1.INTRODUCTION

This document sets out the procedures to be used during the SPIRE Specific Performance Test which will be carried out at system level as part of the Integrated System Test. The format of the document is identical to that used for the Warm Functional Test Procedures (RD1). In this document only the individual procedures are detailed; neither the timing nor the sequencing of the tests are given or should be implied from the order given in the document. AD01 gives a possible overall sequence and duration for the performance tests. The sequencing of the EMC and thermal tests will be detailed in separate documents.

1.1Change Record

Draft 0.1, 17th July 2006	Draft 0.1
Issue 1.0 15th Aug 2006	Issue 1.0 Included detailed procedure for BSM tuning operation Several updates for procedure naming Spectrometer SCAL check rearranged

1.2Applicable Documents

AD01 Definition of SPIRE testing for FM IST and TV/TB SPIRE-RAL-NOT-002595

1.3Applicable Documents

RD01 SPIRE IST Warm Functional Test Procedures SPIRE-RAL-PRC-002422
RD02 SPIRE Instrument User Manual, Issue 1.0, SPIRE-RAL-PRJ-002395, 08/04/2005

1.4General instructions for executing test procedures

- Before executing any of the procedures please always check with the Instrument-EGSE staff
- Any text in **boldface** in the procedural steps generally indicates an action which has to be performed manually by the I-EGSE staff.
- The last row in a procedure table should be used to record the overall Pass/Fail result of each test.

1.5Assumptions

- The CCS is only required to check changes in instrument configuration related HK parameters.
- For each test the instrument will be in a pre-defined mode as listed in the IUM (**RD02**).
- For the SPIRE spectrometer mechanism (SMECm) tests it is assumed that the Herschel cryostat will be tilted such that the plane of the Herschel Optical Bench (HOB) is vertical and the SPIRE Optical Bench (SOB) is horizontal.
- For the SPIRE Cooler recycle it is assumed that the Herschel cryostat will be tilted such that the plane of the SOB is at, at least, 30 degrees from the vertical with the +Y Spacecraft axis downwards
- These procedures should be suitable for operation of both the Prime and Redundant side of the instrument (TBD).
- Several manual procedures are present in this document for which TCL scripts are used for command sequence generation. These procedures require minimal action from the CCS operator and will be cleary explained within this document.
- **The converted TM parameter values are extracted from the MIB in use for PFM ILT. These values are subject to change for both prime and redundant operations.**

1.6Open Issues

- Sorption pump heat switch and Evaporator heat switch expected voltages for manual cooler recycle procedure are to be confirmed during ILT PFM4 test campaign at RAL,.
- The use of Spire Burst Mode during Photometer Most Sesnitive mode is TBC.

1.7Duration

The estimated duration for executing the entire sequence of procedures, including switch off of the SPIRE instrument afterwards is estimated to be about **5 days (see AD1)**

2.TEST PROCEDURES

The following is a list of the test procedures that can be found in this document:

Procedure: BSM Control Loop Setting
Procedure: Cooler recycle (manual)
Procedure: Cooler recycle (automatic)
Procedure: Photometer bias optimisation
Procedure: Photometer Ambient Background Verification
Procedure: PTC Headroom Characterisation
Procedure: Spectrometer bias optimisation
Procedure: Spectrometer Ambient Background Verification
Procedure: Photometer scan mode POF5
Procedure: Photometer chop/jiggle mode POF2
Procedure: SPEC high resolution mode SOF1
Procedure: Spectrometer Micro vibration Test
Procedure: Spectrometer SCAL check
Procedure: Photometer Thermal Control Verification
Procedure: EMC - Photometer most sensitive mode
Procedure: EMC – Spectrometer most sensitive mode
Procedure: EMC – SPIRE most Emissive mode
Procedure: 300mK Stage Decontamination

2.1Procedure: BSM Control Loop Setting

Version: 1.0
Date: 17th July 2006
Purpose: To optimize the PID control loop for BSM best dynamic behaviour

Duration: 60 minutes

Preconditions:

- Functional tests SPIRE-IST-FUNC-BSM-01,02,03 have been carried out successfully
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal

Initial Configuration:

- SPIRE is in REDY mode

Procedure Steps:

Step#	Action	Comments
1	Execute SPIRE-IST-BSM-ON.tcl template	This switches ON the BSM magneto resistive sensors
2	Wait for SPIRE staff to update the default on/off source positions for the chop throw.	
3	Start chopping the BSM by pressing ok in the popup window with the message "*Start Chopping*"	
4	Update PID settings by manually commanding the instrument The SPIRE personnel will be passing to the operator the command parameters to input as part of the tuning process.	All the commands used for the PID tuning have the following SPIRE MIB mnemonic: SPIRE_SEND_DRCU_COMMAND() The command parameters used for PID tuning are : Parameter 1: (ANY of the following): Chop axis tuning: / Jiggle axis tuning 0x90C8xxxx / 0x9148xxxx 0x90C9xxxx / 0x9149xxxx 0x90CAxxxx / 0x914Axxxx 0x90CFxxxx / 0x9151xxxx Where xxxx denotes the PID parameter value to be changed. Parameter 2: Override = 0 e.g : SEND_DRCU_COMMAND(0x90C8xxxx,0)
5	Repeat steps 2 to 4 for another set of the chop on/off source positions.	
6	Press ok to stop the current test	
7	Switch OFF BSM mechanism Execute SPIRE-IST-BSM-OFF.tcl	

Final Configuration:
SPIRE in REDY

2.2Procedure: Cooler recycle (manual)

Version: 1.0
Date: 24th July 2006
Purpose:
Recycle the cooler to provide the correct operating temperature for the detectors.
This procedure is carried out with operator intervention to ensure the correct conditions are obtained during the recycle and to properly calibration the duration of each phase of the recycle. Once the calibration is obtained an automatic procedure will be used that does not require operator intervention (see section 2.3)

Duration:
About 2 hours

Preconditions:

- Functional test SPIRE-IST-FUNC-SCU-07 has been carried out successfully.
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- Herschel tilted such that SOB is tilted at at least 30 degrees from vertical towards +Y direction

Initial Configuration:
SPIRE in REDY mode

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-CRECm.tcl • **Click on OK button to turn off Pump Heat Switch (whether it is on or off)** • **Apply 1.4 mA to the Evaporator Heat Switch**	STEP *Time (UT)* EVHSV PUMPHSTEMP EVAPHSTEMP	1 TBC TBC TBC		
2	**Wait for PUMPHSTEMP to go just below 12 K and then click on OK to**	STEP	2		

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
	apply 300 mW power to Pump Heater	*Time (UT)* *ΔTime (minutes)* SPHTRV	 TBC		
3	**Wait for PUMPHTRTEMP to increase to 45 K and then click on OK to reduce power to Pump Heater to 40mW**	STEP *Time (UT)* *ΔTime (minutes)* SPHTRV PUMPHTRTEMP	3 TBC TBC		
4	**Wait for SUBKTEMP to fall below 2 K and then click on OK to switch off power to the Pump Heater and Evaporator Heat Switch.** **IMPORTANT: This step should be executed even if SUBKTEMP is above 2 K but more than an hour has elapsed since the start of the recycle procedure.**	STEP *Time (UT)* *ΔTime (minutes)* EVHSV SPHTRV PUMPHSTEMP EVAPHSTEMP	4 TBC TBC TBC TBC		
5	**Wait for EVAPHSTEMP to fall below ~ 16 K and then click on OK to switch on power to the Pump Heat Switch** *The TCL script ends after execution of this step*	STEP *Time (UT)* *ΔTime (minutes)* SPHSV SUBKTEMP PUMPHSTEMP	5 TBC TBC TBC		
6	**Monitor SUBKTEMP and PUMPHSTEMP.** *Cooler recycle procedure completes when SUBKTEMP reaches ~ 0.285 K and PUMPHSTEMP reaches ~TBC K.*	*Time (UT)* *ΔTime (minutes)* SUBKTEMP PUMPHSTEMP	 < 300mK TBC		

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure

Final Configuration:
SPIRE in REDY mode with cooler recycled and detectors at <= 300 mK

2.3Procedure: Cooler recycle (automatic)

Version: 1.0
Date: 24th July 2006
Purpose:
Recycle the cooler without operator intervention

Duration:
Approximately 2 hours

Preconditions:

- Functional test SPIRE-IST-FUNC-SCU-07 has been carried out successfully.
- Manual recycle carried out under nominal temperature and cryostat operational conditions
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- Herschel tilted such that SOB is tilted at at least 30 degrees from vertical towards +Y direction

Initial Configuration:
SPIRE in REDY mode

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-CRECa.tcl	SUBKTEMP	AFTER RECYCLE < 300mK		
Test Result (Pass/Fail):					
Duration of SPIRE Cooler Recycle Procedure:					

Final Configuration:
SPIRE in REDY mode with cooler recycled and detectors at <= 300 mK

2.4Procedure: Photometer bias optimisation

Version: 1.0
Date: 24th July 2006
Purpose:
Find the optimum bias level and frequency for operating the photometer under IST ground nominal conditions

Duration:
Approximately 4 hours

Preconditions:

- Functional tests SPIRE-IST-FUNC-DCU-04P,13P has been carried out successfully.
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

OPEN ISSUE – do we want the PTC operating during this test – see test 2.6?

Initial Configuration:
SPIRE in PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-PDET-ON.tcl • Switch on detectors using ILT determined setting • Observe signals and ensure correct profile is observed during JFET switch on	PLIABITSTAT	1	-	
2	Execute TCL script SPIRE-IST-PHASEUP-P.tcl • Observe signal levels and determine optimum phase setting for ILT bias levels – this is the staring point	N/A	N/A	N/A	
3	Execute TCL script SPIRE-IST-DNA-P.tcl	N/A	N/A	N/A	

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
	• Set frequency to 70 Hz and ILT nominal • Phase up • Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set frequency to 100 Hz and ILT nominal • Phase up • Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set frequency to 130 Hz and ILT nominal • Phase up • Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set frequency to 190 Hz and ILT nominal • Phase up • Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set to ILT nominal values				
4	Analyse data in real time to determine IST ground nominal operating parameters				
Test Result (Pass/Fail):					
Approximate optimum bias settings each detector: **Bias Level Frequency Phase** **PSW** **PMW** **PLW**					

Final Configuration:
SPIRE in PHT STBY mode with bias set to ILT nominal values

2.5Procedure: Photometer Ambient Background Verification

Version: 1.0
Date: 24th July 2006
Purpose:
Determine the optical power load onto the photometer detectors using a detector "loadcurve" at fixed frequency and phase to measure the detector temperature.

Duration:
Approximately 45 minutes

Preconditions:

- Photometer IST Ground Nominal bias setting have been determined by procedure "Photometer bias optimisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

Initial Configuration:
SPIRE is set to PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-LC-P.tcl •	N/A	N/A	N/A	
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in PHOT STBY mode with bias set to IST Ground Nominal

2.6Procedure: PTC Headroom Characterisation

Version: 1.0

Date: 24th July 2006

Purpose: Determine the required PTC power setting required to enable stable operation of the photometer detectors under Ground Nominal conditions.
Duration: Approximately 4 hours
Preconditions:

- Functional test SPIRE-IST-FUNC-DCU-13P has been carried out successfully
- Photometer IST Ground Nominal bias settings have been determined by procedure "Photometer bias optimuisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

Initial Configuration:
SPIRE is set to PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-PTC-PWR.tcl • Set PTC to first level • Wait 30 minutes (TBD) – observe PTC thermistor and detector signals • *Loop n-times* • Set PTC heater power to n'th level +1 • Wait 30 minutes (TBD) – observe PTCthermistor and detector signals	N/A	N/A	N/A	
Test Result (Pass/Fail):					
PTC power level required to stabilise typical thermal drift					

Final Configuration:
SPIRE in PHOT STBY mode with bias set to IST Ground Nominal

2.7Procedure: Spectrometer bias optimisation

Version: 1.0
Date: 24th July 2006
Purpose:
Find the optimum bias level and frequency for operating the spectrometer under IST ground nominal conditions

Duration:
Approximately 4 hours

Preconditions:

- Functional tests SPIRE-IST-FUNC-DCU-04S,13S been carried out successfully.
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

Initial Configuration:
SPIRE in SPEC STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-SDET-ON.tcl • Switch on detectors using ILT determined setting • Observe signals and ensure correct profile is observed during JFET switch on	SLIABISTAT	1	-	
2	Execute TCL script SPIRE-IST-PHASEUP-S.tcl • Observe signal levels and determine optimum phase setting for ILT bias levels – this is the staring point	N/A	N/A	N/A	
3	Execute TCL script SPIRE-IST-DNA-S.tcl • Set frequency to 100 Hz and ILT nominal • Phase up	N/A	N/A	N/A	

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
	• Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set frequency to 160 Hz and ILT nominal • Phase up • Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set frequency to 240 Hz and ILT nominal • Phase up • Set Frequency to each predetermined level and phase up at each in turn - observe maximum signal at each level and measure noise • Set to ILT nominal values				
4	Analyse data in real time to determine IST ground nominal operating parameters	N/A	N/A	N/A	
Test Result (Pass/Fail):					
Approximate optimum bias settings each detector: **Bias Level Frequency Phase** **SSW** **SLW**					

Final Configuration:
SPIRE in SPEC STBY mode with bias set to ILT nominal values

2.8Procedure: Spectrometer Ambient Background Verification

Version: 1.0
Date: 24th July 2006
Purpose:
Determine the optical power load onto the photometer detectors using a detector "loadcurve" at fixed frequency and phase to measure the detector temperature.

Duration:
Approximately 45 minutes

Preconditions:

- Spectrometer IST Ground Nominal bias setting have been determined by procedure "Spectrometer bias optimisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

Initial Configuration:
SPIRE is set to PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-LC-S.tcl •	N/A	N/A		
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in SPEC STBY mode with bias set to IST Ground Nominal

2.9Procedure: Photometer scan mode POF5

Version: 1.0
Date: 24th July 2006
Purpose: To exercise the photometer POF5 AOT – also sets photometer mode for thermal tests etc
Duration: Indeterminate – depends on master procedure
Preconditions:

- Photometer IST Ground Nominal bias setting have been determined by procedure "Photometer bias optimisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible
- "PTC Headroom" procedure has been carried out and power setting has been determined

Initial Configuration:
SPIRE in PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-PHOTO-LARGE-SCAN.tcl *Open issue do we use PTC Control Procedure here?*	N/A	N/A		
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in PHOT STBY

2.10Procedure: Photometer chop/jiggle mode POF2

Version: 1.0
Date: 24th July 2006
Purpose:
To exercise the photometer POF2 AOT – also sets photometer mode for thermal tests etc

Duration:
Indeterminate – depends on master procedure

Preconditions:

- Photometer IST Ground Nominal bias setting have been determined by procedure "Photometer bias optimisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible
- "PTC Headroom" procedure has been carried out and power setting has been determined

Initial Configuration:
SPIRE in PHOT STBY

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-AOT-PHOTO-POINT-JIGGLE.tcl	N/A	N/A		
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in PHOT STBY

2.11Procedure: SPEC high resolution mode SOF1

Version: 1.0
Date: 24th July 2006
Purpose:
To exercise the photometer SOF1 AOT – also sets photometer mode for thermal tests etc

Duration:
Indeterminate – depends on master procedure

Preconditions:

- Spectrometer IST Ground Nominal bias setting have been determined by procedure “Spectrometer bias optimisation”
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible
- Herschel tilted such that SOB is horizontal

Initial Configuration:
SPIRE in SPEC STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script SPIRE-IST-AOT-SPECTRO-SCAN-POINT.tcl	N/A	N/A		
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in SPEC STBY

2.12Procedure: Spectrometer Microvibration Test

Version: 1.0
Date: 24th July 2006
Purpose:
Evaluate the influence of space craft systems on the performance of the SPIRE spectrometer mechanism

Duration:
Approximately 2 hours

Preconditions:

- Spectrometer IST Ground Nominal bias setting have been determined by procedure “Spectrometer bias optimisation”
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible
- Herschel tilted such that SOB is horizontal
- Initially S/C reaction wheels are stationary
- Acoustic and vibrational environment is as quiet as possible – night time operation?

Initial Configuration:
SPIRE in SPEC STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute SPIRE-IST-SMEC-MICROVIBRATION.TCL Generate high rate SMEC science data – we are looking for fluctuations in SMEC velocity Scan SMEC at 0.1 mm/s over full range for four scans Scan SMEC at 0.2 mm/s over full range for four scans Scan SMEC at 0.3 mm/s over full range for four scans	N/A	N/A	N/A	

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
	Scan SMEC at 0.5 mm/s over full range for four scans				
2	Switch on S/C reaction wheels at TBD Hz	N/A	N/A	N/A	
3	Repeat scan procedure	N/A	N/A	N/A	
4	Switch reaction wheels to TBD Hz	N/A	N/A	N/A	
5	Repeat scan procedure	N/A	N/A	N/A	
6					
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in SPEC STBY

2.13Procedure: Spectrometer SCAL check

Version: 1.0
Date: 24th July 2006
Purpose:
Check calibration of spectrometer calibrator

Duration:
Approximately 2 hours

Preconditions:

- Spectrometer IST Ground Nominal bias setting have been determined by procedure “Spectrometer bias optimisation”
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible
- Herschel tilted such that SOB is horizontal

Initial Configuration:
SPIRE in SPEC STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Set SCAL4 to TBD K Execute SPIRE-IST-SCAL4-WARMUP.TCL Wait for SCAL4 to reach TBD K	N/A	N/A	N/A	
2	Execute TCL script SPIRE-IST-LC-S.tcl	N/A	N/A	N/A	
3	Execute TCL script to scan SMEC at nominal velocity at high resolution Execute SPIRE-IST-SMEC-SCAN.TCL	N/A	N/A	N/A	
4	Switch off SCAL4 Constantly scan SMEC at nominal velocity at high resolution while SCAL4	N/A	N/A	N/A	

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
	cools The next step will run a TCL script which performs these tasks: Execute SPIRE-IST-SCAL4-COOLDOWN.TCL 1. Press ok to Switch off SCAL4 2. Wait for SPIRE staff go ahead 3. Press ok to to constantly scan SMEC at nominal velocity at high resolution while SCAL4 cools 4. Wait for SPIRE staff go ahead 5. Press ok to reset offsets 6. Wait for SPIRE staff go ahead 7. Repeat steps 5 and 6 within this subsequence for n times Press Ok to stop scanning				
5	Wait until SCAL4 is <6 K (~15 minutes)	N/A	N/A	N/A	
6	Set SCAL2 to TBD K Execute SPIRE-IST-SCAL2-WARMUP.TCL Wait for SCAL2 to reach TBD K	N/A	N/A	N/A	
7	Execute TCL script SPIRE-IST-LC-S.tcl	N/A	N/A	N/A	
8	Execute TCL script to scan SMEC at nominal velocity at high resolution Execute SPIRE-IST-SMEC-SCAN.TCL Press ok to stop scanning when prompted.	N/A	N/A	N/A	
7	The next step will run a TCL script which performs several tasks: Execute SPIRE-IST-SCAL2-COOLDOWN.TCL 8. Press ok to Switch off SCAL2 9. Wait for SPIRE staff go ahead 10. Press ok to to constantly scan SMEC at nominal velocity at high resolution while SCAL2 cools 11. Wait for SPIRE staff go ahead 12. Press ok to reset offsets 13. Wait for SPIRE staff go ahead	N/A	N/A	N/A	

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
	14. Repeat steps 5 and 6 within this subsequence for n times9Press Ok to stop scanning				
8					
Test Result (Pass/Fail):					

Final Configuration:
SPIRE in SPEC STBY

2.14Procedure: Photometer Thermal Control Verification

Version: 1.0
Date: 24th July 2006
Purpose:
To test detector thermal stability whilst under PTC control – this can be carried out at any point

Duration:
Indeterminate - see AD1

Preconditions:

- Functional test SPIRE-IST-FUNC-DCU-13P has been carried out successfully
- Photometer IST Ground Nominal bias settings have been determined by procedure “Photometer bias optimuisation”
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible
- The “PTC Headroom” procedure has been carried out and the optimum PTC power setting has been established

Initial Configuration:
SPIRE is in PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script to switch PTC to on and in VM control mode Execute SPIRE-IST-PTC-VM.tcl	N/A	N/A	N/A	
Test Result (Pass/Fail):					

Final Configuration:
SPIRE is in PHOT STBY with detector temperature under PTC control

2.15Procedure: EMC - Photometer most sensitive mode

Version: 1.0
Date: 24th July 2006
Purpose:
Sets SPIRE into the mode used for EMC susceptibility testing for photometer

Duration:
Indeterminate see EMC test procedure

Preconditions:

- Photometer IST Ground Nominal bias setting have been determined by procedure “Photometer bias optimisation”
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

Initial Configuration:
SPIRE is in PHOT STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script to set photometer bias frequency to highest compatible with low noise with corresponding phase set and detector sampling to as fast as practicable. **IEGSE staff: Specify this settings as default s for the Mode_ILT_PERF-DNS-P CUS mode in the database** Then Execute SPIRE-IST-DNS-P.tcl template	N/A	N/A	N/A	
Test Result (Pass/Fail):					

Final Configuration:

SPIRE is in PHOT OBSV with high data rate

2.16Procedure: EMC – Spectrometer most sensitive mode

Version: 1.0
Date: 24th July 2006
Purpose: Sets SPIRE into the mode used for EMC susceptibility testing for photometer

Duration: Indeterminate see EMC test procedure

Preconditions:

- Spectrometer IST Ground Nominal bias setting have been determined by procedure "Spectrometer bias optimisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- The cooler is recycled, the detectors are at <300 mK and the detector temperatures are as stable as possible

Initial Configuration:
SPIRE is in SPEC STBY
Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute TCL script to set spectrometer bias frequency to highest compatible with low noise with corresponding phase set and detector sampling to as fast as practicable. **IEGSE staff: Specify this settings as default s for the Mode_ILT_PERF-DNS-S CUS mode in the database** Then Execute SPIRE-IST-DNS-S.tcl template	N/A	N/A	N/A	
Test Result (Pass/Fail):					

Final Configuration: SPIRE is in SPEC OBSV with detector sampling at high rate

2.17Procedure: EMC – SPIRE most Emissive mode

Version: 1.0
Date: 24th July 2006
Purpose:
Sets SPIRE into what we assume will be the most emmisive mode – i.e. scanning the spectrometer mechanism

Duration:
Indeterminate – see EMC test procedure

Preconditions:

- Spectrometer IST Ground Nominal bias setting have been determined by procedure "Spectrometer bias optimisation"
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- Herschel tilted such that SOB is horizontal
- It is not necessary to have the cooler recycled but if it is that is o.k. too

Initial Configuration:
SPIRE is in REDY or SPEC STBY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	If SPIRE is in SPECSTBY go to step 3. If SPIRE is in REDY Execute SPIRE-IST-SDET-ON.tcl , then go to step 2	MODE	REDY or SPECSTBY		
2	Execute procedure to initalise spectrometer mechanism if in REDY mode Execute SPIRE-IST-SMEC-INIT.tcl	N/A	N/A	N/A	
3	Execute procedure to set spectrometer mechanism to constant scanning over low resolution at nominal velocity Execute SPIRE-IST-SMEC-SCAN.tcl	N/A	N/A	N/A	

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
3	Wait for operator instruction to stop scanning	N/A	N/A	N/A	
4	If SPIRE was in REDY mode Execute procedure to switch off spectrometer mechanism Execute SPIRE-IST-SMEC-OFF.tcl Then go to step 5	N/A	N/A	N/A	
5	Execute SPIRE-IST-SDET-OFF.tcl	N/A	N/A	N/A	
Test Result (Pass/Fail):					

Final Configuration:
SPIRE is mode we started from – REDY or SPEC STBY

2.18Procedure: 300mk Stage

Decontamination

Version: 1.0
Date: 15th August 2006
Purpose:
To remove any traces of Helium deposited over the 300mK stage during the SPT testing

Duration:
2hr- 4hr

Preconditions:

- Functional test SPIRE-IST-FUNC-SCU-07 has been carried out successfully.
- SPIRE is at ground nominal operating temperature and temperatures are as stable as possible
- Cryostat flow rates are at ground nominal
- Herschel tilted such that SOB is tilted at at least 30 degrees from vertical towards +Y direction

Initial Configuration: SPIRE is in REDY

Procedure Steps:

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute SPIRE-IST-DECONTAMINATE.tcl	MODE	REDY		
Test Result (Pass/Fail):					

Final Configuration:
SPIRE is mode we started from – REDY