

CROME register maintenance  
 File: H\_CRP\_DHS\_3021.xls  
 Author: S. Manganelli



## Procedure Summary

### Objectives

This procedure describes the steps needed to modify the content of a CROME register.  
 The register layout can be found in the CROME UM and other HW documentation.  
 The only practical case of need to write to a CROME register is to force a Power-On Reset at next init acting on the POR register (PORR)  
 Writing a value of 0 will cause, at next SW restart, the execution of those SW initialization steps programmed for the case of spacecraft first power on.

### Summary of Constraints

Note that there are already dedicated TCs, implemented by CDMU ASW as part of the TTR management and relying on dedicated BSW Service Calls, that have to be used to modify specific CROME Registers. The added value of this procedure is to provide the user with the capability allowing a write operations of the PORR. It is recalled that the PORR is functionally used to identify a Cold OR Warm Boot.

### Spacecraft Configuration

**Start of Procedure**

Any

**End of Procedure**

PORR value modified

### Reference File(s)

**Input Command Sequences**

**Output Command Sequences**

HRD3021  
 HRD3021B  
 HRD3021A  
 HRD3021C

### Referenced Displays

ANDs	GRDs	SLDs
ZAZAI999		
ZAZ7R999		

### Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
29/11/08	2	1	Created	S. Manganelli	

Status : Version 3 - Unchanged  
 Last Checkin: 13/04/09

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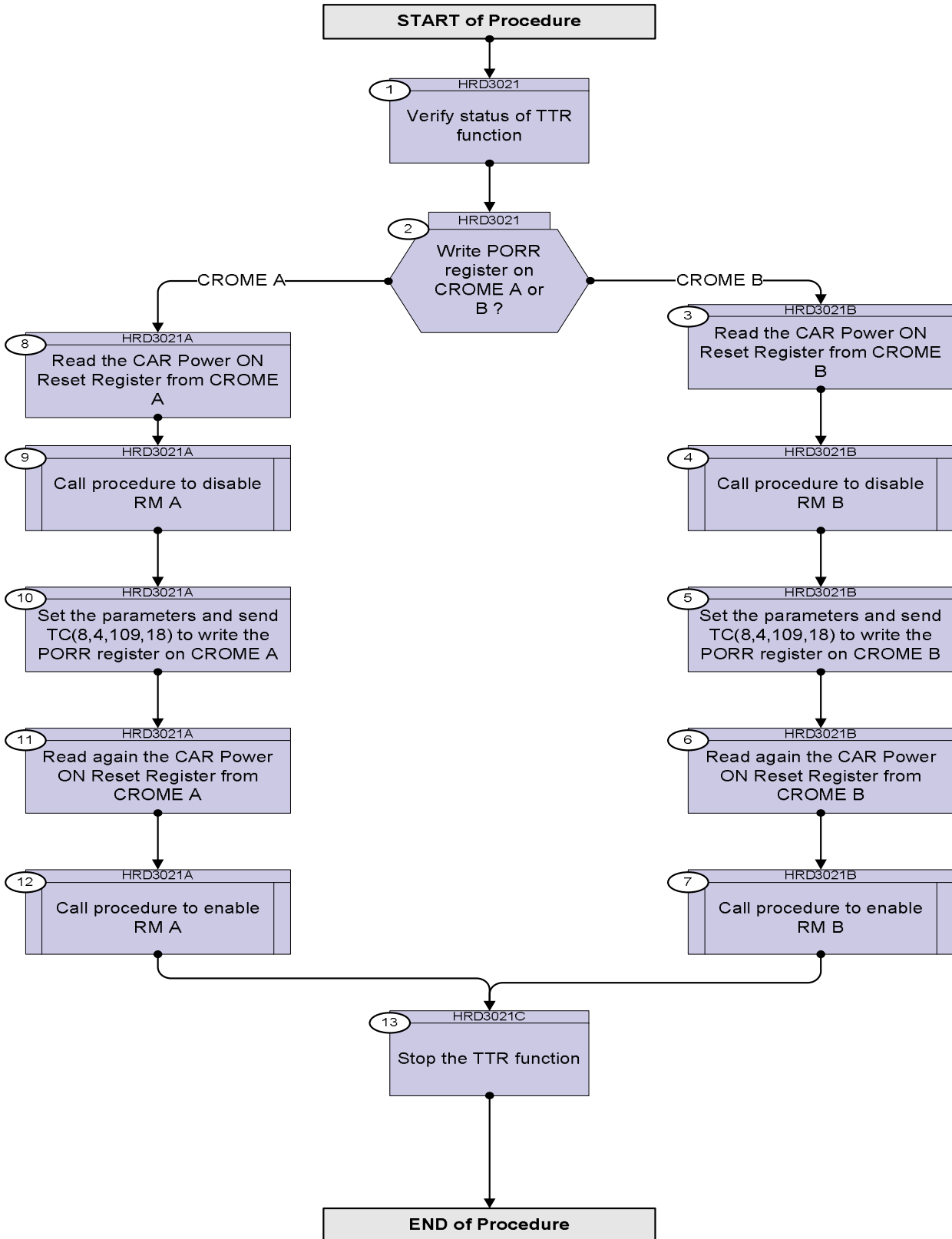


21/03/09	2.2	2	Completely revised (two branches, use of instantiated TC) following TAS-I inputs 3 march 09	S. Manganelli	
13/04/09	2.3	3	Added check on TTR function status at beginning, Switch off TTR function at end, streamlined flow including the PORR read TC in the procedure.	S. Manganelli	

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**Procedure Flowchart Overview**

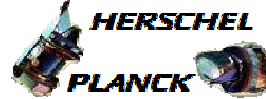


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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
<b>Beginning of Procedure</b>				
<p><i>TC Seq. Name :HRD3021 (Dummy sequence)</i></p> <p><i>TimeTag Type: N</i>  <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
1		Verify status of TTR function		Next Step: 2
		Verify Telemetry	TtrSts DEL17170 = Stopped	AND=ZAZAI999
		If the TTR Management function is already running go to next step.		
		Execute Telecommand	StartTtrManag DCN06170	
		TC Control Flags :	GBM IL DSE --Y -- ---	
		Subsch. ID : 10 Det. descr. : Start Ttr Management TC(8,1,109)		
		Verify Telemetry	TtrSts DEL17170 = Running	AND=ZAZAI999
2		Write PORR register on CROME A or B ?		Next Step: CROME A 8 CROME B 3
<p><i>TC Seq. Name :HRD3021B (Write PORR on CROME )</i></p> <p><i>TimeTag Type: N</i>  <i>Sub Schedule ID:</i>  <i>Formal Parameter List :</i>            CromeRegData PORR_set= &lt;dec&gt;</p>				
3		Read the CAR Power ON Reset Register from CROME B		Next Step: 4
		<b>The address of the CAR Power ON Reset Register is 0700_0890 (hex).</b>		
		Execute Telecommand	CRMB_CAR_PwrOnResetReg DCW1Y159	
		TC Control Flags :	GBM IL DSE --Y -- ---	
		Subsch. ID : 10 Det. descr. : CROME B: Read CAR Power On Reset Register		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Packet Reception <b>TM 8-6-109-17 TTR Management - Crome Register Report</b> Packet Details: APID: 16 Type: 8 Subtype: 6 PI1: 27921 PI2: 0	CromeRegRpt	
		Verify Packet Telemetry CromeId DE285170	= Crome_B	AND=ZAZ7R999
		Verify Packet Telemetry CromeAddr DE329170	= 7000890 <hex>	AND=ZAZ7R999
		Verify Packet Telemetry CromeData DE367170	note down	AND=ZAZ7R999
4		Call procedure to disable RM B		Next Step: 5
		Execute Procedure: <b>H_CRP_DHS_3011</b> <b>Enable or disable Reconfiguration Module</b>		
5		Set the parameters and send TC(8,4,109,18) to write the PORR register on CROME B		Next Step: 6
		By using the CAR Power On Reset Register it is possible for the software to find out if a power-on reset has occurred during operation. The register is reset to 0 during power-on reset. After power-on initialisation, the software writes 1 to CAR Power On Reset Register. During initialisation the BSW will read 0 in the PORR register if a power-on reset has occurred.		
		Execute Telecommand <b>WriteCrome_B_PwrOnRstReg</b> Command Parameter(s) : <b>CromeRegData DHZA7159</b> TC Control Flags : <b>GBM IL DSE</b> <b>--Y -- ---</b> Subsch. ID : 10 Det. descr. : TC(8,4,109,18): Write CROME B CAR PowerOnReset Reg (0700_0890)	DCW81159  PORR_set	
6		Read again the CAR Power ON Reset Register from CROME B		Next Step: 7

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		<b>The address of the CAR Power ON Reset Register is 0700_0890 (hex).</b>		
		Execute Telecommand CRMB_CAR_PwrOnResetReg  TC Control Flags : GBM IL DSE --Y -- --  Subsch. ID : 10 Det. descr. : CROME B: Read CAR Power On Reset Register	DCW1Y159	
		Verify Packet Reception <b>TM 8-6-109-17 TTR Management - Crome Register Report</b> Packet Details: APID: 16 Type: 8 Subtype: 6 PI1: 27921 PI2: 0	CromeRegRpt	
		Verify Packet Telemetry CromeId DE285170	= Crome_B	AND=ZAZ7R999
		Verify Packet Telemetry CromeAddr DE329170	= 7000890 <hex>	AND=ZAZ7R999
		Verify Packet Telemetry CromeData DE367170	as commanded	AND=ZAZ7R999
7		Call procedure to enable RM B		Next Step: 13
		Execute Procedure: <b>H_CRP_DHS_3011</b> <b>Enable or disable Reconfiguration Module</b>		
TC Seq. Name :HRD3021A (Write PORR on CROME )  TimeTag Type: N Sub Schedule ID: Formal Parameter List : CromeRegData PORR_set=1 1 <dec>				
8		Read the CAR Power ON Reset Register from CROME A		Next Step: 9
		<b>The address of the CAR Power ON Reset Register is 0700_0890 (hex).</b>		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand  <b>CRMA_CAR_PwrOnResetReg</b>  <i>TC Control Flags :</i>  Subsch. ID : 10 Det. descr. : CROME A: Read CAR Power On Reset Register Register  GBM IL DSE --Y -- --	DCW00159	
		Verify Packet Reception <b>TM 8-6-109-17 TTR Management - Crome Register Report</b> <i>Packet Details:</i>  APID: 16 Type: 8 Subtype: 6 PI1: 27921 PI2: 0	CromeRegRpt	
		Verify Packet Telemetry <b>CromeId</b> DE285170	= Crome_A	AND=ZAZ7R999
		Verify Packet Telemetry <b>CromeAddr</b> DE329170	= 7000890 <hex>	AND=ZAZ7R999
		Verify Packet Telemetry <b>CromeData</b> DE367170	note down	AND=ZAZ7R999
9		Call procedure to disable RM A		Next Step: 10
		Execute Procedure: <b>H_CRP_DHS_3011</b> <b>Enable or disable Reconfiguration Module</b>		
10		Set the parameters and send TC(8,4,109,18) to write the PORR register on CROME A		Next Step: 11
		By using the CAR Power On Reset Register it is possible for the software to find out if a power-on reset has occurred during operation. The register is reset to 0 during power-on reset. After power-on initialisation, the software writes 1 to CAR Power On Reset Register. During initialisation the BSW will read 0 in the PORR register if a power-on reset has occurred.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand <b>WriteCrome_A_PwrOnRstReg</b> Command Parameter(s) : <b>CromeRegData DHZA7159</b> TC Control Flags : <b>GBM IL DSE</b> <b>--Y -- ---</b> Subsch. ID : 10 Det. descr. : TC(8,4,109,18): Write CROME A CAR PowerOnReset Reg (0700_0890)	DCW80159  PORR_set	
11		Read again the CAR Power ON Reset Register from CROME A		Next Step: 12
		<b>The address of the CAR Power ON Reset Register is 0700_0890 (hex).</b>		
		Execute Telecommand <b>CRMA_CAR_PwrOnResetReg</b> TC Control Flags : <b>GBM IL DSE</b> <b>--Y -- ---</b> Subsch. ID : 10 Det. descr. : CROME A: Read CAR Power On Reset Register	DCW00159	
		Verify Packet Reception <b>TM 8-6-109-17 TTR Management - Crome Register Report</b> Packet Details: <b>APID: 16</b> <b>Type: 8</b> <b>Subtype: 6</b> <b>PI1: 27921</b> <b>PI2: 0</b>	CromeRegRpt	
		Verify Packet Telemetry <b>CromeId DE285170</b>	= Crome_A	AND=ZAZ7R999
		Verify Packet Telemetry <b>CromeAddr DE329170</b>	= 7000890 <hex>	AND=ZAZ7R999
		Verify Packet Telemetry <b>CromeData DE367170</b>	as commanded	AND=ZAZ7R999
12		Call procedure to enable RM A		Next Step: 13
		Execute Procedure: <b>H_CRP_DHS_3011</b> <b>Enable or disable Reconfiguration Module</b>		



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
<i>TC Seq. Name :HRD3021C (Stop TTR function)</i>  <i>TimeTag Type:</i> <i>Sub Schedule ID:</i>  <input type="checkbox"/>				
13		<i>Stop the TTR function</i>		Next Step: END
		Verify Telemetry <div style="text-align: right;"> <b>TtrSts</b>                      <b>DEL17170</b> </div>	<b>= Running</b>	AND=ZAZAI999
		If the TTR Management function is already stopped go to next step.		
		Execute Telecommand <div style="text-align: right;"> <b>StopTtrManag</b> </div> <i>TC Control Flags :</i> <div style="text-align: right;"> <b>GBM IL DSE</b>  <b>--Y -- --</b> </div> <i>Subsch. ID : 10</i> <i>Det. descr. : Stop Ttr Management TC(8,2,109)</i>	<b>DCN07170</b>	
		Verify Telemetry <div style="text-align: right;"> <b>TtrSts</b>                      <b>DEL17170</b> </div>	<b>= Stopped</b>	AND=ZAZAI999
<b>End of Procedure</b>				

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**Info PORR**

**4.4.1.1.4.3 TTR/RM Board (CROME) setup**

Most of the CROME registers are initialised by the H/W, however some adjustments are carried out by the BSW during start-up. The BSW initialisation of the CROME registers does not differ for a cold start and a warm start but the status of each TTR/RM board is identified anyway since initialisation of default pattern in the SGM shall be done only for uninitialised boards.

In order to distinguish if a TTR/RM board is initialised, the BSW reads the Power On Reset Register (PORR) from the CAR module. If this register holds the value 0 at start-up, the board is considered uninitialised. The retrieved PORR values are also provided in the data pool (DID\_STARTUP\_CFG).

**Saab Space AB**

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After completed initialisation the BSW will write 1 to this register. (But note that the corresponding PORR field in DID\_STARTUP\_CFG will keep showing the original value, regardless of that update.) Unless the TTR/RM board is reset, this register will hold the new value the next time the BSW initialises, which results in a warm start.

**CAR Power On Reset Register [CAR\_PwrOnRst]**

**RW**



Bit/field	Value	Description
Rst	0	A power on reset has been seen.
	1	

Note that this is just a simple read/write register that is reset to 0. To be able to detect a power on reset, write 1 to it.

**6.1.3.2.13 Power-on reset**

By using the CAR Power On Reset Register it is possible to find out if a power-on reset has occurred during operation. The register is reset to 0 during power-on reset. By writing 1 to it after initialisation it is possible to determine if the CROME ASIC has lost power.

To be able to use the power-on reset register, do the following:

After power-on initialisation, write 1 to CAR Power On Reset Register

To check if there has been a loss of power read CAR Power On Reset Register. The register contains 0 if a power-on reset has occurred.