

Set central time reference synchronization
 File: H_FCP_DHS_3021.xls
 Author: S. Manganelli



Procedure Summary

Objectives

This procedure describes the steps needed to set the master clock of the CDMU to a new value.

Summary of Constraints

The MTL must not be executing TCs, otherwise execution time of TCs will be affected by the new CTR.

Spacecraft Configuration

Start of Procedure

CDMU in default 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

End of Procedure

CDMU in default 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

Reference File(s)

Input Command Sequences

HFD1034

Output Command Sequences

HFD3021
 HFD3021B
 HFD3021C
 HFD3021D

Referenced Displays

ANDs	GRDs	SLDs
ZAZ2U999		
ZAZ0Y999		

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
16/11/07		1	Created	cmevi-hp	
19/12/07		2	Formal parameters introduced.	cmevi-hp	
16/01/08		3	Batch update of TC flags	S. Manganelli	
12/03/08	1	4	Added step at the end with a couple of ACC events seen when changing CRT on the CDMU.	cmevi-hp	

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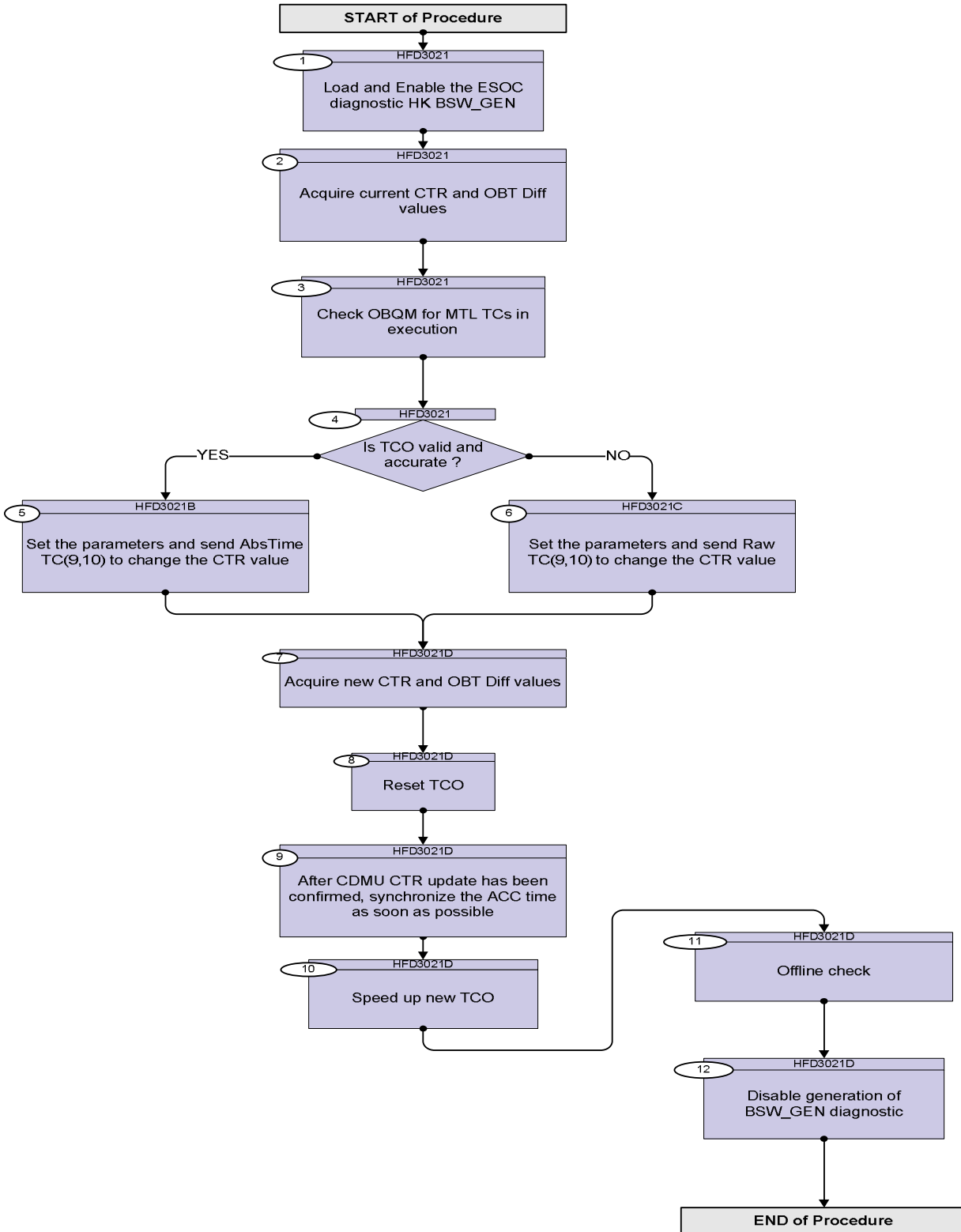


10/11/08	2	5	Procedure updated according to latest version received from industry on 09/09/2008	cmevi-hp	
12/03/09	2.2	6	Procedure restructured to differentiate the cases with TCO valid or invalid and usage of dedicated spreadsheet. Constraint added.	S. Manganelli	
15/04/09	2.3	7	Restructured.	S. Manganelli	

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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 :HFD3021 (Procedure Properties)				
TimeTag Type: N Sub Schedule ID: □				
1		Load and Enable the ESOC diagnostic HK BSW_GEN		Next Step: 2
		Execute Telecommand <div style="text-align: right; margin-right: 100px;">CDMU_BSW_GEN</div> Command Parameter(s) : <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <div style="width: 30%;"> HK ID SID sample interval SEGM ID N </div> <div style="width: 30%;"> XH100991 XH101991 XH102991 XH103991 XH104991 </div> <div style="width: 30%;"> 160 <dec> (Def) 31131 <dec> (Def) 1 <dec> (Def) 0 <hex> (Def) 77 <dec> (Def) </div> </div> TC Control Flags : <div style="text-align: right; margin-right: 100px;">GBM IL DSE --Y -- --</div> Subsch. ID : 30 Det. descr. :	XC252991	
		Execute Telecommand <div style="text-align: right; margin-right: 100px;">EnableTmGen</div> Command Parameter(s) : <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <div style="width: 30%;"> N Sub-Type Packet-ID </div> <div style="width: 30%;"> DH017180 DH019180 DH020180 </div> <div style="width: 30%;"> 1 <dec> (Def) Diag Report 160 <dec> </div> </div> TC Control Flags : <div style="text-align: right; margin-right: 100px;">GBM IL DSE --Y -- --</div> Subsch. ID : 10 Det. descr. : Enable Generation of Telemetry Packets	DC900180	
		This packet contains the parameter DEL5F160 BSW_OBT_DIFF that is not available otherwise.		
2		Acquire current CTR and OBT Diff values		Next Step: 3
		Store current value <div style="text-align: right; margin-right: 100px;">BSW_ObtCycBound</div> <div style="text-align: right; margin-right: 100px;">DEL50160</div>		AND=ZAZ2U999
		Verify Telemetry <div style="text-align: right; margin-right: 100px;">BSW_OBT_DIFF</div> <div style="text-align: right; margin-right: 100px;">DEL5F160</div>		AND=ZAZ0Y999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		<p>The setting of a new CTR value is commanded in advance of the actual adjustment according to the approach "when CTR equals Y, set it to X".</p> <p>Use the Excel spreadsheet <Time Correlation operational> in order to populate the TC parameters correctly.</p> <p>In the TC(9,10) it will be necessary to set the following parameters:</p> <p><u>Current Time (coarse and fine)</u>: the old value of the CDMS master time (CTR) at which synchronisation shall take place, referred to as Y.</p> <p><u>New Time (coarse and fine)</u>: the new value of the CDMS master time (CTR), referred to as X.</p>		
		<p>Note: as soon as the CTR "jumps" to the new value, the instrument RTs may become unsynchronized for a while and ACC time will go free-running.</p> <p>Constraints :</p> <p>1) No MTL TCs must be executing while the time is being updated !!!</p> <p>2) Due to HW constraints, the Fine-part of Y (2 bytes) must be set to 0.</p> <p>3) When the TC is received on board, Y must be at least 2 seconds in the future respect to the current CTR. If this constraint is not obeyed the updating of the CTR may not take place (implicitly cancelled) and no warning event will be issued.</p> <p>4) As soon as the value of DEL5F160 BSW_OBT_DIFF "jumps" (indicating the CTR update) the TCO should be reset.</p>		
3		<p><i>Check OBQM for MTL TCs in execution</i></p>		Next Step: 4
		<p>The CTR synchronization shall impact on execution time of MTL TCs.</p> <p>The switch to the new time must occur while the MTL is empty or within a time window free of TCs.</p>		
4		<p><i>Is TCO valid and accurate ?</i></p>		Next Step: YES 5 NO 6

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch						
TC Seq. Name :HFD3021B (Set CTR with good TC) TimeTag Type: Sub Schedule ID: Formal Parameter List : CurrTime CURRTIME= <abs> NewTime NEWTIME= <abs>										
5		Set the parameters and send AbsTime TC(9,10) to change the CTR value		Next Step: 7						
		The TC DCT11170 cannot be used if the time correlation is not valid or if the datation of TM is TF mode.								
		Execute Telecommand <p style="text-align: right;">SynchroniseCTR_Tmpl</p> Command Parameter(s) : <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">CurrTime</td> <td style="width: 30%;">DHA37170</td> <td style="width: 30%;">CURRTIME</td> </tr> <tr> <td>NewTime</td> <td>DHA39170</td> <td>NEWTIME</td> </tr> </table> TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- ---</p> Subsch. ID : 10 Det. descr. : TEMPLATE Time: Synchronise Central Time Reference TC(9,10)	CurrTime	DHA37170	CURRTIME	NewTime	DHA39170	NEWTIME	DCT11170	
CurrTime	DHA37170	CURRTIME								
NewTime	DHA39170	NEWTIME								
TC Seq. Name :HFD3021C (Set CTR with bad TCO) TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>										
6		Set the parameters and send Raw TC(9,10) to change the CTR value		Next Step: 7						
		The TC XC183991 can be used even when the time correlation is not valid or if the datation of TM is TF mode.								

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand SynchroniseCTR_Templ	XC183991	
		Command Parameter(s) : CurrTime_Coarse XH257991 CurrTime_Fine XH258991 NewTime_Coarse XH259991 NewTime_Fine XH260991	0 <dec> (Def) 0 <dec> (Def) 0 <dec> (Def) 0 <dec> (Def)	
		TC Control Flags : GBM IL DSE --Y -- ---		
		Subsch. ID : 0 Det. descr. : TEMPLATE Time: Synchronise Central Time Reference TC(9,10)		
TC Seq. Name :HFD3021D (End CTR sync)				
TimeTag Type: N Sub Schedule ID: □				
7		Acquire new CTR and OBT Diff values		Next Step: 8
		Check the new CTR value minimum 10 seconds after the NewTime set in TC(9,10).		
		Verify Telemetry BSW_ObtCycBound DEL50160	The value may become invalid (grey)	AND=ZAZ2U999
		Verify Telemetry BSW_OBT_DIFF DEL5F160	The value, normally fixed, should change	AND=ZAZ0Y999
8		Reset TCO		Next Step: 9
		Reset TCO now if not already done.		
9		After CDMU CTR update has been confirmed, synchronize the ACC time as soon as possible		Next Step: 10
		Expect a short series of events "task overrun" immediately after this TC is executed		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand TimeSynchroAcms <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : Time: Synchronise Acms TC(9,3) GBM IL DSE --Y -- --	DC31F170	
10		<i>Speed up new TCO</i>		Next Step: 11
		Command some dumps in order to speed up the new TCO		
		Execute Sequence HFD1034 Increase VC0 rate v01 Sequence Grouping = - SSID : 0		SEQ
11		<i>Offline check</i>		Next Step: 12
		Check the difference between the value of BSW_OBT_DIFF read in step 6 and the one read in step 2. This difference has to be equal to the difference between NewTime and CurrentTime, as used in the parameters of TC(9,10).		
12		<i>Disable generation of BSW_GEN diagnostic</i>		Next Step: END
		Execute Telecommand DisableTmGen <i>Command Parameter(s) :</i> N DH017180 1 <dec> (Def) Sub-Type DH019180 Diag Report Packet-ID DH020180 160 <dec> <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : Disable Generation of Telemetry Packets GBM IL DSE --Y -- --	DC902180	
End of Procedure				