1. INTRODUCTION

This document reports on the acceptance tests performed on 18-19 Janu ary2007 on the OBS v2.2.G installed on the HSDPU AVM-1.

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

1.3 Acceptance 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.G installed on AVM-1 DPU.
- HCSS v0.3.4, Build #1062.
- EGSE Router and Gateway running on Chichester.
- SPIRE MIB 2.2.E1.
- EGSE Test Tool PacketDisplay running on Chichester 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.

2.1 Assumptions

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: TMIngestion_Jan_GMT.log located on Chichester in directory /home/sg55/logs/tmingest/
2	Start Test Control Server running on Lincoln	Test control server process running (on Chichester)	Not running
3	The DPU is switched on		OK

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.

Comments:
18-01-2007

15:18: Switched on the AVM-1 DPU

15:20: Loading OBS 2.2.G from sops23e@truro using script ObsLoader_Issue2.2.G in directory /home/sops23e/SPIRE/OBS/OBSLoader.

2185 DmPageTcnnnn.dm TC files being loaded from directory /home/sops23e/SPIRE/OBS/2.2.g/result/.

15:32: 2185 TCs loaded OK.

15:33: Executed LOAD_TC_AND_BOOT TC from SCOS.
Hit the red reset button. HK generation started OK.

3.1.2 Loading 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.

3.2 Housekeeping 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.

3.2.1 HK 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)

3.2.2 DPU 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.G	Success	
TMMODE	0 – Nominal TM Mode	0	Success	
DPUP5V	~5.0 V	5.00 V	Success	
DPUP15V	~14.70 V	14.70 V	Success	
DPUM15V	~-14.98 V	-14.98 V	Success	
DPUTEMP	~304.68K	302.40	Success	
DPUP2_5V	~2.48V	2.48V	Success	
CPULOAD	< 300	Switching between 0x29 and 0x36	Success	
LSLOAD	< 700000	Switching between 33875 and 35250	Success	Note that the units of this parameter have changed from micro-seconds to (1/65535) seconds.
MONSTAT	Depends on test configuration If DPU is STANDALONE must be 0x222 (RD05)	0x222	Success	DPU was in standalone mode and MONSTAT was 0x222
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	

3.3 Command 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 2007.078.15.42.23.015	Success	
SET_OBSID(*OBSERVATION_ID=0x30000000*)	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_ID =0x80000000*)	BBID	0	0x80000000	Success	
SET_OBSID(*OBSERVATION_ID=0x30000000*)	OBSID BBID	0 0x80000000	0x30000000 0	Success	The SET_OBSID command also sets the BBID to 0

0

Command (*Parameters)*	HK parameter name	Value before	Value after	Result Success /Failure	Comments
SET_BBID(*BUILDING_BLOCK_ID =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.tcl	Packet Ids 0x300 & 0x301			Success	Critical and nominal and HK reports should be cleared. used MSTK commands: CLEAR_HK_REPORT(0x300) and CLEAR_HK_REPORT(0x301).
define_new_HK_report_ 1.2J.tcl	Packet Ids 0x300 & 0x301			Success	Default critical and nominal reports should start to be generated Ran TOPE script define_new_HK_report.tcl – but there was no HCSS connection.

3.4 Virtual Machine

Command (*Parameters)*	Action	Result Success/Failuredefine_new_HK_report.tcl
SET_TABLE(*TABLEID=0x67, TABLESIZE=0x100)*	Check for successful command execution on the SCOS 2000 TC History Display	Before executing this TC decided to check in case the tables were defined already by issuing the REPORT_TABLE(0x67,0,0) command. Received a (1,8) TC execution failure report with code 0x811 – undefined table ID. 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)*	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?	Success Contents of Reports (21,4) agree with contents of table updated by UPDATE_TABLE command. Note that the (21,4) report length is in units of 16 bit words, while the length set in the SET_TABLE TC is in units of 32 bit words. Two (21,4) reports were received, first with 0x1EE 16-bit words and the second with 0x12 16-bit words, which add up to 200 16-bit words.

Command (*Parameters)*	Action	Result Success/Failuredefine_new_HK_report.tcl
RUN_VM	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	Before running this VM issued a REPORT_TABLE(0x46,0,0) TC. Received a (21,4) report of length 0x188 16-bit words. Also cleared the Critical HK Report using MSTK 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: 0x50C, 0x50E and SID ;0x5113 These events were issued by the VM because the DRCU simulator was not 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.

3.5 TC 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)*		Failed as expected. Failure code 0x805 – Illegal_Table_ID. The User Manual still refers to table range 0 – 127 but the number of tables has increased to 256.
REPORT_TABLE(*TABLEID=0x67, INDEX=0x100, COUNT=0x100)*		Failed as expected. Failure code 0x80D – Illegal_Table_index.
HALT_VM	Sent command while no VM is actually running	Failed as expected. Failure code 0x80A – VM Inactive.
FLUSH_FIFO(FIFO_FLAGS=0)		Failed as expected .Failure code 0x80F- Illegal_FIFOFlags
CLEAR_HK_REPORT(0x300) *CLEAR_HK_REPORT(0x301)*	Sent these commands while the nominal housekeeping report was still being generated after the critical house keeping report had already been cleared.	Failed as expected for critical housekeeping. Failure code 0x829.- Unallocated HK packet ID

Time completed 16:49.

16:55: WRITE2EEPROM(0x4000,0x17100,Partition_Flag=0,Jump_Pages=0)
OK - took about 30 seconds to complete.

Received three (5,1) reports during the command execution:

ID: 0D00
Seq: CF6F
Len: 001F
0000: 0D00 CF6F 001F 0005 0100 5C42 04FB 0022 9512 510B 3000 0000 8000 0000 0A46 0002
0020: 0000 0080 CBBD

ID: 0D00
Seq: CF70
Len: 0027
0000: 0D00 CF70 0027 0005 0100 5C42 04FB 0012 0512 5117 3000 0000 8000 0000 0A45 5C42
0020: 04FB 0000 D5E3 7129 D5E3 6847 CDDC

ID: 0D00
Seq: CF71
Len: 0027
0000: 0D00 CF71 0027 0005 0100 5C42 04FB 3A4E 0512 5117 3000 0000 8000 0000 0A47 5C42

0020: 04FB 0000 D628 DDC8 D5E3 6847 7B37

First time a (5,1) NO_TIMESYNC_ID report seen with an EventID 0x9512.

Starting nominal housekeeping generation and leaving to run overnight.

Overnight tests successful. No event reports seen.