SPIRE IBDR
Guide to Documentation

The Instrument Baseline Design Review (IBDR) of the SPIRE instrument will be based on the documentation provided, with the opportunity to clarify any open points at the presentation meeting on the 5th and 6th March.

Below are listed the documents that will be provided for the review. Section 1 contains those that are considered to be essential for the Review Board to be able to understand the current status of the project. Section 2 contains documentation provided for information or for the benefit of technical specialists participating in the review who may need to look at some aspects in more detail.

The documentation is meant to reflect the status of the project at the end of December 2001 although, where available, later documents have been provided.

The documents are available on the ESA Herschel/Plank Livelink system. The essential documents (Section 1) will be found in the folder **SPIRE/Review Documentation/IBDR, 5th-6th March 2002.** The additional documentation (section 2) is available in the normal SPIRE folders, notably the majority are in **SPIRE/Draft Documents/SPIRE-Draft** and its subfolders. In addition, board members will receive the complete documentation set (sections 1 & 2) on CD.

The documentation is arranged in folders organised as follows:

IBDR

IBDR Documentation Guide (SPIRE-RAL-NOT-001145) (**this note**)
IBDR Preparation Plan (SPIRE-RAL-NOT-001143)
IBDR Draft Agenda (SPIRE-RAL-MAG-001144)

1. Review Documentation

1.1 Top-level Requirements Documents

- Science Requirements Document (SPIRE-UCF-PRJ-000064)
- Instrument Requirements Document (SPIRE-RAL-PRJ-000034)
- Calibration Requirements Document (SPIRE-RAL-PRJ-001064)

1.2 Instrument Design Description and Development Plan

- SPIRE Design Description Document (SPIRE-RAL-PRJ-000620)
- EMC Control Plan. (SPIRE-RAL-PRJ-000852)

1.2.1 Instrument Development Plan

- SPIRE Instrument Development Plan (SPIRE-RAL-PRJ-000035)
- Major Milestone List (SPIRE-RAL-PRJ-000455)
- SPIRE Instrument Schedule (04Feb02) (SPIRE-RAL-PRJ-000698)

1.2.1.1 Subsystem Development Plans

- ATC BSM Development Plan (SPIRE-ATC-PRJ-000466)
- Cardiff Calibrators Development Plan (SPIRE-QMW-PRJ-000467)
- Cardiff Filters Development Plan (SPIRE-QMW-PRJ-000473)
- Cardiff 300mK Straps Subsystem Development Plan (SPIRE-QMW-PRJ-000629)
- IFSI DPU/ICU Development Plan (SPIRE-IFS-PRJ-000469)
- LAM Mirrors and Alignment Tools Development Plan (SPIRE-LAM-PRJ-000474)
- LAM Spectrometer Mirror Mechanism Development Plan (SPIRE-LAM-PRJ-000476)
- MSSL Structure Subsystem Design and Development Plan (SPIRE-MSS-PRJ-000426)
- RAL AIV Facilities Development Plan (SPIRE-RAL-PRJ-000477)

- SAp Detector Readout Control Unit and Warm Interconnect Harness Development Plan (SPIRE-SAP-PRJ-000471)
- SBT SPIRE & PACS Sorption Cooler Development Plan (SPIRE-SBT-PRJ-000468)
- SO Development Plan for the DRCU simulator (SPIRE-STK-PRJ-000470)
- USK Shutter Development Plan (SPIRE-USK-PRJ-000475)

1.2.1.2 Subsystem Schedules

- ATC BSM (10Sep01)
- Cardiff Filters and Calibrators (31Jan02)
- IFSI DPU (18Oct01)
- JPL BDAs (06Sep01)
- LAM Mirrors (30Mar01)
- LAM SMEC (15Oct01)
- MSSL Structure (26Nov01)
- RAL Test Facility (01Oct01)
- SAp DRCU (28Jan02)
- SBT Cooler (31Oct01)
- SO DRCU Simulator (21Dec00)
- USK Shutter (17Jul01)

1.3 IID-B and related documents

- IID Part A (SPIRE-ESA-DOC-000178)
- IID Part B (SPIRE) (SPIRE-ESA-DOC-000275) – Version 1.0 is provided as the latest signed version. Version 2.0 is provided as the version against which the ECRs are written (note this version is available in this folder only on the CD, on livelink it can be found in the **SPIRE/Configured Documents/ESA Mirror/Spacecraft Interface** folder
- Thermal Model (SPIRE-RAL-PRJ-000560)
- FPU Mechanical Model (Structure FEA) – (SPIRE-MSS-PRJ-001141)
- Harness Definition Document (SPIRE-RAL-PRJ-000608)
- Budgets spreadsheets (SPIRE-RAL-PRJ-000450)
- SPIRE Telemetry Data Rates (SPIRE-RAL-NOT-001083)
- Optical error budget (SPIRE-LAM-PRJ-000446)

1.3.1 IIB Part B ECRs

This folder contains those ECRs relating to the IID Part B

1.3.2 Stray Light Model

- SPIRE Straylight Model Reference Documents (SPIRE-RAL-NOT-001124)
- FIRST Payload Module/Focal Plane Unit Straylight Model: Final Report (SPIRE-RAL-REP-001117)
- Descriptions of CODEV and APART models of FIRST-SPIRE (SPIRE-RAL-NOT-000229)
- CM4 Hole Size Considerations and Straylight Control (SPIRE-RAL-NOT-000576)
- Definition of a Combined Focal Plane Aperture for the SPIRE Instruments (SPIRE-RAL-NOT-000581)
- SPIRE Instrument Beam Sections Forwards of the Focal Plane Aperture Plate (SPIRE-RAL-NOT-000586)
- Proposed Shapes for Spectrometer Baffle Apertures at SBS1 and SBS2 (SPIRE-RAL-NOT-000598)
- Straylight Model Update (SPIRE-RAL-NOT-000625)
- Straylight Model presentation (SPIRE-RAL-MHO-001125)

1.4 On-Board Software

- OBS URD (SPIRE-IFS-PRJ-000444)

- OBS Software Specification Document (SPIRE-IFS-PRJ-001036)
- Note on SPIRE DPU Architecture (SPIRE-IFS-NOT-001130)
- Operating Modes for the SPIRE Instrument (SPIRE-RAL-PRJ-000320)
- Operating the SPIRE Instrument (SPIRE-RAL-DOC-000768)
- SPIRE Data ICD (SPIRE-RAL-PRJ-001078)

1.5 AIV Plan

- AIV Plan (SPIRE-RAL-PRJ-000410)
- Warm Electronics Integration Plan (SPIRE-RAL-DOC-001132)
- FPU integration plan - MAIV Flowchart (SPIRE-MSS-PRJ-001023)
- Alignment Plan (SPIRE-LAM-PRJ-000445)
- Alignment Procedure (SPIRE-LAM-PRJ-000637)
- Manufacturing Flowchart – included in the STM and CQM Test Plans
- SPIRE STM ILT Test Plan (SPIRE-RAL-DOC-001048)
- SPIRE CQM ILT Test Plan (SPIRE-RAL-DOC-001049)

1.6 GSE

- GSE Overview (SPIRE-RAL-DOC-001133)

1.7 PA

- FMECA - Subsystem FMECAS and reliability analyses are to be found in the individual subsystem folders
- Worst Case Analysis - DPU Analysis is to be found in the DPU subsystem folder.
- Sensitivity Analysis - to be found in the Technical Notes (section 2.2)
- HW/SW interaction analysis - Not available
- FDIR Philosophy (SPIRE-RAL-PRJ-001128)
- Cleanliness Plan (SPIRE-RAL-PRJ-001070)
- Verification Matrices - see AIV Plan
- Configured Items Data List (SPIRE-RAL-PRJ-001134)
- Critical Items List (SPIRE-UCF-PRJ-001138)
- Engineering Change Requests – Status Report (SPIRE-RAL-PRJ-1080)
- Non-Conformance Reports – Status Report (SPIRE-RAL-PRJ-0001079)
- Requests for Waiver – Status Report (SPIRE-RAL-PRJ-001081)

1.7.1 Parts, Processes and Materials Lists

- Combined DMPL (SPIRE-RAL-PRJ-001094)
- Combined DML (SPIRE-RAL-PRJ-001092)
- Combined DPL (SPIRE-RAL-PRJ-001093)
- Combined EEE Parts (SPIRE-RAL-PRJ-001095)

2. Other information

2.1 Subsystems

Each subsystem folder contains documentation from the subsystem DDR plus any updated documentation. This includes Interface Control Documents.

2.2 Technical notes and papers

The following technical notes are available on Livelink and on the IBDR distribution CD and are brought to the attention of the review board to add background information on the instrument design and implementation. In particular these notes document changes to the design and issues addressed since the IIDR in April 2001.

2.2.1 Design Description and Overview

SPIRE Instrument for Herschel – (Toledo paper)

SPIE optics paper – (SPIE_4013_31_05)
SPIE diffraction analysis paper – (SPIE4013_12)
SPIE FTS paper – (SPIE4013_11)

2.2.2 Optical Design Tech Notes

Feedhorn Focus Positions (TN000566)
SPIRE Optical Design - Diffraction Analysis and Design (DOC000441)
Angular scaling factors for the chop and jiggle movements in the BSM (TN001050)
Cryostat aperture size requirements (TN000993)
Beam propagation model of the FTS (TN000269)
Herschel telescope performances and performances degradation (TN001137)
Notes on re-design for telecentric FTS Focal Plane (TN001135)
Use of SM12 mirrors as spectrometer stop (TN001136)
SPIRE spectrometer field lens description (LAM.LOOM.SPIRE.NOT.2002.001-D)
SPIRE to HOB Alignment Budget (TN000754)
Straylight path issue in the FTS system of SPIRE Spectrometer (TN000863)

2.2.3 Sensitivity Models and Operations

SPIRE Sensitivity Models (TN000642)
A Note on SPIRE-PACS Parallel Mode (TN001131)

2.2.4 Redundancy/reliability tech notes

Criticality Analysis (TN000319)
Assessment of different WE architectures (TN000764)
A note on the required reliability for the DCU LIA Channels (TN001074)

2.2.5 Thermal Design Tech Notes

FPU Thermal Sensitivity to SMECm Power (TN000771)
JFET Enclosure Thermal Design Trade-Off 9TN001139)
Input Filter Heating Note (TN001126)

2.2.6 Structural Design Tech Notes

Random Vibration Specification for the SPIRE instrument (MSSL-technote-SPIRE-04)

2.2.7 Electronics Design Tech Notes

LIA Breadboard Test Report (Sap-SPIRE-fp-29-01)
E-mail exchange on the LIA Band Pass Filter design (TN001140)

2.2.8 On-board Software Tech Notes

Evaluation of the Command List Concept for SPIRE commanding (TN001011)
On Board Software Logical Model (TN001142)