Extended Meeting of the Commonality Steering Committee
ESTEC, 1 March 2000

Agenda - PART 1

Steering Committee

duration: around 3: 00 h

1. Introduction (FvB): 10 min

2. Approval of the minutes of the 3rd meeting (PE): 5 min

3. Review of the Action Items from the 3rd meeting (PE): 5 min

4. Brief Status Report on CWGs
   - CWG # 1-2 (HS): 10 min
   - CWG # 3 (SCI-SA): 10 min
   - CWG # 6 (SCI-SA): 10 min

5. Common Parts Procurement: Status (MvH): 15 min

6. On-Board S/W development: common elements (introduction PE): 30 min
   (this covers DPUs, SPUs, DEC/MEC, DRCU, etc. Each Project's Manager should provide a short status report . It is proposed that O. Bauer reports on the DPU OBSW review on 29.02.00 at IFSI)

7. Identification of additional "commonality" elements (introduction TP/PE): 20 min
   (It is proposed that K. King provides a short status report on "common" EGSE's)

8. Role of the Steering Committee and related groups (introduction PE): 20 min

9. AOB
   - SCOS-2000 status report (PE): 10 min
   - FSC Development K-O meeting: status report (JRR): 15 min
     - Date and place of next meeting
     - ICC and DPC Progress Reporting (PE): 5 min

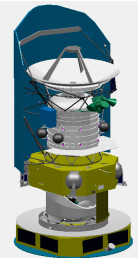
Extended Meeting of the Commonality Steering Committee
ESTEC, 1 March 2000

Agenda - PART 2

Identification of S/C - Instruments interface issues

duration: around 3: 00 h

1. ESA's (prioritised) compilation of instrument needs (TP)
2. ESA's proposed approach (TP)
3. Discussion (all)
4. Conclusions and Actions
5. AOB

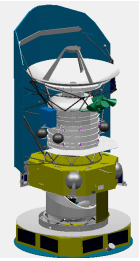


Commonality Working Groups

Steering Committee

Meeting # 4

ESTEC 01 March 2000



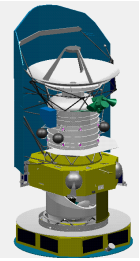
FIRST/Planck

Commonality Working Group #1-2

(microprocessors, coordinated parts procurement, S/C interfaces)

Status Report

ESTEC, 1 March 2000 A. Heske/ H. Schaap (SCI-PT)



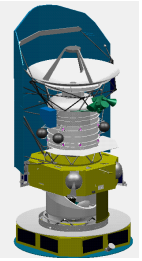
Commonality Working Group #1-2

Meetings

- 1 st meeting held 3 March 1999 at ESTEC
- 2 nd meeting held 2 July 1999 at ESTEC
- 3 rd meeting scheduled 19 Nov. 1999 at ESTEC (postponed)

Technical Results

- Microprocessor TSC21020DSP selected as common processor
- OBDH interface MIL-1553 B selected
- FIRST AOCS dedicated meeting held 11 June 1999
- Parts Procurement activities started (M. von Hoegen)



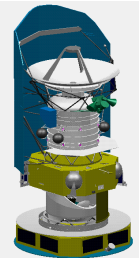
Commonality Working Group #1-2

Next Steps

- Terminate CWG #1-2 activities
- Transfer tasks to smaller dedicated working groups.

Outstanding items

- KAL philosophy: Discussion on concept started 21 Feb.
- Further 1553-B definition/ Bus redundancy philosophy/ Protocols: Will be dealt with in dedicated working groups.



Commonality Working Group #1-2

AI status

- CW-06893-00A/B Responded in Email H. Schaap 05-10-99. Status: Closed
- CW-06893-01 Specified in IID-A. Status: Closed
- CW-06893-02 Info as in IID-B. Status: Closed
- CW-06893-03 Dedicated activity started. Status: Closed

- AI-FI-06892-00PACS and SPIRE: Open. HIFI: Closed
- AI-FI-06892-01PACS and SPIRE: Open. HIFI: Closed
- AI-FI-06892-02Fax: SCI-PT-06929. Status: Closed
- AI-FI-06892-03PACS and SPIRE: Open. HIFI: Closed

CWG #3 RTA Report

CWG#3 RTA activities

- Meeting #2 (19 May 1999):
  - Planning for the assessment of SCOS-2000 as RTA framework
  - Planning on RTA user requirements definition
  - Presentation on RTA package used for Integral operations
- RTA URD draft 1 distributed for comments (1 June 1999)
- SCOS-2000 presentation at ESOC attended by Planck and FIRST Instrument Teams (17-18 June 1999)
- Demonstration/testing of the usage of SCOS-2000 as RTA framework (MPE, 3-4 November 1999)
- Meeting #3 (5 November 1999) to discuss the results from the SCOS-2000 test and how to proceed in the future
- Final evaluation report on SCOS-2000 as RTA framework issued (22 December 1999)

- RTA Delta-URD with requirements listed in the RTA URD, but not implemented in SCOS-2000, issued by HIFI for comments (27 January 2000)
- CWG#3 RTA has finished its activities. A new WG in the framework of SCOS-2000 will be set-up. Details of participation/coordination to be discussed.

Results of Commonality WG no. 6

FINDAS-IDIS Commonality Status Report

ESTEC, 1 March 2000

Peter Claes

ESA Astrophysics Division, Space Science Department

1. Structure of the CWG6 meetings

Part 1 : report on FINDAS prototype activities

- Development of client-applications for the testing of the FINDAS-prototype.
- Testing of the FINDAS concept with these clients.
- System testing to test interoperability of clients.
- Presentation of the test/evaluation results by the different FINDAS prototype evaluation groups.
- Integration at and support from ESTEC.
- Discussions about FINDAS and its testing.

Part 2 : FINDAS-IDIS commonality

- Presentation about FINDAS and IDIS progress and Architecture
- Commonality of DMS, Configuration Control, CASE-tools, (Database ?)
- Potential of other types of commonality were examined

2. Chairman perception

- very active and enthousiastic meetings with inputs from all different test groups
- the system testing experience was of great benefit to understanding FINDAS and the problems associated with distributed development and operations
- test/evaluation results (conclusions and recommendations) are clear and univocal
- a desire exists from all FIRST Scientific Ground Segment groups to construct a common Object Data Model across the FIRST Scientific Ground Segment
- a consensus was reached about what FIRST has to offer to Planck and vice versa

3. Technical results

- Coherent Test Plan distributed including contributions of all groups.
- FINDAS Concept Evaluation Report (coherent Test Report) produced with conclusions and recommendations for the Operational System.
- Recommendations were made about the re-usability of the FINDAS-prototype as delivered by Vega, the FINDAS concept, how to best manage the FINDAS risks, the database product and associated vendor, training, the choice of COTS-soft-ware/products and the three tier architecture of FINDAS.
- Recommendations were made as well about how to develop in a distributed environment and make distributed operations work.

3. Technical results (cont'd)

What IDIS has to offer to FINDAS ...

- a Document Management System
- Experience with the Object Data Base Management System : "Objectivity"
- Evaluation of and Possible re-use of the SPR and RID-system originally coming from Integral
- the Data Management Component Interface (DMCI) as a means of encapsulating the client-application from the database

3. Technical results (cont'd)

What FINDAS has to offer to IDIS ...

- Storage of Planck data

- Possible common usage of certain abstract domain classes such as Observation of which both Planck and FIRST can inherite and which will be there interface for persistent storage of e.g. level 4 products at a later stage, at least the design should not be incompatible with this scenario.

4. Next activities

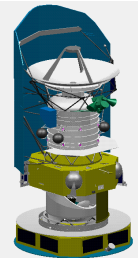
- Activities of CWG6 are taken over by the FIRST Ground Segment System Engineering Group.
- Group will only convene in the future when a special issue appears that needs to be discussed in the framework of FINDAS-IDIS commonality.
- It was agreed that the chairman and participants will be the same.

5. Critical Items of FINDAS

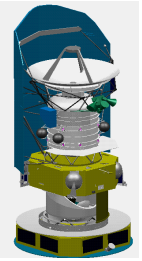
- the choice of Commercial Off the shelf software has a great impact on schedule and cost.

- Working together on geographically distributed locations is not evident and requires special preparation and attention : a suitable environment, set-up and communication means, another management approach, appropriate tools.

- An unclear definition, boundaries and multiple views of what FINDAS is and should do at present, exists.



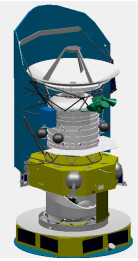
Coordinated Parts Procurement - CPP



Coordinated Parts Procurement - CPP

Why has ESA decided on Coordinated Parts Procurement?

- Maintain a specified quality level of all parts
- Reduce number of part - types/lots for economic and quality reasons
- Obtain timely delivery of parts
- Reduce multiple management structures

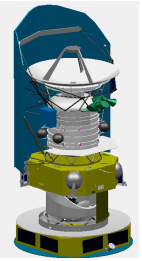


Coordinated Parts Procurement - CPP (cont'd)

Advantages to Instrument Teams

- Certainty to obtain correct parts/qualities
- Timely delivery due to coordination effort for all participants
- Big benefit in terms of parts costs and effort to the instrument teams

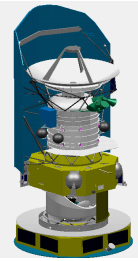
as ESA is prepared to pay for non-recurring and surcharge costs



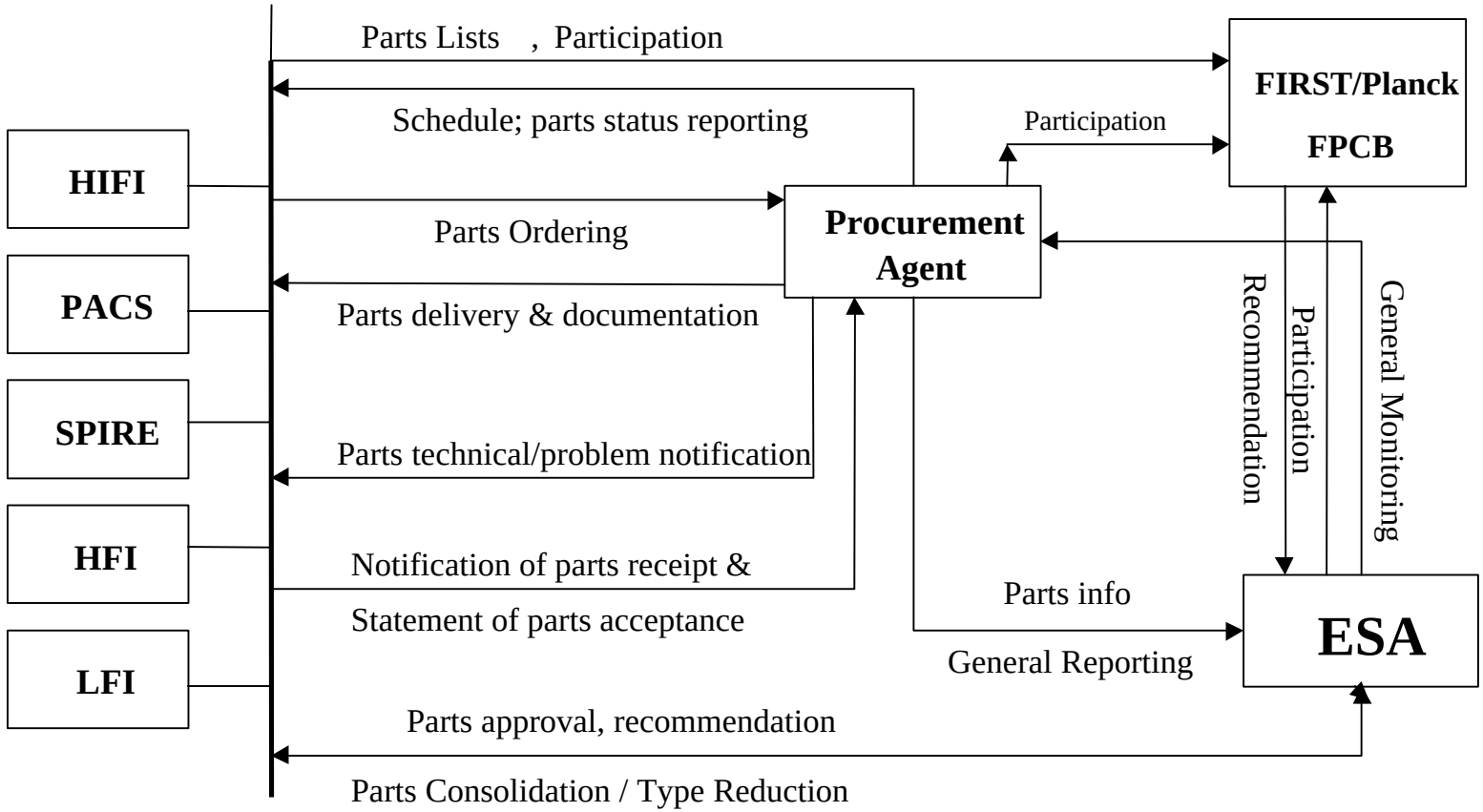
Coordinated Parts Procurement - CPP (cont'd)

Rules and Prerequisites:

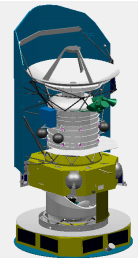
- Parts quality level is general B for active and C for passive components
- Only Parts which have common users
- Purchase order dates will be coordinated and harmonised as well as part need dates (only one order/Lot per part category)
- Rigorous type reduction exercise have to be accepted by the users
- Timely delivery of actions becomes absolutely vital
- Users which are not in line with overall schedule/action carry their own costs
- More detailed rules are defined in Instrument - ESA agreement documents



Parts Procurement Organisation



Principal Investigator Involvement



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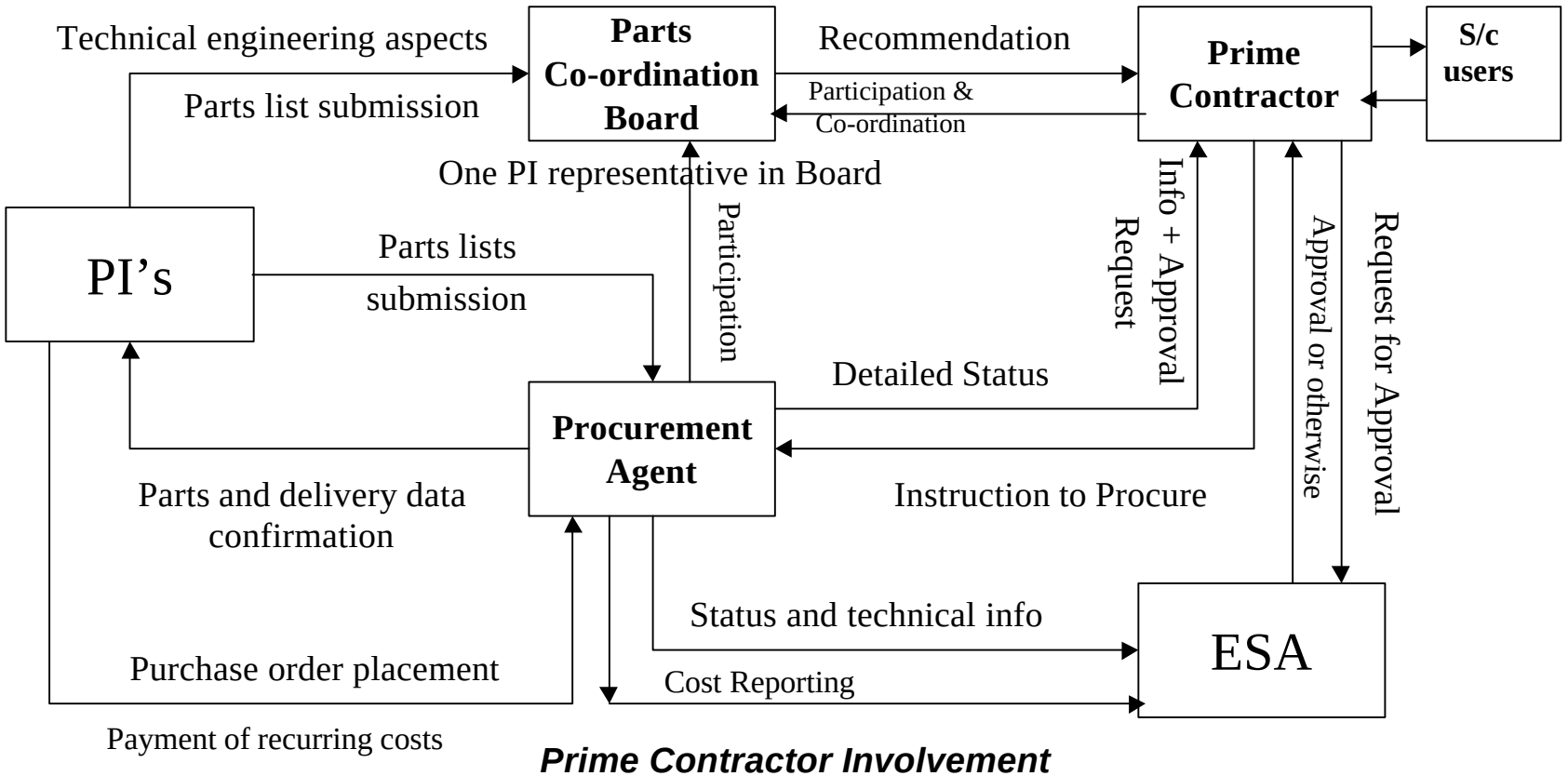
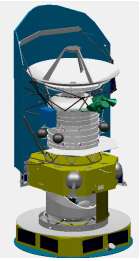


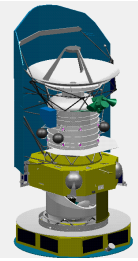
Prime Contractor Involvement



Coordinated Parts Procurement - CPP (cont'd)

Schedule:

- Proposal evaluation starting June till mid July 2000 (TBC)
- Kick Off meeting with selected Procurement Agent: 27 July 2000 (TBC at Agent)
- Introductory meeting Instruments, Proc. Agent and ESTEC: 28 July 2000 (TBC at Agent)
- Preliminary Instruments parts lists available at ESTEC: begin May 2000
- FPCB Meetings: 28.07.2000
  6/7.09.2000
  11/12.10.2000
  8/9.11.2000
  7/8.12.2000



Coordinated Parts Procurement - CPP (cont'd)

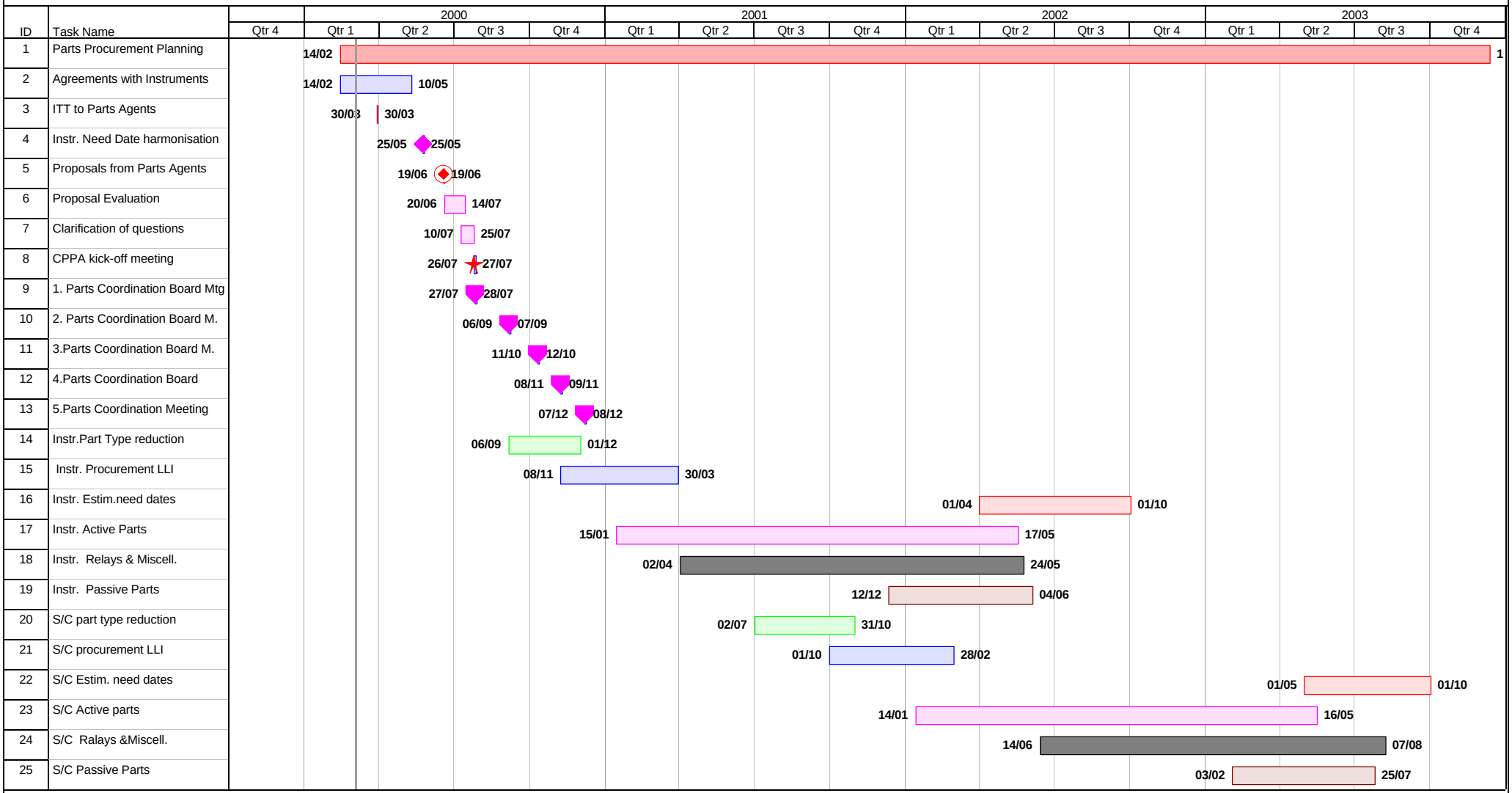
Future Outlook

- PI's to **accept and sign** agreement
  - incl. Model Purchase Order
  - definition of FRST/Planck Parts Coordination Board
- Parts lists to be send by **May 2000**
- Instrument need dates to be defined by **15 March 2000 the latest**

(Input to ITT for Procurement Agent)

FIRST/Planck

Coordinated Parts Procurement Schedule (Preliminary)



Project: Manfred
Date: Fri 03/03/00
Issue: 1

Task	Milestone	Rolled Up Critical Task	Split		
Critical Task	Summary	Rolled Up Milestone	External Tasks		
Progress	Rolled Up Task	Rolled Up Progress	Project Summary		

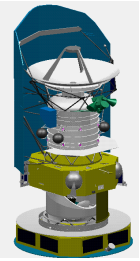
FIRST/Planck

Coordinated Parts Procurement Schedule (Preliminary)

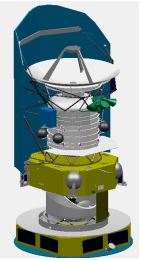
ID	Task Name	Qtr 4	2000 Qtr 1	2000 Qtr 2	2000 Qtr 3	2000 Qtr 4	2001 Qtr 1	2001 Qtr 2	2001 Qtr 3	2001 Qtr 4	2002 Qtr 1	2002 Qtr 2	2002 Qtr 3	2002 Qtr 4	2003 Qtr 1	2003 Qtr 2	2003 Qtr 3	2003 Qtr 4
26	Parts need dates	04/10																
27	LFI												16/09	16/09				
28	-REBA									17/12	17/12							
29	HIFI											15/05	15/05					

Project: Manfred
Date: Fri 03/03/00
Issue: 1

Task	Milestone	Rolled Up Critical Task	Split		
Critical Task	Summary	Rolled Up Milestone	External Tasks		
Progress	Rolled Up Task	Rolled Up Progress	Project Summary		

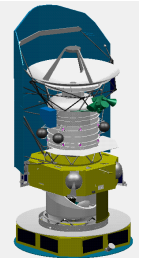


On- Board S/W Development
Common Elements



OBSW - Planck Instruments

HFI	DPU TSC 21020 (TEMIC) VIRTUOSO Language: H/W IN2P3 - LAL (F. Couchot) S/W IN2P3 - LAL (F. Couchot)	SCE ? CNRS - ISN (Grenoble)
LFI	DPU TSC 21020E (TEMIC) VIRTUOSO Language: C H/W IAC (J.M. Herreros) S/W IAC (J.M. Herreros)	SPU TSC 21020E (TEMIC) VIRTUOSO Language: C H/W IAC (J.M. Herreros) S/W IAC (J.M. Herreros)



OBSW - FIRST Instruments

SPIRE

DPU

ADSP 21020
VIRTUOSO
Language: C
H/W & S/W IFSI (R. Orfei)

DRCU

SPARC
R/T Kernel
Language: C/C++
H/W & S/W SaP (C. Cara)

PACS

DPU

ADSP 21020
VIRTUOSO
Language: C
H/W & S/W IFSI (R. Orfei)

SPU

ADSP 21020
VIRTUOSO ?
Language: ?
H/W IAC - (J. Herreros)
S/W TUW (?i)

DEC/MEC

DSP 21020
VIRTUOSO
Language: C
H/W CSL (J.M. Gillis)
S/W CSL (L. Renson)

HIFI

ICU

ADSP 21020
VIRTUOSO
Language: C
H/W & S/W IFSI (R. Orfei)

FIRST/PLANCK Steering Committee Meeting 1/3/2000

LFI Onboard Software Development Status

by

Chris Butler LFI Project Manager TESRE/CNR

LFI Onboard S/W Status 1/2

- IAC are preparing the Low Level Software Requirements for issue 14/3/00 for the REBA Development model of CRISA

  This in particular should include the interface towards the CDMU over the Mil Std 1553B bus, and will require revision with ESA

LFI Onboard S/W Status 2/2

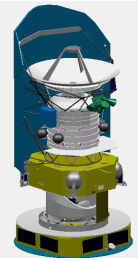
- IAC will commence the REBA URD doc. At beginning of April and first draft will be available at beginning of June.

Inputs are in preparation based on-

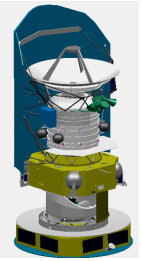
-REBA Specification

- Outputs of CWG 4+1/2 commanding, telemetry availability.

-Also telemetry modes, housekeeping, science data reduction and compression

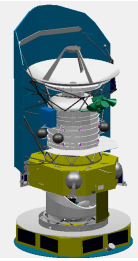


Identification of Additional Commonality Elements



Approach to “Additional” Commonality Elements

- Concentrate on the timeframe up to mid 2001
- Identify instrument needs (inputs to continue development)
- Identify common needs
- Define detailed specific task areas with
  - clear objectives
  - well defined timeframe
  - clear documented output
- Needs, not common, treated in technical meetings ESA/Instrument

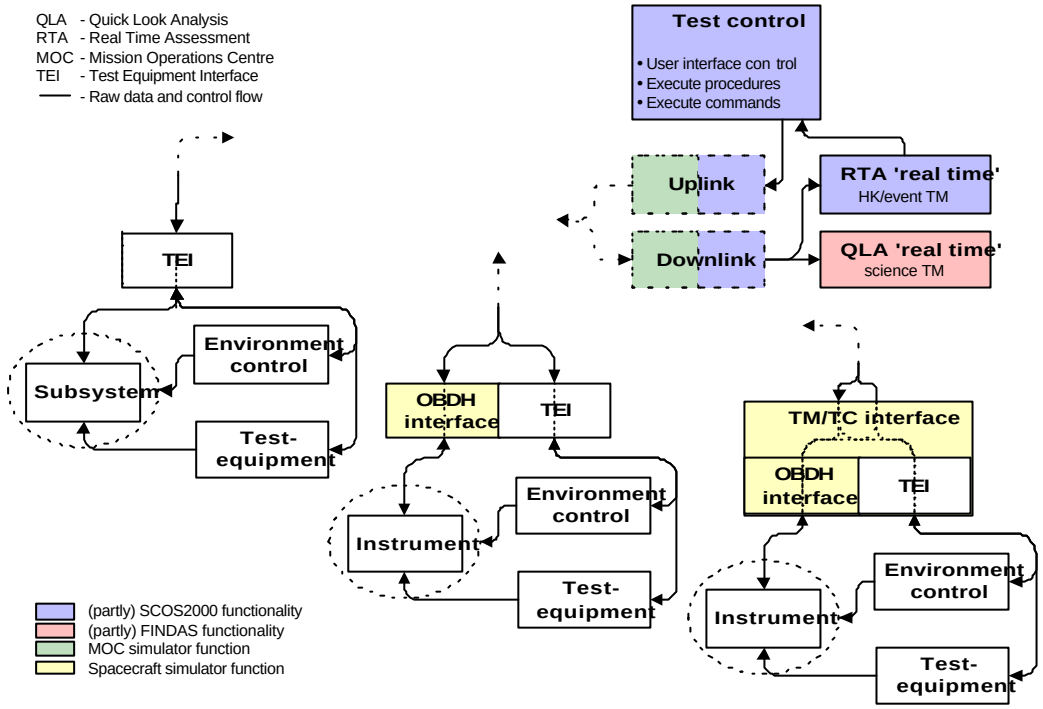


Implementation:

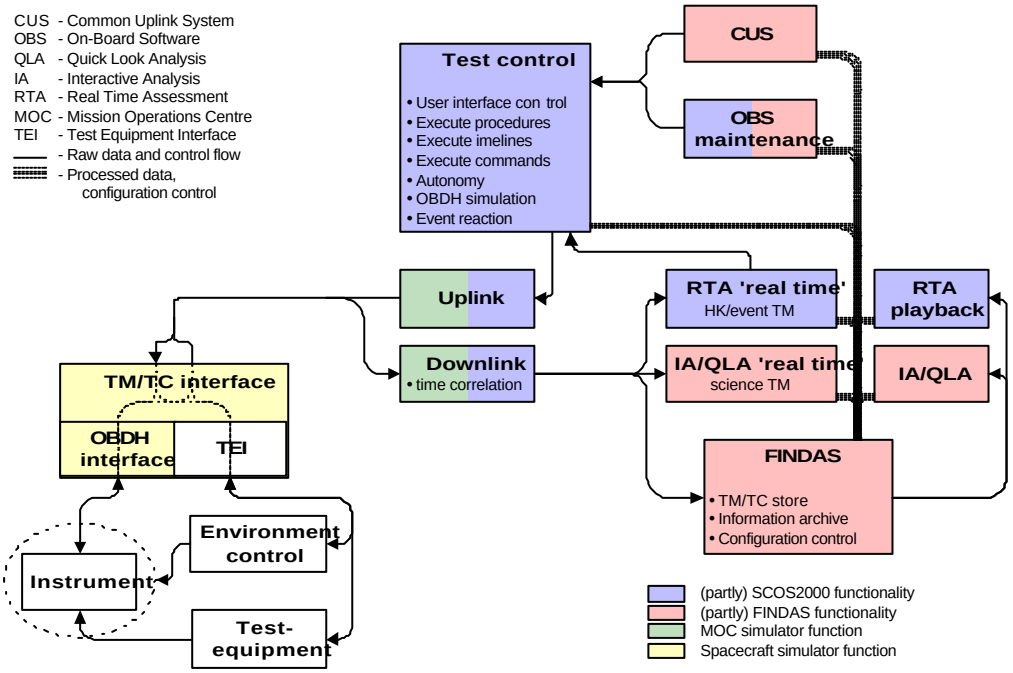
See activities on the agenda this afternoon

Replaces activities on CWG 1/2, “s/c interfaces”

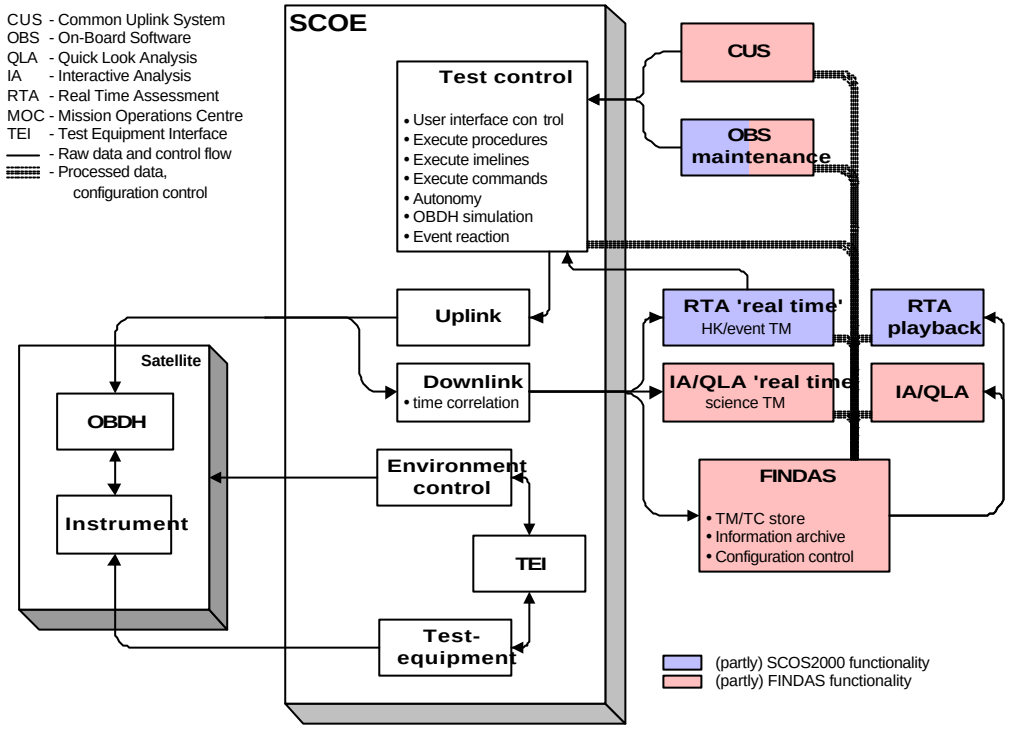
B Subsystem tests



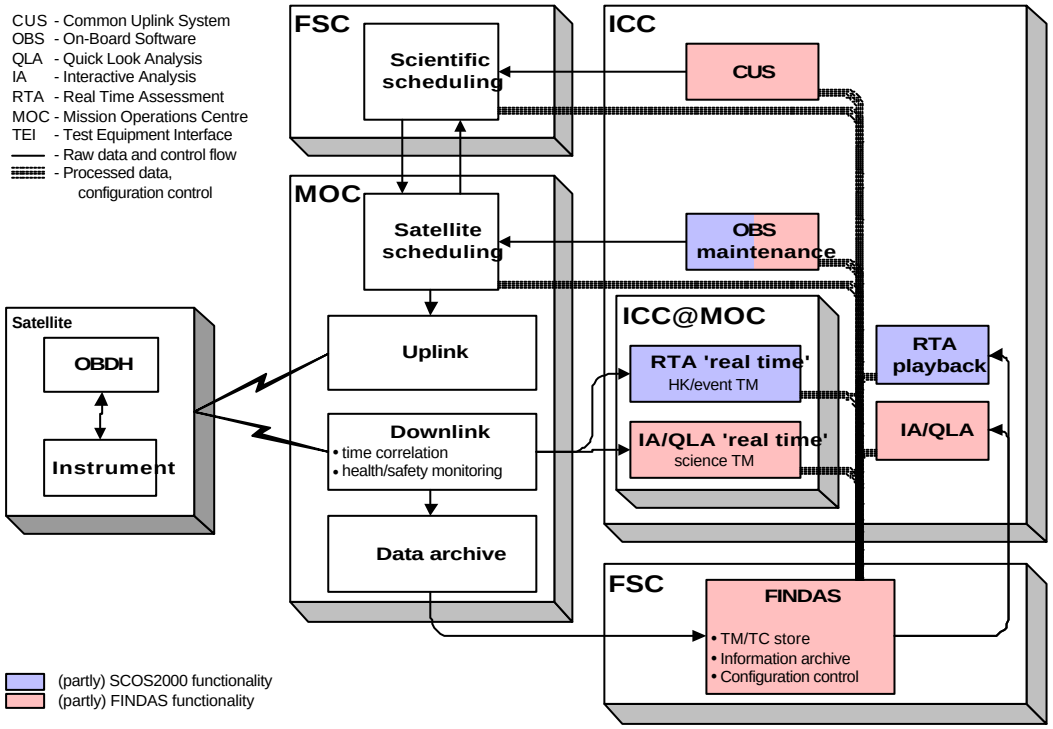
C ILT

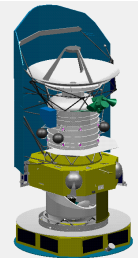


D IST

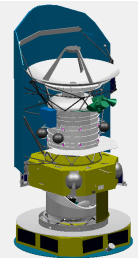


E Operations





SCOS-2000
Status Report



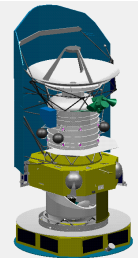
SCOS-2000 STATUS REPORT

History

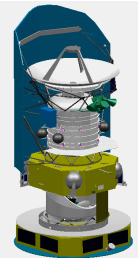
- 15-01-98 An approach to Common check-out and Control Systems for Rosetta and FIRST/Planck (Issue 1)

  27-02-98 High Level Requirements Specification Common Check-out and Control Systems for Science projects (Issue 1)

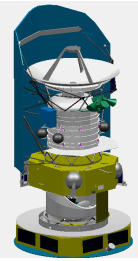
- 02-02-99
  - CWG#3 (RTA) recommends to investigate the possibility of using SCOS-2000 as a 'framework' for RTA (1st CWG meeting)
  - It also requests that an implementation plan for FINDAS be established. Highest priorities: R/T data provision and local storage



- 16-06-99 Draft RTA URD produced
- 17/18-06-99 SCOS-2000 presentation/Demo in ESOC
- 24-08-99
  - Informal meeting between HIFI-EGSE group and ESTEC EGSE section (B. Melton): Investigate feasibility of using SCOS-2000 in EGSE's (based on PROBA work)
  - F/P Project budgets 0.5 man-year in 2000 for ESTEC technical support to the F/P PIs (EGSE-related work)
- Oct. '99 Installation of SCOS-2000 version 0.2 (with ESOC and TERMA support) by PACS

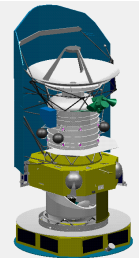


- 3/5-11-99 SOCS-2000 Evaluation at MPE-Garching (PACS)
- 23-11-99 Draft “licence agreements” sent by ESOC to O. Bauer, K. King, P. Roelfsema, F. Pasian and J.F. Sygnet
- 20-12-99 Short demo in ESOC of SCOS-2000 commanding capabilities (manual stack, TC history, TC verification).
  F-GSSE group meeting # 2
- 22-12-99 SCOS-2000 Evaluation report produced and sent to ESOC



- 18-01-00 ESOC's proposal for "SCOS-2000 Services and Support" sent to the PI groups (same distribution list as "licences")

- 28-02-00 ESOC's proposal for a SCOS-2000-to-SCOE standard interface sent to the PI groups



Current status

- No comments/queries received on the draft licence agreements (my E-mail of 18-01-00)
- Comments received on the “Service & Support” proposal

  HIFI (L. Dubbelman 24-02-00)

  SPIRE (K. King 20-01-00)

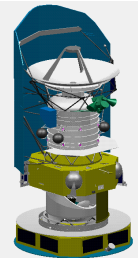
  PACS (O. Bauer 27-01-00)

  HFI (F. Couchot 17-02-00)
- SCOS-2000 Delta URD

  - Generation co-ordinated by HIFI (L. Dubbeldam)

  - Issue 1 RTA Delta URD available (27-01-00) - extract from Evaluation Report

  - WILL NOT be expanded to cover “commanding” and “test control”



- SCI/P willing to ‘indicate’ in the ITT that PI groups will use SCOS-2000 based EGSE (if confirmed)
- Need to close the loop latest by 15-04-00 (ITT schedule)
- Proposal: PI-ESA meeting in ESOC early April
- Reminder: F/P Project will not finance SCOS-2000 maintenance and support

4th meeting of the CWG Steering Committee

Report from the FSC Development Kick-Off Meeting

ESTEC, 01-March-2000

FSC Development Kick-Off Meeting

- Held at ESTEC on 23-Feb-2000 with participation from Project, Project Scientist Team, FSC Development Team, PACS, HIFI, SPIRE and MOC
- Presentations were given by FSCDT, PACS, HIFI, SPIRE and MOC

Agreements - 1

Agreement was reached on

- Short term work plan to update, review and agree the following essential documentation by mid April 2000:
  - FSC System URD
  - FIRST Operational Scenario Document
  - FIRST Ground Segment Interface Requirements Document
  - FSC Development Software Project Management Plan (SPMP)
- Medium term work plan to establish in collaboration between the FSC and ICCs
  - The Scientific Ground Segment Use Cases Document by June 2000
  - The Common Object Model by October 2000

Agreements - 2

Agreement was reached on

- Adopting for further discussion the FSCDT-proposed schedule framework for the overall development even if during detailed planning some of the dates for the currently identified ~50 “deliverable items” might have to be adjusted.
- Adopting the proposed object-oriented development approach which distinguishes the following phases:
  - Inception Phase (considered closed based on available documents)
  - Elaboration Phase
  - Incremental Construction Phase
  - Transfer Phase

Points to watch out for - 1

- Any demands from FIRST Scientific Ground Segment development on the MOC that causes MOC development to deviate from established ESOC templates will cost extra. Such “extras” include expecting
  - Any deliveries to be made earlier than required by MOC end users (e.g. Flight Dynamics S/W)
  - Support to any stand-alone tests of the Scientific Ground Segment (e.g. mini-MOC, NCTRS simulator, requirements on satellite simulator beyond generation of S/C and instrument HK data)

  Any such “extras” need to be identified in the MIRD and carefully justified (towards the Project prior to inclusion in the MIRD) because of the resulting cost increase in ESOC

Points to watch out for - 2

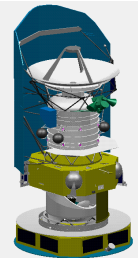
- FINDAS remains a high risk item, both in terms of its definition/functionality/boundaries (there will be as many different opinions on several aspects of FINDAS as there are people around the table) and its early deployment (availability of a first version in October 2001 considered critical to ILTs and related instrument deliveries by ICCs)
  $\Rightarrow$ Closely spaced checkpoints required to take corrective action **before** things can seriously go wrong
- Although ICCs apparently do have the necessary manpower to support use cases and Common Object Model definition according to the agreed milestones, not all ICCs appear to have organigrams and responsibilities clearly sorted out.

FSC Development

In need of improvement

- Relationship between FSC system releases (six between 2001 and 2006) and S/C AIV & instrument model deliveries needs to be identified (currently most system releases are only tied to ICC ILT and to scientific user needs).
- Functionality of the different FSC system releases from the point of view of all stakeholders needs to be expanded.

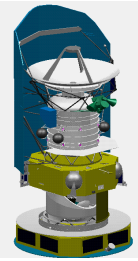
These improvements should be included in the SPMP, which will be issued in week 10/2000 for review



Identification

of

S/C - Instrument Interface Issues



Identification of S/C - Instrument Interface Issues

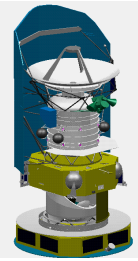
Why do we (ESA) want to do this?

Instrument teams need a minimum set of input to continue their development and delivery the instrument models in time

We (ESA) have to know the needs of the instruments in order to establish the S/C requirements

What do we want to do?

Define necessary minimum inputs/needs - leave maximum flexibility to industry for S/C design (we do not want to design the S/C !)



Identification of S/C - Instrument Interface Issues

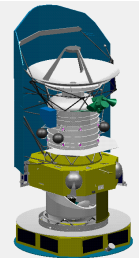
How do we want to do this?

Define dedicated tasks, with ESA leader/chair

Independent working groups (parallel work possible)

Work together with Instrument teams (everybody has to accept his responsibilities and has to contribute)

Various different ways - as it is most economic, i.e. written exchange, meetings (at ESTEC), ….



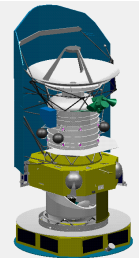
Identification of S/C - Instrument Interface Issues

When do we want to do this?

As needed, but the most important activities to start now!

Instrument teams to define participants

Further activities/needs can be defined at any stage



Identification of S/C - Instrument Interface Issues

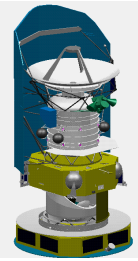
ESA had, in anticipation of needs, set up a number of activities and nominated the chairperson

An introduction to these activities is presented later by the chairmen

The inputs provided by all teams have been compiled and categorised (in view of predefined common activities)

Non-common needs, have linked to “IID-A related” or “dedicated need of one instrument”.

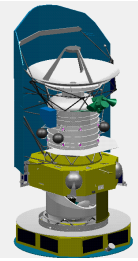
The complete list from instrument teams is attached to the handout



Identification of S/C - Instrument Interface Issues

The anticipated working groups/activities

- FIRST Instrument Alignment Plan update (FIA)
- Planck Telescope Working Group (PTW)
- Planck Cryogenic Testing (PCT)
- FIRST Instrument CQM Testing (FIT)
- Planck Instrument to AOCS Interfaces (PAO)
- FIRST Instrument to AOCS Interfaces (FAO)
- FIRST/Planck Instrument to CDMS Interfaces (FPD)
- FIRST System EMC Working Group (FEMC)
- Planck System EMC Working Group (PEMC)



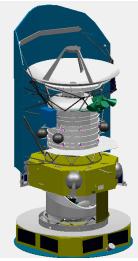
Identification of S/C - Instrument Interface Issues

Conclusion on working groups/activities

The identified working group tasks cover most needs

Areas to be discussed/potential additional common tasks

- FIRST/Planck Power Interface Working Group (FPP) ?
- Black Paint Working Group (BP) ?

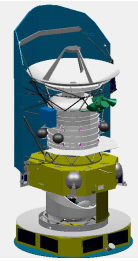


Planck Telescope Working Group

Tasks:

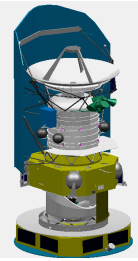
- Agree Planck Telescope Design Specification
- Agree Planck Telescope Reflectors Specification

  Establish Alignment Plan for Focal Plane Assembly with Telescope



Planck Telescope Working Group Composition

• Chair, organisation and lead	M. Anderegg
• ESA members	P. de Maagt
• Planck PS	J. Tauber
• Planck Instruments	Representatives of PI's
• Planck Reflectors	Representatives of DSRI

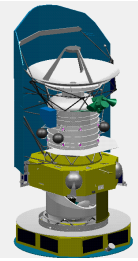


Planck telescope Working Group

Meetings and Duration

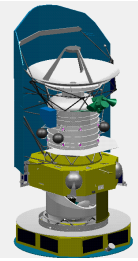
Four meetings on a monthly basis:

#1: 29-2-2000



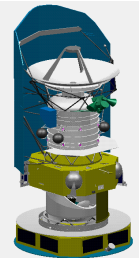
FIRST Alignment Working Group Task

- Update of existing First Alignment Plan



FIRST Alignment Working Group Composition

• Chair, organisation and lead	M. Anderegg
• ESA Members	P. de Maagt
• FIRST PS	G. Pilbratt
• FIRST Instruments	Representative of PI's
• FIRST Telescope	Representative of JPL

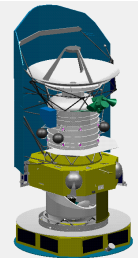


First Alignment Working Group

Meetings and Duration

Four meetings on a monthly basis

Kick off	CW 11
PM#1	CW 15
PM#2	CW 19
PM#3	CW 23



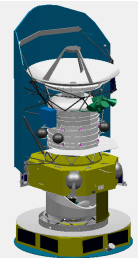
Planck Cryogenic Testing (PCT)

Subject

Testing of Planck Payload Module at operational temperature conditions is complex

Test is the only “integrated system test” with instruments near “real” operational conditions

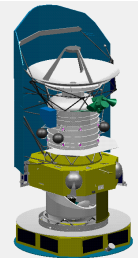
Modified test facility planned for testing of Planck Reflectors and the Planck Telescope



Planck Cryogenic Testing (PCT)

Objectives of Activity

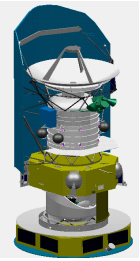
- Establish test configuration of PPLM cryogenic test in CSL
- Establish test objectives
- Establish first draft of the test success criteria
- Review and consolidate the instrument level tests
- Define facility interfaces to instruments, PPLM, Planck telescope and reflectors



Planck Cryogenic Testing (PCT)

Composition

Chair, organisation and lead:	**T. Passvogel**
ESA members:	**B. Collaudin, P. de Maagt, F. Wechsler**
Planck PS	**J. Tauber**
Planck Instruments:	**Representatives of the teams**
Planck Reflectors:	**Representative of DSRI**

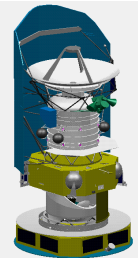


Planck Cryogenic Testing (PCT)

Meetings and Duration

Four meetings on a monthly basis:

Kick off:	**CW 11, 15.3.2000**
PM#1:	**CW 15, 14.4.2000**
PM#2:	**CW 20, 16.5.2000**
PM#3:	**CW 24, 14.6.2000**



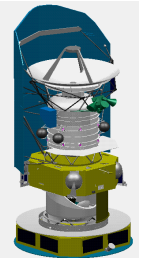
FIRST Instrument CQM Testing (FIT)

Subject

Test FIRST CQM instruments at operational temperature conditions in order to validate instrument to instrument compatibility

Validate the test procedures and operations with the CQM instruments for PFM.

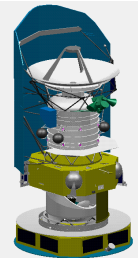
Use of existing ISO QM cryostat, refurbished for FIRST



FIRST Instrument CQM Testing (FIT)

Objectives of Activity

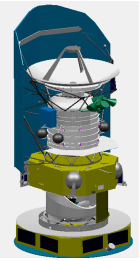
- **Establish test configuration of FIRST CQM instruments in test cryostat**
- **Establish test objectives**
- **Establish first draft of the test success criteria**
- **Review and consolidate the instrument level tests**



FIRST Instrument CQM Testing (FIT)

Composition

Chair, organisation and lead:	**T. Passvogel**
ESA members:	**B. Collaudin, F. Wechsler**
FIRST PS	**G. Pilbratt**
FIRST Instruments:	**Representatives of the teams**

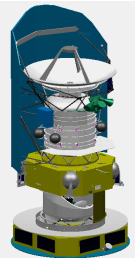


FIRST Instrument CQM Testing (FIT)

Meetings and Duration

Three meetings on a monthly basis:

Kick off:	**CW 11, 16.3.2000**
PM#1:	**CW 15, 14.4.2000**
PM#2:	**CW 20, 16.5.2000**

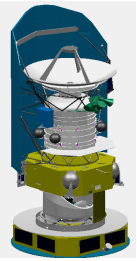


Planck Instrument to AOCS Interfaces (PAO)

Subject

AOCS functional and performance requirements

Instrument<>AOCS interfaces

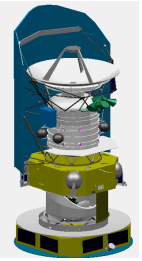


Planck Instrument to AOCS Interfaces (PAO)

Objectives of Activity

Ensure that all the instrument essential requirements are covered in the ITT

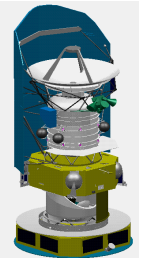
Ensure that the PIs understand what the requirement specification really means



Planck Instrument to AOCS Interfaces (PAO)

Composition

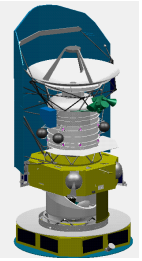
Chair, organisation and lead:	**A. Elfving**
Planck PS	**J. Tauber**
Planck Instruments:	**Representatives of the teams**



Planck Instrument to AOCS Interfaces (PAO)

Activities and Duration

Distribution of IID-A-0-2:	**15.02.2000**
Comments from PIs:	**15.03.2000**
Follow-up meeting:	**22.03.2000**
Close-out meeting (if needed):	**19.04.2000**



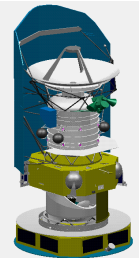
FIRST Instrument to AOCS Interfaces (FAO)

Subject

AOCS functional and performance requirements

FIRST Pointing Modes

Instrument<>AOCS interfaces

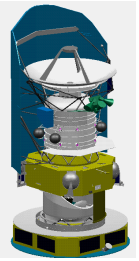


FIRST Instrument to AOCS Interfaces (FAO)

Objectives of Activity

Ensure that all the instrument essential requirements are covered in the ITT

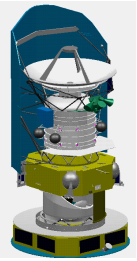
Ensure that the PIs understand what the requirement specification really means



FIRST Instrument to AOCS Interfaces (FAO)

Composition

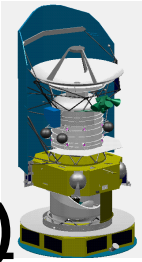
Chair, organisation and lead:	**A. Elfving**
FIRST PS	**G. Pilbratt**
FIRST Instruments:	**Representatives of the teams**



FIRST Instrument to AOCS Interfaces (FAO)

Activities and Duration

Distribution of IID-A-0-2:	**15.02.2000**
Comments from PIs:	**15.03.2000**
Follow-up meeting:	**23.03.2000**
Close-out meeting (if needed):	**20.04.2000**



FIRST / Planck Instrument to CDMS Interface (FPD)

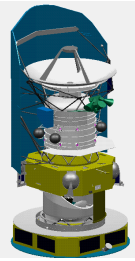
Subject

- **The instrument teams need a definition of the data and electrical interfaces between instruments and satellite bus for instrument development.**

  - **ESA will ensure, via satellite level specifications, that the industrial Prime complies with functional and performance requirements on the data interface.**

  - **A detailed I/F design can only be specified and worked out by instrument groups (and S/C Prime for the S/C).**

    The FPD WG will take care of providing a necessary and sufficient set of requirements to all parties involved.

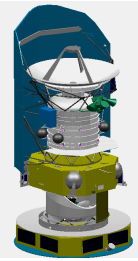


FIRST / Planck Instrument to CDMS Interface (FPD)

Objectives of Activities

- Identify and select options from the MIL 1553B Standard for implementation on FIRST / Planck.
- Identify missing implementation issues needed to establish a complete on-board data service. Review S/C level requirements for consistency with the intended implementation and derive missing requirements, such that they can be incorporated into the IID-A.

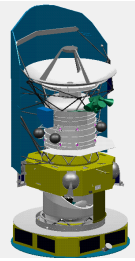
- As ESA is not going to make a proposal for a detailed I/F-electronics design the instrument groups are requested to provide a I/F pre-design and a specific assessment of the requirement status for possible updates. These inputs shall be subject to harmonisation and endorsement by the working group.



FIRST / Planck Instrument to CDMS Interface (FPD)

- Detailed Objectives:

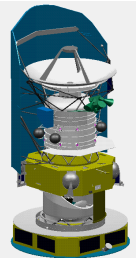
- Clarification of open questions on the MIL 1553B Std., raised by the instrument teams.
- Discussion of implementation alternatives of the data I/F design, proposed by the instrument teams.
- Identification of missing requirements on IID-A and S/C level.
- Modification of inconsistent existing requirements.
- Identification of I/F electronics components for procurement.
- Identfication and clarification of open issues on TM/TC Packet structures described in the F/P PS-ICD, provided by ESA.



FIRST / Planck Instrument to CDMS Interface (FPD)

Composition

Chair, organisation and lead:	**S. Thürey**
ESA functional support:	**n.n.**
FIRST/Planck Instruments:	**Representatives of the teams**

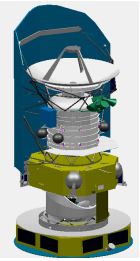


FIRST / Planck Instrument to CDMS Interface (FPD)

Meetings and Duration

Three meetings on a monthly basis:

Kick off:	**CW 11, 15.3.2000,**	**1 day, ESTEC**
PM#1:	**CW 16, 19.4.2000,**	**1 day, location TBD**
PM#2:	**CW 20, 18.5.2000,**	**1 day , location TBD**

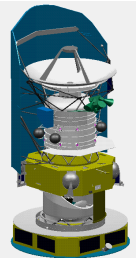


FIRST/EMC Interfaces Issues (FEMC/PEMC)

Items to be addressed

- **Inputs / questions received from SPIRE & HIFI regarding Grounding requirements, Spacecraft, Instruments, connectors, EMC plan**

- **Interface Issues to be addressed in System EMC Working Group**



FIRST/EMC Interfaces Issues (FEMC/PEMC)

Working Group Tasks

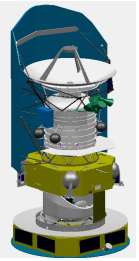
- Identification and assessment of potential EMI sources and susceptors

  To be done by questionnaire to be prepared for the instrument teams

- Support instrument teams in the identification of critical elements

that require special attention, and in the completion of the questionnaire

- Establish draft instrument grounding concepts
- Prepare instrument return and grounding diagrams
- Establish guidelines for instrument harness design, shielding and routing
- Prepare input for industrial phase modelling.

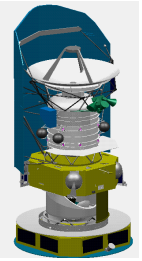


FIRST/EMC Interfaces Issues (FEMC/PEMC)

EMC Grounding

Instrument Grounding diagrams to show

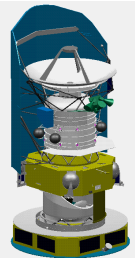
- Unit cases
- grounding/isolation of unit cases
- primary & secondary power grounding resp. isolation
- primary & secondary power interfaces
- secondary power network & interface circuit grounds inside the Instrument
- principal interface circuits showing circuit isolation resp. grounding reference and the type of interface (i.e. analogue digital thermistor, relay status etc.)
- DC/DC converters
- filters
- wiring, i.e. twisting of wires, shielding, grounding of wire shield etc.
- cross-coupling at redundant components, where applicable and where grounding/isolation requirements are affected



FIRST/EMC Interfaces Issues (FEMC/PEMC)

Composition

Chair, organisation and lead:	**B. Jackson**
ESA functional support:	**A. Ciccolella**
FIRST / Planck Instruments:	**Representatives of the teams**



FIRST/EMC Interfaces Issues (FEMC/PEMC)

Meetings and Duration

Seven meetings on a bi - monthly basis:

Kick off:	**CW 11,**	**17.3.2000**
PM#1:	**CW 19,**	**11/12.5.2000**
PM#2:	**CW 27,**	**6/7.7.2000**
PM#3:	**CW 35,**	**4/5.9.2000**
PM#4:	**CW 43,**	
PM#5:	**CW 51,**	
PM#6:	**CW 08,**	

Number	Subject	Category	Comment
HFI-45	Common On-Board Software language is still to be defined/agreed on (IID-A 5.13.2 cannot remain TBD for a long time).		Question not clear, to de discussed
HFI-46	Inside instrument, not interfacing with spacecraft CDMU, acceptable software(s) has/have to be listed as a matter of urgency.		Question not clear, to de discussed
HFI-01	Please describe autonomy function(s) of Planck spacecraft in order to allow evaluation of impact on Instruments.	?	Instrument Autonomy modes - input required from HFI
HFI-02	Please describe also Planck spacecraft possible “safe” modes in order to allow evaluation of impact on Instruments.	?	
HFI-14	Attachment points of all units have to be specified as soon as possible. It is not understood why IID-A figure 5.6.3.1 is not included. Is it that different from 5.6.3.2 ?	?	to be clarified in technical meeting with HFI
HFI-53	Instruments “surrogate” RF Focal Plane Unit definition needs a detailed review and clarification in order to come to an agreement.	?	dedicated WG??
HFI-58	Agreement on ESTEC documentation repository (DMS versus Livelink) is to be agreed now (both are already in use).	?	Question not clear, to de discussed
HIFI-07	The cleanliness requirements, as defined in the HIFI Instrument Specification, can be used as a baseline.	?	Cleanliness WG needed, Requirement are given in the IID A
HIFI-08	Standing waves at the secondary mirror	?	Covered by existing telescope spec.?
LFI-09	I also note that their is probably little expertise in the FIRST/Planck instruments regarding the effect of cosmic rays on instrument scientific performance (I am not talking simply of radiation dose in components). It may be useful to everyone to have consultation with ESA experts e.g. through SSD concerning this.	?	JT
PACS-05	agreement on FOIRD and services to be provided by the OBDH	?	FOIRD existing - no activity
PACS-10	Black paint WG organised by ESA	?	dedicated WG??
Sorp-19	No autonomous actions other than shut down? 4 day minimum turn around to command	?	Instrument Autonomy modes - input required from LFI/HFI
Sorp-22	Instrument integration interface information/processes	?	Question not clear

HIFI-02	Pointing and peak-up mode and the consequence for HIFI-OBDH-AOCS communication.	FAO
SPIRE-04	With the selection of the Feedhorm arrays for SPIRE, it becomes more important to have a telescope pointing accuracy appropriate to the beam size. In addition, if the pointing is improved we may be able to simplify the instrument by removing the requirement for chopping in two axes. We would like a study into the possibility of improving the guaranteed pointing accuracy, both for point sources and line scanning.	FAO

HIFI-06	The ISO EMC requirements, as recently communicated, can be used as a baseline.	FEMC
SPIRE-08	We still believe it is important to produce an EMC/microphonics plan, and in particular, a grounding scheme, as soon as possible.	FEMC

HIFI-05	That the cryostat study results can be used as a baseline for FPU – LOU alignment concepts. Currently alignment concepts are being worked out and will be discussed within the consortium on 2 March and presented during the technical meeting on 6 March.	FIA	in addition to FIA dedicated assessment for HIFI

SPIRE-02	From our Warm Electronics Review it is clear that we have a different view from the project of the tests to be carried out on the AVM and CQM when at ESTEC. We need a much clearer definition of these tests in order to confirm that we are delivering an appropriate model. We also need to define any GSE that is required to support these tests.	FIT

HFI-18	Power budgets allocated to instruments non-op substitution heaters are not included in instruments allocation. They have to be included into Planck Thermal Control System one.	FPO	yes
HFI-19	Telemetry budgets allocated to instruments spacecraft powered thermistors are not included in instruments allocation. They have to be included into Planck spacecraft HSK one.	FPO	yes
HFI-32	Is J. Dodsworth proposal to have different specialised HSK packets (physical measurements packets, events packets, TC reporting packets, instrument configuration packets,..) accepted ?	FPO	
HFI-33	If the answer is YES what is the length of each of them ? Do not forget that one of the purpose of this proposal is to optimise the TM load.	FPO	
HFI-34	If there is only one type of HSK packet what is the length, 512 bytes ? Does this length include encapsulation or is entirely free for data as indicated in the PUS ?	FPO	
HFI-35	Bus 1553 B is self redundant, is it acceptable to use this feature to connect a single unit to both S/C Main and Red bus ?	FPO	
HFI-36	Bus 1553 B is selected. We need to know/impose on the Prime a commonly agreed interface circuit.	FPO	
HFI-37	When a Planck instrument is tested/operated alone, is it possible for it to use full instruments TM allocation (about 60kbits/s TBC) ?	FPO	
HFI-38	What is the maximum rate of transmission from Instrument to CDMU on the data Science channel in a “burst mode” compliant in volume with the instrument daily mean TM allocation ?	FPO	
HFI-39	Delivered to Instruments Planck High Frequency clock frequency has to be frozen as soon as possible.	FPO	
HFI-40	Planck On-Board Time (OBT) driving frequency has to be frozen as soon as possible. Is HFI 65.53KHz required time freqency acceptable (Instruments and AOCS distributed OBT coded on three 16 bits words, one of them being fraction of second devoted) ?	FPO	
HFI-41	Planck OBT in-flight maintenance scheme is not defined : we need to know now if it shall be an absolute maintained clock (we suggest TAI) or a relative “local” synchronisation signal to be translated on-ground into absolute time.	FPO	
HFI-49	IID-A suggests (§6.3) that :”(Central Check-out Equipment) detailed interfaces, hardware and software, will be defined in these areas when the CCE contractor will have been selected”. We believe that such a late definition is not compatible with an instruments EGSE development schedule compatible with overall Planck planning. Dialog protocol rules have to be defined within less than 3 months.	FPO	

HIFI-04	Implementation of the OBDH bus through wires connections or by transformers.	FPO
HIFI-09	Packet structure definition.	FPO
LFI-03	Verification of the LFI proposed REBA electrical hardware interfaces to the CDMU communications bus (subsequent to the CWG 1 meeting of July 1999)	FPO
LFI-04	Low level protocols to use on the communications bus	FPO
PACS-01	200 or 100 kbits into SSR	FPO
PACS-02	400 kbits burst mode into SSR	FPO
PACS-03	TM/TC packet size and structure (in principle we need a special FIRST PUS)	FPO
PACS-04	TC rate from SSR to instrument	FPO
PACS-06	flexible data compression factor of SPU s/w to fill the average 200/100 kbits	FPO
PACS-08	1553 B interface, general specs, simulator (PC board), protocol	FPO
SPIRE-01	We are still confused about the telemetry/telecommand interface to the S/C - the recent email from Thuerey once again highlighted the problem as the figures quoted did not seem to be consistent with each other. Among the questions we have are: a. how the protocol for transferring packets between the instrument and the S/C will operate - so that we can estimate the buffering required within the instrument and how to extract the most from the average data rate. b. where the figure for the maximum packet size comes from c. why the TC data rate is so low (we understand why the uplink rate is low, but not why the S/C cannot transfer to the instrument at a much higher rate)	FPO

HIFI-01	SVM thermal stability, as discussed during the last technical meeting.	HIFI	HIFI issue

HFI-03	As already mentioned labelling rule used in IIDs is different from that identifying units in the Work Breakdown Structure proposed by the Project. Should we change/harmonise that?	IID-A
HFI-04	The IIDs labelling rule does not address the identification of redundated units. Please make a proposal.	IID-A
HFI-05	The IID-Bs labelling table does not detail cables and pipes. Should it be expanded to that deliverables?	IID-A
HFI-06	The IID-Bs labelling table does not detail savers. Should it be expanded to that deliverables? Savers labelling rule should avoid confusion with cables.	IID-A
HFI-07	A new identifier has to be attributed to the Sorption Cooler if, as proposed, a separate ICD is generated.	IID-A
HFI-08	An identifier has also to be attributed to this ICD.	IID-A
HFI-09	Names of coordinate systems presented in IID-A are not the same that those in the Telescope Design Specification (PT-DS-07024), we suggest to have only one identifier per system. Please harmonise them.	IID-A
HFI-10	In order to design/select “warm” cables/pipes (it also impacts on mass budgets knowledge) we need at least a first evaluation of these cables and pipes length.	IID-A
HFI-11	Routing of same 300K cables and pipes is also needed for manufacturing/costing evaluation as well as design.	IID-A
HFI-12	As already mentioned some PPLM Architecture documents do not include the fact that for the 4K cooler the high-pressure gas is routed from the compressor unit first to the “Ancillary” unit before going to the cold end. This must be corrected.	IID-A
HFI-15	It is understood that thermal conductive fillers (to be inserted between some instrument units and spacecraft accommodation panel/radiator) shall be provided by spacecraft builder. Their characteristics are needed to design/test units thermally.	IID-A
HFI-16	Non-op substitution heaters keeping instruments units in storage temperature range when not operated, shall be design and provided by S/C Prime. Accommodation characteristics on instruments units have to be defined: needed surface, surface roughness,…	IID-A
HFI-17	Spacecraft powered thermistors measuring instruments units temperature when not operated, shall be designed and provided by S/C Prime. Accommodation characteristics on instruments units have to be defined: needed surface, surface roughness,…	IID-A
HFI-20	It is understood that delivered HFI units storage temperature range are included into HFI IID-B §5.7 tables as “non-operating” ranges. Is this understanding correct ?	IID-A

HFI-21	Instrument units thermal design requires information on units thermal “environment”: conduction to mounting panel and radiation by other faces. Relevant information is to be provided.	IID-A	
HFI-50	Could you kindly clarify IID-A §7.3.5 : is there a difference or not between CQM tests planned for PPLM and SVM mounted instruments units ?	IID-A	yes there is a difference, might end up in a dedicated chapter in IID-A
HFI-51	Same question for IID-A §7.3.7 for PFM units ?	IID-A	yes there is a difference, might end up in a dedicated chapter in IID-A
HFI-54	Planck PLM mechanical limit loads specifications cannot remain TBD. Please provide, even preliminary, figures for PLM and SVM mounted units.	IID-A	
HFI-55	Planck PLM acceptance & qualification sine vibration levels specifications cannot remain TBD. Please provide, even preliminary, figures for PLM and SVM mounted units.	IID-A	
HFI-56	Planck PLM acceptance & qualification random vibration levels specifications cannot remain TBD. Please provide, even preliminary, figures for PLM and SVM mounted units.	IID-A	
HFI-57	Planck PLM shock specifications levels are also needed for instrument units design. Please provide, even preliminary, figures for PLM and SVM mounted units.	IID-A	
HFI-63	IID-A §10.12 table of documentation associated to ESA reviews cannot be left TBD more than 3-4 months prior to formal review date notification/agreement.	IID-A	update in line with review doc.
HIFI-03	Vibration levels, especially the random and shock levels for the focal plane units, the LOU mounted to the cryostat, and the SVM.	IID-A	
LFI-01	Documentation requirements for the future reviews by ESA (and knowledge of replanning if expected for the IIDR)	IID-A	Info is included in the review document (PT-06692), this considered part of IID-A
LFI-02	Vibration test levels at the interface points	IID-A	Information will be included in future update
Sorp-01	Enhanced Ariane V launch vibration specification	IID-A	
Sorp-02	Enhanced Ariane V separation shock environment	IID-A	
Sorp-06	QM and FM thermal test levels and methodology (at component, payload and spacecraft levels)	IID-A	
Sorp-13	material of radiator (differential contraction concerns)	IID-A	
Sorp-14	Compressor height is 80 cm or narrower? (If 75 cm then length will increase ~10 cm)	IID-A	
Sorp-20	Confirmation that cooler connectors are located on cold heads and compressors assemblies	IID-A	
Sorp-21	confirmation that requirements for electrical and mechanical ground support equipment are compatible with JPL standards	IID-A	

SPIRE-05	As indicated in the report on cooler redundancy (SPIRE-RAL-NOT-000341) we wish to increase the margin on our thermal load into the LHe tank by around 40-50%. In order to proceed with the preliminary design of the cooler we require ESA's view on whether this is an acceptable price to pay for the reduction in risk we anticipate in implementing the redundancy.	IID-A	SPIRE dedicated discussion, evaluation of cooler redundanc
SPIRE-06	We would like the FIRST cryostat thermal model to be made available.	IID-A	
SPIRE-09	We would like to consolidate the series of reviews proposed by ESA in the AO with the reviews proposed by SPIRE in order to reduce their number and to harmonise their scope.	IID-A	also to be part of updated review plan

LFI-06	Discussion of ground safety issues for the Sorption Cooler	LFI	LFI dedicated issue
LFI-08	Review of LFI RAA vibration test approach.	LFI	LFI dedicated issue
Sorp-08	Confirmation of proposed mechanical interfaces	LFI/HFI	LFI/HFI dedicated issue
Sorp-09	Confirmation that pressurized components and lines will be designed and tested as described in Mil. Std. 1522-A	LFI/HFI	LFI/HFI dedicated issue
Sorp-10	Clear definition of cooler mounting locations and connecting pipes routing (must allow cooler to be tested in a 1.2 m dia chamber given maximum of two additional bends)	LFI/HFI	LFI/HFI dedicated issue
Sorp-11	confirmation Radiator is prime structure (no separate mounting plate supplied by JPL)	LFI/HFI	LFI/HFI dedicated issue
Sorp-12	confirmation Bolts inserted from space side (interface layout similar to that given to Payload contractor)	LFI/HFI	LFI/HFI dedicated issue
Sorp-17	Mounted on radiator with sorption compressors (i.e. how are power dissipation variations dealt with)	LFI/HFI	LFI/HFI dedicated issue
Sorp-18	Cross strapping: can one sorption cooler electronics set control either cooler?	LFI/HFI	Internal to LFI/HFI

HFI-42	It is our understanding that no Planck attitude or orbit control thrusters firing shall be performed during the “one hour” stable attitude sky scans. Please confirm.	PAO
HFI-43	A 2 degrees Planck “wobble” angle has been mentioned during PPLM Architecture study. Is this in agreement with “around line of sight” specification in IID-A table 5.12.3-1 ?	PAO
HFI-44	Does the “Absolute Rate Error” about Planck spin axis specified as being better than 5.4acmin/sec can be translated into : “absolute spin duration” shall be within 60 seconds plus or minus 0.9 sec ? Please confirm or provide us with a specification using this unit.	PAO

HFI-29	Connectors shielding is a commonality issue. Some types of connector shield may have to be specifically developed. Is there any heritage available from ISO ?	PEMC
HFI-30	Grounding pins located on instruments units have to be specified.	PEMC
HFI-31	It is understood that grounding straps shall be designed and provided by ESA PPLM integration contractor.	PEMC
HFI-47	IID-A § 5.14.1 conducted susceptibility spec. has to be issued.	PEMC
HFI-48	IID-A § 5.14.2 radiated susceptibility spec. has to be issued.	PEMC
Sorp-03	Grounding requirements	PEMC
Sorp-04	Isolation requirements	PEMC
Sorp-07	EMI/EMC requirements	PEMC

HFI-22	Planck power bus (accurate) voltage has to be frozen immediately to allow DC/DC converters, heaters,… design and procurement.	Power
HFI-23	Planck power bus ripple has to be frozen immediately to allow DC/DC converters design.	Power
HFI-24	In order to save power it is foreseen to use/apply spacecraft 28volts without further regulation on instruments heaters (some of them already require hundreds of watts). This implies that these heaters shall not perform nominally in the 26-30 volt range as specified in IID-A. Is this acceptable ?	Power
HFI-25	Power interface circuits need to be specified. This includes spacecraft Main and Redundant power bus interfacing design (and cross-strapping one ?).	Power
HFI-26	Should a specific design be applied to “large” currents feeds ? If YES it must be specified too.	Power
HFI-27	If different from IID-A specified ones, what connectors are to be used to drive “large” currents.	Power
HFI-28	Planck DC/DC converters common synchronisation frequency has to be frozen as soon as possible.	Power
LFI-05	Power interfaces implementation (implementive use of the spacecraft main and redundant power bus)	Power
PACS-07	S/C power interface, separate switching of DPU, SPU and MEC/DEC, regulated bus, KAL	Power
Sorp-05	Confirmation of Tolerance on 28 V as +/- 1%	Power
Sorp-15	In rush current limits	Power
Sorp-16	switched power off state time limits	Power

HFI-13	Any alignment mirror(s) or reference(s) to be mounted on the instrument FPU(s) necessary to perform telescope alignment and focussing activities have to be specified to instrument as a matter of high urgency as it could impact on these units design already highly mature.	PTW

LFI-07	Support for implementation of SCOS 2000 in the LFI EGSE, and issuing of the delta URD for SCOS 2000	SCOS 2000 evolution	ongoing activity - no dedicated WG
PACS-09	SCOS 2000, delta-URD, maintenance, general support, !! quick agreement is necessary	SCOS 2000 evolution	
SPIRE-03	We need complete the work being carried out to clarify the situation with regard to the use of SCOS2000 as the RTA system, both during ILT and IST. In particular we wish to know: a. what functionality will be available in the delivered version b. what additions may be put in place by ESA towards satisfying the requirements in the Delta URD c. a definition of the interface used by SCOS2000 to receive and sent packets over a network. Only at this time can we start to estimate the cost of using SCOS2000 and make a decision for its use in ILT.	SCOS 2000 evolution	

HFI-52	AVM deliverables definition needs a detailed review and clarification in order to come to an agreement.	yes
HFI-59	Important documents (such as ALCATEL reports) are still not available in electronic format, this is no longer acceptable or a large part of the benefit of this study could be lost.	will be provided
HFI-60	As already formally required a systematic electronic copy of all formal documents (faxes,…) is to be provided to instruments teams to ease their diffusion in our complex consortia. Present situation creates un-productive work loads in our teams and consequently un-necessary transmission delays.	to be discussed
HFI-61	As already formally required a systematic electronic copy of all mail has to copied to HFI Project Assistant (valerie@ias.u-psud.fr).	to be discussed
HFI-62	As already required a management tool for Action Items tracking should be implemented by ESA Project, the sooner the better.	to be discussed
HFI-64	Whatever the name they had, instrument teams – project team meetings were held monthly in the past, such technical meetings were extremely constructive. Seeing the above list of needed clarifications/requirements it sounds quite reasonable to ask for the continuation of such meetings on a to be agreed on basis of TBD weeks recurrence.	done
SPIRE-07	We would like a statement on the availability and cost of the ESA funded cold vibration facility.	running activity at ESTEC