Herschel/SPIRE

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

SPIRE – MGSE VERIFICATION

Document Number: MSSL/SPIRE/PA016.02 October 2005

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Approved:	**A Spencer**	A. Spencer	**Date:** 03/11/05

Change Record

ISSUE	Date	Brief description of change
1.0	October 2004	New document
2.0	October 2005	Updated to reflect the test of the second set of MGSE. Update of the assembly drawing.

Table of Contents

Table of Figures

Glossary

All terms are listed in the CIDL.

1. SCOPE OF DOCUMENT

This document describes the verification of the SPIRE MGSE and lifting gear. It also describes the proof loading, conducted by the SPIRE team. Drawings of the MGSE assembly and installation are shown in the Appendix.

2. DOCUMENTS

All documents are listed in Figure 3.2 of the CIDL.

3. PARTS LISTS

3.1 HOB Lifting Hoist Arrangement

The instrument and HOB weight is 120kg.

Assembly Drawing No	Item	Part Description	QTY	Part Number	Manufacturer	Manufacturers Specified Maximum Load	Load carried*	MOS
5264-404 Sheets 4 and 5	1	Eyebolt M8	8	947A078N	Key Industrial	Documented Breaking Load 1500kg	40 kg	36.5
5264-404 Sheets 4 and 5	3	Hoist Cable Long	4	A3-5264-404-22	Anglia Handling	Safe Working Load 181 Kg (Proof Load 362 kg)	40 kg	3.5 (8.1)
5264-404 Sheets 4 and 5	4	Hoist Cable Short	4	A3-5264-404-21	Anglia Handling	Safe Working load 500 Kg	30 kg	15.7
5264-404 Sheets 4 and 5	7	Shackle Standard	12	940A078N	Key industrial	Breaking Load 1800kg	40 kg	45
		Bow Shackle	2	942A078N	Key Industrial	Breaking Load 5400kg	Maximum 80 Kg	67.5

* Under normal working conditions i.e. carrying instrument and HOB plate

3.2 SPIRE Instrument Lifting Gear

These parts will be part of the proof load test conducted at RAL, which also include the yoke for the JFETS. The Instrument weight is 49 kg.

Assembly Drawing No	Item	Part Description	Qty	Part Number	Manufacturer	Manufacturers Specified Maximum Load	Load carried *	MOS
5264-404 Sheets 6 and 7	2	Front Lift Strap 2	1		MSSL		17 kg	
5264-404 Sheets 6 and 7	3	Hoist cable Long	2	A3-5264-404-22	Anglia Handling	Safe Working Load 181 Kg (Proof Load 362 kg)	17 kg	9.6 (20.3)
5264-404 Sheets 6 and 7	4	Hoist Cable Split	2	A3-5264-404-35	Anglia Handling	Safe Working Load 181 Kg (Proof Load 362 kg)	17 kg	9.6 (20.3)
5264-404 Sheets 6 and 7	10	Rear Lift Channel	1	A2-5264-404-16	MSSL		34 kg	
5264-404 Sheets 6 and 7	11	Rear Lift Plate	1	A3-5264-404-15	MSSL		34 kg	
5264-404 Sheets 6 and 7	13	Rigging Screw M10	1		Anglia Handling (ST STL)		17 kg	
5264-404 Sheets 6 and 7	22	Shackle STD	3	KEY – 940A07 8N	Key industrial	Documented Breaking Load 1800kg	17 kg	105.9
5264-404 Sheets 6 and 7	23	Shoulder eyebolt M10	2		Anglia Handling		17 kg	

* Under normal working conditions i.e. carrying instrument and HOB plate

4. PROOF LOADING OF INSTRUMENT LIFTING GEAR

4.1 4.1 Configuration 1 FPU and HOB simulator plate as shown in Sheet 4 of Appendix

Mass of FPU is 50Kg
Mass of HOB plate is 70Kg

Proof Load require for factor 2 240 Kg total

Mass to applied to HOB plate 170Kg

The assembly without the FPU was attached to a crane as shown in fig 1.

175Kg was applied, inspection afterward showed no evidence of damage.

4.2 Configuration 2 FPU only as shown in Sheet 6 of Appendix

Mass of FPU is 50Kg

Proof Load require for factor 2 100Kg total

The assembly was attached to a dummy SPIRE optical bench to give the same interface to the MGSE and then to a crane as shown in Figure 2.

100Kg was applied in the form of 4x25 Litres of water.

The load was applied, inspection afterward showed no evidence of damage.

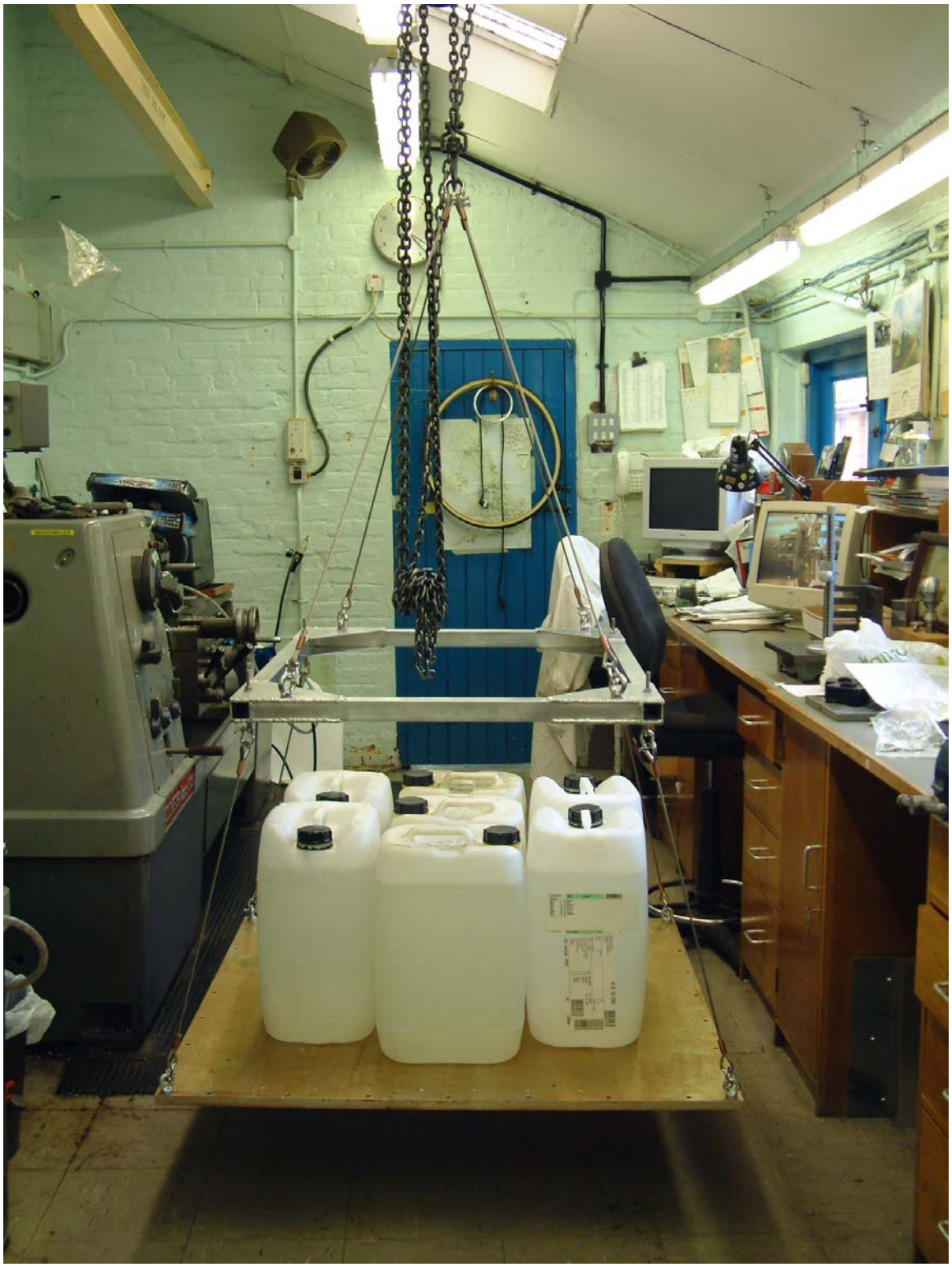

Figure 1

Figure 2

PROOF LOAD CERTIFICATE
SPIRE MGSE

This is to certify that the SPIRE MGSE to
Drawing No MSSL-5264-404
has been proof loaded in accordance with Report Number
MSSL/SPIRE/PA016.02 October 2005

Certified by

Chris Brockley-Blatt
MSSL SPIRE Project Manager
Mullard Space Science Laboratory
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5. APPENDIX - DRAWINGS

DRAWING No.		
A1	5264	404 SHT 8

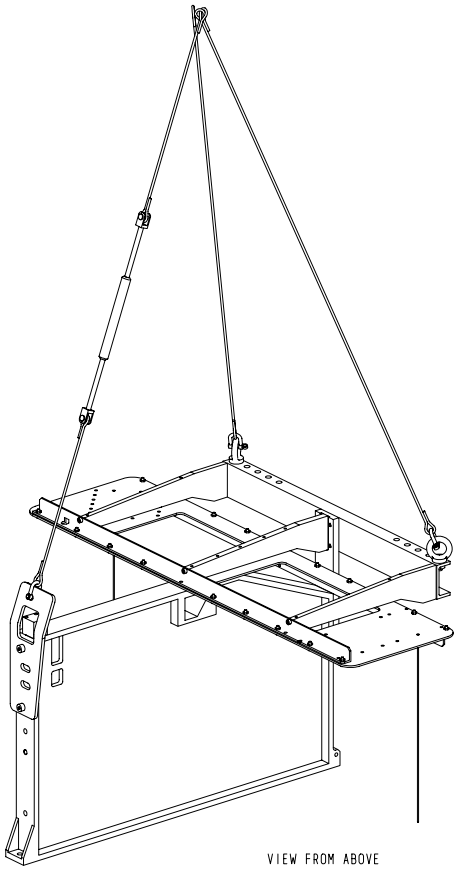
USED ON
SPIRE
MGSE

THIRD ANGLE PROJECTION

DO NOT SCALE

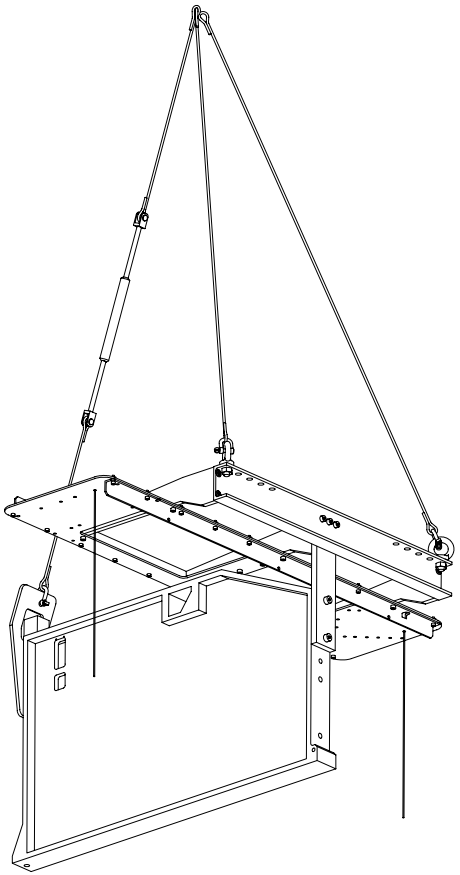
REMOVE ALL BURRS & SHARP EDGES

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



VIEW FROM ABOVE

THESE VIEWS TAKEN FROM
SPIRE LIFT ASSEMBLY
CONFIG LIFT-FRAME-PARTS



VIEW FROM BELOW

	ISSUE	DATE	AMENDMENT
CHECKED	5	2/2/04	SUPPORT PLATE FOR JFET BOXES ADDED
	4	28/1/04	ASSEMBLY JIG PARTS REMOVED DUE TO SPACE LIMITATIONS
TRACED	3	8/8/03	FRONT LIFT BRACKET REPLACED WITH FRONT LIFT STRAP
	2	28/3/03	
DRAWN	ISSUE	DATE	AMENDMENT
PMB	1	2/10/02	

ISSUE	DATE	AMENDMENT
9	23/9/05	ITEMS 30 AND 31 ADDED/SHEET 8 ADDED
8	15/7/05	ITEM BALLOONS REDEFINED
7	17/5/05	UPDATED FOR M12 RIGGING SCREW AND NEW SPLIT CABLES
6	29/3/04	BOM ADDED
ISSUE	DATE	AMENDMENT

COMPUTER FILE SPIRE-LIFT (ASSEMBLY)
3 CONFIGURATIONS
A1-5264-404-SHT 6 / 7 and 8(dwg)

PROTECTIVE FINISH

ESTD WT.

ACTL WT.

MATERIAL & SPEC.

DIMENSIONS IN mm

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

SCALE SEE VIEWS

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

TITLE
SPIRE LIFTING FOR
INSTALLATION

DRAWING No
A1 5264 404 SHT 8

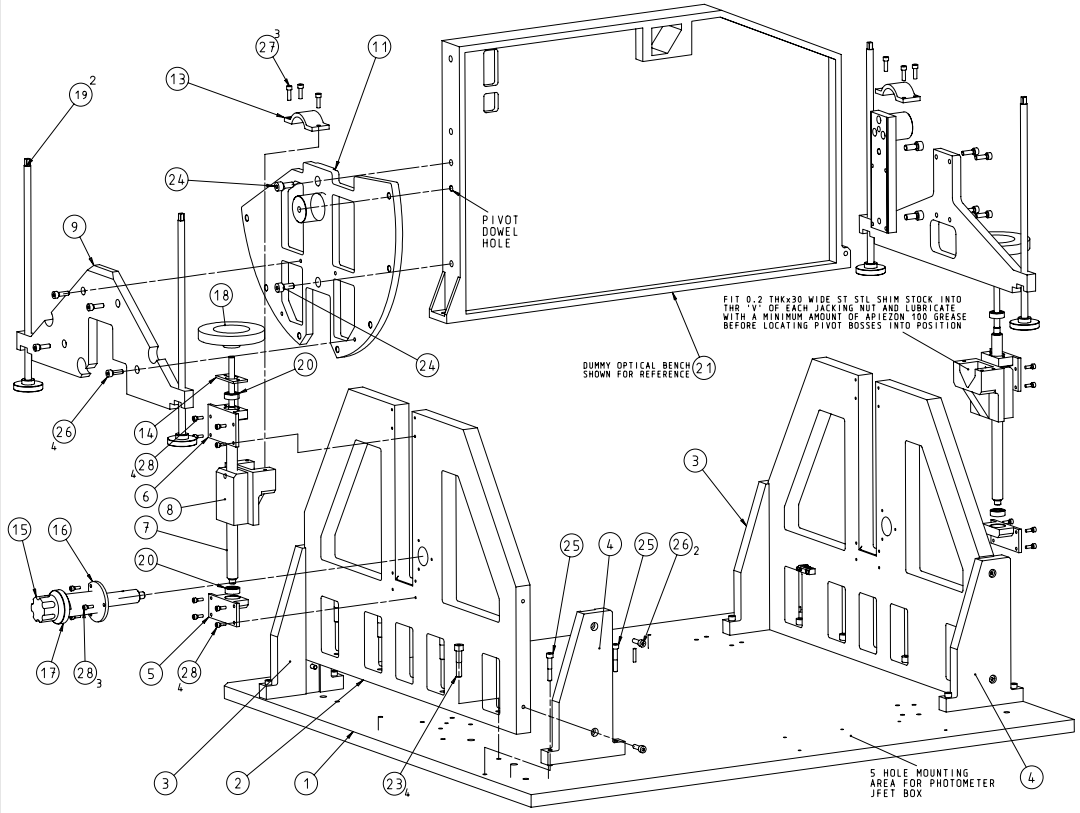
DRAWING No. A1 5264 404 SHT 1 OF 8

USED ON SPIRE MGSE

THIRD ANGLE PROJECTION

DO NOT SCALE

REMOVE ALL BURRS & SHARP EDGES



VIEW TAKEN FROM JIG-ASSEMBLY-10 CONFIG11

ITEM No.	DRAWING No.	DESCRIPTION	No. OFF	REMARKS
28		M4 x 12L SKT CAP HD SCREW	19	ST STEEL
27		M5 x 16L SKT CAP HD SCREW	6	ST STEEL
26		M6 x 20L SKT CAP H D SCREW	16	ST STEEL
25		M6 x 35L SKT CAP HD SCREW	8	ST STEEL
24		M8 x 20L SKT CAP HD SCREW	4	ST STEEL
23		M8 x 40L SKT CAP HD SCREW	8	ST STEEL
22	ND	DOWEL (10DIA x 40L)	4	
21		DUMMY SOB	REF	
20	SR6SSTBS-DRY	BEARING	4	BARDEN
19	A3-5264-404-25	FINE JACKING SCREW M10	4	
18	A3-5264-404-23	WHEEL MOD	2	
17	A3-5264-404-20	LOCK RING	1	
16	A3-5264-404-19	LOCK SHAFT BOSS	1	
15	A3-5264-404-18	LOCK SHAFT	1	
14	A3-5264-404-17	BEARING CAP UPPER	2	
13	A3-5264-404-13	PIVOT CLAMP	2	
12	A2-5264-404-12	REAR PIVOT	1	
11	A2-5264-404-11	COMBINED PIVOT	1	
10	A2-5264-404-10	BLADE MOUNT REAR	1	
9	A2-5264-404-9	BLADE MOUNT FRONT	1	
8	A2-5264-404-8	JACKING NUT	2	
7	A2-5264-404-7	LEAD SCREW	2	
6	A3-5264-404-6	BEARING BLOCK LOWER	2	
5	A3-5264-404-5	BEARING BLOCK UPPER	2	
4	A2-5264-404-4	GUSSET PLATE RH	2	
3	A2-5264-404-3	GUSSET PLATE LH	2	
2	A1-5264-404-2	END PLATE	2	
1	A1-KG0710-301	HOB SIMULATOR PLATE	1	RAL

ISSUE	DATE	AMENDMENT
3	23/9/05	UPDATE REVISIONS
2	28/3/03	
1	27/9/02	

CHECKED

TRACED

DRAWN PMB

COMPUTER FILE JIG-ASSEMBLY-10 (assembly) CONFIG11-BASIC-ASSY JIG-ASSEMBLY-10-SHT 1 / 2 & 3(dwg)

PROTECTIVE FINISH

ESTD WT.

ACTL WT.

MATERIAL & SPEC.

DIMENSIONS IN mm

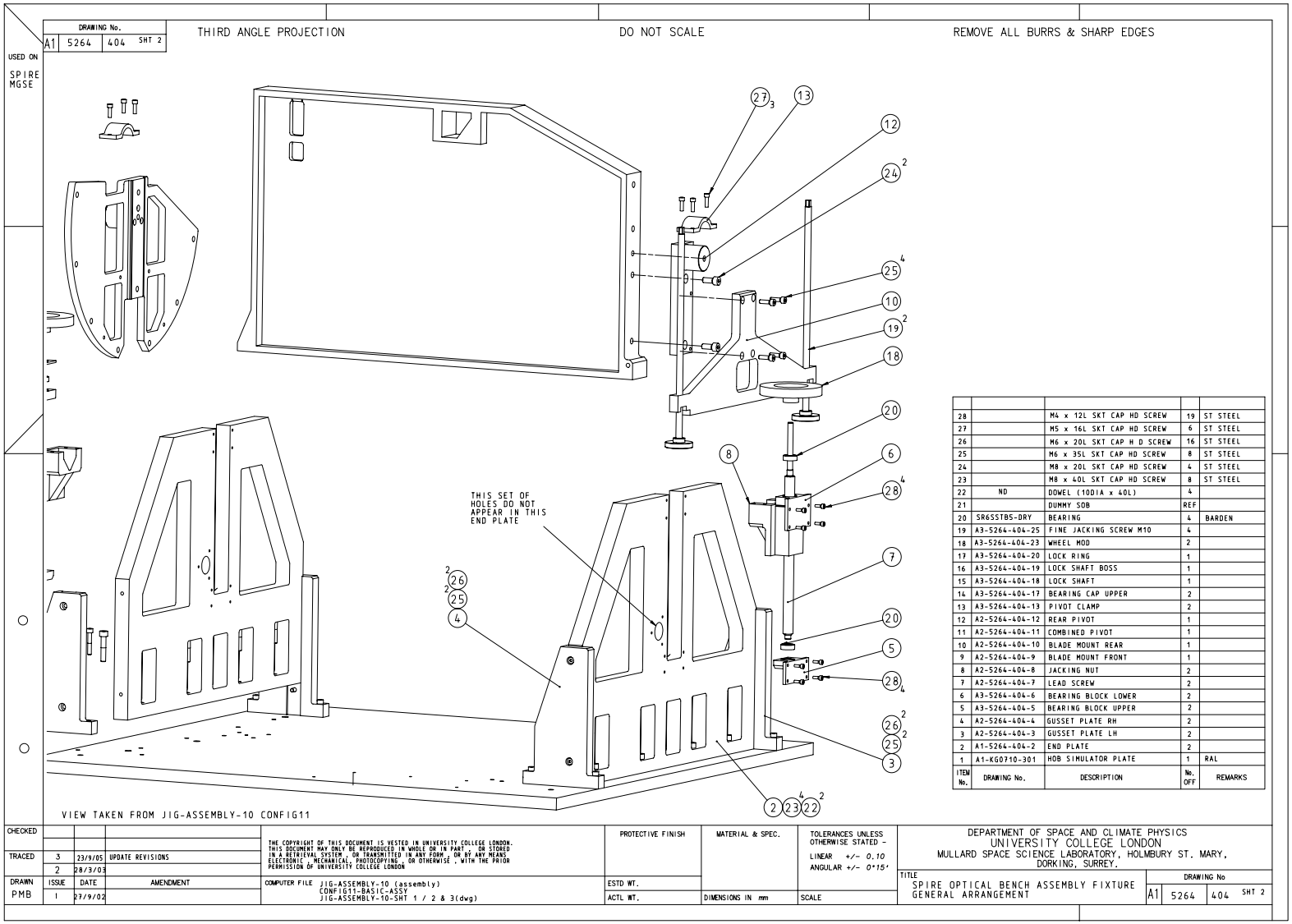
TOLERANCES UNLESS OTHERWISE STATED – LINEAR +/- 0.10 ANGULAR +/- 0°15'

SCALE

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

TITLE SPIRE OPTICAL BENCH ASSEMBLY FIXTURE GENERAL ARRANGEMENT

DRAWING No A1 5264 404 SHT 1 OF 8



ITEM No.	DRAWING No.	DESCRIPTION	No. OFF	REMARKS
28		M4 x 12L SKT CAP HD SCREW	19	ST STEEL
27		M5 x 16L SKT CAP HD SCREW	6	ST STEEL
26		M6 x 20L SKT CAP H D SCREW	16	ST STEEL
25		M6 x 35L SKT CAP HD SCREW	8	ST STEEL
24		M8 x 20L SKT CAP HD SCREW	4	ST STEEL
23		M8 x 40L SKT CAP HD SCREW	8	ST STEEL
22	ND	DOWEL (10DIA x 40L)	4	
21		DUMMY SOB	REF	
20	SR6SSTBS-DRY	BEARING	4	BARDEN
19	A3-5264-404-25	FINE JACKING SCREW M10	4	
18	A3-5264-404-23	WHEEL MOD	2	
17	A3-5264-404-20	LOCK RING	1	
16	A3-5264-404-19	LOCK SHAFT BOSS	1	
15	A3-5264-404-18	LOCK SHAFT	1	
14	A3-5264-404-17	BEARING CAP UPPER	2	
13	A3-5264-404-13	PIVOT CLAMP	2	
12	A2-5264-404-12	REAR PIVOT	1	
11	A2-5264-404-11	COMBINED PIVOT	1	
10	A2-5264-404-10	BLADE MOUNT REAR	1	
9	A2-5264-404-9	BLADE MOUNT FRONT	1	
8	A2-5264-404-8	JACKING NUT	2	
7	A2-5264-404-7	LEAD SCREW	2	
6	A3-5264-404-6	BEARING BLOCK LOWER	2	
5	A3-5264-404-5	BEARING BLOCK UPPER	2	
4	A2-5264-404-4	GUSSET PLATE RH	2	
3	A2-5264-404-3	GUSSET PLATE LH	2	
2	A1-5264-404-2	END PLATE	2	
1	A1-KG0710-301	HOB SIMULATOR PLATE	1	RAL

CHECKED						
TRACED	3	23/9/05	UPDATE REVISIONS			
	2	28/3/03				
DRAWN PMB	ISSUE	DATE	AMENDMENT			
	1	27/9/02				

COMPUTER FILE JIG-ASSEMBLY-10 (assembly) CONFIG11-BASIC-ASSY JIG-ASSEMBLY-10-SHT 1 / 2 & 3(dwg)

PROTECTIVE FINISH | ESTD WT. | ACTL WT.

MATERIAL & SPEC. | DIMENSIONS IN mm

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

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

TITLE: SPIRE OPTICAL BENCH ASSEMBLY FIXTURE GENERAL ARRANGEMENT

DRAWING No: A1 5264 404 SHT 2

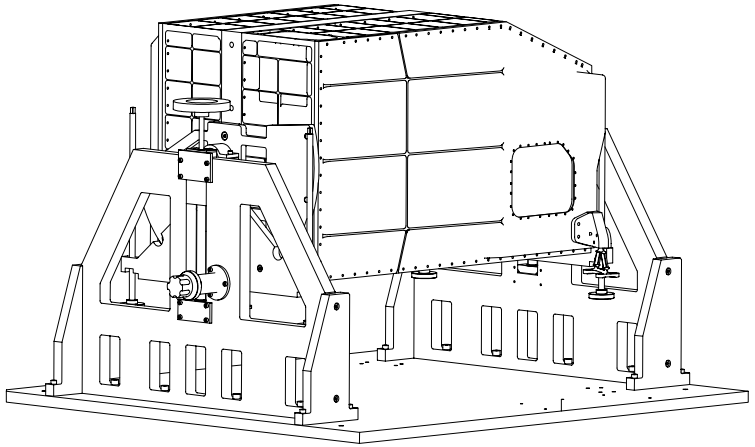
DRAWING No. A1 5264 404 SHT 3

USED ON SPIRE MGSE

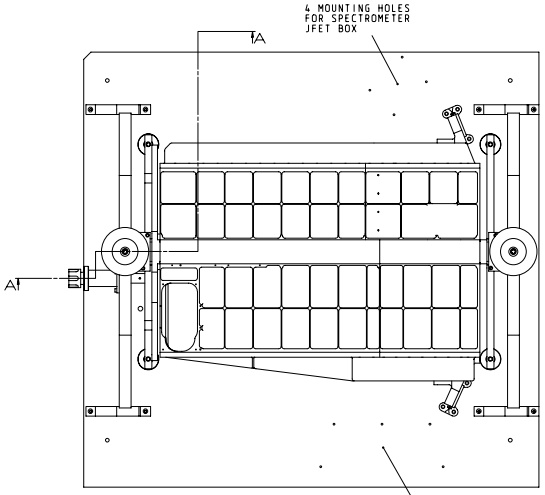
THIRD ANGLE PROJECTION

DO NOT SCALE

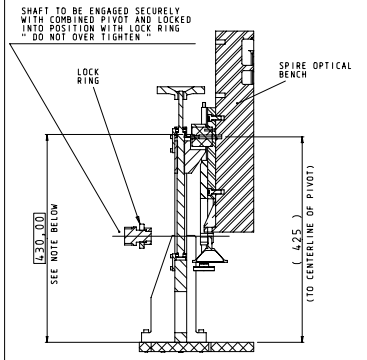
REMOVE ALL BURRS & SHARP EDGES



VIEW TAKEN FROM JIG-ASSEMBLY-10 CONFIG1

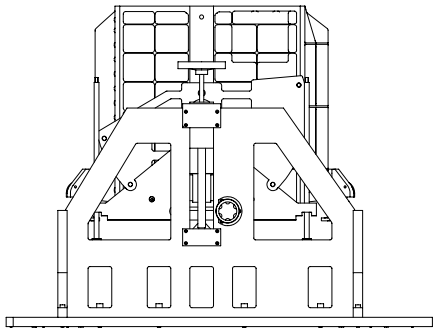


VIEW TAKEN FROM JIG-ASSEMBLY-10 CONFIG1



PART SECTION A-A

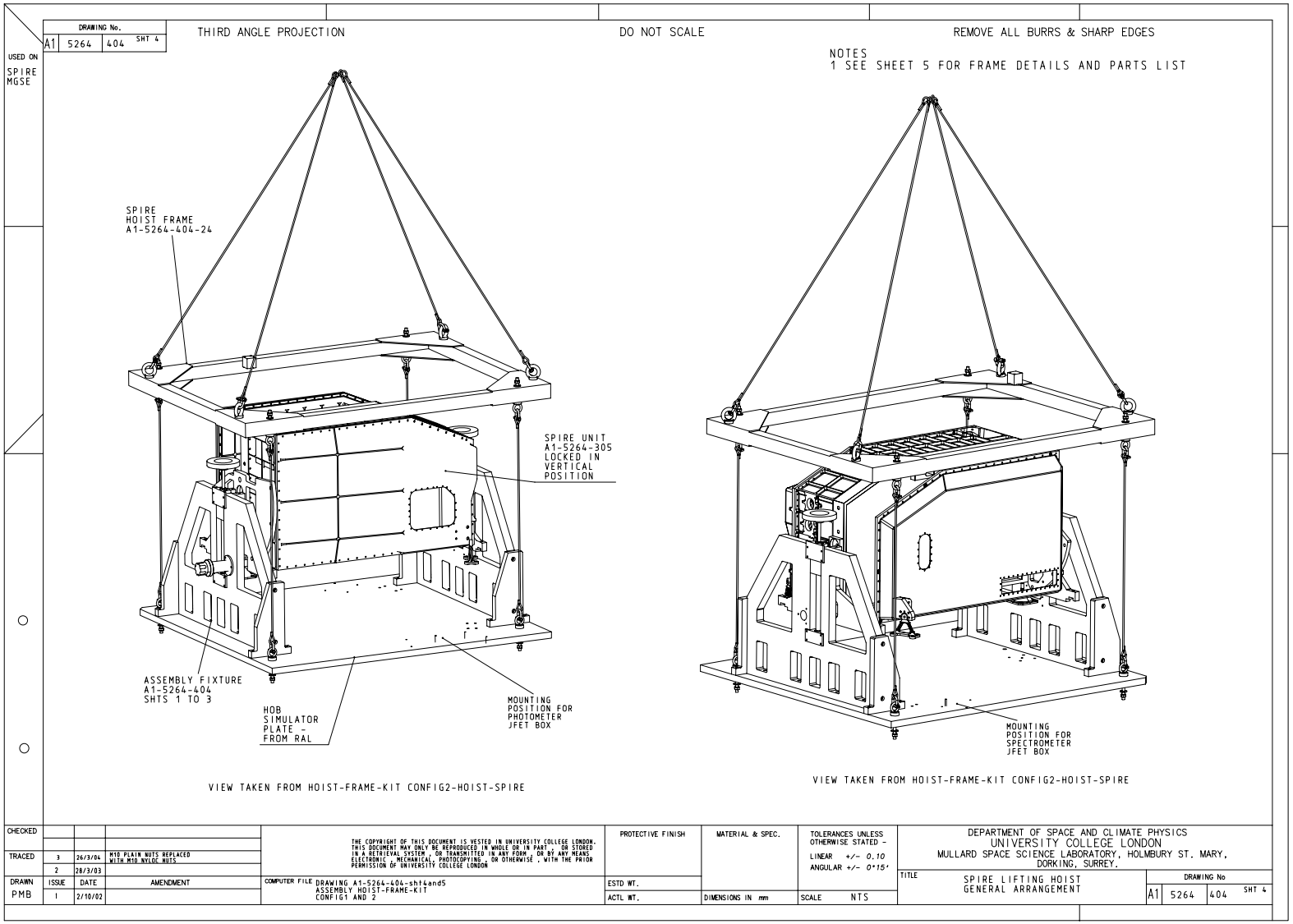
NOTE - TOP SURFACE OF EACH JACKING NUT TO BE SET AT 430 FROM BASE PLATE SURFACE FOR INITIAL SETUP AND LOCK SHAFT ENGAGED WITH HOLE IN COMBINED PIVOT FOR VERTICAL ATTITUDE OF SPIRE OPTICAL BENCH



VIEW TAKEN FROM JIG-ASSEMBLY-10 CONFIG1

NOTES
1 FOR INITIAL SETUP SEE PART SECTION A-A TO SET JACKING NUT HEIGHT WHEN SET REMOVE HAND WHEELS FROM LEAD SCREWS (STORE FOR LATER USE)
2 FIT BOTH PIVOTS AND BLADE MOUNTS TO THE SPIRE OPTICAL BENCH
3 FIT SHIMS INTO EACH JACKING NUT 'V' SET OPTICAL BENCH INTO A HORIZONTAL POSITION AND LOWER PIVOTS INTO EACH 'V' - ALLOW TO ROTATE TO A VERTICAL POSITION THEN FIT PIVOT CLAMPS - ROTATE TO A HORIZONTAL POSITION AND ENGAGE LOCKSHAFT - THEN SECURE PIVOT CLAMP SCREWS. THE OPTICAL BENCH IS NOW READY FOR ASSEMBLY PROCESS TO BEGIN.
4 THE COMBINED PIVOT ALLOWS ROTATION BETWEEN +/- 90 DEG FROM THE VERTICAL IN 30 DEG INCREMENTS.
5 TO ROTATE OPTICAL BENCH - RELEASE AND WITHDRAW LOCKSHAFT AND LOOSEN THE SINGLE SCREW FROM EACH PIVOT CLAMP - ROTATE OPTICAL BENCH TO NEW POSITION THEN RE-ENGAGE LOCKSHAFT AND SECURE THE TWO PIVOT CLAMP SCREWS.
6 WHEN ASSEMBLY HAS BEEN COMPLETED LOWER THE OPTICAL BENCH AS FOLLOWS-
a) SET THE 4 FINE JACKING SCREWS TO PROTRUDE 50mm BELOW EACH BLADE MOUNT
b) REFIT HAND WHEELS - WIND EACH TOGETHER ANTI-CLOCKWISE TO LOWER COMPLETED ASSEMBLY UNTIL THE 4 FEET MAKE CONTACT WITH THE BASE PLATE - REMOVE PIVOT CLAMPS AND LOWER JACKING NUTS TO LOWEST POSITION.
c) FIT SPIRE FRONT MOUNT TO BASE PLATE AT LOCK SHAFT END - FIT M6 THREADED DOWELS INTO 'A' FRAME MOUNTING HOLES
REMOVE FRONT AND REAR PIVOTS AND BLADE MOUNTS.
d) USING THE FINE ADJUSTING SCREWS GRADUALLY LOWER THE COMPLETE ASSEMBLY UNTIL THE 'A' FRAMES ENGAGE WITH THE THREADED DOWELS AND THE FRONT MOUNT ENGAGES WITH THE OPTICAL BENCH FRONT LOCATION - CONTINUE TO LOWER UNTIL THE 'A' FRAMES AND FRONT MOUNT ARE FULLY SUPPORTING THE ENTIRE ASSEMBLY - REMOVE THREADED DOWELS AND SECURE 'A' FRAMES TO BASE PLATE - SECURE FRONT MOUNT SCREWS AND SPIGOT FASTENERS.
7 WHEN THE OPTICAL BENCH IS LOWERED AND SECURED TO THE BASE PLATE - THE LIFTING ATTACHMENTS CAN BE FITTED AS PER SHEETS 4 AND 5.
8 THE PHOTOMETER AND SPECTROMETER JFET BOXES CAN NOW BE SECURED TO THE BASE PLATE USING THE APPROPRIATE FIXINGS.
8 THE ENTIRE ARRANGEMENT IS NOW READY FOR RE-LOCATION.

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	23/9/05	UPDATE REVISIONS					TITLE SPIRE OPTICAL BENCH ASSEMBLY FIXTURE GENERAL ARRANGEMENT
	2	28/3/03						DRAWING No A1 5264 404 SHT 3
DRAWN	ISSUE	DATE	AMENDMENT	COMPUTER FILE JIG-ASSEMBLY-10 (assembly) CONFIG11-BASIC-ASSY JIG-ASSEMBLY-10-SHT 1 / 2 & 3(dwg)	ESTD WT.			
PMB	1	27/9/02			ACTL WT.	DIMENSIONS IN mm	SCALE	


DRAWING No.
A1 5264 404 SHT 4
USED ON
SPIRE MGSE
THIRD ANGLE PROJECTION
DO NOT SCALE
REMOVE ALL BURRS & SHARP EDGES
NOTES
1 SEE SHEET 5 FOR FRAME DETAILS AND PARTS LIST
SPIRE HOIST FRAME A1-5264-404-24
SPIRE UNIT A1-5264-305 LOCKED IN VERTICAL POSITION
ASSEMBLY FIXTURE A1-5264-404 SHTS 1 TO 3
HOB SIMULATOR PLATE - FROM RAL
MOUNTING POSITION FOR PHOTOMETER JFET BOX
VIEW TAKEN FROM HOIST-FRAME-KIT CONFIG2-HOIST-SPIRE
MOUNTING POSITION FOR SPECTROMETER JFET BOX
VIEW TAKEN FROM HOIST-FRAME-KIT CONFIG2-HOIST-SPIRE
CHECKED
TRACED 3 26/3/04 M10 PLAIN NUTS REPLACED WITH M10 NYLOC NUTS
2 28/3/03
DRAWN PMB ISSUE 1 DATE 2/10/02 AMENDMENT
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COMPUTER FILE DRAWING A1-5264-404-sht4and5 ASSEMBLY HOIST-FRAME-KIT CONFIG1 AND 2
PROTECTIVE FINISH
ESTD WT.
ACTL WT.
MATERIAL & SPEC.
DIMENSIONS IN mm
TOLERANCES UNLESS OTHERWISE STATED -
LINEAR +/- 0.10
ANGULAR +/- 0°15'
SCALE NTS
DEPARTMENT OF SPACE AND CLIMATE PHYSICS
UNIVERSITY COLLEGE LONDON
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.
TITLE
SPIRE LIFTING HOIST GENERAL ARRANGEMENT
DRAWING No
A1 5264 404 SHT 4

DRAWING No. A1 5264 404 SHT 5

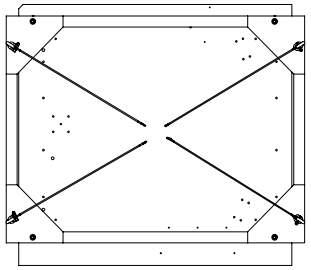
THIRD ANGLE PROJECTION

DO NOT SCALE

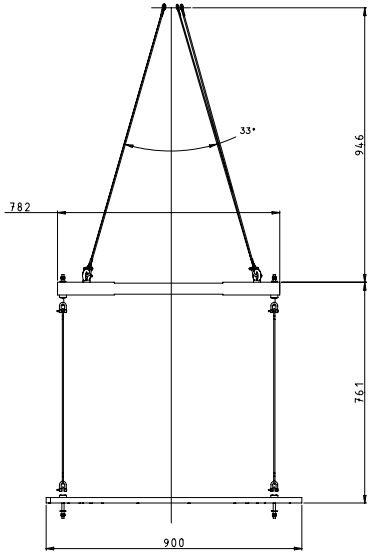
REMOVE ALL BURRS & SHARP EDGES

USED ON SPIRE MGSE

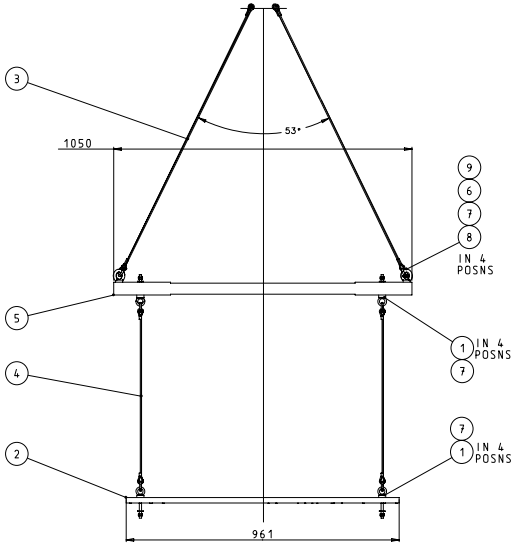
NOTES
1 SEE SHEET 1 FOR PICTORIAL VIEWS WITH SPIRE AND THE MGSE FITTED
2 ANGLES QUOTED ARE APPROXIMATE



VIEW TAKEN FROM HOIST-FRAME-KIT CONFIG1-HOIST-FRAME



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



VIEW TAKEN FROM HOIST-FRAME-KIT CONFIG1-HOIST-FRAME

ITEM No	DRAWING No	DESCRIPTION	QTY	REMARKS
9				
8		EYEBOLT (SHOULDER) M10	4	ANGLIA HANDLING (ST STL)
7	927A078N	SHACKLE STANDARD	12	KEY INDUSTRIAL
6		NUT M10 HEX NYLOC	4	ST STL
5	A1-5264-404-24	HOIST FRAME	1	
4	A3-5264-404-21	HOIST CABLE SHORT	4	
3	A3-5264-404-22	HOIST CABLE LONG	4	
2	REF	HOB SIMULATOR PLATE	1	
1	947A078N	EYEBOLT M8	8	KEY INDUSTRIAL

ISSUE	DATE	AMENDMENT
3	26/3/04	M10 PLAIN NUTS REPLACED WITH M10 NYLOC NUTS
2	28/3/03	
1	2/10/02	

CHECKED

TRACED

DRAWN PMB

COMPUTER FILE DRAWING A1-5264-404-sht4and5 ASSEMBLY HOIST-FRAME-KIT CONFIG1 AND 2

PROTECTIVE FINISH

ESTD WT.

ACTL WT.

MATERIAL & SPEC.

DIMENSIONS IN mm

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

SCALE NTS

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

TITLE SPIRE LIFTING HOIST GENERAL ARRANGEMENT

DRAWING No A1 5264 404 SHT 5

DRAWING No. A1 5264 404 SHT 6

THIRD ANGLE PROJECTION

DO NOT SCALE

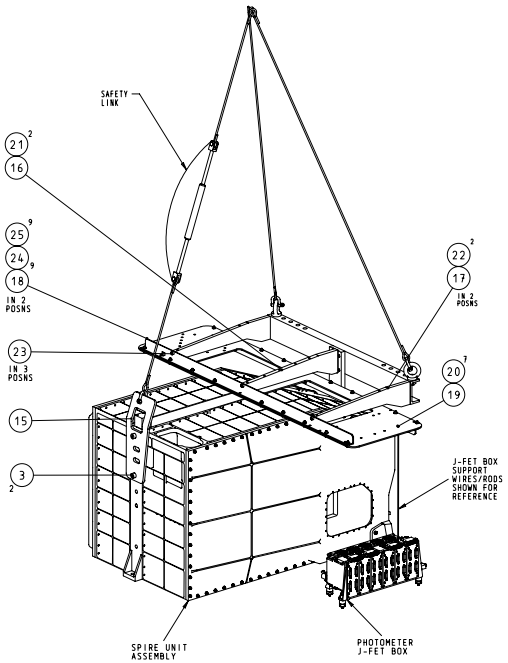
REMOVE ALL BURRS & SHARP EDGES

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



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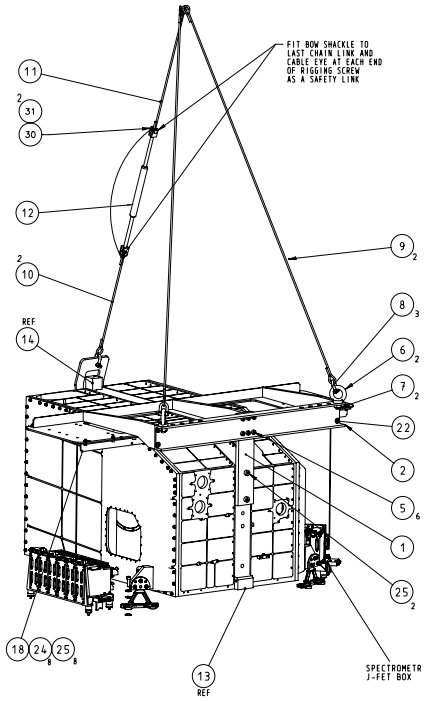


VIEW SCALE 0.2 : 1

Item	Part #	Name	Qty
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

ISSUE	DATE	AMENDMENT
5	2/2/04	SUPPORT PLATE FOR JFET BOXES ADDED
4	28/1/04	ASSEMBLY JIG PARTS REMOVED DUE TO SPACE LIMITATIONS
3	8/8/03	FRONT LIFT BRACKET REPLACED WITH FRONT LIFT STRAP
2	28/3/03	
1	2/10/02	
9	23/9/05	ITEMS 30 AND 31 ADDED/SHEET 8 ADDED
8	15/7/05	ITEM BALLOONS REDEFINED
7	17/5/05	UPDATED FOR M12 RIGGING SCREW AND NEW SPLIT CABLES
6	29/3/04	BOM ADDED

CHECKED
TRACED
DRAWN PMB

COMPUTER FILE SPIRE-LIFT (ASSEMBLY)
3 CONFIGURATIONS
A1-5264-404-SHT 6 / 7 and 8(dwg)

ESTD WT.
ACTL WT.

PROTECTIVE FINISH

MATERIAL & SPEC.

DIMENSIONS IN mm

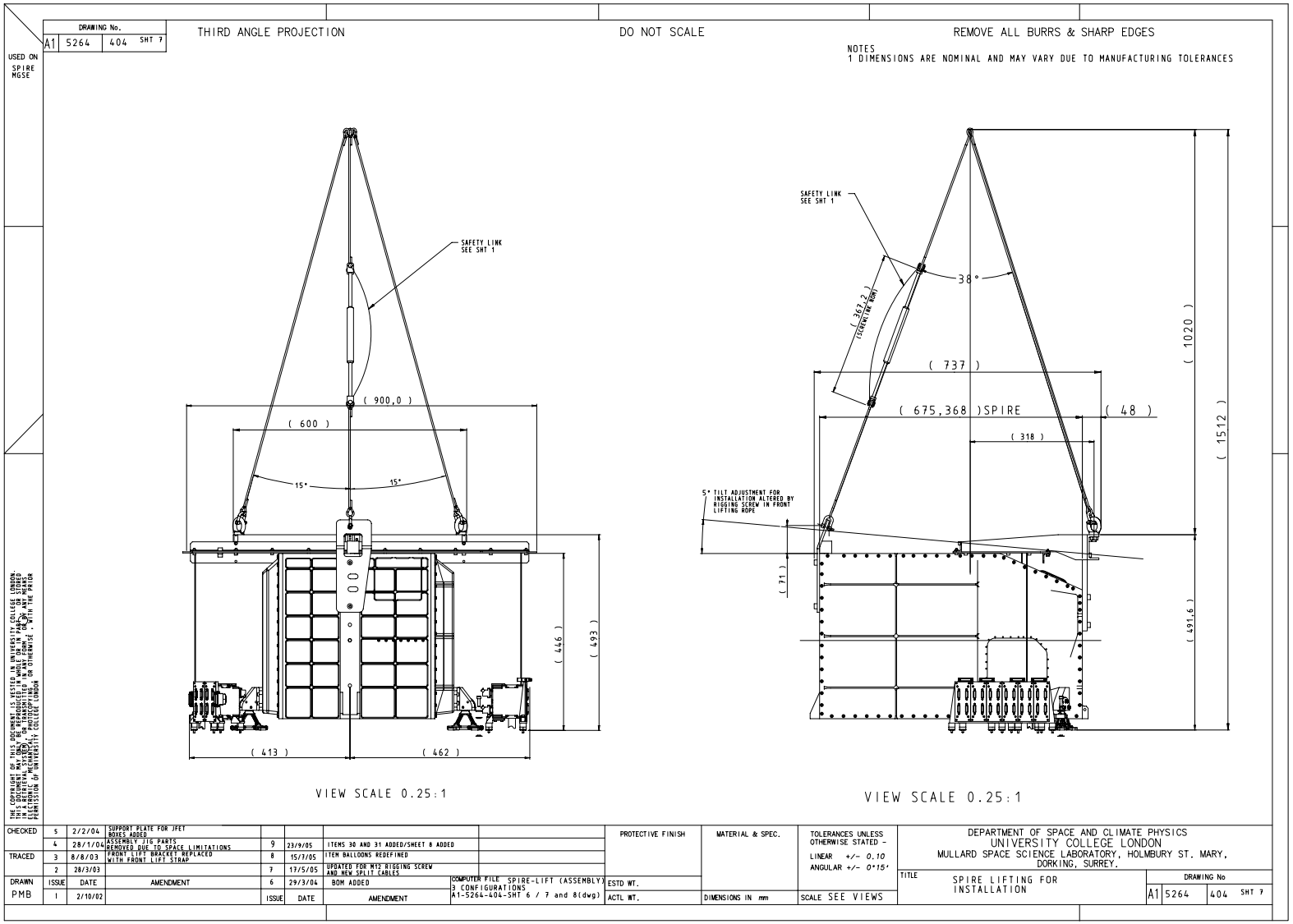
TOLERANCES UNLESS OTHERWISE STATED –
LINEAR +/- 0.10
ANGULAR +/- 0°15'

SCALE SEE VIEWS

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

TITLE: SPIRE LIFTING FOR INSTALLATION

DRAWING No: A1 5264 404 SHT 6


DRAWING No. A1 5264 404 SHT 7
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
SAFETY LINK SEE SHT 1
(900,0)
(600)
15°
15°
(446)
(493)
(413)
(462)
VIEW SCALE 0.25:1
SAFETY LINK SEE SHT 1
38°
(363,2) (CENTRE OF ROD)
(737)
(675,368)SPIRE
(48)
(318)
(1020)
(1512)
5° TILT ADJUSTMENT FOR INSTALLATION ALTERED BY RIGGING SCREW IN FRONT LIFTING ROPE
(71)
(491,6)
VIEW SCALE 0.25:1
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CHECKED
TRACED
DRAWN PMB
5 2/2/04 SUPPORT PLATE FOR JFET BOXES ADDED
4 28/1/04 ASSEMBLY JIG PARTS REMOVED DUE TO SPACE LIMITATIONS
3 8/8/03 FRONT LIFT BRACKET REPLACED WITH FRONT LIFT STRAP
2 28/3/03
1 2/10/02
ISSUE DATE AMENDMENT
9 23/9/05 ITEMS 30 AND 31 ADDED/SHEET 8 ADDED
8 15/7/05 ITEM BALLOONS REDEFINED
7 17/5/05 UPDATED FOR M12 RIGGING SCREW AND NEW SPLIT CABLES
6 29/3/04 BOM ADDED
COMPUTER FILE SPIRE-LIFT (ASSEMBLY) 3 CONFIGURATIONS A1-5264-404-SHT 6 / 7 and 8(dwg)
PROTECTIVE FINISH
ESTD WT.
ACTL WT.
MATERIAL & SPEC.
DIMENSIONS IN mm
TOLERANCES UNLESS OTHERWISE STATED - LINEAR +/- 0.10 ANGULAR +/- 0°15'
SCALE SEE VIEWS
DEPARTMENT OF SPACE AND CLIMATE PHYSICS
UNIVERSITY COLLEGE LONDON
MULLARD SPACE SCIENCE LABORATORY, HOLMBURY ST. MARY, DORKING, SURREY.
TITLE
SPIRE LIFTING FOR INSTALLATION
DRAWING No
A1 5264 404 SHT 7