



SPIRE - ESA-MOM-000181



## FIRST/Planck Project Telefax

**Fax No** : (31) 71 565 5244

**Tel. No** : (31) 71 565 5962

**Ref.** : PT-06426

**Date** : 23 February, 1999

**From** : T. Passvogel (SCI-PT)

**Page** : 1 of 1 + attachments

**To** : Th. de Graauw (SRON/Groningen)

**Fax No**: 050 363 4033

**Copy** : A. Poglitsch (MPE/Garching)

**Fax No**: 49 89 3299 3292

M. Griffin (QMWC/London)

44 181 980 0986

B. Swinyard (RAL/Oxfordshire)

44 1235 44 6667

**Subject** : FIRST/Planck - FIRST Optical Bench Sharing

**Ref.** : 1. Minutes of the meeting held at ESTEC on 16.02.1999

2. HIFI e-mail, dated 21.2.1999

Dear Thijs,

Please find as an attachment the ref. 1 minutes. There is only one modification, related to the due date of the action item on PACS.

However, I do not know whether it makes still sense to send these minutes around, since I understand that basically everything that has been discussed and agreed during the meeting is not relevant anymore.

The main action on you, to confirm the feasibility to find a design that avoids need of the SPIRE corner is not answered and further, I understand from your update that the interference is increased from potentially up to 50 mm to now 60 mm.

At the interface to the PACS the length of the HIFI FPU is increased from 150 mm now to 211 mm what means another compromise with PACS.

I consider meetings as we had it on the 16.02.1999 as completely useless and waste of time if the discussions held and the statements given are waived immediately after the meeting.

I feel forced to propose to go back to the original configuration for SPIRE and PACS and to ask you to provide a HIFI design consistent with the original HIFI envelope dimensions (attached as annex 2 to avoid any misunderstandings).


Best regards

T. Passvogel

Attachments: PT-MM-06407 (annex 1), optical bench layout (annex 2)

**ESTEC**

Postbus 299 - NL 2200 AG Noordwijk - Keplerlaan 1 - NL 2201 AZ Noordwijk ZH  
<http://sci.esa.int/first> - <http://sci.esa.int/planck>


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**SUBJECT:** FIRST/Planck - FIRST Optical Bench Sharing**PLACE:** ESTEC


Participants	Organ.	Distribution
A. Poglitsch	MPE	
T. de Graauw	SRON	
B. Swinyard	RAL	
G. Pilbratt	ESTEC	
T. Passvogel	ESTEC	

AGREEMENTS STATEMENTS	ACTION
<p><b>1. Optical Bench Sharing</b></p> <p>The different instrument inputs for the optimisation of the optical bench sharing of the three FIRST instruments have been discussed. Major elements of the discussion were:</p> <ul style="list-style-type: none"> <li>- <b>SPIRE</b>            SPIRE presented the results of their analyses of the optical design of the SPIRE FPU with the main result being, that off-axis position of SPIRE (in accordance with the HIFI design) is acceptable for SPIRE.            A potential interface problem is identified at the corner to the HIFI structure (see below). The area of concern is considered necessary for structural reasons, however, the mechanical design activities are not yet completed and clear picture will only be available by mid March 1999.</li> <li>- <b>HIFI</b>            The need to stay on axis for HIFI has been explained by HIFI and is related to symmetric chopping, i.e. symmetric to the telescope.            The question has been discussed whether there are further solutions for the M3 design than the one selected by HIFI. It appears that an optimisation of the mirror design trying to reduce its size could be carried out, if necessary.</li> <li>- <b>PACS</b>            The analysis carried out by PACS on the effect of an off-axis position has been presented and discussed. It is understood that PACS applied a very stringent requirement to perform the optimisation of the optical quality. However, the effect of a non-perfect (up to 10 micron WFE) telescope on this optimisation process has not been included.</li> </ul>	

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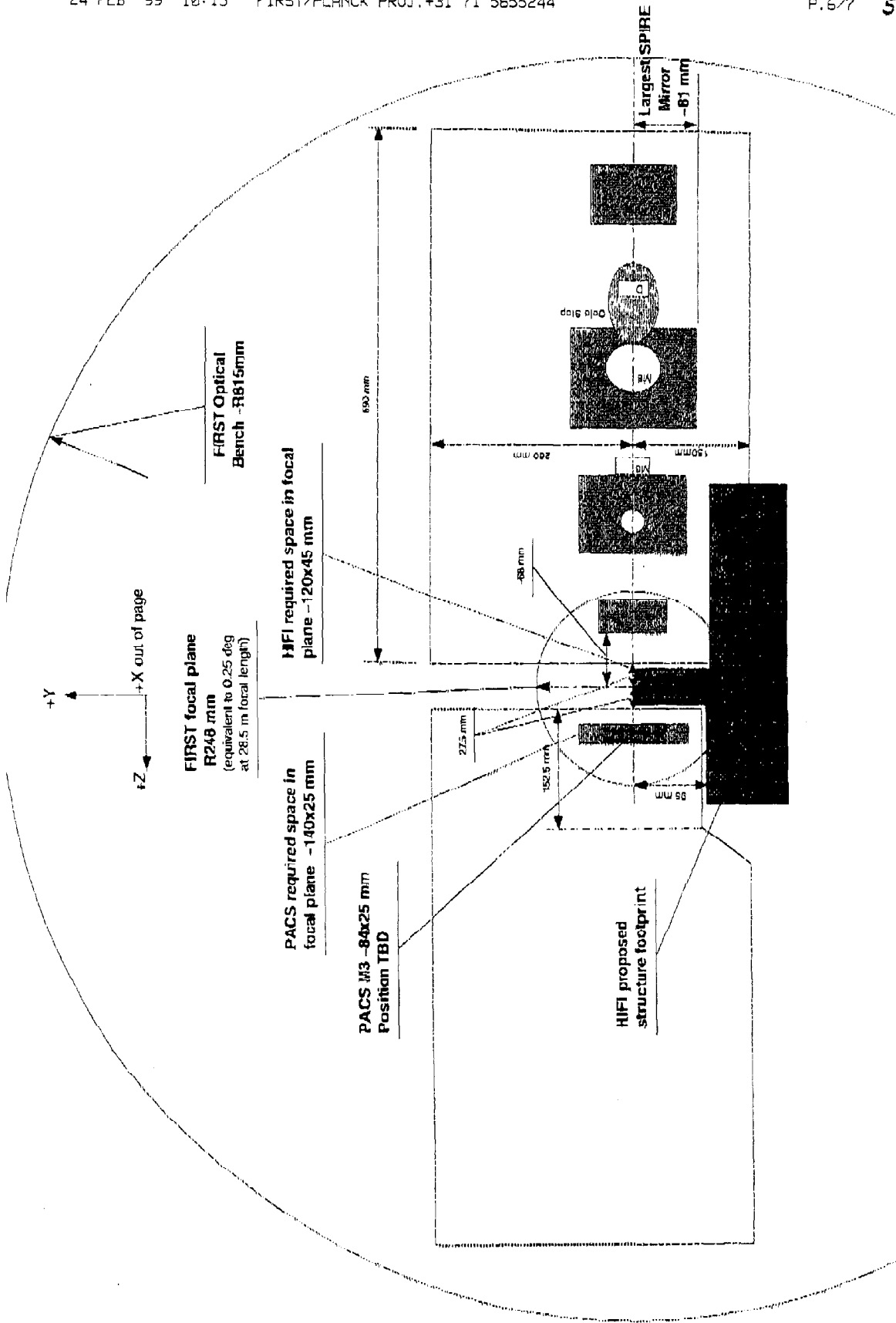
AGREEMENTS STATEMENTS	ACTION
<p><b>- Discussion and agreement</b></p> <p>After some discussion the following sharing of the optical bench has been agreed and is given in the sketch (annex 1) attached:</p> <ol style="list-style-type: none"> <li>1. HIFI will stay in the central symmetric position with the envelope dimensions as given in annex 1</li> <li>2. PACS will come as close as possible to the HIFI envelope – a minimum distance of 5 mm is required from ESA (tbc)</li> <li>3. HIFI will confirm by 19.2.1999 the feasibility to modify the instrument design at the corner to SPIRE to stay outside the SPIRE volume. Implementation of this change will be subject to the results of the SPIRE mechanical design (see 4.)</li> <li>4. SPIRE will complete the running activities on the mechanical design by mid March 1999. The design activities will be carried out such as to minimise the "overlap" between SPIRE and HIFI at the "corner".</li> </ol> <p>In order to avoid misinterpretation of the optical bench allocations a drawing will be setup by ESA, taking into account the inputs from the instrument teams (see actions below)</p> <ul style="list-style-type: none"> <li>- SPIRE to provide update of optical bench footprint sketch (annex 1)</li> <li>- PACS to provide envelope definition of the FPU on the basis of the SPIRE update</li> <li>- HIFI to provide envelope definition of the FPU on the basis of the SPIRE update</li> <li>- ESA to consolidate the input.</li> </ul> <p><b>2. FIRST Telescope</b></p> <p>ESA briefly informed on the status of the FIRST Telescope development at NASA/JPL, especially w.r.t. the new design features discussed in ESTEC fax PT-06359, dated 4.2.99.</p> <p>The following main comments are given by the instrument teams and will be taken up by the project with JPL:</p>	<p>AI#1 - HIFI</p> <p>AI#2 - SPIRE</p> <p>AI#3 - PACS</p> <p>AI#4 - HIFI</p> <p>AI#5 - ESA</p>

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<b>AGREEMENTS STATEMENTS</b>	<b>ACTION</b>
<ul style="list-style-type: none"><li>- The radial gaps of the order of 2 mm thickness are considered acceptable from the point of view of missing collecting area and increase of overall emissivity. Additional effects, however, resulting from non-homogeneity of the gap, varying optical properties along the radius, diffraction effects from edges etc. are considered a serious problem</li> <li>- The temperature discontinuity between separate petal segments is considered a potentially serious problem, especially since this discontinuity will be different at different locations of the primary mirror. However, this can only be evaluated with a complete temperature map of the primary reflector.</li></ul>	





Proposed FIRST focal plane layout 15/2/99 showing clash between HIFI and SPIRE structure

1/A



Attachment 2

Doc. No. : PT-HIFI-02125  
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 Date : 31/01/1999  
 Chapter-Page : 5-2

**5.3 LOCATION AND ALIGNMENT**

Figures 5.3-1 and 5.3-2 show the concept of the location of the three Focal Plane Units (FPU) on the Optical Bench (OB) inside the cryostat and the concept of the location of the Local Oscillator Unit (FHLOU) external to the cryostat.

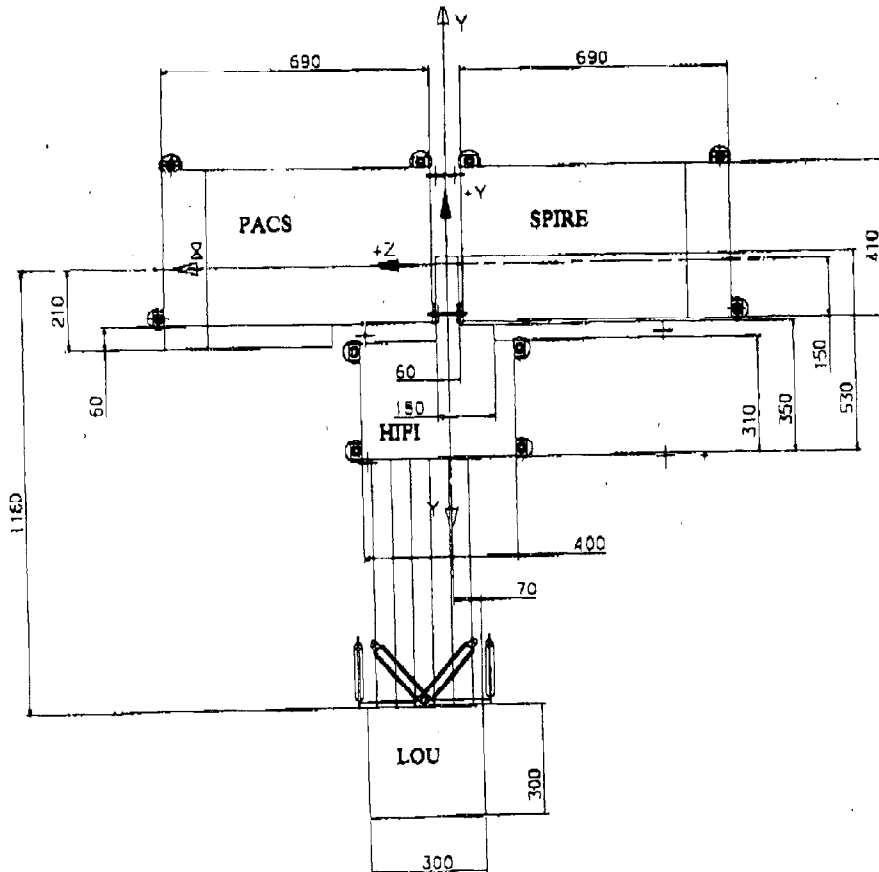


Figure 5.3-1: The FIRST Focal Plane, side view towards -X  
 Unit dimensions and nr of LO beams out of date