



SPIRE
INTERFACE DOCUMENT.

Doc #: SPIRE-RAL-DWG-001409
Issue: 8
Date: December 2003
Page 1 of 19

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

Subject: **SPIRE MECHANICAL INTERFACE DRAWINGS**

PREPARED BY: J. DELDERFIELD  *John Delderfield* 2003.12.03
..15:56:44 Z

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



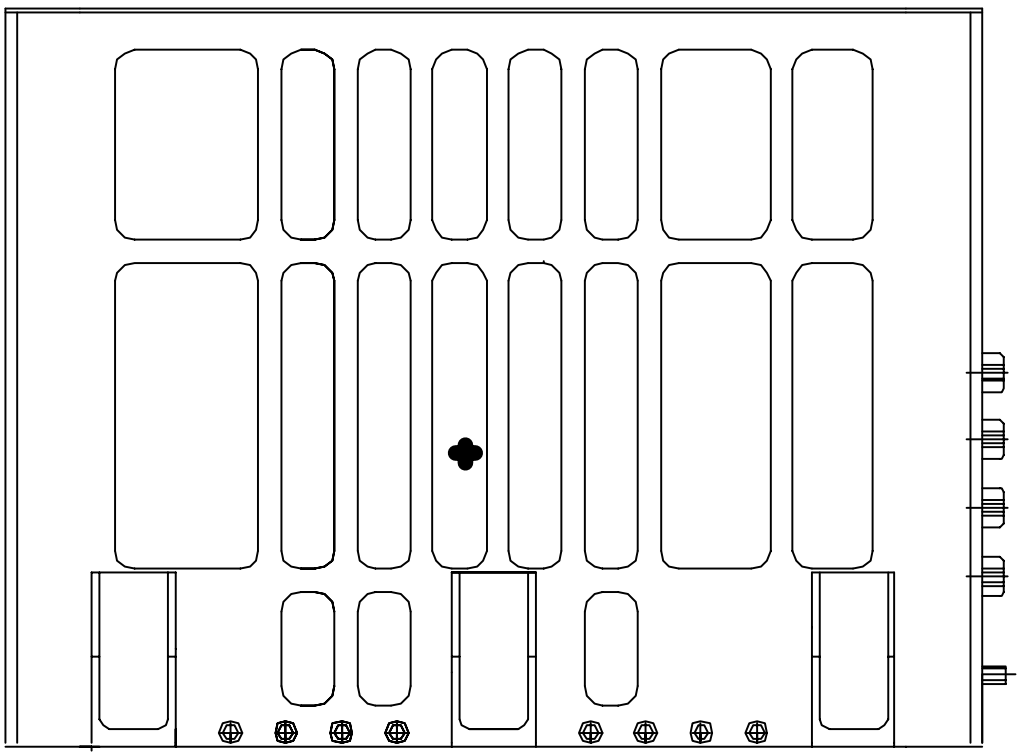
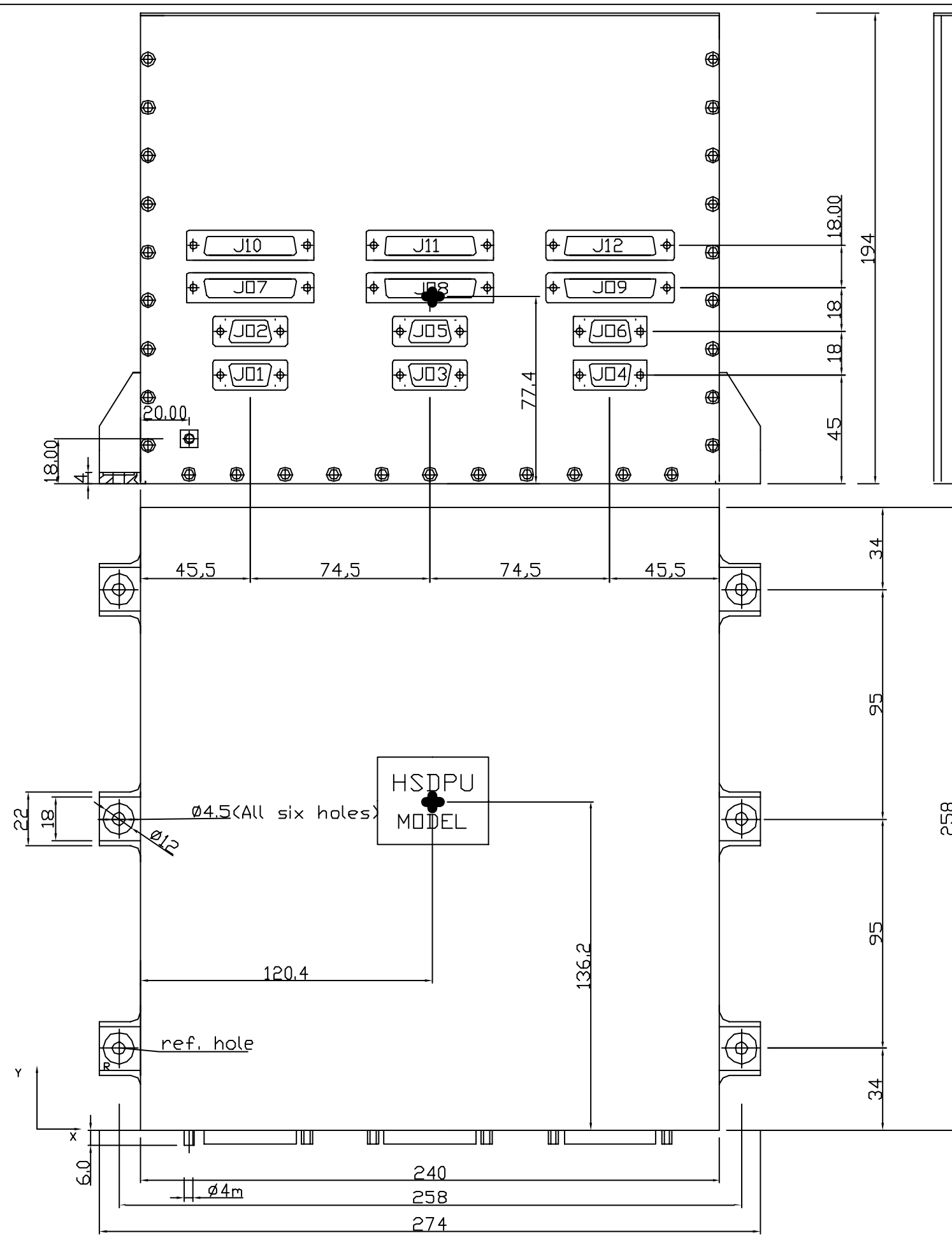
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Issue Drawing Change List

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.



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

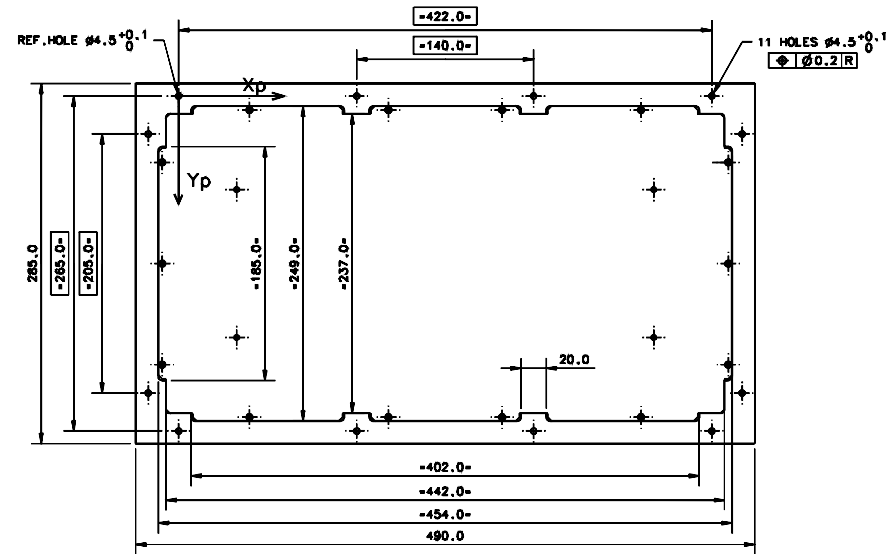
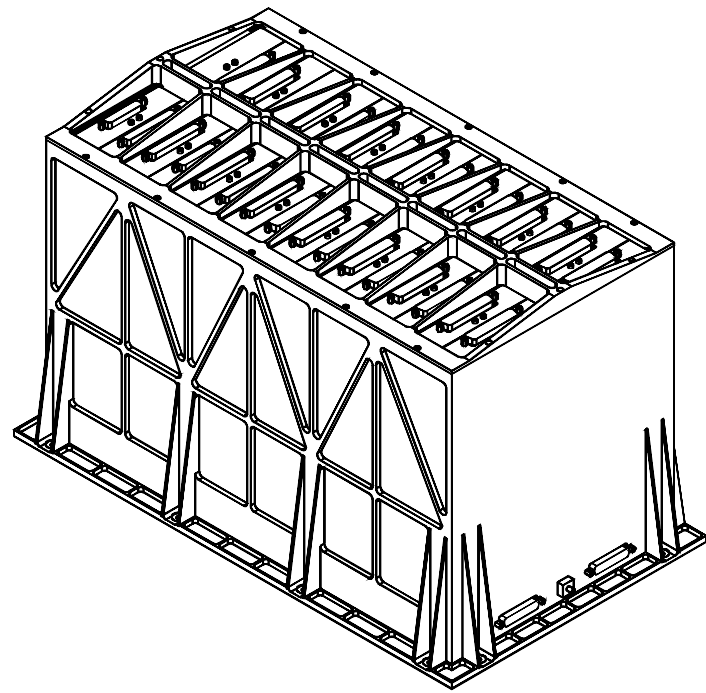
CASING MATERIAL: ANTICORROSIONAL 6082
 SURFACE TREATMENT: ALODINE 1200:
 alfa solar = 0,604
 R-solar = 0,396
 epsilon IR = 0,172
 R-IR = 0,828

THERMAL CAPACITANCE: 7.177J/°C (E)
 CONTACT AREA OF BASEPLATE PLUS FEET 64428mm²
 FLATNESS OF MOUNTING AREA: 0.1mm/100mm
 CONNECTORS:

- J01= DEMA-9P From DPU Prime to PDU Prime
- J02= DEMA-9P From DPU Red. to PDU Red.
- J03= DEMA-9S From DPU Prime to Bus A Prime
- J04= DEMA-9S From DPU Prime to Bus B Prime
- J05= DEMA-9S From DPU Red. to Bus A Red.
- J06= DEMA-9S From DPU Red. to Bus B Red.
- J07= DBMA-25P From DPU Prime to DCE Prime
- J10= DBMA-25P From DPU Red. to DCE Red.
- J08= DBMA-25P From DPU Prime to MCE Prime
- J11= DBMA-25P From DPU Red. to MCE Red.
- J09= DBMA-25P From DPU Prime to SCE Prime
- J12= DBMA-25P From DPU Red. to SCE Red.

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

Consiglio Nazionale delle Ricerche ISTITUTO di FISICA dello SPAZIO INTERPLANETARIO Via del Fosso del Mulino n.100 tel. 06/4993 fax 06/49934383	data 5/04/2001	prog. Baldetti	dis.
	scala	materiale	
	tratt.	Progetto: HERSCHEL- HSDPU	
	toll. rev. 4 data 23/02/03	titolo: HSDPU N.dis HER S005/03	



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=4.71 N,m2 Jyp=2.50 N,m2 Jzp=4.44 N,m2

CONTACT AREA MOUNTING FEET=28180mm2

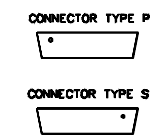
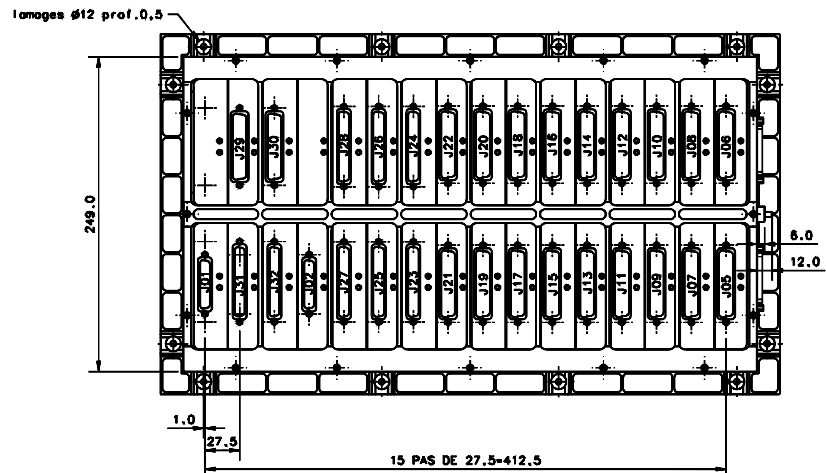
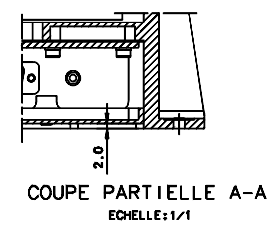
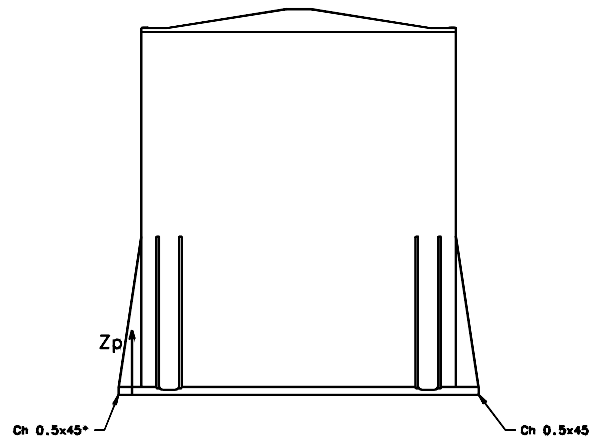
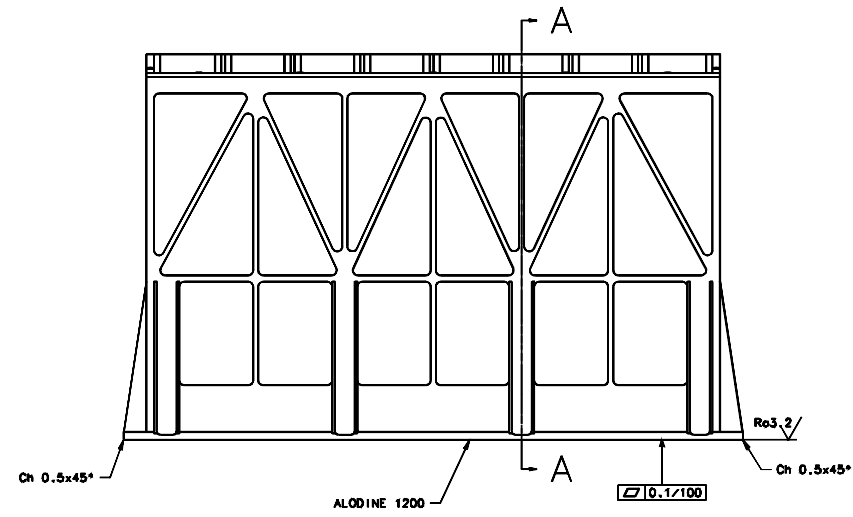
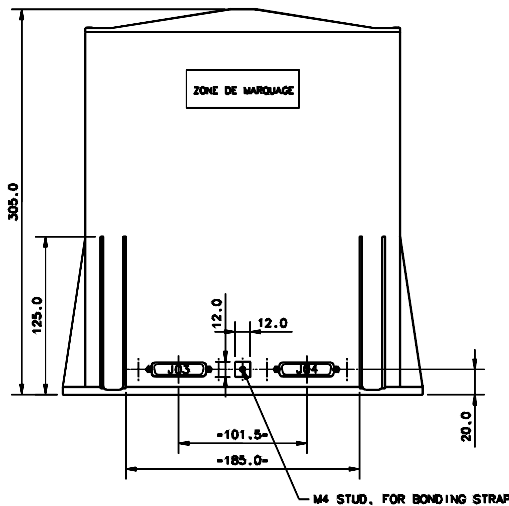
THERMAL COATING AND BLACK ANODISING ESA.PSS.703

SURFACE EMISSIVITY >0.85

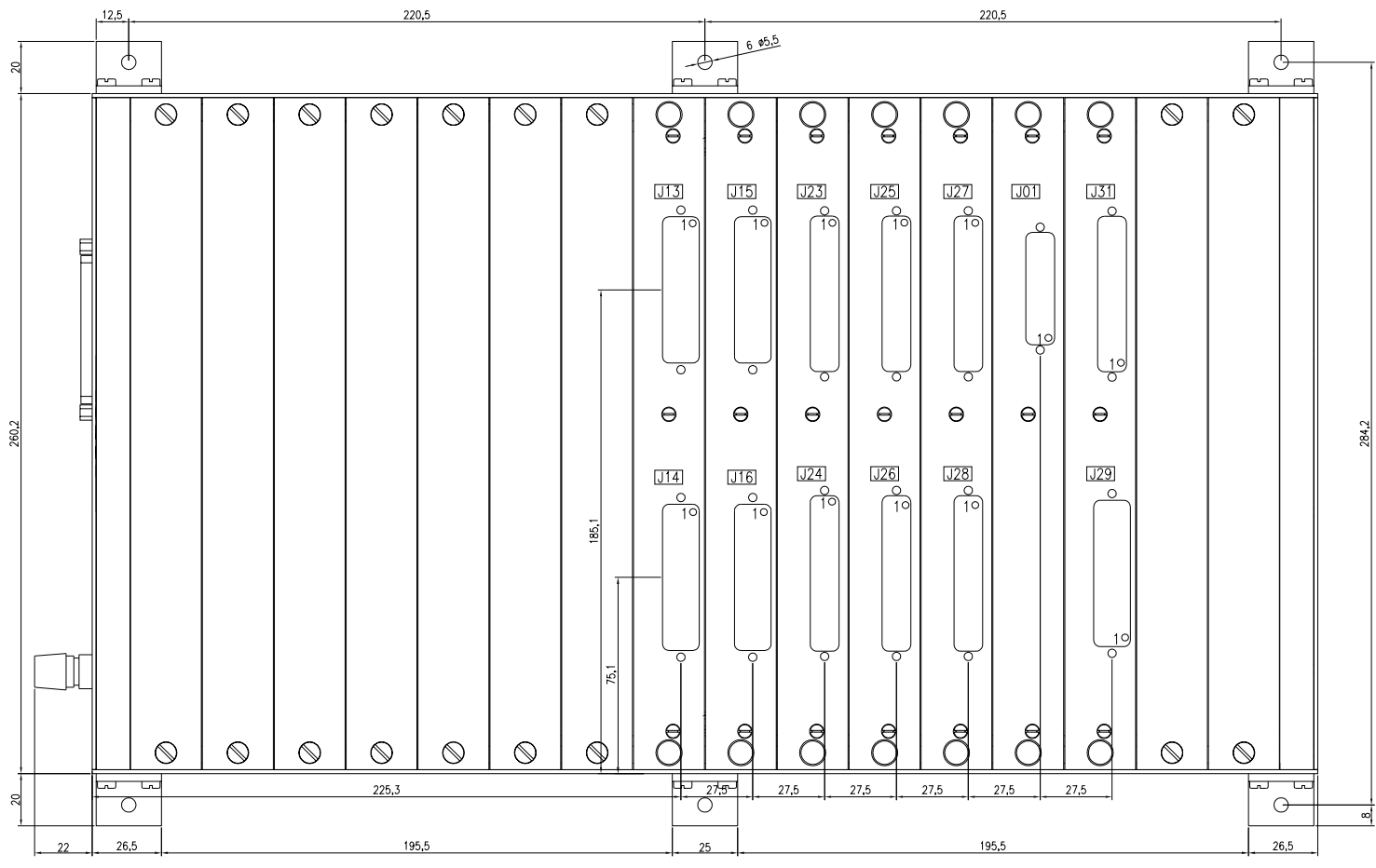
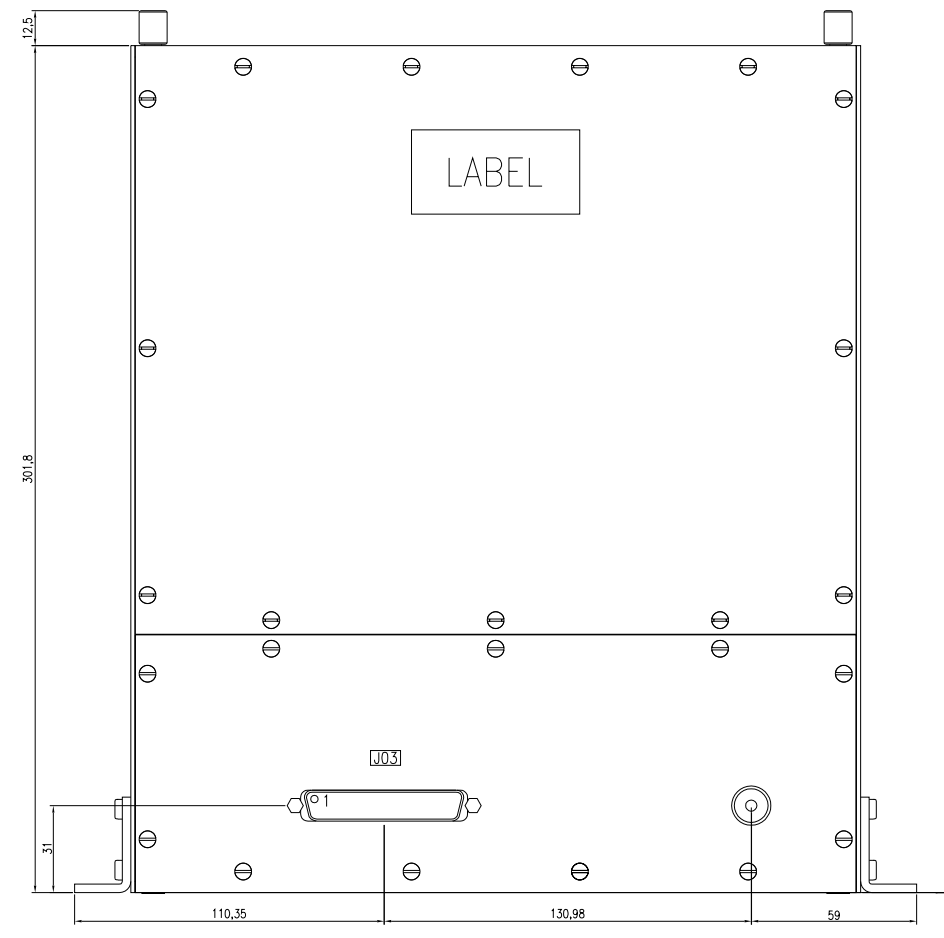
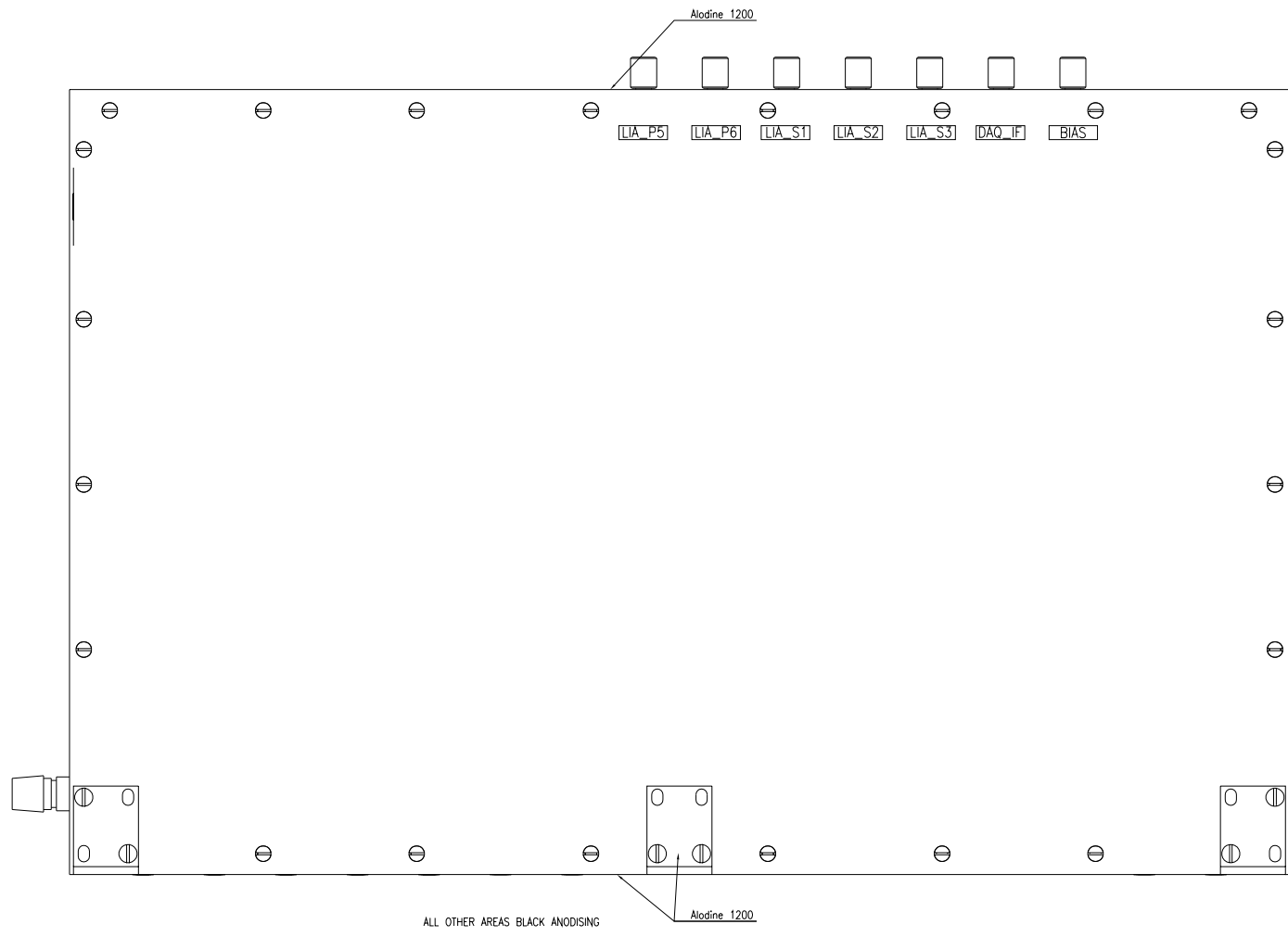
TORQUE VALUE FOR CONNECTOR FIXATION SCREWS-
 - MALE=0.3mN
 - FEMALE=0.45mN

SPECIFIC HEAT 1170 J/Kg.*K

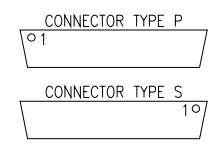
ESTIMATED MASS=15676g



D	Ajout coupe A-A	10/02	DREMAIN		
C	Mise à jour	09/02	DREMAIN		
B	Mise à jour	06/02	DREMAIN		
A	Origine	11/01	DREMAIN		
Index	Modifications	Date	Dessiné par	Vérifié par	Approuvé par
Spécifications particulières					
Tolérances	Indice de rugosité général xxx	SOUS-TRAITANT			
généralisées	Tol.ang.:xxx				
	● 3mm	Casser les angles vifs			
Matière:		Protection			
Traitement thermique:		Echelle	Poids	Niveau qualité	
		1/2			
SPIRE					
HSDCU ELECTRONIC BOX					
MECHANICAL INTERFACE CONTROL DRAWING					
11 s'est permis d'utiliser ce dessin qu'avec l'autorisation écrite de l'Etat - 101 du 11 mars 1987					
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		AD		SPIR-MX-5100 000 D	

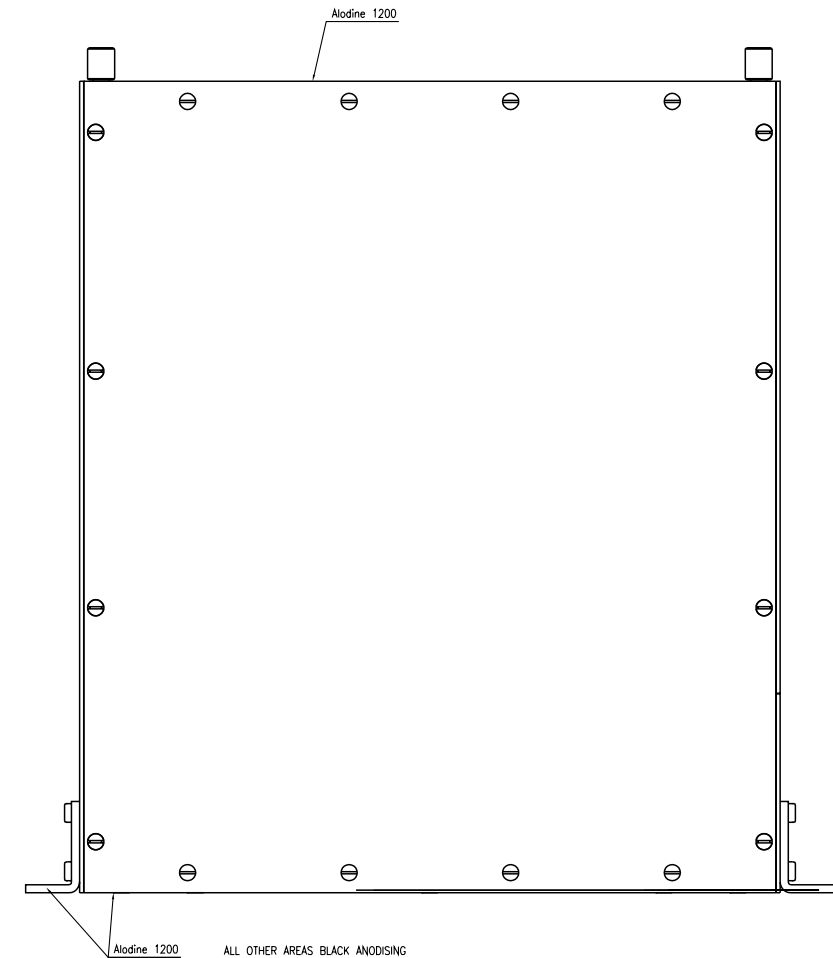
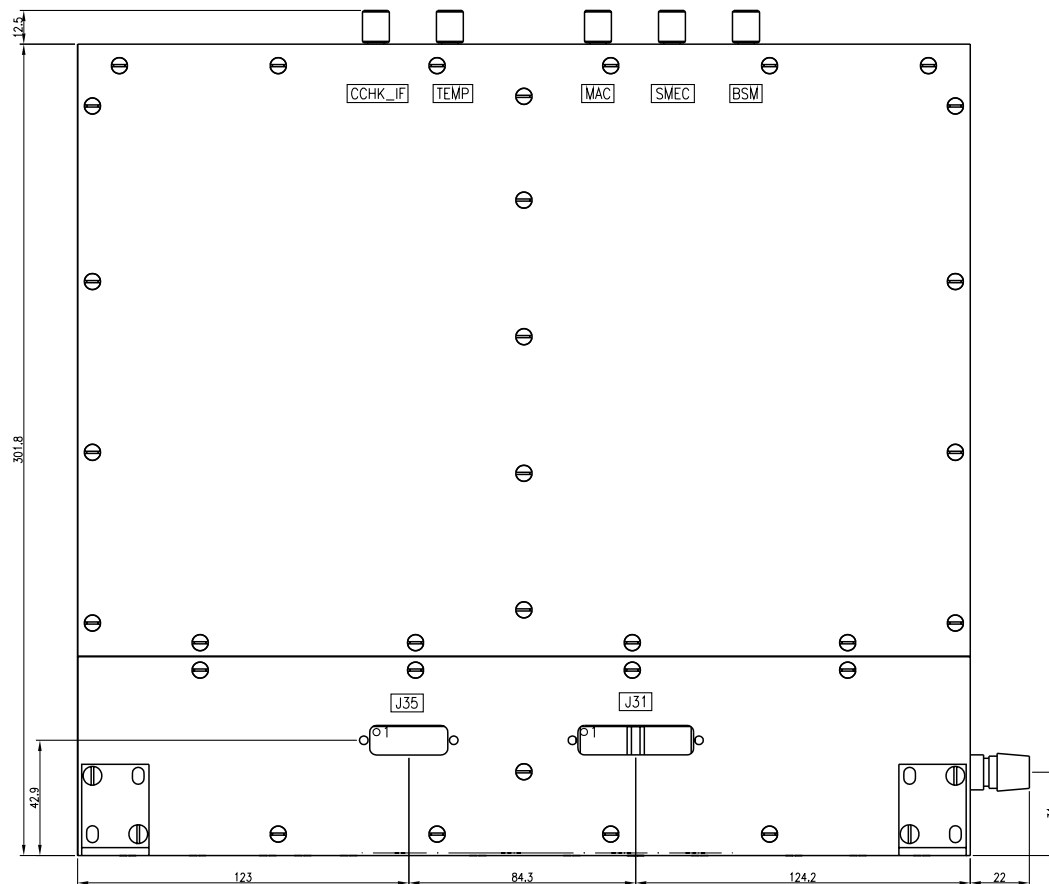
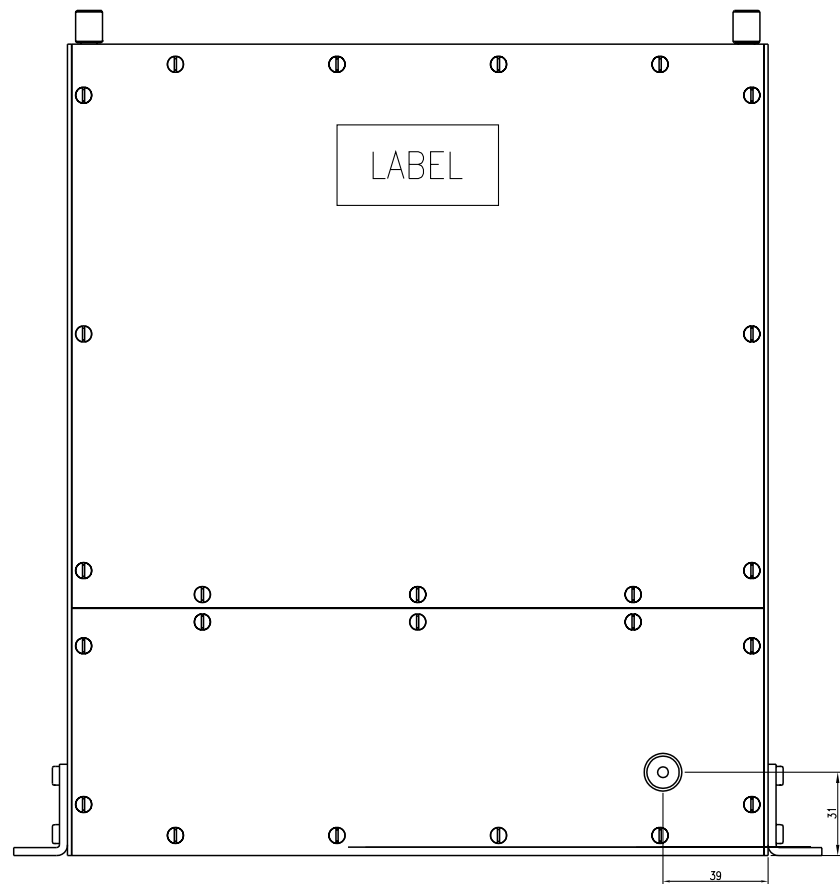


CONNECTORS					
IDENT	TYPE	FUNCTION	IDENT	TYPE	FUNCTION
J01	DBMA 25S	DAO_IF_M/DPU	J24	DCMA 37P	LIA_S_1/FPU
J03	DBMA 25P	DCU/PSU_M	J25	DCMA 37P	LIA_S_2/FPU
J13	DDMA 50P	LIA_P_5/FPU	J26	DCMA 37P	LIA_S_2/FPU
J14	DDMA 50P	LIA_P_5/FPU	J27	DCMA 37P	LIA_S_3/FPU
J15	DDMA 50P	LIA_P_6/FPU	J28	DCMA 37P	LIA_S_3/FPU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



ONLY FOR QM1

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



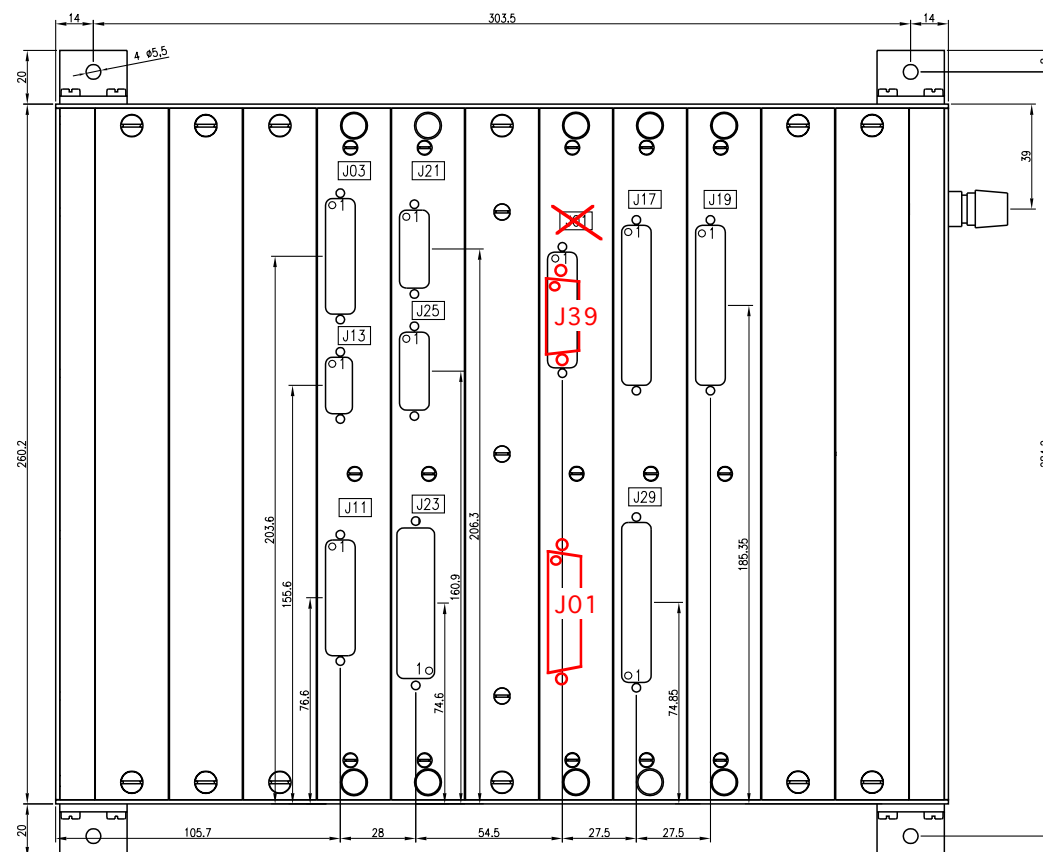
Change History:

Version C comes as part of the QM1 ADP
There's no change list; modules are reordered

In this version C of QM1, and indeed in B, J01 is in the same position within its module as is shown on the latest FM drwg. So J01 is drawn in the same position in its module in all three drawings.

However, NCR_MCU_#105.pdf says that J01 is in J39's position and vice versa, so this is shown in red to the right.

NCR_MCU_#104.pdf also notes unspecific discrepancies, but this issue C is said to discharge NCR 104 by showing all the variations.



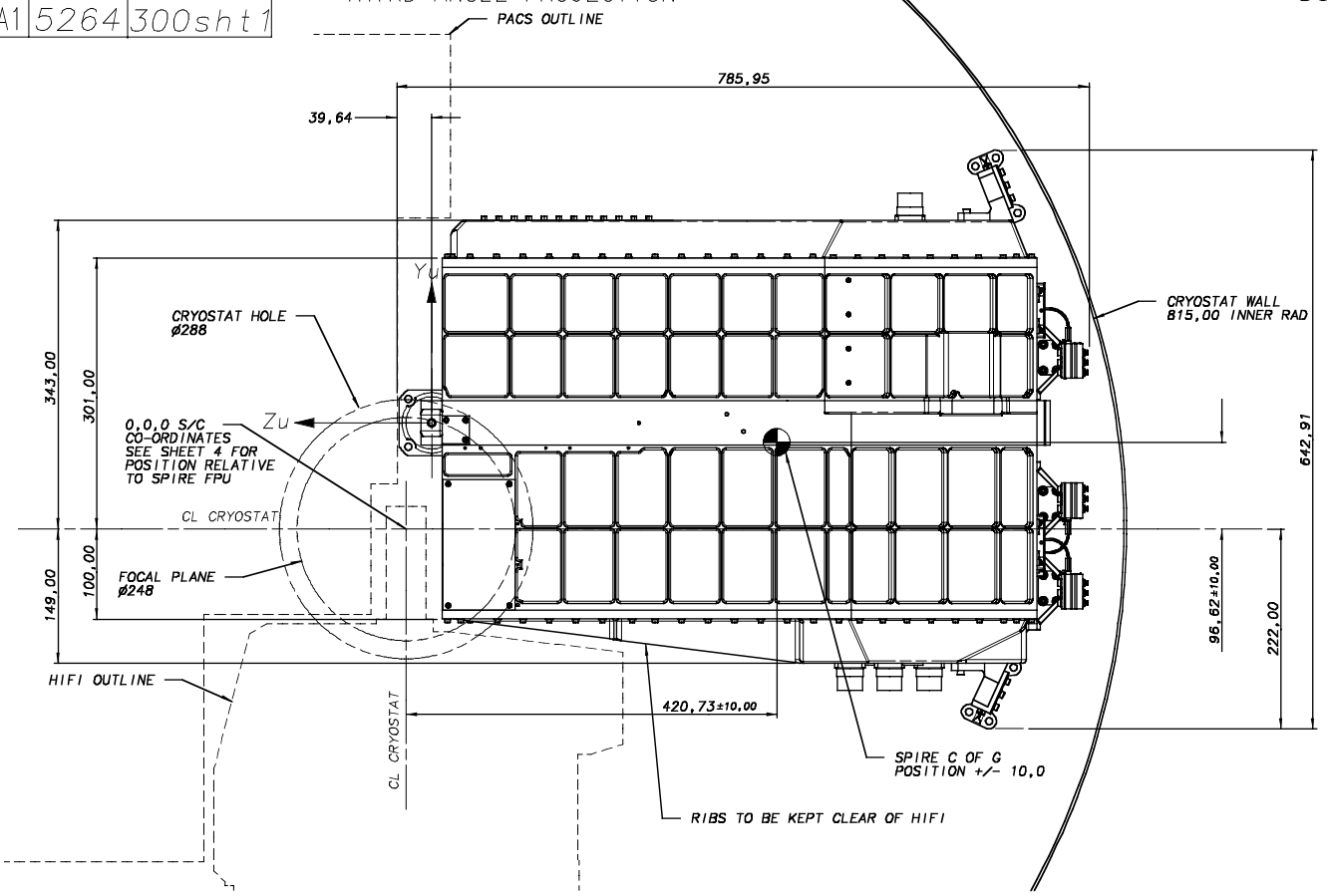
CONNECTORS					
IDENT	TYPE	FUNCTION	IDENT	TYPE	FUNCTION
J01	DBMA 25S	MAC/DPU	J21	DAMA 15S	TEMP/FPU-TS-1
J03	DBMA 25S	CCHK-IF/DPU	J23	DDMA 50S	TEMP/FPU-TS-2
J11	DBMA 25S	CCHK-IF/FPU-COOL-CAL	J25	DAMA 15S	TEMP/FPU-MEC-TS
J13	DCMA 9S	CCHK-IF/FPU-PH-STIM	J29	DCMA 37P	SMEC/FPU-SMECm-2
J17	DCMA 37S	SMEC/FPU-SMECm-1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

CEA /SAP 91191 GIF/YVETTE Cedex	MATIERE : Alu 2017A	PROTECTION :
	TRAITEMENT : ALODINE 1200	DESSINE : SREE DATE : 08/09/03
CE DOCUMENT EST LA PROPRIETE DE LA SOCIETE C.E.A. ET NE PEUT ETRE REPRODUIT OU COMMUNIQUE SANS AUTORISATION ECRITE		VERIFIE : VISA :
DESIGNATION ICD HS FCU/QM1	ECHELLE : 3/4	TOLERANCES GENERALES : ±0.2
SPIR-MX-5201 000 C		Ra1,6

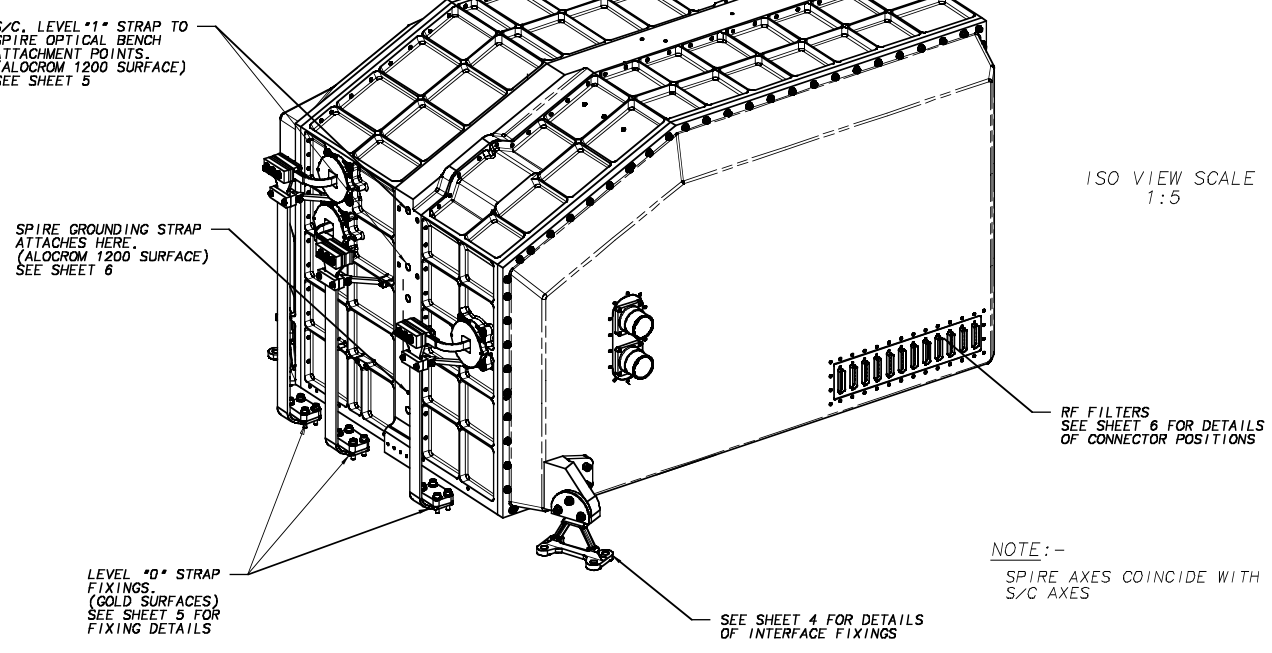
USED ON
HERSCHEL

DRAWING No.
A1 5264 300sht1

THIRD ANGLE PROJECTION
DO NOT SCALE

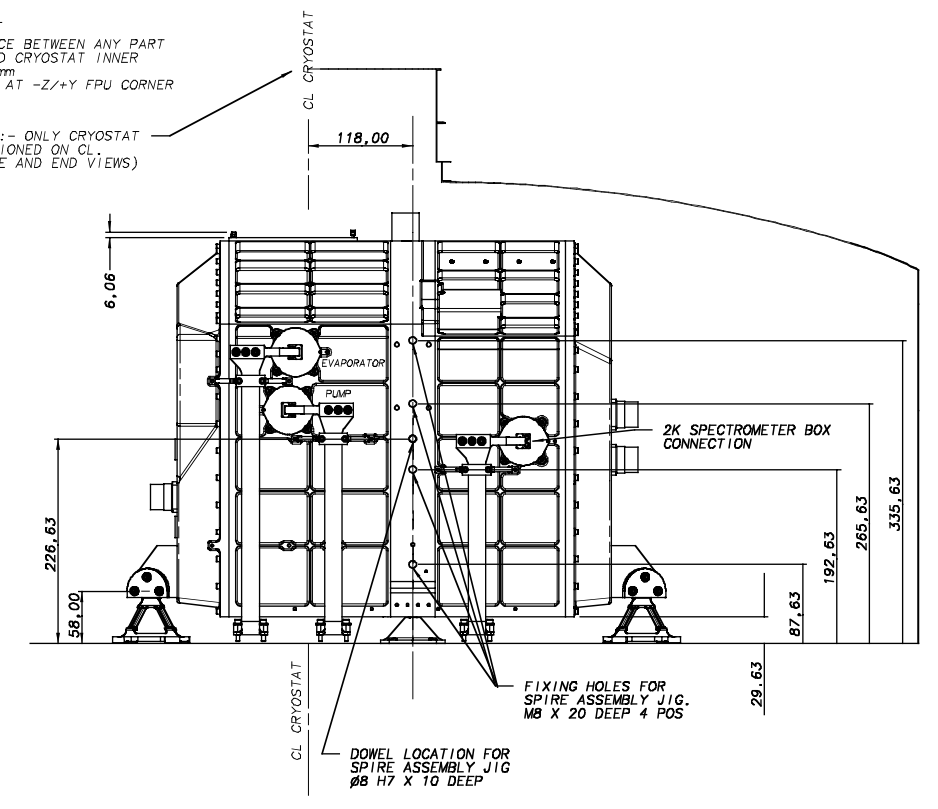
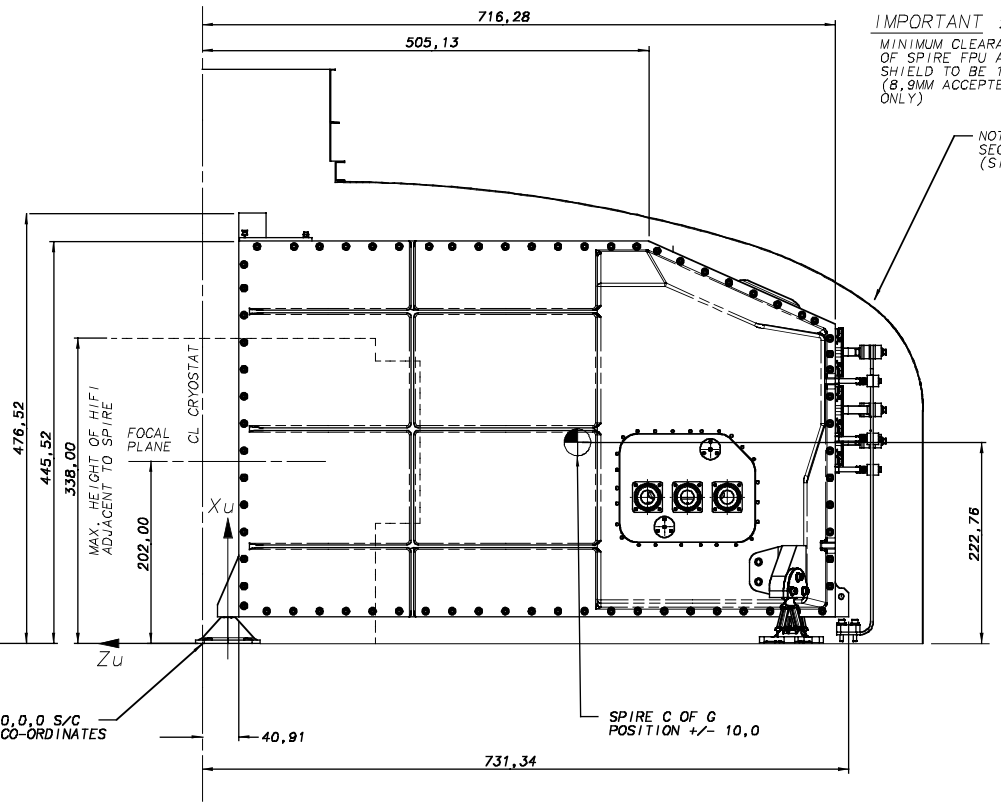
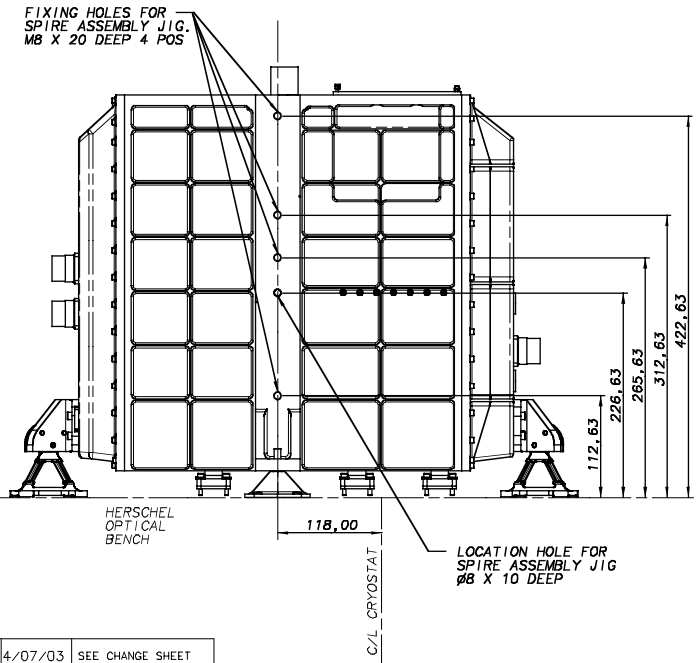


NOTE:-
1. ALL DIMENSIONS AT ROOM TEMPERATURE
2. J-FET BOXES NOT SHOWN ON THIS SHEET



MOMENTS OF INERTIA ABOUT CG:-
(NOTE:- ALL MASS PROPERTIES EXCLUDE JFETS, AND EXTERNAL FPU HARNESSSES)
 $I_{xx} = 2,929 \text{ kg m}^2$
 $I_{yy} = 2,878 \text{ kg m}^2$
 $I_{zz} = 1,548 \text{ kg m}^2$
(MASS 45.63 kg)

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)



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.
PBG	13	19/11/01 UPDATED RF1 FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & *A* FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
DRAWN	ISSUE	DATE
AJC	1	24/11/01

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

SPIRE Flight Assemblies
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) SEE NOTE SHT.1	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 (GENERAL DIMENSIONS)	DRAWING No A1 5264 300sht1
SHEET 1 OF 7	

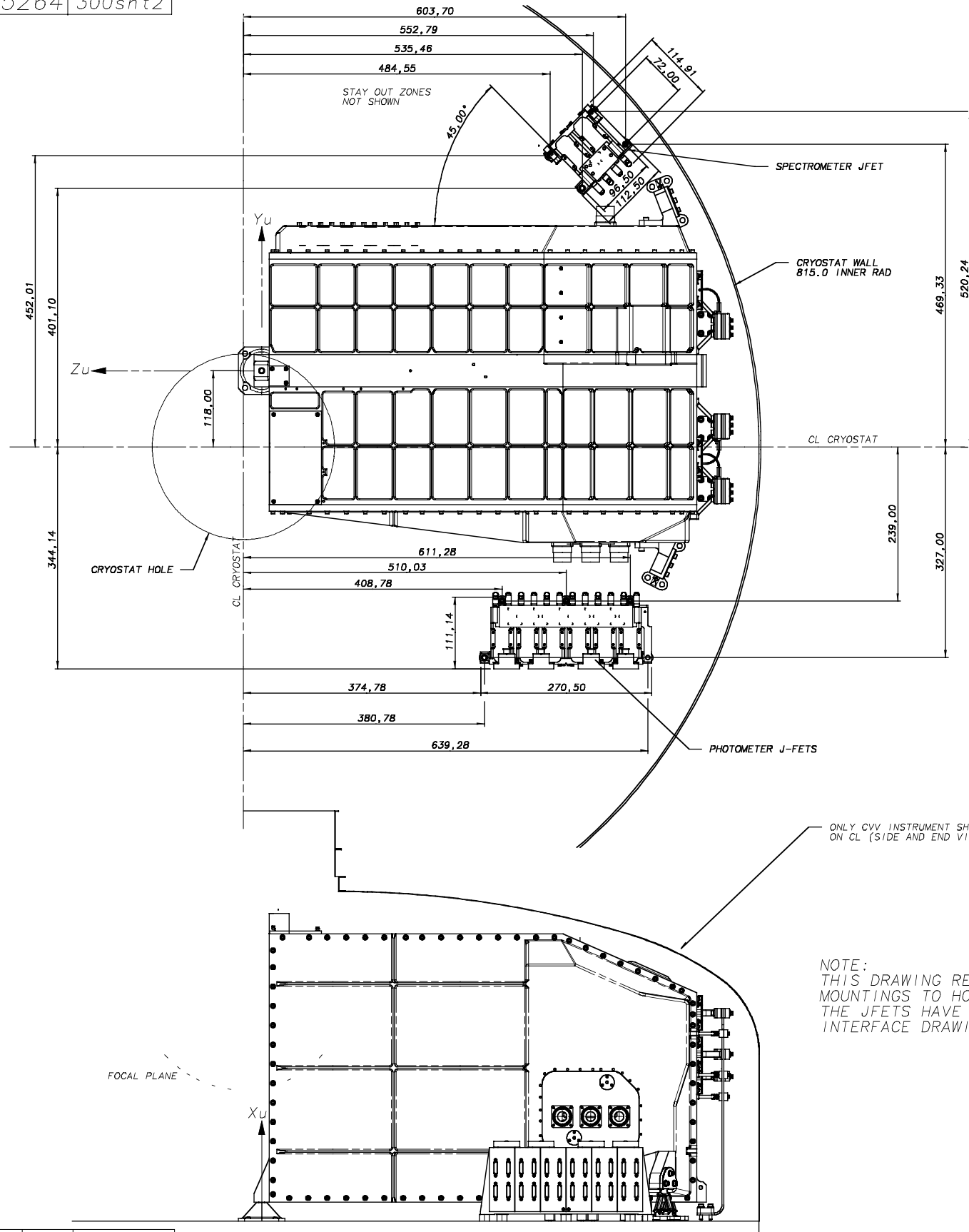
USED ON
HERSCHEL

DRAWING No.

A1 5264 300sht2

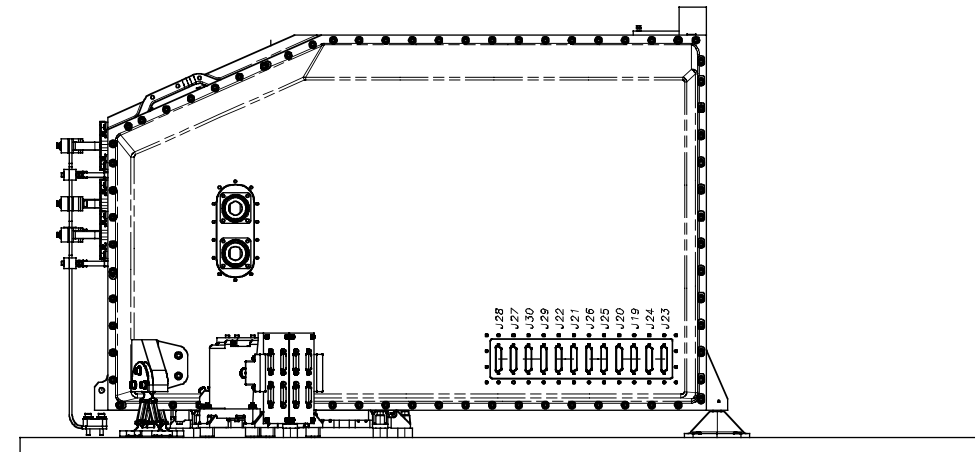
THIRD ANGLE PROJECTION

DO NOT SCALE



NOTE:-

1. ALL DIMENSIONS AT ROOM TEMPERATURE

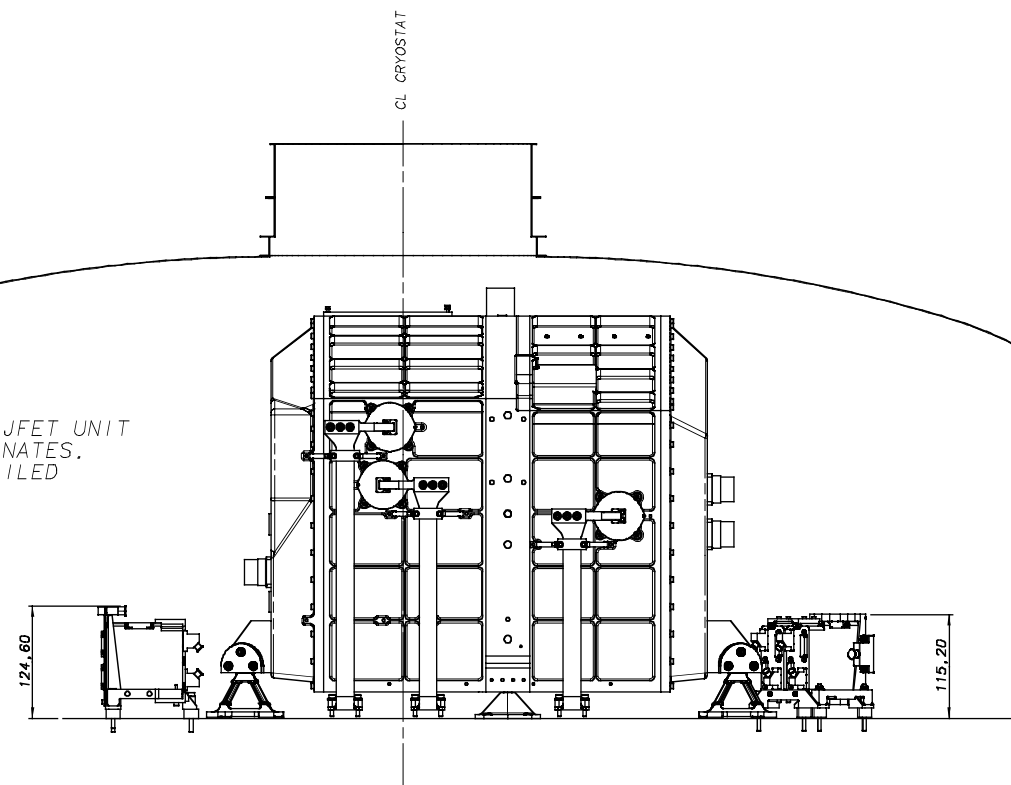


FOCAL PLANE

Xu

PHOTOMETER SIDE

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



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.
PBG	13	19/11/01	UPDATED RFI FILTER & PHOT CONNECTORS ADDED, FOCAL PLANE & *A* FRAME MOUNT DIM ADDED. SHEET 7 ADDED.
DRAWN	ISSUE	DATE	AMENDMENT
AJC	1	24/11/01	

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

SPIRE Flight Assemblies
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 45,63kg(NO CONT) SEE NOTE SHT.1		
ACTL WT.	DIMENSIONS IN mm	SCALE 1:4

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 300sht2

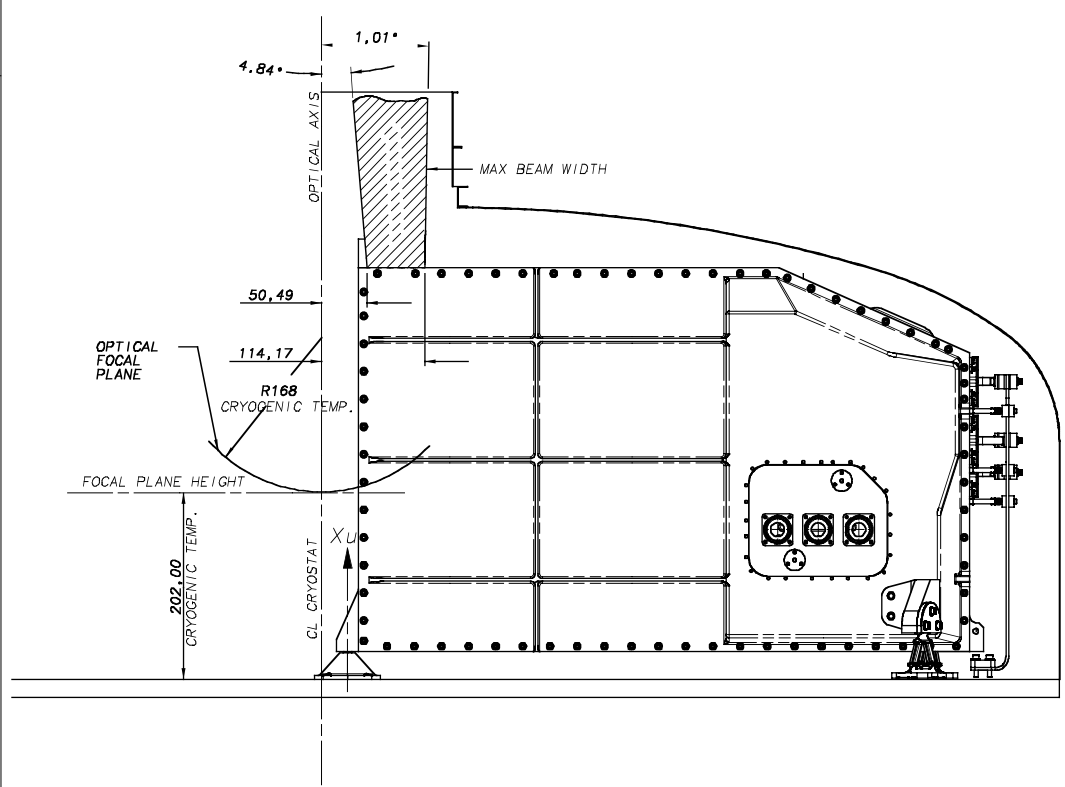
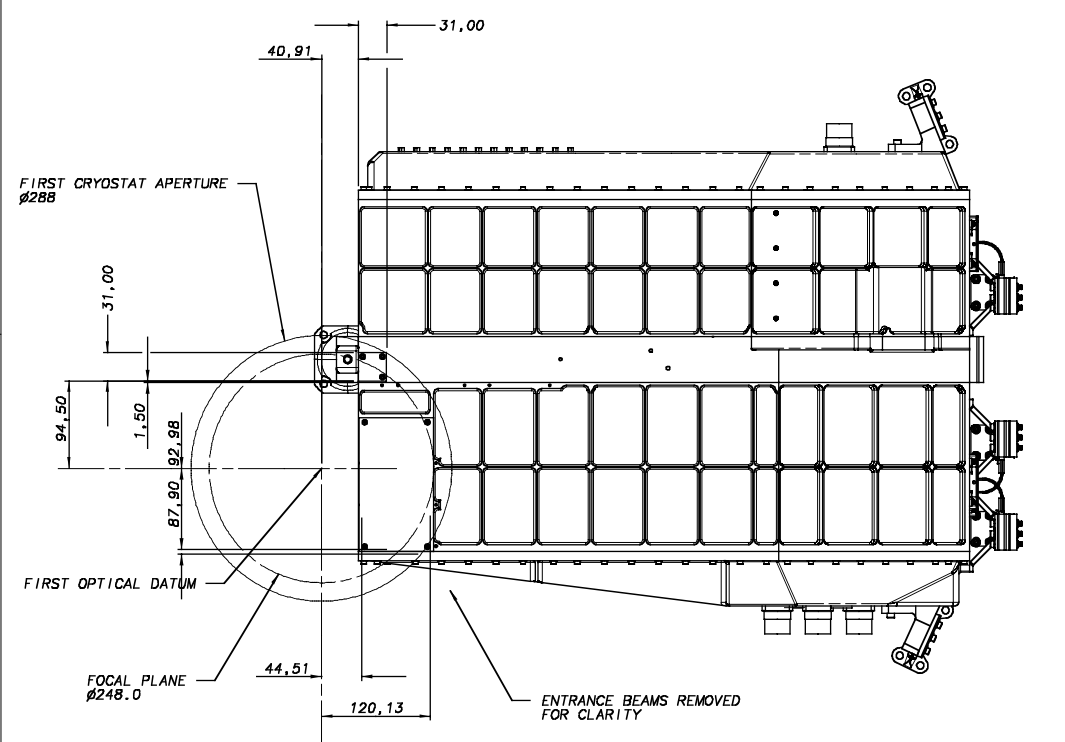
SHEET 2 OF 7

USED ON
HERSCHEL

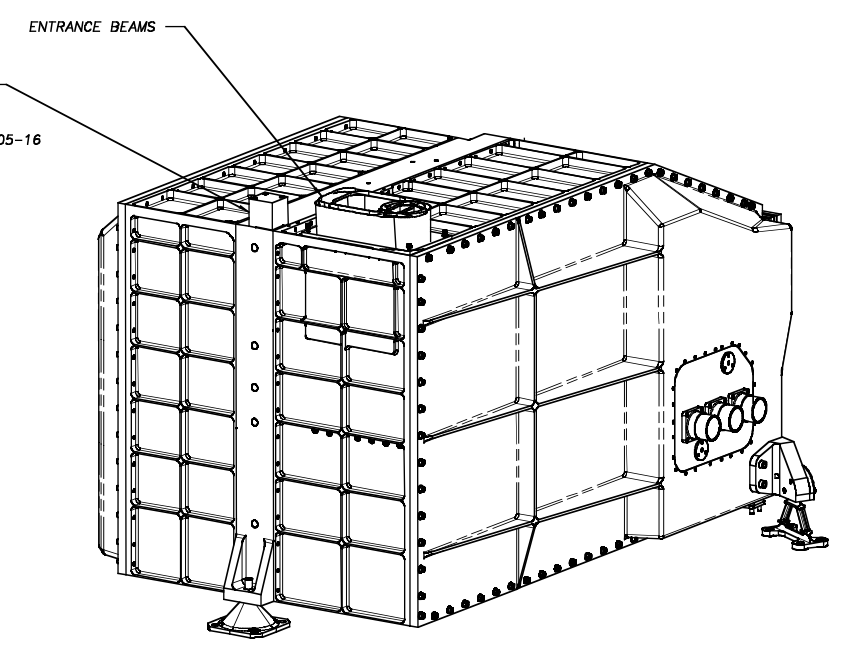
DRAWING No.
A1 5264 300sht3

THIRD ANGLE PROJECTION

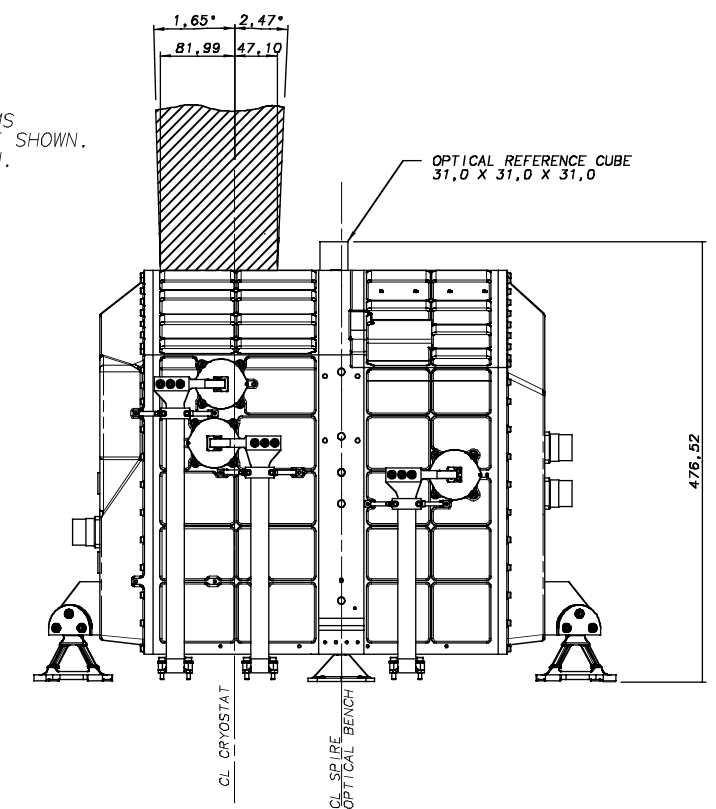
DO NOT SCALE



ANGULAR ACCURACY OF OPTICAL CUBE POSITION
0,05° (3 ARC MIN).
ANGULAR ACCURACY TO Xu, Yu, Zu CO-ORDINATES
0,05° +/- OPTICAL CUBE ANGULAR TOL. (TBD.)
REFER TO OPTICAL CUBE DRAWING No. A3/5264/305-16



ONLY PRIMARY DIMENSIONS 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

18	4/07/03	SEE CHANGE SHEET	
17	16/10/02	SEE CHANGE SHEET	
16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.	
15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED.	
14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT. 1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED	
13	19/11/01	UPDATED RFI FILTER & 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

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 45,63kg (NO CONT) *SEE NOTE SHT. 1	DIMENSIONS IN mm	SCALE 1:1
ACTL WT.		

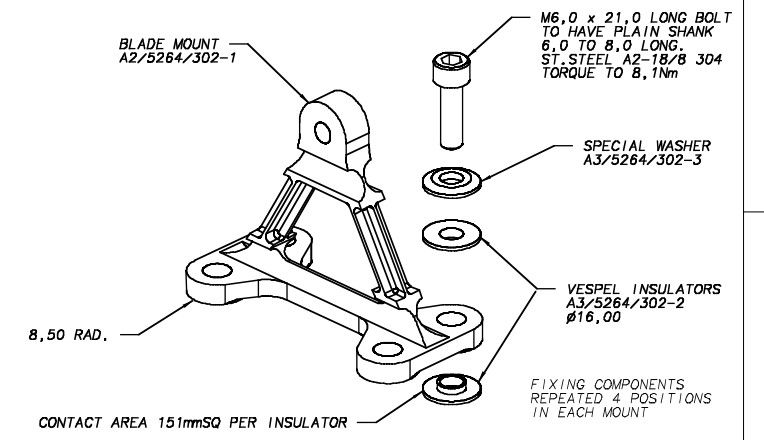
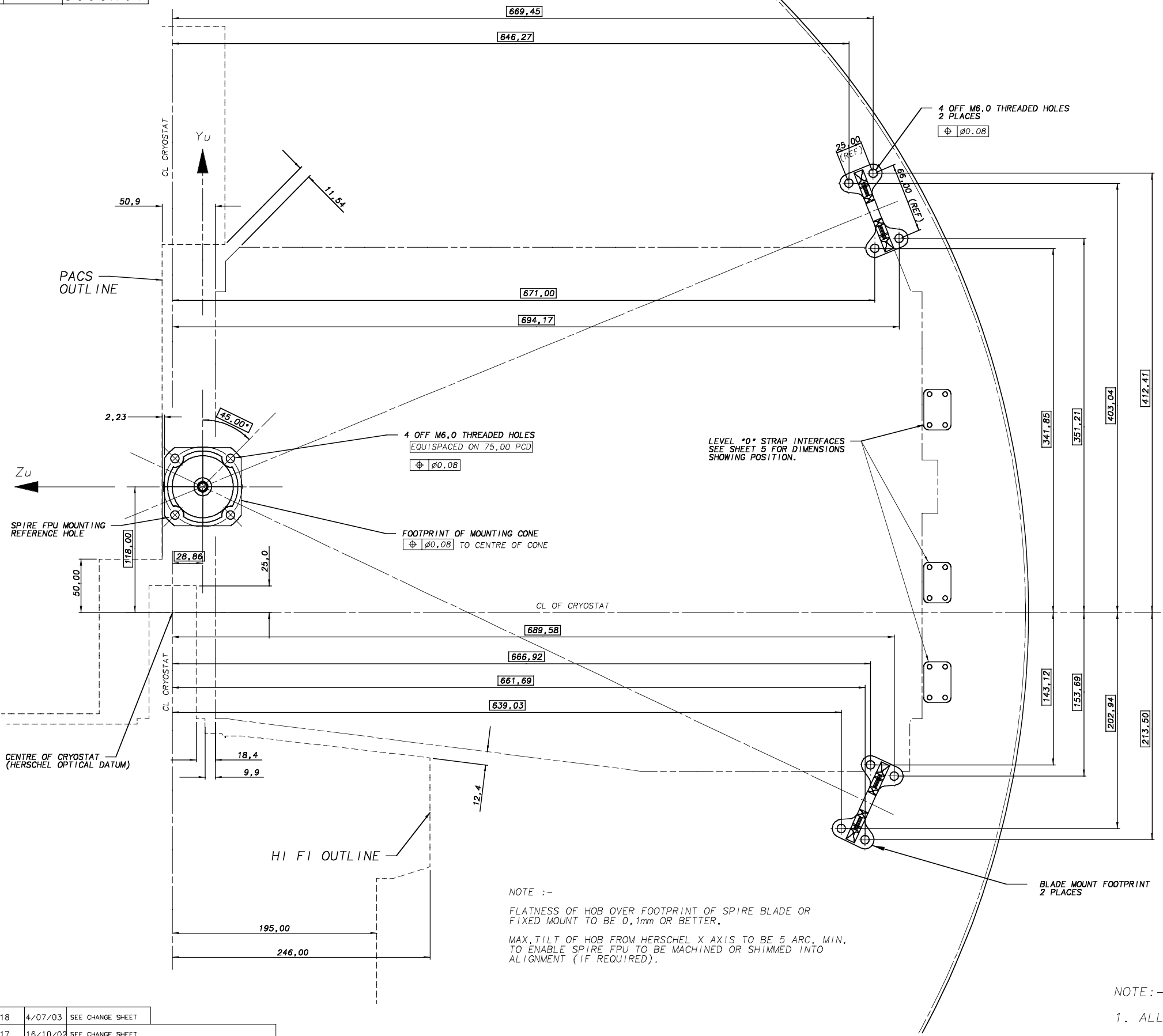
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.	
TITLE SPIRE INTERFACE (OPTICAL DETAILS)	DRAWING No A1 5264 300sht3

USED ON
HERSCHEL

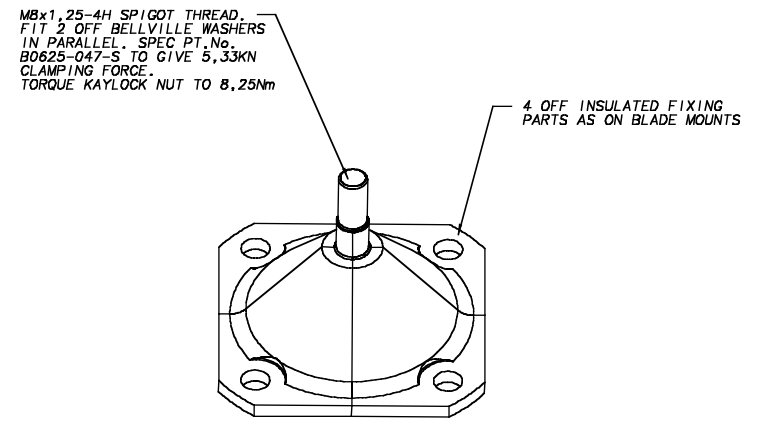
DRAWING No.
A1 5264 300sht 4

THIRD ANGLE PROJECTION

DO NOT SCALE



DETAIL OF BLADE MOUNT FIXINGS
SCALE 1 : 1



DETAIL OF FIXED MOUNTING
SCALE 1 : 1

NOTE :-
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

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

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

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1,0 ANGULAR +/- 0*15'
ESTD WT. 45,63kg (NO CONT) SEE NOTE SHT. 1	DIMENSIONS IN mm	SCALE SCALE 1:2 & 1:1
ACTL WT.		

DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.	
TITLE SPIRE INTERFACE (INTERFACE FIXING DETAILS)	DRAWING No A1 5264 300sht 4
SHEET 4 OF 7	

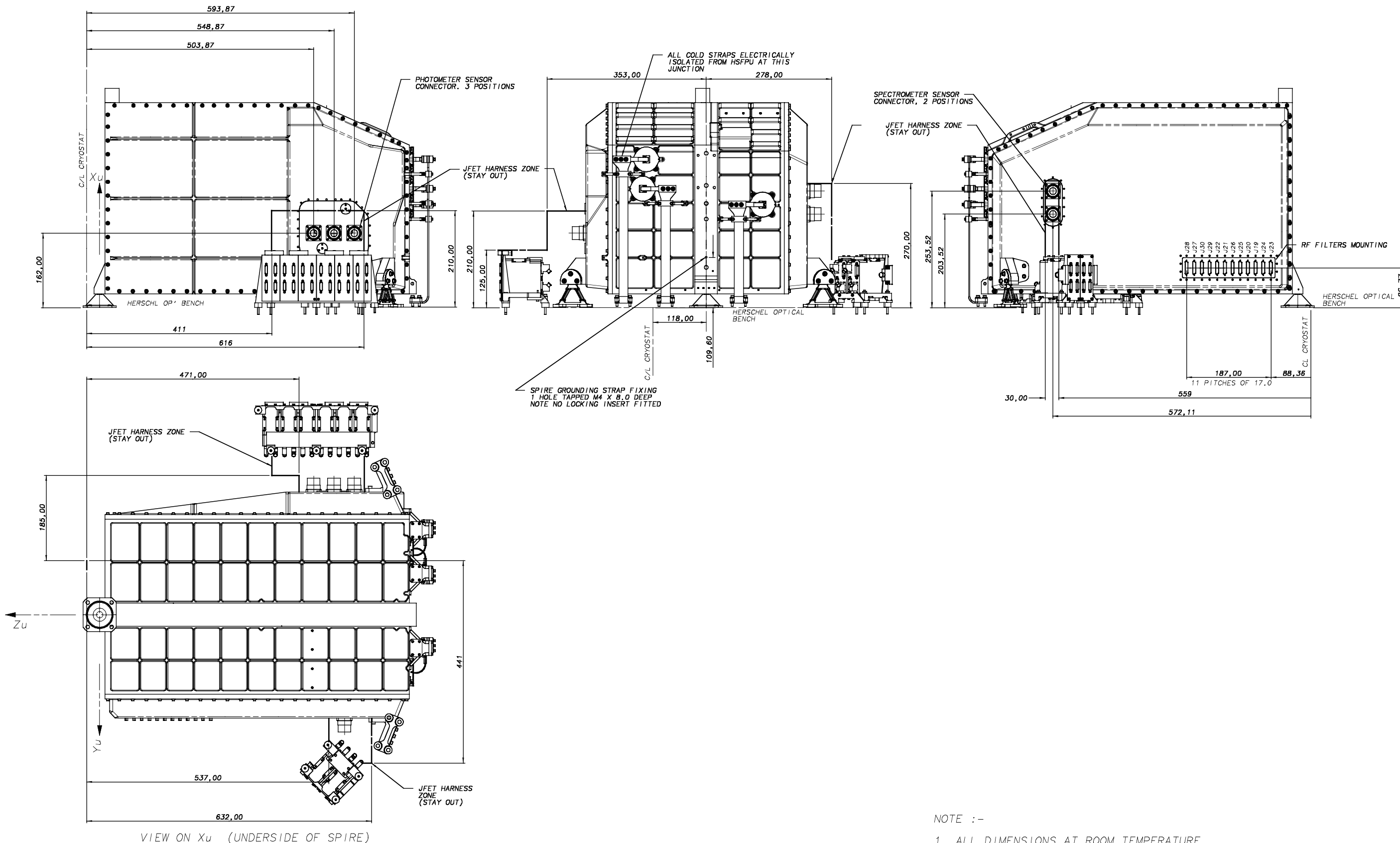
DRAWING No.

A1 5264 300 sht 6

THIRD ANGLE PROJECTION

DO NOT SCALE

USED ON
HERSCHEL



NOTE :-
1. ALL DIMENSIONS AT ROOM TEMPERATURE

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

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

SPIRE Flight Assemblies
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) SEE NOTE SHT.1	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 (ELECTRICAL)	DRAWING No A1 5264 300 sht 6
SHEET 6 OF 7	

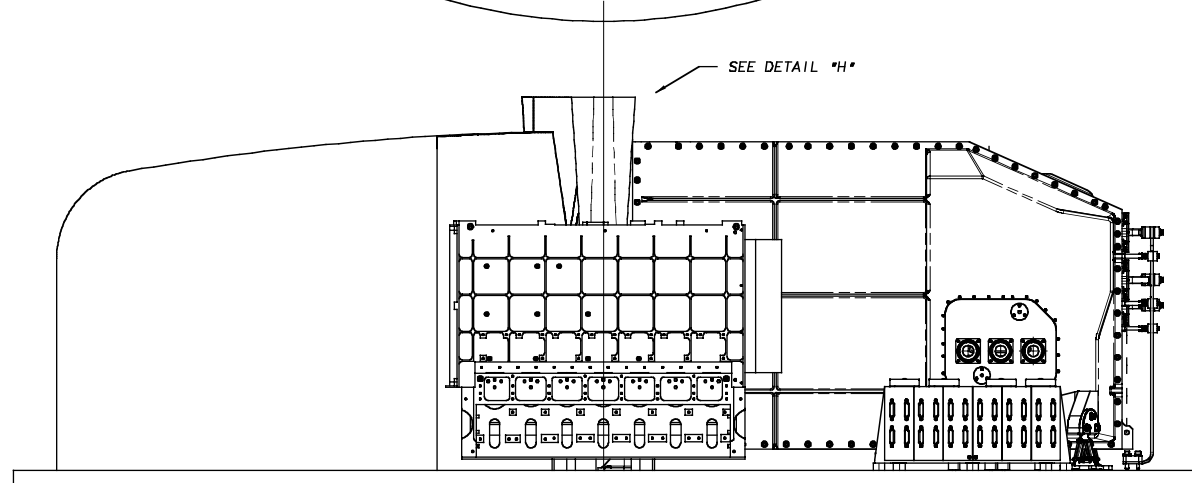
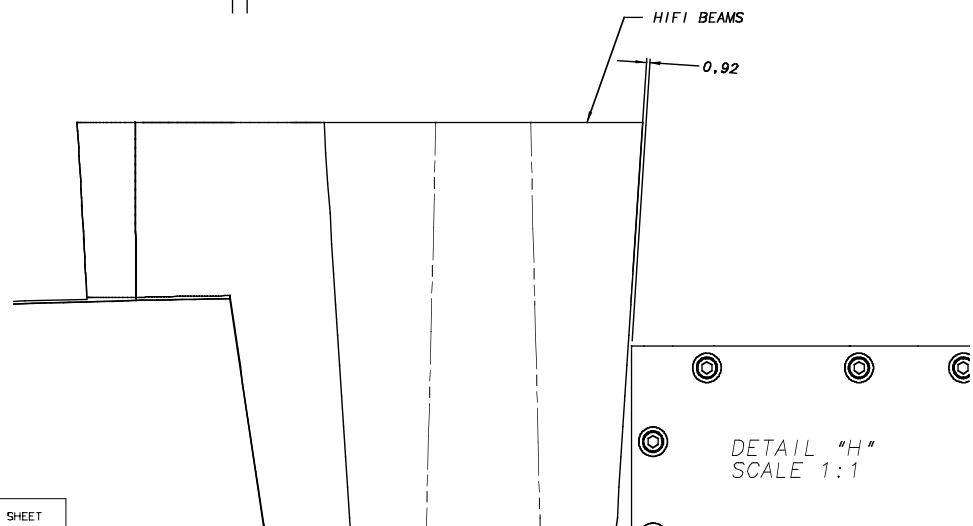
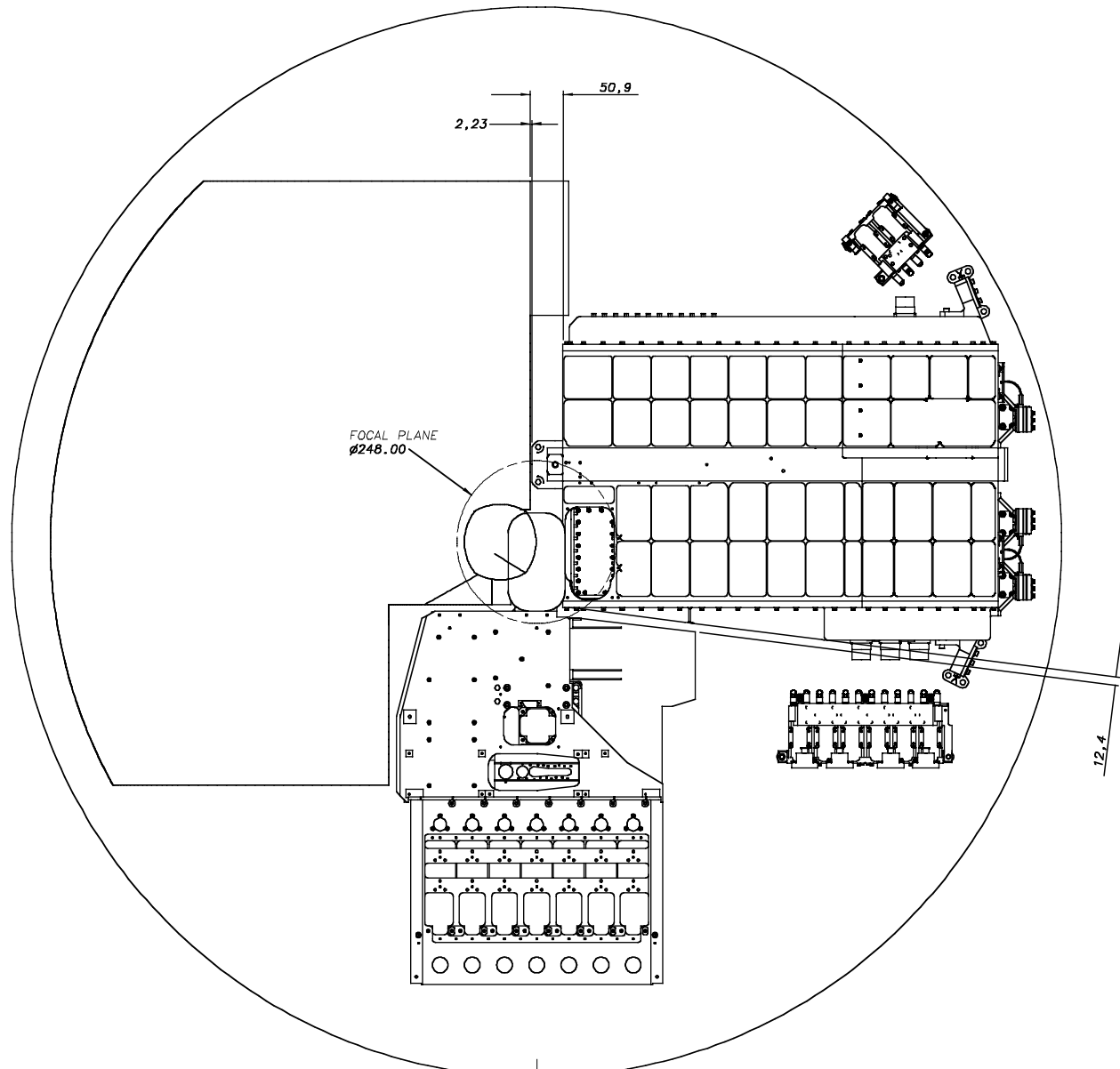
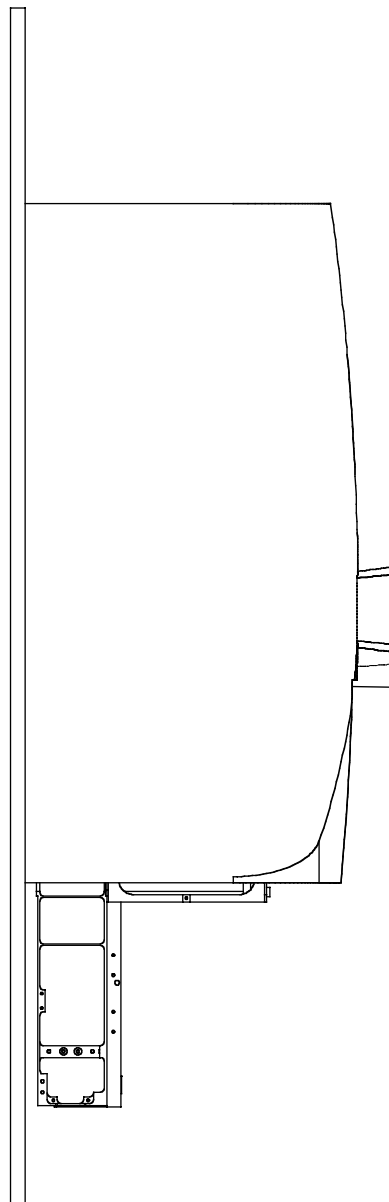
DRAWING No.

A1 5264 300sht7

THIRD ANGLE PROJECTION

DO NOT SCALE

USED ON
HERSCHEL



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

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

SPIRE Flight
Assemblies
COMPUTER FILE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 45.63kg (NO CONT) *SEE NOTE SHT. 1	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 AND HIFI OPTICAL & CLEARANCES	DRAWING No A1 5264 300sht7

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 : 1 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
KE-2952	DRAWING NUMBER: KE-0104-360	
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING	

Date:	12-Jun-2002
NCR/ECR:	
Modification Description:	<p>Connector identification markings updated. J15, J12, J17, J14 reversed with J11, J16, J13, J18.</p> <p>Connector Table updated accordingly</p> <p>RAISED ISSUE TO B 21-Jun-2002 K.Burke</p> <p>Connector Table, 2nd Label J2 corrected to read J3</p> <p>Note showing position of REF HOLE added</p> <p>RAISED ISSUE TO C 21-Jun-2002 K.Burke</p> <p>Parts table modified to read "JPL Supply" as a Remark in the JFET Module entry.</p> <p>Parts table modified to read "Backshell" rather than "Backplate" in the 15-way connector entry</p> <p>Parts table modified to read "Phosphor" rather than "Phosphur"</p> <p>Note 4 modified to read "J9-10 & J15-18" rather than "J9-14"</p> <p>RAISED ISSUE TO D 24-Jun-2002 M. Whalley</p> <p>CofG added, MOI table added, Note modified for warm testing torque, bolt material added, pin1 indicated for connectors.</p> <p>Raised to issue E 4/7/02 T.Froud</p>
Issue raised to:	E By:

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2952

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

Date:	07-Feb-2003
NCR/ECR:	
Modification Description:	<p>1. Swop connector pairs (MSW)</p> <p>2. move connector labels (MSW)</p> <p>3. make back harness into parts (MSW)</p> <p>4. Dimension and label thread lengths</p> <p>5. add column to parts list showing drawing numbers (also create repeat region BOM table)</p> <p>6. replace thermal strap part as an assembly</p> <p>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 machining if trial assembly of rack on flat surface shows gaps before fasteners are tightened"</p> <p>8. add note 5 " Heat capacity = {0.9 x mass} joules / Kelvin</p> <p>9. show insulation additions to feet (kapton tape washers)</p> <p>10. add note to section view showing that fasteners are coated with parylene C</p> <p>11. put m2.5 washers under various screws</p> <p>12. change note 3 to say "items 8 to be torqued to 2.1Nm above locking insert running torque</p> <p>13. add note 6 " fitted back harness to afford open access to 51 ways as shown"</p> <p>14. add note 7 " kapton tape insulators shall be cut to fit annuls of thermal standoff to within +/- 1"</p>
Issue raised to:	F By: IPG

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2952

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 3 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
KE-2952	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

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2952

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

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>
Issue raised to:	H By: Kevin Burke

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2952

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 5 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
KE-2952	DRAWING NUMBER: KE-0104-360	
	DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING	

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

KE-2952

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 : 6 of 6
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
KE-2952	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 points 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

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED

KE-2952

? *John D. ...* 2003.11.12 15:13:21 Z

NOTE THESE Y&Z SUB-SYSTEM AXES ARE NOT PARALLEL TO SPACECRAFT AXES

(SEE NOTE 2)

FASTENERS THRU 4 HOLES Ø4.125 (REFERENCE HOLE)

THESE TWO WASHERS TO BE RELIEVED IN ORDER TO AVOID CLASH WITH FOOT BEAM RADIUS

TEMPERATURE SENSOR INTERFACE SHOWN ON BOTH SIDES THERMAL CONTACT SURFACE DEFINED BY ENCLOSED AREA (SEE NOTE 7)

THERMAL STRAP INTERFACE VIEW SHOWN WITH L3 CLAMPS REMOVED

0.4 INSULATED SURFACE OVER SHADED AREA 0.005

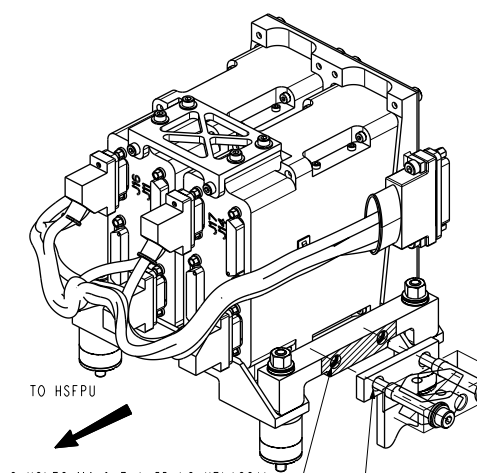
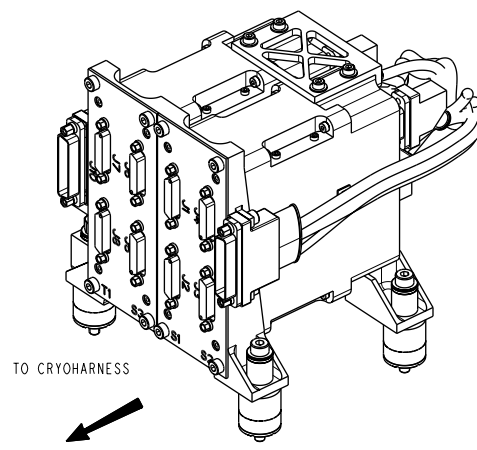
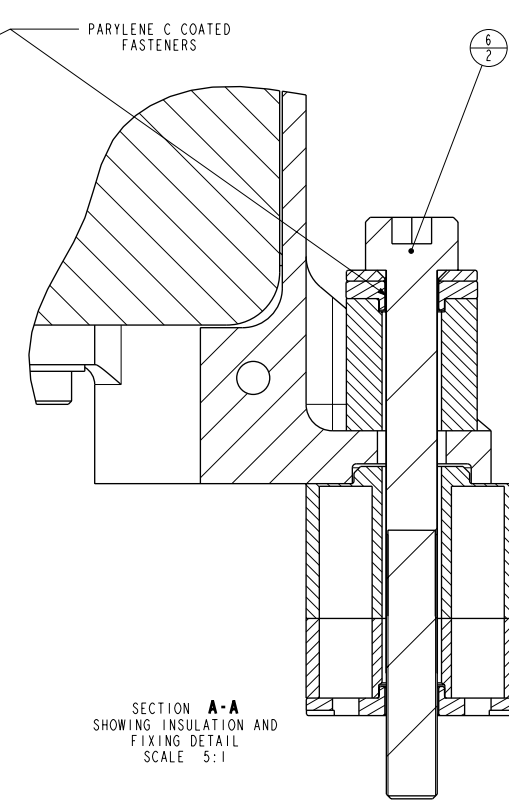
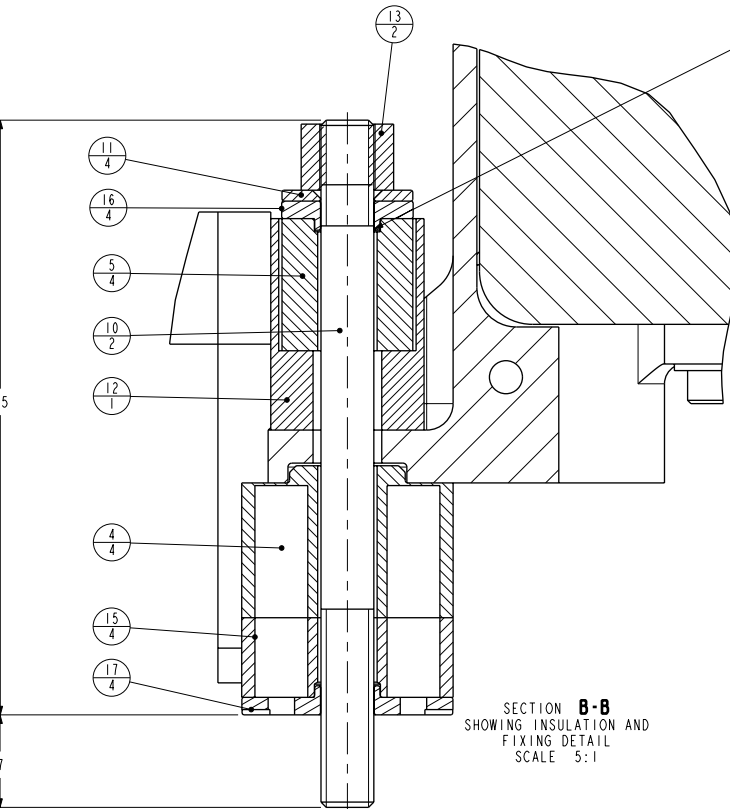
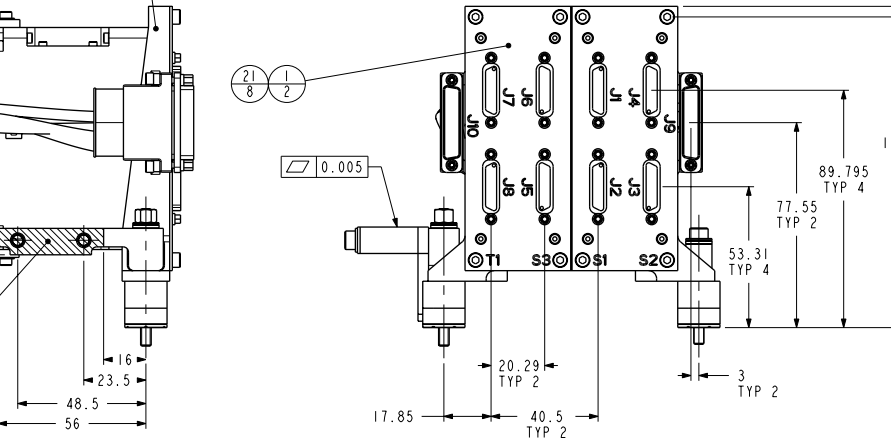
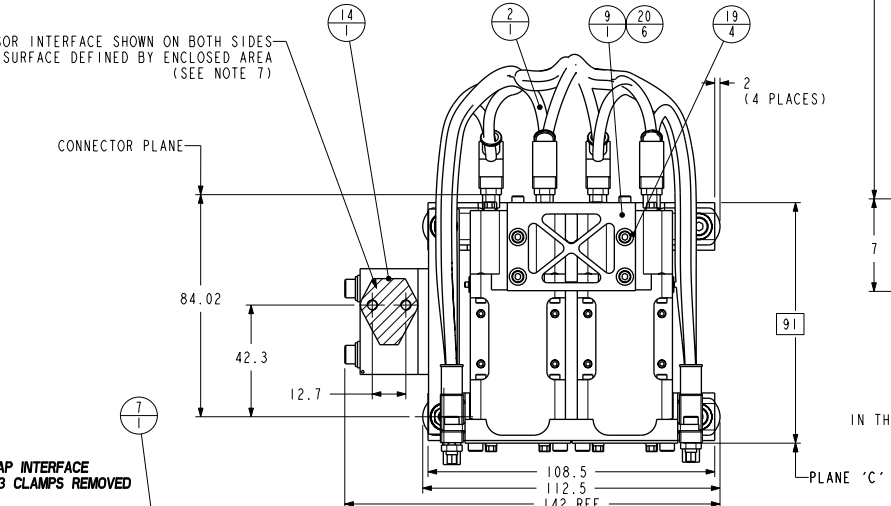
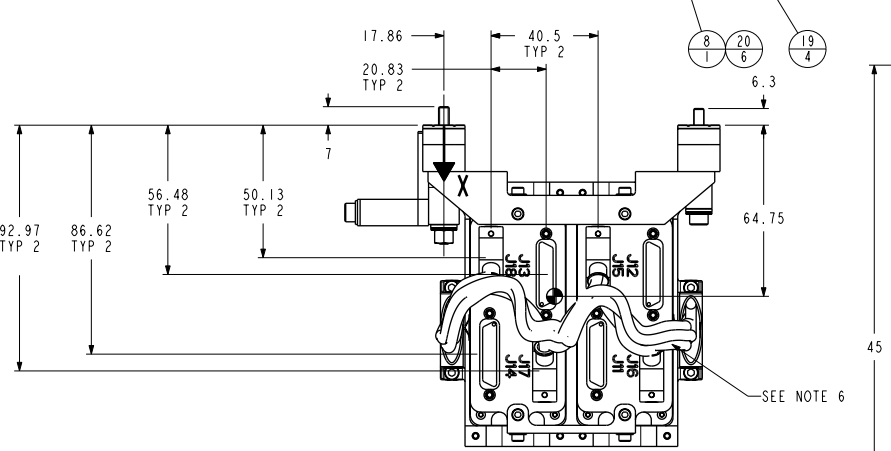
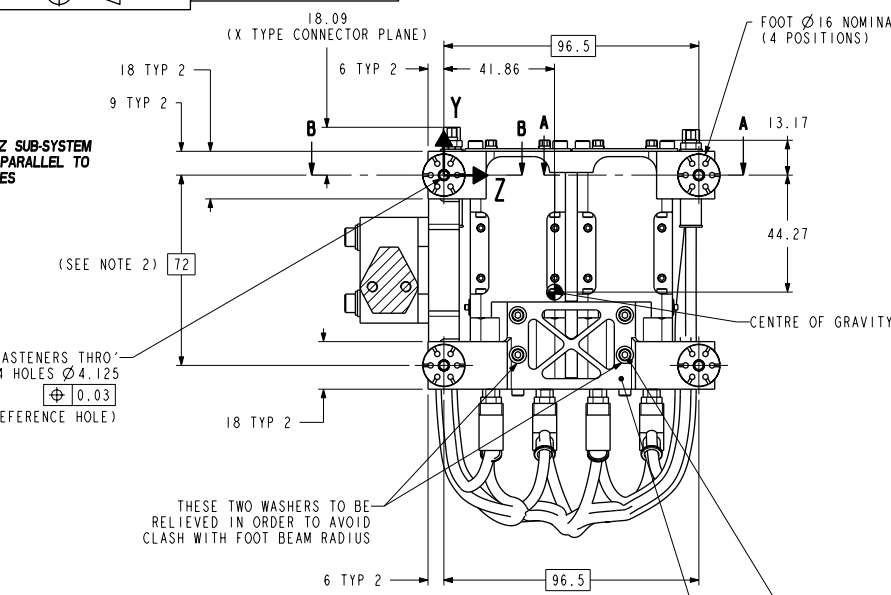
CONNECTOR TABLE

LABEL	TYPE	FUNCTION
J1	ALL MDM2SP	ALL SIGNAL FEEDS TO CRYOHARNESS
J2		
J3		
J4		
J5		
J6		
J7		
J8		
J9	MDM3TS	BIAS WIRES FROM CRYOHARNESS
J10	ALL MDM5IP	SIGNALS IN FROM DETECTORS
J11		
J12		
J13		
J14		
J15		
J16		
J17		
J18	ALL MDM5IP	BIAS FEEDS INTO MODULES

MOMENTS OF INERTIA (Kg mm²) WITH RESPECT TO C OF G

I _{xx}	1.71e+03
I _{yy}	1.94e+03
I _{zz}	2.31e+03

ITEM	PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS	COMMENTS
1	Z3836-10209722	JFET MODULE	2	260.00	520.00	JPL SUPPLY
2	ZJFET_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	33.50	33.50	
9	KE-0104-363	REAR TOP BEAM - 2 JFET	1	8.53	8.53	
10	KE-0104-365	M4 STUD (PARYLENE C COATED)	2	5.08	10.16	
11	KE-0104-367	THERMAL STANDOFF WASHER	4	0.39	1.55	
12	KE-0104-368	THERMAL STRAP 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_8LG_CPHD_SKT_SS	FASTENER	12	0.58	6.93	S/STEEL BS3506-1:1998 A2-70
21	M3_X_8LG_CPHD_SKT_SS	FASTENER	8	0.74	5.95	S/STEEL BS3506-1:1998 A2-70
				ASSEMBLY MASS	967.84 GRAMS	



- NOTES:-
- BOND ITEM 15 TO 4 PRIOR TO ASSEMBLY. BOND ITEMS 16 & 14 TO 3 PRIOR TO ASSEMBLY. ITEMS 3 & 4 TO BE PERMANENTLY GLUED TO MATING SURFACES.
 - TO ATTAIN THE CORRECT MOUNTING 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

ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
J	12-Nov-03	KE-2952.	D. SMART			ISSUED
TOLERANCES UNLESS STATED			FINISH CLEAN REMOVE ALL BURRS		ORIGINAL SCALE 1:1 DO NOT SCALE	
MATERIAL & SPEC. SEE DETAILS			SURFACE TEXTURE µm SEE DETAILS UNLESS STATED		0 50mm	

SPiRE MASTER DRAWING

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

USED ON

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CENTRAL LABORATORY OF THE RESEARCH COUNCILS

TITLE

2 JFET RACK INTERFACE DRAWING

SPiRE

A0-KE-0104-360-J 1 of 1

SSTTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.:ISO9FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 2 of 5
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-350	DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING	
KE-2953		
Date: 7-Feb-2003	NCR/ECR:	
Modification Description:		

1. Swop 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 jet module sizes..." and append note 2 with "pads on item 3 will also need machining if trial assembly of rack on flat surface shows gaps before fasteners are tightened"	
8. add note 5 " Heat capacity = {0.9 x mass} joules / Kelvin"	
9. show insulation additions to feet (kapton tape washers)	
10. add note to section view showing that fasteners are coated with parylene C	
11. put m2.5 washers under various screws	
12. change note 3 to say "Items 8 to be torqued to 2.1Nm above locking insert running torque	
13. add note 6 " fitted back harness to afford open access to 51 ways as shown"	
14. add note 7 " kapton tape insulators shall be cut to fit annulus 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	

SSTTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.:ISO9FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 4 of 5
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-350	DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING	
KE-2953		
Date: 20-May-2003	NCR/ECR:	
Modification Description:		

1. Note Associated with tapped holes in the Thermal Strap Interface, first line modified for clarity to read:	
2 HOLES M4x0.7.5D LG HELICOIL	
Issue raised to: F	By: Kevin Burke
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED	
KE-2953	

SSTTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.:ISO9FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 3 of 5
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-350	DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING	
KE-2953		
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 8 added regarding the protrusion and trimming of the parylene coating	
4. Typos fixed	
5. 2 off thermal strap standard washers replaced with Belleville washers, BOM updated to this effect.	
6. 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	

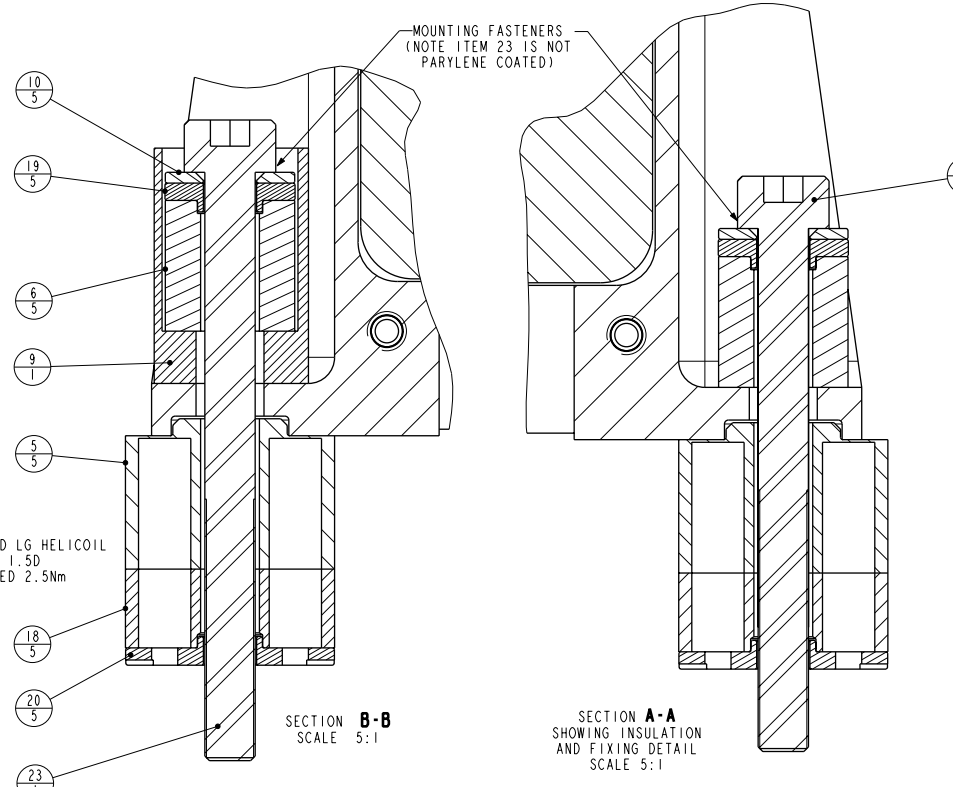
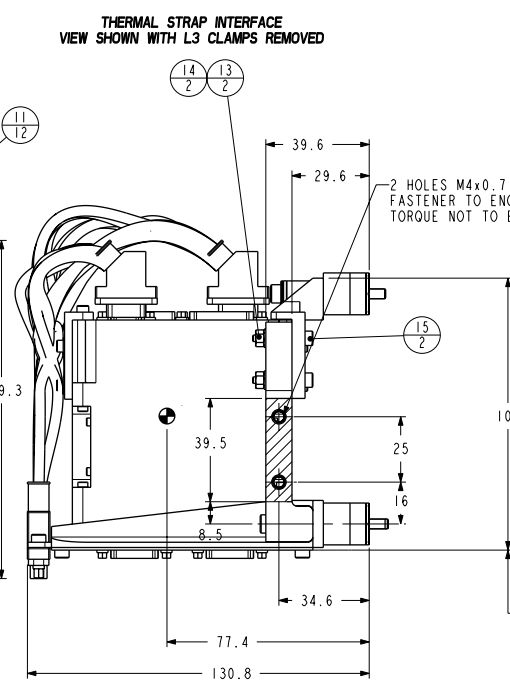
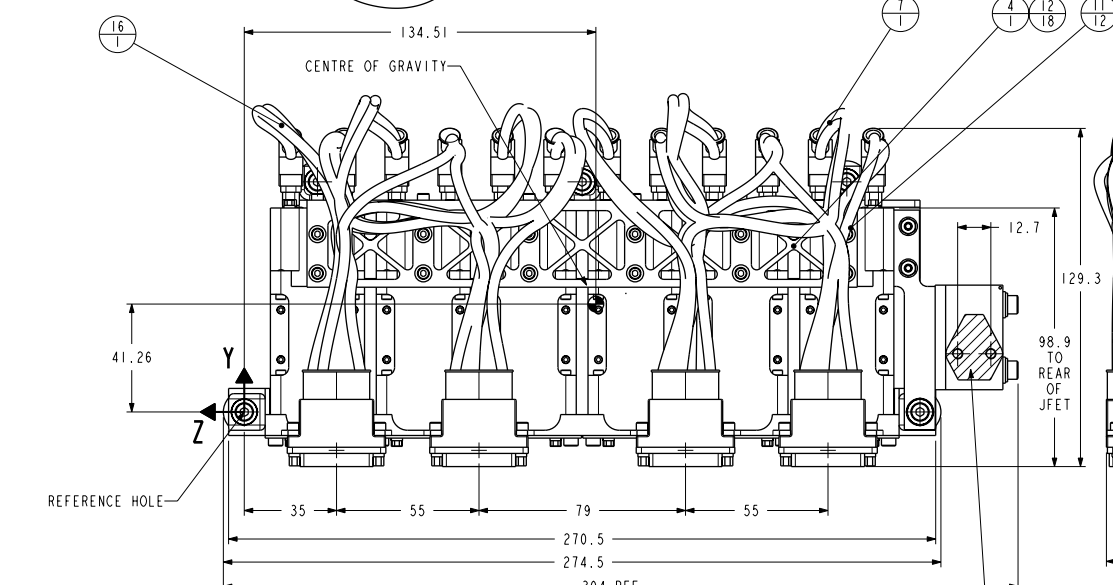
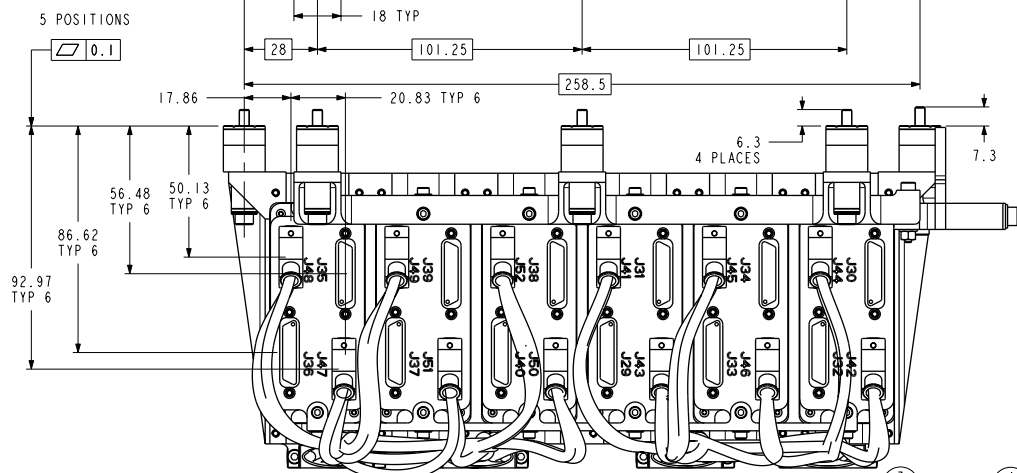
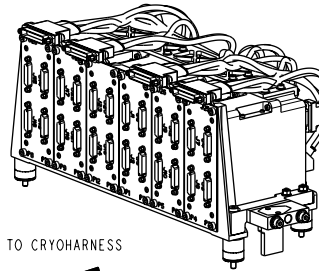
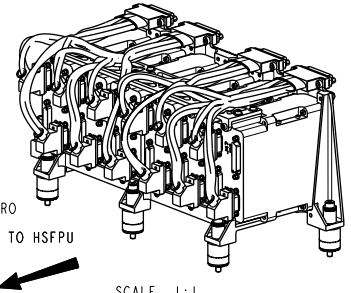
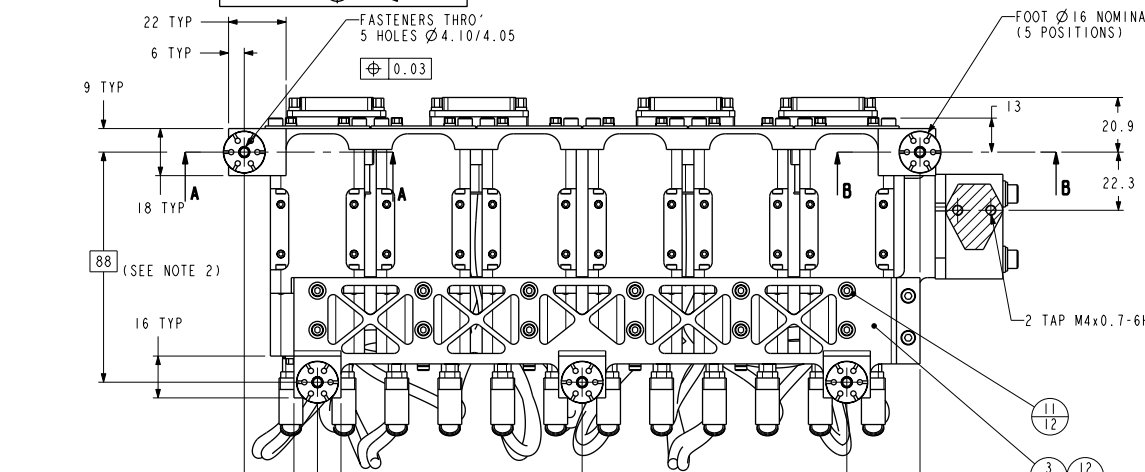
SSTTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No.:ISO9FORM/MECH/006 Issue : 2 Date : 21/12/2001 Page : 5 of 5
MODIFICATION SHEET		
THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY		
DRAWING NUMBER: KE-0104-350	DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING	
KE-2953		
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 harnesses increased from 165g to 270g.	
3. L3 strap and interface assembly added. Views updated and added 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. Fastener for thermal strap assembly changed to non parylene coated M4 x 45mm long.	
8. Kapton tape note removed from L3 interface area.	
9. Incorrectly specified M2.5 x 8 long fasteners used to fasten JFET modules to front plate replaced with M3 x 8 long.	
10. Temperature sensor interface shown on both sides of the L3 interface sub-assembly.	
11. 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.	
12. New dimensions applied to L3 interface area.	
13. 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	

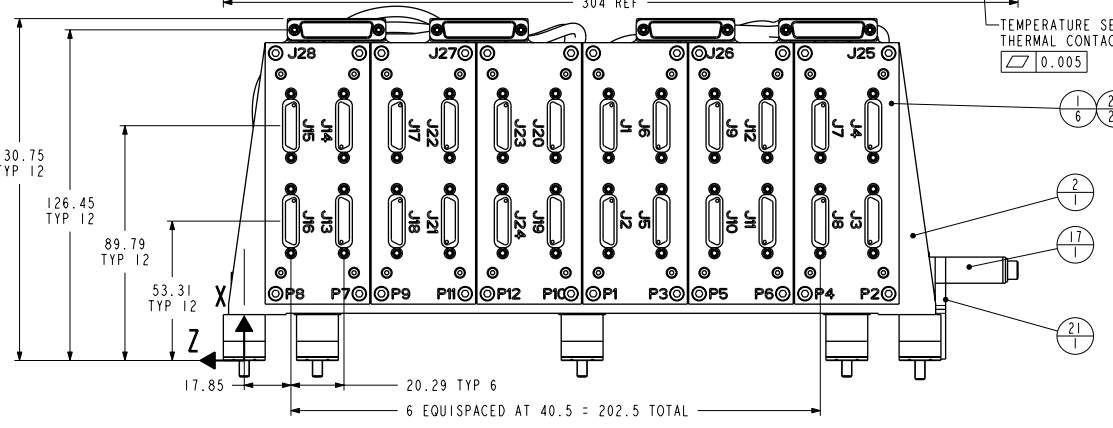
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MOMENTS OF INERTIA (kg mm ²) WITH RESPECT TO C OF G	
I _{xx}	1.70e+04
I _{yy}	1.66e+04
I _{zz}	4.73e+03

ITEM	PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS	COMMENTS
1	23836-10209722	JFET MODULE	6	260.00	1560.00	JPL SUPPLY
2	KE-0104-351	FRONT PLATE 6 JFET	1	128.66	128.66	
3	KE-0104-352	REAR FOOT BEAM - 6 JFET	1	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	



LABEL	TYPE	FUNCTION
J1	ALL MDM2SP	ALL SIGNAL FEEDS TO CRYOHARNES
J2		
J3		
J4		
J5		
J6		
J7		
J8		
J9		
J10		
J11		
J12		
J13		
J14		
J15		
J16		
J17		
J18		
J19		
J20		
J21		
J22		
J23		
J24		
J25		
J26	MDM3TS	BIAS WIRES FROM CRYOHARNES
J27		
J28		
J29		
J30		
J31	ALL MDM5IP	SIGNALS IN FROM DETECTORS
J32		
J33		
J34		
J35		
J36		
J37		
J38		
J39		
J40		
J41	ALL MDM5P	BIAS FEEDS INTO MODULES
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 PARTS 2, NOTING THE SIX VALUES. MACHINE RAISED PADS ON PART 3 TO REMOVE (VALUE ~ 87.7). PADS ON ITEM 4 WILL ALSO NEED MACHINING IF TRIAL ASSEMBLY OF RACK ON FLAT SURFACE SHOWS GAPS BEFORE FASTENERS ARE TIGHTENED.
 - ITEMS 22 AND 8 TO BE TORQUED TO 2.1 Nm ABOVE LOCKING INSERT RUNNING TORQUE.
 - UNIT SHOWN FITTED WITH BACK-HARNES MATING TO J25-28 & J41-52 BECAUSE THIS WILL BE FITTED BEFORE ITEM IS INTEGRATED TO HOB.
 - HEAT CAPACITY AT RT = 2100 JOULES / KELVIN.
 - FITTED BACKHARNES TO AFFORD OPEN ACCESS TO 51 WAYS AS SHOWN.
 - AFFIX ONE SENSOR WITH LONG BOLTS AND THEN THE OTHER ON THE REVERSE WITH NUTS

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

G	13-OCT-03	KE-2953.	D. SMART			ISSUED
ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
TOLERANCES UNLESS STATED		FINISH CLEAN REMOVE ALL BURRS		ORIGINAL SCALE 1:1 DO NOT SCALE		
MATERIAL & SPEC. SEE DETAILS		SURFACE TEXTURE µm SEE DETAILS ✓ UNLESS STATED		0 50mm		
USED ON						© CLRC 2003
CENTRAL LABORATORY OF THE RESEARCH COUNCILS						
TITLE						
6 JFET RACK INTERFACE DRAWING						
SPIRE						
A 0-KE-0104-350-G						1 of 1