1. INTRODUCTION

This document reports on the acceptance tests performed on the 9th August 2006 on the OBS v2.2.D installed on the HSDPU FM model.

1.1 Scope

The coverage of this test is limited to basic OBS functionality.

- commanding reception acknowledgement and execution.
- error condition identification and reporting.

This report judges the success or failure of a DPU functional test by checking that

- the commands were correctly received and executed by the DPU.
- no unexpected error or exception reports were generated.
- the appropriate telemetry parameters changed in an expected manner.

1.2 Reference Documents

RD01 SPIRE On-Board Software Verification and Validation Plan/Acceptance Test Plan
RD02 SPIRE Data ICD (SPIRE-RAL-PRJ-001078), Issue 1.1, 25th May2004
RD03 SPIRE OBS URD
RD04 SPIRE EGSE-ILT Startup Procedures (SPIRE-RAL-DOC-001630), Issue 0.7, 24th June 2003
RD05 SPIRE On-Board Software User Manual (SPIRE-IFS-PRJ-001391 Issue 2.2 12th June 2006

1.3Acceptance Test Configuration

SPIRE EGSE Setup

- CDMS Simulator v2.5.
- SCOS 2000 2.3e Patch Level 5 + TOPE installed and running on Truro.
- Truro Server running Linux SuSE 7.3 OS.
- OBS 2.2.D installed on FM DPU.
- HCSS v0.3.3.
- EGSE Router and Gateway running on Truro.
- SPIRE MIB 2.2.D.
- EGSE Test Tool PacketDisplay running on Truro to display TC and TM packet contents.

2.PRE-TEST PREPARATIONS

- The latest version of the OBS should be installed on the Q drive. A folder with the OBS version number (e.g. 1.2J) should normally be created in Q:\OBS\OBS_Source. Because of access restrictions the OBS test team has found it appropriate to install the latest version under Q:\ICC\OBS.
- Ensure that the pcss.jar file containing the PACS supplied OBS loader program is present in directory /home/sops23e/SPIRE/OBS/OBSLoader.

- To load the OBS using the Load Memory telecommands (service 6,2), the zipped file containing the commands will need to be placed in the SCOS 2000 account in a directory under /home/sops23e/SPIRE/OBS/OBSLoader. For example, the telecommands to be loaded for installing 1.2J would be placed in directory /home/sops23e/SPIRE/OBS/OBSLoader/OBSTCs_1.2J.

- The shell script to load the OBS may need to be modified to point to the location of the Load Memory telecommands.

2.1Assumptions

Before the start of the OBS acceptance tests the remainder of the SPIRE EGSE is to be set up and configured using RD03 and RD04. For each set of tests the following minimum steps were also executed beforehand if they were not already activated.

Step #	**Description**	**Status** **Parameter Values Before/After**	**Test Step Status/** **Success/Fail**
1	Start TM ingestion	TM ingestion process running (on Chichester)	Success TM ingestion logs: **FM_DPU_AT_TM_Ingestion.log** and **FM_DPU_AT_TM_Ingestion_after_DPU_errors.log** located in: chichester: /home/sg55/logs/tmingest/
2	Start Test Control Server running on Lincoln	Test control server process running (on Chichester)	Success
3	The DPU is switched on		See comments bellow.

Comments:

Several problems found in booting the OBS 2.2.D on DPU FM
Symptoms:
After the DPU is switched ON the Boot SW v2.0 starts sending (5,1) packets as expected:

Event Packet : READY to ACCEPT TCs
EventID : 0x8008
SID :0x3 as expected.

Then FORCE_BOOT_PRIMARY command is sent to the DPU an a further event (5,1) is received as expected:

Event Packet: TC ACKNOWLEDGE
EventID : 0x8111
SID : 0x3 is received as expected.

but,
just afterwards the boot software starts producing events (5,4):

Event Packet: LOADING EEPROM to PM

Event ID : 0x8005
SID : 0x1
Error Code : 0xC00

Further attempts to boot DPU are unsuccessful with the same type of events being produced.

When the FORCE_BOOT_SECONDARY command is sent the OBS starts normally.
This acceptance test will be performed with the OBS 2.2.D booted from the secondary partition.
NCR to be raised.

3.OBS ACCEPTANCE TESTS

3.1 Loading of the new OBS

3.1.1 Loading the new OBS using Load Memory Service (6,2)

- Execute the script to issue the Load Memory commands. For version 1.2J the script is called ObsLoader_1.2J. Typically four telecommands are sent per second; For version 1.2J it takes about 6 minutes to finish loading the new OBS.

- Once the script has stopped execution the LOAD_TC_AND_BOOT command can be sent from the SCOS 2000 Manual Stack to start running the new OBS.

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- **OBS 2.2.D has already been uploaded using the obsloader program and then saved into EEPROM**

3.1.2Loading of the OBS using the JTAG probe

This should only be attempted if

- DPU and the Warm Electronics are not in the Cryo Lab
- JTAG probe is available and connected between the CPU board of the DPU and ISOPC1 computer
- All attempts to load the new OBS via the OBSLoader program and the LOAD_TC_AND_BOOT command have failed

The load procedure is described in RD04.

3.2Housekeeping Generation and OBS Parameter Monitoring

Once the OBS is running HK reports should be generated automatically. The Telemetry Display page DPU AND OBS PARAMETERS on SCOS 2000 displays all the DPU and OBS specific parameters from the nominal HK report. The Telemetry Display page CRITICAL HK PARAMETERS displays the entire contents of the critical HK report.

3.2.1HK Generation Rate

- On the DPU AND OBS PARAMETERS display page, is the nominal HK packet generation time, THSK, incrementing once every second?

  YES (Success) / NO (Failure)

- On the DPU AND OBS PARAMETERS display page, is the nominal HK packet source sequence count, TM2N, incrementing once every second?

  YES (Success) / NO (Failure)

- Is the time on the CRITICAL HK PARAMETERS display page (top right corner) updating once every two seconds?

  YES (Success) / NO (Failure)

3.2.2DPU and OBS Parameter Monitoring

The following table lists some of the OBS parameters to be monitored from the DPU AND OBS PARAMETERS display page while the nominal HK reports are being generated.

Nominal HK parameter Name	Expected Value	Actual Value	Success/ Failure	Comments
OBSVER	OBS version as specified in the release note	2.2.D	Success	
TMMODE	0 – Normal TM Mode	0	Success	
DPUP5V	~5.0 V	5.04 V	Success	
DPUP15V	~14.70 V	15.43 V	Success	Slightly high?? Floating between 15.9 and 15.4
DPUM15V	~-14.98 V	-15.88 V	Success	Slightly high?? Same comments as above
DPUTEMP	~304.68K	300.22	Success	
DPUP2_5V	~2.48V	2.48V	Success	
CPULOAD	< 300	Switching between 0x27 and 0x33	Success	
LSLOAD	< 700000	Switching between 542000 and 564000	Success	
MONSTAT	Depends on test configuration If DPU is STANDALONE must be 0x222 (RD05)	0x222	Success	
FIFO_DF_FLAG	Refer (RD05)	7	Success	No data requested, so this result is correct.
LOSTTCBLOCK	0	0	Success	
LOSTEVBLOCK	0	0	Success	
LOSTHKBLOCK	0	0	Success	
LOSTNTBLOCK	0	0	Success	

3.3Command Execution

Command (*Parameters)*	HK parameter name	Value before	Value after	Result Success /Failure	Comments
RESET_DRCU_ COUNTERS()	TRESET	2094.037.06.28.16 (undefined value)	Current Time 2006.221.10.11.10	Success	
SET_OBSID(*OBSERVATION_ID=0x 30000000*)	OBSID BBID	0xd05 0	0x30000000 0	Success	The SET_OBSID command also sets the BBID to 0
SET_OBSID(*OBSERVATION_ID=0*)	OBSID	0x30000000 0	0 0	Success	The SET_OBSID command also sets the BBID to 0
SET_BBID(*BUILDING_BLOCK_I D=0x80000000*)	BBID	0	0x80000000	Success	
SET_OBSID(*OBSERVATION_ID=0x 30000000*)	OBSID BBID	0 0x80000000	0x30000000 0	Success	The SET_OBSID command also sets the BBID to 0
SET_BBID(*BUILDING_BLOCK_I D=0x8000000*)	BBID	0	0x80000000	Success	
SET_OBS_STEP(*OBSERVATION_ STEP=0xffff*)	STEP	0	0xffff	Success	A (5,1) New Step Report should be generated
SET_OBS_STEP(*OBSERVATION_ STEP=0*)	STEP	0xffff	0	Success	A (5,1) New Step Report should be generated
SET_OBS_MODE(*OBSERVING_ MODE=1*)	MODE	0	1	Success	A (5,1) New Obs Mode Report should be generated
SET_OBS_MODE(*OBSERVING_ MODE=0*)	MODE	1	0	Success	A (5,1) New Obs Mode Report should be generated
SET_OBS_MODE(*OBSERVING_ MODE=0xffff*)	MODE	0	0xffff	Success	A (5,1) New Obs Mode Report should be generated
SET_OBS_MODE(*OBSERVING_ MODE=0*)	MODE	0xffff	0	Success	A (5,1) Obs Mode Report should be generated
clear_HK_report_1.2J.tc l	Packet Ids 0x300 & 0x301			Success	Critical and nominal and HK reports should be cleared
define_new_HK_report_ 1.2J.tcl	Packet Ids 0x300 & 0x301			Success	Default critical and nominal reports should start to be generated

3.4Virtual Machine

Command (*Parameters)*	Action	Result Success/Failure
SET_TABLE(*TABLEID=0x67, TABLESIZE=0x100)*	Check for successful command execution on the SCOS 2000 TC History Display	Success
Execute TCL script UpdateTable3.1.tcl Input VM Table File: PTC_TC0.txt SCOS 2000 directory: tcl/TC/VMTables directory	Check for successful script execution on the TOPE command window and monitor command execution on the SCOS 2000 TC History Display	Success
REPORT_TABLE(*TABLEID=0x67, INDEX=0, COUNT=0x0)* RUN_VM	Use PacketDisplay and/or QLA to examine the contents of the (21,4) Report Table Report. Do the packet contents agree with the contents of the VM Table file? Used PCAL_VM.truro saved stack to verify if table is loaded and if is executed. This executed a PCAL flash VM with parameters: Table ID =0x46 Index = 0 N params= 9 Param 1 = 100 Param 2 = 2000 Param 3 = 40 Param 4 = 250000 Param 5 = 3 Param 6 = 11 Param 7 = 12000 Param 8 = 0 Param 9 = 9	Success Contents of Reports (21,4) agree with contents of table updated by UPDATE_TABLE command. Success VMSTAT went from 0 to 0x46 as expected. OBS correctly notified a VM exception. These exception are in effect no responses of the DCU and SCU subunits to the commands sent to them by the PCAL flash VM. Event Packets (5,1) with error codes: 0x520 , 0x522 and SID ;0x5113 Nor these units neither the DRCU simulator were used for this acceptance test. FIFO_DF_FLAG went from 7 to 2 accordingly as the DPU was expecting frames on the DCU and SCU FIFOs.

3.5TC Verification Reports

Command (*Parameters)*	Action	Result Success/Failure
REPORT_TABLE(*TABLEID=0x27, INDEX=0, COUNT=0x25)*		Failed as expected. Failure code 0x811 – table not defined.
REPORT_TABLE(*TABLEID=0x500, INDEX=0, COUNT=0x100)* REPORT_TABLE(*TABLEID=0x67, INDEX=0x100, COUNT=0x100)* *HALT_VM* *FLUSH_FIFO(FIFO_FLAGS=0)* *CLEAR_HK_REPORT(0x300)* *CLEAR_HK_REPORT(0x301)*	 Sent command while no VM is actually running Sent this commands after the reports had been already cleared	Failed as expected. Failure code 0x805 – Illegal_Table_ID. Failed as expected. Failure code 0x80D – Illegal_Table_index. Failed as expected. Failure code 0x80A – VM Inactive. Failed as expected .Failure code 0x80F- Illegal_FIFOFlags Failed as expected .Failure code 0x829.- Unallocated HK packet ID