



**SPIRE**  
INTERFACE DOCUMENT.

Doc#:SPIRE-RAL-DWG-001409  
Issue: 13  
Date: October 2005  
Page 1 of 25

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:** .....

## 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 change lists.
- 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 list included herein.
- Issue 11...Omitted connectors and unit ref. holes clarified in QM1 DRCU ICDs  
JFET unit drawing minor corrections, see drawings’ change lists included herein  
Append SPIRE cryogenic integration MGSE drawing sheets.
- Issue 12...All drawings now represent FM build...see individual change lists except for DPU.  
Note that the MGSE changes, which are all minor, are in a changebox on the drawing.
- Issue13 Change note for DPU ICD generated.

## Changes to DPU ICD

**from 23/2/03 issue to 10-SPIRE-00.02 21/3/05**

C. of G. moved in Z direction from 77.4 to 85

Tolerances on hole positions added.

Moments of inertia updated

Details of bonding stud added

Details of mounting foot added

Re-dimensioned from reference hole.

3D view added

Mass changed from 7.177Kg +/- 200g to 7.23Kg +/- 5%.

Surface roughness of base added

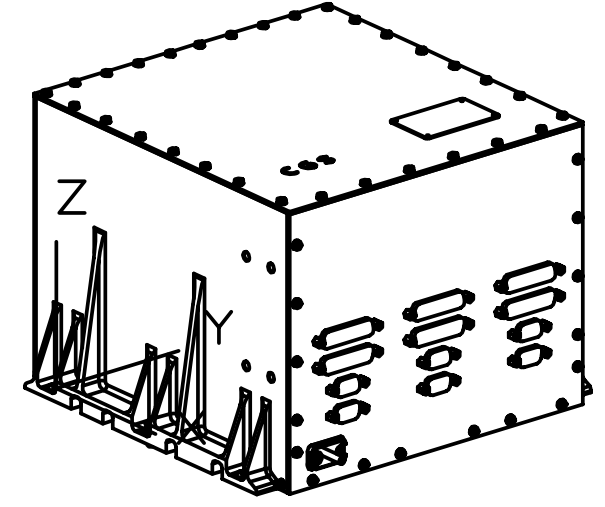
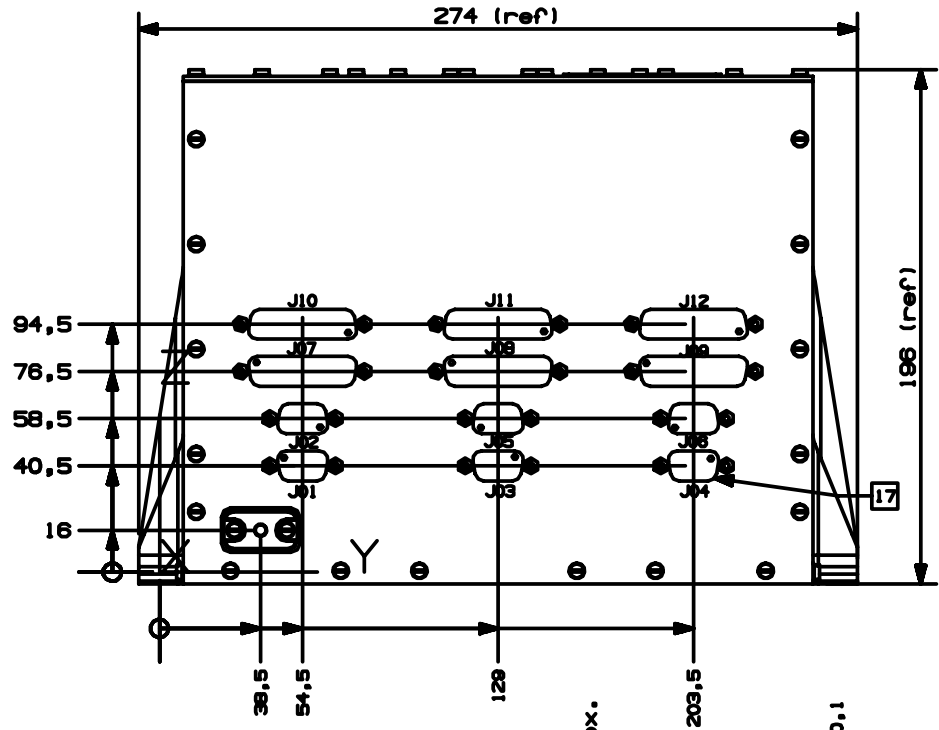
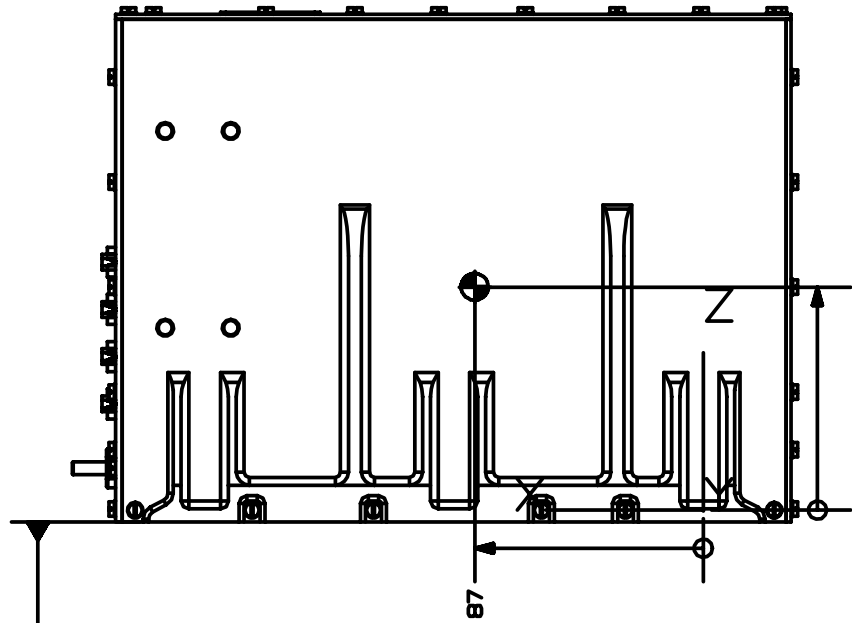
Material changed from Anticorodal 6082 to AL 7075 T7351

Surface treatment changed from Alodine 1200 to Black anodise.

Connector torque added.

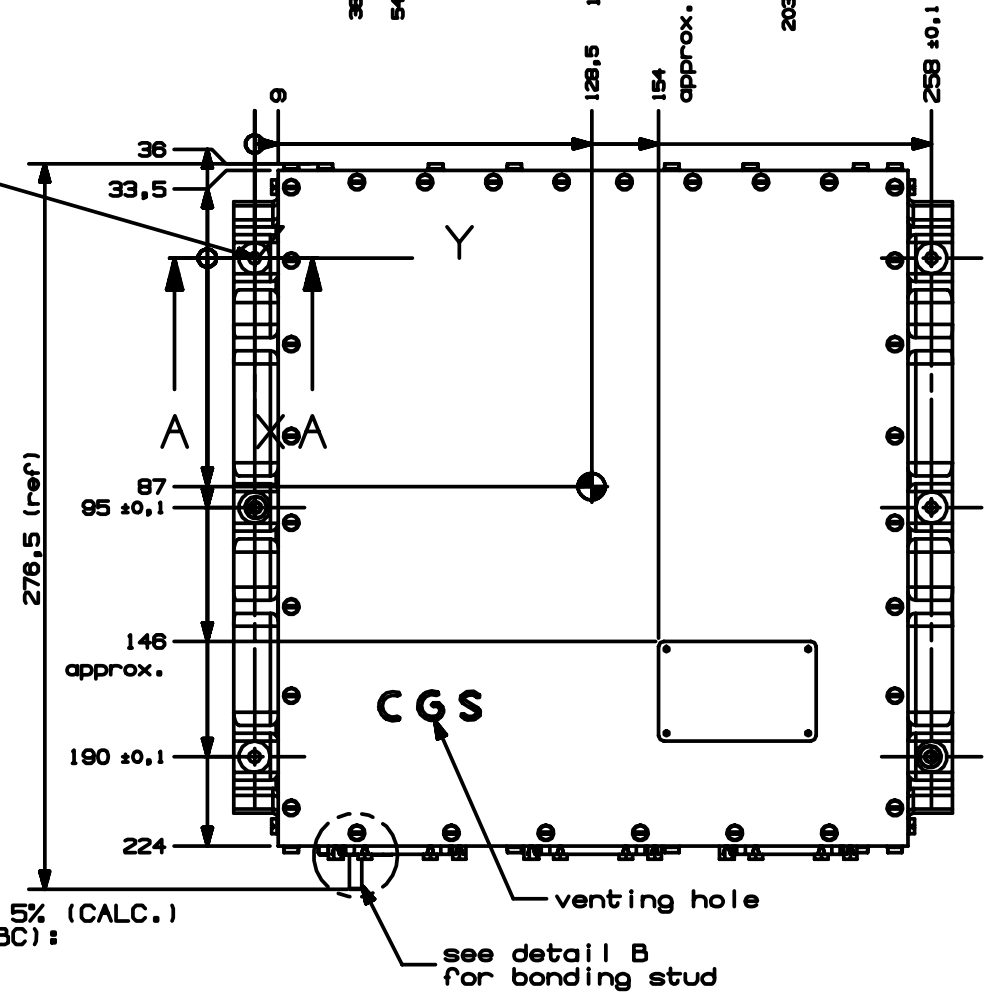
Chotherm 1671 thermal contact layer added under base.

E.C.S.

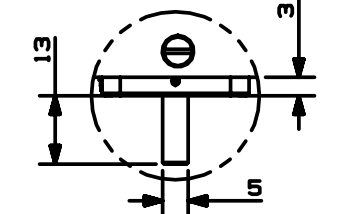
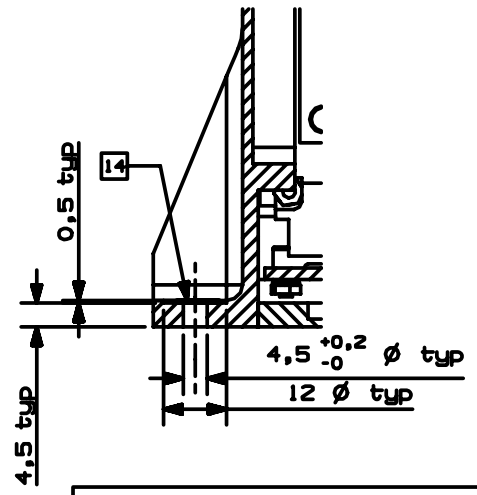


Mounting plane to HERSCHEL Electrical Box [9]

Reference Hole (R) Mounting holes positions in bold font



typ for all six mounting holes SECTION A-A



- NOTES:**
- GENERAL ASSEMBLY TOLERANCE  $\pm 0.2$  mm
  - MOUNTING SURFACE CONTACT AREA: 67200 mm<sup>2</sup>. MOUNTING SURFACE FLATNESS: 0.1mm/100mm AND ROUGHNESS: 2.6 micron
  - INDICATES THE CENTRE OF GRAVITY  $\pm 5\%$
  - MASS NOT INCLUDING MOUNTING HARDWARE: 7.23 Kg  $\pm 5\%$  (CALC.)
  - MOMENT OF INERTIA REFERRED TO PRINCIPAL AXES (TBC):  
 $J_{xx} = 0.8 \times 10^{-1}$  Kg m<sup>2</sup>  
 $J_{yy} = 7.81 \times 10^{-1}$  Kg m<sup>2</sup>  
 $J_{zz} = 9.06 \times 10^{-2}$  Kg m<sup>2</sup>
  - EMISSIVITY: 0.85 (OUTER WALLS)
  - POWER DISSIPATION MAX 27.85 W
  - SEE FAMILY TREE FOR ENGINEERING DRAWINGS: HERS-HIFI-DT-CGS-001
  - CHO-TERM 1671 P/N 60-12-0808 FOR THERMAL CONTACT
  - ALL WALLS IN AL 7075 T7351 QQ-A 250/12 or EQUIVALENT
  - BONDING STUD IN AISI 316 PASSIVATION ACCORDING TO QQ-P-35 BONDING STUD FASTENING TORQUE 4 Nm  $\pm 0.1$
  - OUTER SURFACE TREATMENT: BLACK ANODIZE ACCORDING TO MIL-A-8625 TYPE III CLASS 2. BASEPLATE: ALODINE 1200 MIL-C-5541 CLASS 3
  - ALL CONNECTORS ID ENGRAVINGS ARE LOCATED AS PER DWG 10-SPIRE-00.04
  - MOUNTING BOLTS M4
  - CONNECTORS TORQUE AS PER ESA SCC 3401/022
  - NO EIGEN MODES WITH FREQUENCY LOWER THAN 140Hz AND EFFECTIVE ASSOCIATED MASS HIGHER THAN 5% PRESENT IN INSTALLED CONFIGURATION
  - INDICATES CONNECTOR PIN 1

**CONNECTORS TABLE**

ID	P/N	Function
J01	3401002 01B DEMASP NMBFO	from DPU Prime to PDU Prime
J02	3401002 01B DEMASP NMBFO	from DPU Red. to PDU Red.
J03	3401002 01B DEMASP NMBFO	from DPU Prime to Bus A Prime
J04	3401002 01B DEMASP NMBFO	from DPU Prime to Bus B Prime
J05	3401002 01B DEMASP NMBFO	from DPU Red. to Bus A Red.
J06	3401002 01B DEMASP NMBFO	from DPU Red. to Bus B Red.
J07	3401002 01B DBMA25P NMBFO	from DPU Prime to DCE Prime
J08	3401002 01B DBMA25P NMBFO	from DPU Red. to DCE Red.
J09	3401002 01B DBMA25P NMBFO	from DPU Prime to MCE Prime
J10	3401002 01B DBMA25P NMBFO	from DPU Red. to MCE Red.
J11	3401002 01B DBMA25P NMBFO	from DPU Prime to SCE Prime
J12	3401002 01B DBMA25P NMBFO	from DPU Red. to SCE Red.

FILE MODEL: herschel\_1\_assembly\_rev8  
FILE DRAWING: 10\_spiire\_dwg\_rev8

REV	DATE	BY	CHECK	DATE	BY	DATE	PA	DATE	CHG	DATE	CHANGE AUTHORITY
DRAWING TITLE										CARLO GAVAZZI SPACE	
HERSCHEL SPIRE (DPU) INTERFACE CONTROL DOCUMENT										CARLO GAVAZZI	
APPL	SIZE	CAGE CODE	DRAWING NUMBER	REV	SHEET 1 OF 1						
10-SPIRE-00.00	A2		10-SPIRE-00.02								

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List of changes  
SPIR-MX-5100 000  
Rev. E to Rev G

cea  
DSM-DAPNIA  
SAP-SPIRE-QA-0188-04  
Date : 03/09/2004  
Page: 1/1

## List of changes

### Document identification

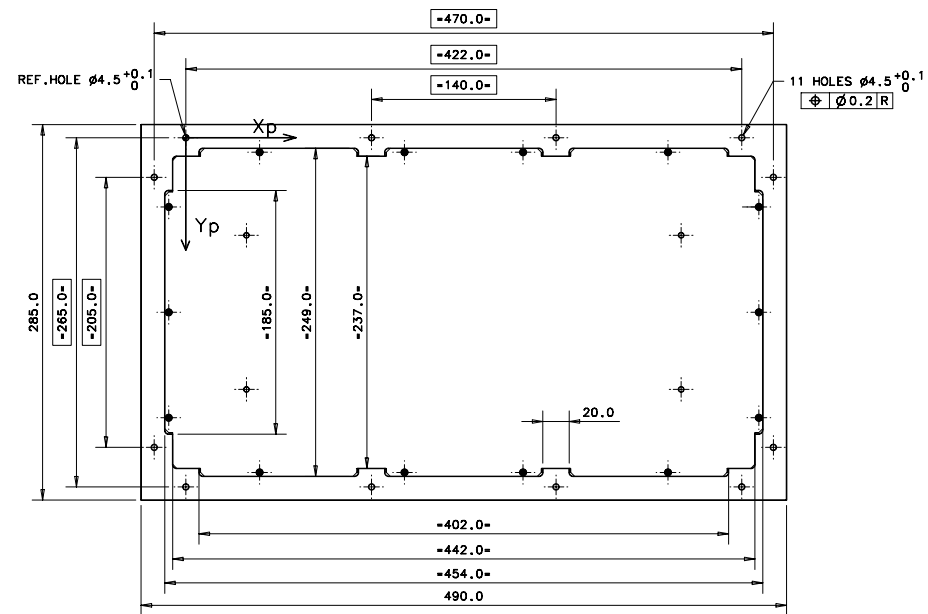
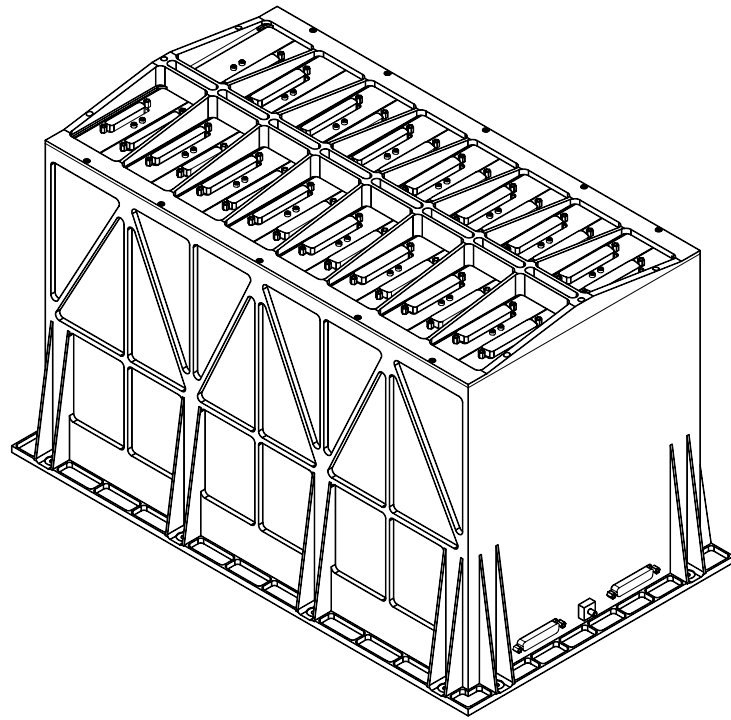
Document n°	SPIR-MX-5100 000	
Title of document	SPIRE DCU Electronic box mechanical i/f drawing	
Changes	From rev.	Rev. E (01/2004)
	To rev.	Rev. G (08/2004)

Nota : rev F has not been released.

### Detail of changes

Description	Associated RFD / ECR (if any)	Status
No changes introduced, only added following informations : - base plate height 4mm ("Coupe partielle A-A") - position of top connectors on Xp and Zp - position of fixation hole on Xp (470mm)	--	--

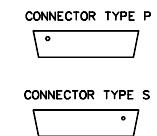
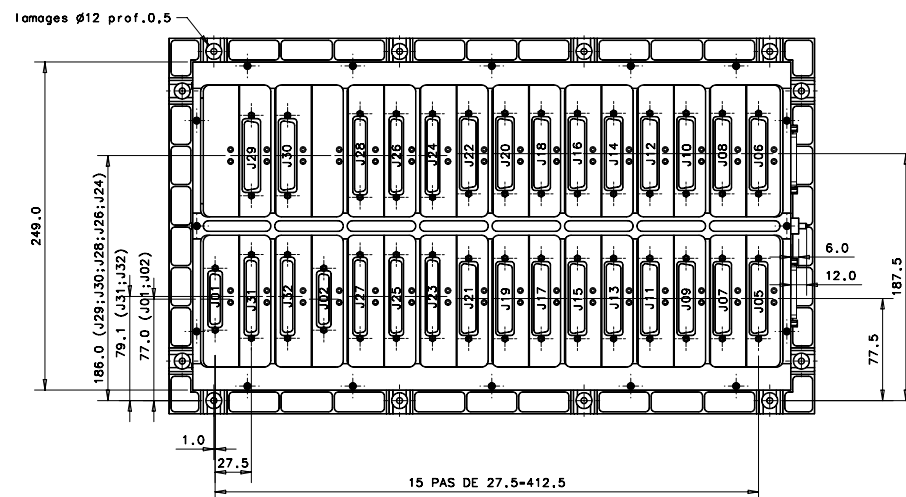
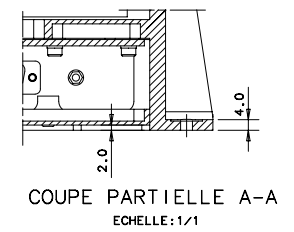
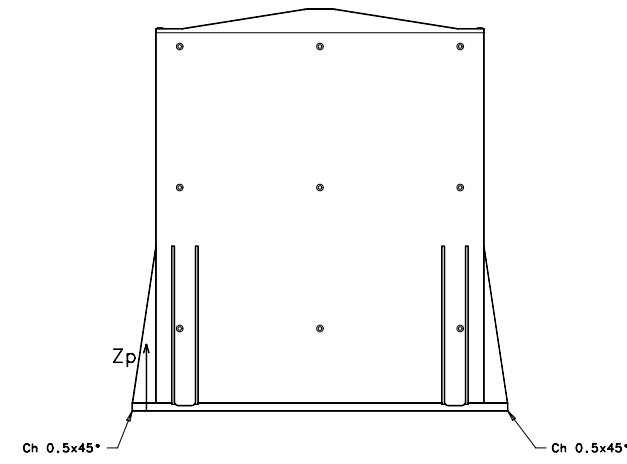
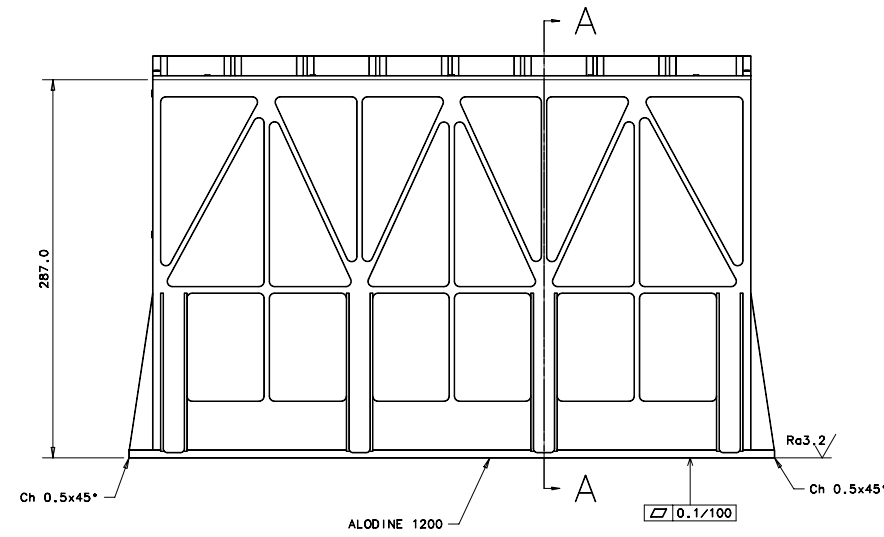
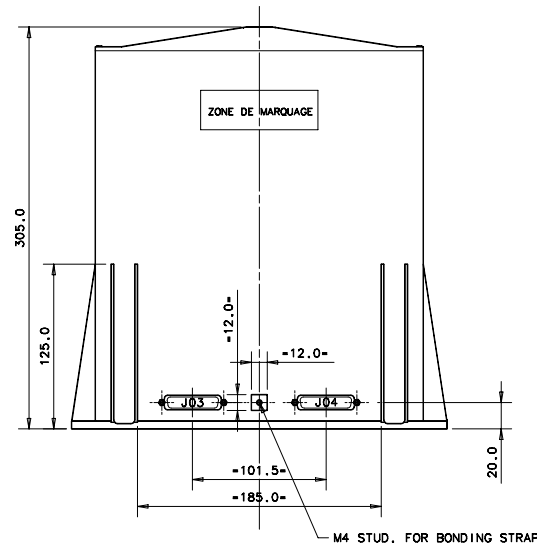
	Position	Name	Signature
Prepared by	PA manager	J. Fontignie	09/09/04
Verified by	Mechanical Designer	T. Tourrette	27/09/04
Approved by	Project manager	J.L. Augères	28/09/04



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

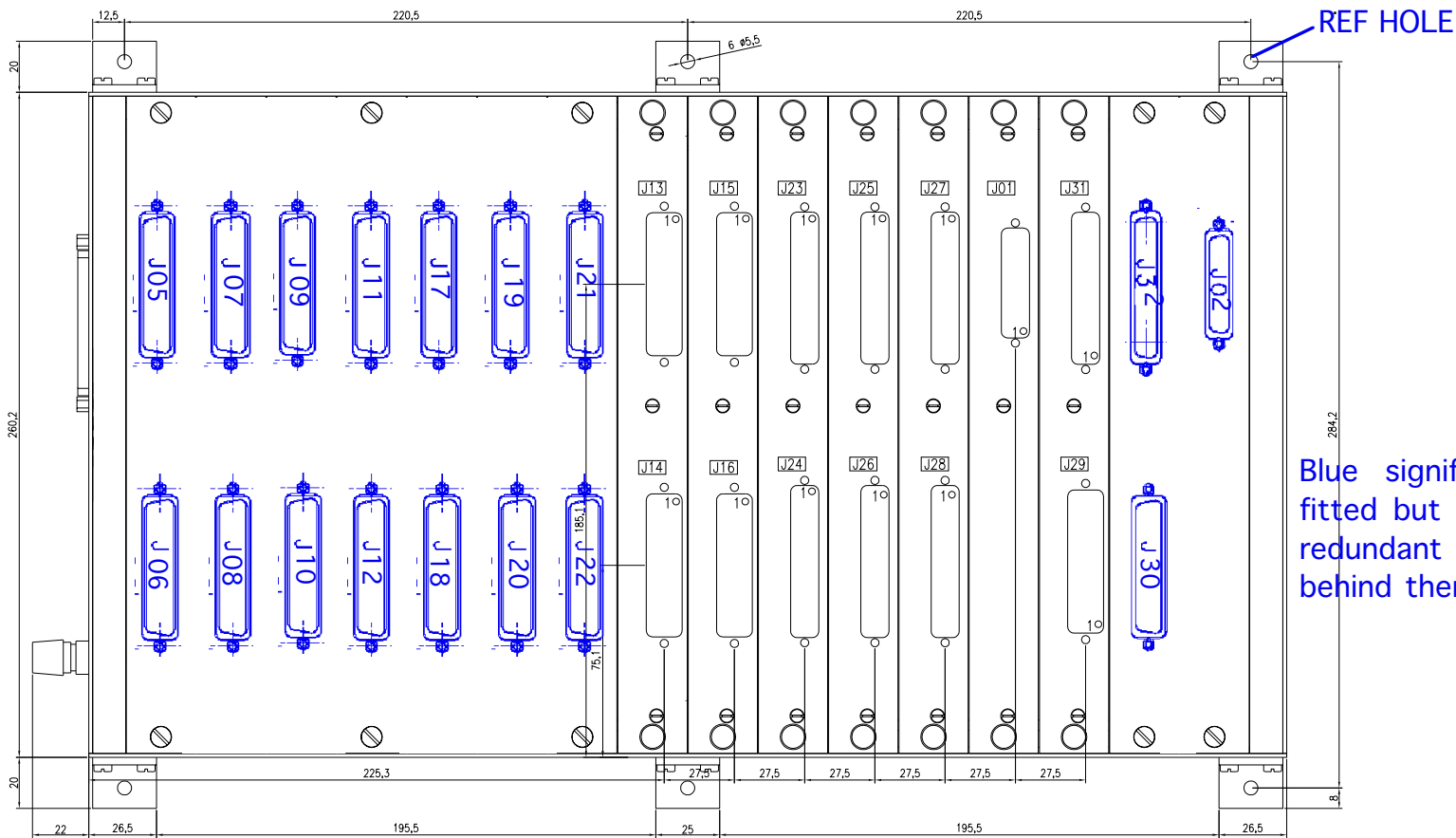
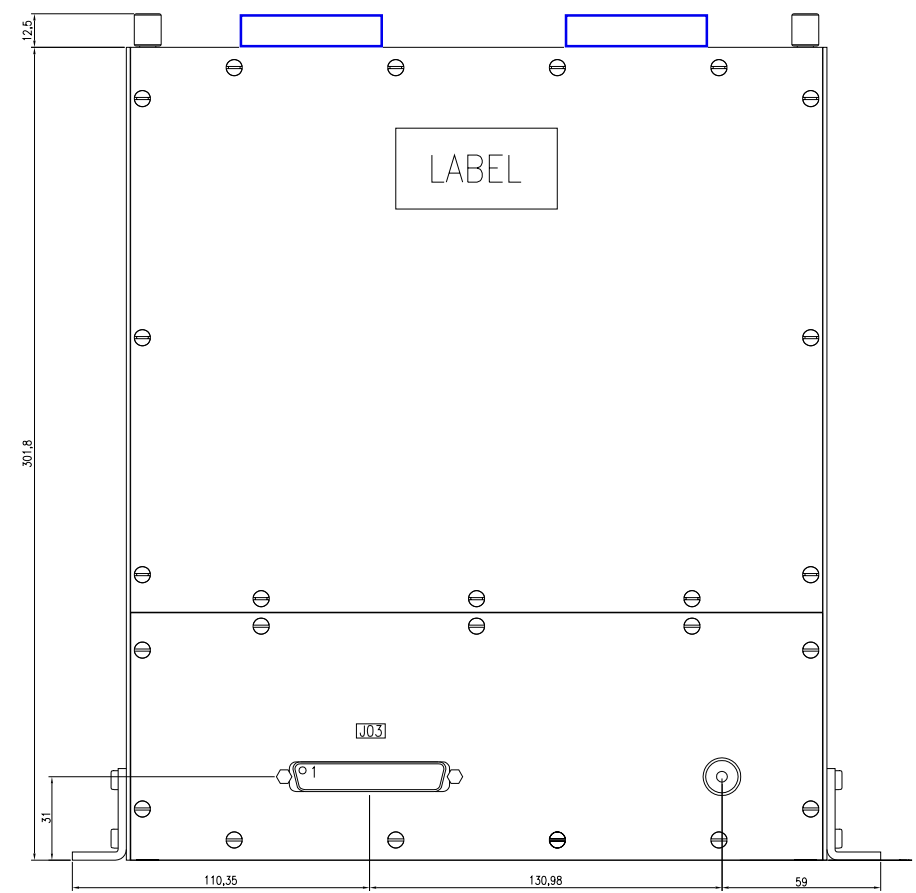
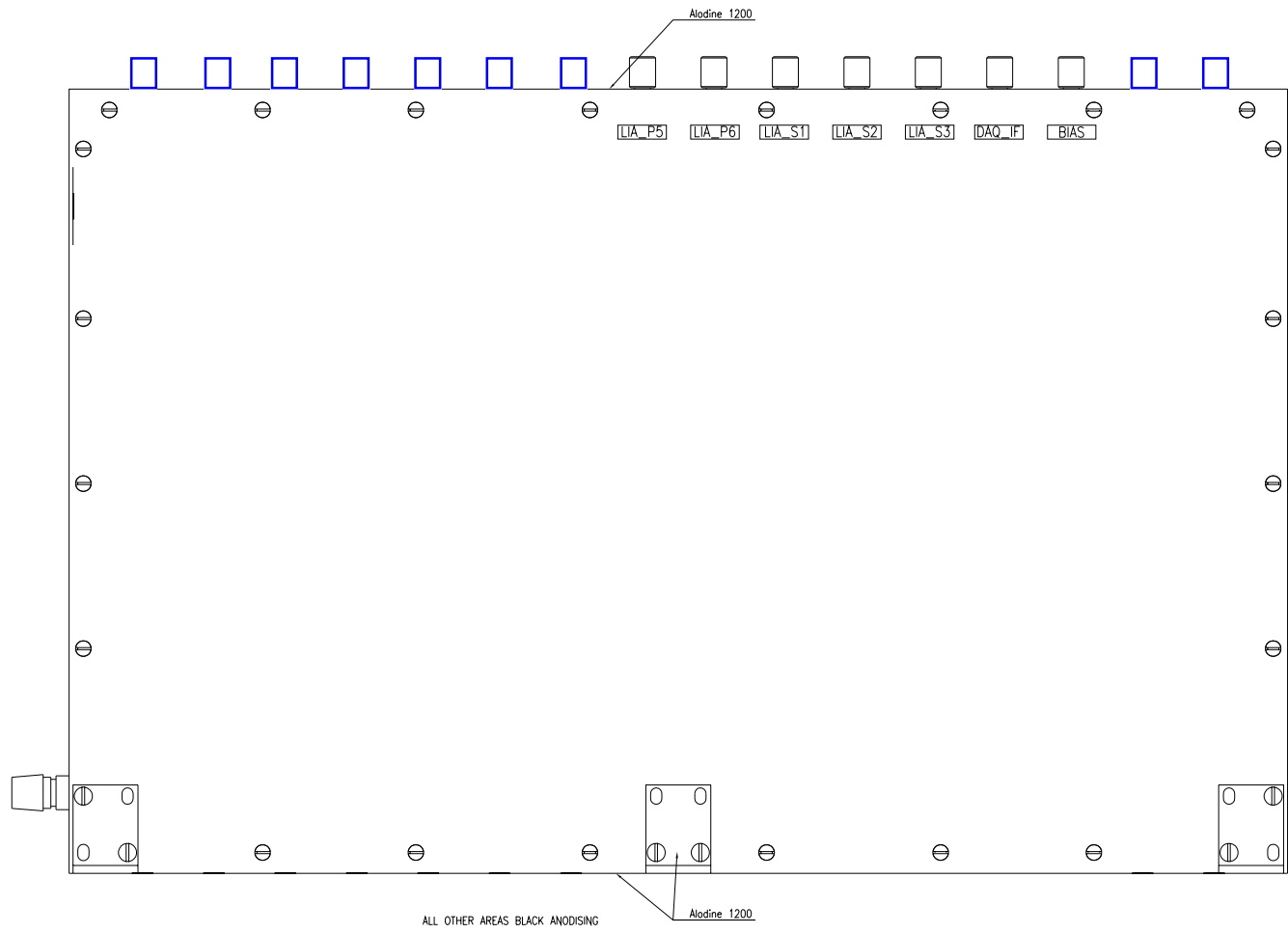
MATERIAL AL 6082  
 CENTRE OF GRAVITY REFERRED TO REFERENCE HOLE  
 X=213.2mm Y=132.4mm Z=157.9mm  
 MOMENTS OF INERTIA REFERRED TO CENTRE OF GRAVITY  
 Jxp=0.471 Kg.m<sup>2</sup> Jyp=0.250 Kg.m<sup>2</sup> Jzp=0.444 Kg.m<sup>2</sup>  
 CONTACT AREA MOUNTING FEET=28180mm<sup>2</sup>  
 THERMAL COATING 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



Indice	Modifications	Date	Dessiné par	Vérifié par	Approuvé par
G	Mise à jour	08/04	DHENAIN		
F	Mise à jour	06/04	DHENAIN		
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		

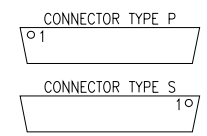
Spécifications particulières	
Indices généraux	<ul style="list-style-type: none"> <li>▨ Indice de rugosité général XXXX SOUS-TRAITANT</li> <li>▨ Tol.ang.:xxx*</li> <li>◆ Casser les angles vifs</li> </ul>
Matière:	Protection
Traitement thermique:	Echelle Poids Niveau qualité

**SPIRE**  
**HSDCU ELECTRONIC BOX**  
**MECHANICAL INTERFACE CONTROL DRAWING**



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

Blue signifies connectors fitted but without redundant side electronics behind them.



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	

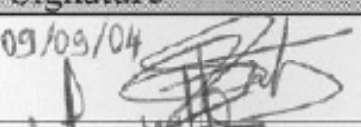

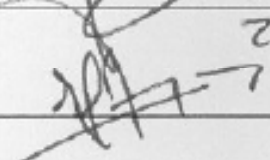
## List of changes

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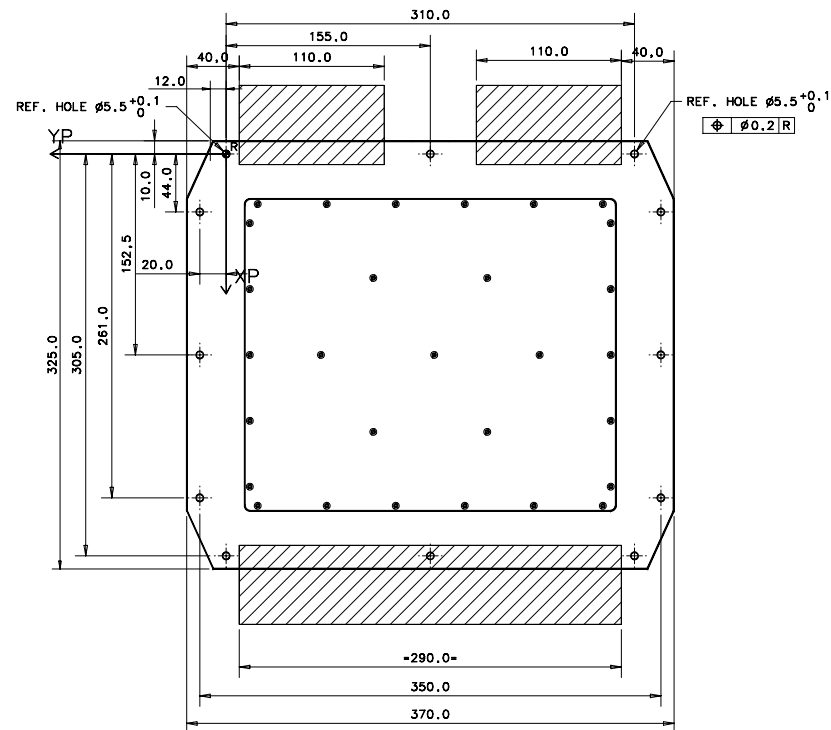
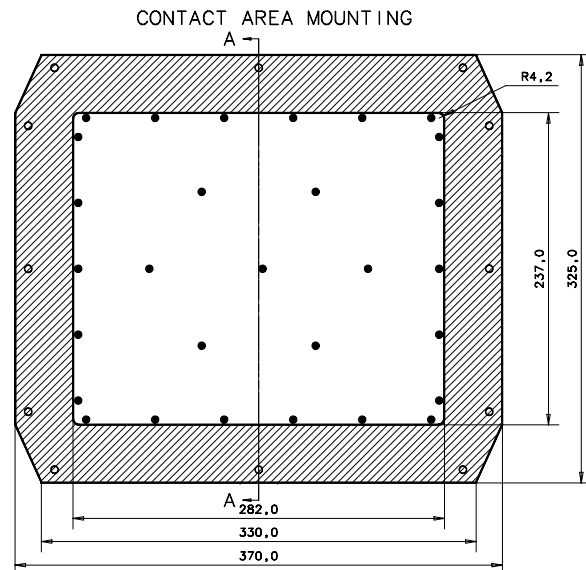
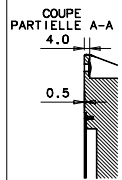
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Title of document	SPIRE FCU Electronic box mechanical i/f drawing	
Changes	From rev.	Rev. J (01/2004)
	To rev.	Rev. K (08/2004)

### Detail of changes

Description	Associated RFD / ECR (if any)	Status
No changes introduced, only added follwong informations : - base plate height 4mm ("Coupe partielle A-A") - enhanced readability of top connectors position on Xp - position of fixation hole on Xp (350mm)	--	--

	Position	Name	Signature
Prepared by	PA manager	J. Fontignie	09/09/04 
Verified by	Mechanical Designer	T. Tourrette	 27/09/04
Approved by	Project manager	J.L. Augères	 28/09/04

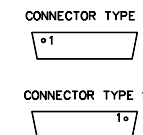
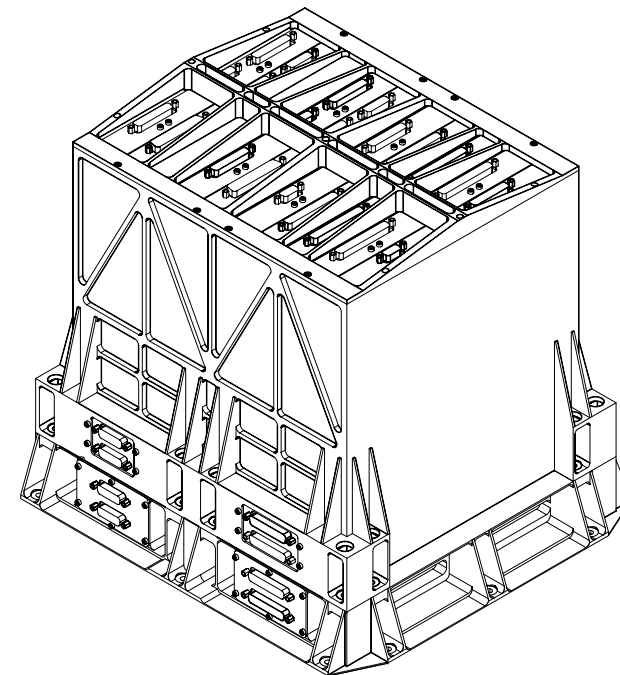
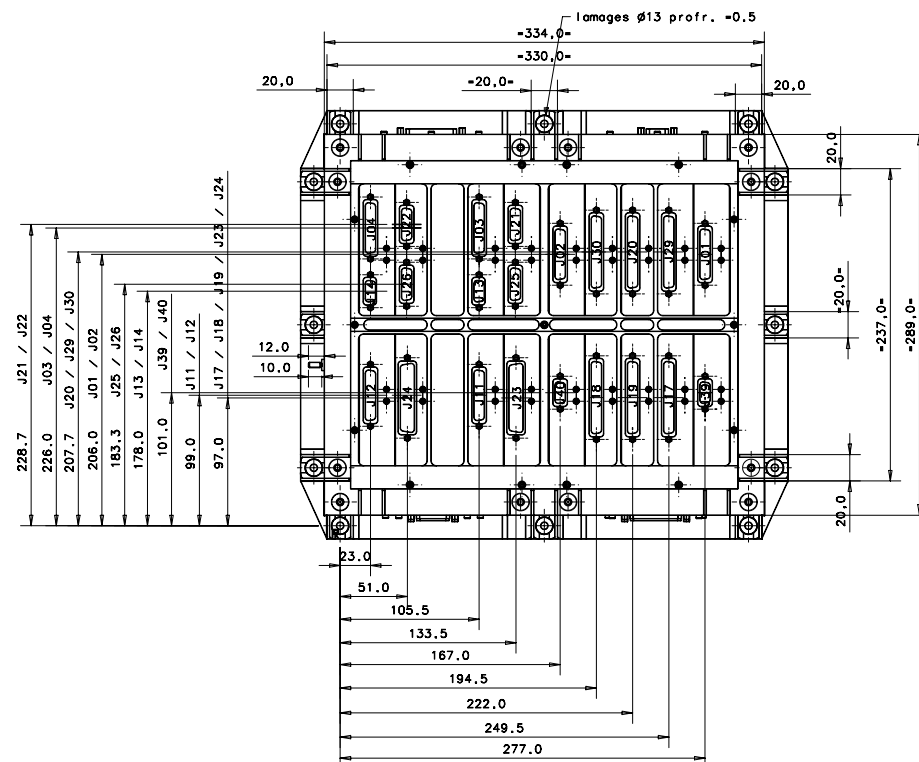
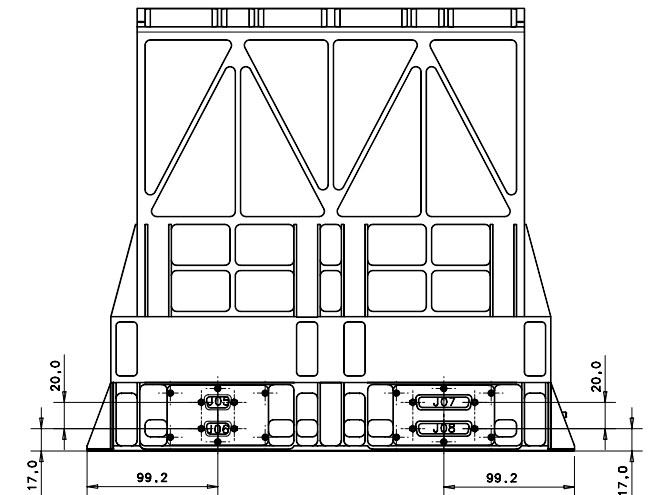
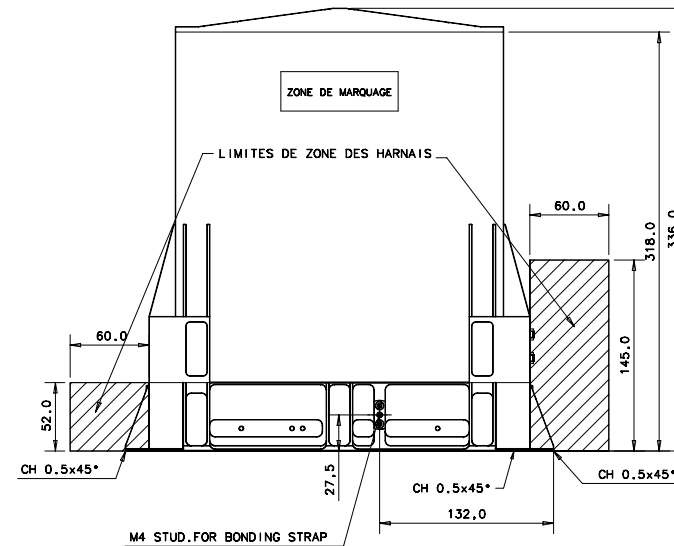
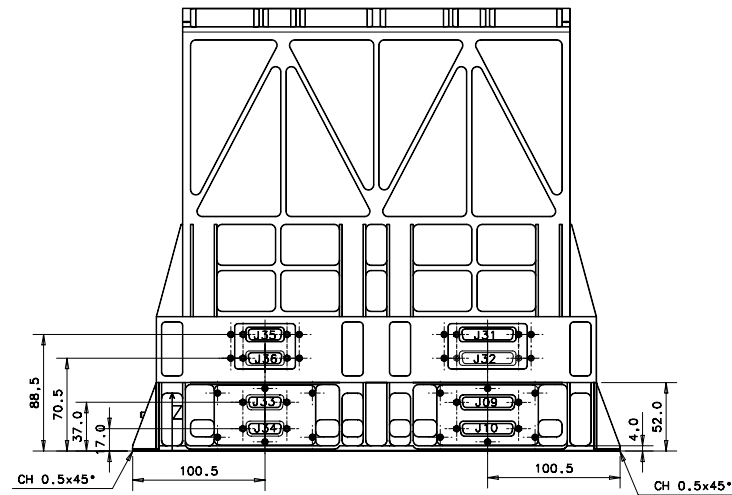
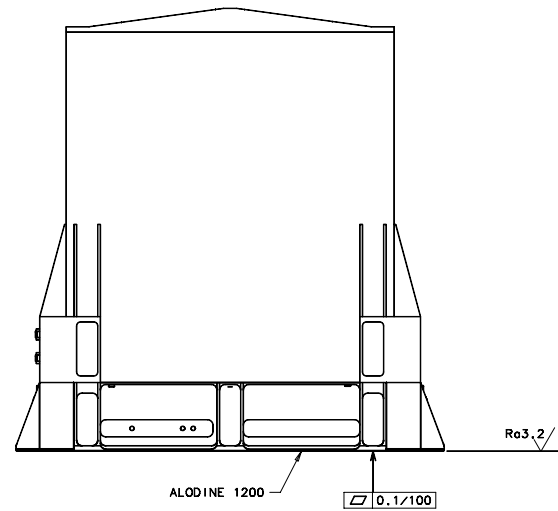




NOTES

MATERIAL AL 6082  
 CENTRE OF GRAVITY REFERRED TO REFERENCE HOLE  
 X=148.8mm Y=-153mm Z=138.5mm  
 MOMENTS OF INERTIA REFERRED TO CENTRE OF GRAVITY  
 JX=0.338 Kg.m2 JY=0.318 Kg.m2 JZ=0.282 Kg.m2  
 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
K	Mise à jour	08/04	DHENAIN		
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		

Matériau	Protection

Traitement thermique	Echelle	Poids	Niveau qualité
	1/2		

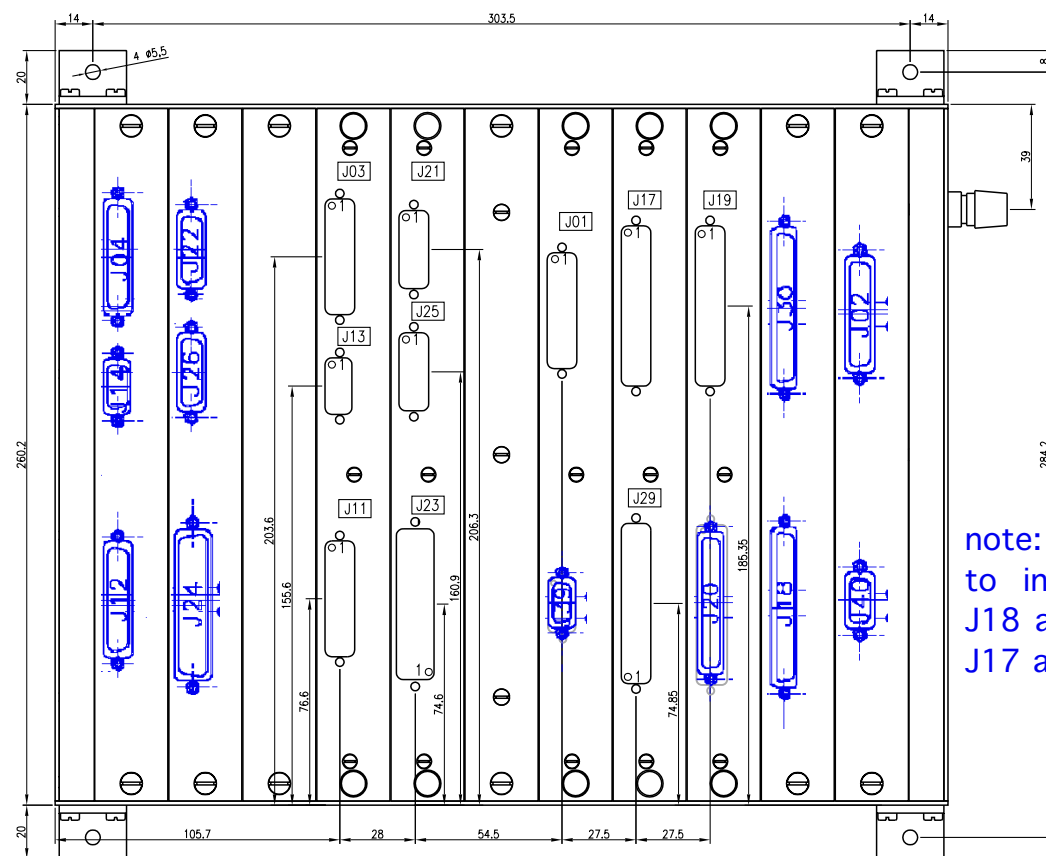
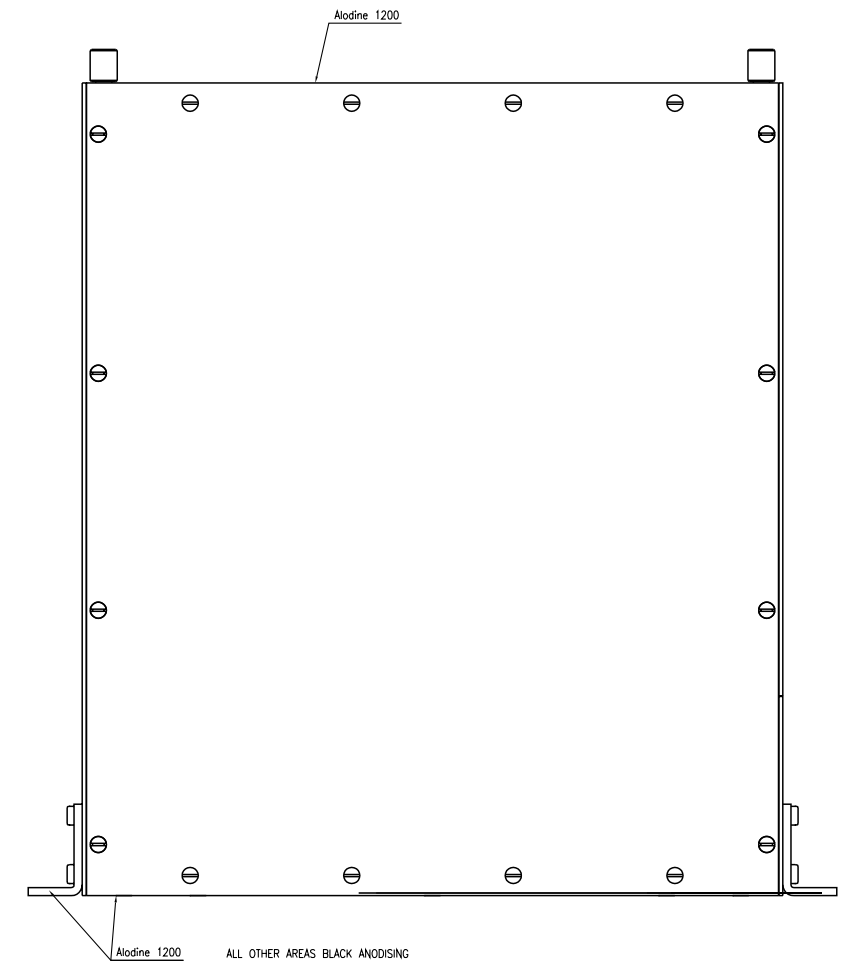
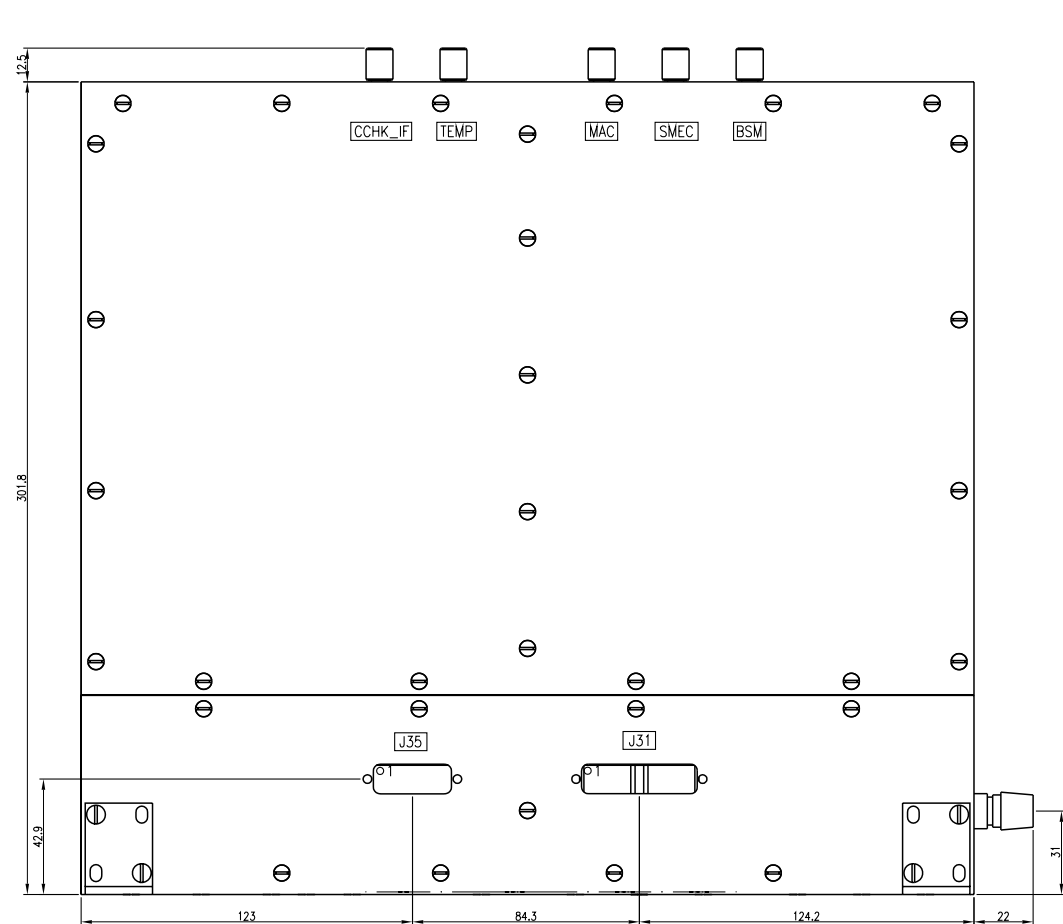
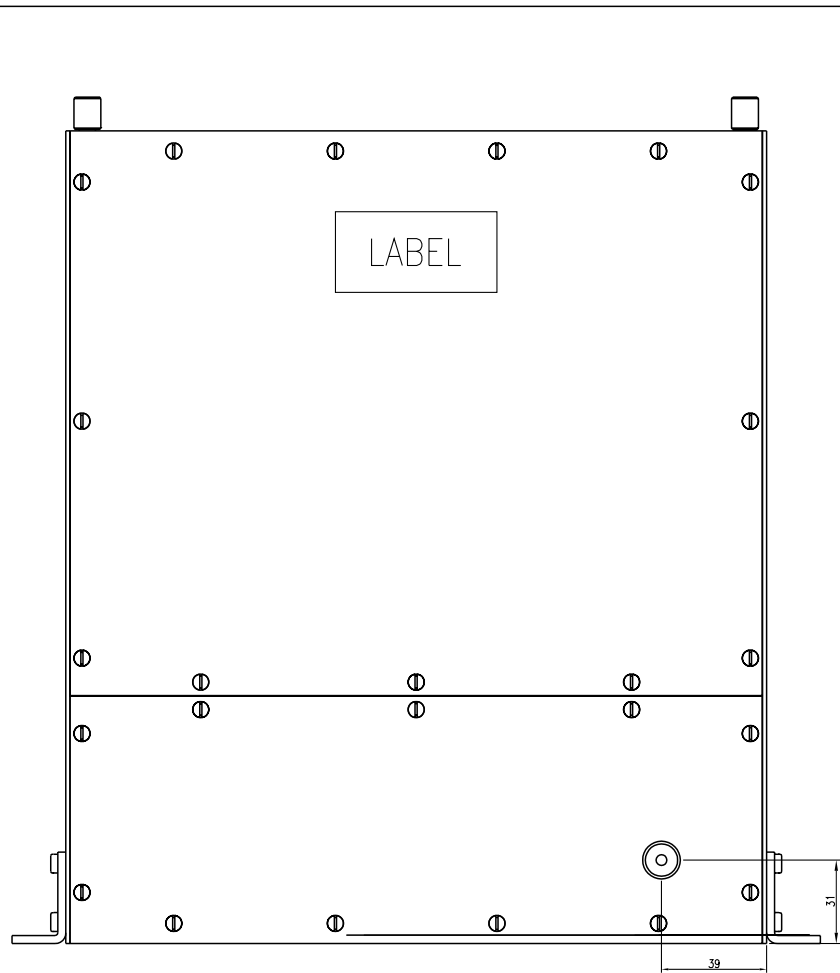
**SPIRE**  
**FCU ELECTRONIC BOX**  
**MECHANICAL INTERFACE CONTROL DRAWING**

Il n'est permis d'utiliser ce dessin qu'avec l'licence spéciale ou autorisation expresse - val 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-5200 000 K



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

ONLY FOR QM1

Blue signifies connectors fitted but without redundant side electronics behind them.

note: do not intend to incorrectly transpose J18 and J30 just because J17 and J39 are swapped!

CEA /SAP 91191 GIF/YVETTE Cedex		MATIERE : Alu 2017A	PROTECTION :
TRAITEMENT : ALODINE 1200		DESSINE : SREE DATE : 08/09/03	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 FCU/QM1		SPIR-MX-5201 000 C	0 A1



**SPIRE – STRUCTURE INTERFACE DRAWING ISSUE 20  
AND MODIFICATION SHEET**

**Document Number: MSSSL/SPIRE/SP005.05 .....30 September 2005**

**ISSUE 20**

SHEET	MODIFICATION
All Sheets	Drawing redrawn due to loss of Computer File
All Sheets	Main Instrument Mounts replaced with CFRP mounts
All Sheets	Details of the Level 1 Thermal Interface added
All sheets	The PFM spectrometer level 0 strap replaed the CAM spec strap.
Sheet 1	Addition of dimension between end of L0 straps and the centre line pf the fixed cone mount
Sheet 1	Addition of dimension at bottom of Evaporator L0 strap (4.5 mm)
Sheet 3	Addition of dimension from centre of fixed cone mount to the First Optical Datum
Sheet 6	Addition of pictorial view and cross section of the Level 1 thermal interface

**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 Alochrom 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 dismantled 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 (Reference HR-SP-RAL-ECR-034v1)
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 'O' 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

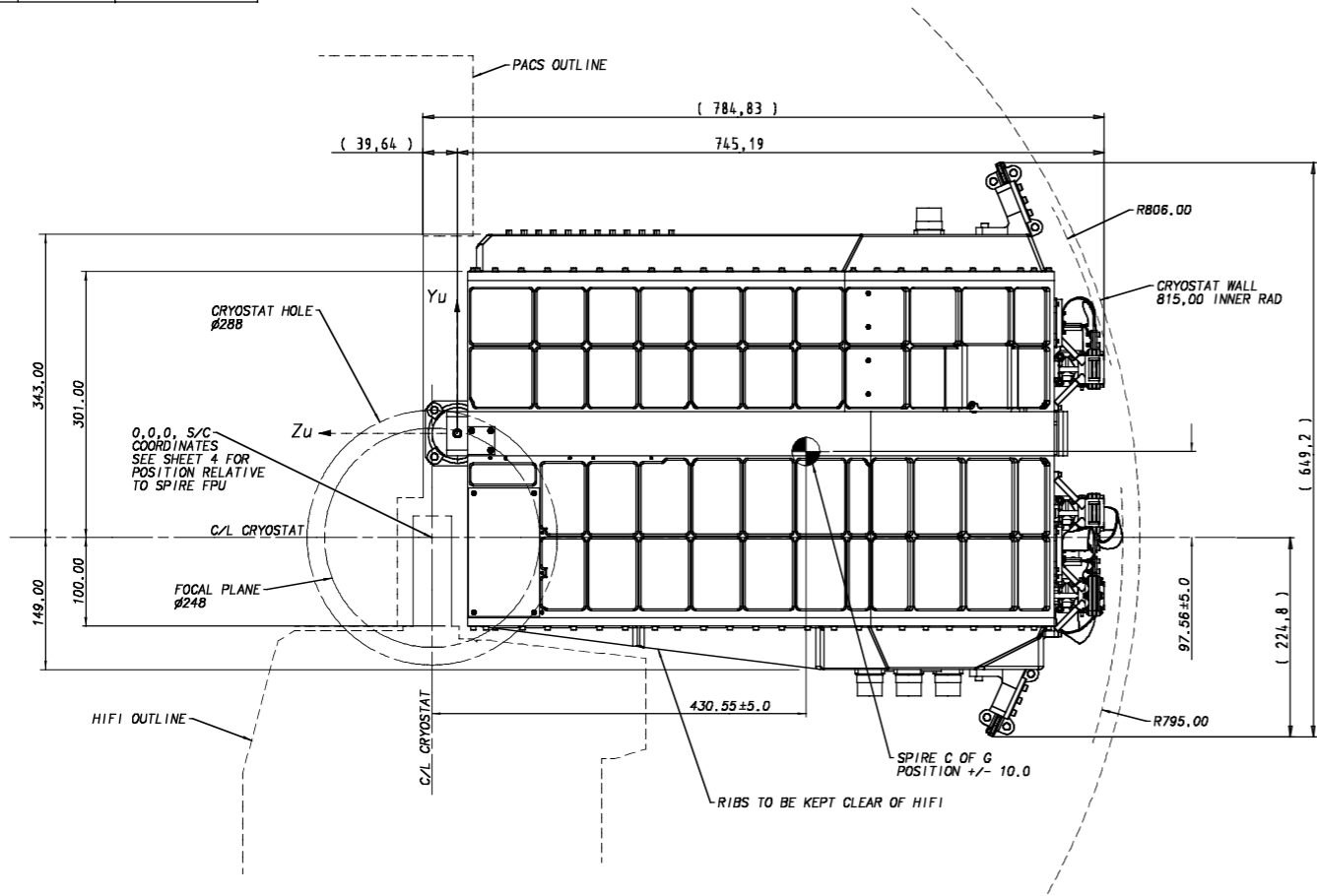
**ISSUE 16**

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 MSSSL note added.
5	HSFPU 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

USED ON  
HERSCHEL

NOTE:-

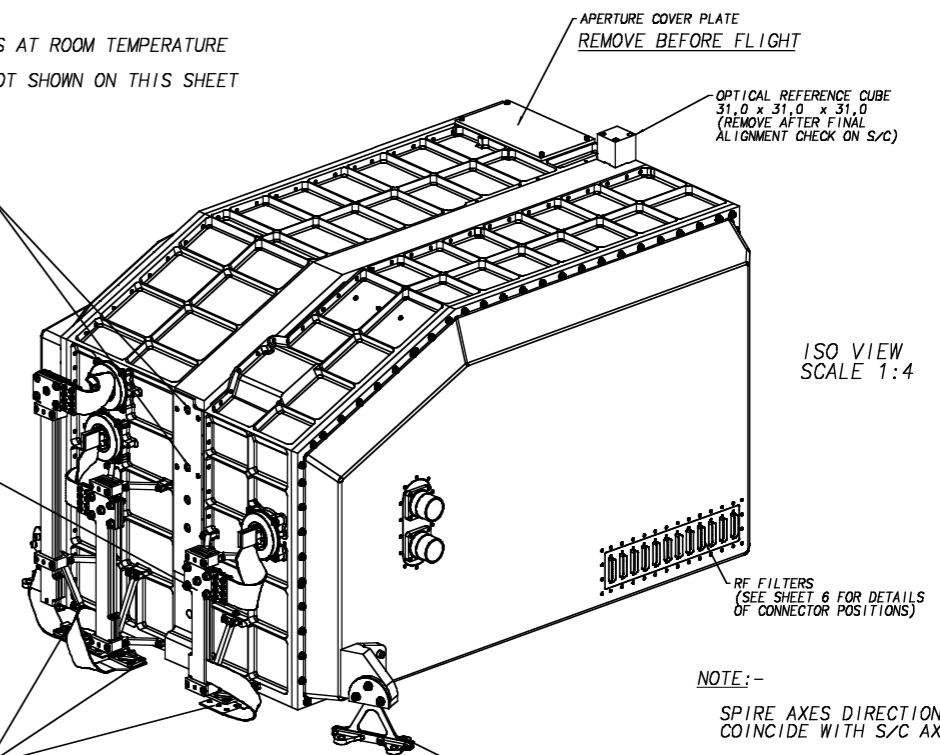
1. ALL DIMENSIONS AT ROOM TEMPERATURE
2. J-FET BOXES NOT SHOWN ON THIS SHEET



S/C LEVEL \*1\* STRAP TO SPIRE OPTICAL BENCH ATTACHMENT POINTS. (SOFT GOLD PLATE) SEE SHEET 5

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

LEVEL \*0\* STRAP FIXINGS (GOLD SURFACES) SEE SHEET 5 FOR FIXING DETAILS



ISO VIEW  
SCALE 1:4

NOTE:-  
SPIRE AXES DIRECTIONS COINCIDE WITH S/C AXES

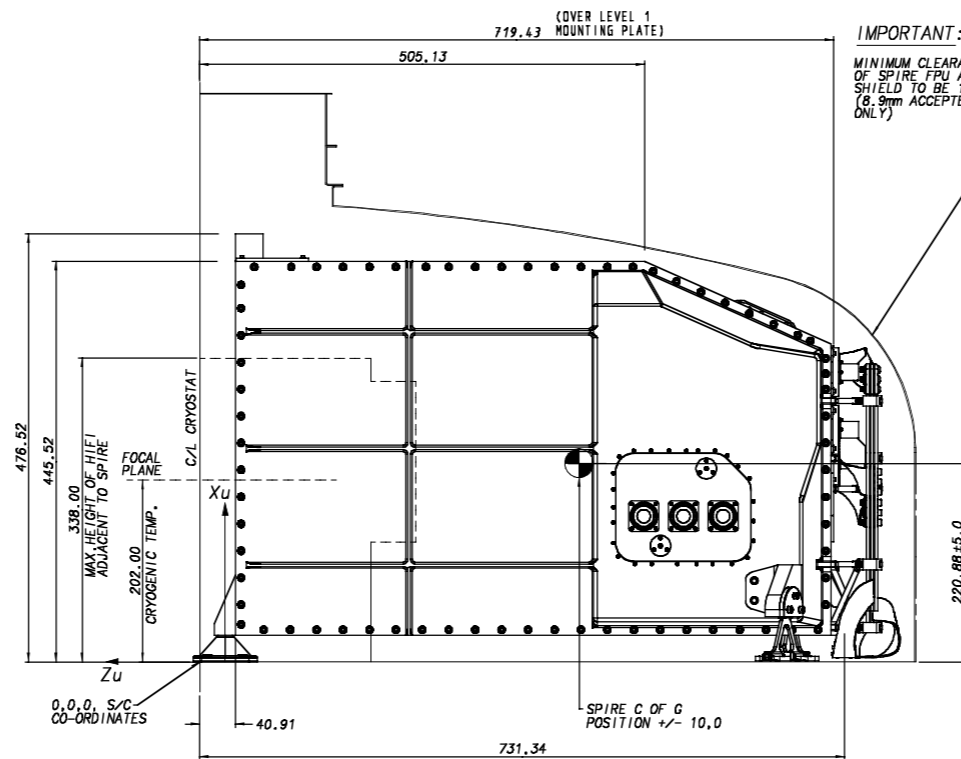
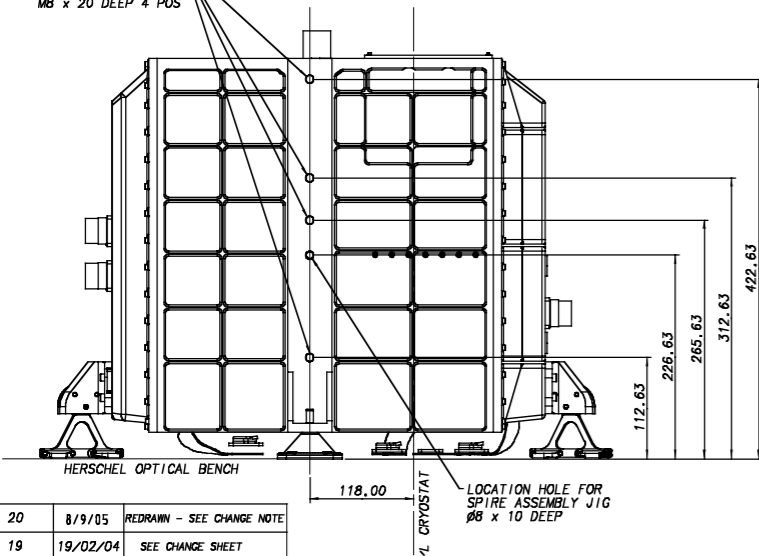
MOMENTS OF INERTIA ABOUT CG:-

(NOTE:- ALL MASS PROPERTIES EXCLUDE JFETS, EXTERNAL FPU HARNESSSES AND ASTRIUM SUPPLIED LEVEL \*0\* INTERFACE PARTS)

$I_{xx} = 3.056 \text{ kg m}^2$   
 $I_{yy} = 3.008 \text{ kg m}^2$   
 $I_{zz} = 1.559 \text{ kg m}^2$

(MASS 46.18 kg)

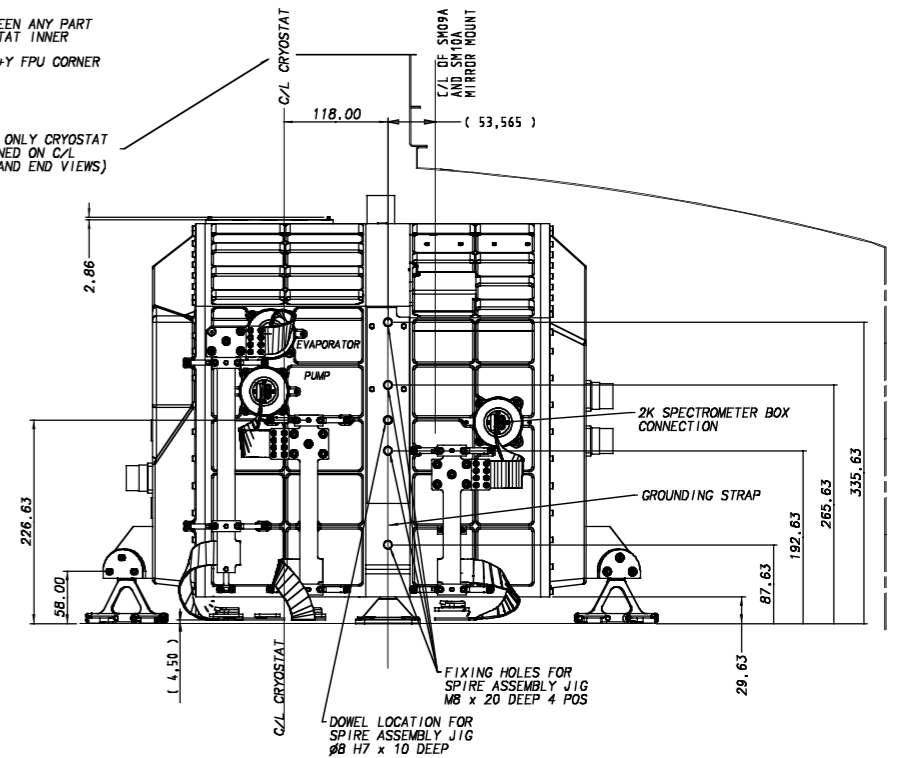
FIXING HOLES FOR SPIRE ASSEMBLY JIG MB x 20 DEEP 4 POS



IMPORTANT:-

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

NOTE:- ONLY CRYOSTAT SECTIONED ON C/L (SIDE AND END VIEWS)



CHECKED	20	8/9/05	REDRAWN - SEE CHANGE NOTE
	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
	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
PGC	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	

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

SPIRE INTERFACE mar 2002 (ASSEMBLY MODEL)  
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 AL PARTS GOLD PLATED AREAS ON COPPER PARTS (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0*15'
ESTD WT. 45.63kg (NO CONT)	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.		
TITLE	DRAWING No	
SPIRE INTERFACE (GENERAL DIMENSIONS)	A1 5264 300 sht1	
SHEET 1 OF 7		

DRAWING No.

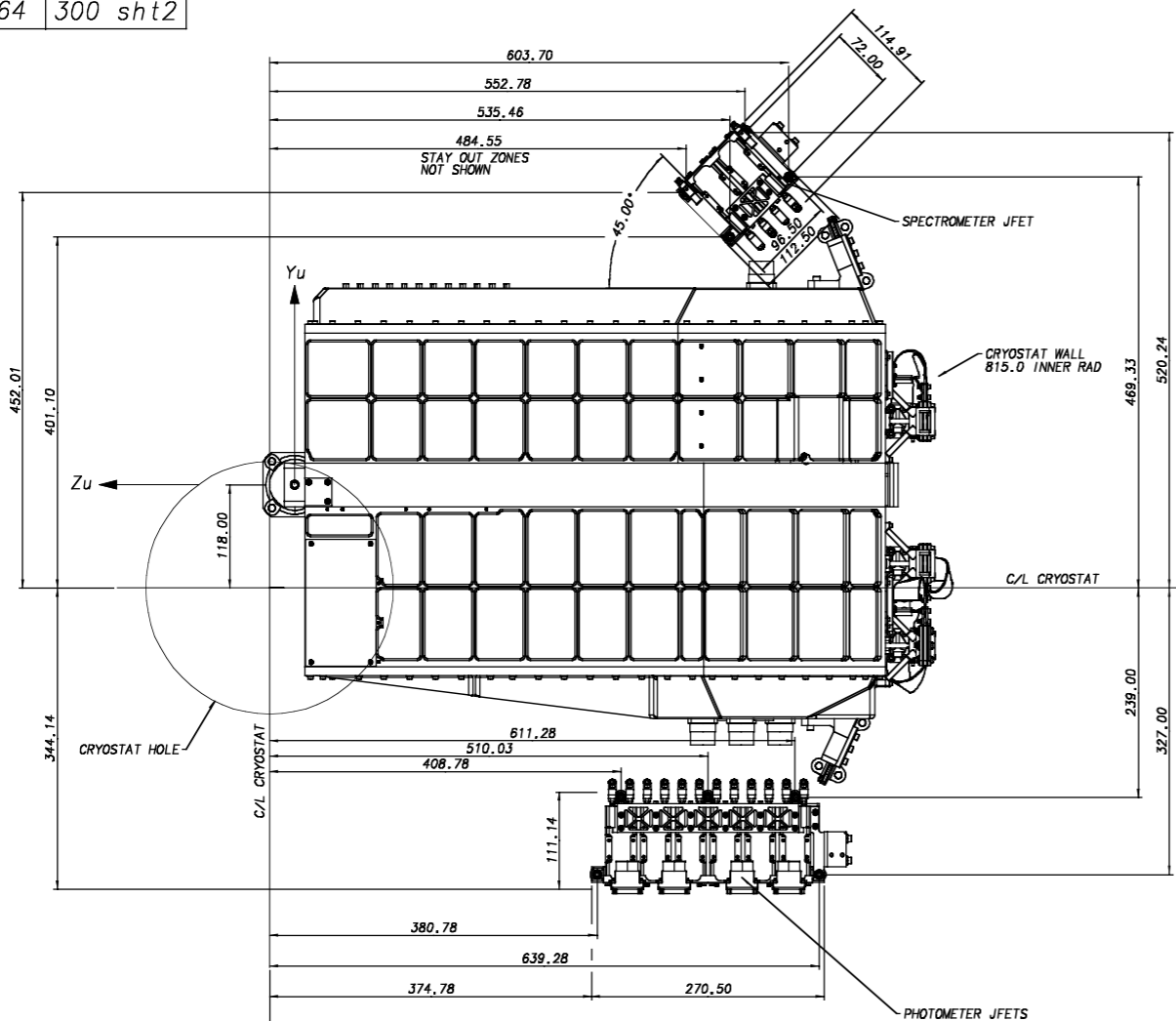
A1 5264 300 sht2

THIRD ANGLE PROJECTION

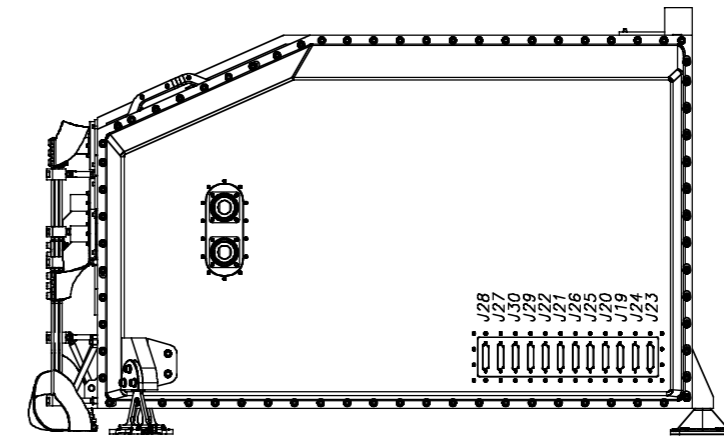
DO NOT SCALE

REMOVE ALL BURRS & SHARP EDGES

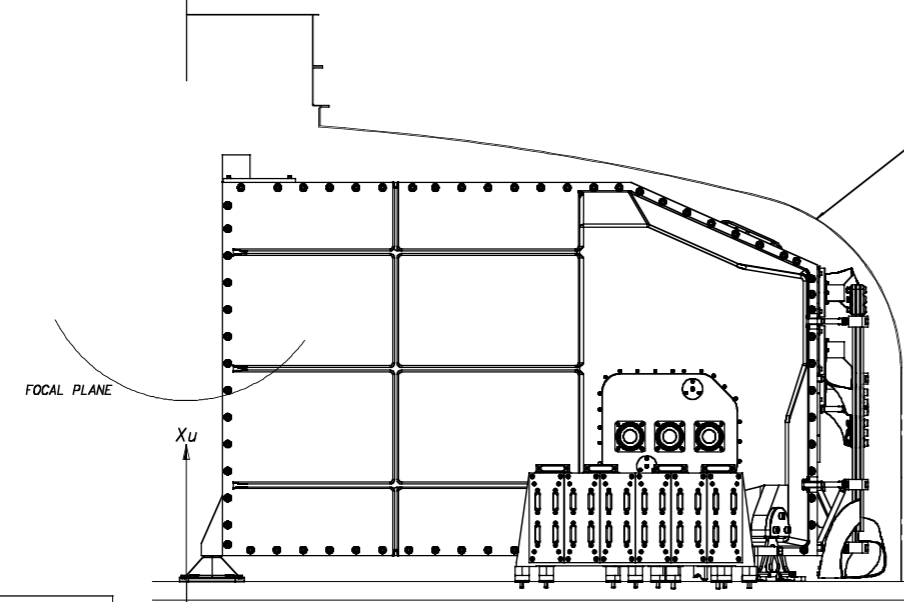
USED ON  
HERSCHEL



NOTE:-  
ALL DIMENSIONS AT ROOM TEMPERATURE



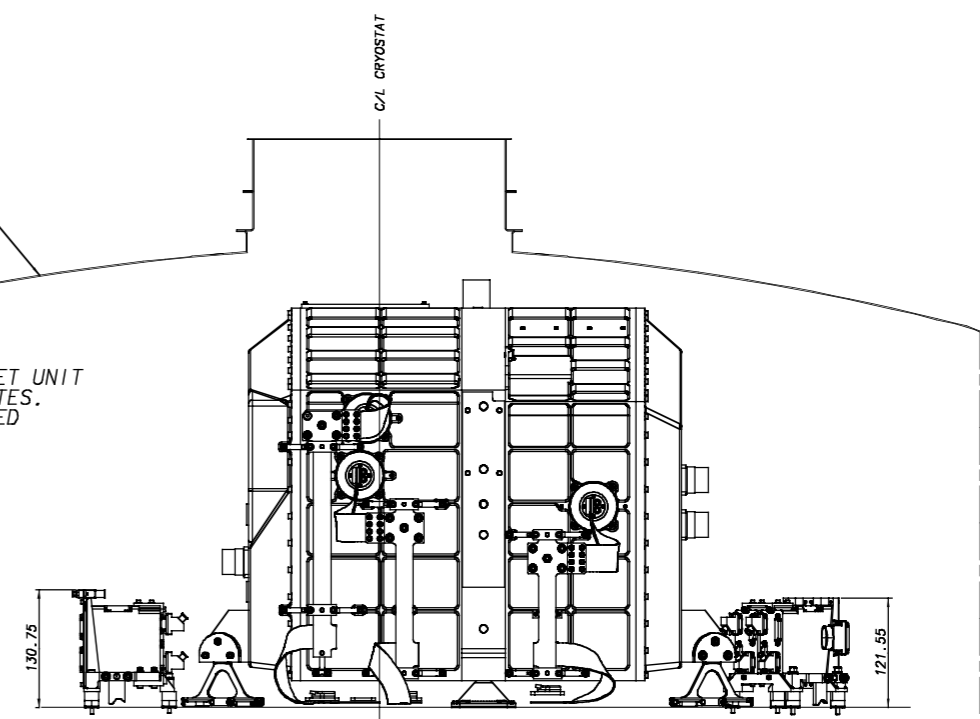
SPECTROMETER SIDE  
(VIEWED IN -Y<sub>u</sub> DIRECTION)



PHOTOMETER SIDE

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

ONLY CVV INSTRUMENT SHIELD SECTIONED ON C/L (SIDE AND END VIEWS)



20	8/9/05	REDRAWN-SEE CHANGE NOTE
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
	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
PGC	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	

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

SPIRE INTERFACE mar 2002 (ASSEMBLY MODEL)  
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) 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.

TITLE	SPIRE INTERFACE (J-FET POSITIONS)	DRAWING No	A1 5264 300 sht2
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USED ON  
HERSCHEL

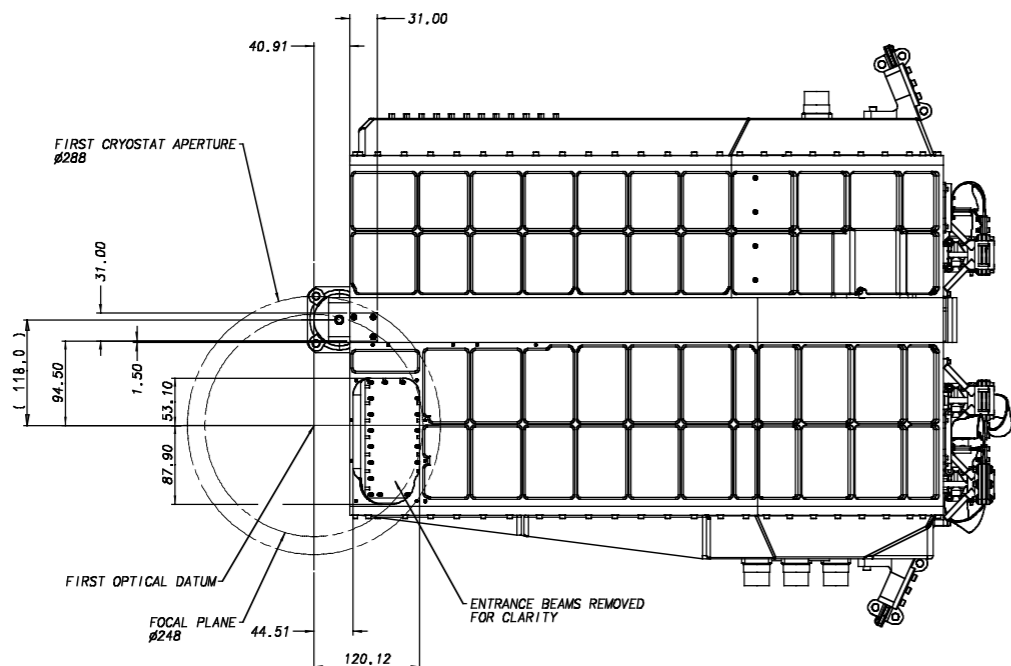
DRAWING No.

A1 5264 300 sht3

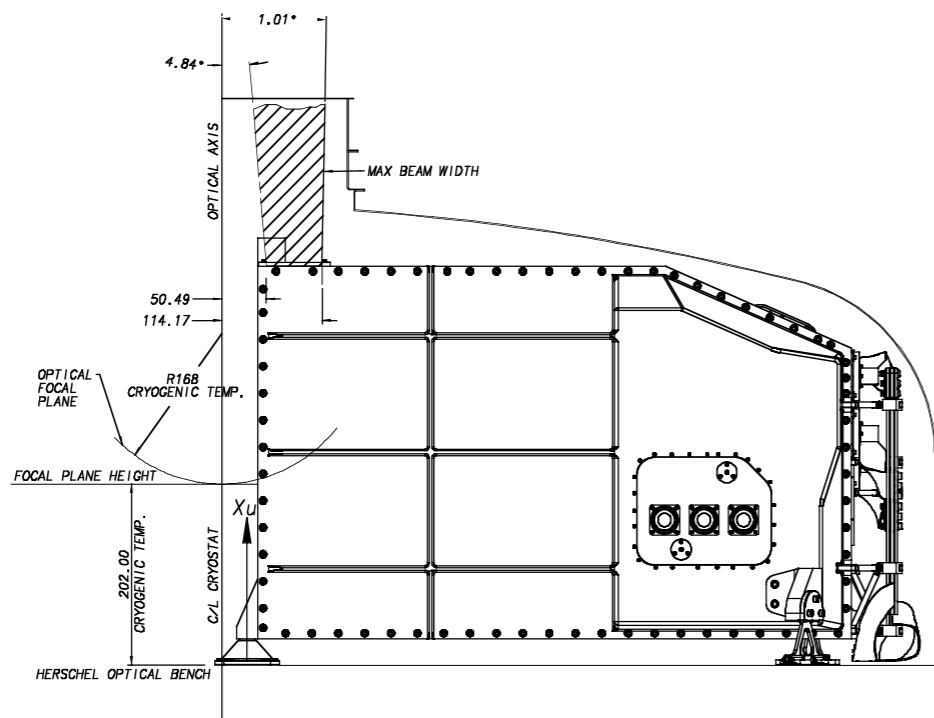
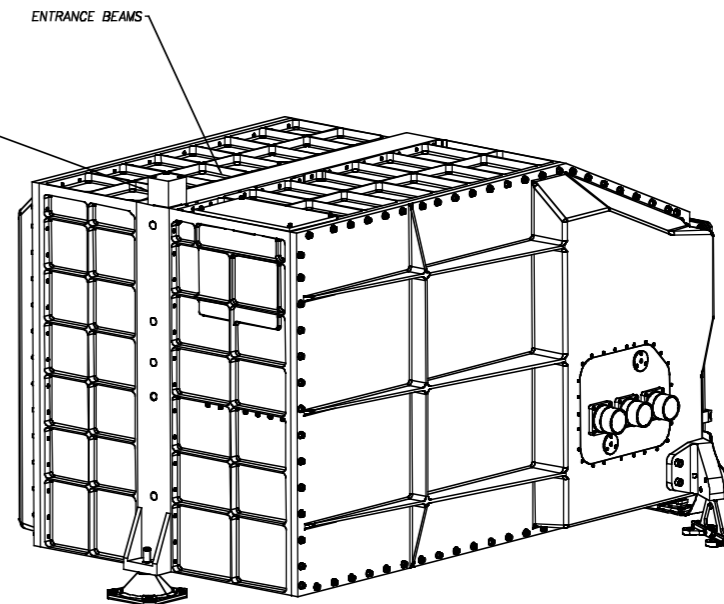
THIRD ANGLE PROJECTION

DO NOT SCALE

REMOVE ALL BURRS & SHARP EDGES

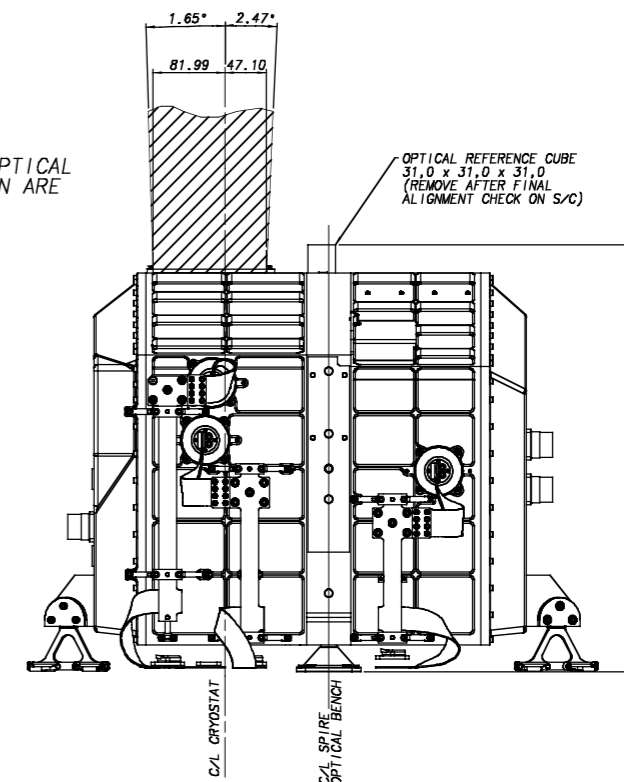


ANGULAR ACCURACY OF OPTICAL CUBE POSITION  
0.05° (3 ARC MIN)  
ANGULAR ACCURACY TO X<sub>u</sub>, Y<sub>u</sub>, Z<sub>u</sub> CO-ORDINATES  
0.05° +/- OPTICAL CUBE ANGULAR TOL. OF 50 ARC SEC  
REFER TO OPTICAL CUBE DRAWING No. A3/5264/305-16



OPTICAL BEAM DIMENSIONS:-

ONLY DIMENSIONS DEFINING THE VOLUME FOR THE OPTICAL BEAMS WHICH SHALL REMAIN FREE FROM OBSTRUCTION ARE SHOWN.  
REFER TO I1D-B FOR MORE DETAILED INFORMATION



NOTE:-

1. ALL DIMENSIONS AT ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED

20	8/9/05	REDRAWN-SEE CHANGE NOTE
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
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED
TRACED PGC	14	23/11/01	CENTRE OF GRAVITY ADDED TO SH1, 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 AJC	ISSUE	DATE	AMENDMENT
	1	24/11/01	

NOTE:- SEE CHANGE SHEET FOR DETAILS OF CHANGES MADE FROM ISSUE 16 ONWARDS
SPIRE INTERFACE mar 2002 (ASSEMBLY MODEL)
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) SEE NOTE SH1, 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.		
TITLE SPIRE INTERFACE (OPTICAL DETAILS)	DRAWING No A1 5264 300 sht3	
SHEET 3 OF 7		

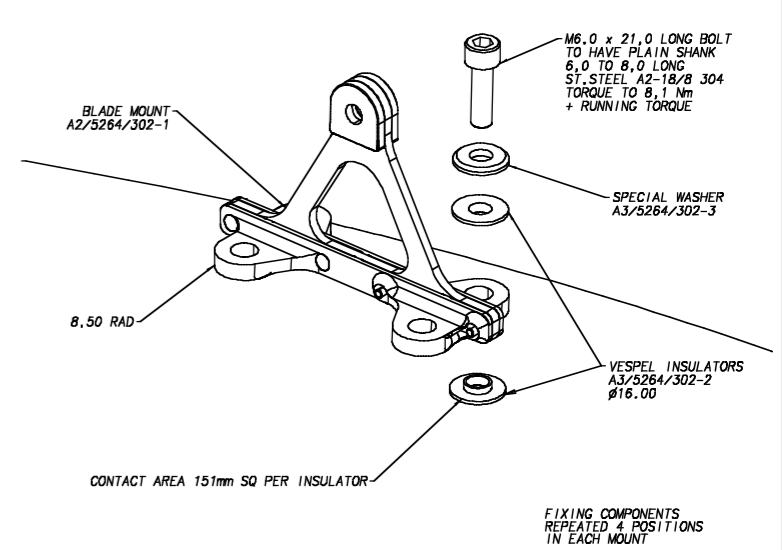
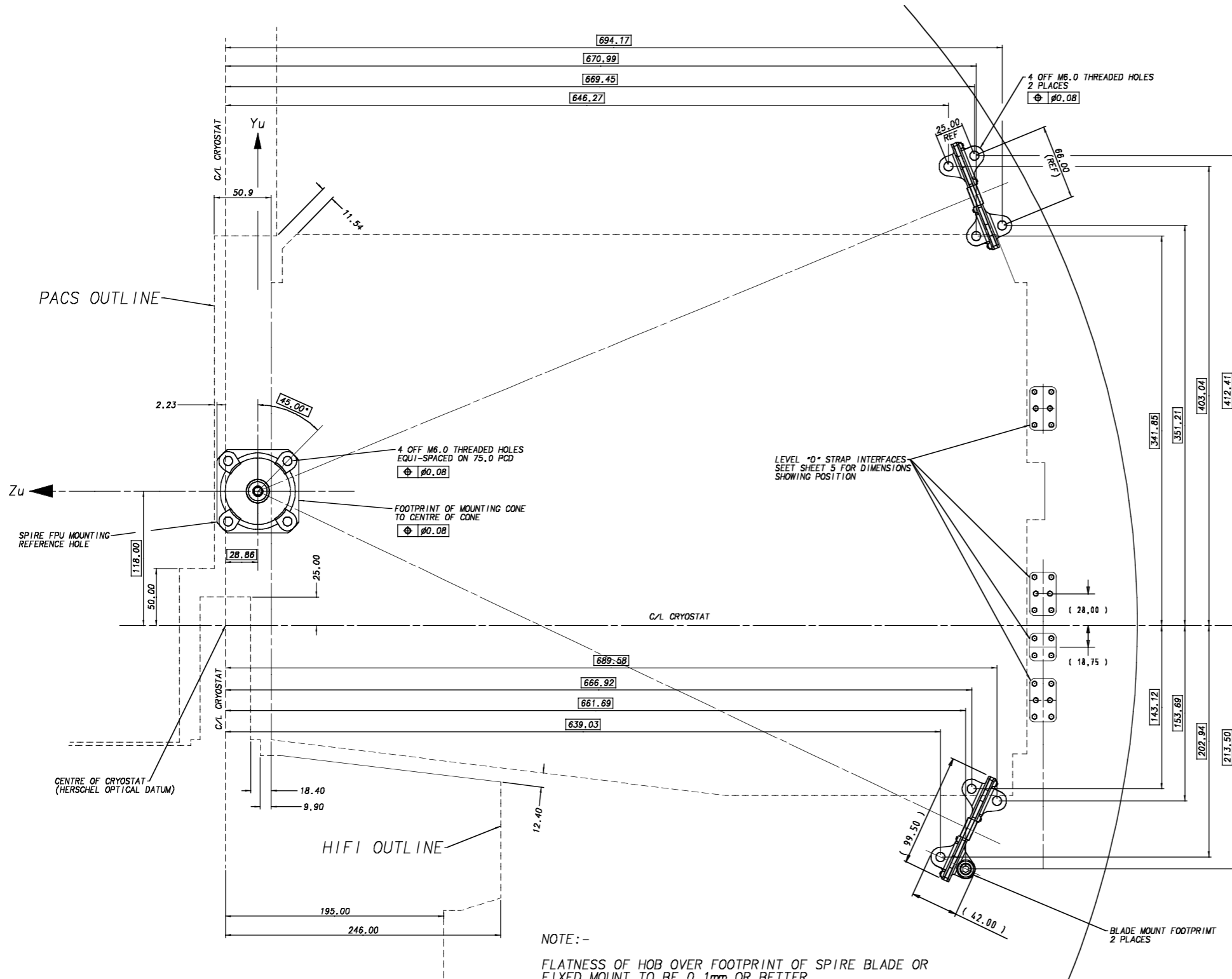
USED ON  
HERSCHEL

DRAWING No.  
A1 5264 300 sht4

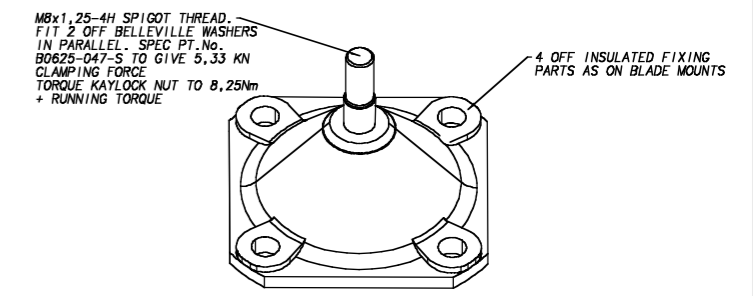
THIRD ANGLE PROJECTION

DO NOT SCALE

REMOVE ALL BURRS & SHARP EDGES



DETAIL OF BLADE MOUNT FIXINGS  
SCALE 1:1



DETAIL OF FIXED MOUNTING  
SCALE 1:1

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 FPU TO BE MACHINED OR SHIMMED INTO ALIGNMENT (IF REQUIRED).

NOTE:-  
1. ALL DIMENSIONS AT ROOM TEMPERATURE

20	8/9/05	SEE CHANGE SHEET
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
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED
TRACED PGC	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 & PHOT CONNECTORS ADDED. FOCAL PLANE & 'A' FRAME MOUNT DIM ADDED. SHEET 7 ADDED
DRAWN AJC	ISSUE	DATE	AMENDMENT
	1	24/11/01	

NOTE:- SEE CHANGE SHEET FOR DETAILS OF CHANGES MADE FROM ISSUE 16 ONWARDS	SPIRE INTERFACE mar 2002 (ASSEMBLY MODEL)	COMPUTER FILE
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PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) (SEE NOTE SHT. 1)	DIMENSIONS IN mm	SCALE 1:2 & 1:1

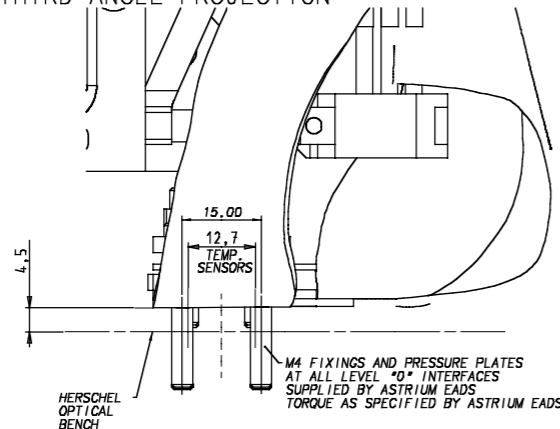
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.		
TITLE SPIRE INTERFACE (INTERFACE FIXING DETAILS)	DRAWING No A1 5264 300 sht4	

USED ON  
HERSCHEL

DRAWING No.

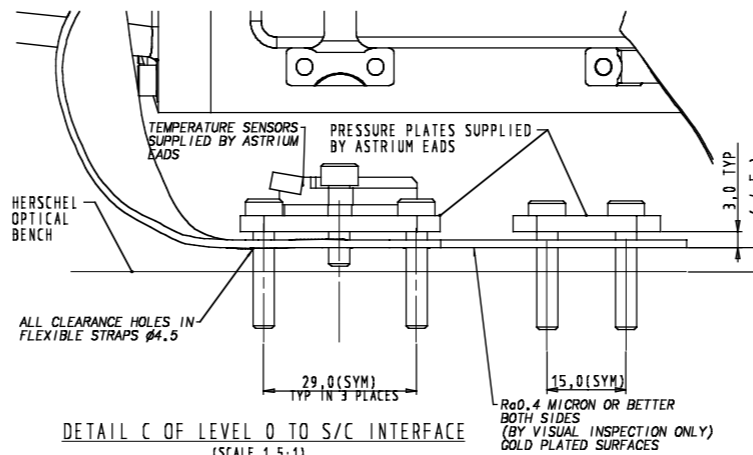
A1 5264 300 sht5

THIRD ANGLE PROJECTION



DETAIL "B" OF LEVEL "0" TO S/C INTERFACE  
(SCALE 1.5:1)

DO NOT SCALE



DETAIL C OF LEVEL 0 TO S/C INTERFACE  
(SCALE 1.5:1)

REMOVE ALL BURRS & SHARP EDGES

HSFPU EXTERNAL FINISHES:-

INSTRUMENT CASE AND EXTERNAL COVERS.  
BLADE AND FIXED MOUNTING.

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

EXTERNAL FIXINGS,  
COLD STRAPS

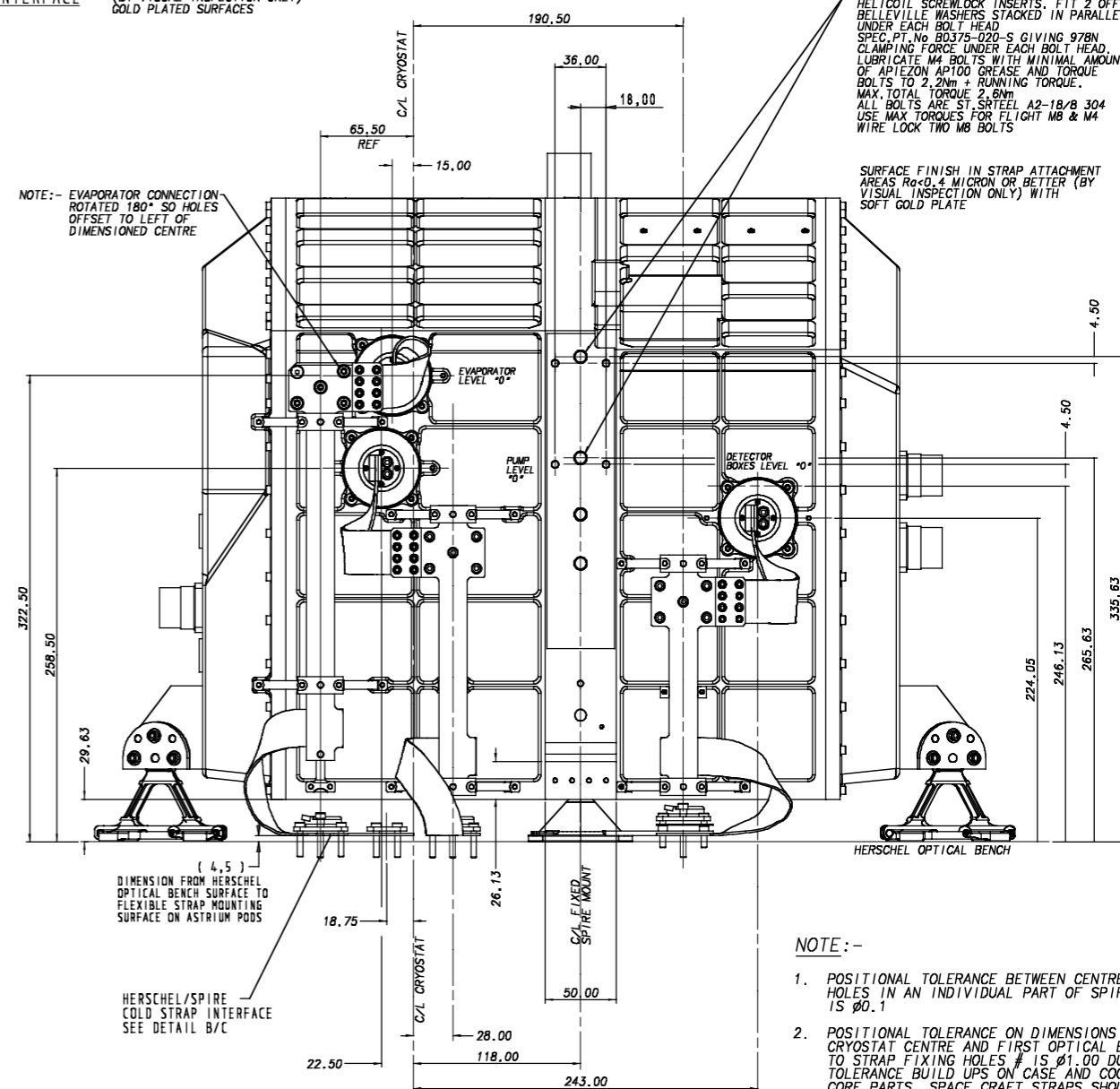
NOTE:-

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. FIT BELLEVILLE WASHER  
SPEC. PT. No. B0750-056-S GIVING 375N  
CLAMPING FORCE UNDER EACH BOLT HEAD.  
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 M4 BOLTS WITH MINIMAL AMOUNT  
OF APIEZON AP100 GREASE AND TORQUE  
BOLTS TO 2.2Nm + RUNNING TORQUE.  
MAX. TOTAL TORQUE 2.6Nm  
ALL BOLTS ARE ST. STEEL A2-18/8 304  
USE MAX TORQUES FOR FLIGHT M8 & M4  
WIRE LOCK TWO M8 BOLTS

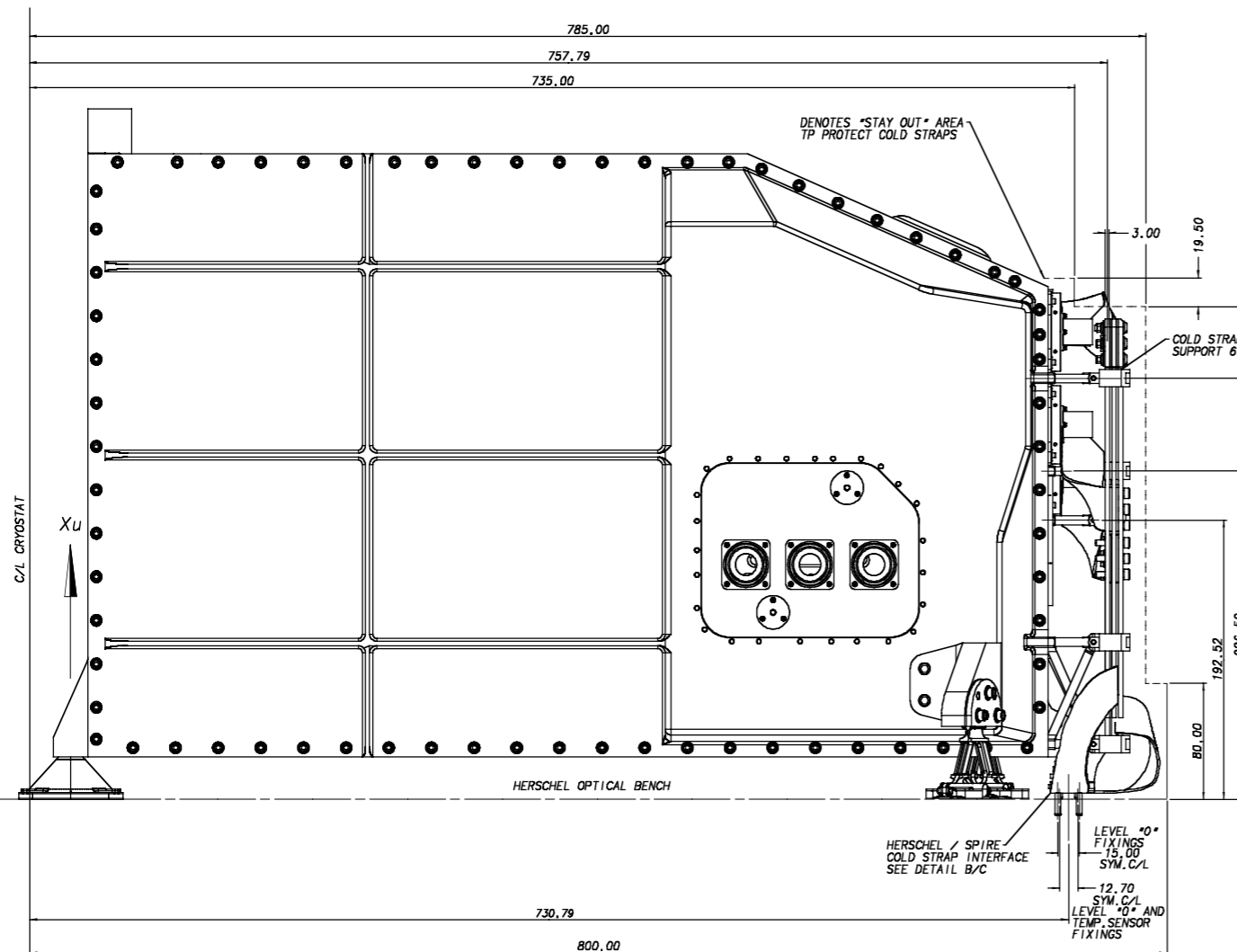
SURFACE FINISH IN STRAP ATTACHMENT  
AREAS Ra<0.4 MICRON OR BETTER (BY  
VISUAL INSPECTION ONLY) WITH  
SOFT GOLD PLATE

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  $\pm 0.1$
2. POSITIONAL TOLERANCE ON DIMENSIONS FROM CRYOSTAT CENTRE AND FIRST OPTICAL BENCH TO STRAP FIXING HOLES IS  $\pm 0.10$  DUE TO TOLERANCE BUILD UPS ON CASE AND COOLER CORE PARTS. SPACE CRAFT STRAPS SHOULD BE ABLE TO ACCOMMODATE THIS.



C/L CRYOSTAT

Xu

Zu

20	8/9/05	SEE CHANGE SHEET
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
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED
TRACED	14	23/11/01	CENTRE OF GRAVITY ADDED TO SH1, J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED
PGC	13	19/11/01	UPDATED REF. 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

NOTE:-  
ALL DIMENSIONS AT ROOM TEMPERATURE

SPIRE INTERFACE mar 2002 (ASSEMBLY MODEL)  
COMPUTER FILE

PROTECTIVE FINISH  
ALOCROM 1200 AND  
SOFT GOLD PLATE  
(ST. STEEL PARTS  
NATURAL)

MATERIAL & SPEC.  
AS LISTED

TOLERANCES UNLESS  
OTHERWISE STATED -  
LINEAR +/- 0.10  
ANGULAR +/- 0°15'

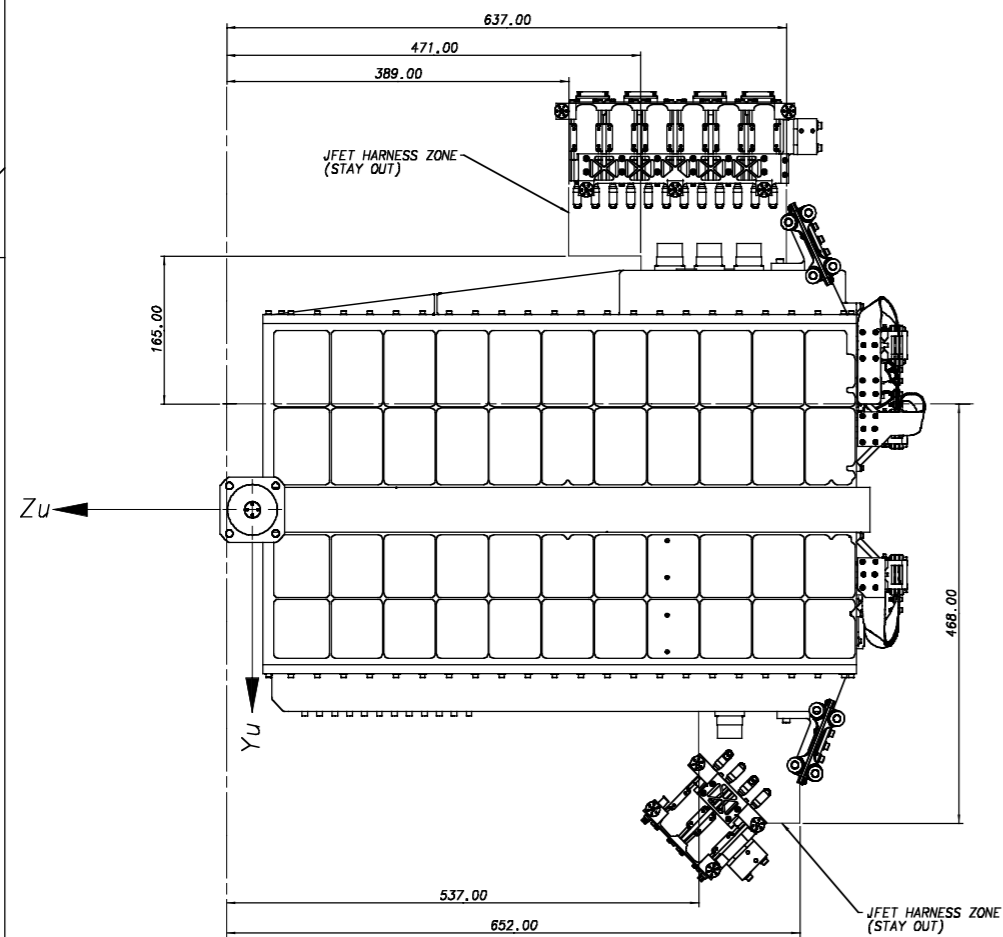
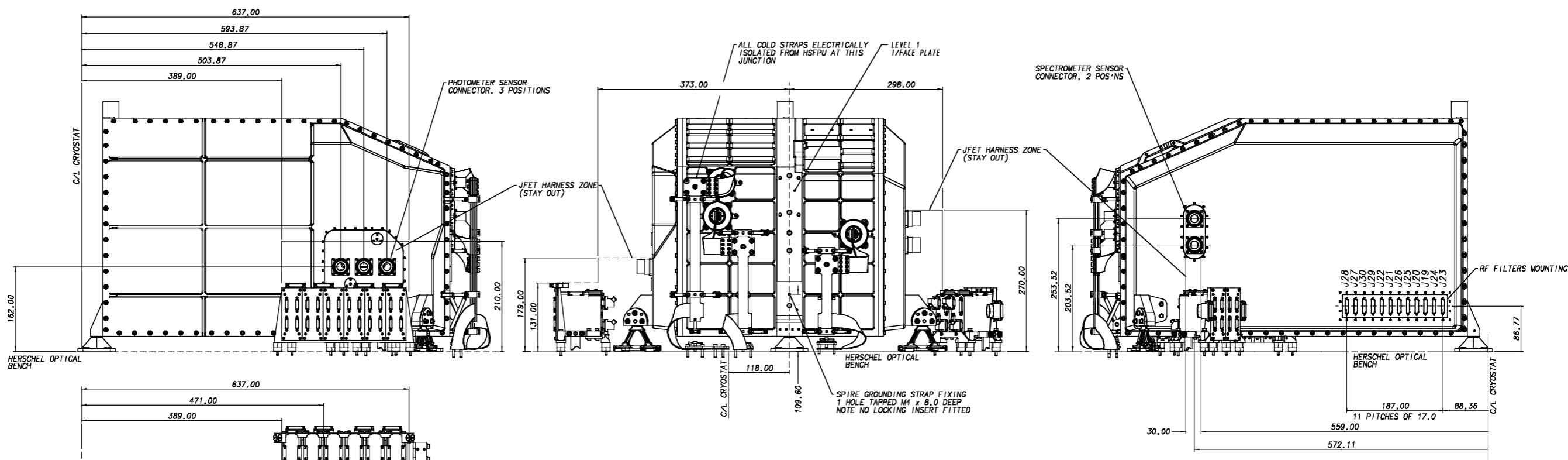
DEPARTMENT OF SPACE AND CLIMATE PHYSICS  
UNIVERSITY COLLEGE LONDON  
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY,  
DORKING, SURREY.

TITLE  
SPIRE INTERFACE  
(THERMAL STRAP CONNECTIONS)

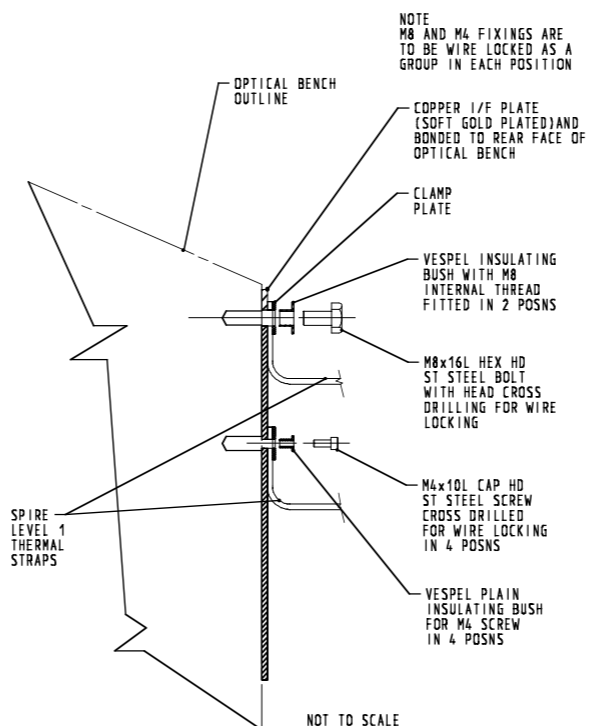
DRAWING No  
A1 5264 300 sht5



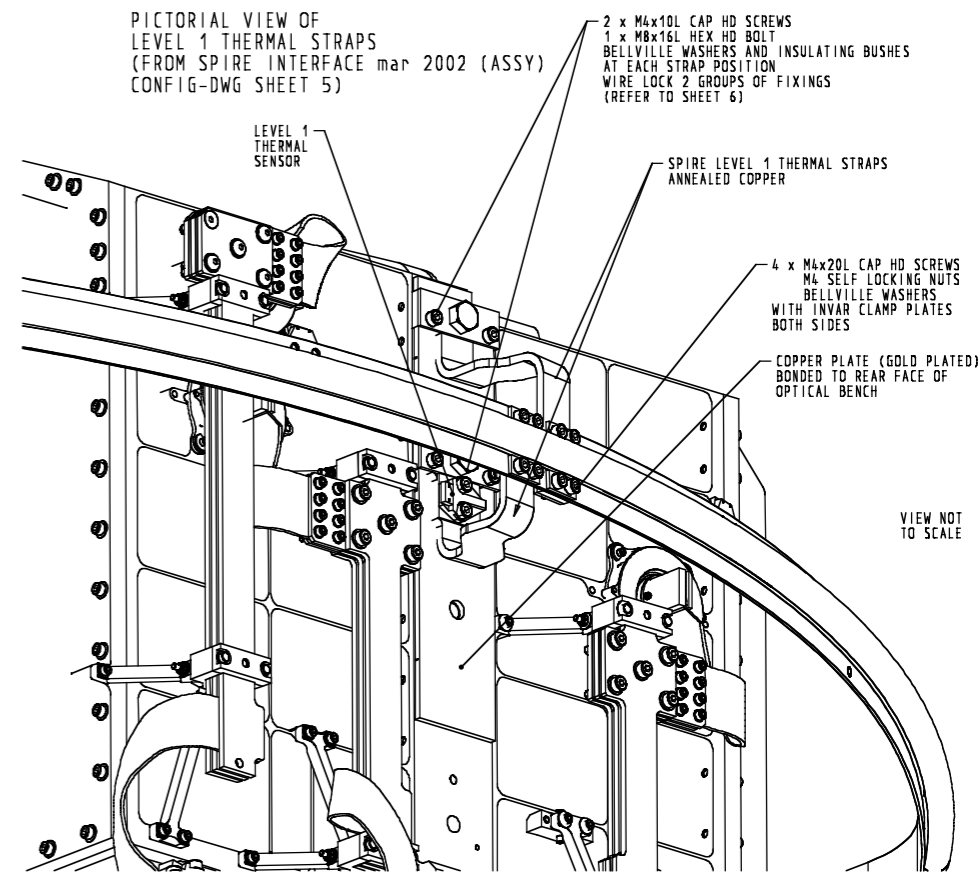
USED ON  
HERSCHEL



VIEW ON Xu (UNDERSIDE OF SPIRE)



PICTORIAL VIEW OF LEVEL 1 THERMAL STRAPS (FROM SPIRE INTERFACE mar 2002 (ASSY) CONFIG-DWG SHEET 5)



NOTE:-  
1. ALL DIMENSIONS AT ROOM TEMPERATURE

20	13/02/05	REDRAIN-SEE CHANGE SHEET	
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	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED	
14	23/11/01	CENTRE OF GRAVITY ADDED TO SH1, 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	

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

SPIRE INTERFACE mar 2002 (ASSEMBLY MODEL)
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 AL PARTS SELECTIVE GOLD PLATE ON COPPER PARTS (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) SEE NOTE SH1.7	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.		
TITLE	SPIRE INTERFACE	
DRAWING No	A1 5264 300 sht6	

DRAWING No.

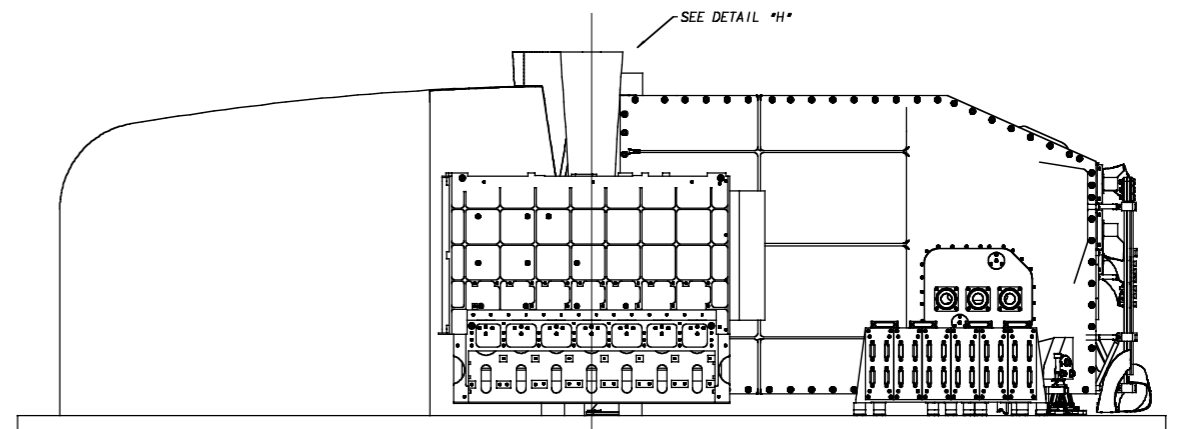
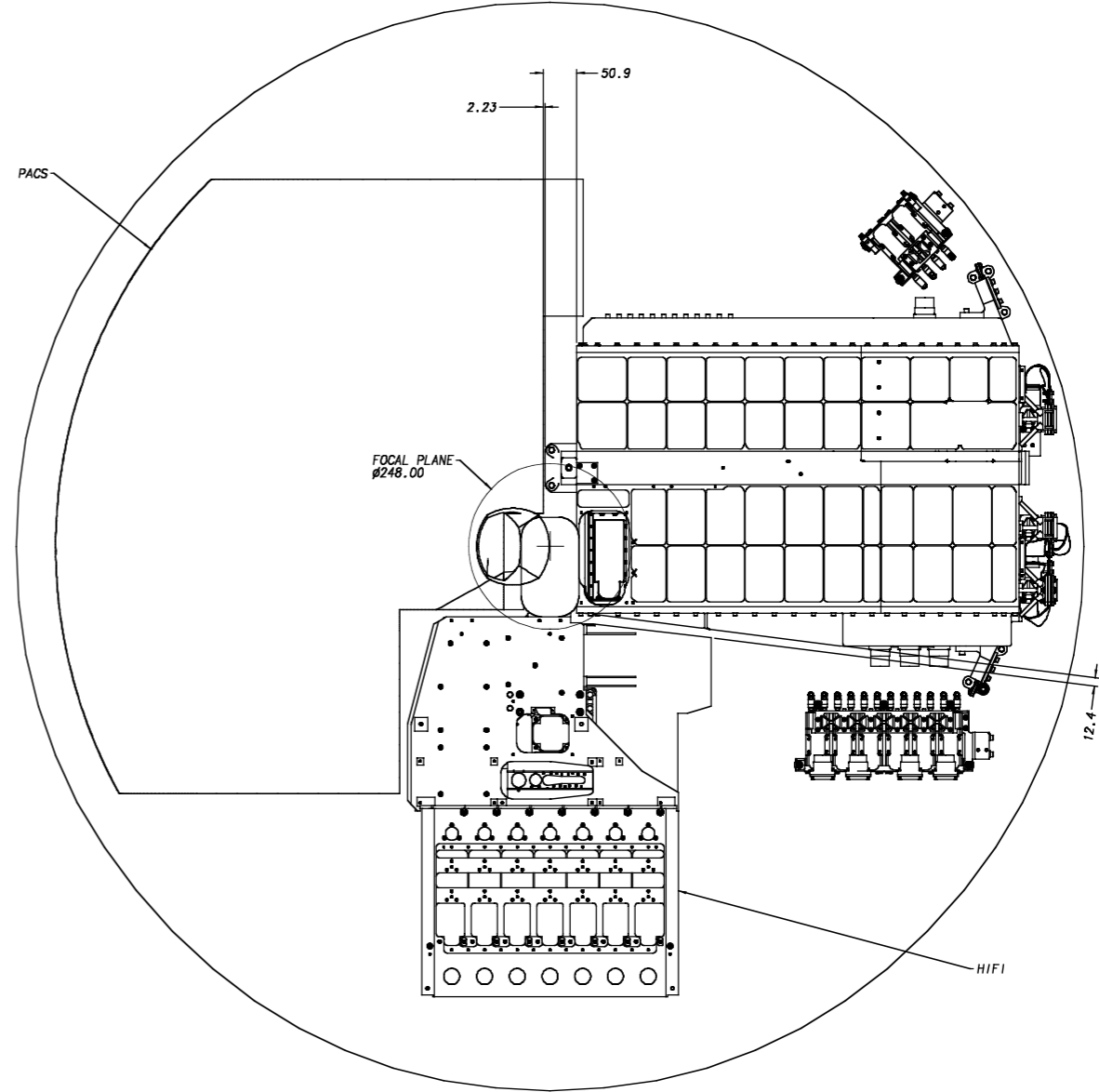
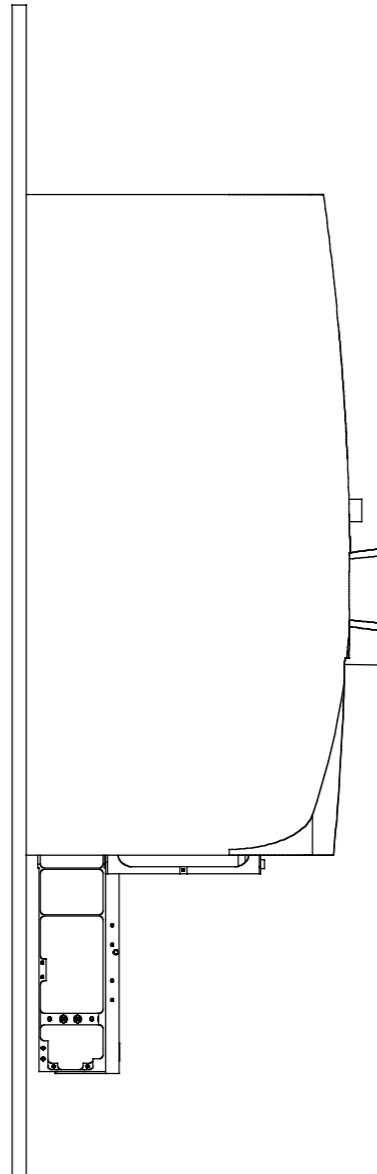
A1 5264 300 sht7

THIRD ANGLE PROJECTION

DO NOT SCALE

REMOVE ALL BURRS & SHARP EDGES

USED ON  
HERSCHEL



20	8/9/05	REDRAWN-SEE CHANGE SHEET
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	THERMAL STRAP INTERFACE MODIFIED, LEVEL 1 STRAP FIXING HOLES MOVED
PGC	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 & '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 INTERFACE mar 2002 (ASSEMBLY MODEL)  
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) (SEE NOTE SHT. 1)	DIMENSIONS IN mm	SCALE
ACTL WT.		

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

TITLE SPIRE INTERFACE (PACS & HIFI OPTICAL & CLEARANCES)	DRAWING No A1 5264 300 sht7
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SSTD Rutherford Appleton Laboratory	<b>Space Product Assurance Form</b> <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 3 of 6
<b>KE-2952</b>	<b>MODIFICATION SHEET</b>	
	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:	<p>1. Thermal standoff positional dimensions changed to basic dimensions.</p> <p>2. Thermal strap interface dimensions added</p> <p>3. Note 3 modified to clarify that stud is set to depth then nut is torqued to 2.1Nm.</p> <p>4. Height of JFET rack dimension added.</p> <p>5. Note 8 added regarding the protrusion and trimming of the parylene coating</p> <p>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).</p> <p>7. Typos fixed</p> <p>8. Unit mounting hole size and positional accuracy added</p>		
Issue raised to:	G	By:	Iain Gilmour

Date:	20-May-2003		
NCR/ECR:			
Modification Description:	<p>Added note to size of tapped holes for attachment of cooling strap ( L-1/2 )</p> <p>2 HOLES M4x0.7 1.5D LG HELICOIL FASTENER TO ENGAGE 1.5d TORQUE NOT TO EXCEED 2.5Nm</p>		

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED			
<b>KE-2952</b>			

SSTD Rutherford Appleton Laboratory	<b>Space Product Assurance Form</b> <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 4 of 6
<b>KE-2952</b>	<b>MODIFICATION SHEET</b>	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-360	
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		

Issue raised to:	H	By:	Kevin Burke
Date:	13-Oct-2003		
NCR/ECR:			
Modification Description:	<p>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.</p> <p>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.</p> <p>3. L3 strap and interface assembly added. Views updated to show interface details and L3 strap hole definition.</p> <p>4. Mass of JFET modules reduced from 305g to 260g.</p> <p>5. Kapton tape removed from fastener and stand-off interfaces (note 7 deleted).</p> <p>6. Moments of inertia updated along with C of G position.</p> <p>7. Kapton tape note removed from L3 interface area.</p> <p>8. Incorrectly specified M2.5 x 8 long fasteners used to fasten JFET modules to front plate replaced with M3 x 8 long.</p> <p>9. Temperature sensor interface shown on both sides of the L3 interface sub-assembly.</p> <p>10. Distance between S/C connector I/F and rear of JFET harness increased due to addition of 15-way connectors to JFET harness.</p> <p>11. New dimensions applied to L3 interface area.</p> <p>12. Connector fasteners and nuts added to spacecraft connectors.</p>		
Issue raised to:	I	By:	Dave Smart

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED			
<b>KE-2952</b>			

SSTD Rutherford Appleton Laboratory	<b>Space Product Assurance Form</b> <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 5 of 6
<b>KE-2952</b>	<b>MODIFICATION SHEET</b>	
	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:	<p>1. Harness re-routed to show clearance required to access connectors on the rear of the JFETS. Reference to note 6 added.</p> <p>2. Harness tie down parts added.</p> <p>3. Note 8 added concerning the pre-fitting of the M4 fasteners prior to the assembly of the harness.</p>		
Issue raised to:	J	By:	Dave Smart

Issue raised to:	K	By:	Dave Smart
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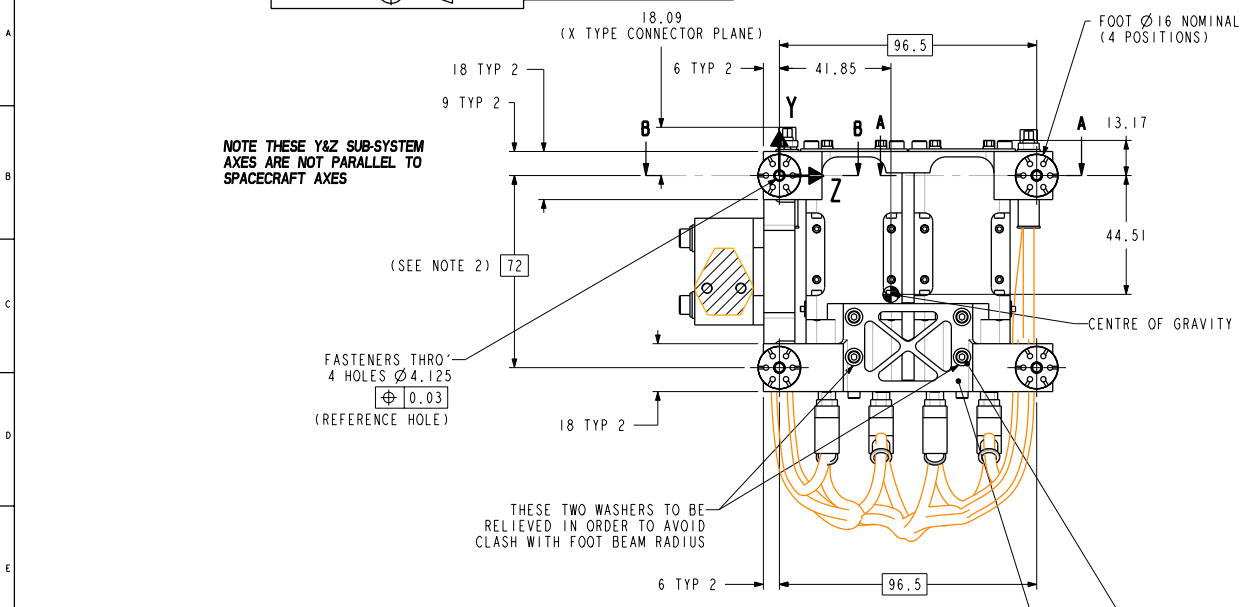
SSTD Rutherford Appleton Laboratory	<b>Space Product Assurance Form</b> <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 6 of 6
<b>KE-2952</b>	<b>MODIFICATION SHEET</b>	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-360	
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		

Date:	10-Mar-2004		
NCR/ECR:			
Modification Description:	<p>1. Note 9 and leaders added indicating 3mm jackscrew length below the mating plane.</p> <p>2. Label added to Part 23836-10209722 (JFET) to indicate orientation:</p> <p style="text-align: center;">SPIRE</p> <p style="text-align: center;">10209750</p> <p style="text-align: center;">JFET MODULE</p> <p style="text-align: center;">JPL</p> <p>(NOTE: 10209750 is the JPL part number, 10209722 is the JPL ICD drawing number. JD wishes to leave the ProE part name as 23836-10209722)</p>		
Issue raised to:	K	By:	Dave Smart

Date:	05-Aug-2005		
NCR/ECR:			
Modification Description:	<p>1. Note added to describe removal of Carbon Whiskers and coating with D222a</p> <p>RAISED TO ISSUE L</p>		
Issue raised to:	L	By:	Sam Tobin

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED			
<b>KE-2952</b>			

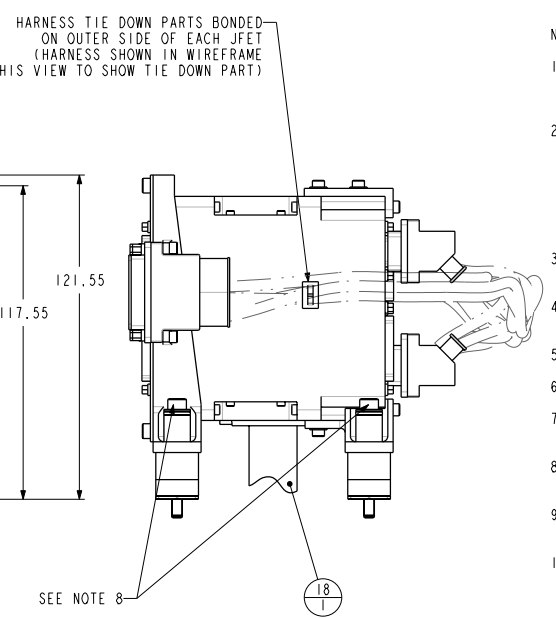
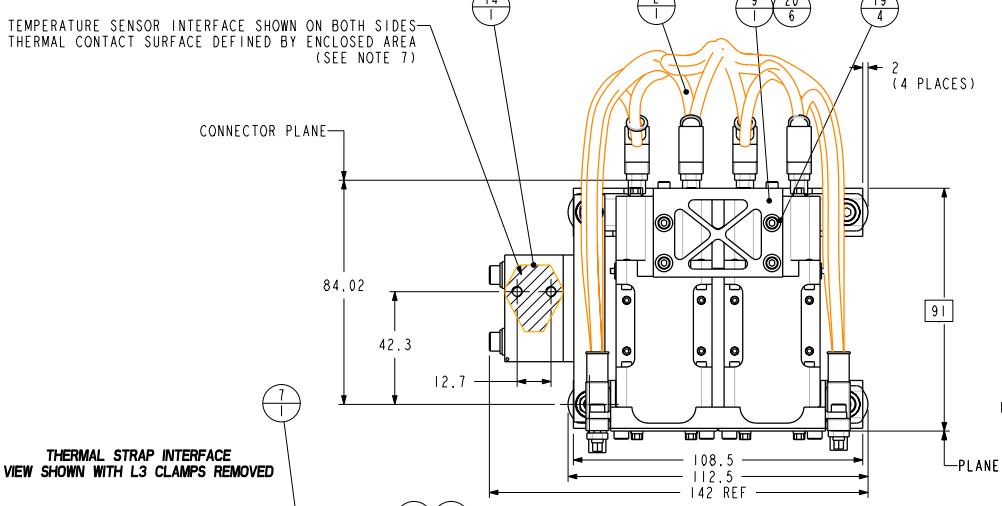
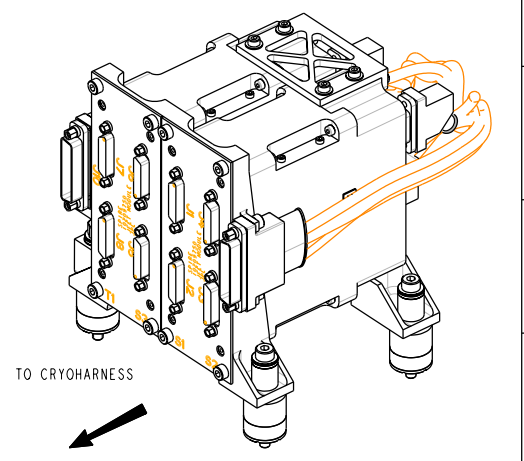
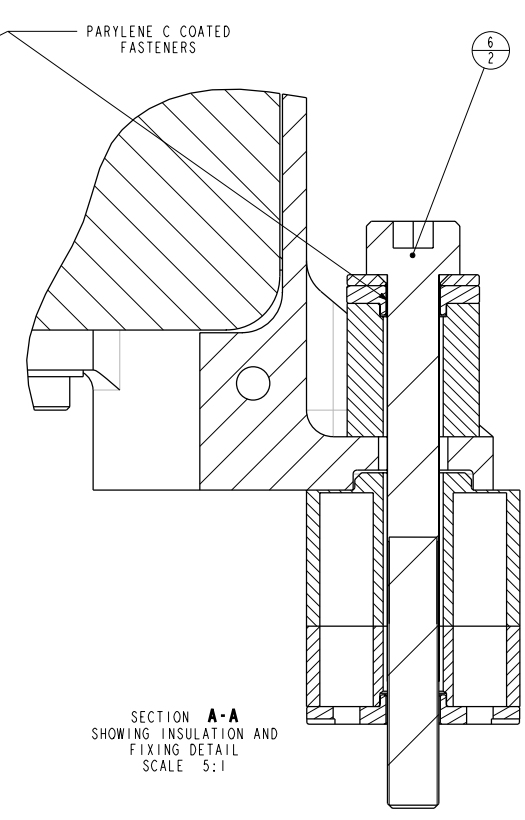
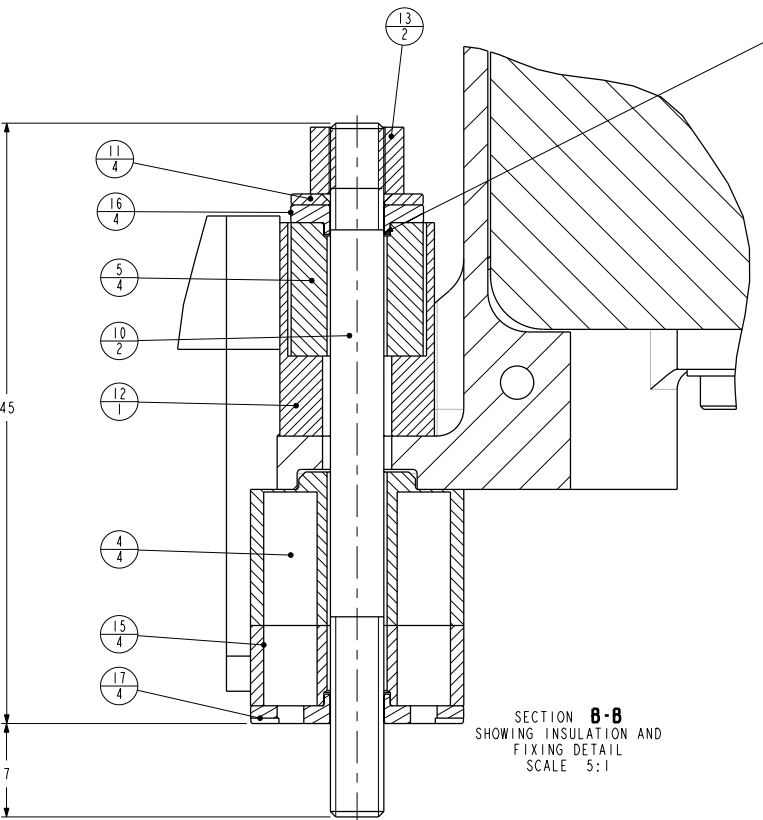
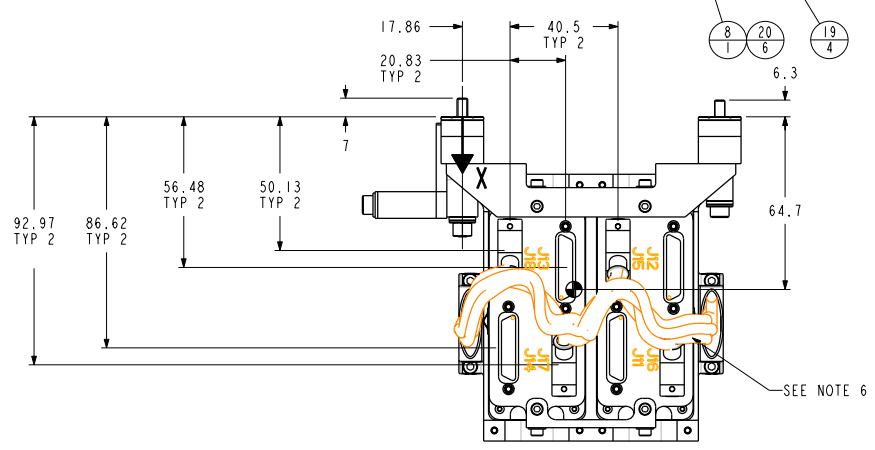
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED			
<b>KE-2952</b>			



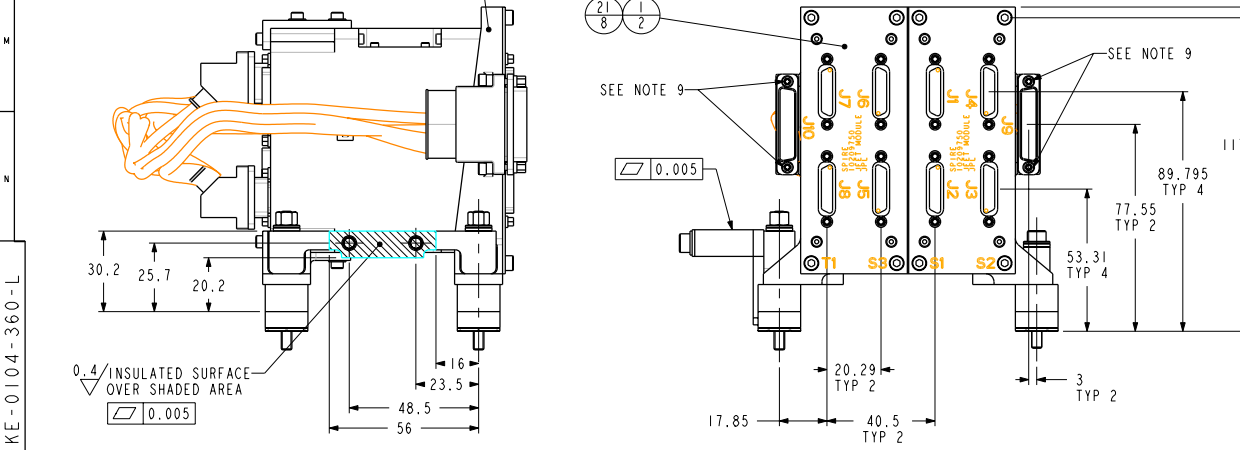
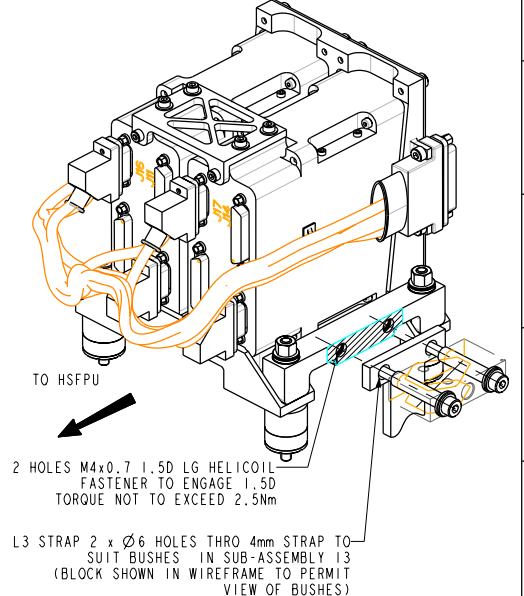
CONNECTOR TABLE		
LABEL	TYPE	FUNCTION
J1	ALL MDW2P	ALL SIGNAL FEEDS TO CRYOHARNESS
J2		
J3		
J4		
J5		
J6		
J7		
J8		
J9	MDW37S	BIAS WIRES FROM CRYOHARNESS
J10	ALL MDW5P	SIGNALS IN FROM DETECTORS
J11		
J12		
J13		
J14		
J15	ALL MDW5P	BIAS FEEDS INTO MODULES
J16		
J17		
J18		

MOMENTS OF INERTIA (kg mm <sup>2</sup> ) WITH RESPECT TO C OF G	
I <sub>xx</sub>	1.71e+03
I <sub>yy</sub>	1.94e+03
I <sub>zz</sub>	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	M4 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	33.69	33.69	
9	KE-0104-363	REAR TOP BEAM - 2 JFET	1	8.62	8.62	
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 ASSY - 2 JFET	1	23.28	23.28	
13	KE-0104-386	M4 NUT (5mm LONG)	2	1.31	2.62	
14	KE-0104-393	L3 INTERFACE ASSY	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	968.13 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 INTERFACE 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 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-HARNESS 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 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
  - ONLY 3mm JACKSCREW LENGTH GUARANTEED BELOW THE MATING PLANE
  - INNER SURFACES OF PARTS 4, 5 AND 15 TO BE CLEAN OF CARBON WHISKERS AND OVERCOATED WITH D222A AFTER ASSEMBLY.



ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
L	05-Aug-05	KE-2952.	D. SMART			ISSUED
TOLERANCES UNLESS STATED		FINISH		ORIGINAL SCALE		
±0.2 mm		CLEAN		1:1		
±0.3		REMOVE ALL BURRS		DO NOT SCALE		
MATERIAL & SPEC.		SURFACE TEXTURE µm		SEE DETAILS		
SEE DETAILS		UNLESS STATED		0 50mm		
USED ON						© CLRC 2005
CENTRAL LABORATORY OF THE RESEARCH COUNCILS						
TITLE						
2 JFET RACK INTERFACE DRAWING						
SPIRE						
A 0-KE-0104-360-L						1 of 1

SSTD Rutherford Appleton Laboratory	<b>Space Product Assurance Form</b> <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 3 of 6
<b>KE-2953</b>	<b>MODIFICATION SHEET</b>	
	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"> <li>Thermal standoff positional dimensions changed to basic dimensions.</li> <li>Thermal strap interface dimensions added</li> <li>Note 8 added regarding the protrusion and trimming of the parylene coating</li> <li>Typos fixed</li> <li>2 off thermal strap standard washers replaced with Belleville washers, BOM updated to this effect.</li> <li>Unit mounting hole size and positional accuracy added</li> </ol>
Issue raised to:	E
By:	Iain Gilmour

Date:	20-May-2003
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> <li>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</li> </ol>
Issue raised to:	F
By:	Kevin Burke

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

**KE-2953**

SSTD Rutherford Appleton Laboratory	<b>Space Product Assurance Form</b> <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 4 of 6
<b>KE-2953</b>	<b>MODIFICATION SHEET</b>	
	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"> <li>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.</li> <li>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.</li> <li>L3 strap and interface assembly added. Views updated and added to show interface details and L3 strap hole definition.</li> <li>Mass of JFET modules reduced from 305g to 260g.</li> <li>Kapton tape removed from fastener and stand-off interfaces (note 7 deleted).</li> <li>Moments of inertia updated along with C of G position.</li> <li>Fastener for thermal strap assembly changed to non parylene coated M4 x 45mm long.</li> <li>Kapton tape note removed from L3 interface area.</li> <li>Incorrectly specified M2.5 x 8 long fasteners used to fasten JFET modules to front plate replaced with M3 x 8 long.</li> <li>Temperature sensor interface shown on both sides of the L3 interface sub-assembly.</li> <li>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.</li> <li>New dimensions applied to L3 interface area.</li> <li>Connector fasteners and nuts added to spacecraft connectors.</li> </ol>

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

**KE-2953**

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

Issue raised to:	G
By:	Dave Smart

Date:	10-Mar-2004
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> <li>Note 8 and leaders added indicating 3mm jackscrew length below the mating plane.</li> <li>Label added to Part 23836-10209722 (JFET) to indicate orientation:  SPIRE  10209750  JFET MODULE  JPL</li> </ol> <p>(NOTE: 10209750 is the JPL part number, 10209722 is the JPL ICD drawing number. JD wishes to leave the ProE part name as 23836-10209722)</p>
Issue raised to:	H
By:	Dave Smart

Date:	05-Aug-2005
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> <li>Note added to describe removal of Carbon Whiskers and coating with D222a</li> </ol>
RAISED TO ISSUE J	
Issue raised to:	J
By:	Sam Tobin

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

**KE-2953**

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

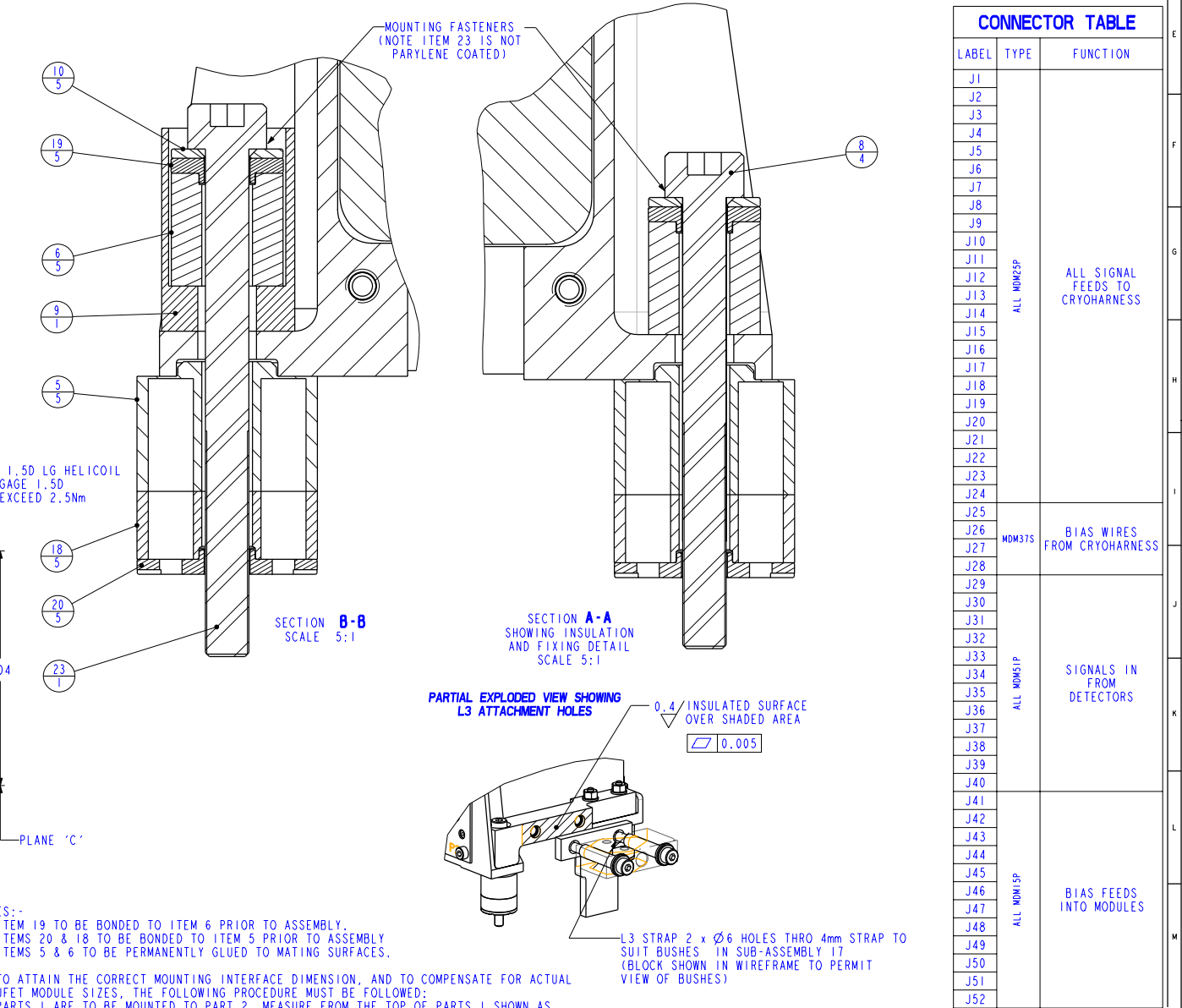
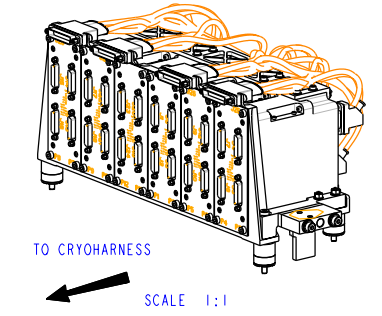
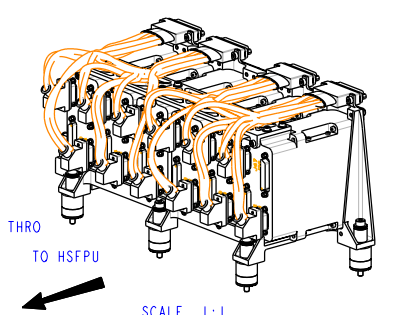
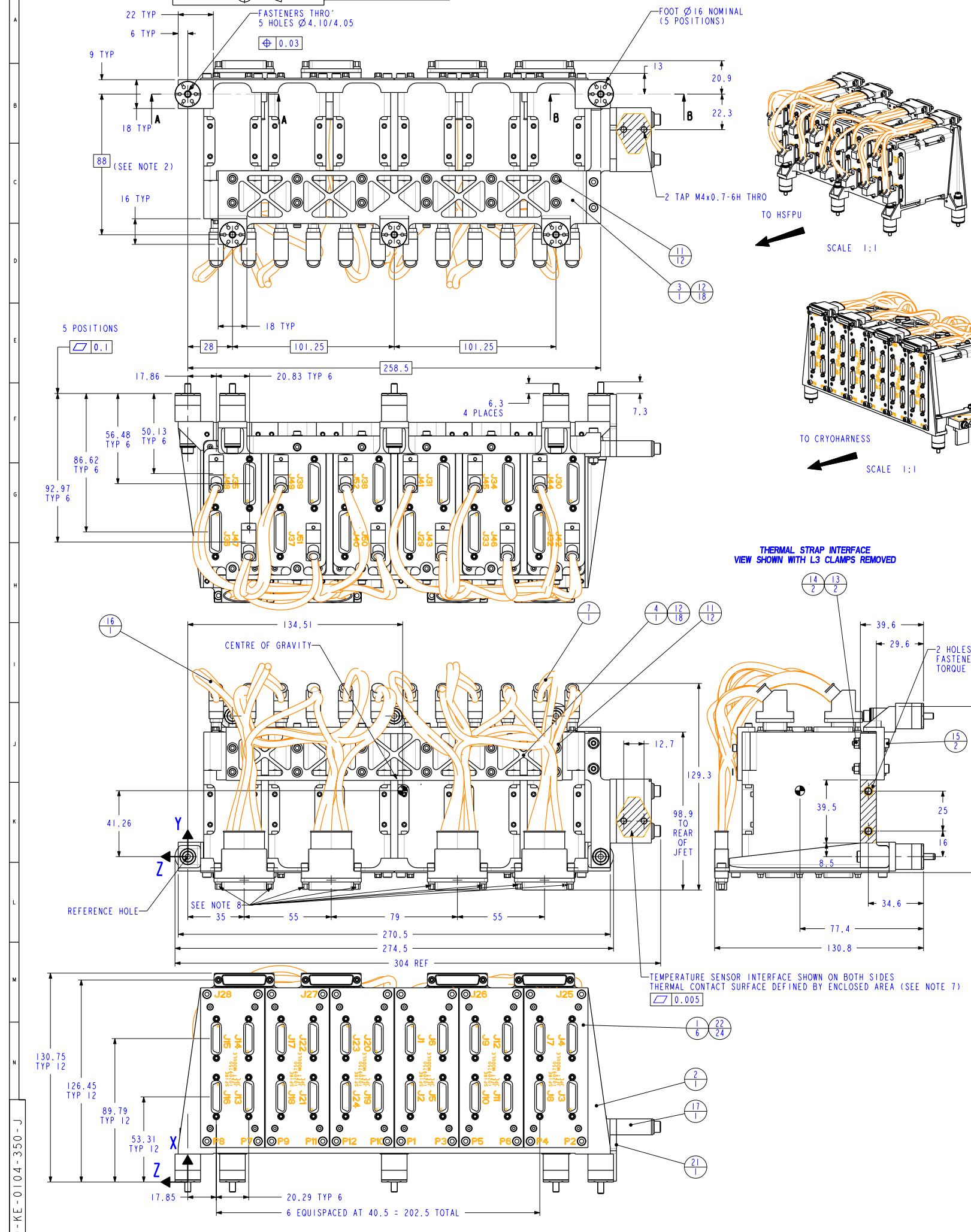
Issue raised to:	
By:	

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

**KE-2953**

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	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	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	M2-5_WASHER	WASHER	24	0.11	2.57	S/STEEL BS970/1501 304S 11/15/31
12	M2-5_X_8LG_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 17415
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_8LG_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

MOMENTS OF INERTIA (kg.mm <sup>2</sup> ) WITH RESPECT TO C OF G
I <sub>xx</sub> 1.70e+04
I <sub>yy</sub> 1.66e+04
I <sub>zz</sub> 4.73e+03



**CONNECTOR TABLE**

LABEL	TYPE	FUNCTION
J1		
J2		
J3		
J4		
J5		
J6		
J7		
J8		
J9		
J10		
J11		
J12		
J13		
J14		
J15		
J16		
J17		
J18		
J19		
J20		
J21		
J22		
J23		
J24		
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J32		
J33		
J34		
J35		
J36		
J37		
J38		
J39		
J40		
J41		
J42		
J43		
J44		
J45		
J46		
J47		
J48		
J49		
J50		
J51		
J52		

- NOTES:-
- 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 PART 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
  - ONLY 3mm JACSREW LENGTH GUARANTEED BELOW MOUNTING PLANE
  - INNER SURFACES OF PARTS 5, 6 AND 18 TO BE CLEAN OF CARBON WHISKERS AND OVERCOATED WITH D222A AFTER ASSEMBLY.

ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
J	05-AUG-05	KE-2953.	D. SMART			ISSUED
TOLERANCES UNLESS STATED		FINISH		ORIGINAL SCALE		
±0.2 mm		CLEAN		1:1		
±0.3		REMOVE ALL BURRS		DO NOT SCALE		
MATERIAL & SPEC. SEE DETAILS		SURFACE TEXTURE µm		0 50mm		
		UNLESS STATED				
USED ON						© CLRC 2005
CENTRAL LABORATORY OF THE RESEARCH COUNCILS						
TITLE						
6 JFET RACK INTERFACE DRAWING						
SPIRE						
A 0-KE-0104-350-J						1 OF 1

DRAWING No.  
A1 5264 404 SHT 4

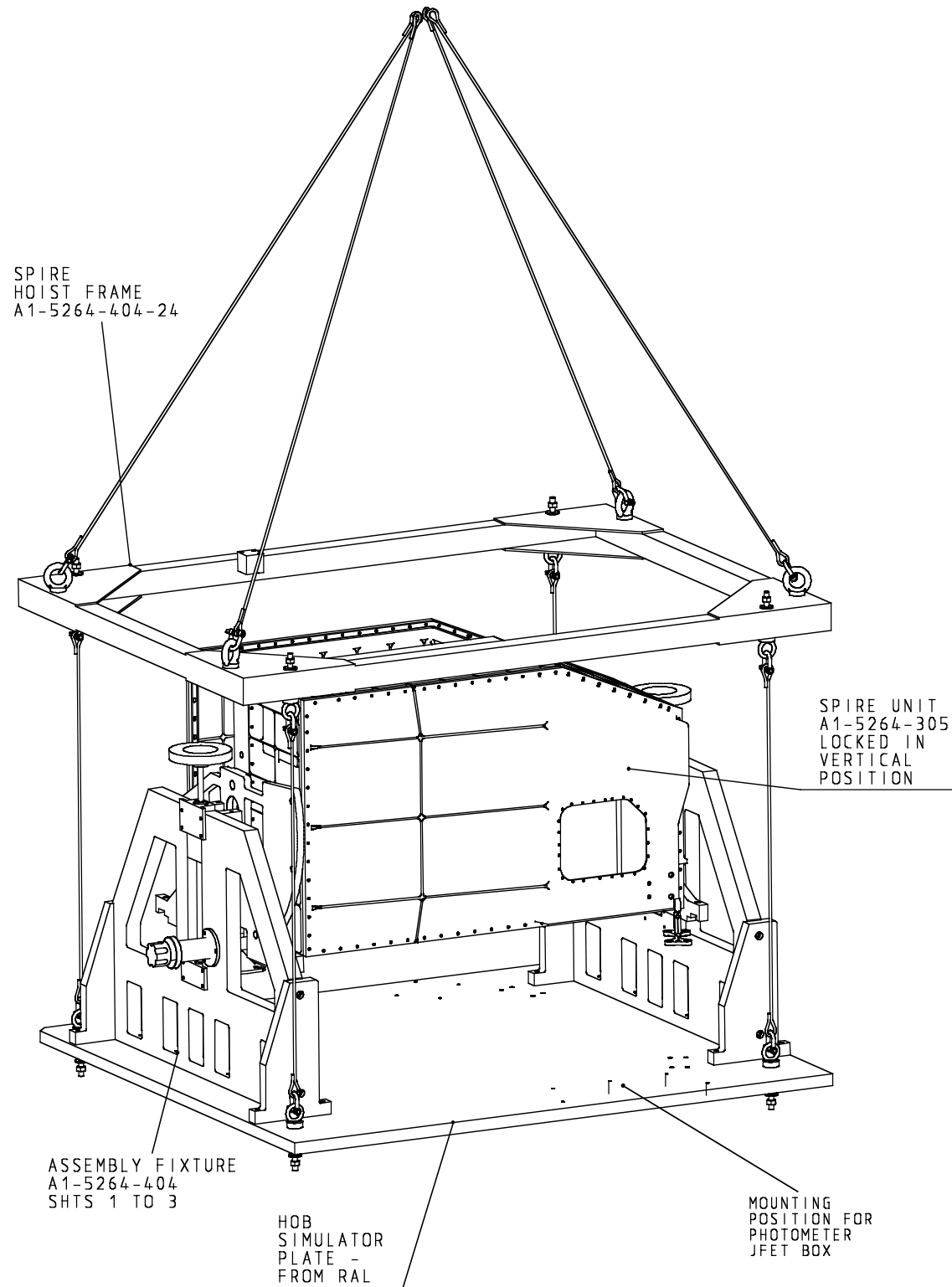
THIRD ANGLE PROJECTION

DO NOT SCALE

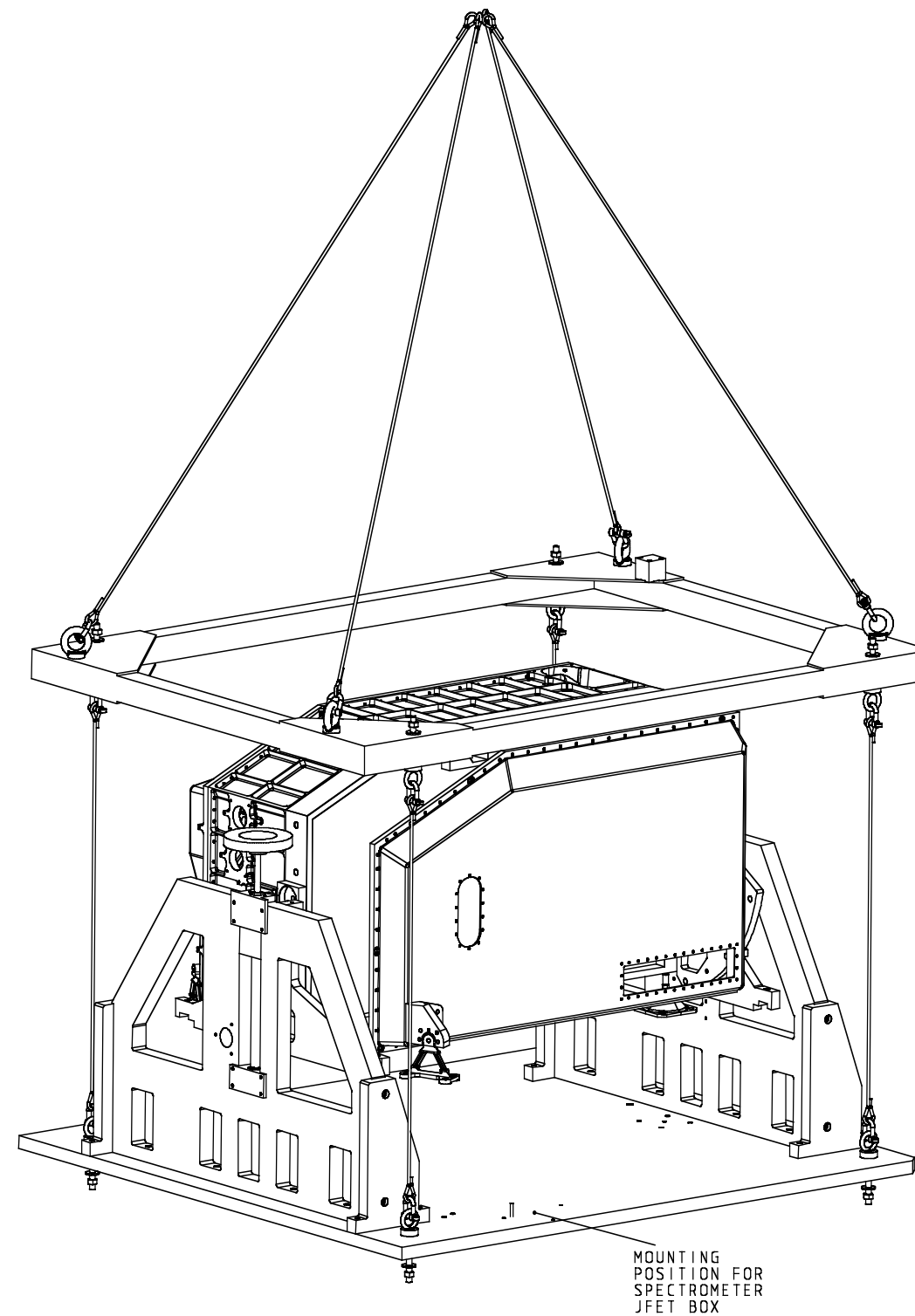
REMOVE ALL BURRS & SHARP EDGES

NOTES  
1 SEE SHEET 5 FOR FRAME DETAILS AND PARTS LIST

USED ON  
SPIRE  
MGSE



VIEW TAKEN FROM HOIST-FRAME-KIT CONFIG2-HOIST-SPIRE



VIEW TAKEN FROM HOIST-FRAME-KIT CONFIG2-HOIST-SPIRE

CHECKED				THE COPYRIGHT OF THIS DOCUMENT IS VESTED IN UNIVERSITY COLLEGE LONDON. THIS DOCUMENT MAY ONLY BE REPRODUCED IN WHOLE OR IN PART OR STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS ELECTRONIC, MECHANICAL, PHOTOCOPYING, OR OTHERWISE, WITH THE PRIOR PERMISSION OF UNIVERSITY COLLEGE LONDON	PROTECTIVE FINISH	MATERIAL & SPEC.	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'	DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.			
TRACED	3	26/3/04	M10 PLAIN NUTS REPLACED WITH M10 NYLON NUTS		ESTD WT.				TITLE		
	2	28/3/03			ACTL WT.	DIMENSIONS IN mm	SCALE	NTS	SPIRE LIFTING HOIST GENERAL ARRANGEMENT		
DRAWN	ISSUE	DATE	AMENDMENT	COMPUTER FILE DRAWING A1-5264-404-sht4and5 ASSEMBLY HOIST-FRAME-KIT CONFIG1 AND 2				DRAWING No			
PMB	1	2/10/02						A1	5264	404	SHT 4

DRAWING No.  
A1 5264 404 SHT 6

THIRD ANGLE PROJECTION

DO NOT SCALE

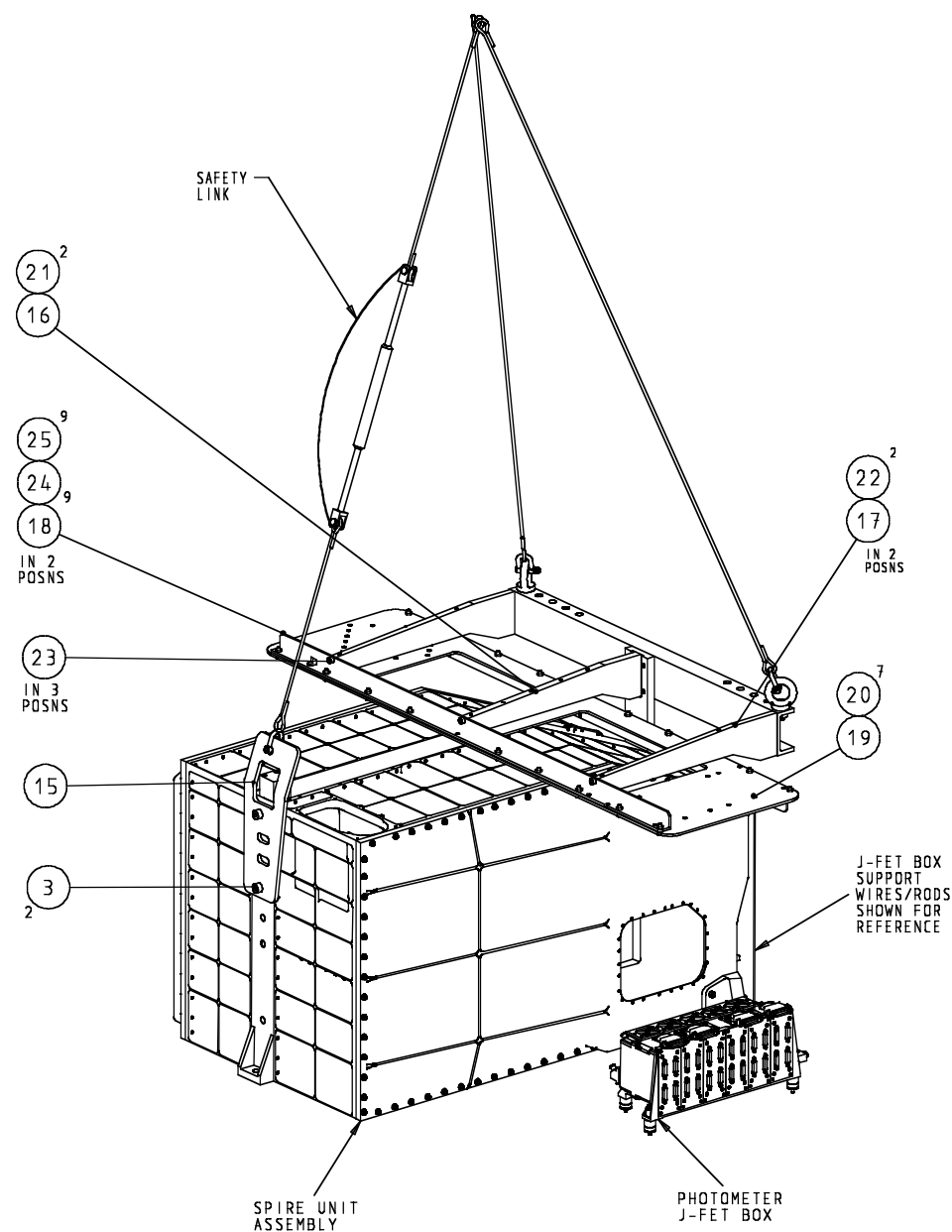
REMOVE ALL BURRS & SHARP EDGES

USED ON  
SPIRE  
MGSE

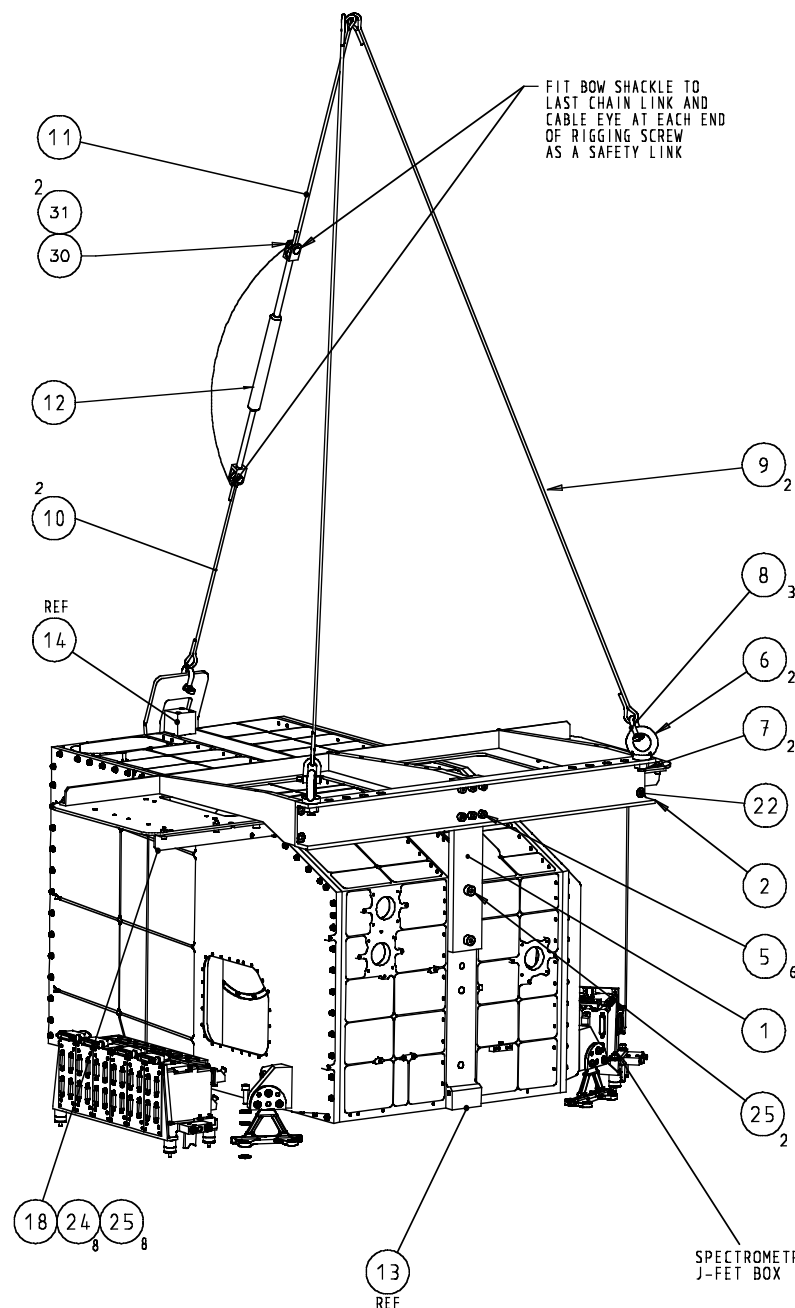
NOTES  
1 DIMENSIONS ARE NOMINAL AND MAY VARY DUE TO MANUFACTURING TOLERANCES

NOTE  
1 SEE SHEET 7 FOR SPIRE INSTALLATION  
LIFTING REFERENCE DIMENSIONS

2 PLEASE NOTE THAT BILL OF MATERIALS  
IS GENERATED FROM THE CORRESPONDING  
ASSEMBLY MODEL EXCEPT FOR ITEMS 30 AND 31



VIEW SCALE 0.2 : 1



VIEW SCALE 0.2 : 1

31	KEY-	BOW SHACKLE	2
30	KEY-	CHAIN	0.5M
29	KE-0104-350_ASM	KE-0104-350_ASM	1
28	KE-0104-360_ASM	KE-0104-360_ASM	1
27	REFERENCE	PHOT COVER ASSEMBLY	1
26	REFERENCE	SPEC COVER ASSEMBLY	1
25		NUT-M4-NYLOC-ST-STL	17
24	ST STL	SCR-M4x12L-CAP-HD	17
23		SCR-M5x12L-CAP-HD	3
22		SCR-M6x20L-CSK-SKT-HD	4
21		SCR-M5x20-SKT-CSK-HD	2
20		SCR-M5x20-SKT-BUTT-HD	7
19	5264-404-37	yoke	1
18	5264-404-39	yoke-stiffener	2
17	5264-404-38	yoke-support-fillet	2
16	5264-404-36	yoke-center-support	1
15		front-lift-strap-2	1
14	REFERENCE	reference cube	1
13	REFERENCE	dummy-SOB	1
12	ANGLIA-HANDLING	RIGGING-SCREW-M12-JAW-JAW-CLOSED	1
11	5264-404-35	hoist-cable-split	1
10	A3-5264-404-36	hoist-cable-short-2	1
9	A3-5264-404-22	hoist-cable-long	2
8	KEY-927A078N	shackle-STD	3
7		NUT-M10-NYLOC-ST-STL	2
6	ANGLIA-HANDLING-ST-STL	shoulder-eyebolt-M10	2
5	ST STL	SCR-M6x20L-CAP-HD	6
4	ST STL	SCR-M8x25L-CAP-HD	2
3	ST STL	SCR-M8x20L-CAP-HD	2
2	5264-404-16	rear-lift-channel	1
1	A3-5264-404-15	rear-lift-plate	1
Item	Part #	Name	Qty

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CHECKED	DATE	AMENDMENT	DATE	AMENDMENT	COMPUTER FILE	ESTD WT.	ACTL WT.	MATERIAL & SPEC.	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
5	2/2/04	SUPPORT PLATE FOR JFET BOXES ADDED							
4	28/1/04	ASSEMBLY JIG PARTS REMOVED DUE TO SPACE LIMITATIONS	9	23/9/05	ITEMS 30 AND 31 ADDED/SHEET 8 ADDED				
3	8/8/03	FRONT LIFT BRACKET REPLACED WITH FRONT LIFT STRAP	8	15/7/05	ITEM BALLOONS REDEFINED				
2	28/3/03		7	17/5/05	UPDATED FOR M12 RIGGING SCREW AND NEW SPLIT CABLES				
1	2/10/02		6	29/3/04	BOM ADDED				
					COMPUTER FILE SPIRE-LIFT (ASSEMBLY) 3 CONFIGURATIONS A1-5264-404-SHT 6 / 7 and 8(dwg)				

DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.			
TITLE		DRAWING No	
SPIRE LIFTING FOR INSTALLATION		A1 5264 404 SHT 6	



DRAWING No.			
A1	5264	404	SHT 7

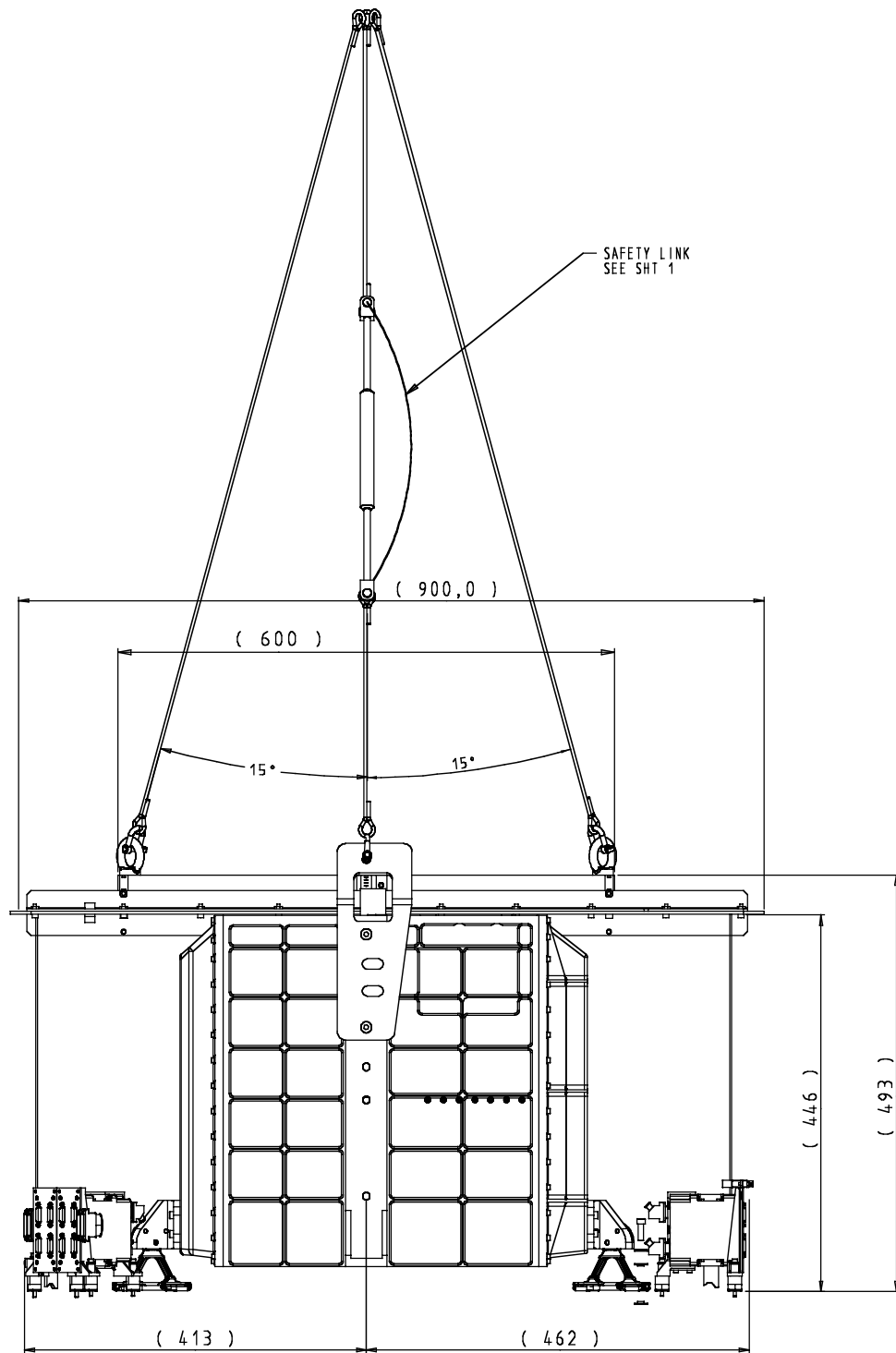
THIRD ANGLE PROJECTION

DO NOT SCALE

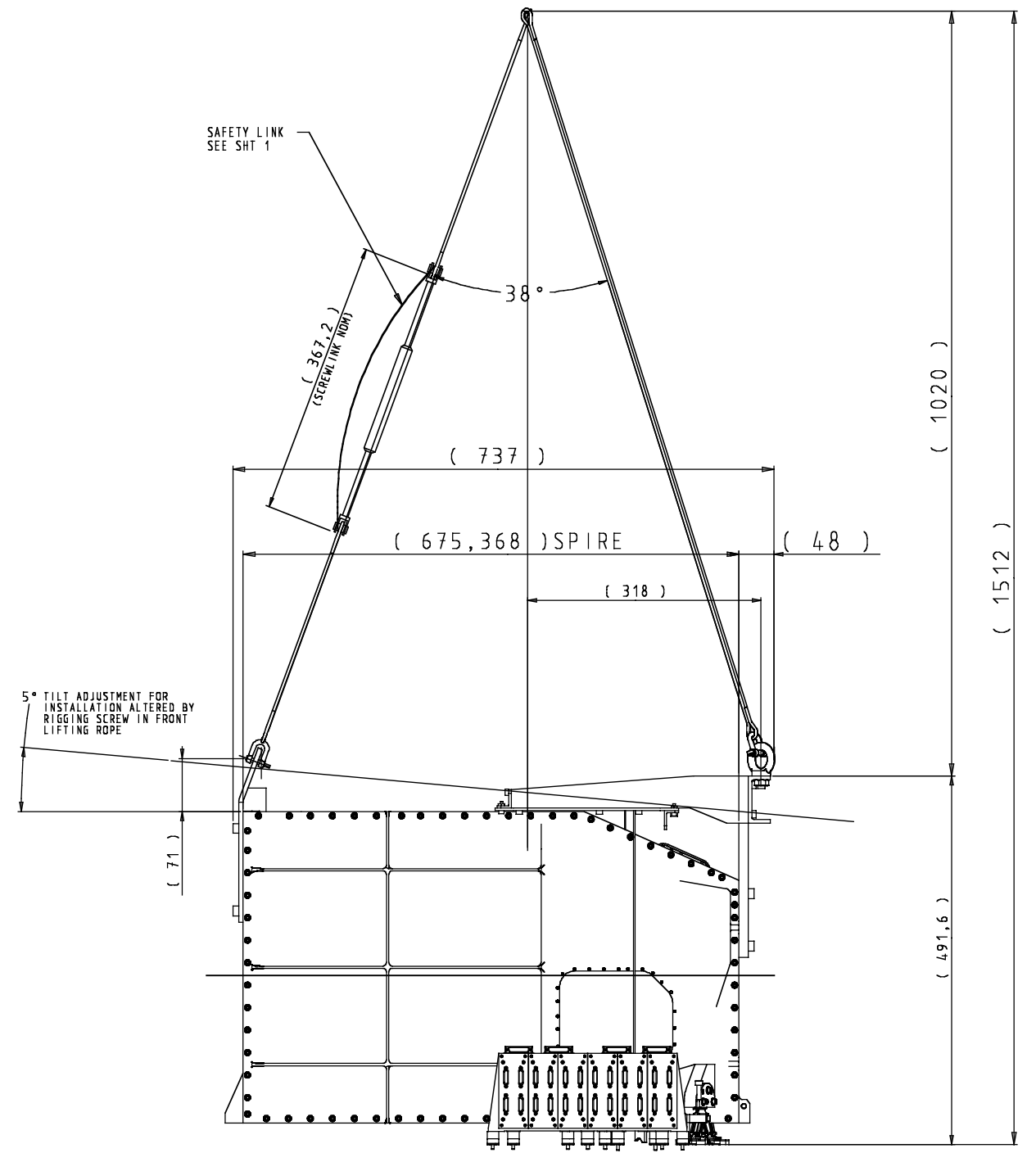
REMOVE ALL BURRS & SHARP EDGES

NOTES  
1 DIMENSIONS ARE NOMINAL AND MAY VARY DUE TO MANUFACTURING TOLERANCES

USED ON  
SPIRE  
MGSE



VIEW SCALE 0.25:1



VIEW SCALE 0.25:1

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 BY ANY MEANS WITHOUT THE PRIOR PERMISSION OF UNIVERSITY COLLEGE LONDON.

CHECKED	5	2/2/04	SUPPORT PLATE FOR JFET BOXES ADDED					PROTECTIVE FINISH	MATERIAL & SPEC.	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'	DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.	DRAWING No			
	4	28/1/04	ASSEMBLY JIG PARTS REMOVED DUE TO SPACE LIMITATIONS	9	23/9/05	ITEMS 30 AND 31 ADDED/SHEET 8 ADDED						A1	5264	404	SHT 7
TRACED	3	8/8/03	FRONT LIFT BRACKET REPLACED WITH FRONT LIFT STRAP	8	15/7/05	ITEM BALLOONS REDEFINED					TITLE SPIRE LIFTING FOR INSTALLATION	DRAWING No			
	2	28/3/03		7	17/5/05	UPDATED FOR M12 RIGGING SCREW AND NEW SPLIT CABLES						A1	5264	404	SHT 7
DRAWN	ISSUE	DATE	AMENDMENT	ISSUE	DATE	AMENDMENT	COMPUTER FILE SPIRE-LIFT (ASSEMBLY) 3 CONFIGURATIONS A1-5264-404-SHT 6 / 7 and 8 (dwg)	ESTD WT.							
PMB	1	2/10/02						ACTL WT.	DIMENSIONS IN mm	SCALE SEE VIEWS					