Load OBCP using OBCP Development Environment generated TC File
File: H_FCP_OBS_7101.xls
Author: lstefanov-hp

Procedure Summary

Objectives

This Herschel OBSM nominal procedure is used to perform the
upload of an OBCP (add an OBCP to the OBCP list and upload its
code).
The TC(18,1) commands are loaded from a TC File in S2K Import
Stack format generated by the OBCP Development Environment and
previously transferred from the OBCP DE to the HPMCS. The
generation and transfer of the TC File is not covered by this
procedure.
Note: The OBCP DE is the only source of OBCP Load command files.

Summary of Constraints

The ASW function "OBCP Management" is responsible of loading
OBCPs. No OBCP can be loaded when the function is Stopped.

Default status of the function: "Stopped".

When the function is stopped, it does not accept any other
telecommands than the:
- Start Function TC(8,1,107);
- Report Function Status TC(8,5,107).

Thus, if the function is stopped this procedure cannot be
executed.

Spacecraft Configuration

Start of Procedure

CDMU in Nominal configuration, that is:
- PM A or B ON (nominally A)
- TM Encoder/OBT A or B active (nominally A)
- RM A and B enabled
- MM A and B ON
"OBCP Management" function Stopped or Running

End of Procedure

CDMU in Nominal configuration:
- PM A or B ON (nominally A)
- TM Encoder/OBT A or B active (nominally A)
- RM A and B enabled
- MM A and B ON
"OBCP Management" function Running
Selected OBCP loaded

Reference File(s)

Input Command Sequences

Output Command Sequences

OFCP7101

Referenced Displays

ANDs   GRDs   SLDs

Status   : Version 2 - Unchanged
Last Checkin: 01/04/09

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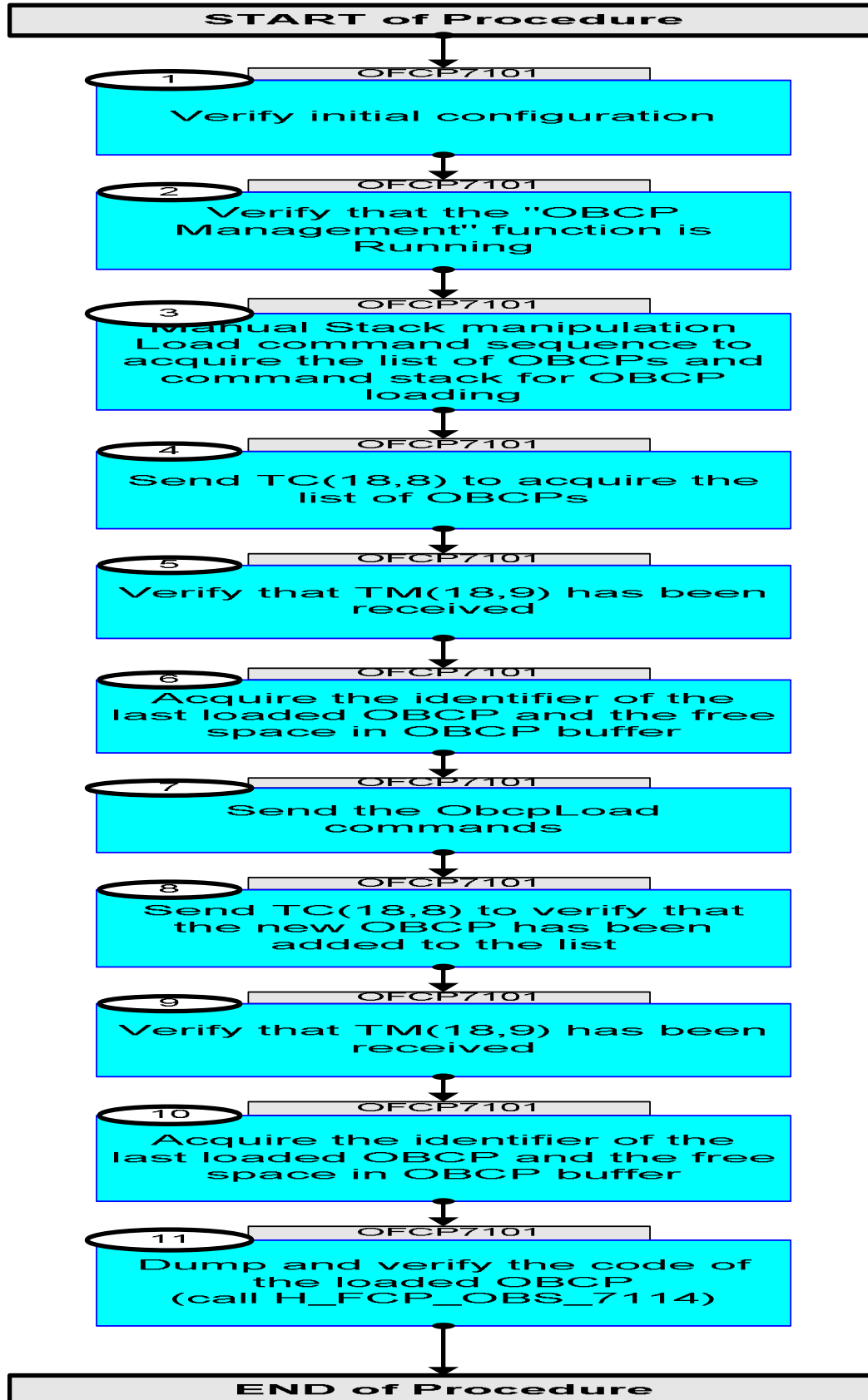```
ZAZAI999   (None)
ZAD42999
```

| | Configuration Control Information | |
|---|---|---|

| DATE | FOP ISSUE | VERSION | MODIFICATION DESCRIPTION | AUTHOR | SPR REF |
|---|---|---|---|---|---|
| 13/06/08 | 1 | 1 | Created | lstefanov-hp | |
| 01/04/09 | 2.3 | 2 | 1. steps 2, 3.3.2, 5, 7 and 9 updated in line with DB for CDMS OBS v.3.8.2<br>2. step 8 updated: TC Control Flags changed to Enable PTVs and EV | lstefanov-hp | |

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## Procedure Flowchart Overview

**START of Procedure**

**1** — OFCP7101
Verify initial configuration

**2** — OFCP7101
Verify that the "OBCP Management" function is Running

**3** — OFCP7101
Manual Stack manipulation
Load command sequence to acquire the list of OBCPs and command stack for OBCP loading

**4** — OFCP7101
Send TC(18,8) to acquire the list of OBCPs

**5** — OFCP7101
Verify that TM(18,9) has been received

**6** — OFCP7101
Acquire the identifier of the last loaded OBCP and the free space in OBCP buffer

**7** — OFCP7101
Send the ObcpLoad commands

**8** — OFCP7101
Send TC(18,8) to verify that the new OBCP has been added to the list

**9** — OFCP7101
Verify that TM(18,9) has been received

**10** — OFCP7101
Acquire the identifier of the last loaded OBCP and the free space in OBCP buffer

**11** — OFCP7101
Dump and verify the code of the loaded OBCP (call H_FCP_OBS_7114)

**END of Procedure**

Load OBCP using OBCP Development Environment generated TC File
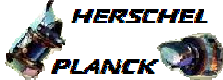File: H_FCP_OBS_7101.xls
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## Procedure Flowchart Overview

END of Procedure

Load OBCP using OBCP Development Environment generated TC File
File: H_FCP_OBS_7101.xls
Author: lstefanov-hp

| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch | AIT Comment |
|---|---|---|---|---|---|
| | | **Beginning of Procedure** | | | |
| | OFCP7101 | *TC Seq. Name :*OFCP7101 ( Load OBCP )<br>Load OBCP using OBCP DE generated TC File<br><br>*TimeTag Type:*  N<br>*Sub Schedule ID:* | | | |
| 1 | | Verify initial configuration | | Next Step:<br>2 | |
| | | Check CDMU Nominal configuration:<br>- PM A or B ON (nominally A)<br>- TM Encoder/OBT A or B active (nominally A)<br>- RM A and B enabled<br>- MM A and B ON | | | |
| 2 | | Verify that the "OBCP Management" function is Running | | Next Step:<br>3 | |
| | | Verify Telemetry<br>**ObcpSts          DEH36170** | **= Running** | AND=ZAZAI999 | |
| 2.1 | | IF "OBCP Management" function NOT Running<br><br>THEN<br>Start the OBCP function via H_FCP_DHS_3046 | | | |
| | | H_FCP_DHS_3046  Start or stop the whole OBCP function | | | |
| 3 | | Manual Stack manipulation<br>Load command sequence to acquire the list of OBCPs and command stack for OBCP loading | | Next Step:<br>4 | |
| 3.1 | | Load command sequence OFCP7101 on top of the Manual Stack | | | |
| 3.1.1 | | Sequence data<br><br>FP:   N/A<br>TT:   N/A | | | |
| 3.2 | | Load command stack for OBCP upload | | | |

Load OBCP using OBCP Development Environment generated TC File
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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch | AIT Comment |
|---|---|---|---|---|---|
| | | Select the File -> **LoadStack** option from the main menu of the Manual Stack window | | | |
| | | Select file<br><br>**OBCPCDMU_PI_XXXXYYY_N_NoModel_NoModel_YYYY_DDDThhmmss. machine**<br><br>from directory<br><br>/home/hmcsops/HPMCS/SESSION/current/data/CMD/STACKS/OBSM/OBCPCDMU<br><br>as indicated by the OBSM engineer | | | |
| | | IMPORTANT:<br><br>XXXXYYYY = OBCP Release(X) and Version(Y) - generated by the OCL compiler<br><br>YYYY_DDD hhmmss - depend on stack generation time<br><br>machine - depends on the name of the machine used for stack generation | | | |
| | | File name **example:**<br><br>OBCPCDMU_PI_0002001_N_NoModel_NoModel_2008_133T123400. hpdevcl | | | |
| | | | | | |
| 3.3 | | Check OBCP load command stack loaded | | | |
| | | **Note:**<br>Depending on the OBCP size, the stack may consist of one or several TC(8,1) commands.<br>If an OBCP contains more code than can be loaded with a single TC-packet, it has to be loaded by a sequence of TC-packets, each of them identified by a unique Segment-Identifier and carrying a segment of the overall OBCP code. | | | |
| | | | | | |
| 3.3.1 | | IF<br>command stack contains only one TC(18,1) | | | |
| | | If the OBCP code size doesn't exceed 232 bytes, a single TC(18,1) is needed | | | |
| | | **Note:**<br>The value of the **ObcpSegmLen** parameter in the LoadObcp TC has a value **between 1 and 232**, depending on the size of the OBCP code.<br>The **number of ObcpCode parameters** is **equal to** the value of **ObcpSegmLen**. | | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch | AIT Comment |
|---|---|---|---|---|---|
| | | Execute Telecommand<br><br>     **LoadObcp_Even**<br><br>*Command Parameter(s) :*<br>   **ObcpId**   **DH135170**<br>   **ObcpSegmId**   **DH136170**<br>   **ObcpSegmLen**   **DH144170**<br>   **ObcpCode**   **DH137170**<br><br>*TC Control Flags :*<br>     **GBM IL DSE**<br>     **--Y -- ---**<br><br>*Subsch. ID : 10*<br>Det. descr. : TEMPLATE Load OBCP TC(18,1): Even number of ObcpCode (8-bit)<br>This Telecommand will not be included in the export | **DCT69170**<br><br><br>ObcpId<br>0 **&lt;dec&gt;**<br>1 **&lt;dec&gt;** (Def)<br>OBCP code | **TC** | |
| | | | | | |
| 3.3.2 | |  IF<br>command stack contains several TC(18,1) | | | |
| | | If the OBCP code size exceeds 232 bytes, several TC(18,1) are needed | | | |
| | | **Note:**<br>If the to be loaded OBCP is divided into K Segments, the Segment-ID shall always start with 1, and be incremented one by one up to K for the last segment of the new OBCP (allowed range : 1 to 254). After transmission of K Telecommands a TC(18,1) shall be sent with Segment-ID set to FFhex. | | | |
| | | Check first TC(18,1) in the stack: | | | |
| | | **Note:**<br>The value of the **ObcpSegmLen** parameter in the first LoadObcp TC in the stack is **232**.<br>The **number of ObcpCode parameters** is **232**. | | | |
| | | Execute Telecommand<br><br>     **LoadObcp_Even**<br><br>*Command Parameter(s) :*<br>   **ObcpId**   **DH135170**<br>   **ObcpSegmId**   **DH136170**<br>   **ObcpSegmLen**   **DH144170**<br>   **ObcpCode**   **DH137170**<br><br>*TC Control Flags :*<br>     **GBM IL DSE**<br>     **--Y -- ---**<br><br>*Subsch. ID : 10*<br>Det. descr. : TEMPLATE Load OBCP TC(18,1): Even number of ObcpCode (8-bit)<br>This Telecommand will not be included in the export | **DCT69170**<br><br><br>0 **&lt;dec&gt;** (Def)<br>1 **&lt;dec&gt;** (Def)<br>1 **&lt;dec&gt;** (Def)<br>OBCP code | **TC** | |
| | | Check last TC(18,1) in the stack: | | | |
| | | **Note:**<br>The value of the **ObcpSegmLen** parameter in the last LoadObcp TC in the stack is **0**.<br>The **number of 8 ObcpCode parameters** is **0**. | | | |

Load OBCP using OBCP Development Environment generated TC File
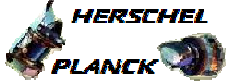File: H_FCP_OBS_7101.xls
Author: lstefanov-hp

| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch | AIT Comment |
|---|---|---|---|---|---|
| | | Execute Telecommand<br><br>     **LoadObcp_Even**<br><br>*Command Parameter(s) :*<br>   ObcpId   **DH135170**<br>   ObcpSegmId  **DH136170**<br>   ObcpSegmLen  **DH144170**<br>    ObcpCode  **DH137170**<br><br>*TC Control Flags :*<br>      **GBM IL DSE**<br>      **--Y -- ---**<br>*Subsch. ID : 10*<br>Det. descr. : TEMPLATE Load OBCP TC(18,1): Even number of ObcpCode (8-bit)<br>This Telecommand will not be included in the export | **DCT69170**<br><br><br>ObcpId<br>**FF <hex>**<br>**1 <dec>** (Def)<br>OBCP code | TC | |
| 4 | | Send TC(18,8) to acquire the list of OBCPs | | Next Step:<br>5 | |
| | | Uplink TC with **ARM GO** | | | |
| | | Execute Telecommand<br><br>     **ReptOnBoardObcps**<br><br>*TC Control Flags :*<br>      **GBM IL DSE**<br>      **--Y -- YYY**<br>*Subsch. ID : 10*<br>Det. descr. : TEMPLATE Report list of on-board OBCPs TC(18,8) | **DCT76170** | TC | |
| | | **Note**:<br>Following successful execution of TC(18,8), a report Type **(18,9)** is generated. | | | |
| 5 | | Verify that TM(18,9) has been received | | Next Step:<br>6 | |
| | | Verify Packet Reception<br><br>TM 18-9 List of on-board Procedures<br>Packet Mnemonic :  OnBrdObcpLst<br>APID :    16<br>Type :    18<br>Subtype :   9<br>PI1 :<br>PI2 : | | | |
| | | Verify Telemetry<br>    **N_Repetition**   **DE014170** | | | |
| | | **The following parameter is repeated N times** | | | |
| | | Verify Telemetry<br>    **ProcedureID**   **DE293170** | | (None) | |
| 6 | | Acquire the identifier of the last loaded OBCP and the free space in OBCP buffer | | Next Step:<br>7 | |
| | | Verify Telemetry<br>    **ObcpLoadId**   **DE83E170** | **= Last Loaded OBCP ID** | AND=ZAD42999 | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch | AIT Comment |
|---|---|---|---|---|---|
| | | Verify Telemetry<br><br>      **ObcpBufFree**         **DEA75170** | **= Free space in the OBCP buffer** | AND=ZAD42999 | |
| 7 | | Send the ObcpLoad commands | | Next Step:<br> 8 | |
| | | Uplink TCs one by one with **ARM GO** | | | |
| | | For each successfully executed TC DCT69170, a TM(1,1) and a TM(1,7) will be received on ground. | | | |
| | | Verify Packet Reception<br><br>Telecommand Acceptance Report - Success<br>Packet Mnemonic :       D_TcAccSucc<br>APID :             16<br>Type :            1<br>Subtype :         1<br>PI1 :<br>PI2 : | | | |
| | | Verify Packet Reception<br><br>Telecommand Execution Report - Completed<br>Packet Mnemonic :       D_TcExeComp<br>APID :             16<br>Type :            1<br>Subtype :         7<br>PI1 :<br>PI2 : | | | |
| 8 | | Send TC(18,8) to verify that the new OBCP has been added to the list | | Next Step:<br> 9 | |
| | | Execute Telecommand<br><br>        **ReptOnBoardObcps**<br><br>*TC Control Flags :*<br>           **GBM IL DSE**<br>           **--Y -- ---**<br>*Subsch. ID : 10*<br>Det. descr. : TEMPLATE Report list of on-board OBCPs TC(18,8) | **DCT76170** | TC | |
| | | Note: Following successful execution of TC(18,8), a report Type **(18,9)** is generated. | | | |
| 9 | | Verify that TM(18,9) has been received | | Next Step:<br> 10 | |
| | | Verify that the loaded OBCP has been added to the list. | | | |
| | | Verify Packet Reception<br><br>TM 18-9 List of on-board Procedures<br>Packet Mnemonic :       OnBrdObcpLst<br>APID :             16<br>Type :            18<br>Subtype :         9<br>PI1 :<br>PI2 : | | | |
| | | Verify Telemetry<br>      **N_Repetition**        DE014170 | | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch | AIT Comment |
|---|---|---|---|---|---|
| | | **The following parameter is repeated N times** | | | |
| | | Verify Telemetry <br>     **ProcedureID**     **DE293170** | | (None) | |
| 10 | | Acquire the identifier of the last loaded OBCP and the free space in OBCP buffer | | Next Step: <br> 11 | |
| | | Verify that the identifier of the last loaded OBCP is the selected one and check the remaining free space in OBCP buffer. <br> The free space in the OBCP buffer shall decrease with the amount of OBCP code uploaded. | | | |
| | | Verify Telemetry <br>     **ObcpLoadId**     **DE83E170** | **= Last Loaded OBCP ID** | AND=ZAD42999 | |
| | | Verify Telemetry <br>     **ObcpBufFree**     **DEA75170** | **= Free space in the OBCP buffer** | AND=ZAD42999 | |
| 11 | | Dump and verify the code of the loaded OBCP (call H_FCP_OBS_7114) | | Next Step: <br> END | |
| | | Execute procedure **H_FCP_OBS_7114** | | | |
| | | H_FCP_OBS_7114  Dump and verify OBCP code | | | |
| | | End of Sequence | | | |
| | | **End of Procedure** | | | |