

|  |                                       |       |                             |
|--|---------------------------------------|-------|-----------------------------|
| <b>SPIRE</b>   | <b>Project Document</b>               | Ref   | SPIRE-RAL-DOC-002840        |
|  |                                       | Issue | 2.0                         |
|  | SPIRE PFM AS BUILT<br>STATUS (ABCIDL) | Date  | 27 <sup>th</sup> March 2007 |
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|                     |   |
|---------------------|---|
| <b>SUBJECT:</b>     | <b>AS BUILT CONFIGURATION ITEM DATA LIST<br/>BUILD STATUS</b> |
| <b>PREPARED BY:</b> | E C Sawyer  |
| <b>MODIFIED BY</b>  |   |
| <b>DOCUMENT No:</b> | SPIRE-RAL-DOC-002840  |

| <b>APPROVED BY:</b>                   | <b>Name</b>      | <b>Signature &amp; Date</b> |
|---------------------------------------|------------------|-----------------------------|
| <b>Instrument Development Manager</b> | Eric Sawyer      |                             |
| <b>Systems Engineer</b>               | Douglas. Griffin |                             |
| <b>Product Assurance Manager</b>      | Eric Clark       |                             |

**Distribution**

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|  |   | <b>Issue</b> | <b>2.0</b>                        |
|  | <b>SPIRE PFM AS BUILT<br/>STATUS (ABCIDL)</b> | <b>Date</b>  | <b>27<sup>th</sup> March 2007</b> |
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## CHANGE RECORD

| <b>ISSUE</b> | <b>DATE</b> | <b>Comments / change</b>  |
|--------------|-------------|---|
| 1.0          | 27/2/07     | First issue for PFM   |
| 2.0          | 27/3/07     | SPIRE-RAL-PRJ-000608 SPIRE Harness Definition Document now 1.3.1            |
|              |             | SPIRE-SBT-PRJ-000686 SPIRE Sorption Coolers CIDL HSO-SBT-LI-010 now issue 1 |
|              |             |   |
|              |             |   |
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| Build change record   |          |
| FPU   |          |
| JFETS   |          |
| Warm Electronics  |          |

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|  |   | <b>Issue</b> | <b>2.0</b>                        |
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## 1. SCOPE

This document defines the list of configured documents and Drawing etc for the SPIRE instrument and gives the configuration status of each document.

## 2. APPLICABLE DOCUMENTS

|                          |                                     |
|--------------------------|-------------------------------------|
| ECSS-M-40A               | Configuration Management            |
| SPIRE-RAL-PRJ-000626     | SPIRE Configuration Management Plan |
| SPIRE-RAL-PRJ-000032     | SPIRE Document Management Plan      |
| SPIRE-PROJECT-PRJ-000017 | SPIRE Product Assurance Plan        |
|                          |                                     |

## 3. CONFIGURATION STATUS

| <b>3.1 SubSystem Configured Item Document List (CIDL)</b> |  |                |              |
|---|--|----------------|--------------|
| <b>Doc Ref</b>  | <b>Doc Title</b>                                   | <b>Iss/Rev</b> | <b>Date</b>  |
| SPIRE-RAL-PRJ-001134                                      | Spire Instrument CIDL                              | 2.0            | 1 Dec 04     |
| SPIRE-ATC-PRJ-001054                                      | BSM CIDL   | 1.2            | 15 July 02   |
| SPIRE-IFS-DOC-001033                                      | SPIRE DPU Configuration Status List                | 1.2            | 11Feb 02     |
| HERTS-SPIRE-LI-CGS-006                                    | SPIRE DPU CIDL                                     | 3              | 15/5/06      |
| LAM-SSP-SPI-ADP-060630                                    | LAM SMEC CIDL - contained within the EIDP          | 1              | 28/7/06      |
| MSSL-SPIRE-CF002.01                                       | Structure Document Tree (CIDL) for PFM             | 1.0            | 12 July 2004 |
| SPIRE-QMW-PRJ-001099                                      | Calibrators & Filters CIDL                         | 1.0            | 07 Sep 01    |
| SPIRE-SBT-PRJ-000686                                      | SPIRE Sorption Coolers CIDL HSO-SBT-LI-010         | 1              | 7/10/04      |
| SPIRE-JPL-DOC-002427                                      | PTC - contained within EIDPs                       | 1              | 8/1/07       |
| LAM-SSP-SPI-ADP-030040_10                                 | Mirrors contained within EIDP                      | 1.1            | 11/6/04      |
| MSSL-SPIRE-CF0005.A                                       | 300mK bus bar                                      | 1              | 25/1/06      |
| SPIRE-UCF-DOC-002126                                      | Beam dividers - Contained within HSO-CDF-EIDP-060  | 1              | 11/8/04      |
| SPIRE-UCF-DOC-002182                                      | 300mK supports – contained within HSO-CDF-EIDP-072 | 1              | 27/7/04      |
| SPIRE-UCF-DOC-002185                                      | Filters – contained within HSO-CDF-EIDP-059        | 1              | 22/10/04     |
| SPIRE-UCF-DOC-002125                                      | Scal – contained within HSO-CDF-EIDP-071           | 1              | 19/8/04      |
| SPIRE-UCF-DOC-002797                                      | Pcal contained within HSO-CDF-EIDP-073             | 1              | 15/3/05      |
| SPIRE-UCF-DOC-002798                                      | dichroics contained within HSO-CDF-EIDP-114        | 1              | 6/3/06       |
| SPIRE-JPL-DOC-002429                                      | JFETS – contained within EIDPs                     |                | various      |
| SPIRE-JPL-DOC-002044                                      | BDA – contained within EIDPs                       |                | various      |



|  |  |              |                                   |
|--|--|--------------|-----------------------------------|
| <b>SPIRE</b>   | <b>Project Document</b>                      | <b>Ref</b>   | <b>SPIRE-RAL-DOC-002840</b>       |
|  |  | <b>Issue</b> | <b>2.0</b>                        |
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| <b>3.4 Specifications. – Subsystems</b> |   |                |             |
|---|---|----------------|-------------|
| <b>Doc Ref</b>                          | <b>Doc Title</b>                              | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-ATC-PRJ-000460                    | Beam Steering Mirror subsystem Specification  | 3.7            | 11 Sep 03   |
| SPIRE-IFS-PRJ-000444                    | ON board \software URD                        | 1.3            | 27/9/04     |
| SPIRE-IFS-PRJ-000462                    | DPU Subsystem Specification                   | 1.2            | 26 Nov 01   |
| SPIRE-IFS-PRJ-001036                    | Onboard software Specification Document       | 1.1            | 5/8/04      |
| SPIRE-JPL-PRJ-000456                    | SPIRE Detector Subsystem Spec                 | 3.2            | 7 Jan 03    |
| SPIRE-LAM-PRJ-000459                    | Spectrometer Mirror Mechanism Subsystem Spec  | 8.0            | 12 Oct 01   |
| SPIRE-MSS-PRJ-000427                    | Structure Specification Doc                   | 2.0            | 26 Nov 02   |
| SPIRE-QMW-PRJ-000454                    | Filters Subsystem Specification               | 2.0            | 7 Sep 01    |
| SPIRE-QMW-PRJ-000648                    | Spire Calibrators Software Interface Req      | 1.0            | 10/Apr/01   |
| SPIRE-QMW-PRJ-000649                    | Spire Calibrators Electrical Interface Req    | 1.1            | 10/Apr/01   |
| SPIRE-QMW-PRJ-001101                    | Photometer Calibrator (PCAL) Subsystem Spec   | 1.0            | 7 Sep 01    |
| SPIRE-QMW-PRJ-001105                    | Spectrometer Calibrator (SCAL) Subsystem Spec | 1.0            | 7 Sep 01    |
| SPIRE-SAP-PRJ-000461                    | DRCU Subsystem Spec                           | 1 0            | 14 Feb 03   |
| SPIRE-SAP-PRJ-000638                    | FPU Simulator                                 | 0.3            | 20 Jan 03   |
| SPIRE-SBT-PRJ-000458                    | SPIRE & PACS Sorption Coolers Specification   | 3.6            | 18/3/04     |
| SPIRE-UCF-PRJ-000064                    | SPIRE Science Requirements Document           | 3.0            | 21 Nov 00   |
|   |   |                |             |
|   |   |                |             |
|   |   |                |             |

| <b>3.5 Interfaces (ICD) - RAL</b> |   |                |             |
|-----------------------------------|---|----------------|-------------|
| <b>Doc Ref</b>                    | <b>Doc Title</b>  | <b>Iss/Rev</b> | <b>Date</b> |
| SCI-PT-IIDB/SPIRE-02124           | SPIRE IIDB  | 4              | 1/4/06      |
| SPIRE-RAL-DWG-001409              | Forms Annex 1 to SCI-PT-IIDB/SPIRE-02124<br>SPIRE MECHANICAL INTERFACE DRAWINGS | 14.0           | Feb 06      |
|                                   |   |                |             |
| SPIRE-RAL-PRJ-000450              | Spire System Budget   | 4.0            | 01 Jun 03   |
| SPIRE-RAL-PRJ-000608              | SPIRE Harness Definition Document   | 1.3.1          | 13/3/07     |
| SPIRE-RAL-PRJ-000728              | Cryogenic Interface Thermal Mathematical Model                                  | 2.1            | 20 Jan 03   |
| SPIRE-RAL-PRJ-001078              | Spire Data ICD  | 2.0            | 15-Nov-04   |
| SPIRE-RAL-PRJ-000560              | Thermal Configuration Control   | 0.9            | 04 Feb 02   |
|                                   |   |                |             |
|                                   |   |                |             |
|                                   |   |                |             |

|  |   |              |                                   |
|--|---|--------------|-----------------------------------|
| <b>SPIRE</b>   | <b>Project Document</b>                       | <b>Ref</b>   | <b>SPIRE-RAL-DOC-002840</b>       |
|  |   | <b>Issue</b> | <b>2.0</b>                        |
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| <b>3.6 Interfaces (ICD) - Subsystems</b> |  |                |             |
|--|--|----------------|-------------|
| <b>Doc Ref</b>                           | <b>Doc Title</b>                             | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-ATC-PRJ-001171                     | BSM ICD                                      | 3.2            | 28 Sep 04   |
| SPIRE-IFS-PRJ-000650                     | Spire DPU ICD;                               | 1.4            | 24/03/03    |
| SPIRE-JPL-PRJ-001181                     | Detectors (BDA) ICD                          | 2.0            | 26 Feb 02   |
| SPIRE-LAM-PRJ-000446                     | Optical Error Budget                         | 4.0            | 17/Jan/02   |
| SPIRE-LAM-PRJ-000944                     | LAM ICD (SPI.PFM.00.R1.01 A)                 | A              | 3/Oct/01    |
| SPIRE-MSS-PRJ-000294                     | Structure Optics ICD                         | 1.0            | 13/06/00    |
| SPIRE-MSS-PRJ-000298                     | Structure SMEC-m ICD                         | 1.0            | 14/06/00    |
| SPIRE-MSS-PRJ-000299                     | Structure Filters ICD                        | 1.0            | 13/Jun/00   |
| SPIRE-MSS-PRJ-000331                     | Structure-Cooler ICD                         | 1.0            | 13/Jun/00   |
| SPIRE-MSS-PRJ-000617                     | Structure Mechanical ICD MSSL-SPIRE-SP004.11 | 3.0            | 14/02/03    |
| SPIRE-SAP-PRJ-000451                     | DRCU ICD (SAP-SPIRE-CCa-075-02)              | 1.0            | 14/Feb/03   |
| SPIRE-SAP-PRJ-001364                     | DPU/DRCU ICD (DATA: SAP-SPIRE-CCa-076-02)    | 1.1            | 25/6/04     |
| SPIRE-SBT-PRJ-000690                     | Spire & PACS Sorption Coolers ICD            | 2.1            | 3/3/04      |
| SPIRE-UCF-PRJ-001149                     | SCAL ICD                                     | 3.0            | 5 Jul 04    |
| SPIRE-UCF-PRJ-001150                     | PCAL ICD                                     | 3.0            | 17 May 04   |
| SPIRE-UCF-PRJ-001151                     | UCF Filters ICD                              | 3.0            | 5 Jun 03    |
|  |  |                |             |

| <b>3.7 Lists</b>     |   |                |             |
|----------------------|---|----------------|-------------|
| <b>Doc Ref</b>       | <b>Doc Title</b>                        | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-RAL-PRJ-000455 | Major Milestone List                    | 1.4            | 2 Jun 03    |
| SPIRE-RAL-PRJ-002165 | Qualification Matrix                    | 2.0            | 12 Nov 04   |
|                      |   |                |             |
| SPIRE-RAL-PRJ-001079 | SPIRE NCR Status list                   | 10.0           | 1/3/07      |
| SPIRE-RAL-PRJ-001080 | Engineering Change Request List         | 5.0            | 1/3/07      |
| SPIRE-RAL-PRJ-001081 | Request For Waiver List                 | 7.0            | 25 Nov 04   |
| SPIRE-RAL-PRJ-001092 | Combined Declared Materials List        | 4.1            | 22 Feb 07   |
| SPIRE-RAL-PRJ-001093 | Combined Declared Processes List        | 4.0            | 27 Feb 07   |
| SPIRE-RAL-PRJ-001094 | Combined Declared Mechanical Parts List | 3.3            | 20 Feb 07   |
| SPIRE-RAL-PRJ-001095 | Combined Declared EEE Parts list        | 3.2            | 20 Feb 07   |
| SPIRE-RAL-REP-001670 | PAD Status List                         | 3.0            | 27 Jan 05   |
| SPIRE-RAL-DOC-002069 | SPR/SCR List.                           | 1.0D           | 02 Jul 04   |
|                      |   |                |             |
| SPIRE-UCF-PRJ-001138 | Critical Items List                     | 2.0            | 06 Jun 03   |
|                      |   |                |             |
|                      |   |                |             |

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| <b>3.8 Plans - RAL</b> |   |                |             |
|------------------------|---|----------------|-------------|
| <b>Doc Ref</b>         | <b>Doc Title</b>                          | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-RAL-DOC-001123   | SPIRE CQM Performance Test Specification  | 0.4            | 29 May 02   |
| SPIRE-RAL-DOC-001132   | SPIRE Warm Electronics Integration Plan   | 0.1            | 10 Jan 02   |
| SPIRE-RAL-DOC-001652   | SPIRE Functional Test Specifications      | 1.2            | 04 Sep 04   |
| SPIRE-RAL-NOT-001122   | SPIRE STM Performance Test Plan           | 0.1            | 31 Jan 02   |
| SPIRE-RAL-PRJ-000017   | Product Assurance Plan                    | 1.3            | 4 Jan 07    |
| SPIRE-RAL-PRJ-000018   | Spire Science Implementation Plan (DRAFT) | 1.1            | 18 Mar 02   |
| SPIRE-RAL-PRJ-000029   | Spire Management plan                     | 1.1            | 12 Apr 01   |
| SPIRE-RAL-PRJ-000030   | SPIRE Product Tree (DRAFT)                | 2.0            | 12 Apr 01   |
| SPIRE-RAL-PRJ-000032   | SPIRE Document Management Plan            | 1.1            | 13 Sep 00   |
| SPIRE-RAL-PRJ-000035   | Spire Instrument Development Plan         | 1.1            | 12 Apr 01   |
| SPIRE-RAL-PRJ-0001106  | ICC Software Configuration Plan           | 1.1            | 01 Feb 02   |
| SPIRE-RAL-PRJ-000410   | AIV Plan                                  | 3.0            | 25 May 03   |
| SPIRE-RAL-PRJ-000626   | SPIRE Configuration Management Plan       | 1.3            | 28 Feb 02   |
| SPIRE-RAL-PRJ-000852   | EMC Control Plan (DRAFT for comment)      | 0.4            | 29 May 02   |
| SPIRE-RAL-PRJ-001070   | Cleanliness Plan                          | 1.0            | 9 Jan 02    |
| SPIRE-RAL-PRJ-001866   | SPIRE Calibration Plan                    | 0.2            | 12 Jan 05   |
|                        |   |                |             |

| <b>3.9 Plans - Subsystems</b> |   |                |             |
|-------------------------------|---|----------------|-------------|
| <b>Doc Ref</b>                | <b>Doc Title</b>  | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-ATC-PRJ-000736          | BSM Subsystem Test Plan                                 | 4.2            | 24 Mar 04   |
| SPIRE-CGS-DOC-001776          | DPU-SW Verification & Validation Plan / Acceptance Test | 1.0            | 5 Apr 02    |
| SPIRE-IFS-PRJ-000834          | DPU Test Plan   | 0.1            | 8 Aug 01    |
| SPIRE-IFS-PRJ-001756          | DPU/ICU Spacecraft Interface Test Plan                  | 1.1            | 05 Sep 02   |
| SPIRE-LAM-PRJ-001842          | Optical Alignment Plan                                  | 1.0            | 30 Apr 03   |
| SPIRE-MSS-PRJ-000652          | SPIRE Structure Integration Plan                        | 0.1            | Apr 01      |
| SPIRE-MSS-PRJ-001023          | SPIRE STRUCTURE-MAIV Flow Chart                         | 3.0            | Feb 03      |
| SPIRE-MSS-PRJ-001841          | Vibration Test Specification STM Qualification Plan     | 2.0            | 04 Jul 03   |
| SPIRE-QMW-PRJ-001103          | Spectrometer Calibrator MAIV Flow Chart                 | 1.0            | 04 Sep 01   |
| SPIRE-SAP-PRJ-001607          | Detector Control Unit EM/QM1 Preliminary Test Plan      | 1.0            | 14 Feb 03   |
| SPIRE-SBT-PRJ-000691          | SPIRE & PACS Sorption Coolers MAIV Flow Chart           | 1.3            | 13 Jan 04   |
| SPIRE-UCF-PRJ-001686          | 300mk Strap Supports MAIV Flow Chart                    | 1.0            | 10 Feb 03   |
|                               |   |                |             |
|                               |   |                |             |
|                               |   |                |             |

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| <b>3.10 Procedures</b> |  |                |             |
|------------------------|--|----------------|-------------|
| <b>Doc Ref</b>         | <b>Doc Title</b>                                     | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-MSS-PRJ-001650   | Structure Assembly, Integration & Handling Procedure | 4.0            | 12 Jul 04   |
| SPIRE-RAL-DOC-001578   | SPIRE Cold Optical Alignment Procedure               | 1.0            | 17 Jun 03   |
| SPIRE-RAL-DOC-001888   | Cold Verification 1-Master Procedure                 | 1.1            | 22 Jan 04   |
| SPIRE-RAL-PRC-002808   | Warm Electronics mechanical Integration procedure    | 1.0            | 22/1/07     |
| SPIRE-RAL-PRC-002802   | FPU mechanical integration procedure                 | 1.0            | 17/1/07     |
| SPIRE-RAL-PRC-002806   | WIH mechanical integration procedure                 | 1.0            | 24/1/07     |
| SPIRE-RAL-PRC-002807   | WU electrical integration procedure                  | 1.0            | 31/1/07     |
|                        |  |                |             |
| SPIRE-RAL-PRC-002680   | Warm units integration procedure                     | 1.3            | 15/2/07     |
| SPIRE-RAL-PRC-002422   | Warm functional test procedure                       | 2.2            | 2/1/07      |
| SPIRE-RAL-PRC-002398   | Cold functional test procedure                       | 2.2            | 2/1/07      |
| SPIRE-RAL-PRC-002704   | Specific functional test procedure                   | 1.0            | 15/8/06     |
| SPIRE-RAL-PRC-002494   | Short Functional Test procedure                      | 2.2            | 2/1/07      |
|                        |  |                |             |

| <b>3.11 Reports</b>   |                           |                |             |
|-----------------------|---------------------------|----------------|-------------|
| <b>Doc Ref</b>        | <b>Doc Title</b>          | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-RAL-DOC-001293  | SPIRE Safety Submission   | 4.0            | 18 Jun 04   |
| SPIRE-RAL-NOT- 001704 | Harness Derating Analysis | 1.0            | 15 May 03   |
|                       |                           |                |             |

| <b>3.12 Work Statements</b> |                  |                |             |
|-----------------------------|------------------|----------------|-------------|
| <b>Doc Ref</b>              | <b>Doc Title</b> | <b>Iss/Rev</b> | <b>Date</b> |
|                             |                  |                |             |
|                             |                  |                |             |

| <b>3.13 Manuals</b>  |                         |                |             |
|----------------------|-------------------------|----------------|-------------|
| <b>Doc Ref</b>       | <b>Doc Title</b>        | <b>Iss/Rev</b> | <b>Date</b> |
| SPIRE-RAL-PRJ-002395 | Instrument Users Manual | 1.0            | 08 Apr 05   |
| SPIRE-IFS-PRJ-001391 | SPIRE OBS User Manual   | 1.1            | 29/12/04    |



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#### **4. BUILD STATUS**

PFM build

As Built Configuration List

27-Mar-07

SPIRE-RAL-DOC-002326

Issue 2.11

| Date       | Issue | Sheet      | Change   | Reason for change                       |
|------------|-------|------------|--|---|
| 28/06/2004 | 0.1D  | All        |  | First draft                             |
| 21/09/2004 | 2.0   |            | column added for PFM1 reqd   |   |
| 03/02/2005 | 2.1   | all        | updated for PFM1 test campaign   |   |
| 17/08/2005 | 2.2   | all        | updated fpr PFM 2 test campaign  |   |
| 09/11/2005 | 2.3   | FPU        | Updated for PFM Cryo-vibration test  |   |
| 22/11/2005 | 2.4   | FPU        | SMEC was CQM now DM  | Updated for the PFM cryo-vibration test |
| 26/07/2006 | 2.5   | FPU<br>All | Black Tiles added to photometer cover<br>Build std record included for each test replaced              | Correction to CIDL for vibe test        |
| 26/07/2006 | 2.6   | All        | Updated for PFM-3 Campaign   |   |
| 21/08/2006 | 2.7   | All        | SMEC Fitted<br><br>Numbers for redundant SCAL thermometers added<br>Flight thermometers for SMEC added | Updated for cryo-vibration test         |
| 21/08/2006 | 2.8   | All        | Updated for PFM-4 Campaign<br>JFET modules changed   | Updated for PFM-4 Campaign              |
| 28/02/2007 | 2.9   | All        |  | Updated for delivery                    |

| Subsystem             | Unit                    | Item   | Drawing/Ref    | Supplier |
|-----------------------|-------------------------|--|----------------|----------|
| <b>Structure</b>      | Optical Bench Panel     | Optical bench panel                                  | 5264-302-4     | MSSL     |
|                       |                         |  |                |          |
|                       | Photometer Cover        | Photometer Cover Wall                                | 5264-302-6     | MSSL     |
|                       |                         | Photometer cover lid                                 | 5264-302-10    | MSSL     |
|                       |                         | Photometer Seal- Top                                 | 5264-302-7     | MSSL     |
|                       |                         | Photometer Seal- Bottom                              | 5264-302-8     | MSSL     |
|                       |                         |  |                |          |
|                       | Spectrometer Cover      | Spectrometer Cover Wall                              | 5264-303-1     | MSSL     |
|                       |                         | Spectrometer Cover Lid                               | 5264-303-2     | MSSL     |
|                       |                         | Spectrometer seals top                               | 5264-303-4     | MSSL     |
|                       |                         | Spectrometer seals bottom                            | 5264-303-5     | MSSL     |
|                       |                         |  |                |          |
|                       | FPU Supports            | A Frames Stainless steel                             | 5264-302-1     | MSSL     |
|                       |                         | A frames CFRP  | B3MD-00.20.017 | MSSL     |
|                       |                         | Fixed Mount Cone, stainless steel                    | 5264-302-5     | MSSL     |
|                       |                         | Fixed mount CFRP cone                                | B3MD-00.20.022 |          |
|                       |                         | A Frame Support Plates and brackets (both sides)     | 5264-302-14    | MSSL     |
|                       |                         |  | 5264-302-15    | MSSL     |
|                       |                         |  | 5264-302-26    | MSSL     |
|                       |                         | Insulating Bush                                      | 5264-302-2     | MSSL     |
|                       |                         | Special Washer                                       | 5264-302-3     | MSSL     |
|                       |                         | Dowel retaining Plate                                | 5264-302-39    | MSSL     |
|                       |                         | Tubular Dowels (8mm)                                 | 5264-302-40    | MSSL     |
|                       |                         | Dowel - 'A' Frame support                            | 5264-302-41    | MSSL     |
|                       |                         | Dowel - 'A' Frame Top                                | 5264-302-42    | MSSL     |
|                       |                         | Special Washer - A Frame Brackets                    | 5264-302-43    | MSSL     |
|                       |                         |  |                |          |
| <b>Photometer Box</b> | Photometer detector box |  | 5264-306-1     | MSSL     |
|                       |                         |  | 5264-306-2     | MSSL     |
|                       |                         |  | 5264-306-3     | MSSL     |
|                       |                         | BDA Adapter Plate (5 off)                            | 5264-911       | MSSL     |
|                       |                         | Dichroic rings                                       | 5264-310-1     | MSSL     |
|                       |                         |  | 5264-310-2     | MSSL     |
|                       |                         |  | 5264-310-3     | MSSL     |
|                       |                         |  | 5264-311-1     | MSSL     |
|                       |                         |  | 5264-311-2     | MSSL     |
|                       |                         | Detector Box support Cone                            | 5264-312       | MSSL     |
|                       |                         | Detector box support cone CFRP                       | B3MD-00.20.004 | MSSL     |
|                       |                         | Photometer Detector Box A frames supports(2 per set) | 5234-313       | MSSL     |
|                       |                         | Detector box support frames CFRP                     | B3MD-00.20.009 | MSSL     |
|                       |                         | Washer   | 5264-313-1     | MSSL     |
|                       |                         | Bushes   | 5264-313-2     | MSSL     |

|                         |                           |   |                |      |
|-------------------------|---------------------------|---|----------------|------|
| <b>Spectrometer Box</b> | Spectrometer detector box |   | 5264-307-1     | MSSL |
|                         |                           | Filter mount  | 5264-307-2     | MSSL |
|                         |                           | Spectrometer Detector Box supports(3 per set)       | 5264-307-4     | MSSL |
|                         |                           | Spectrometer Detector Box supports CFRP (3 per set) | B3MD-00.20.014 | MSSL |
|                         |                           | BDA Adapter Plate                                   | 5264-911       | MSSL |
|                         |                           | Bushes  | 5264-307-5     | MSSL |
| <b>SCAL</b>             |                           | Scal Box  | 5264-314-1     | MSSL |
|                         |                           | SCAI Cover  | 5264-314-2     | MSSL |
|                         |                           | SCAL Exit Baffle Ring                               | 5264-314-3     | MSSL |
|                         |                           | SCAL Baffle Clamp                                   | 5264-314-4     | MSSL |
|                         |                           | SCAL source   | PFMB-000       | UWC  |
| <b>Mirror Mounts</b>    |                           | Secondary optical Bench                             | 5264-305-12    | MSSL |
|                         |                           | Support PM6   | 5264-305-13    | MSSL |
|                         |                           | PM6 Support Spare                                   | 5264-305-19    | MSSL |
|                         |                           | Support PM8   | 5264-305-14    | MSSL |
|                         |                           | PM10 Support  | 5264-305-17    | MSSL |
|                         |                           | Support SM6   | 5264-305-2     | MSSL |
|                         |                           | sm6 Support Spare                                   | 5264-305-18    | MSSL |
|                         |                           | Support SM7   | 5264-305-3     | MSSL |
|                         |                           | Bulkhead SM6 and SM7                                | 5264-305-15    | MSSL |
|                         |                           | Support SM8a  | 5264-305-4     | MSSL |
|                         |                           | Support SM9-10a                                     | 5264-305-6     | MSSL |
|                         |                           | Support SM9-10b                                     | 5264-305-7     | MSSL |
|                         |                           | Support SM11a                                       | 5264-305-8     | MSSL |
|                         |                           | Support SM11b                                       | 5264-305-9     | MSSL |
|                         |                           | Support SM12a                                       | 5264-305-10    | MSSL |
|                         |                           | Support SM12b                                       | 5264-305-11    | MSSL |
| <b>Other Optics</b>     |                           | SFIL2 Cold Stop                                     | 5264-305-22    | MSSL |
|                         |                           | Photometer Cold Stop Clamp PFI3                     | 5264-306-4     | MSSL |
|                         |                           | Photometer Cold Stop PFI3                           | 5264-306-5     | MSSL |
|                         |                           | CFIL1 Baffle Mount                                  | 5264-304-6     | MSSL |
|                         |                           | CFIL1 Baffle Clamp Ring                             | 5264-304-7     | MSSL |
|                         |                           | PFIL2 Mount Back Plate                              | 5264-302-12    | MSSL |
|                         |                           | PFIL2 Mount CLamp plate                             | 5264-302-17    | MSSL |
|                         |                           | Filter Mounts - SFIL2                               | 5264-305-20    | MSSL |
|                         |                           | Filter Mount - SFIL2 clamp ring                     | 5264-305-21    | MSSL |
|                         |                           | SFIL2 dowels  | 5264-305-27    | MSSL |
|                         |                           | SBS 1and 2 Filter mount (2 per set)                 | 5264-305-23    | MSSL |
|                         |                           | SBS 1and 2 Filter Clamp                             | 5264-305-24    | MSSL |
|                         |                           | Clamp Plate SFIL -3                                 | 5264-307-3     | MSSL |

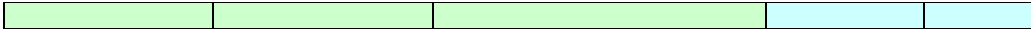
| <b>Optics</b> | <b>Mirrors</b> | CM3     | LAM            |        |     |
|---------------|----------------|---------|----------------|--------|-----|
|               |                | CM5     | LAM            |        |     |
|               |                | PM6     | LAM            |        |     |
|               |                | PM7     | LAM            |        |     |
|               |                | PM8     | LAM            |        |     |
|               |                | PM9     | LAM            |        |     |
|               |                | PM10    | LAM            |        |     |
|               |                | PM11    | LAM            |        |     |
|               |                | SM6     | LAM            |        |     |
|               |                | SM7     | LAM            |        |     |
|               |                | SM8A    | LAM            |        |     |
|               |                | SM9A    | LAM            |        |     |
|               |                | SM10A   | LAM            |        |     |
|               |                | SM11A   | LAM            |        |     |
|               |                | SM12A   | LAM            |        |     |
|               |                | SM8B    | LAM            |        |     |
|               |                | SM9B    | LAM            |        |     |
|               |                | SM10B   | LAM            |        |     |
|               |                | SM11B   | LAM            |        |     |
|               |                | SM12B   | LAM            |        |     |
|               |                | SCCA1   | LAM            |        |     |
|               |                | SCCA2   | LAM            |        |     |
|               |                | SCCB1   | LAM            |        |     |
|               |                | SCCB2   | LAM            |        |     |
|               |                |         |                |        |     |
|               |                |         | <b>Filters</b> | CFIL1  | UWC |
|               |                |         |                | PFIL-2 | UWC |
|               |                | PFIL-3  |                | UWC    |     |
|               |                | PDIC-1  |                | UWC    |     |
|               |                | PDIC-2  |                | UWC    |     |
|               |                | PFIL-4S |                | UWC    |     |
|               |                | PFIL-5S |                | UWC    |     |
|               |                | PFIL-4M |                | UWC    |     |
|               |                | PFIL-5M |                | UWC    |     |
|               |                | PFIL-4L |                | UWC    |     |
|               |                | PFIL-5L |                | UWC    |     |
|               |                | PFIL-6L |                | UWC    |     |
|               | SBS1           | UWC     |                |        |     |
|               | SBS2           | UWC     |                |        |     |
|               | SFIL2          | UWC     |                |        |     |
|               | SFIL3S         | UWC     |                |        |     |
|               | SFIL3L         | UWC     |                |        |     |
|               | SFIL4S         | UWC     |                |        |     |
|               | SFIL5S         | UWC     |                |        |     |
|               | SFIL6S         | UWC     |                |        |     |
|               | SFIL4L         | UWC     |                |        |     |
|               | SFIL5L         | UWC     |                |        |     |
|               | SFIL6L         | UWC     |                |        |     |

|                             |  |                                    |                   |     |
|-----------------------------|--|------------------------------------|-------------------|-----|
| <b>Black Tiles</b>          |  | On Baffle near SM9A Mirror         | BAFSM9A           | RAL |
|                             |  | Photometer Cover -X Inner face     | CMX-01            | RAL |
|                             |  | Photometer Cover -Y Inner face     | CMY-01            | RAL |
|                             |  | Photometer Cover +Z Inner face     | CPZ-01            | RAL |
|                             |  | Below CM3 on Optical Sub-bench     | OSB-01            | RAL |
|                             |  | Below CM3 on Optical Sub-bench     | OSB-02            | RAL |
|                             |  | Phot Box Bottom Cover              | PBB-01            | RAL |
|                             |  | Phot Box Bottom Cover              | PBB-02            | RAL |
|                             |  | Phot Box Bottom Cover              | PBB-03            | RAL |
|                             |  | Photometer Box Bottom Cover        | PBB-04            | RAL |
|                             |  | Photometer Det. Box Bottom Cover   | PBB-05            | RAL |
|                             |  | Phot. Box Bottom Cover             | PBB-06            | RAL |
|                             |  | Phot. Box Lid                      | PBL-01            | RAL |
|                             |  | Photometer Detector Box Spine      | PBS-01            | RAL |
|                             |  | Photometer Detector Box Spine      | PBS-02            | RAL |
|                             |  | Photometer Detector Box Spine      | PBS-03            | RAL |
|                             |  | Photometer Cold Stop               | PCS               | RAL |
|                             |  | S-Cal Box outer wall               | SCB-01            | RAL |
|                             |  | S-Cal Box inside wall              | SCB-02            | RAL |
|                             |  | S-Cal Box inside wall              | SCB               | RAL |
|                             |  | Det Box Level-0 Strat-Light Baffle | SLB               | RAL |
|                             |  | SM 12A                             | SM12A             | RAL |
|                             |  | SM12B                              | SM12B             | RAL |
|                             |  | Inout Baffe Minus Y Face           | SMY-01            | RAL |
|                             |  | Inout Baffe Minus Y Face           | SMY-02            | RAL |
|                             |  | Inout Baffe Minus Y Face           | SMY-03            | RAL |
|                             |  | Inout Baffe Minus Y Face           | SMY-04            | RAL |
|                             |  | Input Baffle Minus Z face          | SMZ-01            | RAL |
|                             |  | Inout Baffe Plus Y Face            | SPY-01            | RAL |
|                             |  | Inout Baffe Plus Y Face            | SPY-02            | RAL |
|                             |  | Inout Baffe Plus Y Face            | SPY-03            | RAL |
|                             |  | Inout Baffe Plus Y Face            | SPY-04            | RAL |
|                             |  | Inout Baffe Plus Y Face            | SPY-05            | RAL |
|                             |  | Input Baffle Plus Z Face           | SPZ-01            | RAL |
|                             |  | Input Baffle Plus Z Face           | SPZ-02            | RAL |
|                             |  | Input Baffle Plus Z Face           | SPZ-03            | RAL |
|                             |  | Input Baffle Plus Z Face           | SPZ-04            | RAL |
|                             |  |                                    |                   |     |
|                             |  |                                    |                   |     |
| <b>Beam steering mirror</b> |  | Mechanism assembly                 | SPIRE-BSM-006-001 | ATC |
| <b>3He Cooler</b>           |  | Cooler s/n 1                       | 2000-14B-000      | SBT |

|   |                     |   |             |      |
|---|---------------------|---|-------------|------|
| <b>300 mK thermal straps and supports</b> |                     | Bus Bar Upper   | 5264-306-7  | MSSL |
|   |                     | Busbar Lower  | 5264-306-8  | MSSL |
|   |                     | BDA-Busbar Flange                                       | 5264-306-9  | MSSL |
|   |                     | Bus Connector PLW                                       | 5264-306-10 | MSSL |
|   |                     | Bus Junction ans PMW Connector                          | 5264-306-11 | MSSL |
|   |                     | Bus Junction Clamp Plate                                | 5264-306-12 | MSSL |
|   |                     | Light Trap to Bus Junction                              | 5264-306-13 | MSSL |
|   |                     | Bus Connector PSW                                       | 5264-306-14 | MSSL |
|   |                     | BDA-Busbar Flange                                       | 5264-306-15 | MSSL |
|   |                     | PLW Bus Strap   | 5264-306-16 | MSSL |
|   |                     | PMW Bus Strap   | 5264-306-17 | MSSL |
|   |                     | PSW Bus Strap   | 5264-306-18 | MSSL |
|   |                     | End stop Photometer Light Trap                          | 5264-306-19 | MSSL |
|   |                     | Light Trap Feed Through - Photometer                    | 5264-306-20 | MSSL |
|   |                     | Stop Bush -Bus Bar Mountings                            | 5264-306-21 | MSSL |
|   |                     | Light Trap Feedthrough spect.                           | 5264-307-6  | MSSL |
|   |                     | Light Baffle Junction                                   | 5264-307-7  | MSSL |
|   |                     | SSW Spect. BDA to light trap strap (5N Cu not annealed) | 5264-307-8  | MSSL |
|   |                     | SLW Spect. BDA to Light Trap Strap (5N Cu not annealed) | 5264-307-9  | MSSL |
|   |                     | BDA Cold Interface Spectrometer                         | 5264-307-10 | MSSL |
|   |                     | Bush inner Spectrometer light trap                      | 5264-307-11 | MSSL |
|   |                     | Bush outer Spectrometer light trap                      | 5264-307-12 | MSSL |
|   |                     | Cold Strap Support                                      | 5264-307-13 | MSSL |
|   |                     | Photometer Baffle                                       | LTS PFM-300 | UWC  |
|   |                     | Spectrometer Baffle                                     | LTS PFM-400 | UWC  |
|   |                     |   |             |      |
| <b>L0 Thermal Straps</b>                  |                     | Detector Box I/F  | 5264-309-02 | MSSL |
|   |                     | Cooler Pump I/F   | 5264-309-02 | MSSL |
|   |                     | Cooler Evap I/F   | 5264-309-02 | MSSL |
|   |                     |   |             |      |
| <b>300 mK Thermal control system</b>      |                     | PTC system s/n 2  | 10217660-1  | JPL  |
|   |                     |   |             |      |
| <b>BDA</b>                                | Photometer LW array | 10209800-1  | s/n 14      | JPL  |
|   | Photometer MW array | 10209800-2  | s/n 12      | JPL  |
|   | Photometer SW array | 10209800-3  | s/n 13      | JPL  |
|   | Spectrometer SW     | 10209800-5  | s/n 09      | JPL  |
|   | Spectrometer LW     | 10209800-4  | s/n 08      | JPL  |

|                               |                   |   |                |         |
|-------------------------------|-------------------|---|----------------|---------|
| <b>SMEC</b>                   | FM                | LAM.SSP.SPI.ADP.041020  |                | LAM     |
| <b>PCAL</b>                   | FM                | PCAL assembly   | PCAL-PFM-000   | UWC     |
| <b>FPU RF Filters</b>         | Box               | RFI Filter Bracket Corner Bracket                             | A2/5264/302-27 | MSSL    |
|                               |                   | Tempory RFI Bracket   | A2/5264/302-28 | MSSL    |
|                               |                   | RFI Filter Frame Edge Bracket                                 | A2/5264/302-29 | MSSL    |
|                               | RF Filter Modules | RF-13   | 10209780-1     | JPL     |
|                               |                   | RF-14   | 10209780-2     | JPL     |
|                               |                   | RF-15   | 10209780-3     | JPL     |
|                               |                   | RF-16   | 10209780-4     | JPL     |
|                               |                   | RF-17   | 10209780-5     | JPL     |
|                               |                   | RF-18   | 10209780-6     | JPL     |
|                               |                   | RF-19   | 10209780-7     | JPL     |
|                               |                   | RF-21   | 10209780-8     | JPL     |
|                               |                   | RF-22   | 10209780-9     | JPL     |
|                               |                   | RF-23   | 10209780-10    | JPL     |
|                               |                   | RF-24   | 10209780-11    | JPL     |
|                               |                   | RF-25   | 10209780-12    | JPL     |
| <b>FPU internal harnesses</b> |                   | F1 PSW BDA J01 to HSJFP J29                                   | relabled J31   | Tekdata |
|                               |                   | F2 PSW BDA J02 to HSJFP J30                                   | relabled J32   | Tekdata |
|                               |                   | F3 PSW BDA J03 to HSJFP J31                                   |                | Tekdata |
|                               |                   | F4 PSW BDA J04 to HSJFP J32                                   |                | Tekdata |
|                               |                   | F5 PSW BDA J05 to HSJFP J33                                   |                | Tekdata |
|                               |                   | F6 PSW BDA J06 to HSJFP J34                                   |                | Tekdata |
|                               |                   | F7 PLW BDA J01 to HSJFP J35                                   |                | Tekdata |
|                               |                   | F8 PLW BDA J02 to HSJFP J36                                   |                | Tekdata |
|                               |                   | F9 PMW BDA J01 to HSJFP J37                                   | relabled J39   | Tekdata |
|                               |                   | F10 PMW BDA J02 to HSJFP to J38                               | relabled J40   | Tekdata |
|                               |                   | F11 PMW BDA J03 to HSJFP to J39                               |                | Tekdata |
|                               |                   | F12 PMW BDA J04 to HSJFP to J40                               |                | Tekdata |
|                               |                   | F13 SSW BDA J05 to HSJFS J11                                  |                | Tekdata |
|                               |                   | F14 SSW BDA J06 to HSJFS J12                                  |                | Tekdata |
|                               |                   | F15 SLW BDA J01 to HSJFS J13 (plus PTC Cold harnessing – F28) |                | Tekdata |
|                               |                   | F16 COOLER-P to FPU J19A                                      |                | Tekdata |
|                               |                   | F17 COOLER-R to FPU J20A                                      |                | Tekdata |
|                               |                   | F18 SCal-P to FPU J21A  |                | Tekdata |
|                               |                   | F19 SCal-R to FPU J22A  |                | Tekdata |
|                               |                   | F20 THERM-P to FPU J23A                                       |                | Tekdata |
|                               |                   | F21 THERM-R from FPU J24A                                     |                | Tekdata |
|                               |                   | F22 BSM-P to FPU J25A   |                | Tekdata |
|                               |                   | F23 BSM-R to FPU J26A   |                | Tekdata |
|                               |                   | F24 SMEC Launch (Prime) connected to FPU J27A                 |                | Tekdata |
|                               |                   | F25 SMEC Control (Prime) connected to FPU J29A                |                | Tekdata |
|                               |                   | F26 SMEC Launch (Red.) connected to FPU J28A                  |                | Tekdata |
|                               |                   | F27 SMEC Control (Red.) connected to FPU J30A                 |                | Tekdata |





| Thermometers   |                                 |          |         |         |
|----------------|---------------------------------|----------|---------|---------|
| <b>Level 1</b> | HSFPU Harness Filter Bracket    | EMCFIL_1 | CX-1030 | RAL     |
|                |                                 | EMCFIL_2 | CX-1030 | RAL     |
|                | M3,5,7 Optical Sub Bench        | T_SUB_1  | CX-1030 | RAL     |
|                |                                 | T_SUB_2  | CX-1030 | RAL     |
|                | Input Baffle                    | T_BAF_1  | CX-1030 | RAL     |
|                |                                 | T_BAF_2  | CX-1030 | RAL     |
|                | BSM/SOB I/F (SOB side)          | T_BSMS_1 | CX-1030 | RAL     |
|                |                                 | T_BSMS_2 | CX-1030 | RAL     |
|                | SCAL Structure                  | T_SCST_1 | CX-1030 | Cardiff |
|                |                                 | T_SCST_2 | CX-1030 | Cardiff |
|                | SCAL 4%                         | T_SCL4_1 | CX-1030 | Cardiff |
|                |                                 | T_SCL4_2 | CX-1030 | Cardiff |
|                | SCAL 2%                         | T_SCL2_1 | CX-1030 | Cardiff |
|                |                                 | T_SCL2_2 | CX-1030 | Cardiff |
|                | BSM                             | T_BSMM_1 | CX-1030 | RAL     |
|                |                                 | T_BSMM_2 | CX-1030 | RAL     |
|                | SMEC                            | T_FTSM_1 | CX-1030 | LAM     |
|                |                                 | T_FTSM_2 | CX-1030 | LAM     |
|                | SMEC/SOB I/F                    | T_FTSS_1 | CX-1030 | LAM     |
|                |                                 | T_FTSS_2 | CX-1030 | LAM     |
| <b>Level 0</b> | Cooler Pump                     | T_CPHP_1 | CX-1030 | CEA     |
|                |                                 | T_CPHP_2 | CX-1030 | CEA     |
|                | Cooler Shunt                    | T_CSHT_1 | CX-1030 | CEA     |
|                |                                 | T_CSHT_2 | CX-1030 | CEA     |
|                | Cooler Evap                     | T_CEV_1  | CX-1030 | CEA     |
|                |                                 | T_CEV_2  | CX-1030 | CEA     |
|                | Cooler Pump Heat Switch (sieve) | T_CPHS_1 | CX-1030 | CEA     |
|                |                                 | T_CPHS_2 | CX-1030 | CEA     |
|                | Cooler Evap Heat Switch (sieve) | T_CEHS_1 | CX-1030 | CEA     |
|                |                                 | T_CEHS_2 | CX-1030 | CEA     |
|                | Photometer Level 0 Enclosure    | T_PL0_1  | CX-1030 | RAL     |
|                |                                 | T_PL0_2  | CX-1030 | RAL     |
|                | Spectrometer Level 0 Enclosure  | T_SL0_1  | CX-1030 | RAL     |
|                |                                 | T_SL0_2  | CX-1030 | RAL     |

| Unit                    | P No | Module s/n | Board s/n | Channel | Supplier |
|-------------------------|------|------------|-----------|---------|----------|
| JFET Structure          |      |            |           |         | RAL      |
| JFET Modules 10209750-1 | P1   | 19         | 42        | PSW     | JPL      |
|                         | P2   | 20         | 50        | PSW     | JPL      |
|                         | P3   | 19         | 44        | PSW     | JPL      |
|                         | P4   | 20         | 51        | PSW     | JPL      |
|                         | P5   | 16         | 40        | PSW     | JPL      |
|                         | P6   | 16         | 45        | PSW     | JPL      |
|                         | P7   | 17         | 43        | PLW     | JPL      |
|                         | P8   | 17         | 41        | PLW     | JPL      |
|                         | P9   | 15         | 35        | PMW     | JPL      |
|                         | P10  | 12         | 22        | PMW     | JPL      |
|                         | P11  | 15         | 34        | PMW     | JPL      |
|                         | P12  | 12         | 23        | PMW     | JPL      |
|                         |      |            |           |         |          |
|                         |      |            |           |         |          |
|                         |      |            |           |         |          |
|                         |      |            |           |         |          |
| JFET Structure          |      |            |           |         | RAL      |
| JFET Modules 10209750-1 | S1   | 24         | 59        | SSW     | JPL      |
|                         | S2   | 24         | 60        | SSW     | JPL      |
|                         | S3   | 14         | 36        | SLW     | JPL      |
|                         | T1   | 14         | 37        | PTC     | JPL      |
|                         |      |            |           |         |          |
|                         |      |            |           |         |          |
|                         |      |            |           |         |          |

**Warm Electronics**

| Subsystem  | Serial No  | Unit | Item         | Drawing/Ref | Supplier |
|------------|------------|------|--------------|-------------|----------|
| <b>DCU</b> | <b>PFM</b> | DCU  |              |             |          |
|            |            |      | LIA P1       |             | SAP      |
|            |            |      | LIA P2       |             | SAP      |
|            |            |      | LIA P3       |             | SAP      |
|            |            |      | LIA P4       |             | SAP      |
|            |            |      | LIA P5       |             | SAP      |
|            |            |      | LIA P6       |             | SAP      |
|            |            |      | LIA P7       |             | SAP      |
|            |            |      | LIA P8       |             | SAP      |
|            |            |      | LIA P9       |             | SAP      |
|            |            |      | LIA S1       |             | SAP      |
|            |            |      | LIA S2       |             | SAP      |
|            |            |      | LIA S3       |             | SAP      |
|            |            |      | Data Acq - P |             | SAP      |
|            |            |      | Data Acq - R |             | SAP      |
|            |            |      | Bias - P     |             | SAP      |
|            |            |      | Bias - R     |             | SAP      |
| <b>FCU</b> | <b>PFM</b> |      |              |             |          |
|            |            | PSU  | PSU-P        |             | SAP      |
|            |            |      | PSU-R        |             | SAP      |
|            |            | SCU  | SCU-P        |             | SAP      |
|            |            |      | SCU-R        |             | SAP      |
|            |            | MCU  | MCU-P        |             | LAM      |
|            |            |      | MCU-R        |             | LAM      |
|            |            |      |              |             |          |
|            |            |      |              |             |          |
| <b>DPU</b> |            | DPU  | DPU-P        |             | IFSI     |
|            |            |      | DPU-R        |             | IFSI     |
|            |            |      |              |             |          |

| OBSW    |            |  |
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| Version | date       |  |
| 2.2.G   | 16/01/2007 |  |
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