1. INTRODUCTION

Science data produced by the SPIRE instrument is only of use if the Herschel telescope is operating in a stable configuration (i.e. either fixed pointing or scanning at a constant velocity). In order to identify these times at which the science data is valid SPIRE has requested that information is available from the spacecraft on the current telescope status. This information takes the form of an On Target Flag (for pointing observations), a Telescope Scan Flag (for scanning observations) and (TBC) a Peak Up Flag.

This note describes a possible implementation of these flags using the Information Telecommand Service of the CDMS (see the Herschel/Planck Packet Structure ICD, SCI-PT-ICD-7527) to pass the information from Spacecraft to instrument.

Note: Currently the SPIRE instrument OBS does not take any action based on this information (i.e. it does not wait for the flag before taking data, as this would lead to an indeterminate length of time for a command to be executed). The information is used solely in the ground processing software. For this reason it is not a requirement that the information is passed to the instrument, provided that it is available in the spacecraft telemetry, in an easily extracted form, and that this is available to the processing software. We believe that it will be more convenient if the information appears in the SPIRE telemetry stream and describe its implementation below.

2. ON TARGET FLAG

When pointing, it is required that we know when the telescope pointing is sufficiently close to the commanded position that it will have no affect on the science data. We expect that the maximum difference between the actual pointing position and the commanded position for which the telescope will be deemed to be 'on target' will be commandable from the ground. We suggest that following a movement of the telescope an Information Telecommand (Service 20,4) is sent to the instrument by the CDMU when the current pointing is confirmed to be within this maximum distance (and also when the current pointing is outside this).

The information required is an indication of the type of event (on target, off target), the on-board time that this occurred and the commanded maximum error distance.

The table below indicates the expected structure of the telecommands.

0 0 0 1 1	APID1
1 1 0 0 0	Count
Length = 13	
0 0 0 0 0 0 0 1 0 0 0 1 0 1 0 0	
0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0	
INFOTYPE	
OTFTIME	
OTFERROR	
Checksum	

Parameter

Name	Comment
INFOTYPE	Type of information 0 = Off Target 1 = On Target
OTFTIME	On Board Time of Report
OTFERROR	OTF flag is set if pointing is within this value

3. TELESCOPE SCAN FLAG

When executing a telescope scan, it is required that we know the time(s) that the telescope is confirmed to be moving in its scan at a constant velocity. We suggest that the start and end of each scan are identified by an Information Telecommand (Service 20,4), sent by the CDMU to the SPIRE instrument. The accuracy of the time contained in each of these telecommands is given in the IID part B (SCI-PT-IIDB/SPIRE-02124) as 5 ms (TBC). For the reasons outlined above, it is not necessary to issue these telecommands with this accuracy (indeed the instrument may not deal with the telecommand for some time).

The information required is an indication of the type of event (start of scan , end of scan) and the time at which this event occurred.

The table below indicates the expected structure of the telecommands.

0 0 0 1 1	APID1
1 1 0 0 0	Count
Length = 13	
0 0 0 0 0 0 0 1 0 0 0 1 0 1 0 0	
0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0	
INFOTYPE	
TSFTIME	
Checksum	

Parameter

Name	Comment
INFOTYPE	Type of information 2 = Start of Scan 3 = End of Scan
TSFTIME	On Board Time of Report

4. PEAK-UP FLAG

In the event that SPIRE will execute a peak-up sequence, it will provide the offset to the current telescope pointing position in the form of an event TM packet (Service 5.1) sent to the CDMU (and passed by it to the AOCS). After implementing the offset, the CDMU should confirm this to the instrument via an Information Telecommand (Service 20,4)

The table below indicates a possible structure of the telecommand.

0 0 0 1 1	APID1
1 1 0 0 0	Count
Length = 13	
0 0 0 0 0 0 0 1 0 0 0 1 0 1 0 0	
0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0	
INFOTYPE	
PKUTIME	
Checksum	

Parameter

Name	Comment
INFOTYPE	Type of information 4 = Peak up confirmation
PKUTIME	On Board Time of Report