

SPIRE IID-B Annex: Unit ICDs

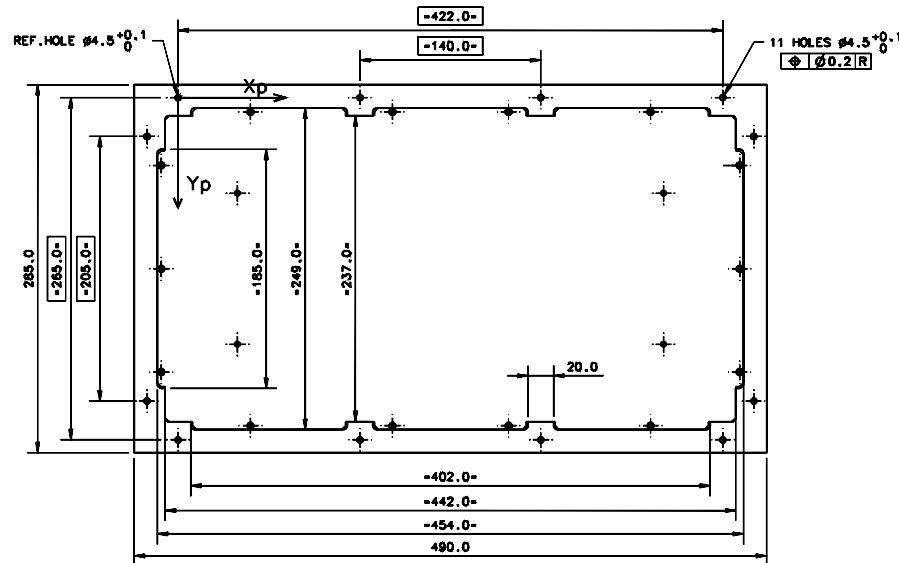
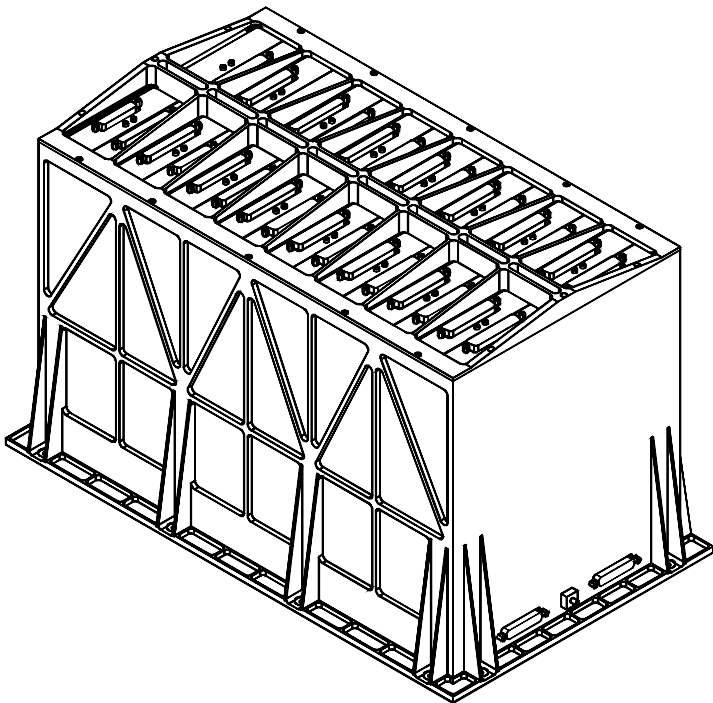
Issue 2. Update to status as of 8th October 2002

Issue 3 Update to status as of 1st November 2002

FCU, DCU & Cryogenic ICDs changed, see changelists where provided

Issue4 Update to status as of 24/2/03. JFET drawing versions raised.

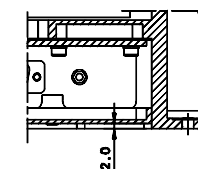
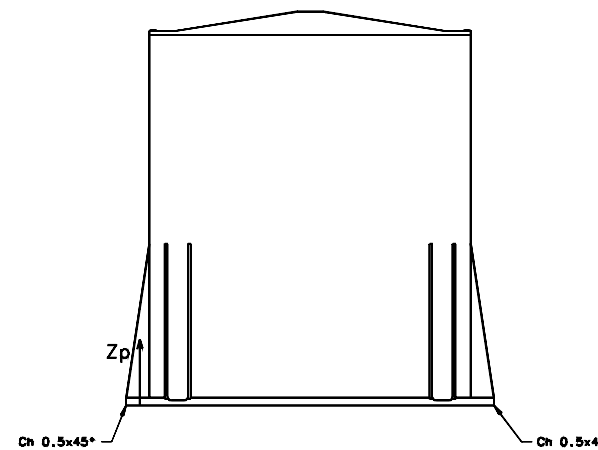
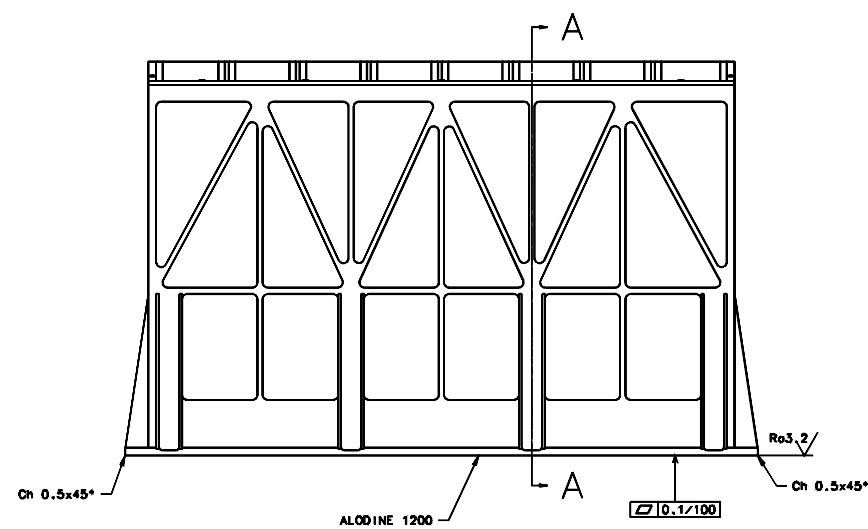
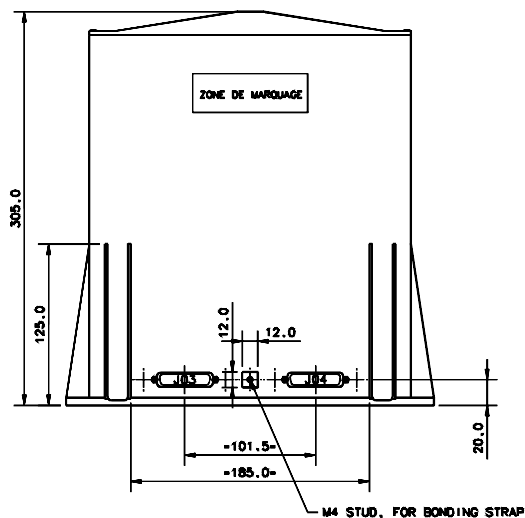
Issue 5 Updated as to status of 27th March 2003. Non-AVM DPU ICD included. JFET ICDs updated.



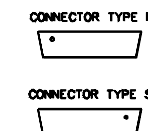
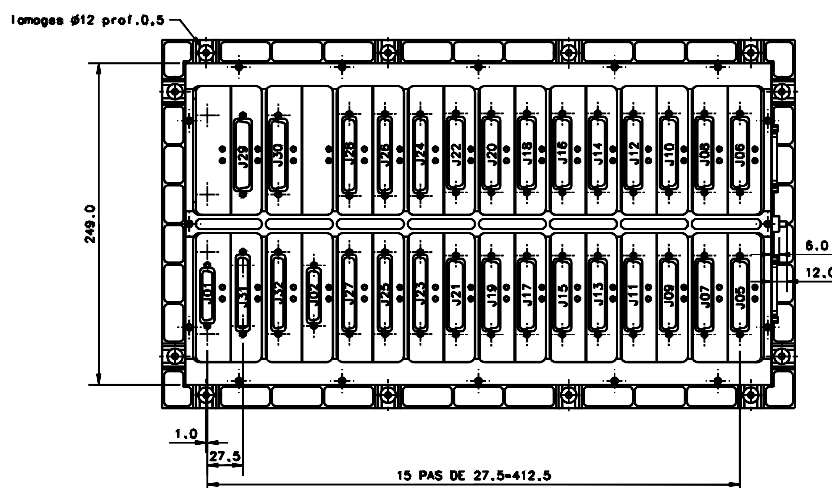
CONNECTORS					
IDENT	TYPE	FUNCTIONS	IDENT	TYPE	FUNCTIONS
J01	DBMA 25S	DAQ_IF_M/DPU_M	J17	DDMA 50P	LIA_P_7/FPU
J02	DBMA 25S	DAQ_IF_R/DPU_R	J18	DDMA 50P	LIA_P_7/FPU
J03	DBMA 25P	DCU/PSU_M	J19	DDMA 50P	LIA_P_8/FPU
J04	DBMA 25P	DCU/PSU_R	J20	DDMA 50P	LIA_P_8/FPU
J05	DDMA 50P	LIA_P_1/FPU	J21	DDMA 50P	LIA_P_9/FPU
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	DDMA 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



COUPE PARTIELLE A-A
 ECHELLE:1/1



Indice	Modifications	Date	Dessiné par	Écrit par	Approuvé par
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

Indice de rugosité général xxx	SOUS-TRAITANT
Tol. ang.: xxx°	
Casser les angles vifs	

Matériau: Protection

Traitement thermique: Echelle Poids Niveau qualité
 1/2

SPIRE
HSDCU ELECTRONIC BOX
MECHANICAL INTERFACE CONTROL DRAWING

Il n'est permis d'utiliser ce dessin qu'avec l'usage autorisé ou autorisation expresse - 1er de 11 mars 1997

SAP/GERES COMMISSARIAT A L'ENERGIE ATOMIQUE C.E.N. SACLAY
 Tel: 01.69.08.79.25
 01.69.08.59.78
 Fax: 01.69.08.79.96

AD SPIR-MX-5100 000 D

Herschel/SPIRE

MULLARD SPACE SCIENCE LABORATORY
 UNIVERSITY COLLEGE LONDON Author: C BROCKLEY-BLATT

SPIRE – STRUCTURE INTERFACE DRAWING ISSUE 17
 AND MODIFICATION SHEET ISSUE 2.0
 Document Number: MSSL/SPIRE/SP005 25 October 2002

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	Author: C Brockley-Blatt	Date:
Checked: B Winter		Date:
Approved: Tony Dibbens		Date:

ISSUE 16

SHEET	MODIFICATION
2	JFET note modified.
1	Dimensions over Blade Mounts added.
1	'Zu' axis added. Spacecraft co-ordinates note added.
1	"Optical Datum Pin" note deleted.
4	Mounting referencing hole added (fixed mounting).
2	Section description note changed.
3	10 mm mechanical clearance zone deleted.
3	Shaded optical beams extended.
3	Note wrt. Beam dimensions added.
3	Reference cube angular mounting ad absolute accuracy note added.
4	Floating details removed.
4	Alignment of HOB wrt. Herschel to permit Spire to be aligned.
5	Unit axes added.
5	Cold Straps detail deleted (saved on new drawing A1/5264/300A).
5	JFET thermal Interfaces note added. External to MSSL note added.
5	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

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
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

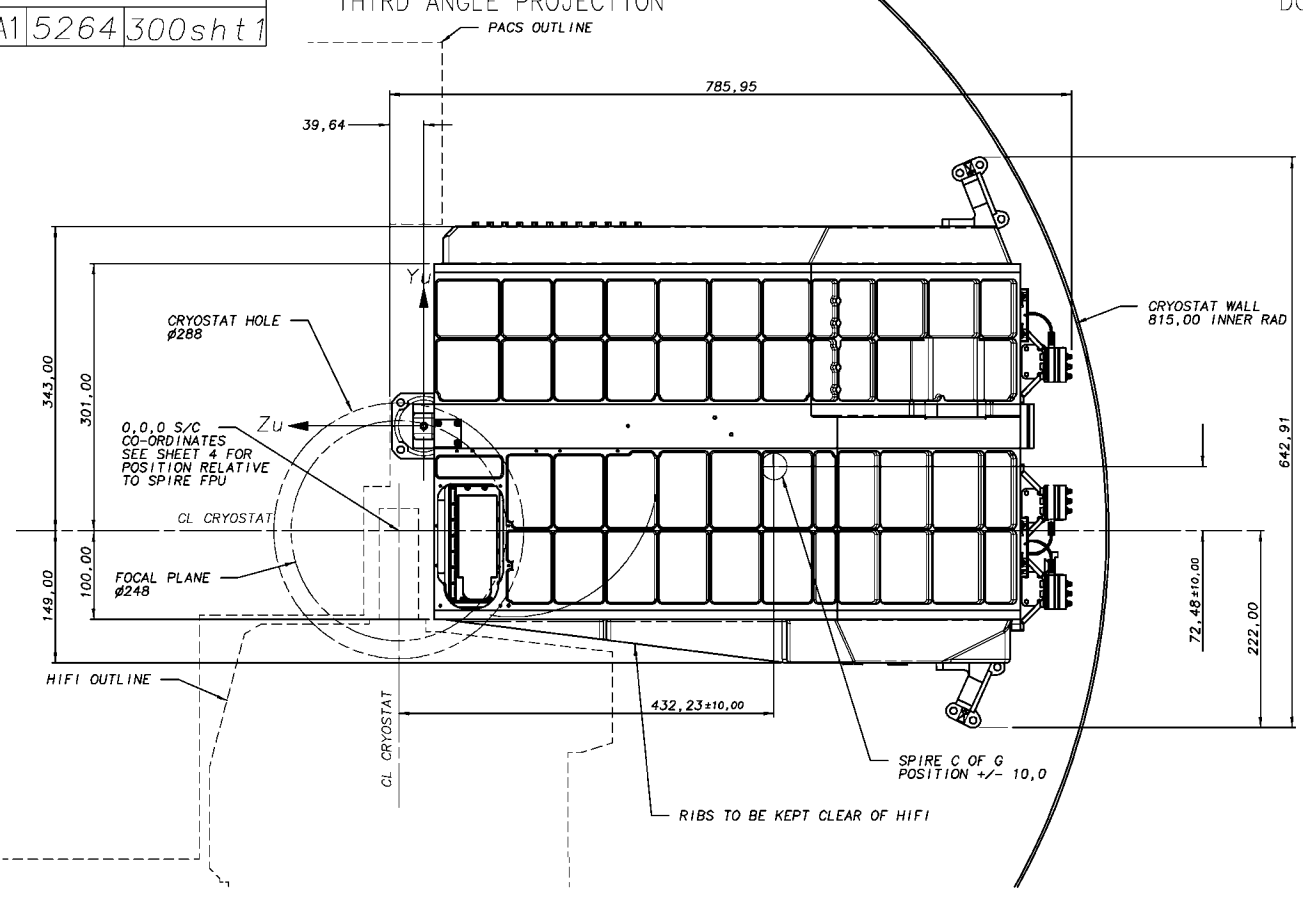
	Belleville types added.
7	Beam clearance dimension not checked, waiting for input from HiFi
1	Note WRT clearance between FPU and Inner Shield Added
1,2,3	Cryostat Inner shield updated
5	"Stay Out" zone around Level '0' straps added

DRAWING No.
A1 5264 300sht 1

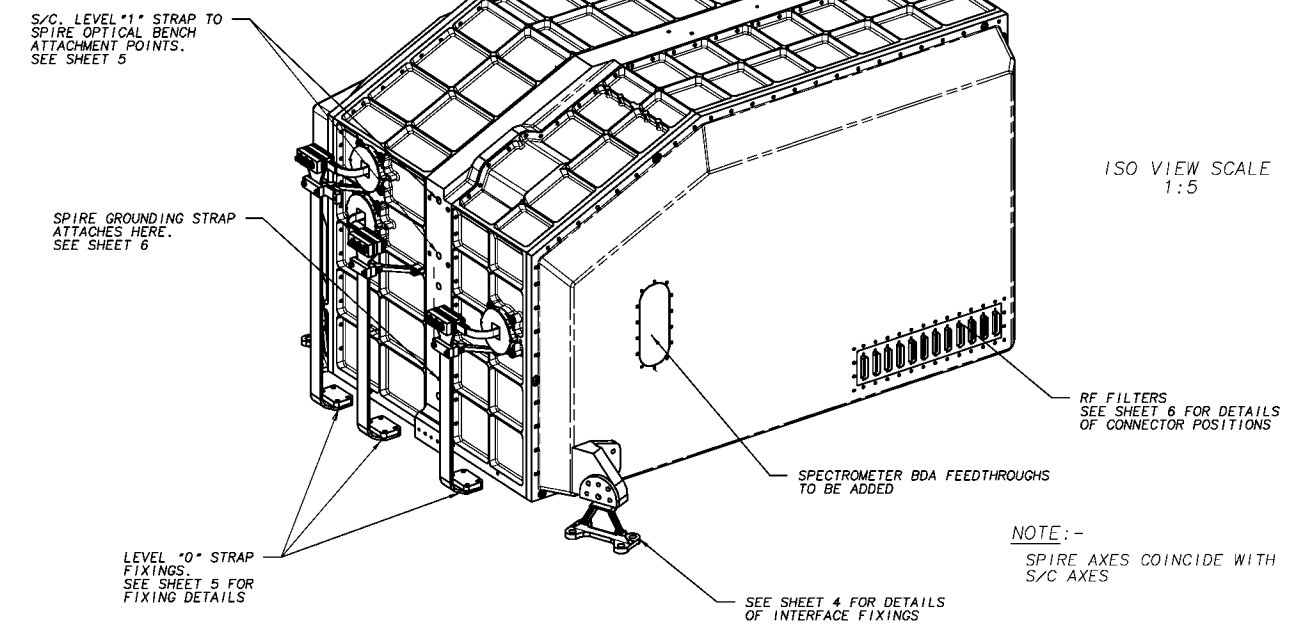
THIRD ANGLE PROJECTION

DO NOT SCALE

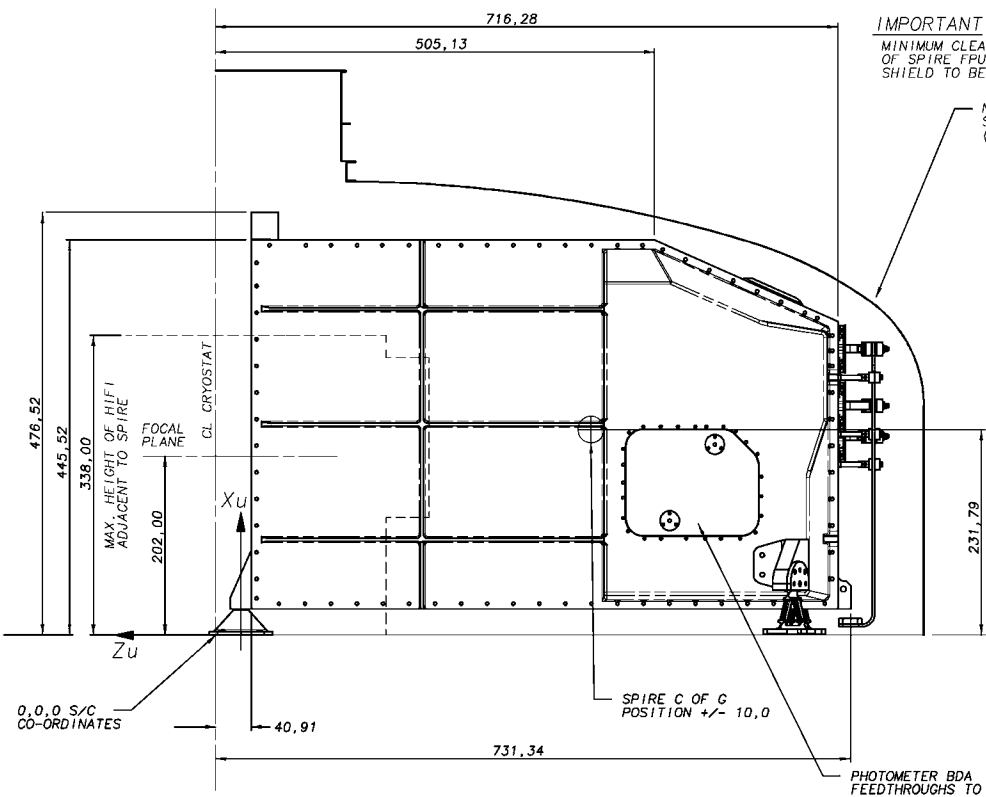
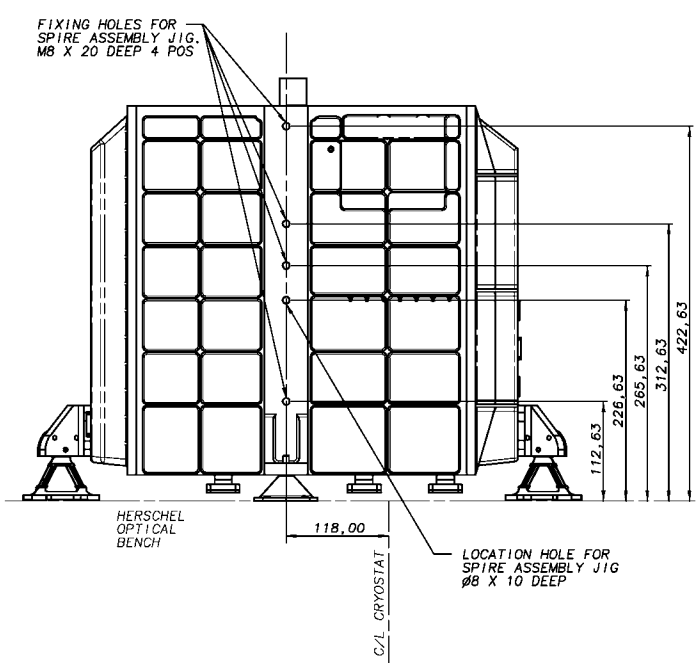
USED ON
HERSCHEL



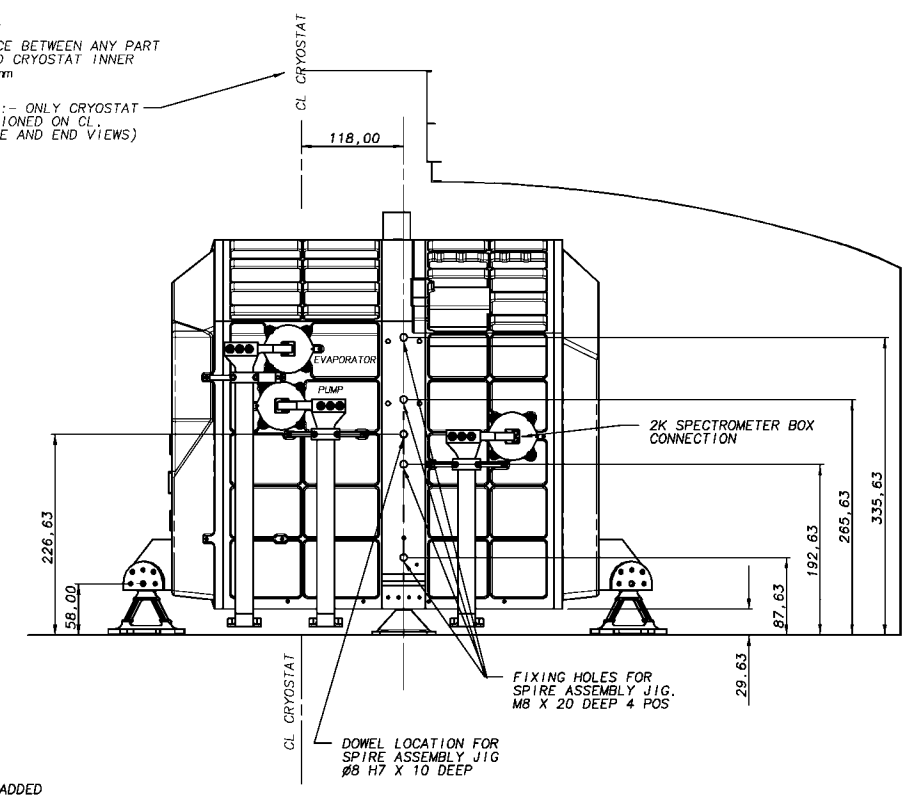
- NOTE:-
 1. ALL DIMENSIONS AT ROOM TEMPERATURE
 2. J-FET BOXES NOT SHOWN ON THIS SHEET



MOMENTS OF INERTIA ABOUT CG:-
 (NOTE:- ALL MASS PROPERTIES EXCLUDE JFETS, HARNESSES AND PENDING CHANGES TO SMEC AND FPU COOLER)
 Ixx = 2,32881e06 kg mm²
 Iyy = 2,32699e06 kg mm²
 Izz = 1,25748e06 kg mm²



IMPORTANT :-
 MINIMUM CLEARANCE BETWEEN ANY PART OF SPIRE FPU AND CRYOSTAT INNER SHIELD TO BE 10mm
 NOTE:- ONLY CRYOSTAT SECTIONED ON CL. (SIDE AND END VIEWS)



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 RF 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 $\pm 0.15'$
ESTD WT. 40kg(NO. CONT.) SEE NOTE SHT. 1	DIMENSIONS IN mm	SCALE 1:4
ACTL WT.		

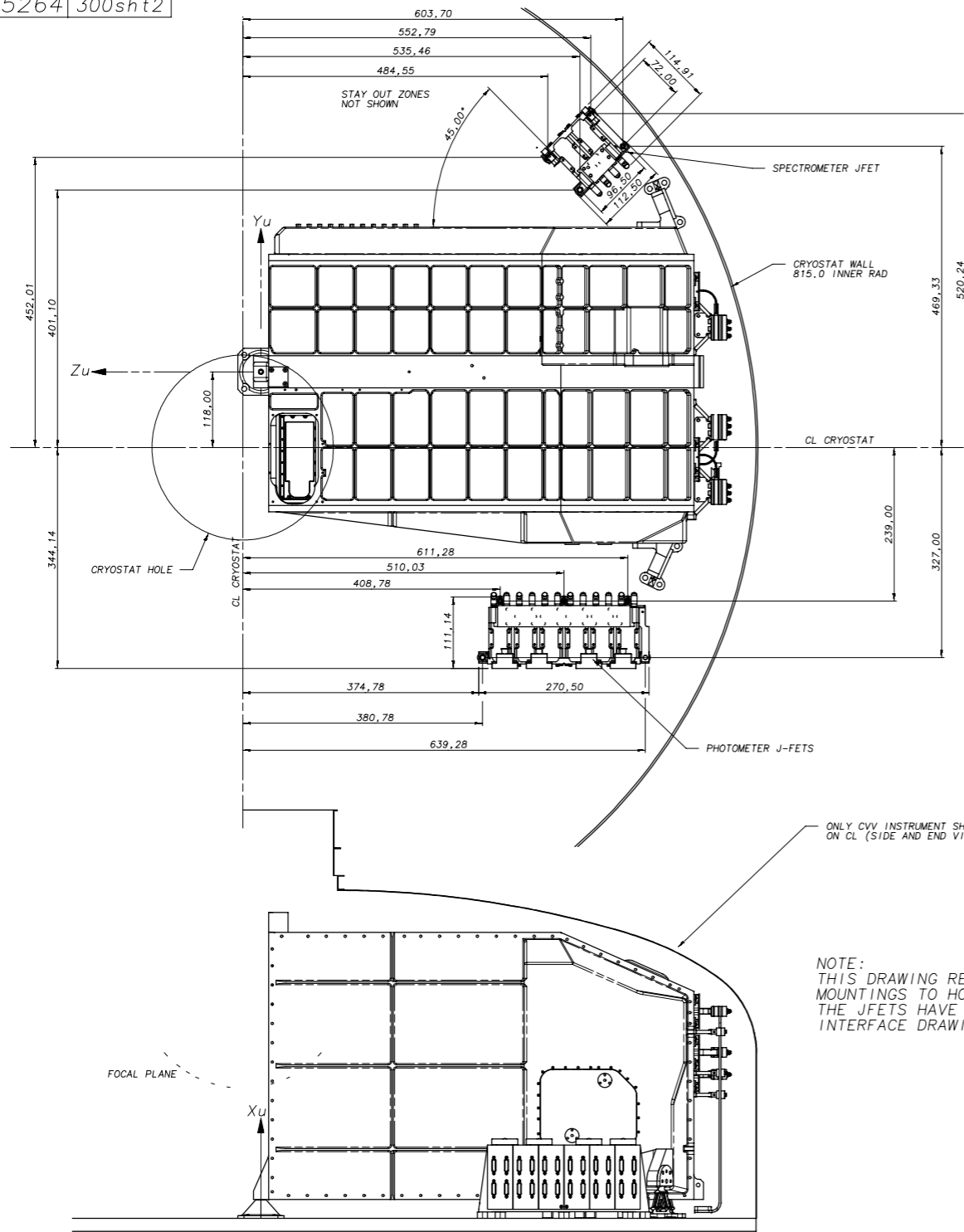
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.		DRAWING No A1 5264 300sht 1
TITLE SPIRE INTERFACE (GENERAL DIMENSIONS)		SHEET 1 OF 7

USED ON
HERSCHEL

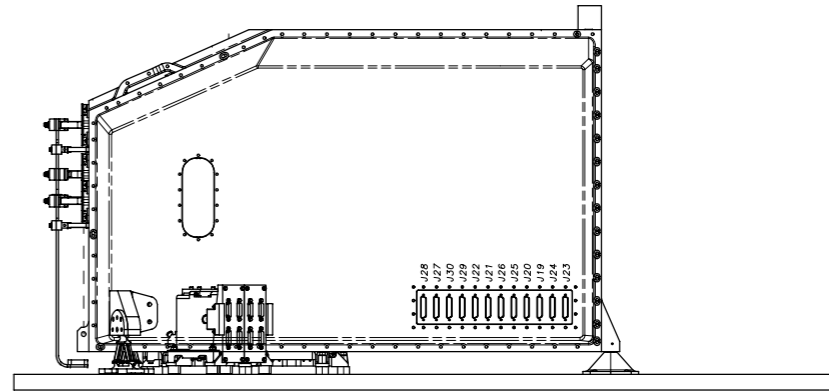
DRAWING No.
A1 5264 300sht2

THIRD ANGLE PROJECTION

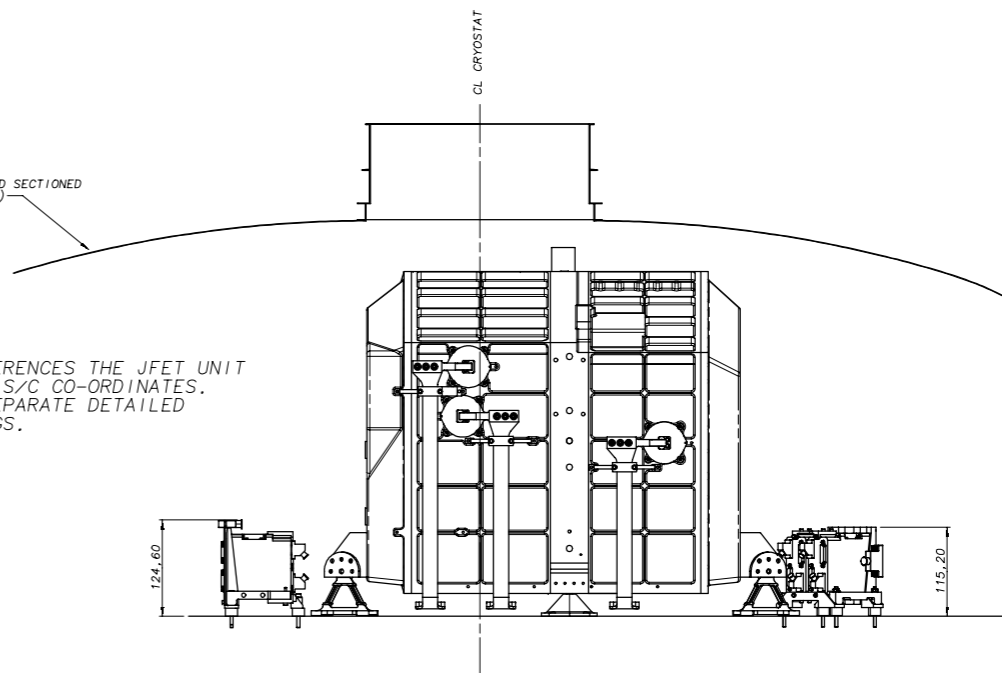
DO NOT SCALE



NOTE:-
1. ALL DIMENSIONS AT ROOM TEMPERATURE



SPECTROMETER SIDE
(VIEWED IN -YU DIRECTION)



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

PHOTOMETER SIDE

CHECKED	17	16/10/02	SEE CHANGE SHEET
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PBG	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	PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
SPiRE Flight Assocs	ESTD WT. 40kg(NO. CONT.) SEE NOTE SHT.1	DIMENSIONS IN mm	SCALE 1:4
COMPUTER FILE	ACTL WT.		

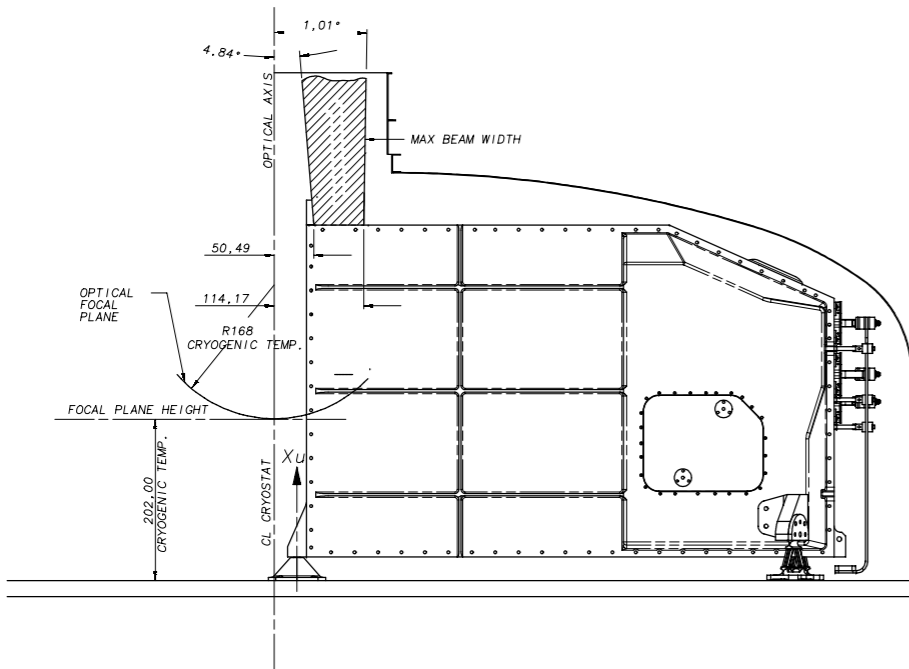
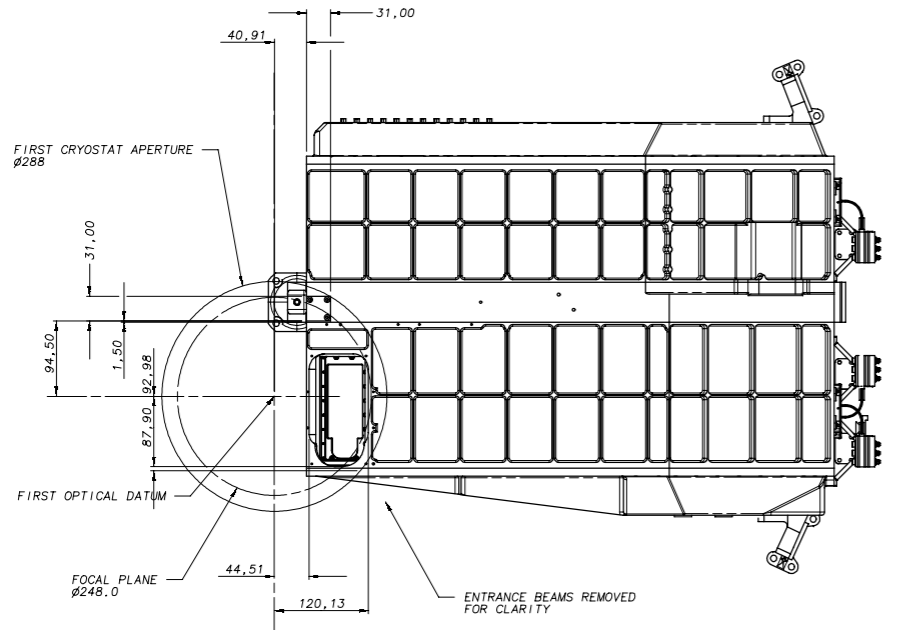
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.		
TITLE SPiRE INTERFACE (J-FET POSITIONS)	DRAWING No A1 5264 300sht2	
SHEET 2 OF 7		

USED ON
HERSCHEL

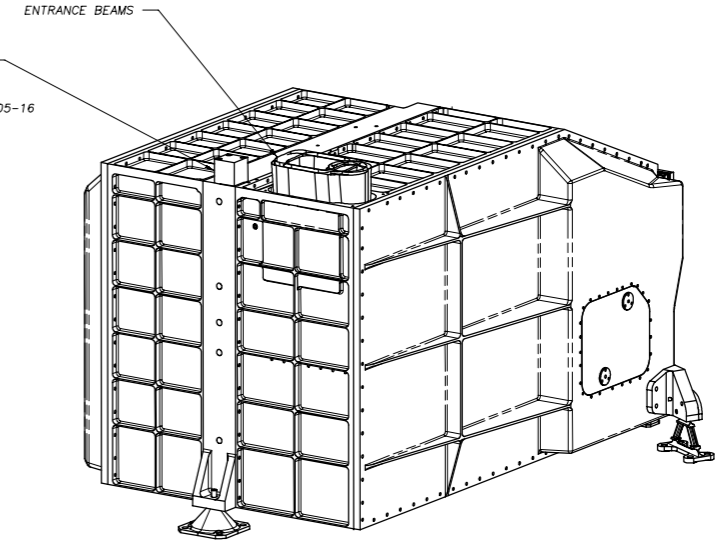
DRAWING No.
A1 5264 300sht3

THIRD ANGLE PROJECTION

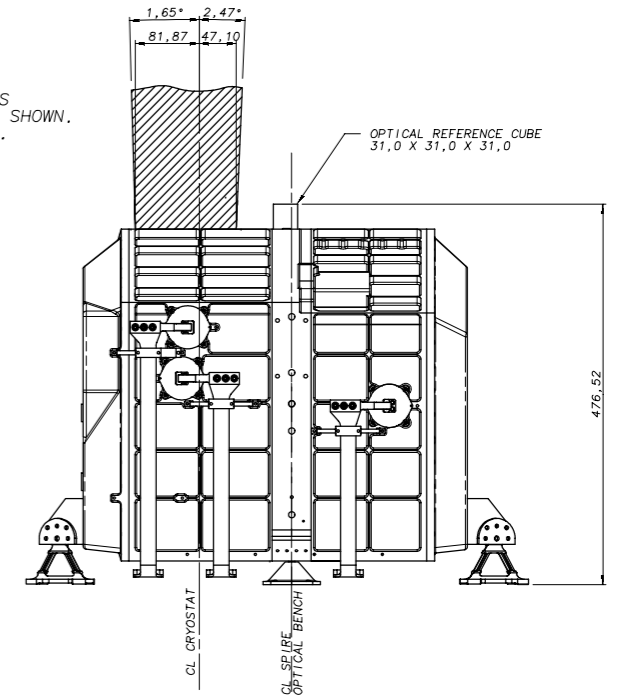
DO NOT SCALE



ANGULAR ACCURACY OF OPTICAL CUBE POSITION
0.05° (3 ARC MIN).
ANGULAR ACCURACY TO X_u, Y_u, Z_u 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 IID-B FOR MORE DETAILED INFORMATION.



NOTE:-

1. ALL DIMENSIONS AT ROOM TEMPERATURE UNLESS OTHERWISE SPECIFIED

CHECKED	17	16/10/02	SEE CHANGE SHEET
	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.
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	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. 40kg(NO CONT.) SEE NOTE SHT.1		
ACTL WT.	DIMENSIONS IN mm	SCALE 1:1

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

TITLE	DRAWING No
SPIRE INTERFACE (OPTICAL DETAILS)	A1 5264 300sht3

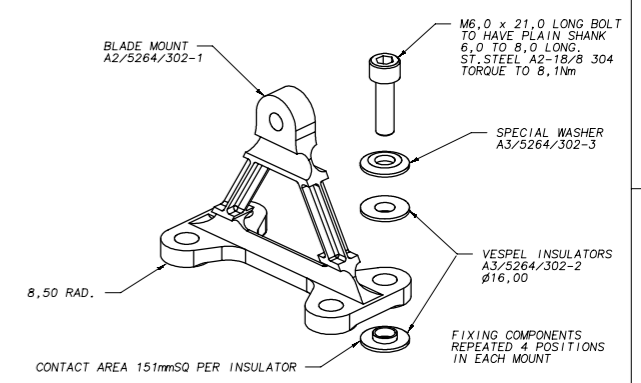
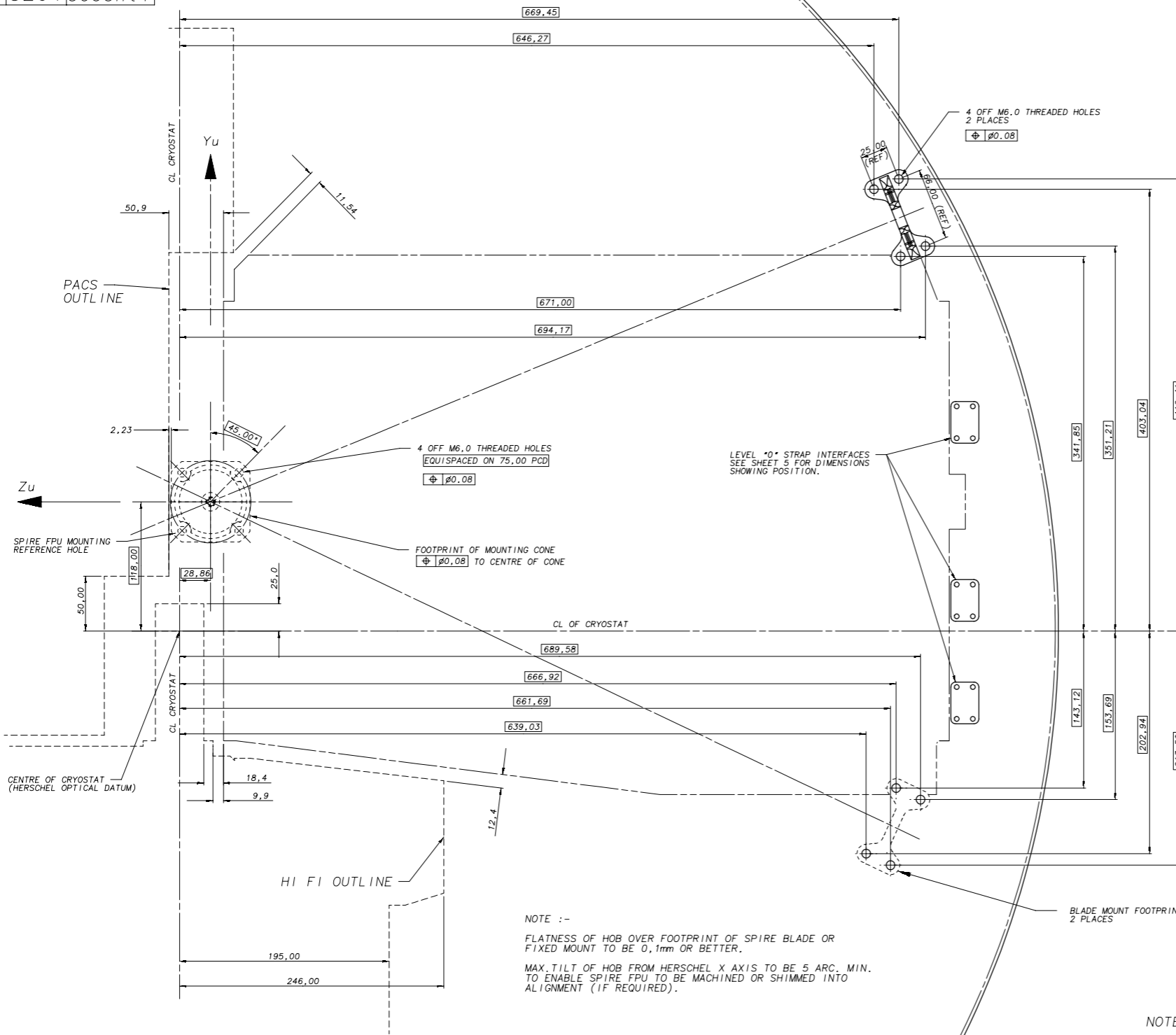
DRAWING No.

A1 5264 300sht4

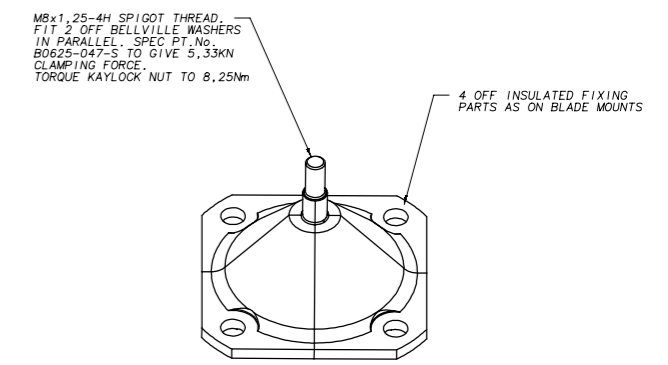
THIRD ANGLE PROJECTION

DO NOT SCALE

USED ON
HERSCHEL



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

CHECKED	17	16/10/02	SEE CHANGE SHEET
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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)

ESTD WT. 40kg(NO. CONT.)
SEE NOTE SHT.1

ACTL WT.

MATERIAL & SPEC.
AS LISTED

DIMENSIONS IN mm

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

SCALE 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) A1 5264 300sht4

DRAWING No
A1 5264 300sht4

USED ON
HERSCHEL

DRAWING No.
A1 5264 300sht5

THIRD ANGLE PROJECTION

DO NOT SCALE

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

6.00
3.00
9.50

15.00

LEVEL "0" STRAP
COPPER

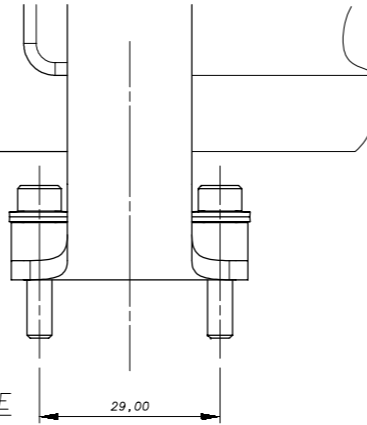
ST. STEEL
CLAMP PLATE

4 OFF M4 x 20.0 LONG
SKT. HD. CAP SCREWS
ST. STEEL A2-18/8 304
TORQUE TO 1.26Nm

HERSCHEL OPTICAL BENCH

DETAIL "B" OF LEVEL "0" TO S/C INTERFACE

SCALE 2:1



HSFPU EXTERNAL FINISHES:-

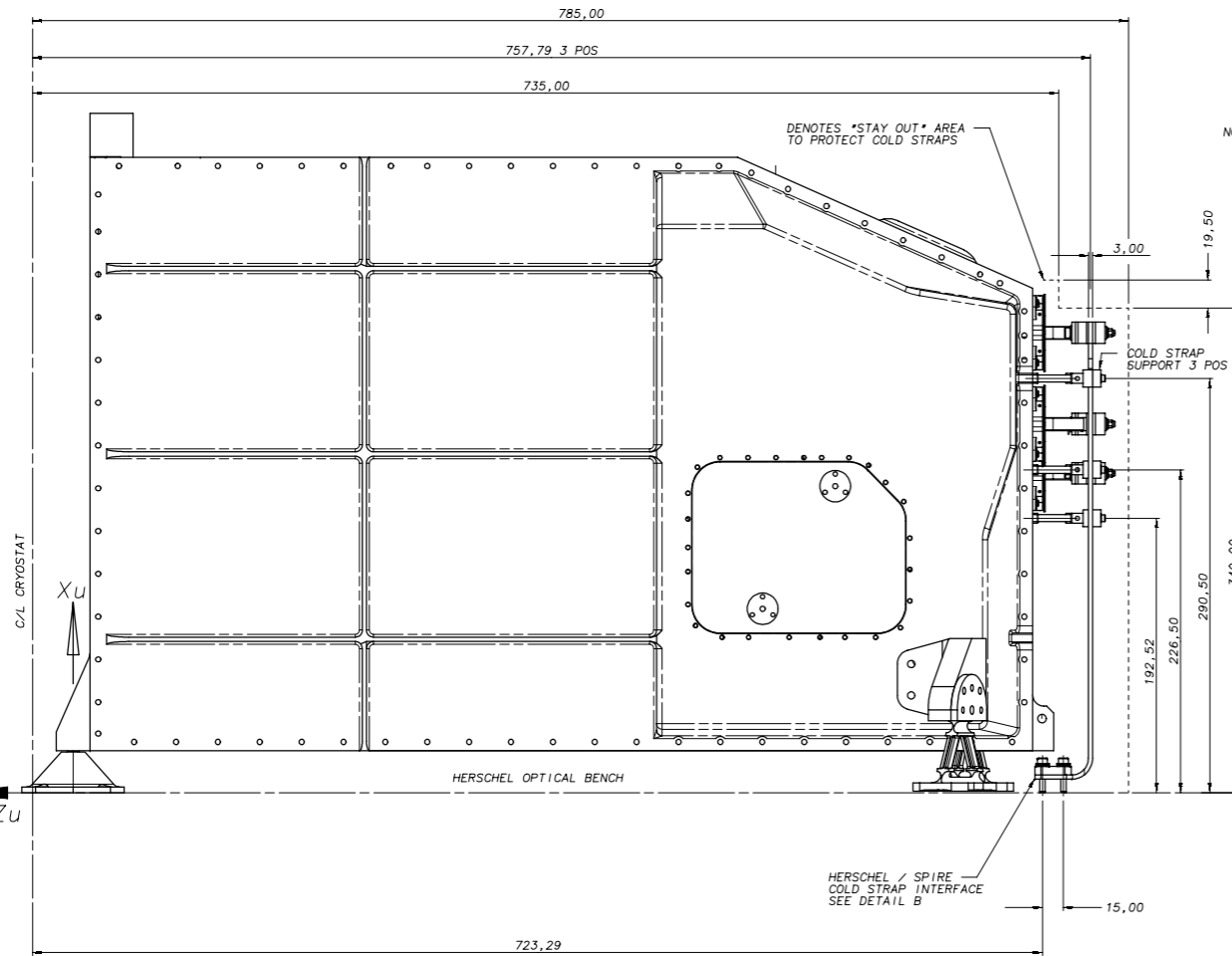
INSTRUMENT CASE AND EXTERNAL COVERS.
BLADE AND FIXED MOUNTING, EXTERNAL
FIXINGS.
COLD STRAPS.

ALOCROM 1200

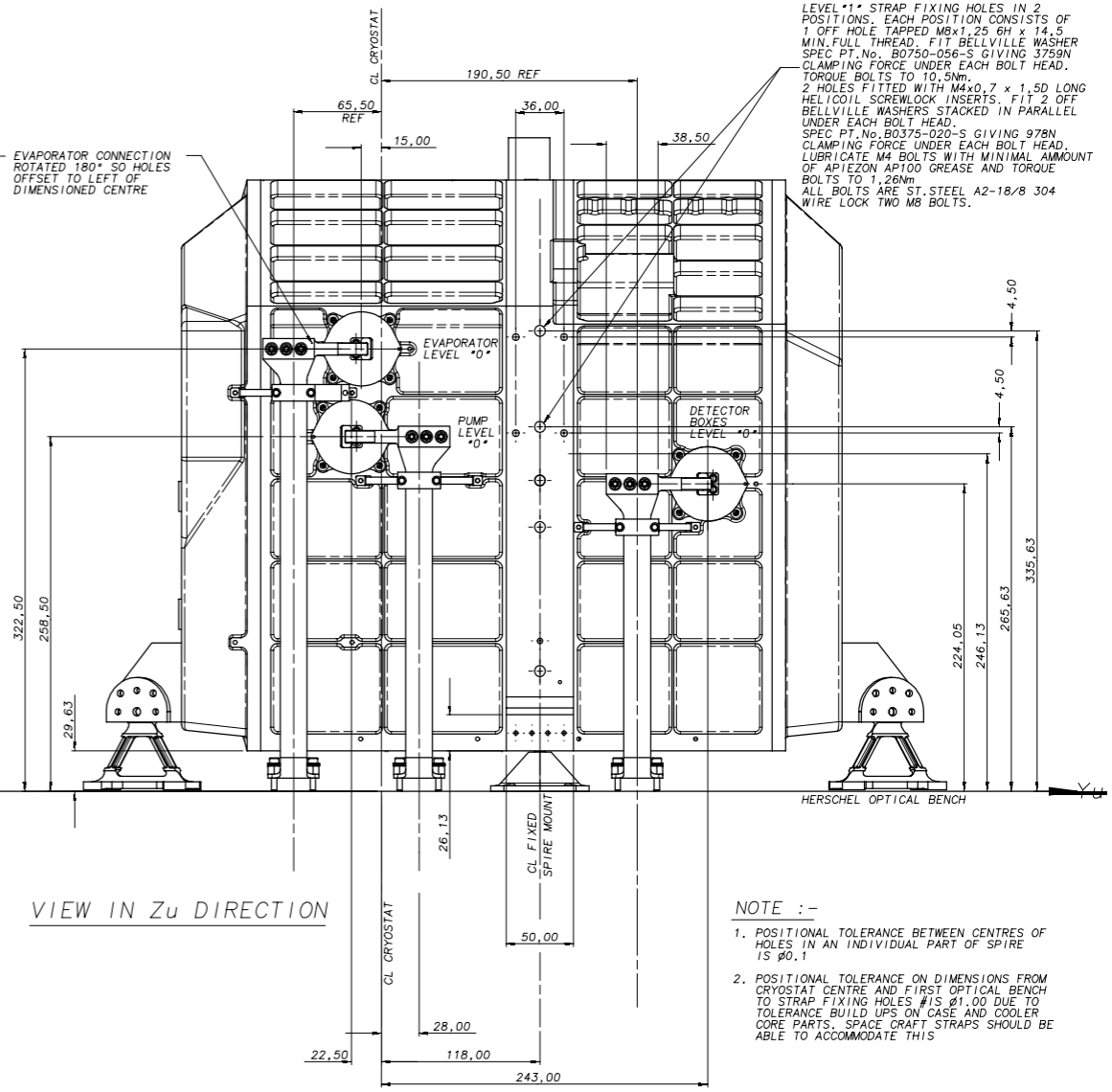
NATURAL ST. STEEL
GOLD PLATED

NOTE:-

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



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



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 3759N
CLAMPING FORCE UNDER EACH BOLT HEAD.
TORQUE BOLTS TO 10.5Nm.
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 1.26Nm
ALL BOLTS ARE ST. STEEL A2-18/8 304
WIRE LOCK TWO M8 BOLTS.

VIEW IN Zu DIRECTION

NOTE :-

1. POSITIONAL TOLERANCE BETWEEN CENTRES OF HOLES IN AN INDIVIDUAL PART OF SPIRE IS 0.1
2. POSITIONAL TOLERANCE ON DIMENSIONS FROM CRYOSTAT CENTRE AND FIRST OPTICAL BENCH TO STRAP FIXING HOLES #1 IS 0.10 DUE TO TOLERANCE BUILD UPS ON CASE AND COOLER CORE PARTS. SPACE CRAFT STRAPS SHOULD BE ABLE TO ACCOMMODATE THIS

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

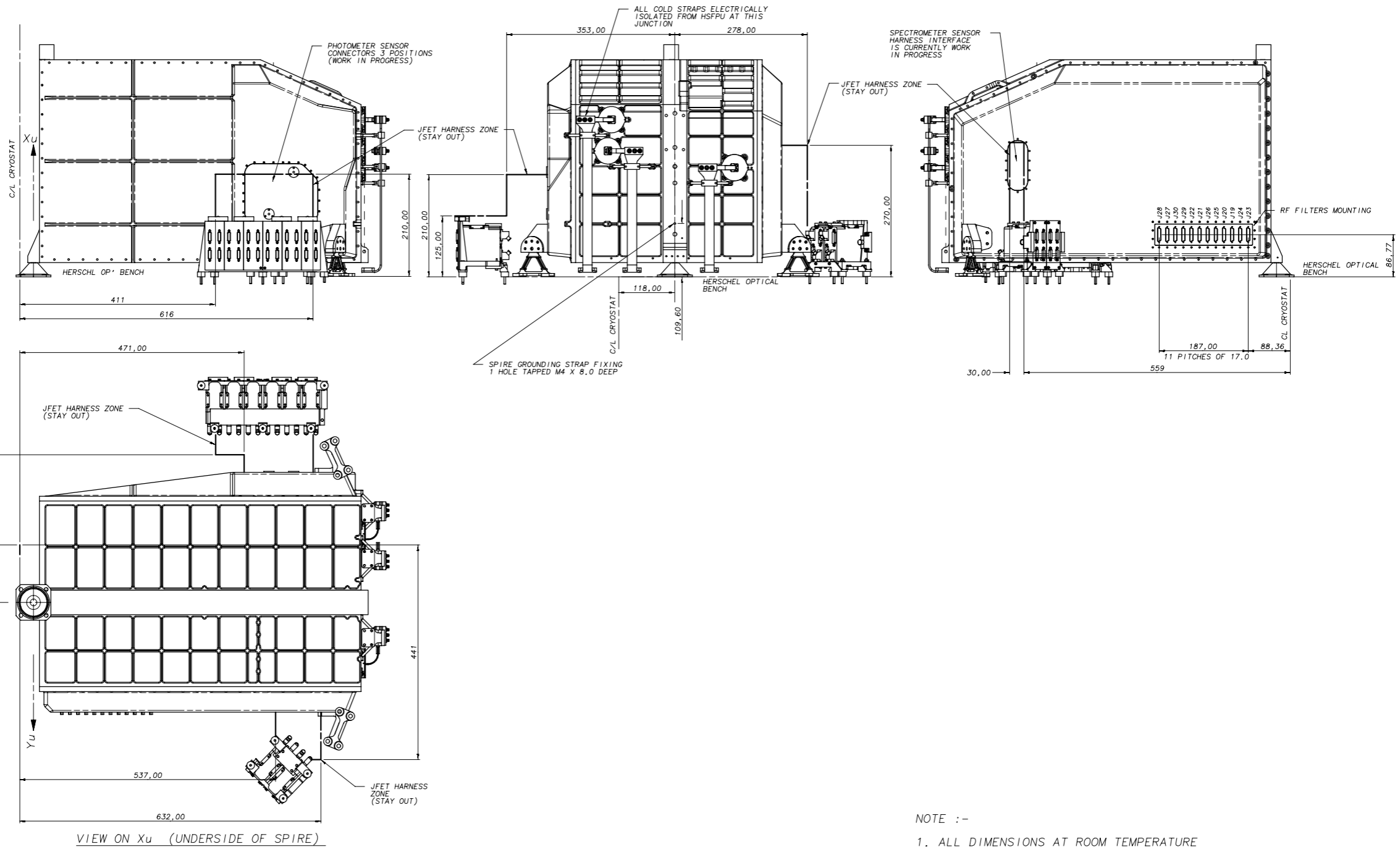
NOTE:-
SEE CHANGE SHEET FOR DETAILS OF CHANGES
MADE FROM ISSUE 16 ONWARDS

NOTE:-
ALL DIMENSIONS AT ROOM TEMPERATURE

PROTECTIVE FINISH ALOCROM 1200 (ST. STEEL PARTS NATURAL)	MATERIAL & SPEC. AS LISTED	TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 1.0 ANGULAR +/- 0°15'
ESTD WT. 40kg(NO. CONT.) SEE NOTE SHT. 1	DIMENSIONS IN mm	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 (THERMAL STRAP CONNECTIONS)	DRAWING No A1 5264 300sht5

USED ON
HERSCHEL



NOTE :-

1. ALL DIMENSIONS AT ROOM TEMPERATURE

CHECKED	17	16/10/02	SEE CHANGE SHEET
	16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED.
TRACED	14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED.
PBG	13	19/11/01	UPDATED 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. 40kg(NO. CONT.) SEE NOTE SHT. 1	DIMENSIONS IN mm	SCALE 1:4
ACTL WT.		

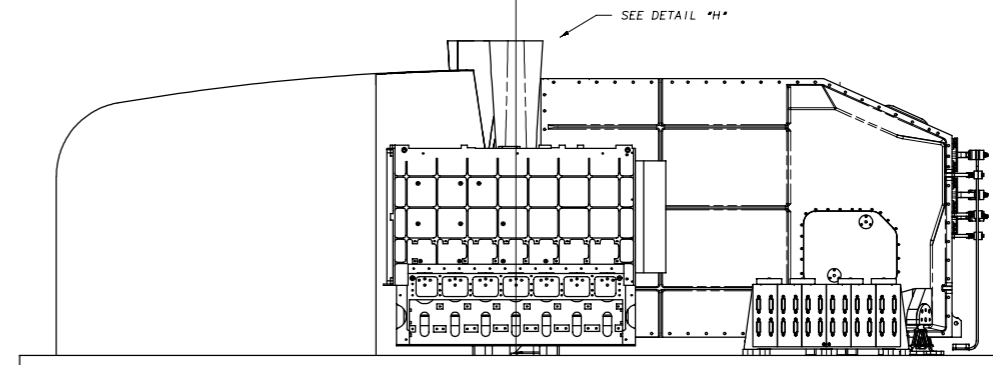
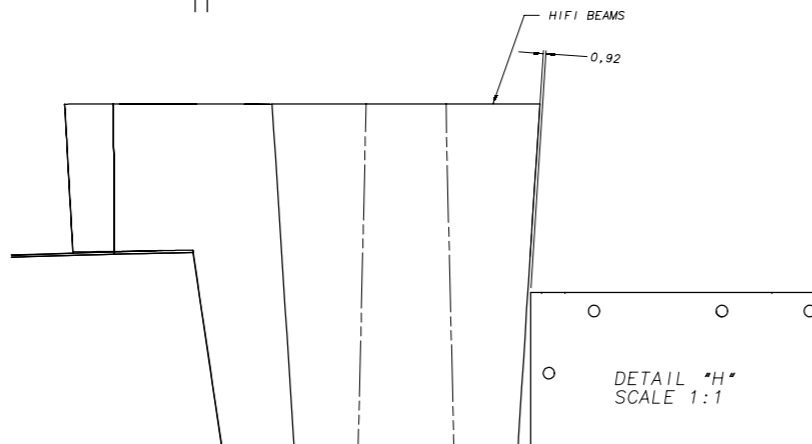
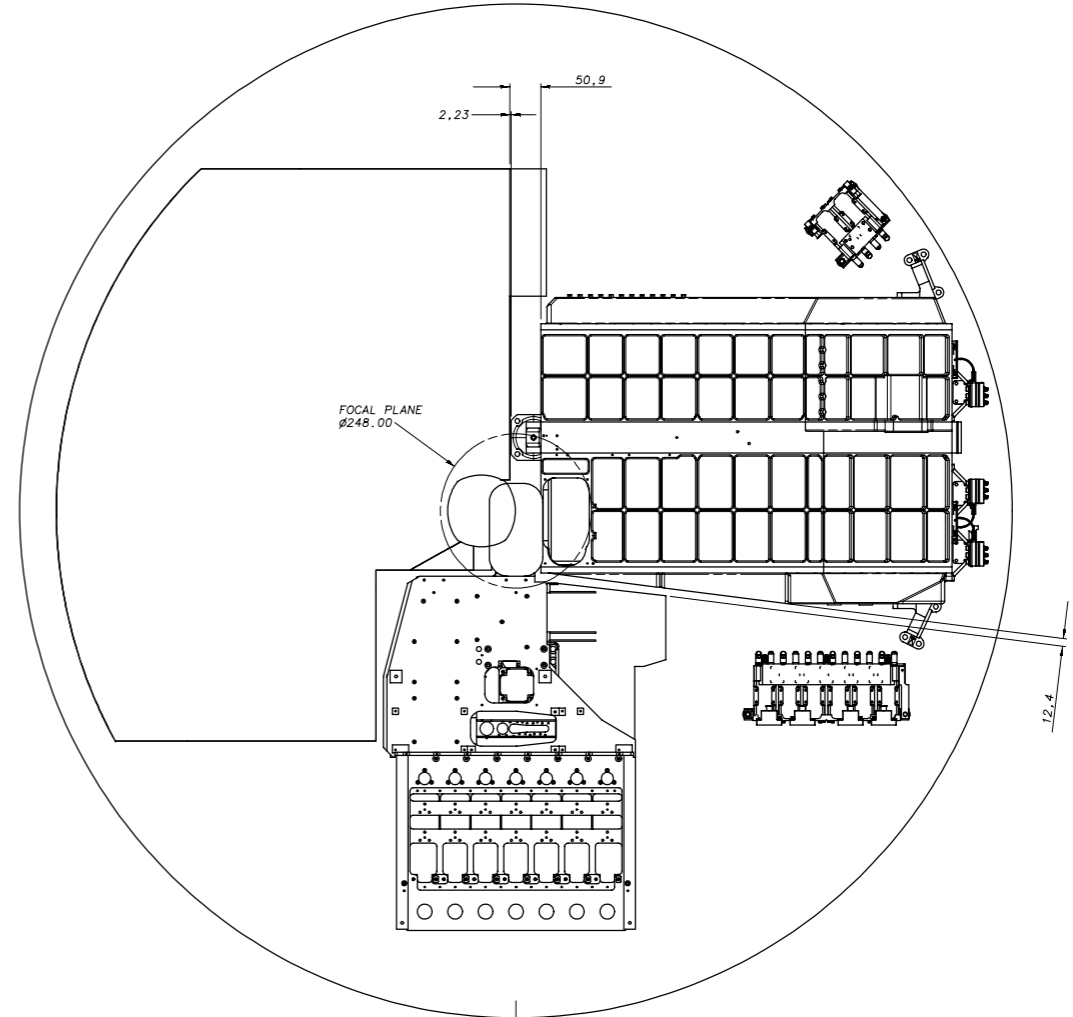
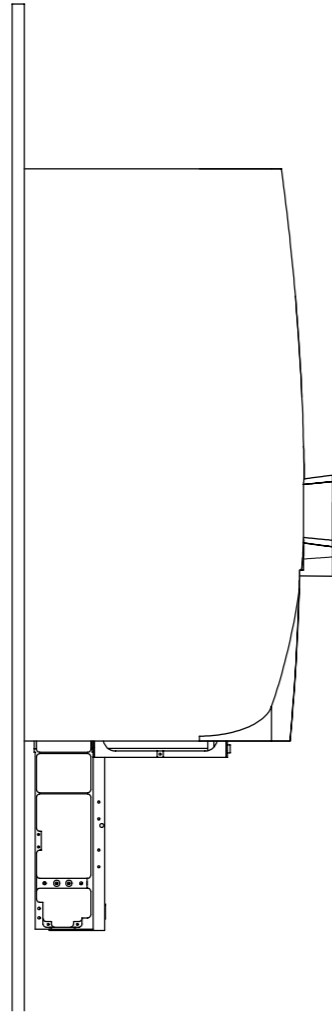
DEPARTMENT OF SPACE AND CLIMATE PHYSICS UNIVERSITY COLLEGE LONDON MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.	
TITLE SPIRE INTERFACE (ELECTRICAL)	DRAWING No A1 5264 300 sht6

DRAWING No.
A1 5264 300sht7

THIRD ANGLE PROJECTION

DO NOT SCALE

USED ON
HERSCHEL



CHECKED	17	16/10/02	SEE CHANGE SHEET
	16	28/08/02	MODIFICATIONS AND CHANGE SHEET CREATED. DRAWING UPDATED TO ISSUE 16 THERE-ON.
	15	27/04/01	THERMAL STRAP INTERFACE MODIFIED. LEVEL 1 STRAP FIXING HOLES MOVED.
TRACED	14	23/11/01	CENTRE OF GRAVITY ADDED TO SHT 1. J-FET DESIGN UPDATED. STAY OUT HOLES REMOVED
PBG	13	19/11/01	UPDATED RF1 FILTER & PHOT CONNECTORS ADDED. FOCAL PLANE & "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. 40kg(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 1
KE-2952	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-360	
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		

Date:	12-Jun-2002		
NCR/ECR:			
Modification Description:	<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 1
KE-2952	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-360	
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		

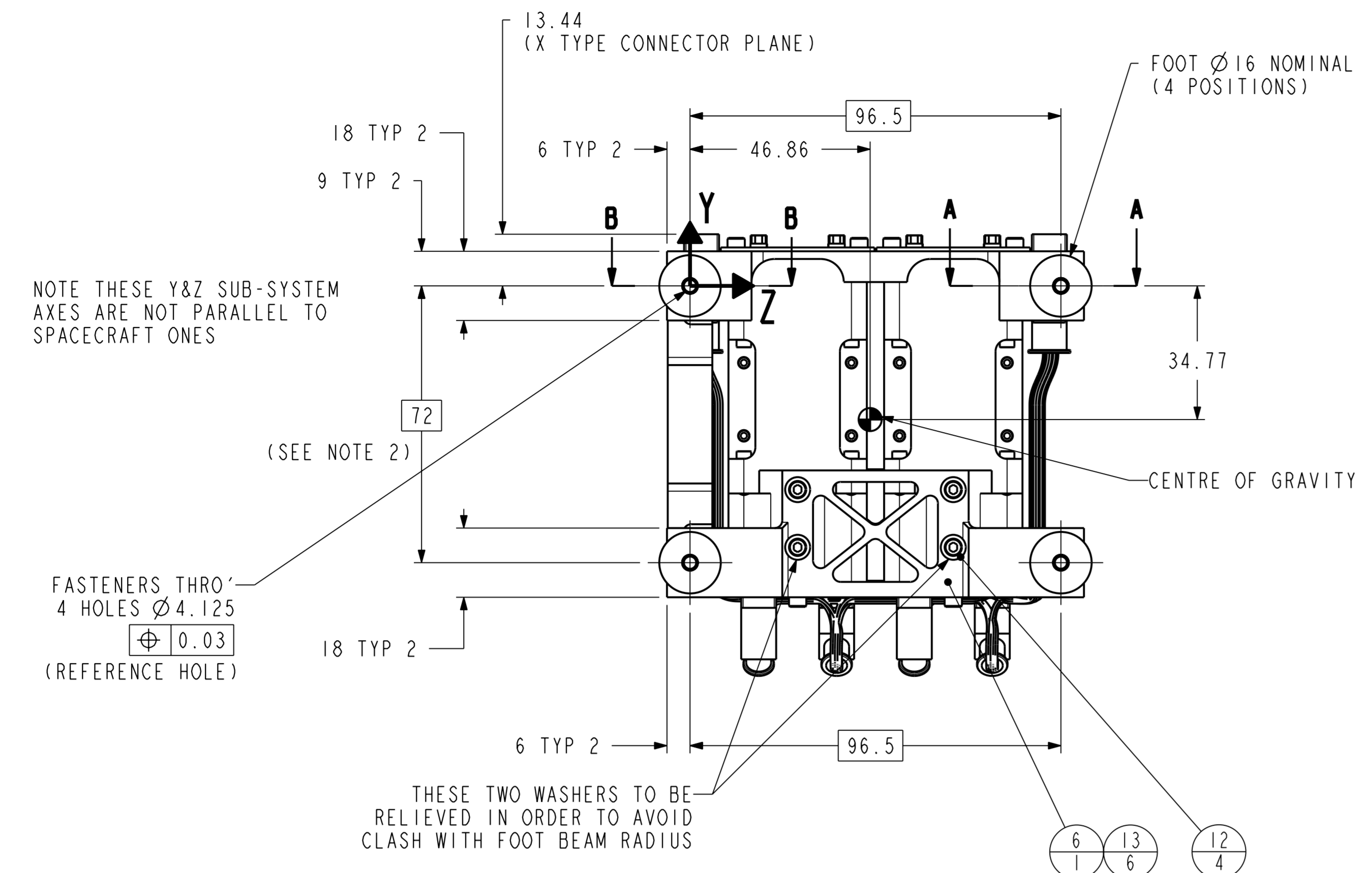
Date:	07-Feb-2003		
NCR/ECR:			
Modification Description:	<p>1. Swop connector pairs (MSW)</p> <p>2. move connector labels (MSW)</p> <p>3. make back harness into parts (MSW)</p> <p>4. Dimension and label thread lengths</p> <p>5. add column to parts list showing drawing numbers (also create repeat region 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 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 1
KE-2952	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-360	
DRAWING TITLE: 2 JFET RACK INTERFACE DRAWING		

Date:	12-Mar-2003		
NCR/ECR:			
Modification Description:	<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



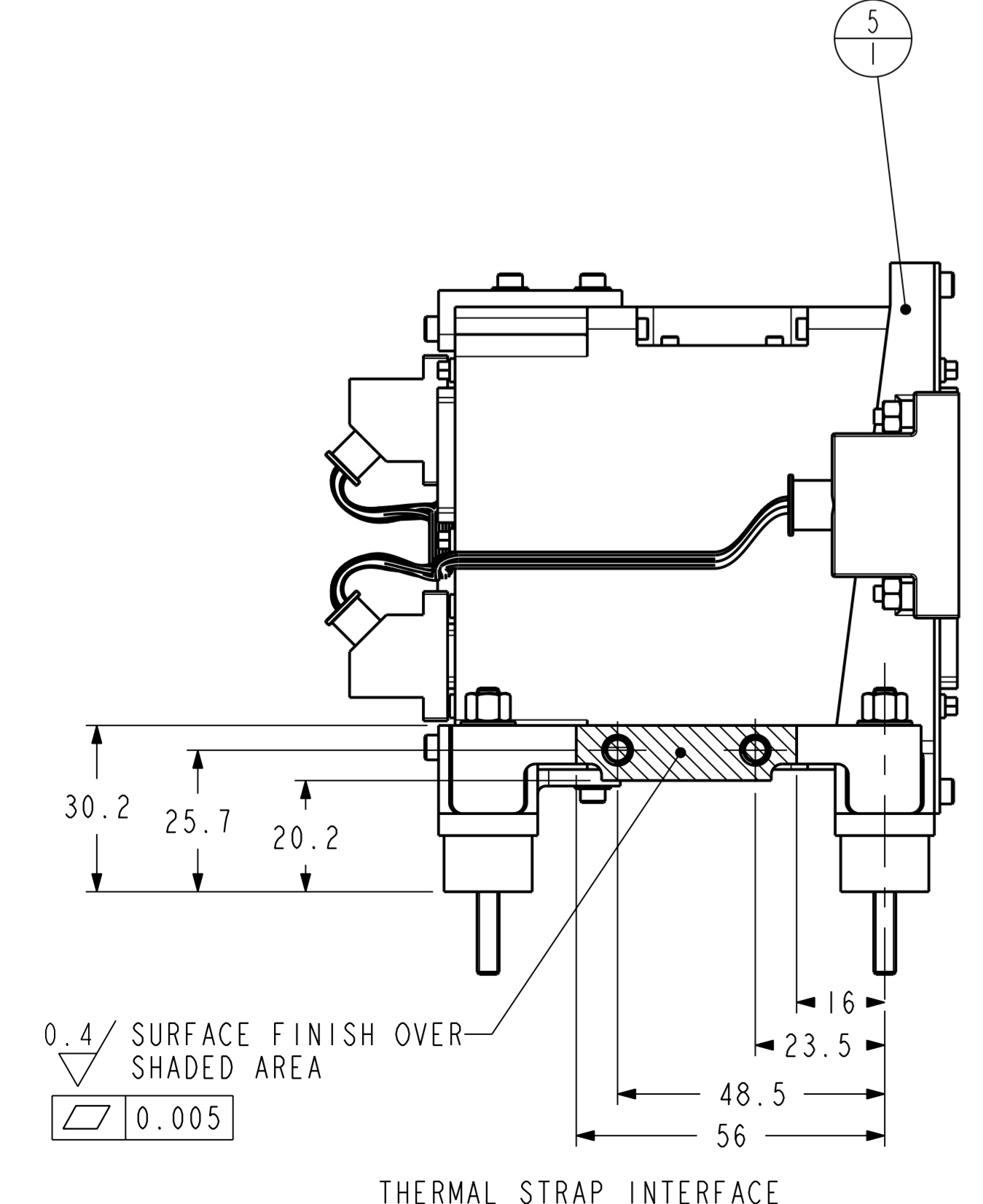
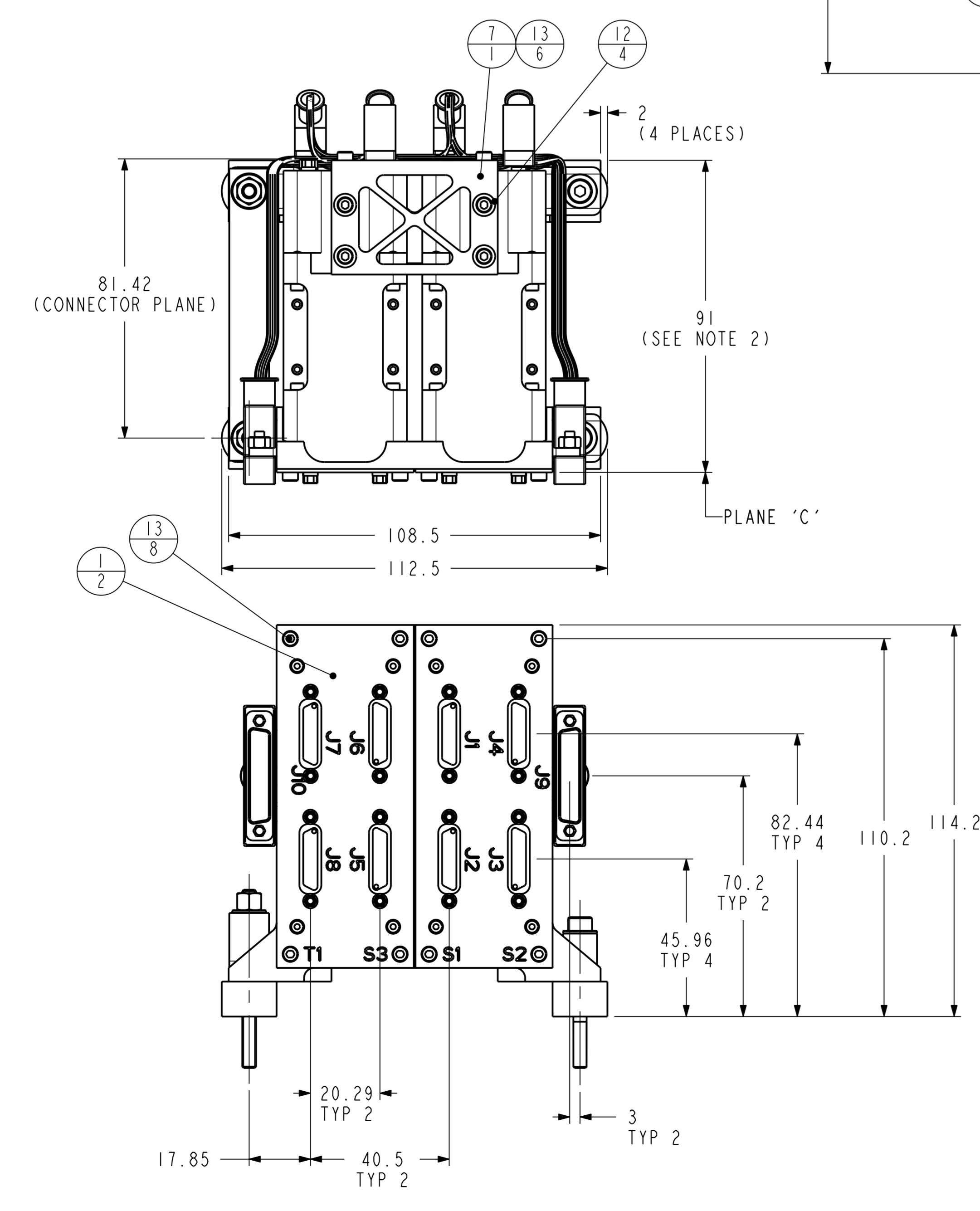
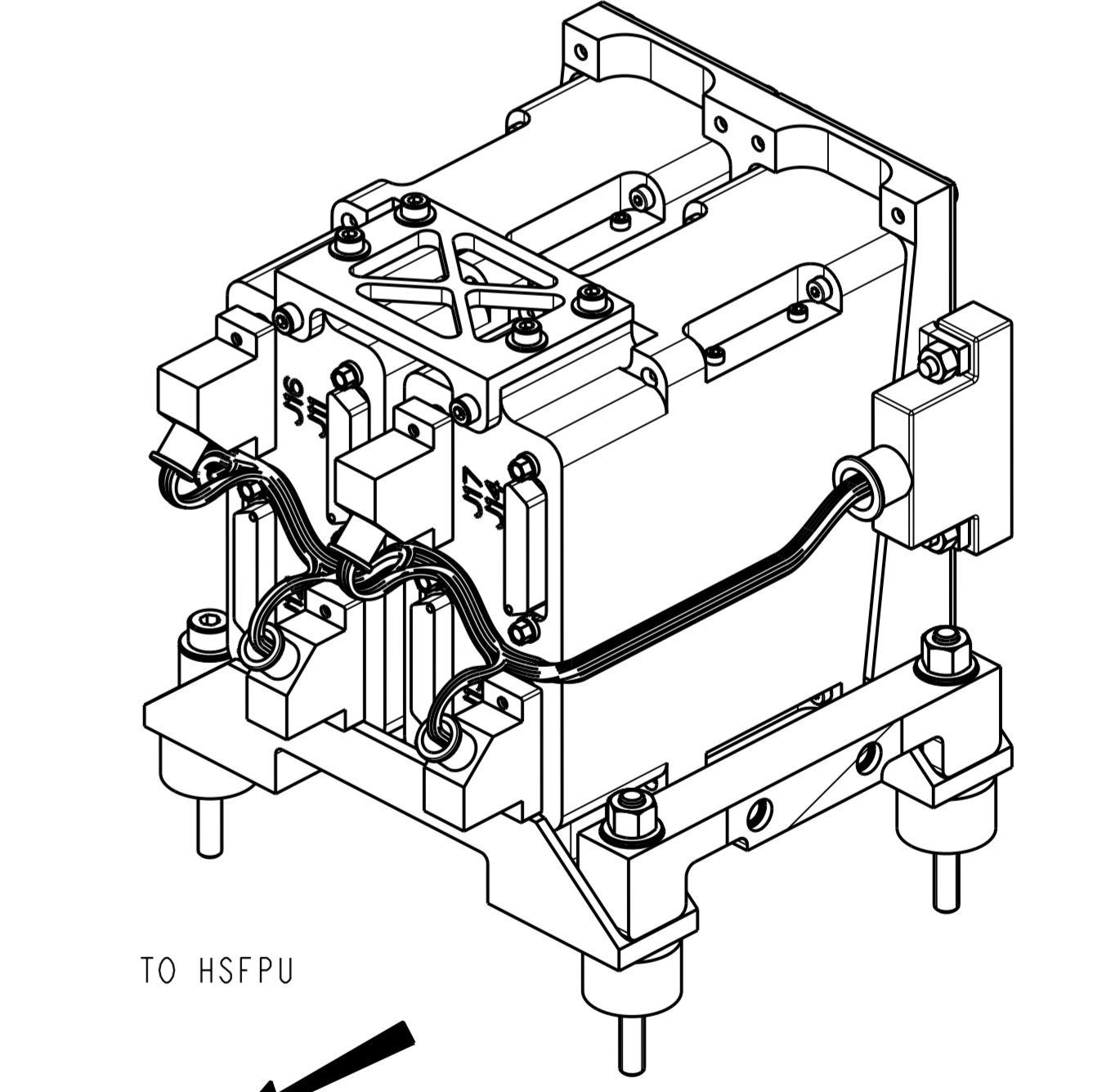
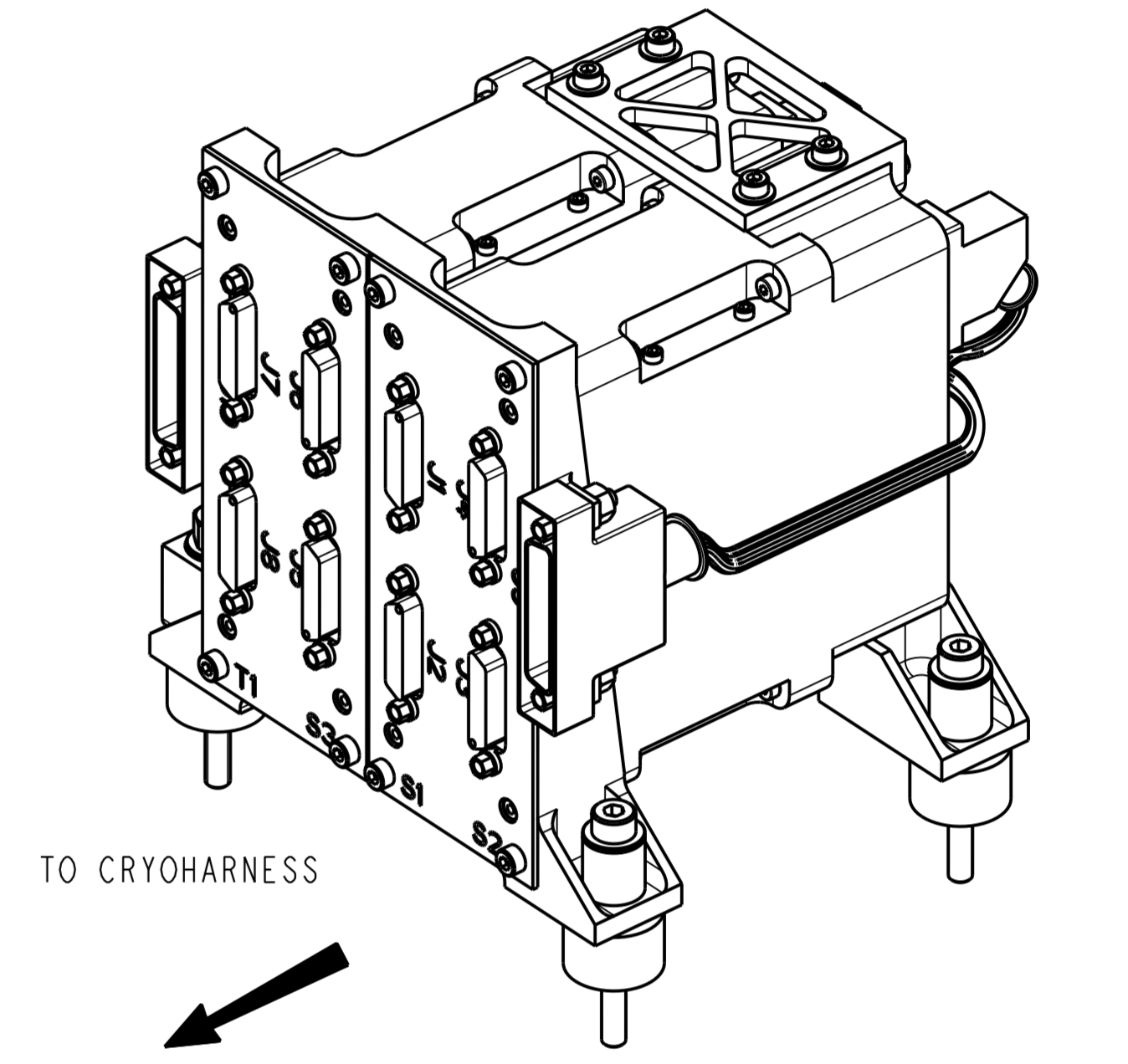
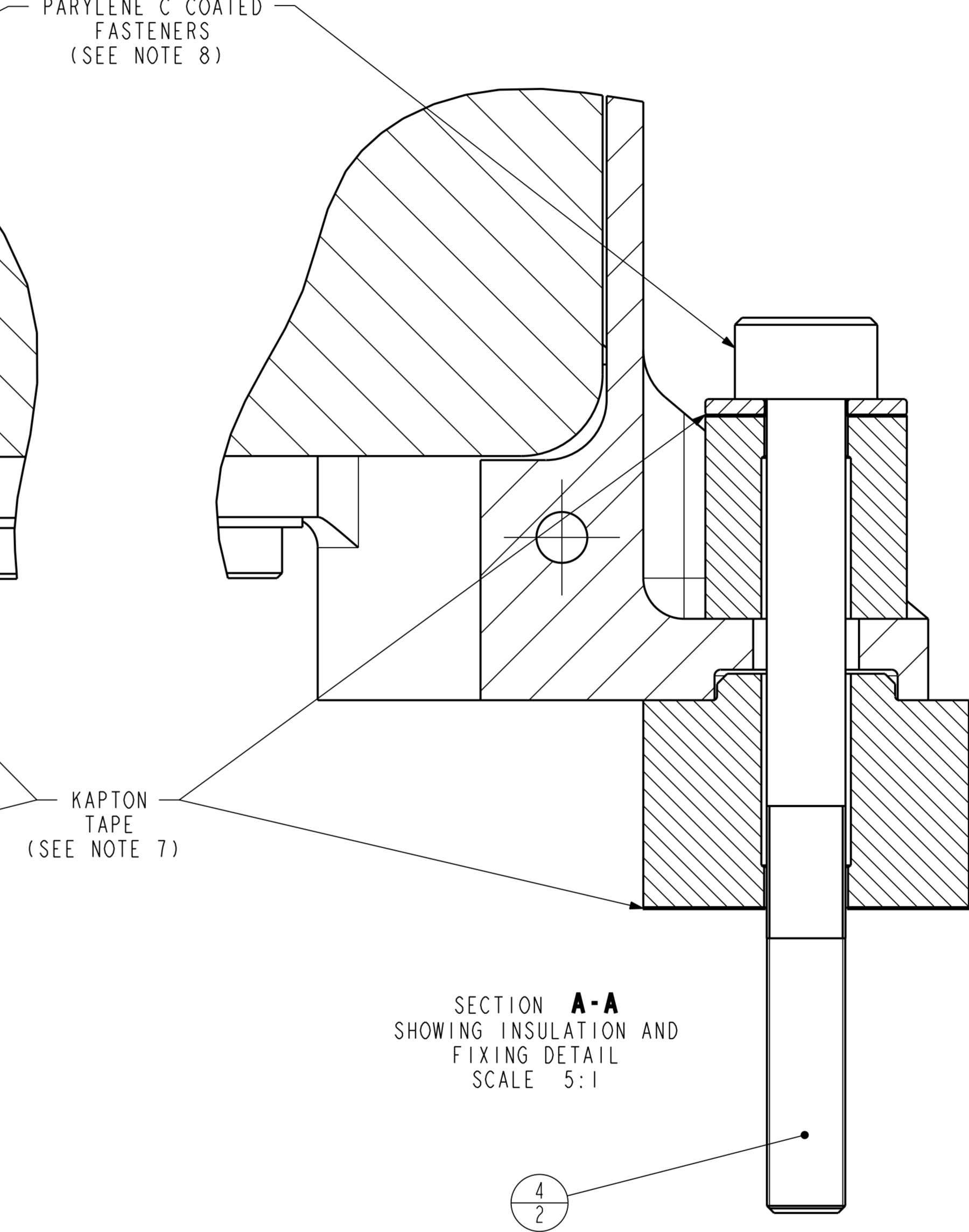
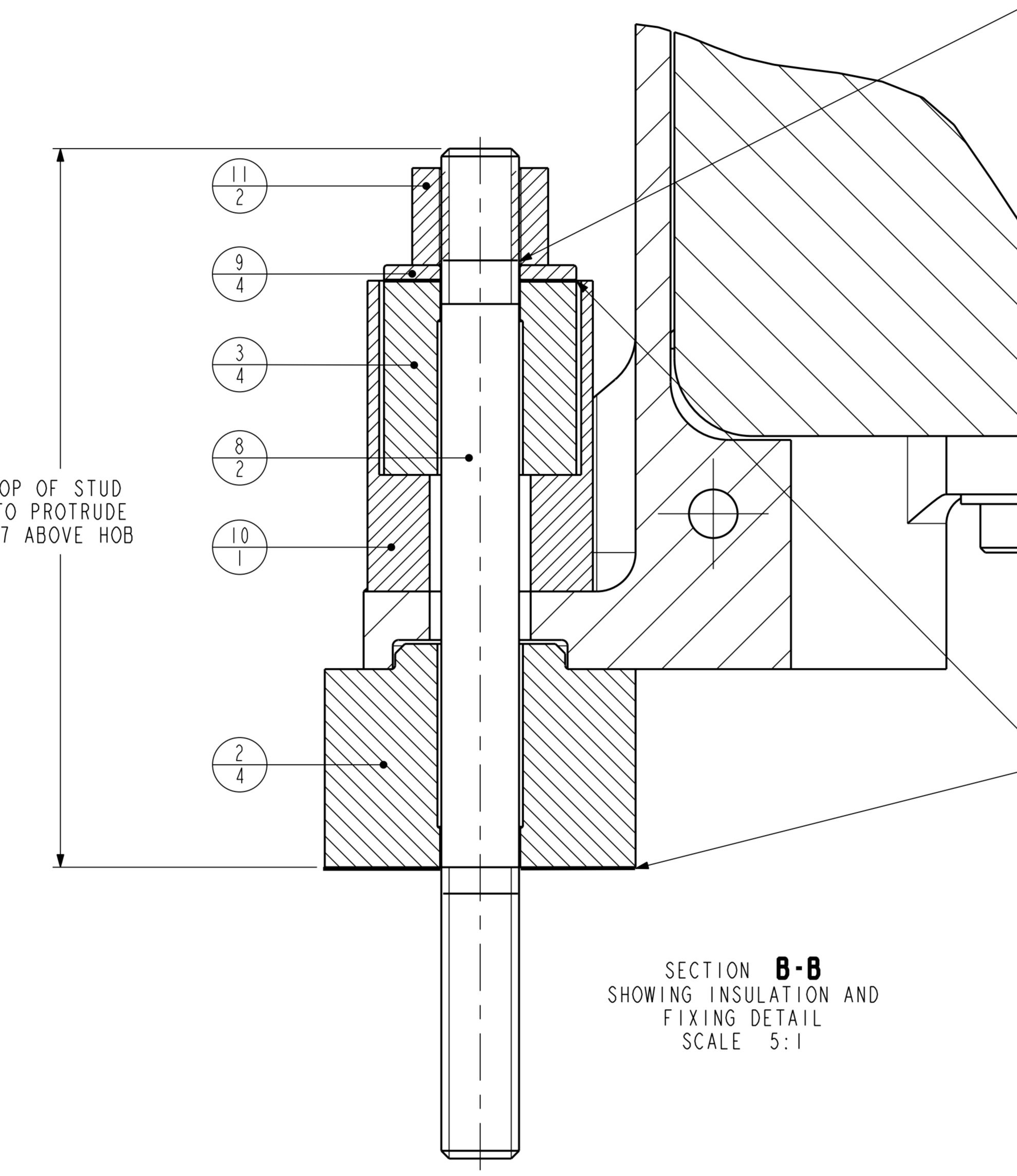
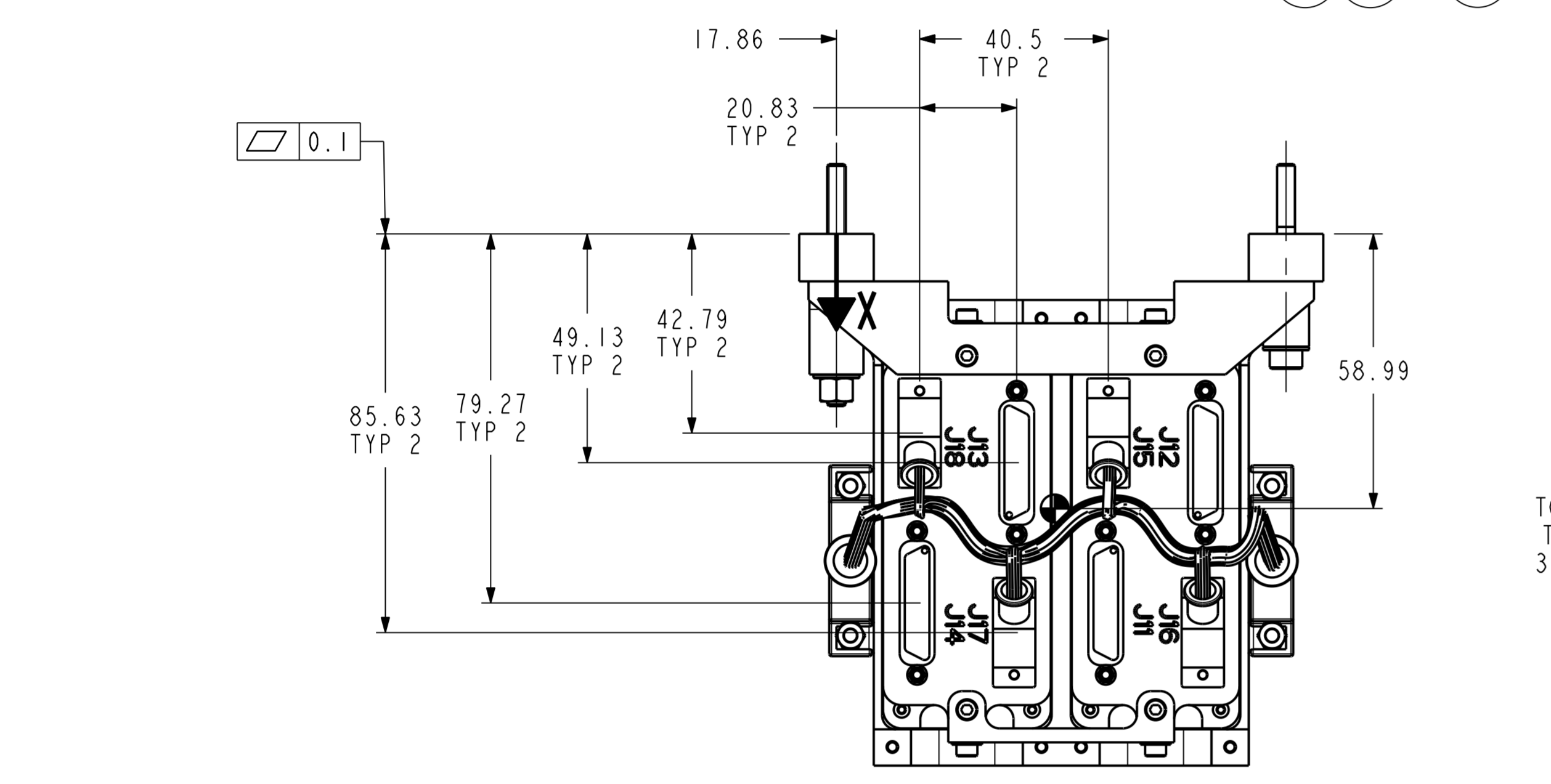
CONNECTOR TABLE

LABEL	TYPE	FUNCTION
J1	ALL MDM2SP	ALL SIGNAL FEEDS TO CRYOHARNESS
J2		
J3		
J4		
J5		
J6		
J7		
J8		
J9	MDM37S	BIAS WIRES FROM CRYOHARNESS
J10		
J11	ALL MDM1SP	SIGNALS IN FROM DETECTORS
J12		
J13		
J14		
J15	ALL MDM1SP	BIAS FEEDS INTO MODULES
J16		
J17		
J18		

MOMENTS OF INERTIA (kg.mm²) WITH RESPECT TO C OF G

I _{xx}	1.53e+03
I _{yy}	1.36e+03
I _{zz}	1.50e+03

ITEM	PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS	COMMENTS
1	23836-10209722	JFET MODULE	2	305.434	610.867	JPL SUPPLY
2	KE-0104-354	STEPPED THERMAL STANDOFF	4	2.795	11.182	
3	KE-0104-355	TOP THERMAL STANDOFF	4	0.889	3.557	
4	KE-0104-358	M4 BOLT (PARYLENE C COATED 26.5mm)	2	4.984	9.968	
5	KE-0104-361	FRONT PLATE - 2 JFET	1	48.151	48.151	
6	KE-0104-362	REAR FOOT BEAM - 2 JFET	1	33.694	33.694	
7	KE-0104-363	REAR TOP BEAM - 2 JFET	1	8.618	8.618	
8	KE-0104-365	M4 STUD (PARYLENE C COATED)	2	5.082	10.165	
9	KE-0104-367	THERMAL STANDOFF WASHER	4	0.396	1.582	
10	KE-0104-368	THERMAL STRAP ASSY - 2 JFET	1	23.277	23.277	
11	KE-0104-386	M4 NUT (5mm LONG)	2	1.312	2.624	
12	M2-5_WASHER	WASHER	8	0.107	0.857	S/STEEL BS970/1501 304S 11/15/31
13	M2-5_X_8LG_CPHD_SKT_SS	FASTENER	20	0.577	11.547	S/STEEL BS3506-1:1998 A2-70
14	BS	BACKHARNESS	1	110.000	110.000	JPL SUPPLY
				ASSEMBLY MASS	886.496 GRAMS	



- NOTES:-
- ITEMS 2 & 3 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 5. MEASURE FROM THE TOP OF PARTS 1 SHOWN AS PLANE 'C' TO THE TAIL END FACE OF PARTS 5, NOTING THE TWO VALUES. MACHINE RAISED PADS ON PART 6 TO REMOVE (VALUE - 87.7). PADS ON ITEM 7 WILL ALSO NEED MACHINING IF TRIAL ASSEMBLY OF RACK ON FLAT SURFACE SHOWS GAPS BEFORE FASTENERS ARE TIGHTENED.
 - ITEMS 4 TO BE TORQUED TO 2.1 Nm ABOVE LOCKING INSERT RUNNING TORQUE. ITEMS 11 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 J1 - J10 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.
 - KAPTON TAPE INSULATORS SHALL EXTEND BEYOND ANNULUS OF ITEMS 2 AND 3.
 - PARYLENE C COATING TO PROTRUDE HOB SURFACE BY 0.5mm MINIMUM BUT AVOID FOULING THREAD ENGAGEMENT. FOR ITEM 8, COATING SHALL PROTRUDE 1mm ABOVE ITEM 9. TRIM AS NECESSARY.

SPIRE MASTER DRAWING

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

ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
G	20-Mar-03	KE-2952	IPG			MANUFACTURE
TOLERANCES UNLESS STATED ±0.2 mm ±0.3			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 2001
CENTRAL LABORATORY OF THE RESEARCH COUNCILS						
TITLE						
2 JFET RACK INTERFACE DRAWING						
SPIRE						
A 0-KE-0104-360-G						1 of 1

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 1 of 1
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

Date:	21-Jun-2002
NCR/ECR:	
Modification Description:	<ol style="list-style-type: none"> External envelope dimensions added Missing single rear mounting fastener and insulation components added Mounting top insulators inverted so that smaller ID near fastener head Connector table added Notes added <p>-----</p> <p>Various changes to notes, layout, dimensions as per J Delderfield sheet</p> <p>Issue raised to C</p> <p>T. Froud 03/07/02</p> <p>-----</p>
Issue raised to:	C
By:	T Froud

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED
KE-2953

SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 2 of 1
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

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

SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED
KE-2953

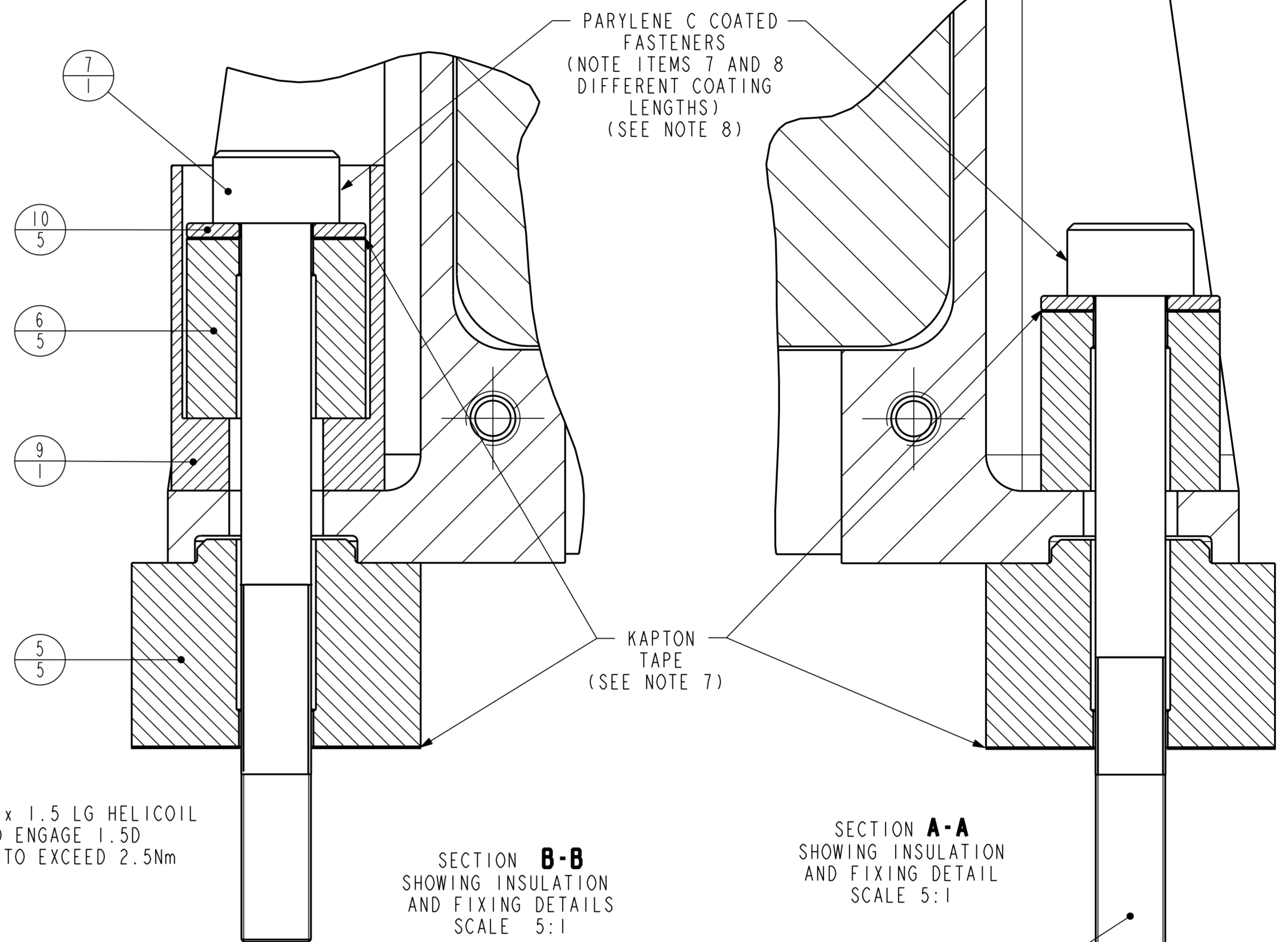
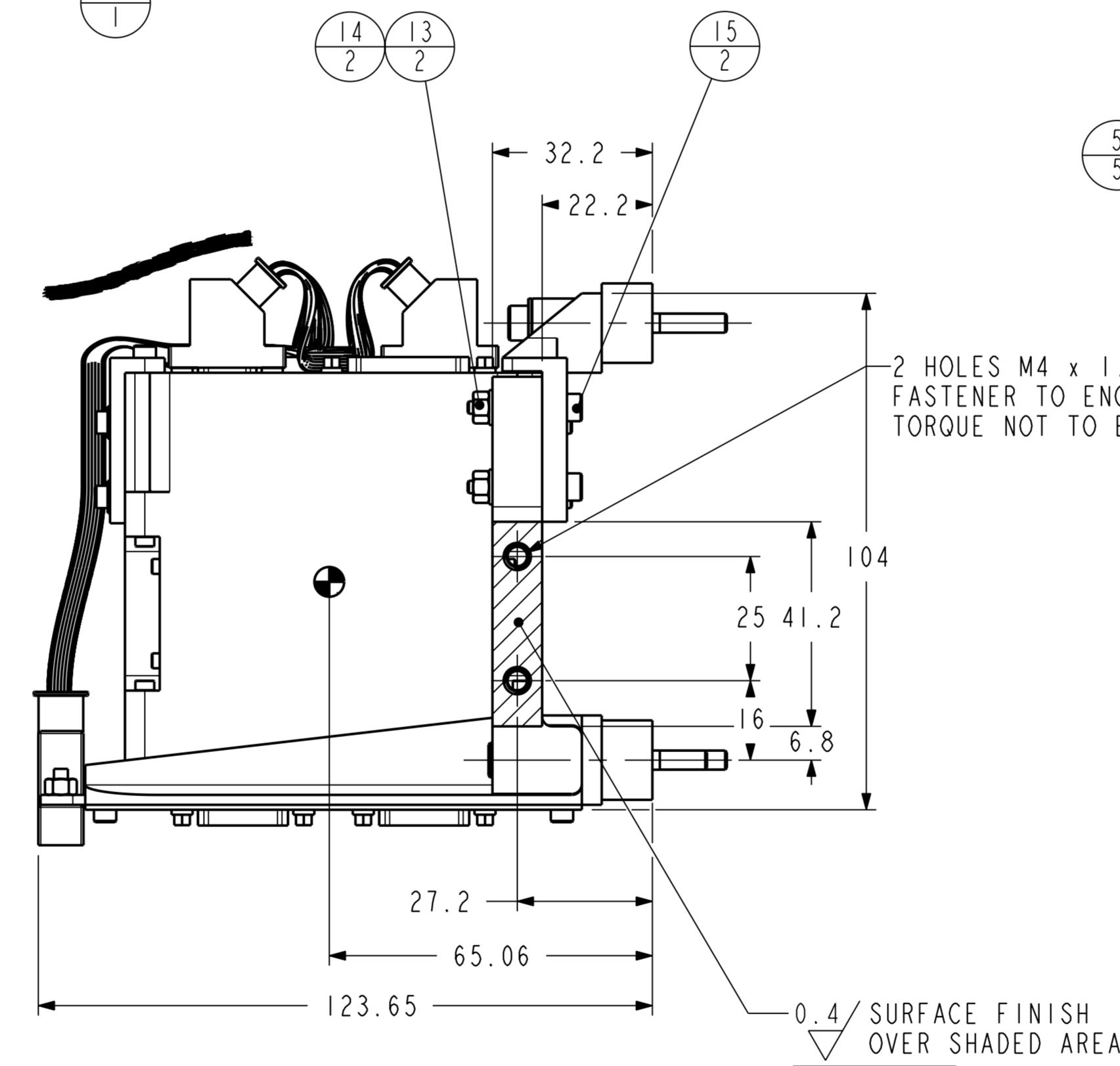
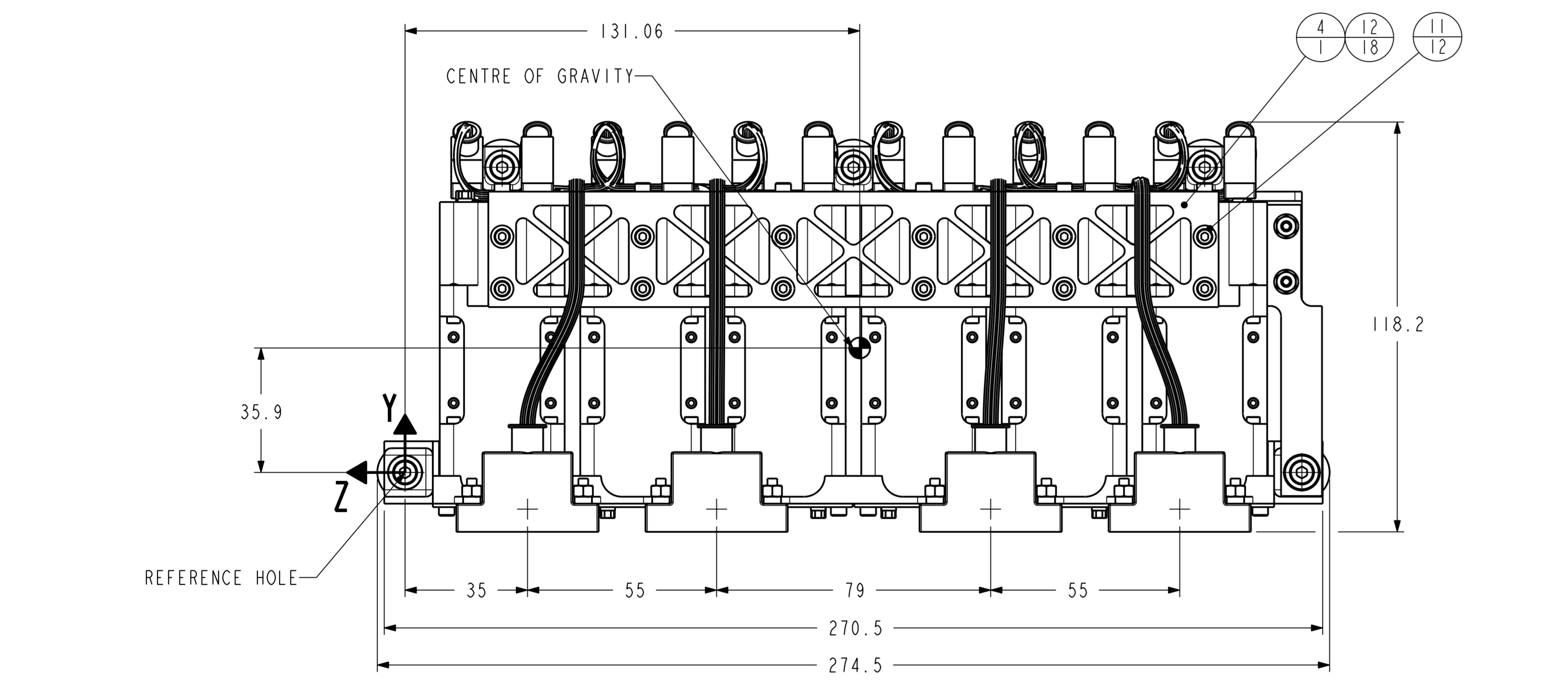
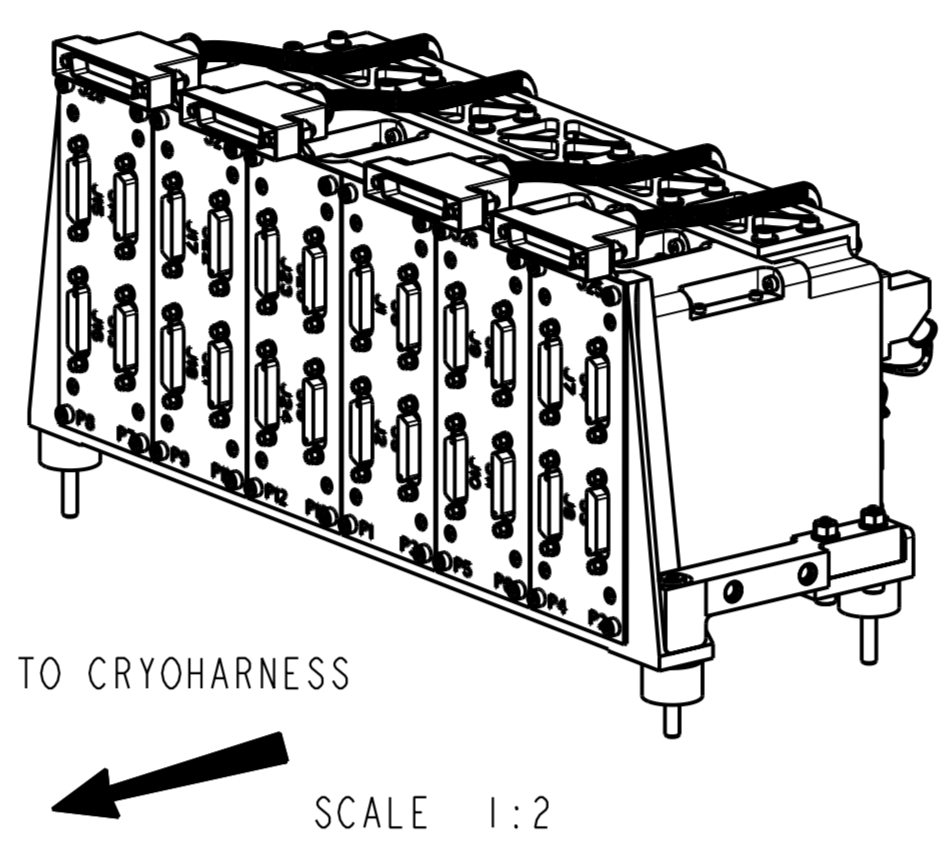
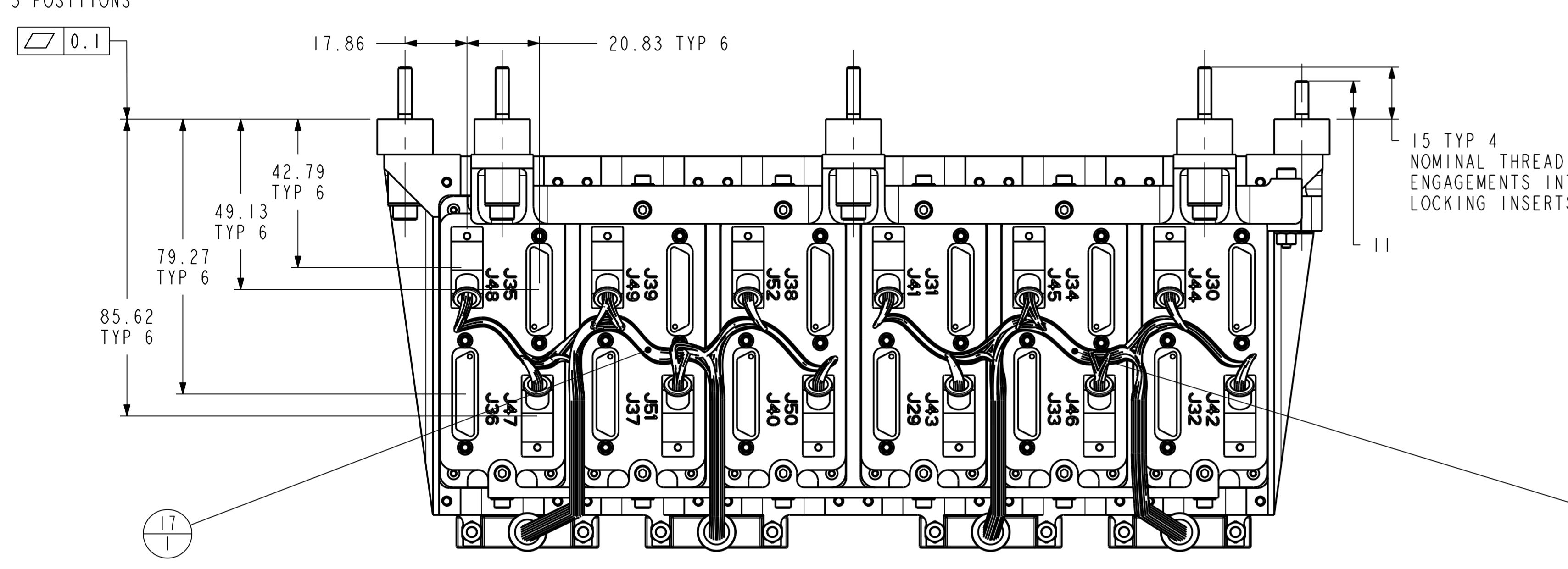
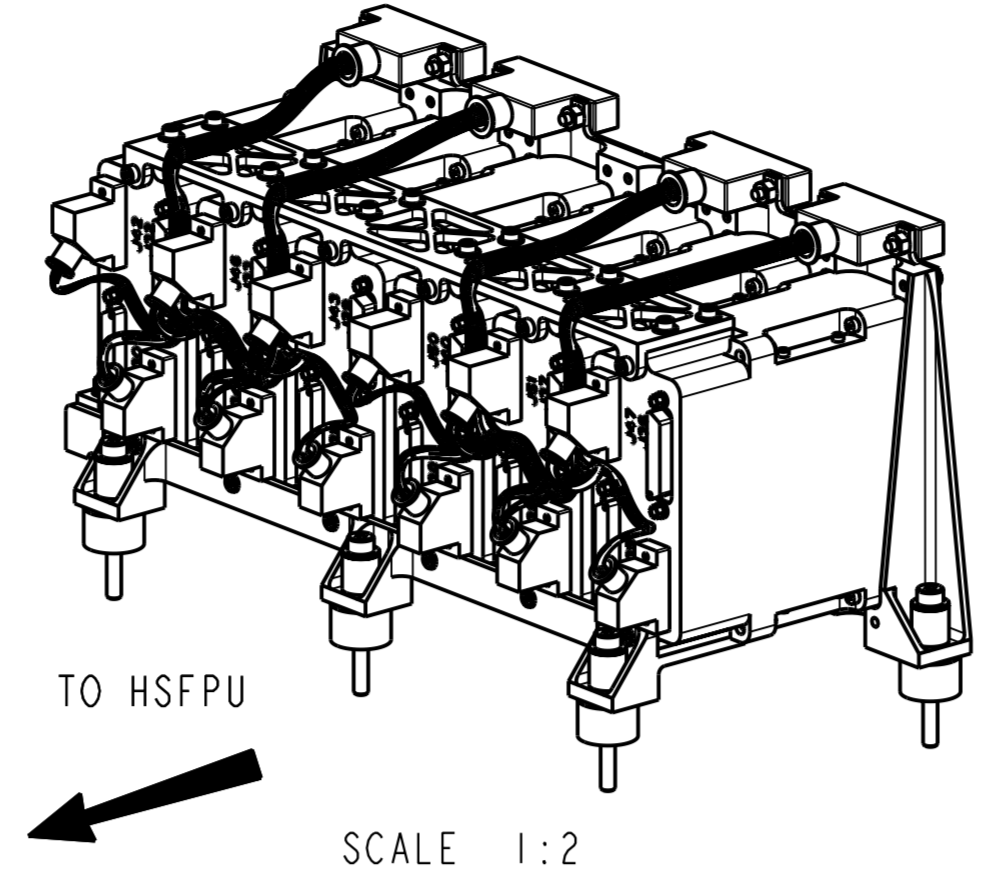
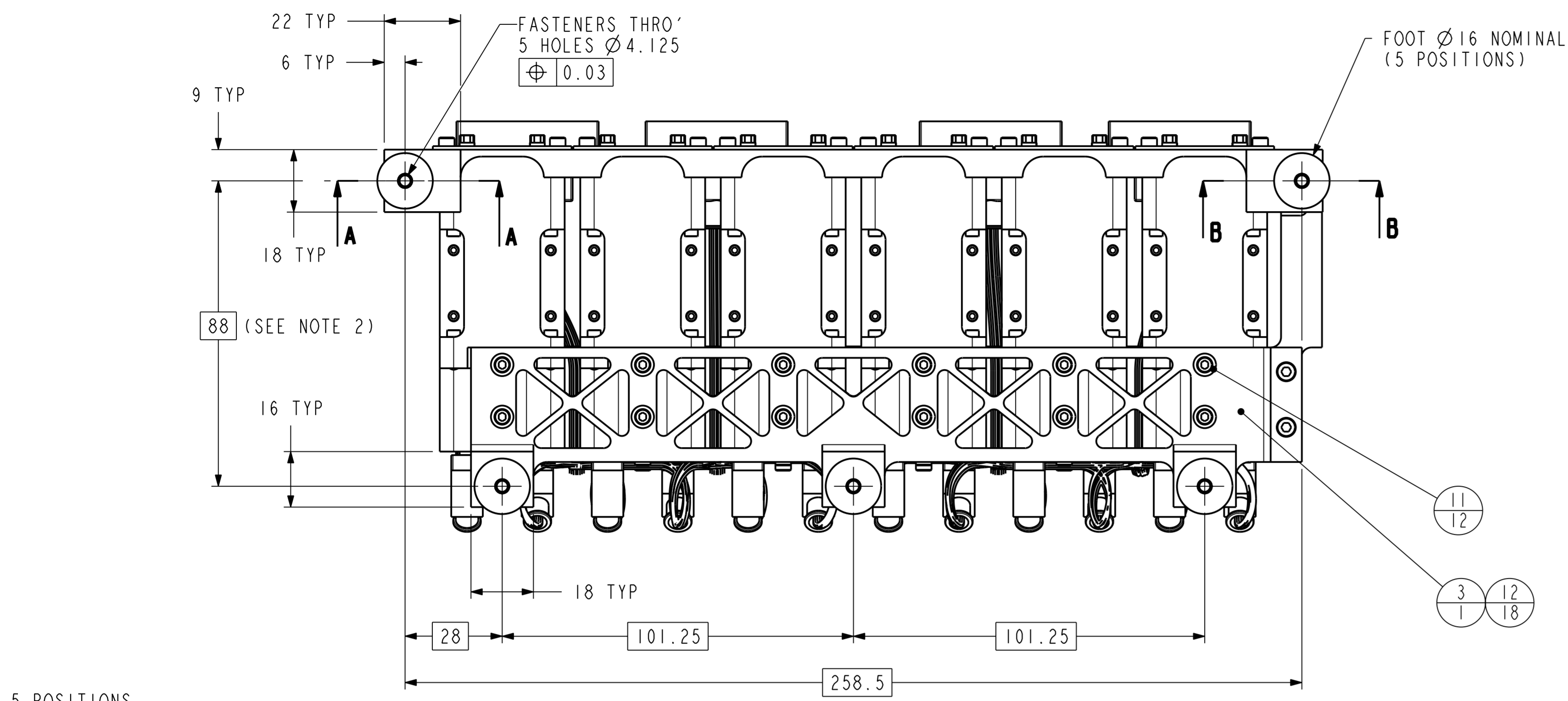
SSTD Rutherford Appleton Laboratory	Space Product Assurance Form <i>Mechanical Design Office</i>	Doc.No. :ISO9:FORM/MECH/006
		Issue : 2 Date : 21/12/2001 Page : 3 of 1
KE-2953	MODIFICATION SHEET	
	THE CENTRAL LABORATORY OF THE RESEARCH COUNCILS RUTHERFORD APPLETON LABORATORY	
	DRAWING NUMBER: KE-0104-350	
DRAWING TITLE: 6 JFET RACK INTERFACE DRAWING		

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

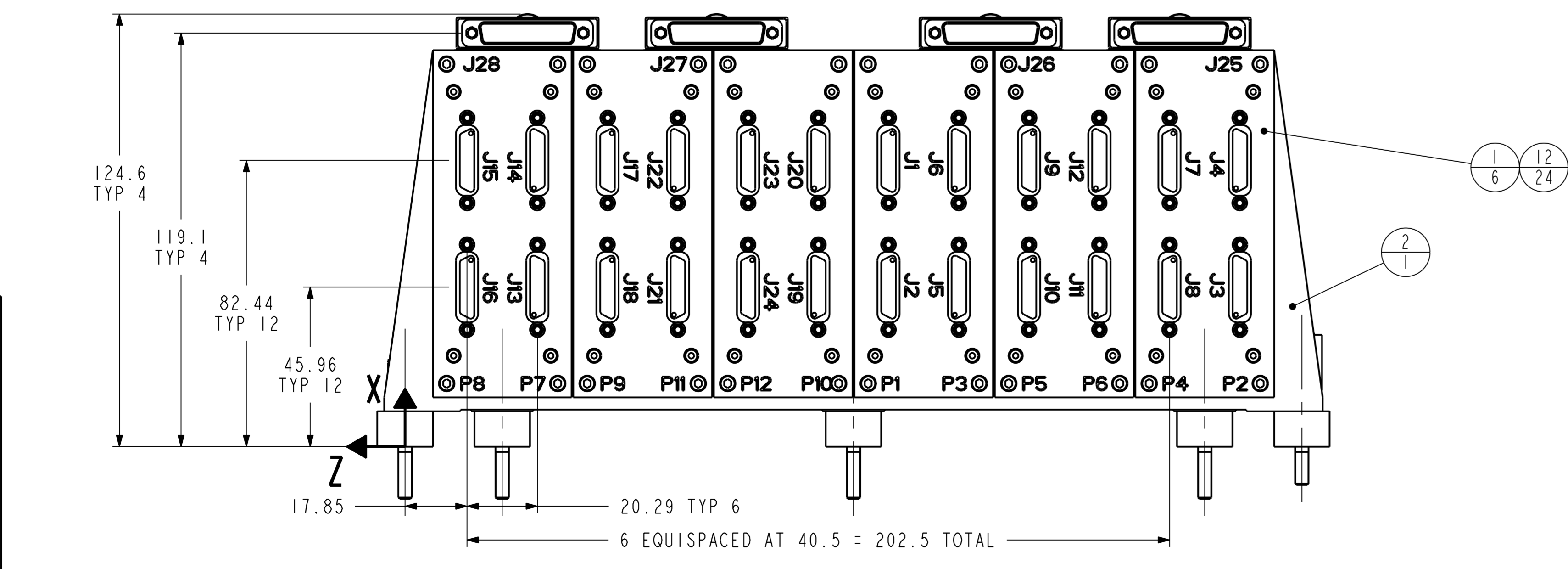
SUPERSEDED ISSUES OF ALL DRAWING HARD COPIES TO BE DESTROYED
KE-2953

MOMENTS OF INERTIA (kg·mm ²) WITH RESPECT TO C OF G	
I _{xx}	1.55e+04
I _{yy}	1.52e+04
I _{zz}	4.54e+03

ITEM	PART NO.	DESCRIPTION	QTY	MASS/ITEM	TOTAL MASS	COMMENTS
1	23836-10209722	JFET MODULE	6	305.434	1832.601	JPL SUPPLY
2	KE-0104-351	FRONT PLATE 6 JFET	1	128.664	128.664	
3	KE-0104-352	REAR FOOT BEAM - 6 JFET	1	69.549	69.549	
4	KE-0104-353	REAR TOP BEAM - 6 JFET	1	32.563	32.563	
5	KE-0104-354	STEPPED THERMAL STANDOFF	5	2.795	13.977	
6	KE-0104-355	TOP THERMAL STANDOFF	5	0.889	4.446	
7	KE-0104-357	M4 BOLT (PARYLENE C COATED 30.5mm)	1	4.984	4.984	
8	KE-0104-358	M4 BOLT (PARYLENE C COATED 26.5mm)	4	4.984	19.936	
9	KE-0104-359	THERMAL STRAP ASSY - 6 JFET	1	23.756	23.756	
10	KE-0104-367	THERMAL STANDOFF WASHER	5	0.396	1.978	
11	M2-5_WASHER	WASHER	24	0.107	2.570	S/STEEL BS970/1501 304S 11/15/31
12	M2-5_X_8LG_CPHD_SKT_SS	FASTENER	60	0.577	34.642	S/STEEL BS3506-1:1998 A2-70
13	M3_NUT	NUT	2	0.485	0.969	S/STEEL BS6105 A2-50 DIN 912
14	58-3205	BELLEVILLE WASHER	2	0.166	0.332	BELLEVILLE SPRINGS LTD, BATCH 17415
15	M3-X_20LG_CPHD_SKT_SS	FASTENER	2	1.261	2.522	S/STEEL BS3506-1:1998 A2-70
16	BP1	BACKHARNESS BP1	1	165.000	165.000	JPL SUPPLY
17	BP2	BACKHARNESS BP2	1	165.000	165.000	JPL SUPPLY
				ASSEMBLY MASS	2502.546 GRAMS	



CONNECTOR TABLE		
LABEL	TYPE	FUNCTION
J1	ALL MOM375	ALL SIGNAL FEEDS TO CRYOHARNESS
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	MOM375	BIAS WIRES FROM CRYOHARNESS
J27		
J28		
J29		
J30		
J31	ALL MOM375	SIGNALS IN FROM DETECTORS
J32		
J33		
J34		
J35		
J36		
J37		
J38		
J39		
J40		
J41	ALL MOM375	BIAS FEEDS INTO MODULES
J42		
J43		
J44		
J45		
J46		
J47		
J48		
J49		
J50		
J51		
J52		



- NOTES:-
- 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 7 AND 8 TO BE TORQUED TO 2.1 Nm ABOVE LOCKING INSERT RUNNING TORQUE.
 - UNIT SHOWN FITTED WITH BACK-HARNESS 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 BACKHARNESS TO AFFORD OPEN ACCESS TO 51 WAYS AS SHOWN.
 - KAPTON TAPE INSULATORS SHALL EXTEND BEYOND ANNULUS OF ITEMS 5 AND 6
 - PARYLENE C COATING TO PROTRUDE HOB SURFACE BY 0.5mm MINIMUM BUT AVOID FOULING THREAD ENGAGEMENT. TRIM AS NECESSARY.

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

E	20-Mar-03	KE-2953	IPG		MANUFACTURE	
ISSUE	DATE	MOD. No.	DRN. BY	CHKD.	APPD.	STATUS
TOLERANCES UNLESS STATED ±0.2 mm ±0.3		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 CENTRAL LABORATORY OF THE RESEARCH COUNCILS ©CLRC 2001						
TITLE 6 JFET RACK INTERFACE DRAWING						
SPIRE						
A 0-KE-0104-350-E			1 of 1			