Roll back to TTR B after TTR switchover
File: H_CRP_DHS_3055.xls
Author: S. Manganelli

Procedure Summary

Objectives

This procedure describes the steps needed to switch to TM encoder/OBT B after a TTR switchover performed on-board following BSW events 56/57/64/65/86/87.

Summary of Constraints

After the TTR roll back Ground has to verify the status of the following entries in Unit In Use (UIU) table, related to TTR components managed by the BSW via the Health Table:
- faiulure on ICB:
  --> SGM, CPDU and Survival Register
- failure on SPW:
  --> SGM
Failed Survival Register and CPDU entries could be set back to "Not failed" by Ground. It is clear that in case of permanent failure of related BSW component these items cannot be operated anymore and they would set again to "Failed" by ASW.

In order to resume the operations on both the SGMs it is necessary to have both of them as "Not failed" in UIU and align their content as necessary for both BSW and ASW data. Also in this case the operations on SGM are strictly depending on BSW related components (i.e. SPW, ICB have to work correctly).

Moreover, when changing the TM encoder a glich on the internal PPS lines of the OBT cannot be excluded, possibly causing the BSW to enter in free running mode; for this reason it is necessary to set the CTR (Centr

Spacecraft Configuration

Start of Procedure

TM Encoder/OBT A active;
TM Encoder/OBT B not active and marked as "Failed" in UIU.

End of Procedure

TM Encoder/OBT B active and marked as "Not failed" in UIU table;
TM Encoder/OBT A not active.

Reference File(s)

Input Command Sequences

Output Command Sequences

HRD3055A
HRD3055B
HRD3055C
HRD3055D

Referenced Displays

ANDs **GRDs** **SLDs**

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ZAZAI999	(None)
ZAZAA999	
ZAZAB999	
ZAZAN999	
ZAZAC999	

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
14/11/08		1	Created	cmevi-hp	
02/01/09		2	Added comment concerning disabling of downlink at step2, modified TC at step 6 to include the TTR RM Interrupt	S. Manganelli	
11/01/09	2	3	Updated following OBSW 3_8	S. Manganelli	
21/03/09	2.2	4	Swapped steps 7 and 8 Updated according to TAS-I inputs 3 march 09	S. Manganelli	
07/04/09	2.3	5	Modified list of health table effects at step 6 (following TASF comments)	S. Manganelli	

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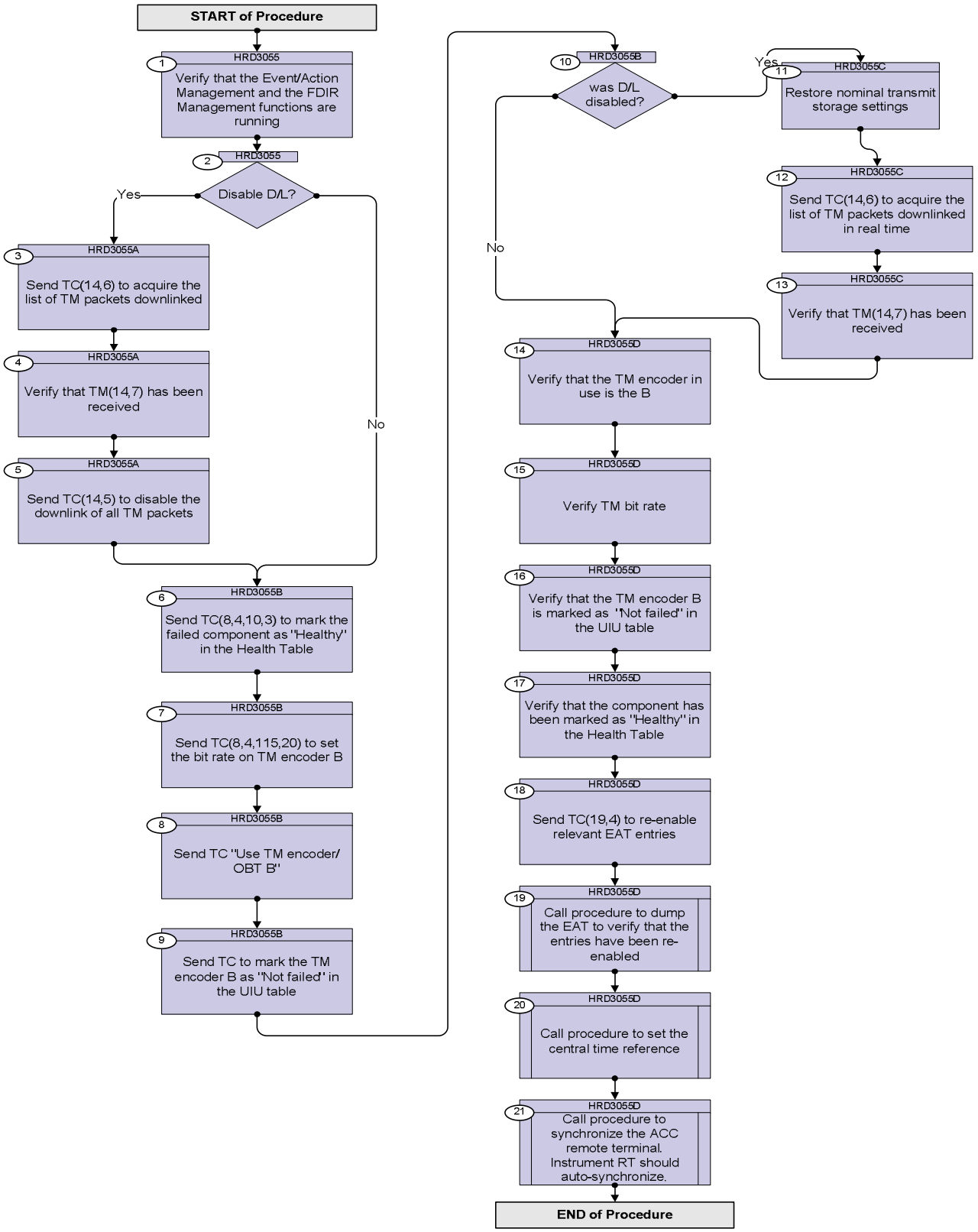
Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :HRD3055 (Verify functions) *TimeTag Type:* N *Sub Schedule ID:*		
1		*Verify that the Event/Action Management and the FDIR Management functions are running*		Next Step: 2
		Verify Telemetry **EaSts** **DEG19170**	**= Running**	AND=ZAZAI999
		Verify Telemetry **FdirSts** **DEG23170**	**= Running**	AND=ZAZAI999
2		*Disable D/L?*		Next Step: Yes 3 No 6
		Disabling downlink would avoid possible ground reception of incomplete frames / packets **but then the procedure must be run in the blind.**		
		TC Seq. Name :HRD3055A (Disable D/L all) *TimeTag Type:* N *Sub Schedule ID:*		
3		*Send TC(14,6) to acquire the list of TM packets downlinked*		Next Step: 4
		When CDMU receives this request, the real time down-linking and SSMM storage status are determined for all telemetry packet {Application ID, Type, Sub-Type} and a report (14,7) is generated.		
		Execute Telecommand **RepDownlinkTMStorage** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Report Telemetry Packets Down-linking/ Storage Status	**DC141160**	
4		*Verify that TM(14,7) has been received*		Next Step: 5

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Packet Reception **Telemetry Packets DownLinking-Storage Status Report** **(14,7)-1400** *Packet Details:* **APID: 16** **Type: 14** **Subtype: 7** **PI1:** **PI2:**		
		Verify Telemetry **N** **DE042160**		(None)
		The following parameters are repeated N times		
		Verify Telemetry **APID** **DE047160**		(None)
		Verify Telemetry **Type** **DE043160**		(None)
		Verify Telemetry **Sub-Type** **DE046160**		(None)
		Verify Telemetry **Transmit_Flag** **DE048160**		(None)
		Verify Telemetry **Storage_Flag** **DE049160**		(None)
5		*Send TC(14,5) to disable the downlink of all TM packets*		Next Step: 6
		When CDMU receives this request, the dedicated parameters update and Real Time down-linking and/or SSMM storage shall be performed according to received flags.		
		In the TC(14,5) it is necessary to set the following parameters: **N: number of TM packet definition that follow.** **Application ID: repeated N times, identifier of Application Process from which TM packets Real Time down-linking and/or SSMM storage shall be Enabled/Disabled.** **Type and Sub-Type (repeated N times)**		
		Keep Transmit flag: repeated N times, is the "mask" of the Transmit flag **0 = Update the Transmit flag** **1 = Keep current Transmit flag value** **Transmit flag: repeated N times, can take two values and indicate if down-linking is to be enabled or disabled.** **0 = Disabled real-time transmission** **1 = Enabled real-time transmission** **The parameter is ignored if its mask is set.**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Keep Storage flag: repeated N times, is the "mask" of the Storage flag **0 = Update the Storage flag** **1 = Keep current Storage flag value** **Storage flag: repeated N times, can take two values and indicate if SSMM storage is to be enabled or disabled.** **0 = Disabled** **1 = Enabled** **The parameter is ignored if its mask is set.**		
		The {Application ID, Type, Sub-Type} set identifies the TM packets to which the Real Time downlinking and/or SSMM storage control shall be applied as follows : **If Application ID > 0, Real Time down-linking and/or SSMM storage of all TM packets carrying the selected Application ID shall be Enabled/Disabled according to the Transmit flag and Storage flag values.** **If Application ID = 0 and Type > 0 (then Sub-Type shall be > 0), Real Time downlinking and/or SSMM storage of all TM packets carrying the selected {Type, Sub-Type} shall be Enabled/Disabled according to the Transmit flag and Storage flag values.** **If Application ID = 0 and Type = 0, Real Time down-linking and/or SSMM storage of all TM packets shall be Enabled/Disabled according to Transmit flag and Storage flag values.** **A packet definition with both APID and Type set to 0 have to be the first definition in the TC.** **In a packet definition, either both Type and Sub-type shall be 0, or none of them shall be 0.**		
		In this case the set needs to be the following: **N = 1** **Application ID = 0** **Type = 0** **Sub-Type=0** **Keep Transmit flag = 0** **Transmit flag = 0** **Keep Storage flag = 1** **Storage flag = 1**		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **SelDownlinkTMStorage** *Command Parameter(s) :* **N DH019160** **Application_ID DH058160** **Type DH020160** **Sub-Type DH021160** **Keep_Transmit DH070160** **Transmit_Flag DH059160** **Keep_Storage DH071160** **Storage_Flag DH060160** *TC Control Flags :* **GBM IL DSE**	**DC140160** **1 <dec>** (Def) **0 <dec>** **0 <dec>** **0 <dec>** **Update** **DISABLED** **Keep** **ENABLED**	
		--Y -- --- *Subsch. ID : 10* Det. descr. : Select Down-linking/ Storage of Telemetry Packets		
		TC Seq. Name :HRD3055B (Switch to Encoder A) *TimeTag Type: N* *Sub Schedule ID:*		
6		*Send TC(8,4,10,3) to mark the failed component as "Healthy" in the Health Table*		Next Step: 7
		In the TC(8,4,10,3) it is necessary to set the following parameters: **N: number of components for which the health tables shall be updated.** **In this case this parameter has to be equal to 1.** **Parameters repeated N times:** **COMP: component for which the Health table shall be updated.**		
		The component that has to be marked as "Healthy" in Health Table is one of the following: **- PM COCOS SPW B Timeout/Reconection failure** **-> PmSpwTtrRmAB if active PM is A** **-> PmSpwTtrRmBB if active PM is B** **->TtrRmSgmB may be "Disabled"** **- TTR-RM B CROME RT failure** **-> TtrRmIcbRtB** **-> TtrRmIntrpB may be "Unhealthy"**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Mask for "Component Health" flag: **0=Ignore Flag; 1=Update the status** **In this case this flag has to be equal to 1.** **Mask for "Component enable/disable status" flag:** **0=Ignore Flag; 1=Update the status** **In this case this flag has to be equal to 0.** **Mask for "Health and Status Update" flag:** **0=Ignore Flag; 1=Update the status** **In this case this flag has to be equal to 0.**		
		Component Health: **0=Unhealthy; 1=Healthy** **In this case this flag has to be equal to 1.** **Component enable/disable status:** **0=Disabled; 1=Enabled** **In this case this flag is ignored.** **Health and Status Update:** **0=Disabled; 1=Enabled** **In this case this flag is ignored.**		
		The following TC is just an example and the value of parameters must be set according to the situation.		
		Execute Telecommand **UpdateHealthTable** *Command Parameter(s) :* **N DH014160** **COMP DH100160** **M0 DH055160** **M1 DH056160** **M2 DH057160** **F0 DH015160** **F1 DH016160** **F2 DH017160** **COMP DH100160** **M0 DH055160** **M1 DH056160** **M2 DH057160** **F0 DH015160** **F1 DH016160** **F2 DH017160** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Update Health Table	**DC822160** **2 <dec>** **TtrRmIcbRtB** **Update Status** **Update Status** **Update Status** **Healthy** **ENABLED** **ENABLED** **TtrRmIntrptB** **Update Status** **Update Status** **Update Status** **Healthy** **ENABLED** **ENABLED**	
7		*Send TC(8,4,115,20) to set the bit rate on TM encoder B*		Next Step: 8
		WARNING: the TM bit rate to be set has to be the same as the one of TM encoder A		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		The following TC is just an example and the value of parameters must be set according to the situation.		
		Execute Telecommand **TtcConfigTmEnc_Templ** *Command Parameter(s) :* **Tm_Enc_Conf_Id DH034170** **TmEncoderId DH033170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE TTC: Config TM Enc, TC(8,4,115,20)	**DCT21170** **TmMod150KbpsM** **TmEncoderB**	
8		*Send TC "Use TM encoder/OBT B"*		Next Step: 9
		Execute Telecommand **Use_TM_Encoder_B** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Use TM Encoder B - High Priority Standard	**DCA64170**	
9		*Send TC to mark the TM encoder B as "Not failed" in the UIU table*		Next Step: 10
		Mark Unit OK telecommand is used for modifying the health status of a unit as OK.		
		Execute Telecommand **MarkOKUnitB_TtrTmEnObt** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Fdir Mark OK Unit B TTR Tm Encoder Obt, TC(8,4,116,22)	**DCBCL170**	
10		*was D/L disabled?*		Next Step: No 14 Yes 11

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRD3055C (Re-enable D/L) *TimeTag Type:* *Sub Schedule ID:*		
11		*Restore nominal transmit storage settings*		Next Step: 12
		Execute Procedure: **H_FCP_DHS_1003** **Nominal TRANSMIT/STORAGE settings**		
12		*Send TC(14,6) to acquire the list of TM packets downlinked in real time*		Next Step: 13
		When CDMU receives this request, the real time down-linking and SSMM storage status are determined for all telemetry packet {Application ID, Type, Sub-Type} and a report (14,7) is generated.		
		Execute Telecommand **RepDownlinkTMStorage**	**DC141160**	
		TC Control Flags : **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Report Telemetry Packets Down-linking/ Storage Status		
13		*Verify that TM(14,7) has been received*		Next Step: 14
		Verify Packet Reception **Telemetry Packets DownLinking-Storage Status Report** **(14,7)-1400** *Packet Details:* **APID: 16** **Type: 14** **Subtype: 7** **PI1:** **PI2:**		
		Verify Telemetry **N** **DE042160**		(None)
		The following parameters are repeated N times		
		Verify Telemetry **APID** **DE047160**		(None)
		Verify Telemetry **Type** **DE043160**		(None)
		Verify Telemetry **Sub-Type** **DE046160**		(None)

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **Transmit_Flag** **DE048160**		(None)
		Verify Telemetry **Storage_Flag** **DE049160**		(None)
		TC Seq. Name :HRD3055D (Checks after switch) *TimeTag Type: N* *Sub Schedule ID:*		
14		*Verify that the TM encoder in use is the B*		Next Step: 15
		Verify Telemetry **Active_TTRBoard** **DEDMG160**	**= B**	AND=ZAZAA999
15		*Verify TM bit rate*		Next Step: 16
		Verify Telemetry **TME_BITRATE** **DEMRF160**		AND=ZAZAB999
16		*Verify that the TM encoder B is marked as "Not failed" in the UIU table*		Next Step: 17
		Verify Telemetry **Ttr2FailSts** **DEL13170**	**= Not_Failed**	AND=ZAZAN999
17		*Verify that the component has been marked as "Healthy" in the Health Table*		Next Step: 18
		Verify Telemetry **PmSpwTtrAB_Hlth** **DEJR6160**	**= Healthy**	AND=ZAZAC999
		Verify Telemetry **PmSpwTtrBB_Hlth** **DEJRL160**	**= Healthy**	AND=ZAZAC999
		Verify Telemetry **TtrRmIcbB_Healt** **DEJLL160**	**= Healthy**	AND=ZAZAC999
		Verify Telemetry **TtrRmIntB_Healt** **DEJKL160**	**= Healthy**	AND=ZAZAB999
		Verify Telemetry **TtrRmSgmB_Enabl** **DEJL5160**	**= ENABLED**	AND=ZAZAC999
18		*Send TC(19,4) to re-enable relevant EAT entries*		Next Step: 19

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		When this request is received, the action-telecommand associated with the events TM (5,x,56/57/64/65/86/87) shall be enabled. **In the TC(19,5) it is necessary to set the following parameters:** **N, number of events to be enabled; in this case equal to 6.** **APID, repeated N times, identifier of the Application Process generating this event report; in this case equal to 16 (CDMU).** **Event ID, repeated N times, identifier of the event to be enabled; in this case equal to 56, 57, 64, 65, 86, 87.**		
		Execute Telecommand **EnableActions** *Command Parameter(s) :* **N_Repetition DH041170** **APID_for_EAT_TC DH236170** **EventId DH146170** **APID_for_EAT_TC DH236170** **EventId DH146170** **APID_for_EAT_TC DH236170** **EventId DH146170** **APID_for_EAT_TC DH236170** **EventId DH146170** **APID_for_EAT_TC DH236170** **EventId DH146170** **APID_for_EAT_TC DH236170** **EventId DH146170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Enable Actions TC(19,4)	**DCT84170** **6 <dec>** **CDMS** (Def) **38 <hex>** **CDMS** (Def) **39 <hex>** **CDMS** (Def) **40 <hex>** **CDMS** (Def) **41 <hex>** **CDMS** (Def) **56 <hex>** **CDMS** (Def) **57 <hex>**	
19		*Call procedure to dump the EAT to verify that the entries have been re-enabled*		Next Step: 20
		Execute Procedure: **H_FCP_DHS_3051** **Report event-action management status or event detection list**		
20		*Call procedure to set the central time reference*		Next Step: 21

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Procedure: **H_FCP_DHS_3021** **Set central time reference synchronization** *Parameters:* CURRTIME CurrTime a CTR value in the future NEWTIME NewTime as required, see TAI spreadsheet		
		Verify if CTR has restarted from zero or not (very low CTR value in the last time packet). The time stamp of the packets is driven by PM_OBT. PM_OBT may have restarted from zero and be unsynchronized (bad time in TMPH) while CTR may still be good.		
21		*Call procedure to synchronize the ACC remote terminal. Instrument RT should auto-synchronize.*		Next Step: END
		Execute Procedure: **H_FCP_DHS_3019** **Remote terminal synchronization with bus controller**		

End of Procedure