



FIRST / PLANCK

Science Operations Documents

Rolling Review Board Meeting

-- ESTEC --

16 September 1997

FIRST/ESA/M/0025-10



Objectives

Review and provide written comments (deadline 8/9/97) on :

- the FIRST SIRD (Draft #2) - 31/07/97
- the Planck SIRD (Draft #1) - 31/08/97
- the Ground Segment Interface Document (GSID) - (draft #1) - 15/08/97

Comments to be categorised as :

- **Critical (C)** and **Major (M)**
- **External relations (E)** or **Internal issues (I)**
- **No** minor comments

The three documents are applicable documents to the FIRST/Planck AO (to be issued on 30/09/97)



Status (1)

FIRST SIRD : Requirements cover FSC and ICCs - generated for a FIRST-alone mission (no fundamental impact)

Draft #1 (30/11/96) :

- reviewed and agreed by FSODG - no major comments

Draft #2 (31/07/97) :

- includes FSODG (minor) comments
- includes post-operations phase (archive)
- considers 'new' FIRST baseline (cryostat, L2 orbit, new launch date)
- fully compliant with the FIRST Science Management Plan

Purpose :

- Establish major responsibilities for science-related activities
- Provide enough information to allow potential PIs to make a proposal for the ICC corresponding to their instrument
- Allow (rough) costing of ICCs and FSC (first estimates available)

Remarks :

- To be reviewed and updated (to issue 0) once ICCs and FSC (and MOC) are established
- Level of detail commensurate with a SIRD



Status (2)

Planck SIRD :

Draft #1 (31/08/97) : reviewed and agreed by Planck Project Scientist

Basic assumptions:

- merged mission (not fundamental)
- FINDAS provides overall communications and archiving facilities fully compliant with the Planck Science Management Plan

Purpose :

- Establish major responsibilities for science-related activities
- Provide enough information to allow potential PIs to make a proposal for the DPC corresponding to their instrument
- Allow (rough) costing of DPCs

Remarks :

- To be reviewed and updated (to issue 0) once DPCs and FSC (and MOC) are established
- Level of detail commensurate with a SIRD



Status (3)

GSID :

- Draft #0 (24/06/97) - FSODG #9 : reviewed and agreed by FSODG - no major comments
- Draft #1 (15/08/97) :
 - includes FSODG (minor) comments
 - added commonality requirements + figures

Purpose :

- List major Ground Segment interfaces
- List main transfers (data and software) between Ground Segment elements
- Establishes (standard) philosophy for interface maintenance and control

Remarks :

- Interfaces to be consolidated following FINDAS prototype implementation
- FINDAS interface document available: June 1999 (TBC)
- GSID to be reviewed and updated once ICCs, FCS, DPCs and MOC are established -- present version can only be very preliminary (no Prime Contractor on board yet !)



Comments Received

Six Board Members provided comments (two sets after the deadline)

- 5 sets of comments on the FIRST SIRD
- 2 sets on the Planck SIRD
- 2 sets on the GSID (comments from one non-member)

Many minor comments

Several comments not in agreement with the approved SMPs

Major comments:

- Centralised Ground Segment not optimal for operations
- Internal FSC organisation (FOT and PST responsibilities) unclear
- Instrument simulators and SDE + SVF no comment - sps vehicle facility
- FINDAS (in connection with Planck) + Interface to DMS Document Management System
- Overall quality control of Science Data
- 5 days/week manning of FSC and ICCs ?
- Many TBDs and TBCs
- Too many ICDS



Proposed Approach

- Minor comments to be evaluated and implemented with issue 0
(December 1998 - TBC)
- Major comments : to be discussed today
- Updates before the AO (major comments only)
 - Text to be provided to Estaria by SSD (Project Scientists?)
Deadline: 22/09/97 @ 18:00hrs
 - Estaria to implement by 26/09/97



FIRST/Planck

Milestones Comparison - Current ESA Scientific Missions

Missions	AO issued	SIRD (1st Draft)	Start Phase B
ISO	Jul. '84	Oct. '93	Nov. '86
XMM	Jan. '89	Nov. '93	Oct. '94
Integral	Jul. '94	Oct. '95	May '95
Rosetta	Mar. '95	No SIRD	May '97
FIRST Planck	Sep. '97	Sep. '97	Apr. '00

Ken

FIRST SIRD

COMMENTS

RRB Meeting: 16 September 1997



David Andrews

10-09-97 04:20 PM

To: Pierre Estaria/estec/ESA
cc: Goeran Pilbratt, Jan Tauber/estec/ESA, Brian Taylor/estec/ESA, Jean Clavel/vilspa/ESA, Mkessler, Lars Hansson/estec/ESA, Christoph Winkler, Riedinger, Kevin Bennett/estec/ESA, Michael Perryman, Jenkner @ stsci.edu, PBENVENU @ ESO.ORG
Subject: FIRST/PLANCK GSID and FIRST SIRD

Pierre, herewith my comments on the above docs. Most of the comments on the FIRST SIRD apply presumably to the PLANCK SIRD(have only glanced at it).

GSID - I question whether this document is necessary, indeed the objective is a list and it is very complex for a list. Chapter 5 appears to define a template for each of the major interfaces. Chapter 6 belongs, I believe, to the ICD's themselves and the preceding chapters could be condensed to form an introductory chapter to each individual ICD.

Maintaining the GSID means configuration control, coherence control and yet another document to update. My proposal would be to have a condensed version as Chapter 1 of each of the major ICD's. Nevertheless, some comments:

Section 1.5 This seems a bit open. Surely, the responsibility can be defined up-front and not left to decisions on prime traffic, what constitutes prime etc...

Section 4 Commonality. A nice statement. What mechanism is in place to ensure that the Space Segment (Instrument design) follows common interfaces/protocols etc.

Section 5 Contains design details e.g. 128 Kbps line plus back-up. What is the availability figure and what is the traffic model from which this is derived?

Figure 2 Mission Planning loop between Science planning and MCC planning?

FIRST SIRD

Section 1.1 Last para "approval". As in the case of the MIRD/MIP, surely the responder to the SIRD(the responsible of the SIP) should also approve any changes to the SIRD.

Section 1.4 FSC responsibility? Is it the ESA DG?

Section 1.5.2. I don't understand the relevance of a "long" Phase B to the optimal scheduling of the GSRM and GSDM within the development Phase. These reviews should be scheduled according to the expected status to achieve maximum benefit.

Section 2.4 Definition. Presumably the "pre-launch phase" is a part of the "development" phase as defined?

Section 2.6 Is an ICD foreseen to define this interface?

Section 3 Appears to be a mixture of responsibilities and tasks, whereas for the ICC's and the FSC Ch. 5 and 6 define the specific tasks on these elements . Do Sections 3.1,3.2 and 3.3 imply that the Project Team,the Project Scientist Team and the P.I. respond with a SIP.

RESP-001 What is the authority over the P.I.'s. Also, Fig. 7.1 shows the PM responsible for the FOT (within the FSC) and the PS responsible for the PST (within the FSC). Who has overall responsibility for the FSC? How does the PM ensure this requirement when he has no authority over the PS?

RESP-004 Are there other interfaces or is this one somehow special?

RESP-008/9 Industry involvement?

RESP-013 Who has the authority?

Section 3.2.2 Lists PS tasks. Ref to previous comment, I think the document would be clearer if Ch3 defined only responsibilities and subsequent Chs defined the tasks for the PS,P.I's,FSC,ICC's

Section 3.3 and Fig 7.1 Who is responsible - the P.I. or the ICC Manager. The Fig. implies the ICC Manager reports directly to the PM.

Section 3.4 Development of the FSC is under two responsibilities. Is the delegation of tasks clear, the interfaces well defined and does the PM have ultimate responsibility?

Section 4.1 ICCF-011/012 Is the MOC responsible for the FOP. If so, the validation of the Instrument Flight Operations Procedures should be the responsibility of the MOC with support from the ICC's.

ICCF-014 Is this a separate translator to the equivalent function in the MOC for platform commanding?

ICCF-023/024 I do not believe that a cost limited simulator can validate scientific processing s/w, nor can it fully validate s/w updates. Is there a separate SDE and SVF for this purpose for each on-board processor?

ICCF-026 Are there any mission planning constraints between the different instruments?

ICCF-033 Major deliverables should be specified with milestones, as they could influence cost.

Section 4.2 ICCO-003 Training of the staff to be foreseen.

ICCO-004 Add SOM approval for new On-board s/w version, since he is responsible for satellite safety.

Ch. 6. The section would be clearer if each requirement had as an attribute its "recipient" i.e FSC, ICC, PS etc

PERF-011 Is this a total figure for the mission? Longest period in any given period? Clarify. Also applies to e.g. PERF-023 and others.

Perf-050/051 appear to be mutually exclusive. What is required?

PERF-060a This requirement implies that the complete system shall be automatic or that weekend/public holiday working is required. Is this acceptable?

Chapter 7. What is the significance of a change in responsibility between a MOM and a SOM for spacecraft ops. At ESOC, it is normally the same person, although one title sounds grander.

P 7.2 2nd para. What is the Mission Operations Management Plan. Surely, this is a high-level strategy plan for the mission which should be issued by the responsible Directorate and not a service provider such as D/TOS

Section 7.1.2 The First Operations Team will build-up much earlier, starting with a GSM/SOM for concept/requirements definition, complemented by Spacecraft Ops Engineers and Analysts(s) for design and validation. The Spacons (Spacecraft Controllers) would normally come on-board at ca. L-6mths.

P 7.3 Leap defined as less than 10 days(3rd paras) which is contradicted by the last para of 7.2.2

Section 7.5.2 The permanent provision throughout the mission of an "Instrument Support Area" will not be without cost impact. Is this really required?

Section 7.6.2 The SOM's team will include Operations Engineers/Analysts/Spacons.

Section 8.3 PAQA-020 This sounds to me like a recipe for never launching. Is it serious?

PAQA-024 The SVT is essentially an interface test between the Satellite and the Control Centre and is driven by satellite and Control Centre availability. Adding other elements at a level below the system level will add unnecessary complications to the test planning.

MNGT-012 Agreement of MOC GSM required?

Regards, Dave



jclavel%isow30.dnet.esa.es @ iso.vilspa.esa.es
08-09-97 07:57 PM

To: btaylor @ estsa2.estec.esa.nl%isous3.dnet.esa.es@iso.vilspa.esa.es
cc: JCLAVEL @ iso.vilspa.esa.es (bcc: Pierre Estaria/estec/ESA)
Subject: Comments on FIRST SIRD (draft #2)

Brian,

Here are my comments on the FIRST SIRD.

Jean

I - GENERAL:

MAJOR:

There is no central authority for quality control (QC) of the data and the overall QC process is not specified in sufficient detail. The only "loose" requirement I could find was on ICC (req ICCO-014). Surely, data can be bad for many reasons, i.e. T/M drops (MOC responsibility), guide star not acquired (MOC/OAD), instrument wrongly set-up (PS team), instrument malfunction (ICC), error in mission planning (FSC), offline processing S/W error (ICC) ... Surely, the PS should be responsible for QC since he represents and defends the interests of the scientific community. He must therefore get full visibility in the data quality. The only way to achieve that is to set-up a QC data-base as part of FINDAS. Entries in this DB should be flags (OK/NOT OK) for each of the data acquisition step involved, from community support to offline processing. These flags should be filled-in with whatever appropriate comments is deemed necessary by the party responsible. The authorization to ship the data should come ultimately from the PS. Also, data quality control should be carried-out systematically on each observation and not randomly as implied under ICCO-14. This implies that each ICC (under the current set-up) processes ALL the data from its instrument.

MAJOR:

The decentralized nature of the GS is very nice on paper but it remains to be seen whether it will work in practice. The main point is that it requires each and every single interface to be documented by formal ICD and thereby requires a very large number of ICDs. Supposing this can be achieved, it further means that the system will be quite rigid and that change requests will be extremely difficult and lengthy to implement. Moreover, "corridor chats" will be impossible and my ISO and IUE experiences tell me that these are terribly important when one wants to "improve the system", not only to find where the problem lies and how to fix it, but simply to build trust among the different parties involved. As an example, achieving a 1 arcsec pointing accuracy with ISO (compared to specs of 11 arcsec) would have been impossible if the SOC and the MOC had not been co-located. In the decentralized FIRST system, nobody will fill ultimately responsible and there will be no team spirit. These make all the difference between an optimized and highly successful mission and one which just gathers data. This aspect is particularly important in the case of FIRST, which, like ISO, has a limited lifetime.

I realise this is a lost battle and the "future" as they say is toward decentralization, but I felt the point had to be made anyway.

To limit the damage, I recommend that a team of system engineers with a expertise on the overall GS be appointed and made responsible to the Project Manager during the development phase and to the PS during operations. This team will have the overall responsibility to oversee the functioning of the GS+S/C as a whole, recommends improvements ("change requests"), supervise their implementation, including end-to-end testing on the simulator and, if appropriate on the S/C. The team should be put in place early in the project development phase, supervise the end-to-end tests prior to launch and carry-over into the operational phase.

SPECIFICS:

ICCF-022: (MAJOR)

Contrary to what is stated in the note, it is important that the simulator also generates representative science data. This will considerably speed-up the in-flight understanding of the instrument and therefore its proper calibration and the validation of the data processing algorithms. It will also assist the community in designing and optimizing their observing programmes. Last but not least, it is one very efficient way to transfer and document expertise from the instrument builders to the users, be they in the FSC, MOC or community. Millimetric instruments are complex, and the interplay of instrumental effects which combine to determine the ultimate quality of the data is also complex. The point is that it is better to start from first physics principle than to wander in an unconstrained and virtually unlimited parameter space. My suggestion, as a minimum, is to remove the restriction in the note. Preferably, a positive requirement on the fidelity of the simulated science data should be added. This point was made repeatedly by Piero during the ISO development phase (and ignored) but experience has shown that he was right.

ICCO-04, 06, 10: (MINOR)

Please, state explicitly that new O/B S/W images, calibration requests, cal files and tables are submitted to MOC via FINDAS. Otherwise, how would FSC know ?

ICCO-14: (MAJOR)

Quality checks must be systematic or they are useless (see also point 1 under section "general").

SECTION 5.2 (MAJOR):

Throughout this section, the respective responsibilities of the FOT and PST are mixed together. This is by definition bad managerial practice. Because it dilutes responsibilities, it will unavoidably add confusion to a system which is already very complex. The very fact that the authors had problem in separating the responsibilities of the two teams means, in my mind, that the division is artificial. This was already the case on ISO. For instance, it is very difficult to draw a line between scientific community support and mission planning. A scientifically optimised schedule require a constant interaction between the two. Moreover, the PS already has too many teams reporting to him. He will have no time and in fact should not be involved in the daily interaction with the scientific community nor with the day to day running of the FSC. Hence, he should not manage a PST team directly. My recommendation is therefore to merge the FOT and PST under the

responsibility of the FSCOM.

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Subject: Re: FIRST and Planck, SIRDs and SIPs

Please find the following comments to the First SIRD

Can you insert a little text describing the relative viewing/FOVs of the 3 instruments ? This would put the 'parallel unique mode' in some sort of context. Regarding the unique mode : perhaps 'static' or 'fixed' would be a clearer name ? See esp. 2.4.6 and 2.5

In section 1.4 the design of the ICC's is left up to the PI's whereas I believe there should be a maximum cloning of the features in the ICC's to keep the costs down and to avoid completely different look-and feel. I believe this is the intention (stated elsewhere in the SIRD) so why not put it up front here.

D/Ops == D/TOS ?

In Section 1.4 H/SA will take over responsibility of the programme which is variously stated as H/SSD and H/SSD/SA. What is the formal responsibility and what is delegated ?

Section 2.4.7.1 : is the orbit of the satellite altered after the mission ? I expect not : could be stated.

3,2,3

RESP 043 : ALL data should be electronically accessible. We should ensure that a system view is taken such that all data are available on the required media and time-lines to enable the data analysis and science to be performed.

3.3.1 Add a RESP : Responsible for a defining a security plan which addresses data security and network security of the ICC's (and eventually the FSC) .

3.4.2 RESP Provide a Helpdesk facility

4.1 ICCF-008 is not clear to me .. is it clear to everyone else ?

ICCO-007, 8 etc refer to near real-time data, whereas LATER it is stated that most of the data will be old : up to 24 hrs (or more after the weekend) This caveat should be brought forward in the text.

ICCO-010 : does it help to refer to unexplained Cal_G, Cal_Q and CAL_U files from ISO ? if not delete.

6.1. the FSC will be manned 5 days per week : this seems OK fro the staffing level (i.e. staff may work a 5 day week) but if PERF-011 is to be assured then the weekend must be covered as there are 62 hrs from 18.00 on Friday till 08.00 on Monday. Why not say 7 days ?

PERF-023 : could be difficult if no weekend shift.

End of Report

Kevin Bennett



cwinkler @ astro.estec.esa.nl
28-08-97 12:07 PM

To: btaylor @ astro.estec.esa.nl
cc: PBENVENU @ ESO.ORG, jenkner @ stsci.edu, jclavel @ iso.vilspa.esa.es, mkessler @ iso.vilspa.esa.es, lhansson @ astro.estec.esa.nl, Irieding @ astro.estec.esa.nl, dandrews @ esoc.esa.de, kbennett @ astro.estec.esa.nl, mperryman @ astro.estec.esa.nl, gpilbrat @ astro.estec.esa.nl, jtauber @ astro.estec.esa.nl, Pierre Estaria/estec/ESA, echeroux @ astro.estec.esa.nl
Subject: Re: FIRST and Planck, SIRDs and SIPs

Brian,
following the recommendation not to wait too long, below is first input from me on the FIRST SIRD. More to follow.

Chris

SIRD

Numbers refer to sections

1.4: This section defines - as it should - individuals being responsible except for FSC. Who is responsible for FSC within ESA, the PM ? PS? Will there be a "science ground segment manager" ? Section 3.4 mentions the PS and the FSCOM (reporting to PM) sharing part of responsibility but I guess a "single node" is missing here and I think there are too many teams involved here.

3.3 If the PI is fully responsible for the ICC, then he is in charge of defining the ICC manager's task. Why is there 3.3.1 ? Should this not be input or 'guidelines' from ESA to PI. What if the PI comes up with different items because he can not find the money to do all?

chapter 4. The tasks for ICC's are quite wide-ranging (s/w development, instrument monitoring, science processing/analysis, training of ESA staff, on-board software maintenance etc..) and all are PI responsibilities to be funded by member states. This means if there are n PI's on FIRST there will be n ICC's each of which is (much?) larger in terms of functionality than one INTEGRAL ISDC (which is a big collaboration) . Is this realistic to assume ? (Note that the same PI also has another collaboration to build the instrument..)

5.1 Do the ICC's have their own archives or is the "only archive" run at FSC relying on ICC input ?

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rieding @ astro.estec.esa.nl
15-08-97 10:42 AM

To: Pierre Estaria/estec/ESA
CC:
Subject: My comments on the FIRST SIRD Draft #2

Dear Pierre,

I think the FIRST SIRD is a very good document and I do not have too many detailed comments (attached). The one thing I find worrying is the dependence of the FSCOM on the goodwill of the PS during FSC development (currently there are significant areas of overlap in their responsibility which are not--and probably cannot be--sorted out at the SIRD level) while their reporting lines are to the PM and H/SSD/SA respectively. I can easily foresee scenarios where this guy gets squashed between Project and SSD demands without having any real power other than the art of persuasion on both sides.

Cheers,
Johannes

===== Detailed comments on FIRST SIRD Draft #2 =====

- (1) General: How can we resolve the substantial number of TEDs/TBCs (i.e. who takes the lead, who needs to be involved, and how are final values agreed) ?
- (2) p. 4-4, note on instrument simulator fidelity: I'm not certain that I agree with the second sentence in the note ("It is likely..."). If the RRB agrees that this sentence cannot be removed then (or perhaps in any case) I propose that a requirement on ICC be added to provide realistic instrument TM for replay from the simulator during simulations when the real instrument is not available. Data for all instrument modes shall be provided with a sufficient quality and in quantity that allows validation of the ICC-provided RTA/QLA and the initial (pre-launch) pipeline processing.
- (3) p. 4-6, req. ICCO-006, last sentence in the note: I don't believe that it will be possible to have commonality between all instruments for the provision of "calibration", "engineering" etc. requests, at least not at the detailed level of the necessary commands. Probably only the top level "request form", containing execution date, reason, etc can be made common but not the instrument specific "pages".
- (4) p. 4-7, ICCO-008, 4th bullet: I doubt that ICCs can (in general) perform pointing verification.
- (5) missing in ch. 4.2: Shouldn't a requirement be added that ICCs need to plan/support the FPG calibration ?
- (6) p. 4-9, ICCO-015, last bullet: As FIRST is not in a near-Earth orbit and has no radiation belt crossings: Can this be deleted ?
- (7) section 4.3, more of a question than a comment: Has a decision

been taken that FINDAS will contain actual data products rather than only the "methods" to generate these products ?

- (8) p. 4-10, ICCA-009: I agree that such a requirement needs to exist but wouldn't cross-calibration between instruments be a typical FSC task ?
- (9) p. 5-4, notes 3 and 4: I find these notes contradictory. Replace "MOC" in note 3 by "FSC" ?
- (10) p. 5-7, FSCO-007, first bullet: Propose to delete this bullet. Contrary to initial thoughts, both ISO and XMM have abandoned the idea of using & maintaining long range schedules.
- (11) p. 6-1, PERF-012: If a remote entry submission tool is used (as opposed to making appointments with people to visit a PDEC), the inflow of proposals will likely show marked peaks close to the submission deadline which are outside FOT control. Under these circumstances 2 weeks to inform all proposers of the technical feasibility of their observations is considered to be extremely optimistic unless a way can be found to almost completely automate this process (which I consider unlikely to be possible).
- (12) p. 6-1, PERF-013: I do not believe OTAC will keep a running involvement during the proposal entry phase to continuously scan and evaluate proposals. I suspect they would rather start work on all proposals after the submission deadline of an AO. Should the "1 month (TBC)" be counted from after the proposal submission deadline ?
- (13) p. 6-3, PERF-056: "shall be accessible to authorised users within 5 minutes (TBC) of a request" should be qualified in the sense that download of the requested information to the user has started from FINDAS within 5 minutes of the receipt of the request. With unknown file sizes and unknown (uncontrollable by FOT) network loads, the only performance specs the FSC can commit to are those that are independent of outside influence (e.g. by using a hierarchical data management system which, for a given maximum number of users starts data retrieval from a disk within a specified time).
- (14) p. 7-5, section 7.4.1: Does the fact that the final orbit (L2 point) will not have been reached yet have an impact on the observation of celestial sources ?
- (15) p. 7-6, section 7.5.2, 3rd para: This appears to imply that ICC H/W to run RTA/QLA will have to remain installed/maintained at ESOC. If this is the case, corresponding requirements (on duplicate H/W, maintenance, etc.) should be put on the ICCs.

Also, it is not clear whether the instrument stations colocated at the MOC receive their data in the same way (through FINDAS) as ISs installed at the ICCs or through a more direct route ? Is this left for the detailed system design without any requirements being imposed by the SIRD ?

- (16) p. 8-2, PAQA-012: I would prefer imposing PDF as the standard because:

-
- Postscript output files can presumably be generated by all text/document processing systems different teams/industry might use.
 - PDF-files can be generated from .ps files on SUNs through (I believe) shareware (utility "distill").
 - Conversion from .ps to PDF generally leads to reasonably compression ratios (3 or so).

From: Andy Robson on 12-08-97 12:36 PM
To: Pierre Estaria/estec/ESA
cc: k.j.king @ rl.ac.uk, ohb @ mpe-garching.mpg.de, pjotr @ sron.rug.nl, Goeran Pilbratt, Brian Taylor/estec/ESA, Johan Steinz/estec/ESA, Harm Schaap/estec/ESA
Subject: FIRST SIRD draft #2

Pierre, some comments

page 1-5 last para : it appears that this MOC archive is either FINDAS or a MOC data repository which is redundant with FINDAS. The MOC archive would be a short term store -- a couple of months or so and be used for MOC ops activities and as a buffer store for replay to the FINDAS in case of realtime data transfer problems.

page 1-8 para 6 : you should mention that the SIRD should be complemented by a SIP to approved by the PM. It could be produced by the Science activity providers -- in sections for ICCs, FSC etc OR as separate implementation plans by ICCs and FSC (you have these IPs later on as specific responsibilities for the ICC and FSC managers).

page 4-2 : ICCF -11 & 12 -- I would like to see these procedures as part of ICCF -10 eg "provision of the Instrument User's Manual including "nominal" and "contingency" Instrument Operating Procedures. These would typically include:

*
*
-
etc.

Note that I've removed the word " Flight" . The procedures would then be incorporated into the Flight Operations Plan procedures by the MOC together with any related spacecraft procedures.

page 4-6: ICCO-004, replace SPACON by MOC

page 4-7 : ICCO-008. 4th bullet -- I know what is meant but strictly speaking, the ICC cannot perform a pointing (which is AOCS related) verification. ICC can however assess IR signal levels which could indicate that the object target direction is not optimum and this could give rise to the need to perform a trim manoeuvre. It might be better to delete ICCO-008 but leave ICCO-009 in place.

page 5.1, 1st para: the problem here and throughout 5.1 is that the science teams are being asked to PROVIDE certain items, some of which they definitely won't want to or can't. The most obvious one is -002 which asks them to " provide infrastructure (buildings etc.). I would propose

5. The tasks described here are carried out under the responsibility of either the PST or FST. In general the FOT will ensure (in the development phase) that the infrastructure and tools necessary for the PST are provided . During OK

5.1 FR

The tasks listed below will be performed under the responsibility of the FSC. The actual execution of some of the tasks will be delegated, where appropriate, to ESOC (TBD later). In some cases OK

page 5.6: FSOC-003 maintain and operate FINDAS (FOT) add " May be delegated to ESOC / Villafranca for 24 hour support." This frees the FSC proper to be staffed for 5 day/week.

page 6.1: PERF-001, remove, from Note " The FSC as no operational role " It's true that the FSC has no role in satellite-related operations but its activities have operational character and so its worth to take out the phrase. It doesn't clarify anything and could be confusing.


regards

From: Andy Robson on 08-09-97 10:11 AM
To: Pierre Estaria/estec/ESA
cc:
Subject: Re: FIRST SIRD draft #2

pierre, for your collection of comments

----- Forwarded by Andy Robson/esoc/ESA on 08/09/97 10:11 -----

Alain Schütz 25/08/97 18:58

To: Andy Hobson/esoc/ESA
cc:
Subject: Re: FIRST SIRD draft #2 

a few comments on that document

Fig 1.3: Ground Segment Overview

There are no **orbit data** going from Ground Segment Interface to Flight Dynamics
To be replaced by **Antenna steering data** from Flight Dynamics to GSI

Page 6-3, PERF-021: Add following requirement:

Daily schedules should be made available to the MOC at least 3 days before their execution
(TBC)

Page 5-4, Note 4

What is called *scheduling* in that context effectively mean **optimisation...**

In none of the observatory-type missions I know of (COS-B, EXOSAT, ISO) was the MOC
responsible for

the optimisation of the sequence of observations and this for good reasons: the MOC cannot
judge whether

from a scientific point of view it would be better to observe that source before that other one.

There are

also observations which must be conducted at fixed times (eg coordinated with other
ground-based or
spaceborne observatories)...

Recommendation: remove note 4

Note 3: Same comments

I could consider a simple optimisation on board: an observation could be aborted because
failing to pass

go-ahead criteria such as guide star not acquired, on-board estimate of pointing stability no
reached, other

instrument-dependant criteria... In that case the on-board scheduler could go straight to the
next request

Page 5-5, FSCF-011

Add: procurement and set-up of ephemerides of Solar System Objects

Note: These ephemerides may also be needed by MOC for the "scheduling"

Regards,.

G S T D



cwinkler @ astro.estec.esa.nl
08-09-97 03:06 PM

To: btaylor @ astro.estec.esa.nl
cc: jenkner @ stsci.edu, jclavel @ iso.vilspa.esa.es, mkessler @ iso.vilspa.esa.es, lhansson @ astro.estec.esa.nl, jrieding @ astro.estec.esa.nl, dandrews @ esoc.esa.de, kbennett @ astro.estec.esa.nl, mperryman @ astro.estec.esa.nl, gpilbrat @ astro.estec.esa.nl, jtauber @ astro.estec.esa.nl, Pierre Estaria/estec/ESA, echeroux @ astro.estec.esa.nl
Subject: Comments to FIRST/PLANCK GSID

Please find below comments as received from J.Nolan/INTEGRAL SGS whom I asked to comment on the interface document GSID.

---Chris

----- Forwarded Message

Return-Path: jnolan@astro.estec.esa.nl

Comments on the First/Planck GSID

General

Not being fully up to date with the FIRST/PLACK operations concepts I find the flow of information around the different centres rather strange. A lot of information would appear to pass through the FSC but the FSC is not involved in defining (approving) the various ICDS. Anything that goes out of the FSC to the ICCs or DPCs should be under the control of the FSC. If not what is the FSC responsible for? Maintaining a piece of Hardware? Who is developing FINDAS? To be honest from a quick glance of the First SIRD it would seem that the FSC (other than Proposal Handling & data dissemination) acts purely to support the MOC & the ICCs. Indeed it states that the FSCOM (FSC Ops Manager) & his FOT (ops team) have got nothing to do with operations! These being agreed between MOC & ICC!

Separate ICDS between the various CCs/DPCs & MOC will mean FIVE different (but almost the same)ICDS. That means FIVE different versions of the S/W in MOC (& FINDAS?). And that is only at the very top level!

Note:

By the way the term FOT means to MOC their Flight Ops Team. Sould use a different term for the First Science Centre (Ops)Team.

The document also uses the terms FSC and FCS The latter being the Flight Control System and the latter the First Science Centre. The FCS sending /receiving data from the FINDAS located at the FSC. I got them confused a few times!

The concept of RTA/QLA as mentioned here is in line with the one used on ISO. However as experience is now showing, on Integral, the Real Time nature of the systems to be implemented in the ISDC (nearest Integral equivalent to the ICCs & DPCs) is not the same. As on Integral, the First / Planck MOC will have responsibility for the Health & Safety monitoring of the Instruments. On ISO, the MOC only monitored for 'safety' whilst the SOC monitored the instrument healths and interacted with the MOC in real time. On First/Planck, I believe the interactions between MOC & ICCs/FSC are much less time critical than those of ISO. More similar to the near-real-time monitoring performed by the Integral ISDC. Indeed because the MOC monitor all instrument H/K data, the ISDC of Integral will not be manned 24 hours per day. To perform their first level monitoring task the Integral ISDC will utilise dedicated (automatic) Observation (execution) Status Monitoring S/W supplemented when necessary by remote access to SPEVAL. Additional semi-automatic software equivalent to QLA will be used to analyse the Science data & Instrument HK data. Unless one envisages real-time interactions (MOC responding in RT to ICC input) between MOC & the ICCs/DPCs the Integral analogy will be closer than the ISO one.

The idea of moving the RTA/QLA systems back & forward between the MOC & the ICC will increase the complexity of the interface. (not to say the operations). Separate ICDS will be required to cover the case that the RTA/QLA systems, which would normally interface to the output of the FINDAS, must also be compatible with an interface on the Flight Control System (FCS). Conversely one could say that the FCS and FINDAS must provide identical interfaces to the RTA/QLA systems.

If as would seem to be the baseline, that the First & Planck operations will be conducted in periods/batches, after the initial Commissioning & PV phases, then one wonders if the RTA/QLA systems will be moved back & forward to MOC at the start of each operational period.

page 14

In section 5.1.2 it is stated that a dedicated 128 kbs line (plus back up) will be in place between FSC & ICC. This is also stated in other places for the other interfaces. Statistics produced by MOC (for Integral) show that one dedicated line plus ISDN backup should be suitable for any non-real-time interface. It is also a lot cheaper!

Instrument Anomaly reports should actually go to MOC. The FSC may be in the loop but MOC have overall responsibility for Satellite Anomalies.

If the ICCs are responsible for analysing the observations they will have to provide feed back to the FSC. Observation Status Reports etc.

The ICC will also require details of the planned /scheduled

observation. Unless it is planned to reuse the 'ISO T-data concept' this information will have to be routed directly from FSC to ICC.

page 15

As stated earlier the FSC must be involved, co-signatory on any ICD which uses the FINDAS system.

page 16

The ICCs & DPCs will need access to the AHF, CCS, and perhaps the First/Planck equivalent to the EPOS (ISO EPOF) summary.

They will also require the 'Observation Log' to analyse the science data. Also TC History if not part of Observation Log.

They will require access to SPEVAL or its equivalent.

If they are required to plan Calibrations they will require access to the Constraint Checker, Slew Predictor, DBOBs etc. developed and maintained by MOC.

page 18

The FSC will require ICDs covering DBOB, Constraint Checker, Slew Time Predictor etc. These are fundamental to FSC operations and should not be in section 6. They are more critical from the FSC point of view than any of the interface defined in this section (5.3).

The FSC & the ICCs/DPCs will require details of Spacecraft Anomalies from MOC.

What will the FSC do with the Observation Log?

Only the ICCs & DPCs will be able correlate them with the Science Data. The FSC will depend on the ICCs to tell them if an observation was successful or not. On Integral the ISOC (almost equivalent to the FSC) will use SPEVAL and information fed back from the ISDC to update the observation database.

What will the FSC do with the CCS?

The FSC needs feed back at the planning level. In ISO terms PSF, EPOF, APF. The CCS used on ISO was needed only by the SPACONS & INSCONS. As First/Planck will be operated more like Integral a 'Timeline' summary is all that will be needed. Unless someone in the FSC plans to follow the schedule execution in detail.

What will the FSC do with the Guide Star Catalogue?

page 19

Table at top of page.

Again access to SPEVAL (or its equivalent) should be added. Transmission of Anomaly (S/C & Instruments) information/reports is missing.

page 19

section 5.5

Does satellite data base include the Science data base?
Should include Satellite User Manual, Commissioning Phase
Concept & Plan.

page 21

I do not fully understand the manner in which some of the
interfaces mentioned in this section are deemed 'LOWER
LEVEL'. Many of those listed seem as important as some of
those mentioned earlier. For example: the Attitude History
File is as important as the Observation Log mentioned in
section 5.3.3.

page 22

This is the only place in the document where the Focal Plane
Geometry Calibration Offsets are mentioned. An interface
between FSC & FD. If ISO is used as an example this
interface will involve MOC(FD), FSC, ICC and Project. The
calibration being an iterative process executed under
Project control.

page 23

Appendix A

Based on this definition it would seem that an ICD will be
needed for every file to be transferred. This will mean a
lot of ICDs especially if one considers that you will need 5
or six different versions of the ICD. (one per ICC and one
per DPC)

#####

John Nolan

INTEGRAL Science Ground Segment

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#####

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----- End of Forwarded Message



Alain Schütz

09-09-97 12:19 PM

To: Pierre Estaria/estec/ESA
cc: Andy Robson/esoc/ESA
Subject: Comments on FIRST/PLANCK GSID draft #1

Please forgive me for the rather provocative comments which follow. They are triggered by the contemplation of the figure 1 (and 2) of the document.
I understand that this document is a attempt to merge interface requirements applicable to FIRST and PLANCK. However re-using for a combined FIRST/PLANCK mission the specific acronyms coming originally from the two separate missions is confusing/misleading.

For instance why keeping the acronym FSC (FIRST Science Centre) when it now covers also functions related to PLANCK, like interface to the outside world, distribution of data and S/W via FINDAS, etc.... (I refer here to the definition of the FSC in the FIRST Science Management Plan).

On the other hand there is a distinction between ICC's (Instrument Control Centres for FIRST) and DPC's (Data Processing Centres for PLANCK) while it seems to me that the definition of ICC's in paragraph 3.3.3 of the FIRST SMP could also be applicable to PLANCK.

One the same Fig.1 a FOT (standing for FSC Operations Team) is mentioned but not a POT (Planck Operations Team)

I would suggest the following:

- replace FSC by SOC (Science Operations Centre), an acronym widely used in many other scientific missions.
- replace DPC1 & DPC2 by ICC4 & ICC5, possibly accompanied by a footnote indicating that ICC1-3 are relative to FIRST and ICC4-5 to PLANCK.
alternately indices 1 to 5 could be replaced by the instrument mnemonic (ie ICC_HET, ICC_PHOC, etc...)
- replace FOT by SOT (Science Operations Team) and leaving PST (Project Scientist Team) as it is.
Question: will the SOT be a combined FIRST/PLANCK operation team or will the teams be separate ???

same question for the PST.

If adopted these suggestions would allow to streamline the document and hence make it more coherent.

For instance in paragraph 1.1 (Objective) the sentence...

...the ICD's to be generated by ESOC, ESTEC, the ICC's, the FSC (FIRST) and the DPC's (PLANCK)

for ...

could be replaced by:

...the ICD's to be generated by ESOC, ESTEC, the ICC's and the MOC...

Similarly in paragraph 1.2 (Scope) the sentence...

...the provision of a FIRST Instrument (and corresponding ICC) or for a PLANCK instrument (and corresponding DCC)...

could be replaced by:

..the provision of an Instrument (and corresponding ICC)

The major ground segment interfaces could be labelled as

in place of 5.1 ICC TO FSC INTERFACE (FIRST ONLY)

5.1 ICC TO SOC INTERFACE

By the way the equivalent interface for PLANCK (ie DPC to FSC) was missing in your document or is there really none ???

Combine 5.2 ICC TO MOC INTERFACE (FIRST ONLY) and
 5.4 DPC TO MOC INTERFACE (PLANCK ONLY)
into 5.2 ICC TO MOC INTERFACE

in place of 5.3 MOC TO FSC INTERFACE (FIRST AND PLANCK)
 5.3 MOC TO SOC INTERFACE

Other general comment on the ICC (or DPC) to MOC interface:

In case the same data file has to be delivered to each of the ICC (for instance orbit data, APH, auxiliary TM data) why should the relevant ICD be duplicated by as many times as they are ICC's ???
Since these data files are made available to the ICC's via FINDAS which acts as a server within the SOC why not list these data files in the MOC to SOC interfaces ?

One detailed comment on Fig.2

Replace *Orbit Data* from Ground Station Interface to Flight Dynamics
By *Antenna steering data* from Flight Dynamics to Ground Station Interface

Regards



David Andrews

10-09-97 04:20 PM

To: Pierre Estaria/estec/ESA
cc: Goeran Pilbratt, Jan Tauber/estec/ESA, Brian Taylor/estec/ESA, Jean Clavel/vilspa/ESA, Mkessler, Lars Hansson/estec/ESA, Christoph Winkler, Riedinger, Kevin Bennet/estec/ESA, Michael Perryman, Jenkner @ stsci.edu, PBENVENU @ ESO.ORG
Subject: FIRST/PLANCK GSID and FIRST SIRD

Pierre, herewith my comments on the above docs. Most of the comments on the FIRST SIRD apply presumably to the PLANCK SIRD(have only glanced at it).

GSID - I question whether this document is necessary, indeed the objective is a list and it is very complex for a list. Chapter 5 appears to define a template for each of the major interfaces. Chapter 6 belongs, I believe, to the ICD's themselves and the preceeding chapters could be condensed to form an introductory chapter to each individual ICD.

Maintaining the GSID means configuration control, coherence control and yet another document to update. My proposal would be to have a condensed version as Chapter 1 of each of the major ICD's. Nevertheless, some comments:

Section 1.5 This seems a bit open. Surely, the responsibility can be defined up-front and not left to decisions on prime traffic, what constitutes prime etc...

Section 4 Commonality. A nice statement. What mechanism is in place to ensure that the Space Segment (Instrument design) follows common interfaces/protocols etc.

Section 5 Contains design details e.g. 128 Kbps line plus back-up. What is the availability figure and what is the traffic model from which this is derived?

Figure 2 Mission Planning loop between Science planning and MCC planning?

FIRST SIRD

Section 1.1 Last para "approval". As in the case of the MIRD/MIP, surely the reponder to the SIRD(the responsible of the SIP) should also approve any changes to the SIRD.

Section 1.4 FSC responsibility? Is it the ESA DG?

Section 1.5.2. I don't understand the relevance of a "long" Phase B to the optimal scheduling of the GSRR and GSDR within the development Phase. These reviews should be scheduled according to the expected status to achieve maximum benefit.

Sectin 2.4 Definition. Presumably the "pre-launch phase" is a part of the "development" phase as defined?

Section 2.6 Is an ICD foreseen to define this interface?

Section 3 Appears to be a mixture of responsibilities and tasks, whereas for the ICC's and the FSC Ch. 5 and 6 define the specific tasks on these elements . Do Sections 3.1,3.2 and 3.3 imply that the Project Team,the Project Scientist Team and the P.I. respond with a SIP.

RESP-001 What is the authority over the P.I.'s. Also, Fig. 7.1 shows the PM responsible for the FOT (within the FSC) and the PS responsible for the PST (within the FSC). Who has overall responsibility for the FSC? How does the PM ensure this requirement when he has no authority over the PS?

RESP-004 Are there other interfaces or is this one somehow special?

RESP-008/9 Industry involvement?

RESP-013 Who has the authority?

Section 3.2.2 Lists PS tasks. Ref to previous comment, I think the document would be clearer if Ch3 defined only responsibilities and subsequent Chs defined the tasks for the PS,PI's,FSC,ICC's

Section 3.3 and Fig 7.1 Who is responsible - the P.I. or the ICC Manager. The Fig. implies the ICC Manager reports directly to the PM.

Section 3.4 Development of the FSC is under two responsibilities. Is the delegation of tasks clear, the interfaces well defined and does the PM have ultimate responsibility?

PLANCK SERD



mperryma @ astro.estec.esa.nl
05-09-97 12:04 PM

To: btaylor @ estsa2.estec.esa.nl, jtauber @ estsa2.estec.esa.nl, gpilbrat @ estsa2.estec.esa.nl, cwinkler @ estsa2.estec.esa.nl, lhansson @ estsa2.estec.esa.nl, Pierre Estaria/estec/ESA, MKESSLER @ iso.vilspa.esa.es

CC:
Subject: Planck SIRD: comments to Review Board

From: M.A.C. Perryman

To: B.G. Taylor
cc: J. Tauber, G. Pilbratt, P. Estaria, P. Benvenuti, H. Jenkner,
J. Clavel, M. Kessler, L. Hansson, C. Winkler

Date: 5 September 1997

Subject: Comments on Planck SIRD, Draft #1

(1) the idea of a single mission with two distinct project scientists, and two separate science teams, will surely give rise to numerous problems in the future, compounding the normal problems of resolving project/science conflicts as the project develops. One specific example can be identified immediately:

- Section 2.4.7 defines the phasing of the full Planck surveys, with the second survey following completion of the FIRST key programmes. Are there ANY circumstances under which this second survey will not start at the specified time? If not, this should be specified here to avoid future conflicts. However, total inflexibility would not necessarily be in the best interests of the total scientific goals of the combined mission.

How will such generic conflicts be resolved?

Recommendation: define a common group to resolve these problems. Normally this conflict resolution should be undertaken by the project science team. In this case, a further team would appear (unfortunately) to be required...

(2) the integration of the Planck activities within FINDAS seems problematic (or at least questionable), especially given the development timescale of FINDAS (see note under PERF-018). Is it correct that FINDAS is developed primarily with FIRST in mind, but is then somehow "retrofitted" to take account of Planck? Will this work? For example, what incentive does the FSC have to provide the tools necessary for the (external) Planck community to access the Planck science products (DPCA-006)? The activities that will really take place within FINDAS are unclear to me since I am not familiar with other elements of the project: this makes it difficult to understand (cf note to PERF-018) how FIRST will function (in terms of document management facilities, etc) before the first operational FINDAS version can be available.

(3) I suppose the role of FINDAS is clearly understood and agreed as crucial by all relevant parties? Has the scientific community agreed to operate within a project-imposed Software Development Environment? What software language is specified within FINDAS? Why is this necessary? Is it re-inventing the wheel (cf IRAF)? Does Planck also have to adhere to the FINDAS software development environment approach?

My recommendation to Jan: ensure that the SIRD permits Planck to make use of FINDAS where you and your science team considers appropriate, but do not accept that FINDAS is imposed on Planck, or becomes essential to its development, while the state of FINDAS seems (to me) to be uncertain.

(4) Section 2.4.8.2 specifies the activities during the proprietary period. It should be recognised that the two activities noted are conflicting. To optimise both will be very difficult, and more attention needs to be devoted to how, and according to what schedule, this will be done. Furthermore, the product delivery to the community needs further specification; without it, it is not obvious how this schedule can be estimated, and misunderstandings will surely arise.

Recommendation: seek an agreement with PIs that appropriate effort must be devoted to the documentation/product definition during the guaranteed time phase, such that neither goal suffers.

(5) Some clarification is needed when referring to the "Planck Community", since it seems to mean different groups in different places. In 2.4.8.3 I understand the "Planck astronomical community" to refer to those scientists "external to the Planck Collaboration", as used under RESP-043: this group is the target of the second call for research proposals. However, under 3.6 we see that the "Planck Community" is responding to the second call for proposals: so here, I understand "Planck Community" to mean precisely "scientists external to the Planck collaboration"... The two groups appear to be the "Planck Collaboration" on the one hand, and the "Planck Community" on the other.

Recommendation: summarise the different parts of the community, and clarify text accordingly.

(6) PERF-022 rather naively wraps up a hugely complex problem in two lines of imposed specification! It takes no account of the unpredictability or complexity of the Planck data. PS should impose suitable caveats or contingency here (cf item (4) above), or understand that he is already exposing himself to potential problems.

Recommendation: use this to ensure that the technical facilities and manpower are in place to address the data analysis problem on these time-scales. Seek an agreement that this becomes a target date. Ensure that the AWG (for example) will support the policy of finalising the data products before accepting that they are distributed to the community before they are fully calibrated, etc.

(7) Recent developments have moved in the direction of PS assuming PM responsibilities post-launch. With two PS, has this been excluded here (cf Figure 6.5)?

Recommendation: do not accept the role of Project Manager post-launch, and have this specified here. Insist that P foresees proper support for this post-launch.

(8) The organigrams in Figs 6.4 and 6.5 are important. The parallel organisation of FIRST and PLANCK within the project seems questionable (cf Item (1) above), and none of the organigrams attempts to resolve the associated responsibility. DPCs switch from reporting to the MOM during PV, to the PS during SO. Is this intentional? How does this tie in with the possibility of the PS assuming the role of the PM post-launch?

Recommendation: as a minimum, revise Fig 6.5 such that the Planck PS (and the Planck ST) stand hierarchically above parallel inputs from the GSAG, and DPC1/DPC2 (which I would propose are represented by the PI's through the medium of the Planck ST).



kbennett @ astro.estec.esa.nl
11-09-97 05:20 PM

To: jtauber @ astro.estec.esa.nl
cc: Pierre Estaria/estec/ESA
Subject: Plank SIRD

-
- 1) See my comments for FIRST SIRD : many overlap
 - 2) The flow of data analysis is not obvious. The post ops analysis is not the first time the analysis is performed : though one might think fso from the text.

Why not tabulate the data processing steps alongside the products and the time line ?

- 3) I think it should be made clear that all the instruments (FIRST and PLANK) are checked out fully in the demo phase.
What would happen if one of the first instruments was seen to be degrading on a time scale of months ? Can the order of the mission be changed ?
- 4) 3.2.2 .. PLANCK is a PI SURVEY mission ?
- 5) I thought there were PLANCK science operations funded by ESA.. now there are by virtue of the FSC .. is this OK ?
- 6) 3.6 .. AT THEIR OWN COST ... WHAT DOES THIS MEAN ?
- 7) 6.3.1 Shouldn't the Demo Phase be included in the commissioning phase ?
- 8) 7-2 Documentation 'available through FINDAS" what about DMS : may not be compliant ?

I am sending this you only you and Pierre

I hope it helps

Kevin

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pbenvenu @ eso.org
16-09-97 08:09 AM

To: btaylor @ astro.estec.esa.nl, Pierre Estaria/estec/ESA
cc:
Subject: SIRD Review today

Dear All,

as mentioned to Brian, I am busy with the ADASS Conference, therefore I cannot attend today's review. Just a brief comment on the SIRD.

I substantially agree with most of the comments so far produced, particularly those by Jean Clavel.

My own general comment is that the Document still suffers from the imposed merging of the two missions. While it is correctly proposed to have a single FIRST/PLANK Project Team, the unity breaks down at the level of Project Scientist. If we take the merging seriously, we should have a single PS and Science Team. :-) :-)

I hear a lot of screaming...

... but just consider the saving (number of people, number of meetings, etc.) and the much easier procedure for solving the inevitable problems in the overall mission profile when malfunctions or anomalies (or unexpected performances) will (inevitably) appear.

The break-down of the FIRLANK (or PLAFIR) mission will then happen at the level of Instrument Definition Teams.

As usual, an heretic view...

Have fun, Piero

P.S. The 1 just above, was meant to be + or -, I am typing from a stupid terminal...