

Tx and TM encoder in use configuration for LRI
File: H_CRP_TTC_TUL1.xls
Author: E. Picallo



Procedure Summary

Objectives

This procedure describes the steps needed to change the TM bit rate to 500 bps when the downlink and the uplink are already established.

This procedure uses the logical addressing thus can be executed under Ground control or not (the commands used can be inserted in the MTL).

Summary of Constraints

XPND and the TM encoder are configured using TC(8,4,115,9), TC(8,4,115,18) and TC(8,4,115,20), thus the status of the ASW function "TTC Management" has to be "running".

Note that:

- the value of the TM modulation index is always 1.2;
- the value of the RNG modulation index, when CM and RNG are ON, is always 0.6;
- the value of the Output power level is always - 4dBm;
- the External reference and Internal bit pattern generator are always OFF.

It is recommended to command ON the coherent and ranging mode parameters by Ground only after confirmation of onboard lock.

If the ASW function "On board Scheduling" is stopped the TCs can not be added into the MTL.

If the function is running, up to four time-tagged TCs are released per second.

Spacecraft Configuration

Start of Procedure

CDMU in default configuration;
Downlink active via TX and TWTA marked as "Nominal" and "Not Failed" in the "Unit in Use" table (nominally the branch 1);
TM bit rate set to any value;
XPND configuration: CM OFF or CM ON and RNG OFF or CM ON and RNG ON.

End of Procedure

CDMU in default configuration;
Downlink active via TX and TWTA marked as "Nominal" and "Not Failed" in the "Unit in Use" table (nominally the branch 1);
TM bit rate equal to 500 bps;
XPND configuration: CM and RNG unchanged.

Reference File(s)

Input Command Sequences

Output Command Sequences

HRRTUL11
HRRTUL12

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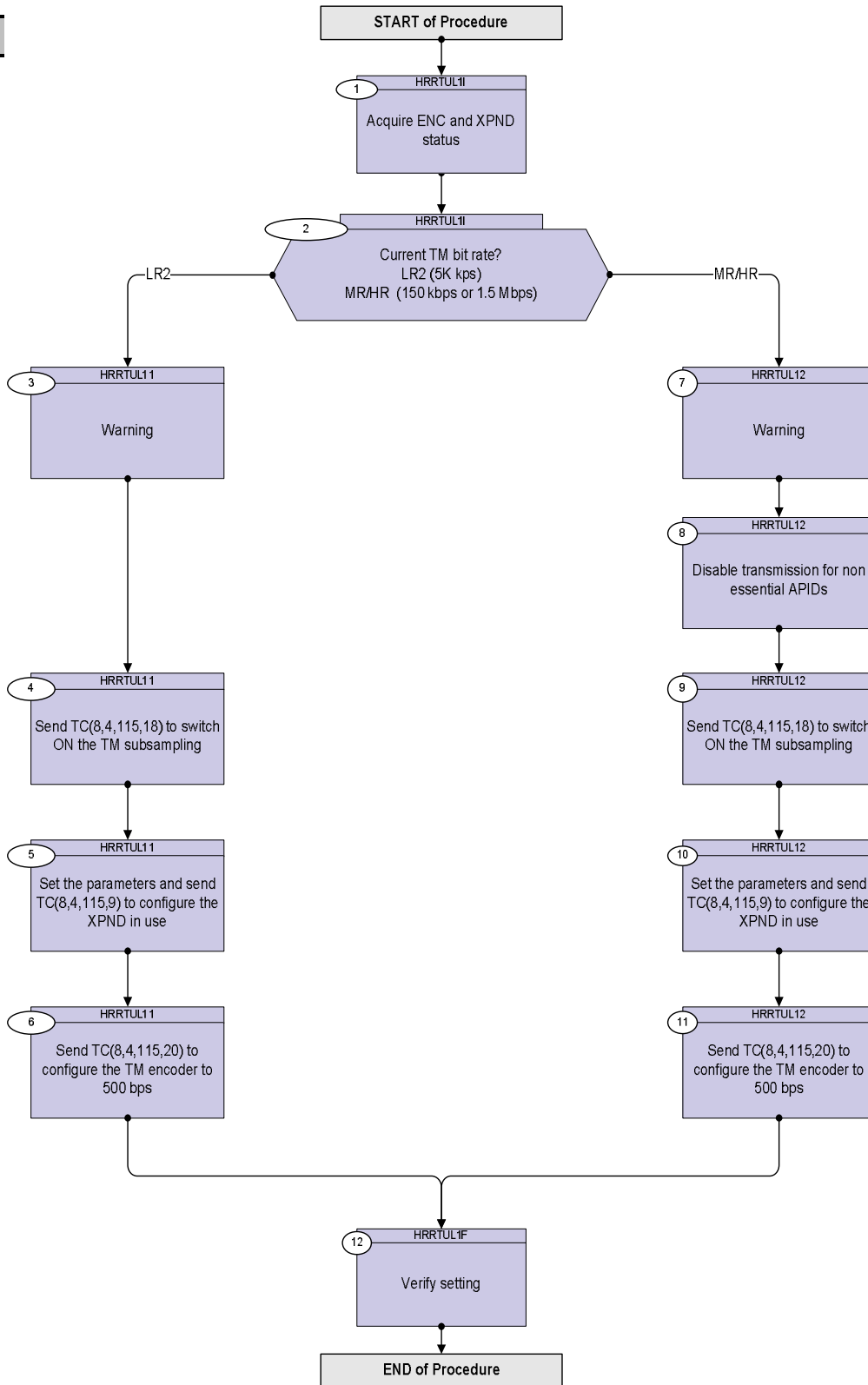
Referenced Displays

ANDs **GRDs** **SLDs**
 ZAZ7J999
 ZAZ7I999

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
29/07/08	1	1	Created	E. Picallo	
03/12/08	2	2	TC DCT18170 Configure Xpnd mask update TCs XPND Config & TM ENC Config blocked TC XPND Config do not update CM and RM	E. Picallo	

Tx and TM encoder in use configuration for LR1
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
Beginning of Procedure				
TC Seq. Name : HRRTUL1I (Txuse for L1 initial) Tx and TM encoder in use configuration for LR1 TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				
1		Acquire ENC and XPND status		Next Step: 2
		Verify Telemetry TME_BITRATE DEMRF160		AND=ZAZ7I999
1.1		Verifications if XPND1 in use		<input type="checkbox"/>
		Verify Rx1 AGC/Uplink Level Telemetry X1 AGC TMUplnk RMB20442	>= -141.0 dbmW <= -45.0 dbmW	AND=ZAZ7I999
		Verify Rx1 Lock status Telemetry X1 Rx Lock - RL RMB24442	= Locked	AND=ZAZ7I999
		Verify Low Rate-1 status Telemetry X1 LowRate-1 MD RMB30442	= OFF	AND=ZAZ7I999
		Verify Low Rate-2 status Telemetry X1 LowRate-2 MD RMB31442		AND=ZAZ7I999
		Verify Medium Rate Modulator status Telemetry X1 MedRate-MRM RMB29442		AND=ZAZ7I999
		Verify High Rate status Telemetry X1 HIRateMD-HRM RMB28442		AND=ZAZ7I999
		Verify Coherent Mode status Telemetry X1 Coher MOD-CM RMB26442		AND=ZAZ7I999
		Verify Ranging Modulator status Telemetry X1 Rang MOD-RM RMB27442		AND=ZAZ7I999
1.2		Verifications if XPND2 in use		<input type="checkbox"/>
		Verify RX2 AGC Level Telemetry X2 AGC TMUplnk RMB41442	>= -141.0 dbmW <= -45.0 dbmW	AND=ZAZ7I999
		Verify RX2 Lock status Telemetry X2 Rx Lock - RL RMB45442	= Locked	AND=ZAZ7I999
		Verify Low Rate-1 status Telemetry X2 LowRate-1 MD RMB51442	= OFF	AND=ZAZ7I999
		Verify Low Rate-2 status Telemetry X2 LowRate-2 MD RMB52442		AND=ZAZ7I999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Medium Rate Modulator status Telemetry X2 MedRate-MRM RMB50442		AND=ZAZ7I999
		Verify High Rate Modulator status Telemetry X2 HIRateMD-HRM RMB49442		AND=ZAZ7I999
		Verify Coherent Mode status Telemetry X2 Coher MOD-CM RMB47442		AND=ZAZ7I999
		Verify Ranging Modulator status Telemetry X2 Rang MD - RM RMB48442		AND=ZAZ7I999
2		Current TM bit rate? LR2 (5K kps) MR/HR (150 kbps or 1.5 Mbps)		Next Step: LR2 3 MR/HR 7
<p>TC Seq. Name :HRRTUL11 (Tx use from L2 to L1) Tx and TM encoder in use configuration from LR2 to LR1</p> <p>TimeTag Type: B Sub Schedule ID: <input type="checkbox"/></p>				
3		Warning		Next Step: 4
		<p>The current TM bit rate is not LR1. Therefore a TM bit rate switch will be performed.</p> <p>A specific feature of this switching, is that it shall be done by several TC. Specifically, separate TC will be necessary to set-up the TM encoder, and the XPND.</p> <p>In the time interval between those TC, the TM flux will be some TM disruption, and no CLCW will be available to acknowledge the TC.</p> <p>Therefore send those TCs via MTL or blocked (encoded in a single CLTU).</p>		
4		Send TC(8,4,115,18) to switch ON the TM subsampling		Next Step: 5
	ET=+00.00.00 UT=+	<p>Execute Telecommand</p> <p style="text-align: right;">TtcSwitchTmSubsamplOn</p> <p>TC Control Flags :</p> <p style="text-align: right;">GBM IL DSE --Y -- --</p> <p>Subsch. ID : 10 Det. descr. : TTC: Switch TM Subsampling On TC(8,4,115,18)</p>	DC04F170	

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5		Set the parameters and send TC(8,4,115,9) to configure the XPND in use		Next Step: 6																																																																																																						
	ET=+00.00.05 UT=+	Execute Telecommand <p style="text-align: right;">XpndConfigure_Templ</p> Command Parameter(s) : <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding-left: 40px;">XpndId</td> <td style="width: 20%;">DH018170</td> <td style="width: 50%;">XpndInUseLogic</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1Unus</td> <td>DH220170</td> <td>11 <bin></td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_ER</td> <td>DH221170</td> <td>ON</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_CM</td> <td>DH222170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_RM</td> <td>DH223170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_HRM</td> <td>DH224170</td> <td>ON</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_MRM</td> <td>DH225170</td> <td>ON</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1LRM1</td> <td>DH226170</td> <td>ON</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1LRM2</td> <td>DH227170</td> <td>ON</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_RMI</td> <td>DH228170</td> <td>Update</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask1_TMI</td> <td>DH229170</td> <td>Update</td> </tr> <tr> <td colspan="3" style="padding-top: 20px;"> </td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask2_PG</td> <td>DH230170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask2Unus</td> <td>DH231170</td> <td>1111111111 <bin></td> </tr> <tr> <td style="padding-left: 40px;">XpndConfMask2OPLS</td> <td>DH232170</td> <td>Update</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1Unus</td> <td>DH020170</td> <td>0 <dec> (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_ER</td> <td>DH021170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_CM</td> <td>DH022170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_RM</td> <td>DH023170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_HRM</td> <td>DH024170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_MRM</td> <td>DH025170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1LRM1</td> <td>DH026170</td> <td>ON</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1LRM2</td> <td>DH027170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_RMI</td> <td>DH028170</td> <td>0.6</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW1_TMI</td> <td>DH029170</td> <td>1.2</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW2_PG</td> <td>DH030170</td> <td>OFF (Def)</td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW2Unus</td> <td>DH031170</td> <td>0 <dec> (Def)</td> </tr> <tr> <td colspan="3" style="padding-top: 20px;"> </td> </tr> <tr> <td style="padding-left: 40px;">XpndConfDW2OPLS</td> <td>DH032170</td> <td>-4</td> </tr> <tr> <td colspan="3" style="padding-top: 20px;">TC Control Flags :</td> </tr> <tr> <td style="padding-left: 80px;">GBM IL DSE</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 80px;">-SY -- ---</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="padding-top: 20px;">Subsch. ID : 10</td> </tr> <tr> <td colspan="3">Det. descr. : TEMPLATE Configure Xpnd TC(8,4,115,9)</td> </tr> </table>	XpndId	DH018170	XpndInUseLogic	XpndConfMask1Unus	DH220170	11 <bin>	XpndConfMask1_ER	DH221170	ON	XpndConfMask1_CM	DH222170	OFF (Def)	XpndConfMask1_RM	DH223170	OFF (Def)	XpndConfMask1_HRM	DH224170	ON	XpndConfMask1_MRM	DH225170	ON	XpndConfMask1LRM1	DH226170	ON	XpndConfMask1LRM2	DH227170	ON	XpndConfMask1_RMI	DH228170	Update	XpndConfMask1_TMI	DH229170	Update				XpndConfMask2_PG	DH230170	OFF (Def)	XpndConfMask2Unus	DH231170	1111111111 <bin>	XpndConfMask2OPLS	DH232170	Update	XpndConfDW1Unus	DH020170	0 <dec> (Def)	XpndConfDW1_ER	DH021170	OFF (Def)	XpndConfDW1_CM	DH022170	OFF (Def)	XpndConfDW1_RM	DH023170	OFF (Def)	XpndConfDW1_HRM	DH024170	OFF (Def)	XpndConfDW1_MRM	DH025170	OFF (Def)	XpndConfDW1LRM1	DH026170	ON	XpndConfDW1LRM2	DH027170	OFF (Def)	XpndConfDW1_RMI	DH028170	0.6	XpndConfDW1_TMI	DH029170	1.2	XpndConfDW2_PG	DH030170	OFF (Def)	XpndConfDW2Unus	DH031170	0 <dec> (Def)				XpndConfDW2OPLS	DH032170	-4	TC Control Flags :			GBM IL DSE			-SY -- ---			Subsch. ID : 10			Det. descr. : TEMPLATE Configure Xpnd TC(8,4,115,9)				
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		Notice that in the configuration of the XPND the coherent mode is unchanged. Although if the receiver losses lock for more than 0.2 s, then the transponder reverts back to noncoherent mode. When receiver locks again, the transponder automatically returns to the memorised mode.																																																																																																								
6		Send TC(8,4,115,20) to configure the TM encoder to 500 bps		Next Step: 12																																																																																																						

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+00.00.05 UT=+	Execute Telecommand TtcConfigTmEncInUseLow1 <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : TTC: Config TM Enc In Use Mode Low 1,500 bps, TC(8,4,115,20) GBM IL DSE -E- - - - -	DC12F170	
<p><i>TC Seq. Name : HRRTUL12 (Tx use from MR to L1)</i> <i>Tx and TM encoder in use configuration from MR to LR1</i></p> <p><i>TimeTag Type: B</i> <i>Sub Schedule ID:</i></p> <p>□</p>				
7		Warning		Next Step: 8
		<p>The current TM bit rate is not LR1. Therefore a TM bit rate switch will be performed.</p> <p>A specific feature of this switching, is that it shall be done by several TC. Specifically, separate TC will be necessary to set-up the TM encoder, and the XPND.</p> <p>In the time interval between those TC, the TM flux will be some TM disruption, and no CLCW will be available to acknowledge the TC.</p> <p>Therefore send those TCs via MTL or blocked (encoded in a single CLTU).</p>		
8		Disable transmission for non essential APIDs		Next Step: 9
		Execute Procedure: H_CRP_DHS_1001 Disabling transmission for non essential APIDs.		
9		Send TC(8,4,115,18) to switch ON the TM subsampling		Next Step: 10
	ET=+00.00.00 UT=+	Execute Telecommand TtcSwitchTmSubsamplOn <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : TTC: Switch TM Subsampling On TC(8,4,115,18) GBM IL DSE --Y - - - -	DC04F170	

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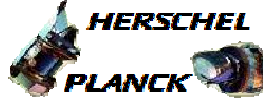
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10		Set the parameters and send TC(8,4,115,9) to configure the XPND in use		Next Step: 11																																																																																																						
	ET=+00.00.05 UT=+	Execute Telecommand <p style="text-align: right;">XpndConfigure_Templ</p> Command Parameter(s) : <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: right;">XpndId</td> <td style="width: 20%;">DH018170</td> <td style="width: 50%;">XpndInUseLogic</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1Unus</td> <td>DH220170</td> <td>11 <bin></td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_ER</td> <td>DH221170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_CM</td> <td>DH222170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_RM</td> <td>DH223170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_HRM</td> <td>DH224170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_MRM</td> <td>DH225170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1LRM1</td> <td>DH226170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1LRM2</td> <td>DH227170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_RMI</td> <td>DH228170</td> <td>Update</td> </tr> <tr> <td style="text-align: right;">XpndConfMask1_TMI</td> <td>DH229170</td> <td>Update</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td style="text-align: right;">XpndConfMask2_PG</td> <td>DH230170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfMask2Unus</td> <td>DH231170</td> <td>1111111111 <bin></td> </tr> <tr> <td style="text-align: right;">XpndConfMask2OPLS</td> <td>DH232170</td> <td>Update</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1Unus</td> <td>DH020170</td> <td>0 <dec> (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_ER</td> <td>DH021170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_CM</td> <td>DH022170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_RM</td> <td>DH023170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_HRM</td> <td>DH024170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_MRM</td> <td>DH025170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1LRM1</td> <td>DH026170</td> <td>ON</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1LRM2</td> <td>DH027170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_RMI</td> <td>DH028170</td> <td>0.6</td> </tr> <tr> <td style="text-align: right;">XpndConfDW1_TMI</td> <td>DH029170</td> <td>1.2</td> </tr> <tr> <td style="text-align: right;">XpndConfDW2_PG</td> <td>DH030170</td> <td>OFF (Def)</td> </tr> <tr> <td style="text-align: right;">XpndConfDW2Unus</td> <td>DH031170</td> <td>0 <dec> (Def)</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td style="text-align: right;">XpndConfDW2OPLS</td> <td>DH032170</td> <td>-4</td> </tr> <tr> <td colspan="3">TC Control Flags :</td> </tr> <tr> <td></td> <td style="text-align: right;">GBM IL DSE</td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">-SY -- ---</td> <td></td> </tr> <tr> <td colspan="3">Subsch. ID : 10</td> </tr> <tr> <td colspan="3">Det. descr. : TEMPLATE Configure Xpnd TC(8,4,115,9)</td> </tr> </table>	XpndId	DH018170	XpndInUseLogic	XpndConfMask1Unus	DH220170	11 <bin>	XpndConfMask1_ER	DH221170	ON	XpndConfMask1_CM	DH222170	OFF (Def)	XpndConfMask1_RM	DH223170	OFF (Def)	XpndConfMask1_HRM	DH224170	ON	XpndConfMask1_MRM	DH225170	ON	XpndConfMask1LRM1	DH226170	ON	XpndConfMask1LRM2	DH227170	ON	XpndConfMask1_RMI	DH228170	Update	XpndConfMask1_TMI	DH229170	Update				XpndConfMask2_PG	DH230170	ON	XpndConfMask2Unus	DH231170	1111111111 <bin>	XpndConfMask2OPLS	DH232170	Update	XpndConfDW1Unus	DH020170	0 <dec> (Def)	XpndConfDW1_ER	DH021170	OFF (Def)	XpndConfDW1_CM	DH022170	OFF (Def)	XpndConfDW1_RM	DH023170	OFF (Def)	XpndConfDW1_HRM	DH024170	OFF (Def)	XpndConfDW1_MRM	DH025170	OFF (Def)	XpndConfDW1LRM1	DH026170	ON	XpndConfDW1LRM2	DH027170	OFF (Def)	XpndConfDW1_RMI	DH028170	0.6	XpndConfDW1_TMI	DH029170	1.2	XpndConfDW2_PG	DH030170	OFF (Def)	XpndConfDW2Unus	DH031170	0 <dec> (Def)				XpndConfDW2OPLS	DH032170	-4	TC Control Flags :				GBM IL DSE			-SY -- ---		Subsch. ID : 10			Det. descr. : TEMPLATE Configure Xpnd TC(8,4,115,9)				
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XpndConfMask1Unus	DH220170	11 <bin>																																																																																																								
XpndConfMask1_ER	DH221170	ON																																																																																																								
XpndConfMask1_CM	DH222170	OFF (Def)																																																																																																								
XpndConfMask1_RM	DH223170	OFF (Def)																																																																																																								
XpndConfMask1_HRM	DH224170	ON																																																																																																								
XpndConfMask1_MRM	DH225170	ON																																																																																																								
XpndConfMask1LRM1	DH226170	ON																																																																																																								
XpndConfMask1LRM2	DH227170	ON																																																																																																								
XpndConfMask1_RMI	DH228170	Update																																																																																																								
XpndConfMask1_TMI	DH229170	Update																																																																																																								
XpndConfMask2_PG	DH230170	ON																																																																																																								
XpndConfMask2Unus	DH231170	1111111111 <bin>																																																																																																								
XpndConfMask2OPLS	DH232170	Update																																																																																																								
XpndConfDW1Unus	DH020170	0 <dec> (Def)																																																																																																								
XpndConfDW1_ER	DH021170	OFF (Def)																																																																																																								
XpndConfDW1_CM	DH022170	OFF (Def)																																																																																																								
XpndConfDW1_RM	DH023170	OFF (Def)																																																																																																								
XpndConfDW1_HRM	DH024170	OFF (Def)																																																																																																								
XpndConfDW1_MRM	DH025170	OFF (Def)																																																																																																								
XpndConfDW1LRM1	DH026170	ON																																																																																																								
XpndConfDW1LRM2	DH027170	OFF (Def)																																																																																																								
XpndConfDW1_RMI	DH028170	0.6																																																																																																								
XpndConfDW1_TMI	DH029170	1.2																																																																																																								
XpndConfDW2_PG	DH030170	OFF (Def)																																																																																																								
XpndConfDW2Unus	DH031170	0 <dec> (Def)																																																																																																								
XpndConfDW2OPLS	DH032170	-4																																																																																																								
TC Control Flags :																																																																																																										
	GBM IL DSE																																																																																																									
	-SY -- ---																																																																																																									
Subsch. ID : 10																																																																																																										
Det. descr. : TEMPLATE Configure Xpnd TC(8,4,115,9)																																																																																																										
		Notice that in the configuration of the XPND the coherent mode is unchanged. Although if the receiver losses lock for more than 0.2 s, then the transponder reverts back to noncoherent mode. When receiver locks again, the transponder automatically returns to the memorised mode.																																																																																																								
11		Send TC(8,4,115,20) to configure the TM encoder to 500 bps		Next Step: 12																																																																																																						

Tx and TM encoder in use configuration for LR1
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
	ET=+00.00.05 UT=+	Execute Telecommand TtcConfigTmEncInUseLow1 <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : TTC: Config TM Enc In Use Mode Low 1,500 bps, TC(8,4,115,20) GBM IL DSE -E- - - - -	DC12F170	
<p><i>TC Seq. Name :HRRTUL1F (Tx use for LR1 final)</i></p> <p><i>TimeTag Type:</i> <i>Sub Schedule ID:</i></p> <p><input type="checkbox"/></p>				
12		Verify setting		Next Step: END
		Verify Telemetry TME_BITRATE DEMRF160	= 500 bps	AND=ZAZ7J999
		Verify Telemetry BSW_TM_MODE DEMF0160	= OnlyFilteredVc	AND=ZAZ7J999
12.1		<i>verifications if XPND1 in use</i>		<input type="checkbox"/>
		Verify Low Rate-1 status Telemetry X1 LowRate-1 MD RMB30442	= ON	AND=ZAZ7I999
		Verify Coherent Mode status Telemetry X1 Coher MOD-CM RMB26442		AND=ZAZ7I999
		Verify Ranging Modulator status Telemetry X1 Rang MOD-RM RMB27442		AND=ZAZ7I999
		Verify RNG Modulation Index Telemetry X1 RNGMD ID-RMI RMB32442	= 0.6 rad	AND=ZAZ7I999
12.2		<i>Verifications if XPND2 in use</i>		<input type="checkbox"/>
		Verify Low Rate-1 status Telemetry X2 LowRate-1 MD RMB51442	= ON	AND=ZAZ7I999
		Verify Coherent Mode status Telemetry X2 Coher MOD-CM RMB47442		AND=ZAZ7I999
		Verify Ranging Modulator status Telemetry X2 Rang MD - RM RMB48442		AND=ZAZ7I999
		Verify RNG Modulation Index Telemetry X2 RNGMD ID-RMI RMB53442	= 0.6 rad	AND=ZAZ7I999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
End of Procedure				