Title: **Herschel Satellite IST - Reference Mission Scenario**

CI-No: 100000

Prepared by:	V. La Gioia/TERMA S. Hamer / TERMA S. Ilsen /TASF	Date:27th August 2008
Checked by:	C. Much	27/8/2008
Product Assurance:	J. Hall p.p.	27/8/2008
Configuration Control	W. Wietbrock	29.08.2008.
TASF Engineering	F. Chatte	27/8/2008
TASF Test Director	S. Mooney	27/8/2008
Project Management:	Dr. W. Fricke / ASED	27/08/2008
Project Management	D. Montet / TASF	27/08/08

Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	27.08.2008		Initial version	

Table of Content

Table of Figures

List of Tables

1 Scope

1.1 Objective

The objective of this procedure is to check the Herschel Spacecraft's capability of supporting a representative and continuous 48hr RMS (Reference Mission Scenario) in HeII conditions for 3 (reduced for test purposes) Operational Days (ODs); one for each instrument HIFI (15hrs), PACS (16hrs) and SPIRE (16hrs). Each OD starts with a 3hr Daily Tele-Communication Period (DTCP), which is then followed by an Autonomy Period (AP) for the instrument concerned.

In nominal flight operations there is no real-time downlink during the AP, however for the purpose of ground testing the real-time TC/TM link is maintained throughout the AP on umbilical, with the TM downlink rate set to 1.5Mbps to support the downlink of Instrument Science TM in conjunction with S/C HKTM (as this may exceed the nominal 150kbps during the AP). Detailed specification of the test is provided in AD-1 (S/C specifics, section 5.8.9) and AD-3 (Instrument specifics).

1.2 Operational Flow

Section 7 provides the detailed step-by-step test procedure. A summary basic timeline is given below:

Year-DOY	Date	Time (Future) UTC	Event
2009-137	17th May	22:10:00	Start EGSE Set-up, S/C switch ON and configuration for test
2009-138	18th May	08:10:00	First MTL command
		08:20:00	Start DTCP1
		11:20:00	Start AP1 (HIFI)
		23:20:00	Start DTCP2 (missed pass)
2009-139	19th May	02:20:00	Start AP2 (PACS)
		15:20:00	Start DTCP3
		18:20:00	Start AP3 (SPIRE Photometry)
2009-140	20th May	07:20:00	Start DTCP4
		07:20:09	Last MTL command
		08:20:00	Start S/C Switch OFF
		13:20:00	S/C OFF

2 Documents/Drawings

This document incorporates, by dated or undated references, provisions from other publications. These normative references are cited at appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these apply to this document only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to apply.

2.1 Applicable Documents

AD-1	Herschel Integrated Satellite Test Specification	H-P-2-ASP-SP-0939
AD-2	S/C I.S.T. Routine Mission Scenario – Operation day framework	ASP-06-AIT-AVIO-PL-008030 iss.2
AD-3	Test Specification for Herschel Instruments AVM and FM Tests performed at Satellite Level	HP-2-ASP-TS-1083
AD-4	Emergency switch off procedure	H-P-ASED-PR-0071
AD-5	Herschel IST Leading Procedure	H-P-ASED-TP-0134
AD-6	Procedure for setup and operation of the HIFI cooling system	HP-2-ASED-PR-0125
AD-7	HIFI I-EGSE Set-up	SRON-U/HIFI/PR/2007-005

2.2 Reference Documents

RD-1	Herschel SVM User Manual	H-P-MA-AI-0001
RD-2	Reference Mission Scenario, Herschel / Planck project	SCI-PT / 12759, issue 3.1, dated August 6th 2004
RD-3	Herschel Instrument Power ON-OFF and Mode Switching Procedure for Functional Testing	HP-2-ASED-TP-0206, Iss 1.3

2.3 Other Documents

2.4 Acronyms

Refer to AD-5

3 Requirements to be verified

AD-1 chapter 5.8.9

4 Configuration

4.1 Herschel S/C Configuration

Refer to AD-5, for IST specifications chapter 5.8.9 "TEST OF REFERENCE MISSION SCENARIO",

4.1.1 Hardware Configuration

Refer to AD-5, for IST specifications chapter 5.8.9 "TEST OF REFERENCE MISSION SCENARIO",

4.1.2 Software Configuration

Refer to AD-5

4.1.3 Test Configuration

Refer to AD-5

4.1.4 Simulated Equipments

Refer to AD-5

4.2 Set-up

Refer to AD-5

5 Conditions

5.1 Personnel

Refer to AD-5

5.2 Environmental

Refer to AD-5 for general Environmental conditions. Specific instrument related conditions are detailed below:

Environmental	Nominal	Actual
Clean Room Class	class 100000 or better	
Temperature	22°C ± 3°C	
Rel. Humidity	40 % - 60 %	
Pressure	Ambient	

S/C Environmental	All Instruments	Actual
S/C Orientation	20° tilted and no movement during test	
Cryostat Connection (Valves)	N/A	
Cryostat Status (Hel/Hell)	Hell	
Cryostat Level 0 Temp (T107)	1.75 – 1.90 K (Pods are inside liquid)	
Cryostat Level 1 Temp (T231 – T237)	< 7 K	
Cryostat Level 2 OBP Temp (T254, T207)	< 12 K	
Cryostat Level 3 Temp	N/A	
L0, L1 & L2 Stability	L0 drifting 15 mK/ day; L1 & L2 <100 mK/h	
Thermal Shield & CVV	No constraint	
Cryo Cover Cooling	N/A – TBC PACS	

5.3 General Precautions and Safety

Refer to AD-5

5.3.1 General Safety Requirements, Precautions

Refer to AD-5

5.3.2 ESD constraints

Refer to AD-5

5.3.3 Special QA Requirements

Refer to AD-5

5.4 GSE

Refer to AD-5

5.4.1 MGSE

Refer to AD-5

5.4.2 CVSE

Refer to AD-5

5.4.3 EGSE

5.4.3.1 EGSE Hardware Configuration

Refer to AD-5

NOTE: IEGSEs shall be running and connected for all Instruments for real-time monitoring during RMS!

5.4.3.2 EGSE User Software

Refer to AD-5

5.4.3.3 Grounding Configuration

Refer to AD-5

5.4.3.4 Test Equipment

Refer to AD-5

5.4.3.5 Data Acquisition System

Refer to AD-5

5.4.4 OGSE

Refer to AD-5

5.4.5 Special Equipment

Refer to AD-5

6 Verification Requirements and Test Criteria

PASS/FAIL CRITERIA

At each test stage completion, the test success is determined comparing the results obtained against the expected values.

If the compliance between obtained and expected values has been met, and authorisation to proceed with the next stage of the test is given, then the actual test stage must be considered satisfactory completed.

The success of the overall testing activities is determined from the satisfactory completion of all test stages.

Successful criteria to be satisfied in each test stage shall be:

Test conditions according to specification requirement;

Complete verification of the requirement aspects according to the test specification [AD-1];

Fulfilment of test results with respect to required data;

Verification that all the TM parameters used to monitor the SVM do not exceed the limit thresholds loaded in the HPSDB (OOL display);

Verification that the TM(5,2), TM(5,4) and TM(1,8) received event reports are only those ones expected to fulfil the pass test criteria.

NOTE:

Due to the fact that SSMM B has only 1 bank ON in this test, some events type (5, 2) with mass memory full are expected and do not indicate failure of the test.

7 Test Execution Step-by-Step Procedure

Responsibility	Name / Organisation
Test Director	
Test Conductor	
EGSE Operator	
PA Responsible	
Cryo Engineer	
Instrument Responsible PACS	
Instrument Responsible SPIRE	
Instrument Responsible HIFI	
Customer Representative	
ESA Representative	

Test Location:	
Test Session Id:	
Test Environment:	

The overall flow of the RMS is described in the following schema:

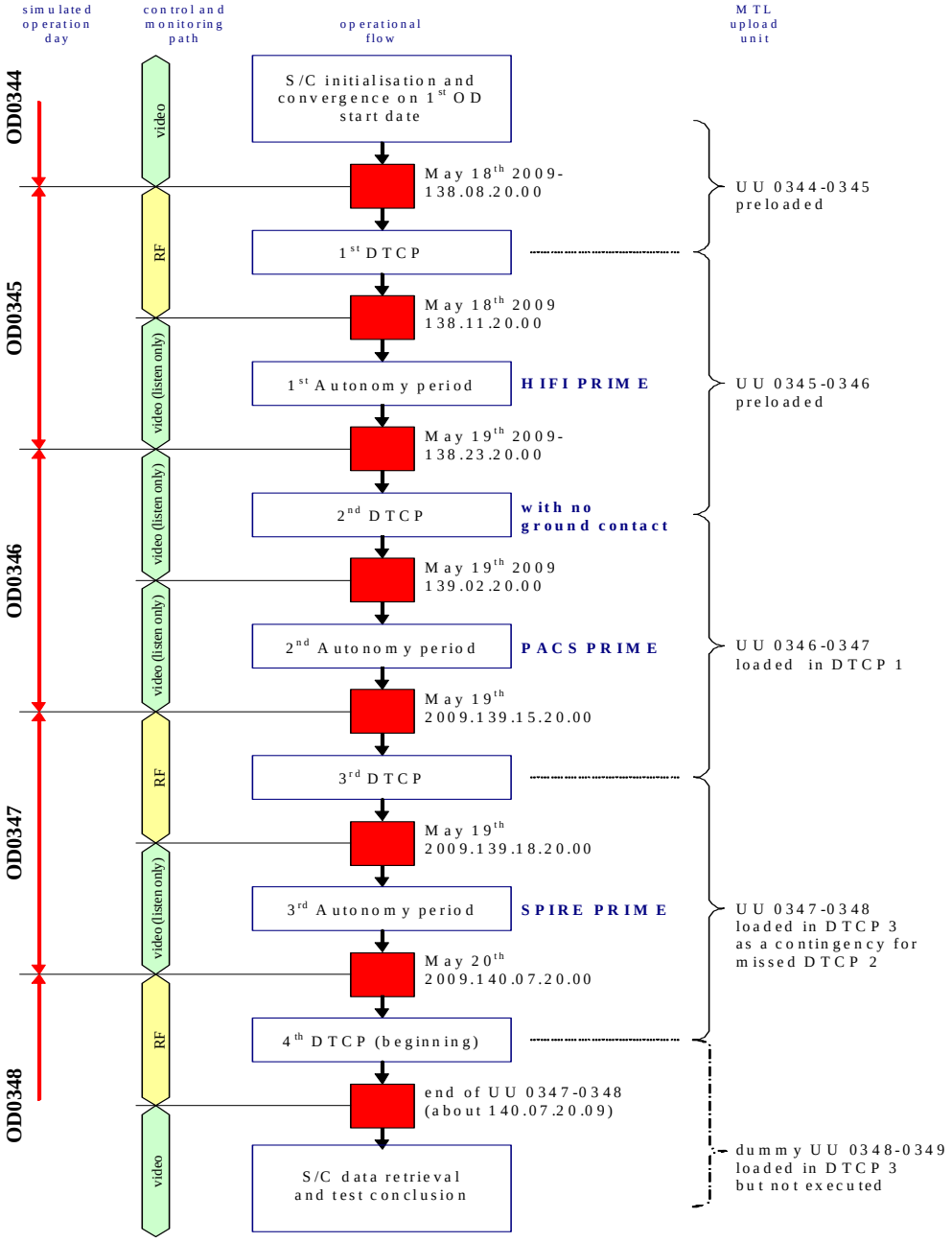


Figure 1 – RMS Operational Day Flow

7.1 OD0344 - S/C Initialization and convergence on 1st OD start date

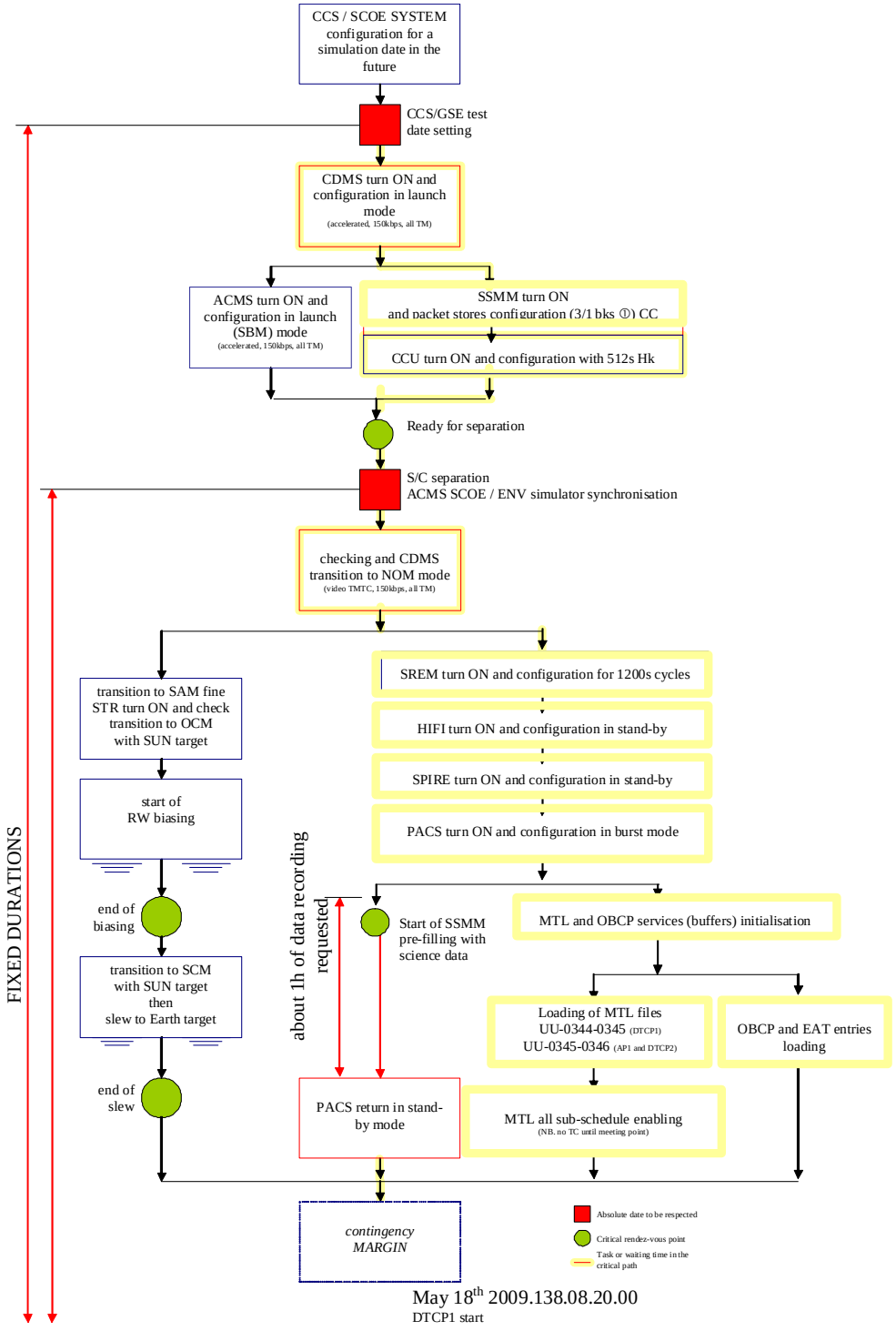


Figure 2 – Initial Configuration Flow For RMS

7.1.1 EGSE Set up RMS Specific

Step No	Operations	Results		Remarks and Record (mark off when performed)
		Required Value	Actual Value	
10	Configure CCS and SCOE system for simulation date in the future (i.e. 2009.137.22.20.00 – init time for start of configuration for RMS with DTCP1 EPOCH at 2009.138.08.20.00) according to procedure **AD-5** Annex E Remember to split archive when necessary during the test (best, DTCP2 after cooler recycling).			Note down real and simulated future time of the CCS server: Simulated Time: Local Time: Note down times of new archives in logbook and below: Split1: Split2: Split3: Split4:
20	Set CCS to accept MCMDs up to 10days in the future and also to accept TM up to 10days old (from SSMM) by typing at the TC console, also disable warning messages for packets arriving outside OBT_THRESHOLD: **setparameter CMD_FUTURE_TIME 010.00.00** **setparameter IFMGR_OBT_THRESHOLD 864000**	OK		

Date:	Time:	Operator:	Product-Assurance:

Step No	Operations	Results		Remarks and Record (mark off when performed)
		Required Value	Actual Value	
	setparameter IFMGR_OBT_VERBOSE NO			
30	Switch on SCOEs according to standard procedure AD-5			
40	Start up CCS session with UNIQUE NAME (e.g. xxxx_RMS48_1) Setup of CCS WS: Monitoring and control of the RMS will require the majority of CCS workstations. 1) Main 2 screen (Left 2)) WS for overall control and event monitoring 3) Main 2 screen (Right) WS for Instrument monitoring 4) Single screen WS left of above for MTL and OBQ monitoring 4) Single screen WS left of above for ACMS monitoring 5) 1 other WS possibly required for CMDS and TT&C monitoring 6) WS in cleanroom for back up overall monitoring – RMS 48hr debug wk32 7) 1 WS for monitoring with NO COMMANDING (ESA observer) 8) Migrate logbook from CCS to PC for duration of the test (put			

Date:	Time:	Operator:	Product-Assurance:

Step No	Operations	Results		Remarks and Record (mark off when performed)
		Required Value	Actual Value	
	back afterwards) to free up a workstation 9) CCSLite running in Monitoring mode (NB this could be also used to monitor ACMS RWL or other background parameters, e.g. CCU temperatures) 10) Ensure that all used IEGSEs have synchronised with the future RMS CCS time. If not and no instrument IEGSE support available, perform **Operator Note 48**. 11) Ensure that HIFI Cooling Cart is configured as per AD-6			

Step No	Operations	Results		Remarks and Record (mark off when performed)
		Required Value	Actual Value	
50	MAIN CONTROL WS: 1) Onboard event display 2) SAT.ilv, LCL_HERSCHEL. Ilv 3) Command history and TM packet history 4) Manual command stack, Test Sequence console 5) Prep environment for patching scripts 6) ANDs for packet stores pointers : ZADC3999, ZADC4999, ZADC5999, ZADC6999; for ephemerides: 7) Packet history filtered for TM(15,13) packet store pointers report 8) Packet history filtered for TM(5,2), TM(5,4) and TM(1,8) 9) OOL Display			During the test execution the following test sequences' windows will be always open and must be visible: **Z010999MCVT085_IST_RMS_ASTRIUM** **Z010999MCVT093_IST_RMS_Date_Watch** During DTCPs also **Z010999MCVT091_IST_RMS_DTCP**

Step No	Operations	Results		Remarks and Record (mark off when performed)
		Required Value	Actual Value	
60	INSTRUMENTS WS 1) INSTRUMENTS.ilv for power on 2) Open packet history windows for the following: HIFI APIDs:1024 SPIRE APIDs:1280 PACS APIDs: 1152			N.B. TERMA have indicated that CCS performance may be affected by having many packet history windows open. They are planning to provide a test script to perform the basic APID monitoring function. .
70	ACMS WS Operator should always monitor the momentum of the reaction wheels. If it converges to 0 (below a certain threshold TBD) the following recovery sequence shall be performed: **ACMS_RECOVERY_from_AutoPeriod.tcl** 2) LCLs_HERSCHEL.ilv to check that QRS LCLs (15 and 24) are always CLOSED. If not, close them immediately!			Recovery sequence does: If speed of wheels is ~ 0: Check that the ephemerides are not being updated and biasing is over. If not, wait. Disable MTL commands for ACMS Store last quaternion Change momentum to the initial one Command SCM with the last quaternion Re-enable MTL release of ACMS commands
80	MTL WS 1) Start the OBQ manager BEFORE starting the MTL service and leave it running throughout the session (open			a) If OBQ is opened after upload of MTL you might get unreliable information. b) To enable/disable release of TCs per APID or for all APIDs, all commands are available in a

Step No	Operations	Results		Remarks and Record (mark off when performed)
		Required Value	Actual Value	
	second OBQ manager on cleanroom WS as a backup) 2) Filter one TM history per type 11 and subtype 13 (MTL reports) 3) Plotting tool with parameter DEA74170 (MTL_BufFree. When MTL is empty this is = 50000 4) Manual command stack			saved stack: /HPCCS/VARIABLE/CONFIG/CMD/STACKS/* Press “Filter” **En_Dis_Rel_TCs_MTL.hpws25** c) for deleting TCs over time period use: DC82F170 with time in sec from 1/1/1958 = expr [asdtosec 2009.xxx.xx.xx.xx.xxx + **378691200**]

7.1.2 IST RMS START

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Satellite & EGSE Switch On					
10.	Confirm I-EGSEs are physically connected to HPCCS	OK				
20.	Switch on HPCCS, SCOEs and Satellite/SVM and configure into Basic Test Mode, with SSMM initialised OBCP/EAT load/active and CCU monitoring in Mode 1 i.a.w. AD-5 sections 7.1 and 7.2. In section 7.2.4 selecting the test case Reference Mission Scenario 5.8.9, in the Master GUI	OK				
30.	If CryoSCOE connected to CCU-A sensors then connect to it to monitor those sensors during the test: connect PFM_CRYO	OK		*Note if it is not possible to change CryoSCOE to (CCS) future time for the test then do not connect otherwise the CCS will constantly report time synchro warning messages*		
40.	Confirm that the for HIFI CVV window cover (red tag) is removed.	OK				
50.	Confirm that the HIFI Cooling Cart is installed and the HIFI panels are not covered by bubble foil, then switch ON cooling cart i.a.w. AD-6	OK				
60.	If not already ON Switch on & configure HIFI I-EGSE i.a.w. AD-7	OK				
70.	Confirm HIFI I-EGSE is in the correct configuration (including CUS configuration for HIFI nominal units) as per AD-7	OK				

Date:	Time:	Operator:	Product-Assurance:

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
80.	On HPCCS execute test script: **HIFI_All_SubscribeParams** Wait until script reports that suscriptions have been completed and it is running in an endless loop	OK				
90.	On the HPCCS perform HL ptv checksum patch by executing: **HIFIST_ASED_PatchPtvChecksum**	OK				
100.	On the HPCCS perform change of temperature limits patch for warm conditions by executing: **HIFIST_ASED_PatchTempLimits**	OK				
110	From HPCCS Test Conductor console issue command to connect to HIFI, SPIRE & PACS (I-EGSEs) **connect HHIFIEGSE** **connect HSPIREEGSE** **connect HPACSEGSE**	 OK OK OK		SPIRE & PACS connections required for monitoring. HIFI required for commanding as well		
120	Confirm from HPCCS and I-EGSEs that the connections have been established	YZS27940 = CONNECTED YZS28940 = CONNECTED YZS29940 =		SYS_PARS		

Date:	Time:	Operator:	Product-Assurance:

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
		CONNECTED				
130	Verify that I-EGSEs are receiving CCU Cryo packets (mode 1, 512sec)	OK				
140	If requested by the instruments the CCU monitoring can be changed temporarily to mode 2 (8sec) by executing: **K102999ECVT001_ASDGENCCU_MnDBOTH1** **K102999ECVT001_ASDGENCCU_MnEBOTH2**	OK				
150	After instruments have confirmed receipt of monitoring packets and checked temperatures the CCU monitoring must be switched back to mode 1 (512sec) by executing the following scripts: **K102999ECVT001_ASDGENCCU_MnDBOTH2** **K102999ECVT001_ASDGENCCU_MnEBOTH1**	OK				
160	Verify HPCCS HIFI-IEGSE connection and time synchronisation by executing the following script: **Y102999ETVT037_ASDGEN_VERHIFIIEGSE**	OK				
	READY FOR RMS INITIALISATION					

Date:	Time:	Operator:	Product-Assurance:

7.1.3 Test Specific Initialisation

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
10	*Enter the following In the CCS Test Console:* *callasync* ***Z010999MCVT085_IST_RMS_ASTRIUM***	PASS				
20	*During* ***Z010999MCVT085_IST_RMS_ASTRIUM*** *START HERSCHEL RMS, Section 5.8.9* *⇨ Click the button "YES" to proceed*	YES		If NO, the sequence is terminated. `Z010999MCVT093_IST_RMS_Date_Watch`		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
30	*Z010999MCVT093_IST_RMS_Date_Watch* *is called asynchronously to keep trace of the timing of the different phases.* It pops up with a separate window, with an overview on the RMS phase, current time, next phase and time left to the next phase. It checks if the DTCP asynchronous tasks are still running 45 minutes prior to the end of the DTCP. If so it warns the operator and asks him to terminate/suspend the timed out sequences. The script takes care of the synchronization with the master when the time has come for the next RMS phase. The script sets a shared variable "phase" according to the time constraints (derived from MTL). The master waits for the phase to change, before calling the subsequent DTCP sequence. ⇨ keep window on a side and continue with next steps			This window shall be visible throughout the test!!		
40	*During Z010999MCVT085_IST_RMS_ASTRIUM* *" TT&C SCOE CONNECTION"* *⇨ Click the button "Confirm" to proceed*	CONFIRM		`Y102989ETVT021_TTC_SCOE_ON is called`		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
50	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"CDMS setting for separation"* *⇨ Click the button "Confirm" to proceed*	CONFIRM		A102109SPVT202_ACMS_STATUS_H is called asynchronously and D102159SCVT138_IST_LAUNCH_SUNACQ synchronously		
60	*At end of A102109SPVT208_)BDB_MASS_INERTIA* *⇨ Click the button "End TS!" to proceed*	ENDTS				
70	*During … D103159SCVT138_IST_LAUNCH_SUNACQ* *When prompted "wait for separation straps to be opened…* *⇨continue to next step*	PASS				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
80	*During A102109SPVT103_ACMS_CONFIG25* *⇨ enter option 88, to go to Main Menu 3* *⇨ Click the button "OK"* *⇨ then press "Continue"*	88 OK CONTINUE				
90	*During A102109SPVT103_ACMS_CONFIG25* *(1,6,4,5,20,99,88)* *SEPARATION (open separation straps)* *Main Menu 3.0: option 2* *⇨ Click the button "OK" and then* *⇨ Click the button "Continue"*	2 OK CONTINUE				
100	*During A102109SPVT034_ACMS_SAM_MON* *Do you want to continue to monitor SAM Sun Pointing mode?* *⇨ Enter your choice: no*	no				
110	*At end of D102159SCVT138_IST_LAUNCH_SUNACQ* *⇨ Click the button "End TS!" to proceed*	ENDTS				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
120	*Back to Master Script, Z010999MCVT085_IST_RMS_ASTRIUM* *TRANSITION TO NOMINAL* *⇨ Click the button "Confirm" to proceed*	CONFIRM				
130	*Script D102159SCVT137_IST_SUNACQ_NOM shall pop-up. Check that script ends without any 'No-Go'* *⇨ Click the button "End TS!" to proceed*	ENDTS				
140	*During Z010999MCVT085_IST_RMS_ASTRIUM* *At the prompt "Command ACMS (via OCM/Earth) to SCM/Earth. "* *⇨ Click the button "OK" to proceed*	OK		**⇨ Perform following steps 150 to 250 (ACMS in SCM) in parallel with steps 260 – 440 (PCDU transition, Instruments ON)**		
150	*During A102109SPVT103_ACMS_CONFIG25* *Select Transition to OCM.* *Main Menu 4.0 SAM Phase: Option 6* *⇨ Click the button "OK" and then* *⇨ Click the button "Continue" to proceed*	6 OK CONTINUE				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
160	*During A102109SPVT036_ACMS_STR_ON* *Do you want to change the current STR in use? Type no* *⇨ Click the button "OK" to proceed*	no				
170	*During A102109SPVT043_TRANSITION_TO_OCM* *Only for info:* *⇨ Verify after ca.7 min if ACMS mode is = OCM point fine (Earth pointing)* *⇨ Verify in AND: ZAA00999 if Est Attitude Q1..Q4 is close to Target (absolute value)* *⇨ Verify AESM3002 = OCM point fine or in synoptic SAT – ACMS – ACC – Mode Nominal*	PASS PASS PASS				
180	*During A102109SPVT043_TRANSITION_TO_OCM* *If the sequence prompts as SUSPENDED (fcv duty cycle higher than 0.01)* *⇨ click on script name in Test Console* *⇨ Click the button "RESUME" to proceed*	RESUME				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
190	*During A102109SPVT103_ACMS_CONFIG25* *Main Menu 7.0: Option 3* *Select Transition to SCM (Science mode).* *⇨ Click the button "OK" and then* *⇨ Click the button "Continue" to proceed*	3 OK CONTINUE				
200	*During A102109SPVT038_RWL_ON* *"Do you want to change actual on-board wheel set selected in the nominal configuration?* *RWL 1-2-3-4 selected* *⇨ Click the button "NO" to proceed ?*	NO		AEW1A002, AEW2A002, AEW3A002, AEW4A002 LOW expected until wheels are spun up.		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
210	*During A102109SPVT042_RWL_SPINUP* *"Change actual Angular Momentum (initial values)?" Option: no* ⇨ *Wait for about 10 minutes*	RWL-1 ang momentum 8.76073169708 RWL-2 ang momentum 8.24755954742 RWL-3 ang momentum -6.74463796616 RWL-4 ang momentum -7.25781011581 no				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
220	*Only for info:* *⇨ Verify RWL speed in plotting window* *1. Select REALTIME => DESKTOP =>* *MONITORING => TM Plotting Tool* *2. Select Directory: Home/heracms/plotting* *3. Select FILE => LOAD =>* */home/heracms/plotter/RWLsSPEED.txt*					
230	*Only for info:* *⇨ Verify 4x RWL momentum parameters are within +/-20%* *AEWMA002 = 10.7 (RWL1 momentum)* *AEWMB002 = 10.7 (RWL2 momentum)* *AEWMC002 = 10.7 (RWL3 momentum)* *AEWMD002 = 10.7 (RWL4 momentum)* *⇨ Verify in SAT synoptic SAT – ACMS – ACC – Mode Nominal = OCM Point Fine* *⇨ Verify in Telemetry window ZAAF0999 (diagnostic TM)* *As long as the ACMS is switched On the Menu Box has to be present !!!*	PASS PASS PASS		*Values in IST_RMS1 file*		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
240	*During A102109SPVT042_RWL_SPINUP* *SUSPEND* *⇨ Click the button "RESUME" in the test sequence console to proceed*	RESUME				
250	*At end of A102109SPVT042_RWL_SPINUP* *⇨ Click the button "End TS!" to proceed*	ENDTS		During transition to SCM for ACMS, ACZ2T109 may timeout because of slew time too short.		
260	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"Transition from SAS 900W and BS 24V to SAS 1475W and BS full charged"* *⇨ Click the button "Confirm" to proceed*	CONFIRM				
270	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"Switch on SREM"* *⇨ Click the button "Confirm" to continue*	CONFIRM				
280	During Z102999SCVT003_SREM_ACQ_START *⇨ Click the button "End TS!" to proceed*	ENDTS				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
290	During Z010999MCVT085_IST_RMS_ASTRIUM *"POWER ON HIFI NOMINAL"* ⇨ *Click the button "Confirm" to continue*	CONFIRM				
300	During **H102999SCVT015_ASDISTHIFI_PWR_ON_P** *"FM HIFI Switch ON for IST or SFT in Hel/Hell conditions with warm LOU - Select NO to abort TS if not correct"* ⇨ *Click the button "YES" to confirm*	YES		See RD3 for current expected prompt and OOLs		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
310	*During* **H102999SCVT015_ASDISTHIFI_PWR_ON_P** At prompt to record OBS_ID_per_hk during subsequent table readback commanding (which starts when OK is pressed); record value of HM003190 (typical reading = 9000xxxx hex), Note: at start & end value is 90000000 hex "Select OK to continue" Select OK	OK				
320	*During* **H102999SCVT015_ASDISTHIFI_PWR_ON_P** Record value of OBS_ID during table read commanding. Give both Hex and Dec values: : **HM003190**	N/A	Hex <OBSID>= Dec <OBSID>=			

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
330	*During* **H102999SCVT015_ASDISTHIFI_PWR_ON_P** Request the nominated I-EGSE operator to run the command 'verifyreadback <OBSID>' from a terminal window (opened from the terminal icon " >_ " at bottom left of HIFIEGSE workstation screen) using the **Dec <OBSID>** value retrieved in the previous step. If the word **PASS** does not appear on the screen at the end of the verifyreadback, this is a nogo on this test procedure. If OK respond to prompt accordingly, otherwise contact SRON to investigate and resolve before continuing.	OK				
340	*During* **H102999SCVT015_ASDISTHIFI_PWR_ON_P** *"Set Bus Profile back to original setting?"* ⇨ *Click the button "YES" to confirm*	YES				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
350	**<<<MANDATORY STEP AFTER HIFI POWERED>>>** **<<<DO NOT SKIP>>>** Ensure HIFI LO operations disabled during the test: Execute test script: **HIFIST_nom_IST_LO_disable_warm** Execute test script: **HIFIST_nom_IST_LO_on_1a_warm** Verify HL_Channel_S is OFF **HM003194**	 OK OK OFF		AND: HA003289 *** **IF VERIFICATION FAILS DO NOT CONTINUE WITH TEST. CONTACT HIFI INSTRUMENT RESPONSIBLE** ***		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
360	Start monitoring the following HIFI temperature parameters (HIFI WEV & WEH Lasers, TCS HRV & HRH foot temps): HM023193 (*HWH_Laser_T*) HM062193 (*HWV_Laser_T*) DEA91170 *(TCS HRH Temp)* DEAA2170 *(TCS HRV Temp)*	OK		Use TM plotting tool to monitor these parameters. **Note 1)** Laser temperatures should not go above 30degC or HPSDB will report HIGH HIGH OOLs. If this cannot be prevented then if the temperatures are reasonably stable the High limit can be increased i.a.w. Operator Note 45 **Note 2)** TCS HRS temperatures must not exceed 40degC (note HIFI internal HRS temperatures may do not have the same limits). If the HIFI Panel Cooling is operating correctly this should not happen. If the trend shows that temperatures are rising towards this limit, then first check cooling cart if operating correctly i.a.w. AD-6. If it is and temperatures still rise then HIFI needs to be switched down to STANDBY1		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
370	Back to Master, Z010999MCVT085_IST_RMS_ASTRIUM *"POWER ON PACS NOMINAL"* ⇨ *Click the button " Confirm" to continue*	CONFIRM				
380	*During* **P102999SCVT905_ASDISTPACS_PWR_ON_N** *"Power on PACS NOMINAL and enable MIL 1553 I/F. FM PACS Switch on in warm or cold conditions, FPU connected … - Select NO to abort TS if not correct"* ⇨ *Click the button "YES" to confirm*	YES		See RD3 for current expected prompt and OOLs		
390	*During* **P102999SCVT905_ASDISTPACS_PWR_ON_N** *PACS FDIR OBCPs/EATs loaded and enabled? If not select NO to abort TS. If not sure, check with D102159SCVT192_GET_EAT_REPORT. Then select "YES"* ⇨ *Click the button "YES" to confirm*	YES				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
400	*During* **P102999SCVT905_ASDISTPACS_PWR_ON_N** If AFO mode not already selected for CDMU the script will prompt that AFO will be commanded next. Click **OK** to continue the script if the prompt appears.	OK	DE81D170 = AFO			
410	*During* **P102999SCVT905_ASDISTPACS_PWR_ON_N** *"Set Bus Profile back to original setting?"* *⇨ Click the button "YES" to confirm*	YES				
420	*Back to Master Script* *Z010999MCVT085_IST_RMS_ASTRIUM* *"Power On Spire NOMINAL"* *⇨ Click the button "Confirm" to continue*	CONFIRM				
430	*During* **S102999SCVT017_ASDGENSPIR_PWR_ON_P** "SPIRE Switch ON for IST activities in any conditions - Select NO to abort TS if not correct" *⇨ Click the button "YES" to confirm*	YES				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
440	*During* **S102999SCVT017_ASDGENSPIR_PWR_ON_P** *"Set Bus Profile back to original setting?"* ⇨ *Click the button "YES" to confirm*	YES				
450	Back to Master, Z010999MCVT085_IST_RMS_ASTRIUM Reply to the prompt: " Final Setting to test start" ⇨ Click the button "Confirm" to continue	CONFIRM				
460	At the end of the step check that the following have been applied: TWTA 1 is OFF, RX-2 is 125 bps, TX-1 is off	PASS				
470	Back to Master, Z010999MCVT085_IST_RMS_ASTRIUM Reply to the prompt: *"FILL SSMM for 60 minutes by setting PACS in 'Burst Mode'* ⇨ Click the button "Confirm" to continue	CONFIRM				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
480	During Z010999MCVT085_IST_RMS_ASTRIUM Reply to the prompt: *"ACMS shall be already in SCM mode (ACMS MASTER)"* ⇨ Click the button "OK" to continue	OK		Check that ACMS mode is "SCM pnt F rdy" and step 250 is completed		
490	During **P102999SCVT913_ASDGENPACS_BurstMode** *"FM PACS Burst Mode for tests in ANY conditions – abort TS if not correct"* ⇨ Click the button "YES" to continue	YES		SSMM will continue in parallel		
500	During **P102999SCVT913_ASDGENPACS_BurstMode** When prompted: "Enter burst mode duration in seconds: (default is 3600)" Enter a value of 3600 and click OK	3600		Script runs asynchronously and continues in parallel with next activities in order to fill SSMM		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
510	Back to Master, Z010999MCVT085_IST_RMS_ASTRIUM Reply to the prompt: *"Start MTL service disabling release of ALL SSID"* ⇨ Click the button "Confirm" to continue	CONFIRM		Open an OnBoardQueue Display		
520	During Z010999MCVT085_IST_RMS_ASTRIUM, at prompt: "Press OK only AFTER MTL upload completion" Do NOT press OK but continue to the next step (the procedure will indicate when to press OK at the appropriate time).	No Action required		MTL_rms_init is called asynchronously. This sequence will upload 2 MTL segments OD344-345 and OD345-346		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
530	During MTL_rms_init.tcl at the prompt: “Script is going to load 2 files for ODs 344-345 and 345-346” ⇨ Open an ON BOARD QUEUE display (if not already open) ⇨ Filter TM PKT histories with TM(1,7), TM(1,8) and TM(1,2) to monitor completed, failed or not acknowledged TCs ⇨ press OK	 PASS PASS OK				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
540	During MTL_rms_init.tcl at the prompt: "Click OK when the next MTL can be loaded (completion flag on last load command)" ⇨ check that no TM(1,8) or TM(1,2) have been received during the upload ⇨ check that TM(1,7) have been received throughout the upload ⇨ check that the CCS had finished processing all TCs of the last MTL (no completion flag is P, pending) ⇨ press OK	 PASS PASS PASS OK		For the last check, you will need to stop and put live the TC history display many times until every "load TC" commands are yellow or green.		
550	Repeat previous step to load second file then back to the prompt in Z010999MCVT085_IST_RMS_ASTRIUM "Press OK only AFTER MTL upload completion" ⇨ press OK	 OK				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
560	Back to **P102999SCVT913_ASDGENPACS_BurstMode** When prompted: *"Is the data flow finished ?"* ⇨ press OK Script completes commanding and terminates. **Do not continue until the script has finished**	OK		Verify that the the VC1 .txt and .bin files in the test session's TMDUMP folder are no longer increasing in size. This is the only way of telling that the dataflow is finished.		
570	*Back to Master,* *Z010999MCVT085_IST_RMS_ASTRIUM* *COMMAND THE S/C BUS PROFILE TO 4 (PACS PRIME)* *⇨ Click the button "Confirm" to continue*	CONFIRM				
580	*During* *Z010999MCVT085_IST_RMS_ASTRIUM* *"STATUS SPACECRAFT (RMS Starting Point)"* ⇨ Click the button "Confirm" to continue	CONFIRM				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
590	*During* *IST_STATUS* *At prompt* *"Do you want to Stop and notice for each failure"* ⇨ Click the button "NO" to continue	NO				
600	*During* *Z010999MCVT153_IST_STATUS* ⇨ *CHECK STATUS then click the button "OK" to continue*	OK				
	END OF INITIAL CONFIGURATION					

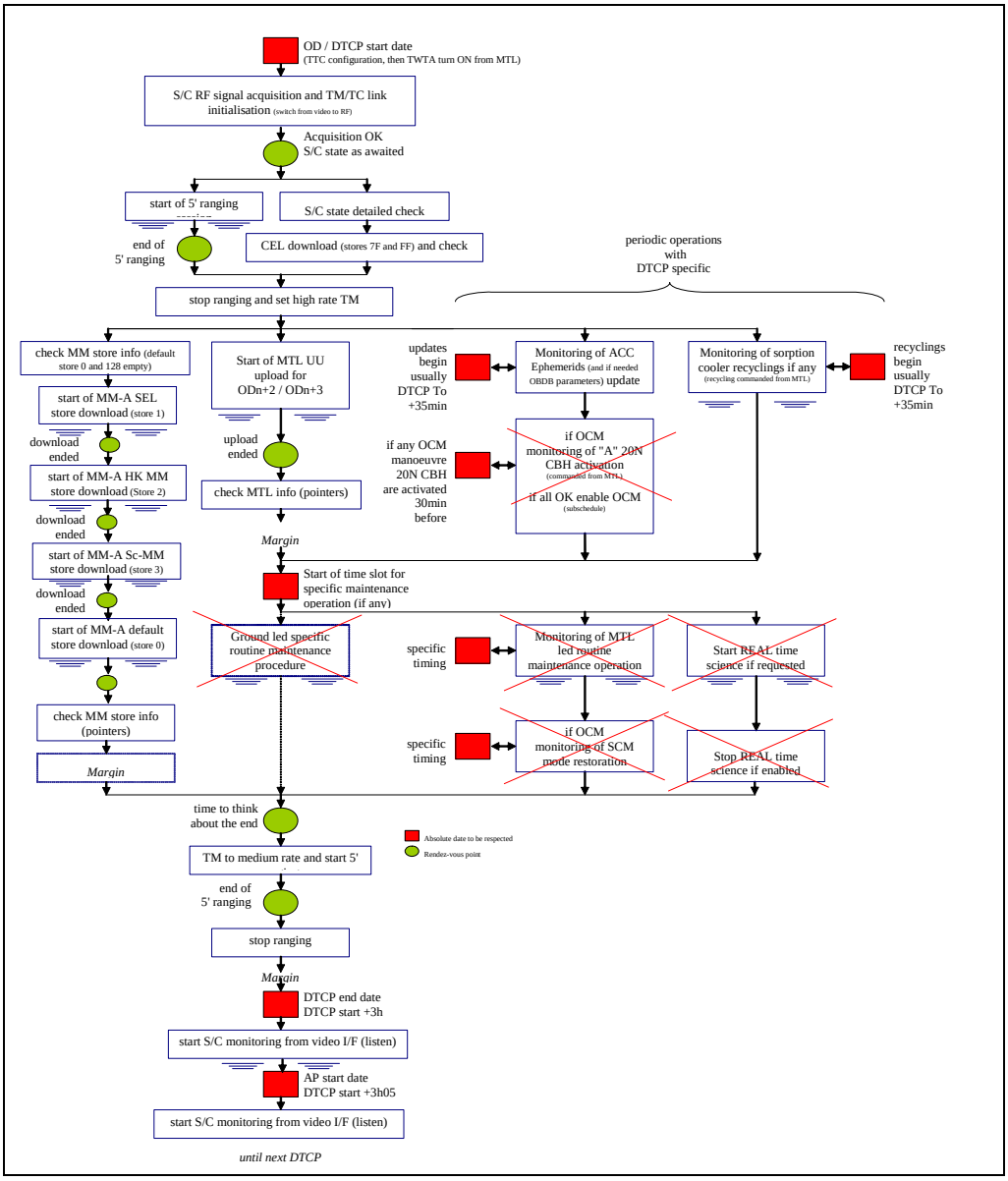
Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
610	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"MTL Execution"* ⇨ Click the button "Confirm" to continue	CONFIRM				
620	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"Click OK when You want to start the MTL"* ⇨ Click the button "OK" to continue	OK				
630	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"Check that all SSIDs are enabled"* ⇨ Perform activity then click the button "OK" to continue	OK				
640	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"Downlink and delete CEL A and B"* ⇨ Click the button "Confirm" to continue	Confirm				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
650	*During Z010999MCVT085_IST_RMS_ASTRIUM* *“Setting TM/TC DFE for AD mode commanding”* ⇨ Click the button "Confirm” to continue	CONFIRM				
660	*During Z010999MCVT085_IST_RMS_ASTRIUM* *“Locking XPND-1”* ⇨ Click the button "Confirm” to continue	CONFIRM				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
670	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"OD management start""* *⇨ Click button "Confirm" to continue*	CONFIRM		The sequence waits until the content of the shared variable "phase" (set by date_watch.tcl sequence) becomes "DTCP1". Then calls asynchronously the script Z010999MCVT091_IST_RMS_DTCP with argument DTCP1 Continue to - section 7.3 DTCP3		

7.2 OD0345: HIFI PRIME

Figure 3 – Generic DTCP + AP operations



Date:	Time:	Operator:	Product-Assurance:

7.2.1 DTCP-1

Note:

All DTCPs have the same structure except DTCP 2 (that is totally missed as per IST Spec). The following steps apply to DTCP 1 - 3 - 4 (with small highlighted differences). In DTCP 2 the operator has just to wait until the end of AP2 and beginning of DTCP 3.

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
10	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "START HERSCHEL RMS DTCP1"	YES				
20	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Switching from Umbilical to RF (TC and TM)"	Confirm				
30	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Start ranging"	Confirm		RF downlink switched to 150Kbps		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
40	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "SETUP OF THE DTCP TRACING OF EPHEMERIDES AND OF COOLER RECYCLING (IF ANY)"	Confirm		Asynchronous tasks let sequences run in parallel. Log messages will be reported at the end if they have not completed before end of the current DTCP		
50	**Z010999MCVT090_IST_DTCP_TRACE_EPH** Reply to prompt: SET UP ephemerides update monitoring	Confirm		Note down the time tag of the TC to update the ephemerides from the On Board Queue.		
60	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "CEL downloading & stop ranging"	Confirm		Note: if no TM (1, 2), TM (1, 8), TM (5, 2) and TM (5, 4) has been received from board after IST_START the CEL is empty.		
70	**D102159SCVT188_IST_DUMP_PKT_STORE** Press ENDTS to continue	END TS				
80	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Set TM DownLink to: high rate"	Confirm				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
90	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Check from TM Pkt History (all APIDS that TM is coming down"	OK		When TM is coming down, it means that the MTL has commanded the switch to RF link in high rate		
100	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: SSMM Packet Stores Download"	Confirm		Asynchronous task. D102159SCVT182_DUMP_PKT_STORE_RMS_DTCP DTCP1 Continue in parallel with with steps 110 to 210, then press ENDTS when sequence D102159SCVT182_DUMP_PKT_STORE_RMS_DTCP prompts.		
110	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Start uploading the next MTL"	Confirm		Note that for MTL upload TC aggregation is enabled (disabled at the end of upload)		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
120	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: `"While uploading the next MTL, please check that DE081170 (NrOfTcsInMtl) and DE82F170 (MtlTcCnt) are consistently updated"`	OK		Plot parameters in TM plotting tool		
130	**Z010999MCVT091_IST_RMS_DTCP** Reply to prompt: *"Uploading MTL OD0346-0347?"* ⇨ press OK	OK				
140	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Press OK only AFTER MTL upload completion" ⇨ first perform following 2 steps and then continue procedure from the subsequent step	WAIT		MTL_rms_dtcp1 is called asynchronously. This sequence will upload all segments of MTL OD 0346-0347		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
150	During MTL_rms_dtcp1.tcl at the prompt: “Script is going to load 1 file for ODs 0346-0347” ⇨ Open an ON BOARD QUEUE display ⇨ Filter TM PKT histories with TM(1,7), TM(1,8) and TM(1,2) to monitor completed, failed or not acknowledged TCs ⇨ press OK	PASS PASS OK				
160	During **MTL_rms_dtcp1.tcl** at the prompt: "Click OK when the MTL load complete (completion flag on last load command)" ⇨ check that no TM(1,8) or TM(1,2) have been received during the upload ⇨ check that TM(1,7) have been received throughout the upload ⇨ check that the CCS had finished processing all TCs of the last MTL (no completion flag is P, pending) ⇨ press OK	PASS PASS PASS OK		For the last check, you will need to stop and put live the TC history display many times until every “load TC” commands are yellow or green.		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
170	Back to the prompt in **Z010999MCVT091_IST_RMS_DTCP** “Press OK only after completion of the MTLs upload” ⇨ press OK	OK				
180	*During* *Z010999MCVT085_IST_RMS_ASTRIUM* *“Check that all SSIDs are enabled"* ⇨ Perform activity then click the button "OK” to continue	OK				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
190	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: `"Check synchronization between end of MTL upload and start maintenance tasks"`	Confirm		This test checks the status of the asynchronous activities: - next MTL upload It waits until the completion of all these activities then returns to the operator. If the MTL upload is still running, date_watch.tcl gives a warning to SUSPEND the sequence and the operator should check that there are no problems with the upload		
200	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: `"Start maintenance tasks"`	Confirm		There are no maintenance tasks defined for the RMS.		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
210	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Check synchronization between end of SSMM packet stores download and MTL operations"	Confirm		The sequence waits until the end of the SSMM download (asynchronous task). If the SSMM download is still running 45 minutes before the end of the DTCP, date_watch.tcl gives a warning, asks the user to issue the commands to stop the download (8, 4) and TERMINATE the sequence at an appropriate time (i.e. before starting ranging).		
220	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Set TM DownLink to: Medium rate and perform 5 minutes ranging"	Confirm				
230	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Check end of DTCP and reset video link"	Confirm				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
240	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "At around end of DTCP."	OK		Around the end of the DTCP (e.g. 10 minutes before) give the OK to set up the transmission back to video (i.e. test time = 2009.138.11.10.00). The downlink is also switched back to HBR (1.5Mbps) for the next AP		
250	**Z010999MCVT090_IST_DTCP_TRACE_EPH** Click ENDTS to continue	ENDTS		If it appears.		
260	**Z010999MCVT091_IST_RMS_DTCP** Click ENDTS to continue	ENDTS				

7.2.2 AP-1

No planned operator activities. However execution of MTL will be monitored and in the in event of anomaly information acquired and recovery/safing actions initiated.

7.3 OD0346: PACS PRIME

7.3.1 DTCP-2

No ground operations (to simulate missed communication). However execution of MTL will be monitored and in the in event of anomaly information acquired and recovery/safing actions initiated. Downlink remains in 1.5Mbps (on umbilical).

7.3.2 AP-2

No planned operator activities. However execution of MTL will be monitored and in the in event of anomaly information acquired and recovery/safing actions initiated.

7.4 OD0347: SPIRE PHOTOMETRY

7.4.1 DTCP-3

Step No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
10	DTCP3 - note: The sequence waits 99900 against start of DTCP3 (should be say 15mins before) seconds after start of DTCP1 (30.75hrs - necessary to reduce the volume of the logs). Than it waits until the value of the shared variable "phase" changes into "DTCP3" (AP1, DTCP2 and AP2 are over) Then calls asynchronously the DTCP sequence with parameter DTCP3.					
20	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "START HERSCHEL RMS DTCP3"	YES				

Step No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
30	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Switching from Umbilical to RF (TC and TM)"	Confirm				
40	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Start ranging"	Confirm		RF downlink switched to 150Kbps		
50	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "SETUP OF THE DTCP TRACING OF EPHEMERIDES AND OF COOLER RECYCLING (IF ANY)"	Confirm		Asynchronous tasks let sequences run in parallel. Log messages will be reported at the end if they have not completed before end of the current DTCP		
60	**Z010999MCVT090_IST_DTCP_TRACE_CR** Reply to prompt: SET UP Cooler recycling	Confirm		Note down the time tag of the TC to start SPIRE Cooler recycling (if in He2) on On Board Queue. Note: in He1 the cooler recycling will not be perfor med, do KILL the sequence and type the following in the test conductor console: setshared CR_completed 1		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
70	Z010999MCVT090_IST_DTCP_TRACE_EPH Reply to prompt: SET UP ephemerides update monitoring	Confirm		Note down the time tag of the TC to update the ephemerides from the On Board Queue.		
80	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "CEL downloading & stop ranging"	Confirm		Note: if no TM (1, 2), TM (1, 8), TM (5, 2) and TM (5, 4) has been received from board after IST_START the CEL is empty.		
90	D102159SCVT188_IST_DUMP_PKT_STORE Press ENDTS to continue	END TS				
100	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Set TM DownLink to: high rate"	Confirm				
110	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Check from TM Pkt History (all APIDS) that TM is coming down"	OK		When TM is coming down, it means that the MTL has commanded the switch to RF link in high rate		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
120	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: SSMM Packet Stores Download"	Confirm		Asynchronous task. D102159SCVT182_DUMP_PKT_STORE_RMS_DTCP DTCP3 Continue in parallel with steps 130 to 230, then press ENDTS when sequence D102159SCVT182_DUMP_PKT_STORE_RMS_DTCP prompts.		
130	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Start uploading the next MTL"	Confirm				
140	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "While uploading the next MTL, please check that DE081170 (NrOfTcsInMtl) and DE82F170 (MtlTcCnt) are consistently updated"	OK		Plot parameters in TM plotting tool		
150	Z010999MCVT091_IST_RMS_DTCP Reply to prompt: uploading MTL OD0347-0348 plus Dummy MTL?	OK		Note that for MTL upload TC aggregation is enabled (disabled at the end of upload)		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
160	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: “Press OK only AFTER MTL upload completion” ⇨ first perform following 2 steps then continue procedure from the subsequent step	wait		MTL_rms_dtcp3 is called asynchronously. This sequence will upload all segments of MTLs for OD0347-0348 and the dummy MTL timed for after DTCP4 (i.e. never executed)		
170	During MTL_rms_dtcp3.tcl at the prompt: “Script is going to call 2 files for OD 347-348 and Dummy starting 2009.140.13.15.00” ⇨ Open an ON BOARD QUEUE display ⇨ Filter TM PKT histories with TM(1,7), TM(1,8) and TM(1,2) to monitor completed, failed or not acknowledged TCs ⇨ press OK	PASS PASS OK				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
180	During MTL_rms_dtcp3.tcl at the prompt: "Click OK when the next MTL can be loaded (completion flag on last load command)" ⇨ check that no TM(1,8) or TM(1,2) have been received during the upload ⇨ check that TM(1,7) have been received throughout the upload ⇨ check that the CCS had finished processing all TCs of the last MTL (no completion flag is P, pending) ⇨ press OK	PASS PASS PASS OK		For the last check, you will need to stop and put live the TC history display many times until every “load TC” commands are yellow or green.		
190	Back to the prompt in Z010999MCVT091_IST_RMS_DTCP “Press OK only AFTER MTL upload completion” ⇨ press OK	OK				

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
200	*During Z010999MCVT085_IST_RMS_ASTRIUM* *"Check that all SSIDs are enabled"* ⇨ Perform activity then click the button "OK" to continue	OK				
210	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Check synchronization between end of MTL upload and start of maintenance tasks"	Confirm		This test checks the status of the asynchronous MTL upload It waits until the completion of all this activity then returns to the operator. If the MTL upload is still running, date_watch.tcl gives a warning to SUSPEND the sequence and the operator should check that there are no problems with the upload		
220	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Start maintenance tasks"	Confirm		There are no maintenance tasks defined for the RMS.		

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
230	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: "Check synchronization between end of SSMM packet stores download and MTL operations"	Confirm		The sequence waits until the end of the SSMM download (asynchronous task). If the SSMM download is still running 45 minutes before the end of the DTCP, date_watch.tcl gives a warning, asks the user to issue the commands to stop the download (8, 4) and TERMINATE the sequence.		
240	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: `"Set TM DownLink to: Medium rate and perform 5 minutes ranging"`	Confirm				
250	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: `"Check end of DTCP and reset video link"`	Confirm				
260	Z010999MCVT091_IST_RMS_DTCP Reply to the prompt: `"At around end of DTCP."`	OK		Around the end of the DTCP (e.g. 10 minutes before) give the OK to set up the transmission back to video (i.e. test time = 2009.139.18.10.00). The downlink is also switched back to HBR (1.5Mbps) for the next AP		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
270	Z010999MCVT090_IST_DTCP_TRACE_EPH Click ENDTS to continue	ENDTS		If it appears.		
280	Z010999MCVT090_IST_DTCP_TRACE_CR Click ENDTS to continue	ENDTS		If it appears.		
290	Z010999MCVT091_IST_RMS_DTCP Click ENDTS to continue	ENDTS				

7.4.2 AP-3

No planned operator activities. However execution of MTL will be monitored and in the in event of anomaly information acquired and recovery/safing actions initiated.

7.5 OD0348 DTCP Only (Test End)

7.5.1 DTCP 4

Step No.	*Test-Step-Description*	*Nominal Value*	*Actual Value*	*Remarks*	*P*	*N*
10	**Z010999MCVT085_IST_RMS_ASTRIUM** The sequence waits 45900 against start of DTCP4 (should be say 15mins before) seconds after start of DTCP3 (15.75hrs - necessary to reduce the volume of the logs). Than it waits until the value of the shared variable "phase" changes into "DTCP4" (DTCP3 and AP3 are over) Then calls asynchronously the DTCP sequence with parameter DTCP4.			If the DTCP sequence is still running when DTCP 4 starts, the sequence date_watch.tcl gives a warning and the operator has to react / interrupt the test. NOTE DTCP4 will skip all the steps after the ranging / CEL download. The S/C will remain in medium rate and RF. After the end of the DTCP, the first step of the master will be to switch back to umbilical before data retrieval and test conclusion.		
20	**Z010999MCVT091_IST_RMS_DTCP** **Reply to the prompt:** **"START HERSCHEL RMS DTCP4"**	YES				

Step No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
30	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "S/C RF acquisition and TM/TC link initialization"					
40	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "Start ranging"					
50	**Z010999MCVT091_IST_RMS_DTCP** Reply to the prompt: "CEL downloading & stop ranging"		Note: if no TM (1, 2), TM (1, 8), TM (5, 2) and TM (5, 4) has been received from board after IST_START the CEL is empty.			
60	**D102159SCVT188_IST_DUMP_PKT_STORE** **Press “END TS!” to continue**					
70	**Z010999MCVT091_IST_RMS_DTCP** **Press "END TS!"**	END TS!				

Date:	Time:	Operator:	Product-Assurance:

7.6 Data retrieval and test conclusion

Step No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
10	**Z010999MCVT085_IST_RMS_ASTRIUM** The sequence waits until the shared variable "phase" changes to "End" then goes on with the final operations				Normally the duration of DTCP4 would be 3 hours. For this test, the end of the DTCP has been set much earlier and the date_watch will set the shared variable phase to “End” much earlier. If you want to anticipate even more the end of the DTCP4: complete the DTCP4 sequence, terminate the sequence date_watch and issue the following command: setshared phase "End"		
20	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: `"Check end of MTL"`	Confirm			Test Conductor should check that this procedure is synchronised with the on-board execution of the MTL; i.e. only Dummy MTL commands still on the OBQ. Last RMS time-tagged TC will execute at 07:20:09.		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
30	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: `"Click OK to Stop MTL"`	OK					
40	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: `"reset video link "`	Confirm					
50	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to prompt: Press OK when you see new telemetry coming in"	Check TM and OK			. Some minutes are required to set back to umbilical		
60	**Z010999MCVT085_IST_RMS_ASTRIUM** *"Setting TM/TC DFE for BD mode commanding"* ⇨ Click the button "Confirm" to continue	Confirm					
70	**Z010999MCVT085_IST_RMS_ASTRIUM** *⇨ Confirm end of BD mode switch by pressing "END TS"*	END TS!					
80	**Z010999MCVT085_IST_RMS_ASTRIUM** If prompted: `"Set SPIRE PHOT back to STBY mode"`	Confirm			If the command to set SPIRE in STBY is in the MTL, the sequence just logs that "SPIRE is correctly set in REDY mode" and the test step ends. If not and the status is PHOTSTBY the		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
					sequence gives a warning and calls S102999SCVT908_ASDDBGSPIR_PHOTSTBY2STBY If the status is not REDY and not PHOTSTBY, the sequence gives a warning and waits for user action. The two warnings are in the following 2 steps		
90	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt (if prompted): "SPIRE is in mode <mode> not in REDY (STDBY) mode. Please execute the proper configuration script and press OK when SPIRE is in REDY"	Execute proper script then OK					
100	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt (if prompted): "SPIRE is in mode <mode> not in REDY (STDBY) mode. Please execute the proper configuration script and press OK when SPIRE is in REDY"	Execute proper script then OK					
110	**Z010999MCVT085_IST_RMS_ASTRIUM**	Confirm			Refer to RD3 for current prompts and expected OOLs.		

Date:	Time:	Operator:	Product-Assurance:

Step No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Reply to the prompt: "POWER OFF HIFI NOMINAL"						
120	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: "POWER OFF PACS NOMINAL"	Confirm			Refer to RD3 for current prompts and expected OOLs.		
130	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: "POWER OFF SPIRE NOMINAL"	Confirm			Refer to RD3 for current prompts and expected OOLs.		
140	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: "Switching OFF TT&C Chain"	Confirm					
150	**Z010999MCVT085_IST_RMS_ASTRIUM** Reply to the prompt: "TTC SCOE OFF and TMTC DFE in NotAggregate mode"	Confirm			Done just in case		
160	**Z010999MCVT085_IST_RMS_ASTRIUM** **Click EndTS to continue**	ENDTS					

Date:	Time:	Operator:	Product-Assurance:

7.6.1 IST RMS END

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	INSTRUMENT EGSE RELATED DISCONNECTION						
10	From HPCCS Test Conductor console issue command to disconnect from HIFI, SPIRE & PACS (I-EGSEs) **disconnect HHIFIEGSE** **disconnect HSPIREEGSE** **disconnect HPACSEGSE**	 OK OK OK					
20	Confirm from HPCCS that I-EGSEs have been disconnected	YZS27940 = DISCONNECTED YZS28940 = DISCONNECTED YZS29940 = DISCONNECTED					
	HIFI SPECIFICS						
30	Switch off the HIFI Cooling Cart i.a.w. AD-6	OK					
40	If no longer required Switch off HIFI I-EGSE i.a.w. AD-7	OK					
50	On HPCCS stop test script: **HIFI_All_SubscribeParams**	OK					
	Satellite & EGSE Switch OFF						
60	Switch off Satellite/SVM and HPCCS, SCOEs i.a.w. AD-5 section 7.4	OK					
	END OF TEST						

Date:	Time:	Operator:	Product-Assurance:

7.7 Emergency Recovery Procedures

In case of problem with a specific instrument OD execution (either internally to the instrument or externally from the SVM or Cryo), the following procedures are defined to:

- Disable the MTL subschedule(s) for the instrument(s) concerned
- If required put the instrument into a SAFE condition (could be either STANDBY or OFF)
- Re-enable the Meta MTL subschedule(s) for the instrument(s) concerned (the latter assumes that the problem has been resolved, instrument(s) concerned returned to the required configuration for resumption of the instrument MTL)

7.7.1 ACMS Gyro Reconfiguration Recovery

In case of Gyro reconfiguration due to mechnical disturbance during the test execute Operator Note 52 to return the Gyros to nominal test configuration.

7.7.2 Disable MTL Subschedule

As an initial action to prevent further commanding of the instrument/sub-system concerned the corresponding subschedules shall be disabled as follows:

1. Disable HIFI subschedules to make sure no new commands are sent to HIFI; from the console execute test script:

   Z010999MCVT220_IST_HIFI_Disable_Subschedules.tcl

2. Disable PACS subschedules to make sure no new commands are sent to PACS; from the console execute test script: Z010999MCVT221_IST_PACS_Disable_Subschedules.tcl
3. Disable SPIRE subschedules to make sure no new commands are sent to SPIRE; from the console execute test script: Z010999MCVT222_IST_SPIRE_Disable_Subschedules.tcl

7.7.3 Switch Instruments to Safe

Next put instrument concerned to the agreed SAFE state as follows:

1) For HIFI

Switch HIFI to STANDBY1 by executing TBD

2) For PACS

Switch PACS to SAFE by executing TBD

3) For SPIRE

Switch SPIRE to REDY by executing TBD

Convene NRB and then perform agreed recovery actions.

7.7.4 Re-Enable MTL Subschedule

At time agreed at the NRB re-enable the MTL Meta-subschedule for the instrument concerned.

Date:	Time:	Operator:	Product-Assurance:

8 Summary Sheets

8.1 Procedure Variation Summary

	Test Change	Curr. No.: Date Page of

Test designation	Test Procedure	Issue	Rev.
Test step changed	Reason for Change		

Prepared by:	Resp. Test Leader	Project Engineer
PA/QA	Prime	Customer

Table 8.1-1: Procedure Variation Sheet

8.2 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.

Table 8.2-1: Non-Conformance Record Sheet

8.3 Sign-off Sheet

	Date	Signature
Test Director		
Test Conductor		
Operator		
PA Responsible		
ESA Representative		

9 ANNEX A : RMS Command Summary

This annex provides a summary of the time-tagged commands executed during the 48hrs RMS. Due to the size of the spreadsheets these are attached as paper copies only.

OD344 – OD345

OD345 – OD346

OD346 – OD347

OD347 – OD348

10 ANNEX B : RMS Test Script List

This annex provides a list of the test scripts used specifically for the actual IST RMS test (note the IST Start/End scripts are listed in AD-5):

Z010999MCVT085_IST_RMS_ASTRIUM

- Z010999MCVT093_IST_RMS_Date_Watch
- Y102989ETVT021_TTC_SCOE_ON
- A102109SPVT208_OBDB_MASS_INERTIA
- A102109SPVT202_ACMS_STATUS_H
- D102159SCVT138_IST_LAUNCH_SUNACQ
- D102159SCVT137_IST_SUNACQ_NOM
- W102584SPVT101_PCDU_TRANSITION_FDIR 1
- Z102999SCVT001_SREM_ON 60
- Z102999SCVT014_ASDGEN_HIFIPWRON_P
- Z102999SCVT010_ASDGEN_PACSPWRON_P
- Z102999SCVT004_ASDGEN_SPIREPWRON_P
- P102999SCVT913_ASDGENPACS_BurstMode
- MTL_rms_init
- Z010999MCVT153_IST_STATUS
- D102159SCVT188_IST_DUMP_PKT_STORE CEL_A CEL_B
- Z010999MCVT132_TCprotMode_BD_AD_BD AD
- Y102989ECVT007_TTC_UL_PARAM_SET {MGA} {-67.4} {OFF} {T} {1} {0.5} {0.06} {A}
- Y102989ECVT008_TCRG_MI_SET_TTC {1.0} {0.7} {4000}
- Y102989ECVT018_TTC_TC_OP_METHOD {ONLINE}

- Y102989ECVT006_TTC_DL_PORT_SET {MGA}
- Z010999MCVT091_IST_RMS_DTCP DTCP1
- Z010999MCVT091_IST_RMS_DTCP DTCP3
- Z010999MCVT091_IST_RMS_DTCP DTCP4
- Y102989ECVT001_TMTC_LINK {BOTH} {SCPRI}
- Y102989ECVT018_TTC_TC_OP_METHOD OFFLINE
- Z010999MCVT132_TCprotMode_BD_AD_BD BD
- S102999SCVT908_ASDDBGSPIR_PHTSTBY2STBY
- Z102999SCVT015_ASDGEN_HIFIPWROFF_P
- Z102999SCVT011_ASDGEN_PACSPWROFF_P
- Z102999SCVT005_ASDGEN_SPIREPWROFF_P
- Y102989ETVT020_TTC_SCOE_OFF

Z010999MCVT091_IST_RMS_DTCP

- Y102989ECVT003_TC_DFE_OUT_2_TTC {4000}
- Y102989ECVT005_TM_DFE_IN_FROM_TTC {MGA} {MBR}
- Z010999MCVT090_IST_DTCP_TRACE_CR
- Z010999MCVT090_IST_DTCP_TRACE_EPH
- Z010999MCVT090_IST_DTCP_TRACE_EPH
- D102159SCVT188_IST_DUMP_PKT_STORE CEL_A CEL_B
- Y102989ECVT006_TTC_DL_PORT_SET {MGA}
- Y102989ECVT001_TMTC_LINK BOTH TTC
- D102159SCVT188_IST_DUMP_PKT_STORE 0 1 2 3
- MTL_rms_dtcp1

- MTL_rms_dtcp3
- Y102989ECVT001_TMTC_LINK {TM} {SCPRI}
- Y102989ECVT006_TTC_DL_PORT_SET {MGA}
- Y102989ECVT005_TM_DFE_IN_FROM_TTC {MGA} {MBR}
- Y102989ECVT001_TMTC_LINK {BOTH} {SCPRI}
- Y102989ECVT018_TTC_TC_OP_METHOD OFFLINE

Z010999MCVT093_IST_RMS_Date_Watch

MTL_rms_init

- MTL_tclgen37_H_IST1_MTL_D344_345_20080801_v01_SEG000_800_end
- MTL_tclgen37_H_IST1_MTL_D345_346_20080801_v01_SEG003_800_end

MTL_rms_dtcp1

- call TC_aggregation_enable
- call MTL_tclgen37_H_IST1_MTL_D346_347_20080801_v01_SEG004_800_end
- call TC_aggregation_disable

MTL_rms_dtcp3

- call TC_aggregation_enable
- call MTL_tclgen37_H_IST1_MTL_D347_348_20080801_v01_SEG004_800_end
- call MTL_tclgen37_H_IST1_MTL_Dummy_20070504_v01_SEG009_800_end
- call TC_aggregation_disable

ACMS_RECOVERY_from_AutoPeriod

HIFI_All_SubscribeParams

HIFIST_ASED_PatchPtvChecksum

HIFIST_ASED_PatchTempLimits

HIFI_All_SubscribeParams

K102999ECVT001_ASDGENCCU_MnDBOTH1

K102999ECVT001_ASDGENCCU_MnEBOTH2

K102999ECVT001_ASDGENCCU_MnDBOTH2

K102999ECVT001_ASDGENCCU_MnEBOTH1

Y102999ETVT037_ASDGEN_VERHIFIIEGSE

HIFIST_nom_IST_LO_disable_warm

HIFIST_nom_IST_LO_on_1a_warm

Z010999MCVT220_IST_HIFI_Disable_Subschedules

Z010999MCVT221_IST_PACS_Disable_Subschedules

Z010999MCVT222_IST_SPIRE_Disable_Subschedules

E N D O F D O C U M E N T

	Name	Dep./Comp.		Name	Dep./Comp.
	Baldock Richard	FAE12	X	Sonn Nico	ASG51
	Barlage Bernhard	AED13		Steininger Eric	AED321
	Bayer Thomas	ASA42	X	Stritter Rene	AED11
	Brune Holger	ASA45		Suess Rudi	OTN/ASA44
X	Chen Bing	HE Space	X	Theunissen Martijn	DSSA
X	Davis William	Captec	X	Vascotto Riccardo	HE Space
	Edelhoff Dirk	AED21		Wagner Klaus	ASG23
	Fehringer Alexander	ASG15	X	Wietbrock Walter	AET12
X	Fricke Wolfgang Dr.	AED 65		Wöhler Hans	ASG23
	Geiger Hermann	ASA42		Wössner Ulrich	ASE252
	Grasl Andreas	OTN/ASA44		Zumstein Armin	AED15
X	Grasshoff Brigitte	AET12			
X	Hamer Simon	Terma			
X	Hanka, Erhard	FI522			
X	Hendrikse Jeffrey	HE Space			
X	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG23			
X	Hohn Rüdiger	AED65			
	Hopfgarten Michael	AET32			
	Huber Johann	ASA42			
	Hund Walter	ASE252			
X	Idler Siegmund	AED312			
	Iványi von András	FAE12			
	Jahn Gerd Dr.	ASG23			
	Jolk Matthias	AET1	X	ESA/ESTEC	ESA
X	Klenke Uwe	ASG72	X	Thales Alenia Space Cannes	TAS-F
X	Kölle Markus	ASA43		Thales Alenia Space Torino	TAS-I
	König Werner	AET32			
X	Koppe Axel	AED312			
X	Kroeker Jürgen	AED65		**Instruments:**	
X	La Gioia Valentina	Terma	X	MPE (PACS)	MPE
	Lang Jürgen	ASE252	X	RAL (SPIRE)	RAL
	Langenstein Rolf	AED15	X	SRON (HIFI)	SRON
	Langfermann Michael	ASA41			
	Leitermann Stefan	AET12			
X	Liberatore Danilo	Rhea		**Subcontractors:**	
X	Martin Olivier	Altec		Austrian Aerospace	AAE
X	Maukisch Jan	ASA43		Austrian Aerospace	AAEM
X	Much Christoph	ASA43		BOC Edwards	BOCE
X	Müller Martin	ASA43		Dutch Space Solar Arrays	DSSA
	Pietroboni Karin	AED65		EADS Astrium Sub-Subsyst. & Equipment	ASSE
	Reichle Konrad	ASA42		EADS CASA Espacio	CASA
	Runge Axel	OTN/ASA44		EADS CASA Espacio	ECAS
	Saal Christoph	External		European Test Services	ETS
	Schink Dietmar	AED321		Patria New Technologies Oy	PANT
	Schmidt Thomas	AED15		SENER Ingenieria SA	SEN
	Schweickert Gunn	ASG23		Thales Alenia Space, Antwerp	TAS-ETCA