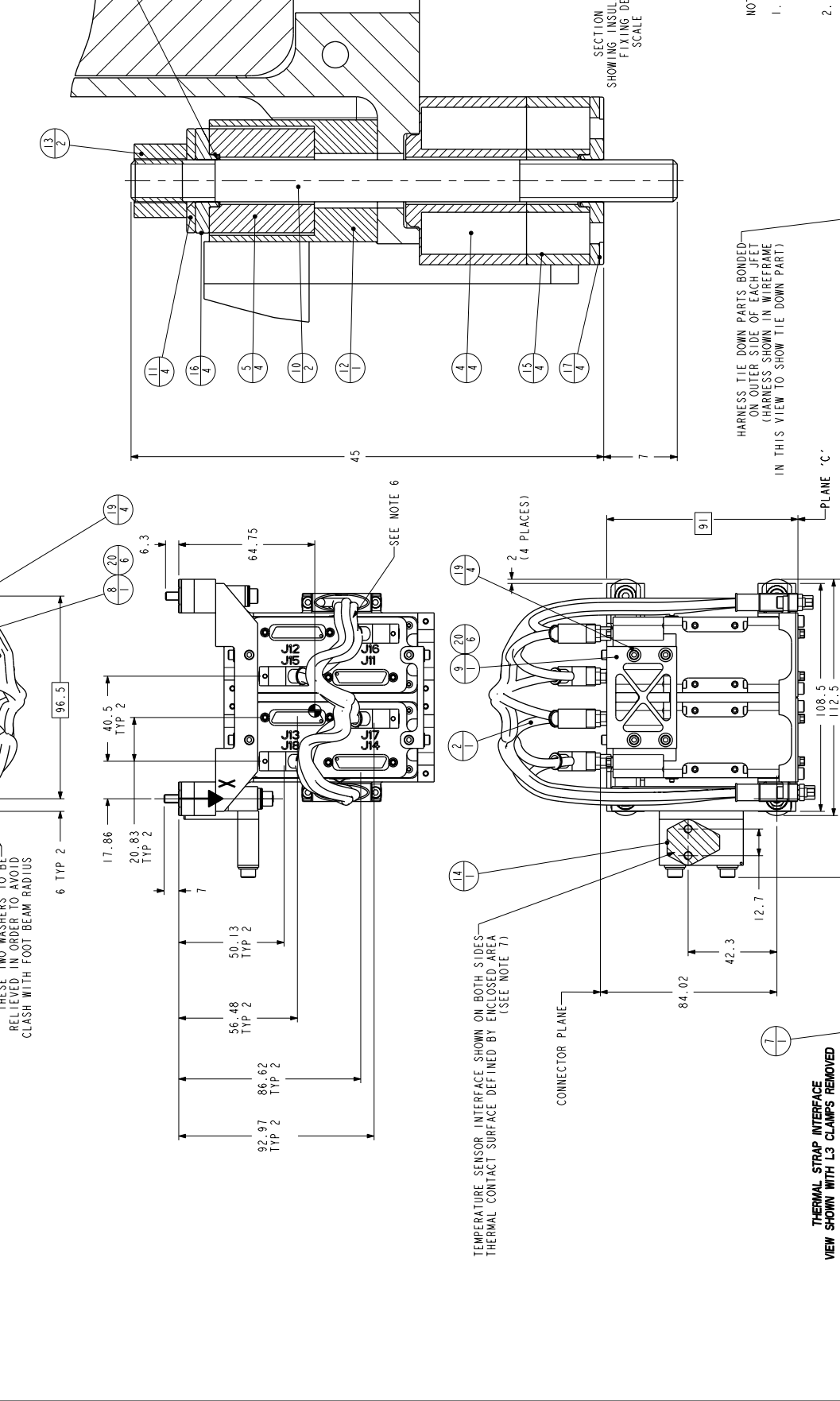
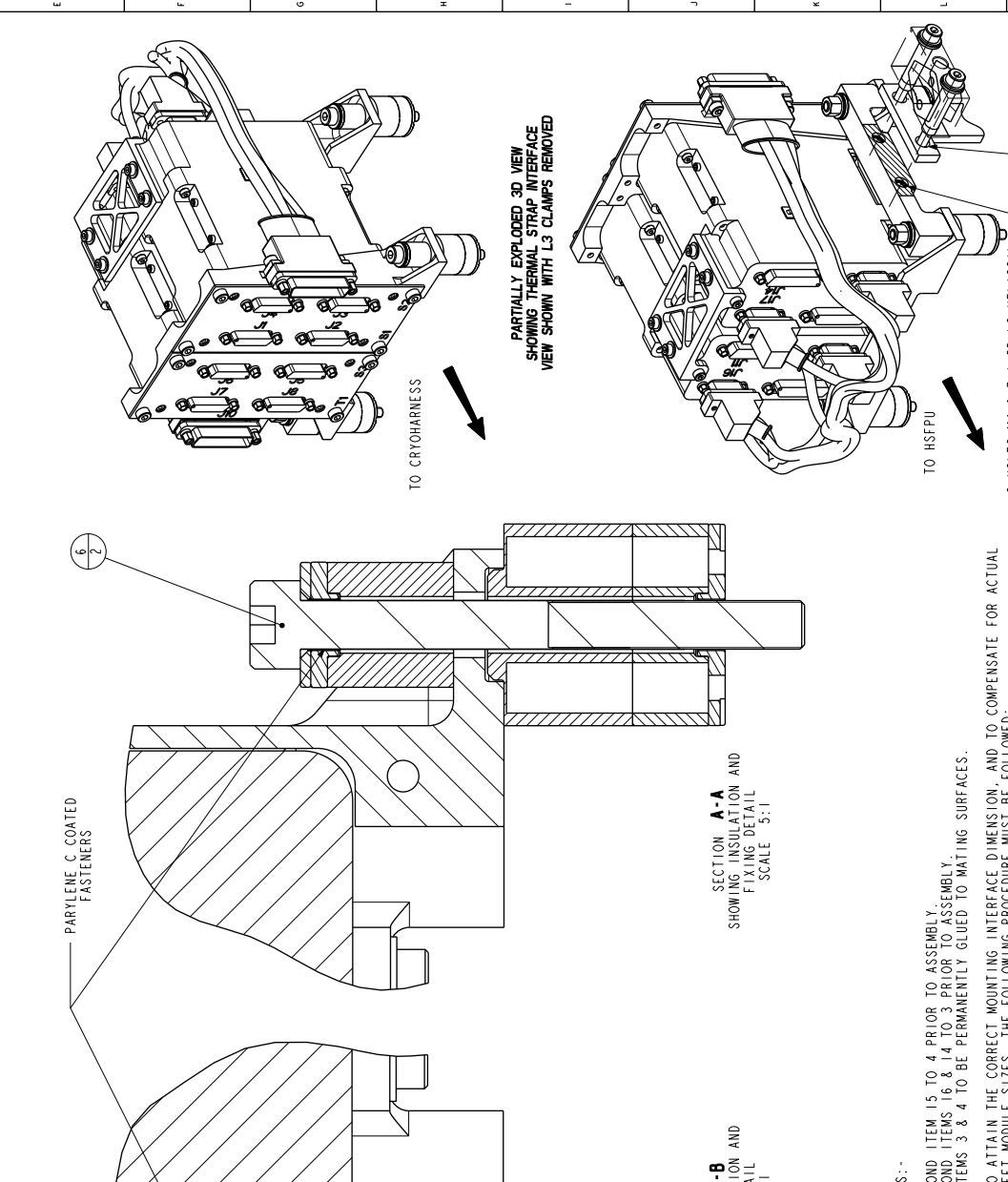
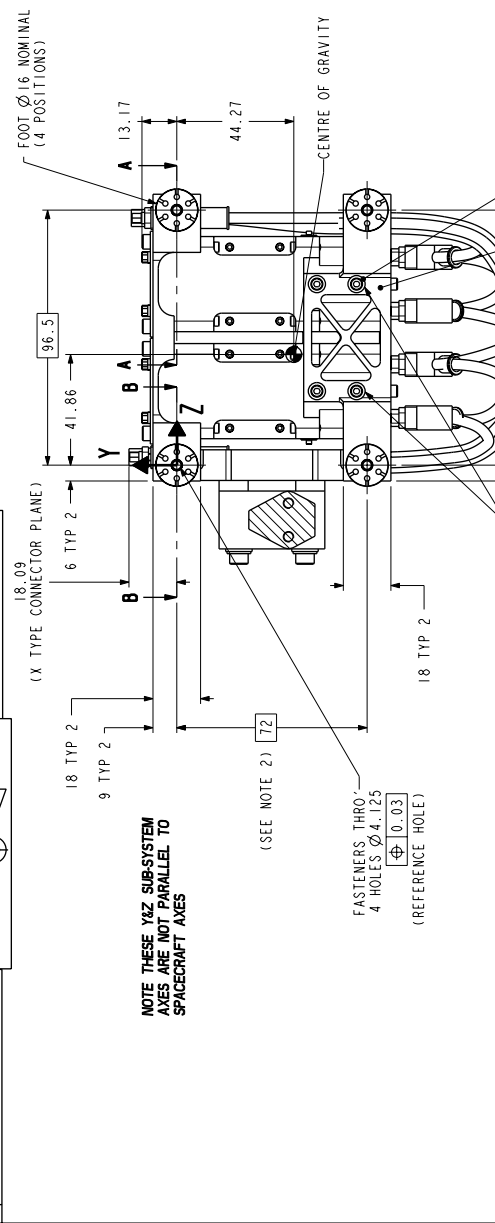
2003.11.12
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ITEM PART NO.	DESCRIPTION	QTY	MASS / ITEM	TOTAL MASS	COMMENTS
1	23836-10209722	2	260.00	520.00	JFET MODULE
2	2 JFET-HARNES	1	216.95	216.95	JPL SUPPLY
3	HARNES-CLIP	2	1.70	3.40	
4	KE-0104-354	4	0.87	3.48	STEPPED THERMAL STANDOFF
5	KE-0104-355	4	4.70	18.80	TOP THERMAL STANDOFF
6	KE-0104-358	2	4.70	9.40	M4 BOLT (PARTYLENE C COATED 26.5mm)
7	KE-0104-361	1	48.01	48.01	FRONT PLATE - 2 JFET
8	KE-0104-362	1	33.50	33.50	REAR FOOT BEAM - 2 JFET
9	KE-0104-363	1	8.53	8.53	REAR TOP BEAM - 2 JFET
10	KE-0104-365	2	5.08	10.16	M4 STUD (PARTYLENE C COATED)
11	KE-0104-367	4	0.39	1.56	THERMAL STANDOFF WASHER
12	KE-0104-368	1	23.28	23.28	THERMAL STRAP ASSY - 2 JFET
13	KE-0104-366	2	1.31	2.62	M4 NUT (5mm LONG)
14	KE-0104-393	1	64.18	64.18	L3 INTERFACE ASSY
15	KE-0104-397	4	0.94	3.76	THERMAL STANDOFF BUSH
16	KE-0104-398	4	0.14	0.56	FOOT UPPER WASHER
17	KE-0104-399	4	0.34	1.36	FOOT LOWER WASHER
18	L3-STRAP-A	1	N/A		L3 STRAP
19	M2-5-WASHER	1	N/A		WASHER
20	M2-5-X-8LG.CPHD.SKT.SS	12	0.58	6.96	FASTENER
21	M3-X-8LG.CPHD.SKT.SS	8	0.74	5.92	FASTENER

ASSEMBLY MASS 967.84 GRAMS

CONNECTOR TABLE	
LABEL	FUNCTION
J1	
J2	
J3	
J4	
J5	
J6	
J7	
J8	
J9	
J10	
J11	
J12	
J13	
J14	
J15	
J16	
J17	
J18	

MOMENTS OF INERTIA (kg-m²) WITH RESPECT TO C.O.G.
I_{xx} 1.71e+03
I_{yy} 1.94e+03
I_{zz} 2.31e+03



ISSUE	DATE	MOD. NO.	FINISH	APPD.	STATUS
J	12-Nov-03	KE-2952	D. SMART		ISSUED

TOLERANCES UNLESS STATED
±0.2mm
±0.3

MATERIAL & SPEC. SEE DETAILS
SURFACE TEXTURE RM UNLESS STATED

REMOVE ALL BURRS
CLEAN
ORIGINAL SCALE
DO NOT SCALE

USED ON
CENTRAL LABORATORY OF THE RESEARCH COUNCILS
2 JFET RACK
INTERFACE DRAWING
SPIRE
A 0-KE-0104-360-J 1 OF 1

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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 INTERFACE DIMENSION, AND TO COMPENSATE FOR ACTUAL PARTS 1 ARE TO BE MOUNTED TO PART 6. MEASURE FROM THE TOP OF PARTS 1 SHOWN AS PLANE 'C' TO THE TAIL END FACE 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 HOB LOCKING INSERT.
- UNIT SHOWN FITTED WITH BACK-HARNES MATING TO J9 - J10 & J15 - J18 BECAUSE THIS WILL BE FITTED BEFORE ITEM IS INTEGRATED TO HOB.
- HEAT CAPACITY AT RT = 700 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
- ITEMS 6 AND 11 TO BE PRE-FITTED BEFORE ITEM 2 IS FITTED

MASTER SPIRE DRAWING APPROVED

PROJECT MANAGER
SYSTEM ENG
ELECTRONICS ENG
IPA GROUP
STRESS ENG
OPTICAL ENG
THERMAL ENG
MECHANICAL ENG

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

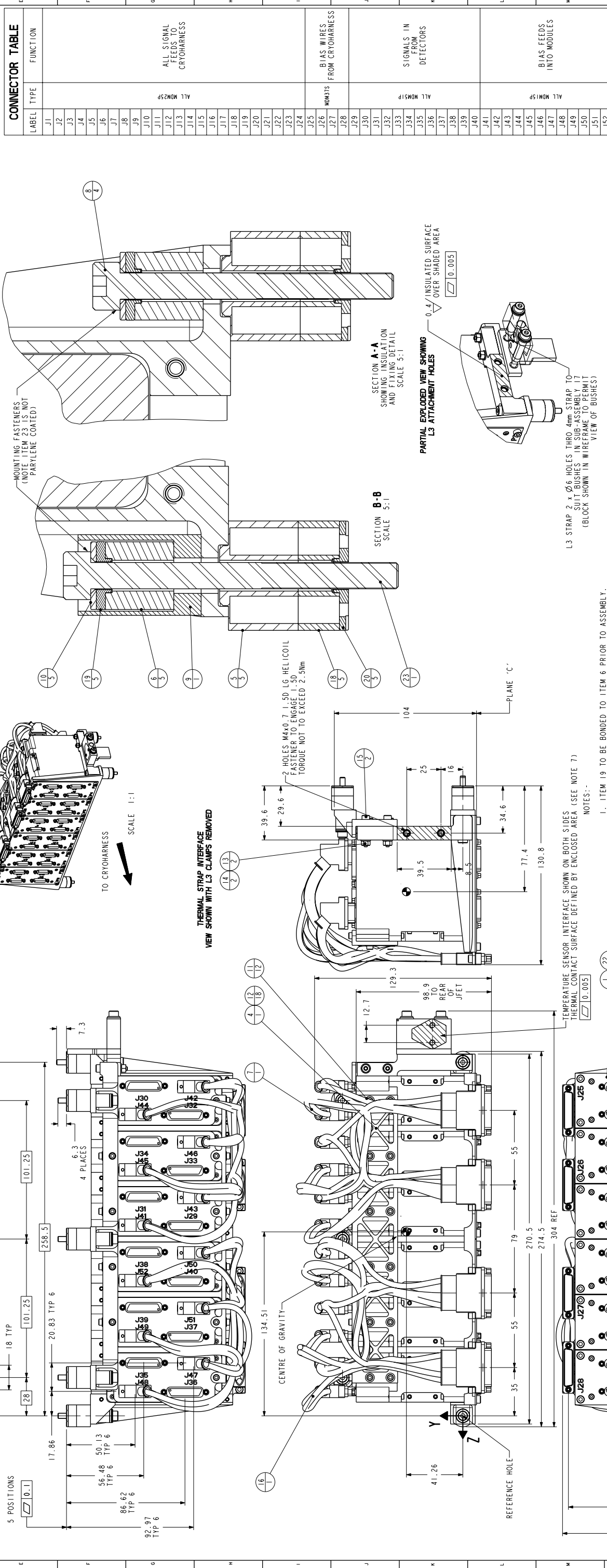
SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 5 of 5
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
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 Deane 2003.11.05 15:12:23 Z

ITEM	PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS (COMMENTS)
1	23836-10209722	JFET MODULE	6	260.00	1560.00
2	KE-0104-351	FRONT PLATE 6 JFET	1	128.66	128.66
3	KE-0104-352	REAR FOOT BEAM - 6 JFET	1	69.55	69.55
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
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	M2-5-WASHER	WASHER	24	0.11	2.57
12	M2-5-X-8LG-CPHD-SKT-SS	FASTENER	36	0.58	20.79
13	M3-NUT	NUT	2	0.17	0.33
14	58-3205	BELLEVILLE WASHER	2	1.26	2.52
15	M3-X-20LG-CPHD-SKT-SS	FASTENER	2	1.26	2.52
16	10209786-1	BACKHARNES (10209786-1)	1	267.70	267.70
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	
22	M3-X-8LG-CPHD-SKT-SS	FASTENER	24	0.74	17.86
23	M4-X-45LG-CPHD-SKT-SS	FASTENER	1	5.15	5.15
				ASSEMBLY MASS	2502.88 GRAMS



ISSUE	DATE	MOD. NO.	DRN. BY	CHGD.	APPD.	STATUS
G	13-01-03	KE-2953	D. SMART			ISSUED

FINISH
CLEAN
REMOVE ALL BURRS
SURFACE TEXTURE R_a SEE DETAILS
UNLESS STATED

TOLEANCES UNLESS STATED
 ± 0.2 mm
 ± 0.3 mm

SCALE
1:1
DO NOT SCALE

MATERIAL & SPEC.
SEE DETAILS
UNLESS STATED

SPiRE DRAWING
PROJECT MEMBER APPROVED

USED ON
CENTRAL LABORATORY OF THE RESEARCH COUNCILS
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PROJECT MANAGER
SYSTEMS ENG
ELECTRONICS ENG
PA GROUP
STRESS ENG
OPTICAL ENG
THERMAL ENG
MECHANICAL ENG

6 JFET RACK
INTERFACE DRAWING

SPiRE
A 0-KE-0104-350-G 1 of 1

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