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Ref. : PT-06700 **Date** : 29 April, 1999

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Subject : **FIRST/Planck Instrument Reviews**

Dear all,

As announced during the last round of instrument technical meetings I want to implement in our planning the milestones/reviews of the instruments as defined in the IID-A.

The note attached summarises our view of these reviews, their relationship to the s/c development and with that, the timing.

The reviews as identified in the IID-A are formal ESA reviews and distinct from any instrument internal reviews. However, I wish to establish together with you a proper timing, such as to get maximum benefit from instrument internal reviews and to avoid duplication of work.

I have included in the attachment II a strawman planning for the first review, the Instrument Science Verification Review (ISVR), for all five instruments, which is planned for autumn this year. Since I know that you have partially settled already dates for your planned reviews, could you propose/confirm by end May 1999 the dates for your ISVR?

Further, I would like you to propose the list of supporting documents for the data package of this first review by the same date.

Best regards,

T. Passvogel

Attachments: PT-06692 (8 pages) and Annex II (1 page)

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FIRST/Planck Project

FIRST/Planck Instrument Reviews

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1 FIRST/Planck Instrument Reviews

1.1 Introduction

This document describes the reviews to be held with the FIRST/Planck Instrument Teams in the course of the programme.

Figure 1.1 shows the system event/review schedule for the FIRST/Planck programme. All detailed planning is based on this schedule.
Not included in the figure are the instrument reviews, as defined in the Instrument Interface Document part A, which relate to the following system events/reviews:

- S/C Development
- System Reviews
- Deliveries

1.2 System Events/Reviews

Two key system events in the FIRST/Planck programme are preceding the system reviews that will be held during the actual satellite development phase. These events, which have a direct bearing on overall instrument development, are planned as follows:

- ITT release 4th quarter of 1999
- Selection of S/C Prime Contractor 4th quarter of 2000

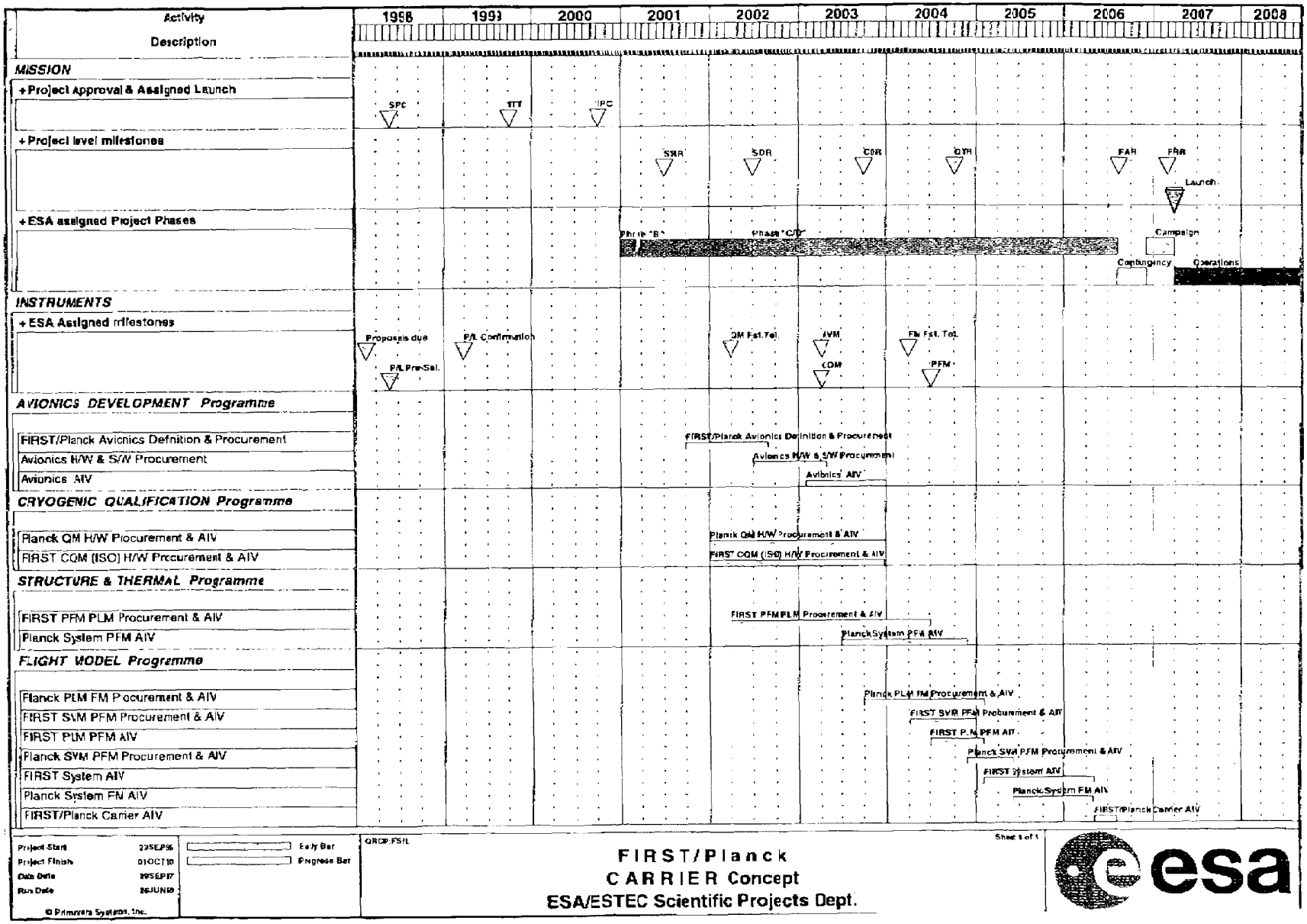
During the satellite development phase, system level reviews will be covering spacecraft, payload and launch vehicle aspects of the FIRST/Planck mission. The baseline schedule for the system level reviews is:

- System Requirements Review SRR mid 2001
- System Design Review SDR mid 2002
- Critical Design Review CDR 4th quarter 2003
- Qualification Test Review QTR 4th quarter 2004
- Flight Acceptance Review FAR 3rd quarter 2006

To prepare for the system reviews, each satellite subsystem will have its separate review. This will include instrument reviews, for which inputs will comprise data review packages for the individual instruments. A list of the nominal contents of these packages is defined in 1.2.8.

Schedule overview

Figure 1.1: FIRST/Planck schedule overview (see next page)



1.3 Instrument Reviews

1.3.1 General

There shall be six major reviews for each instrument selected for the FIRST/Planck mission. The reviews form part of the overall FIRST/Planck review programme as outlined above.

For each of the reviews, a review board will be set-up. The board will consist of ESA personnel and will be chaired by the FIRST/Planck Payload Manager together with the Project Scientist or their designated representatives.

The reviews shall be conducted by ESA, nominally at ESA premises. The objectives will be to ensure that:

- the instrument design will be compatible for achieving the instrument performance.
- the instrument design complies with the interface requirements of the IID-A and B
- the scheduled delivery dates are compliant with the system level programme.

The data package to be reviewed shall cover both the instrument hardware and software together with details of any other deliverables such as MGSE, EGSE, OGSE and documentation and shall be delivered to the ESA Project Team as a minimum twenty working days prior to the scheduled review date.

The output of the review shall provide recommendations for consideration by the ESA Project Manager or the Principal Investigator in technical or programmatic areas. Either party shall provide a formal response to such recommendations within one month of review completion.

Non-compliance with other system elements will be brought forward to the following system level review for resolution.

Following the system level reviews the IID's will be formally reissued to reflect the results of the review.

The following Instrument reviews shall be held:

- the Instrument Science Verification Review (ISVR, date < 4th quarter 1999)
- the Instrument Intermediate Design Review (IIDR, date < 3rd quarter 2000)
- the Instrument Baseline Design Review (IBDR, date < mid 2001)
- the Instrument Hardware Design Review (IHDR, date < mid 2002)
- the Instrument Critical Design Review (ICDR, date < 4th quarter 2003)
- the Instrument Flight Acceptance Review (IFAR, date < 3rd quarter 2006)

In addition Instrument Acceptance Reviews (IAR's) will be held at delivery of each of the instrument models. The dates are < 1st quarter 2003 for the AVM and CQM, < 3rd quarter 2004 for the PFM and TBD for the FS and/or FS components.

1.3.2 Instrument Science Verification Review (ISVR)

It shall be conducted after instrument selection, in preparation for the release of the ITT for S/C development.
The objectives of the review shall be to demonstrate that:

- the instrument conceptual design has been finalised/ i.e. is compatible for achieving the instrument performance
- the instrument design will achieve the anticipated science objectives
- the overall interface requirements definition has been finalised
- the conceptual design for on-board software has been finalised
- the conceptual design for the necessary MGSE, EGSE and OGSE has been finalised.

1.3.3 Instrument Intermediate Design Review (IIDR)

It shall be conducted at the time of Prime Contractor selection.
The objectives of the review shall be to demonstrate that:

- the instrument detailed system design has been finalised
- the instrument subsystem design has been finalised
- the detailed interface requirements have been finalised
- the design for the on-board software has been finalised (User Requirements Document)
- the design of the necessary MGSE, EGSE and OGSE has been finalised.

1.3.4 Instrument Baseline Design Review (IBDR)

It shall be conducted in preparation for the S/C SRR.
The objectives of the review shall be:

- the freeze of instrument system and subsystem requirements
- the freeze of the on-board software (System Requirements Documents)
- the release for manufacture of instrument Avionics Model (AVM) and Cold Qualification Model (CQM)
- the freeze of the MGSE, EGSE and OGSE design
- The release for manufacture of the MGSE, EGSE and OGSE.

1.3.5 Instrument Hardware Design Review (IHDR)

It shall be conducted in preparation for the S/C AVM/CQM phase.
The objectives of the review shall be:

- the assessment of the instrument AVM/CQM programme
- acceptance of the AVM/CQM models for spacecraft system level
- the freeze of the on-board software (Architectural Design Document)

1.3.6 Instrument Critical Design Review (ICDR)

It shall be conducted during the TBD.
The objectives of the review shall be:

- the assessment of the results of the system level AVM/CQM with respect to the instruments
- the assessment of the results of qualification on instrument unit and subsystem level
- the acceptance of instrument Flight Model, its Instrument Users' Manual and the on-board software Detailed Design Document.

1.3.7 Instrument Flight Acceptance Review (IFAR)

This review shall be conducted after completion of the spacecraft system level FM electrical verification including on-line compatibility tests with the respective flight operations centres and shall precede the programme level Flight Acceptance Review.

The objectives of the review shall be:

- the assessment of the results of the system level FM testing with respect to the instrument
- the assessment of the completion of qualification of instrument units and subsystems
- the update of the Instrument Users' Manual as required
- the close out any outstanding issue.

1.3.8 Review Data Packages

A data package shall be provided for each of the scheduled Instrument reviews, detailed above. The package shall be delivered to the ESA Project Team in 5 copies (electronic version?).

The packages shall contain the following sections/documents (to be adapted to each specific review):

Instrument Description Document:

- A description of the current instrument design and interfaces

IID-B:

- The IID-B updated to the current status

Development Plan:

- The Instrument Development and Verification plan

Test reports:

- Test reports of environmental and functional tests, which demonstrate that the objectives of the instrument development, scheduled for the time of the review have been met

Notes:

- Technical notes, covering any topic or analysis which is either required by the IID or has been requested by the ESA Project Team

User Manual:

- The User Manual

Product Assurance:

- Product Assurance documentation as required in the Product Assurance Requirements for the FIRST/Planck instruments

Schedule:

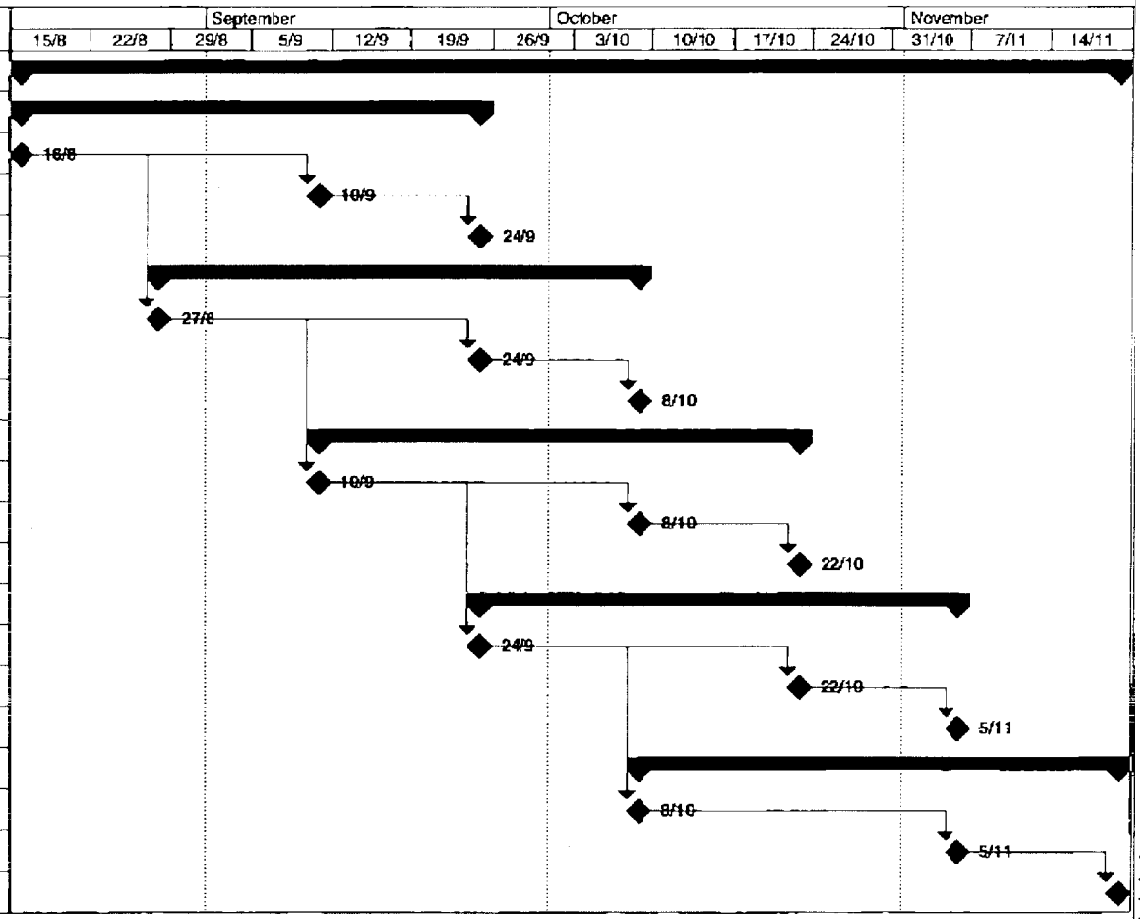
- Schedule network and bar-chart together with an assessment of progress and problem areas covering all aspects of the instrument and associated equipment

Ground Support Equipment:

- Electrical ground support equipment, design, development and verification status including both hardware and software
- Mechanical ground support equipment, design, development and verification status
- Optical ground support equipment, design, development and verification status.

FIRST/Planck — **Instrument Science Verification Review** — Thu 29/4/99

ID	Task Name
1	**Instrument Science Verification Review**
2	**SPIRE**
3	Data Package
4	Review Board Meeting
5	Review Board Report
6	**PACS**
7	Data Package
8	Review Board Meeting
9	Review Board Report
10	**HIFI**
11	Data Package
12	Review Board Meeting
13	Review Board Report
14	**NFI**
15	Data Package
16	Review Board Meeting
17	Review Board Report
18	**LFI**
19	Data Package
20	Review Board Meeting
21	Review Board Report



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ANNEX II