Thermal Control Table maintenance
File: H_CRP_TCS_TCT.xls
Author: E. Picallo

Procedure Summary

Objectives

This procedure describes the steps needed to manage the Thermal Control Table (TCT), that is to perform one of the following actions:
- Enable control loop;
- Disable control loop;
- Modify Temperature thresholds;
- Modify Tref (class B)
- Modify Tolerance
- Modify Monitored Thermistor Parameter;
- Modify Temperature Monitoring Frequency (class A loops);
- Modify FDIR Unit Id connected to the loop;
- Modify Heater (nominal and redundant);
- Modify Class B coeficientes;
- Modify loop installed power;
- Modify Class of the Control Loop.

Summary of Constraints

TCT is changed using ASW TCs(8,4,114,1/2/16/18), thus the status of the ASW function "Thermal Control" has to be "running".

It is not possible to enable spare loops. The TC will be rejected. In order to modify the content of a spare loop update the content of the entry except from the MonFeq field that need to be kept set to 0 until the other fileds are updated. After having verified that all the updated fielda have a value that is consistent, update the
content of the MonFreq.

whenever loop class is changed it has to be ensured that their value is consistent with the new class:
· Class A: Tmin-on / Tmax-on
· Class B: LowClassBThreshold / HighClassBThreshold

The TCs to change loop status [Enable/Disable Control Loop TC(8,4,114,1/2)] only set a request to change loop status and the actual change is done when this loop is processed the next time, instead Loop status changed by Modify TCT Entry TC(8,4,114,16) is processed immediately.

Heaters can be modified only when the loop is disabled

Spacecraft Configuration

Start of Procedure

CDMU in default configuration.

End of Procedure

CDMU in default configuration;
TCT modified.

Reference File(s)

Input Command Sequences

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Output Command Sequences

HRTTCT1
HRTTCT2
HRTTCT3
HRTTCT4
HRTTCT5
HRTTCT6
HRTTCT7
HRTTCT8
HRTTCT9
HRTTCT10
HRTTCT11
HRTTCT12

Referenced Displays

ANDs **GRDs** **SLDs**

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
28/07/08	1	1	Created	E. Picallo	
05/12/08		2	Added Tolerance parameter TCT modifications constrains updated	E. Picallo	
05/12/08	2	3	sequence generation	E. Picallo	
14/02/09		4	TC(8,4,114,16) replaced by MOC instanciated TCs with parameters calibrated	E. Picallo	
27/02/09	2.1	5	correction : Loop_ID formal prm for clas B coef. update added	E. Picallo	
16/03/09		6	Added steps to disable/re-enable control loop to modify heaters	E. Picallo	
24/03/09	2.2	7	Conssitency check TC TCTModCntrLoopHeater	E. Picallo	
07/04/09		7.01	Validation : For Class B if Tref has to be changed most likely both TRefmin and TRefMax should be changed accordingly	E. Picallo	
16/04/09	2.3	7.02	Validation : consistency of new temperatures values with respect to current ones in the TCT check added	E. Picallo	

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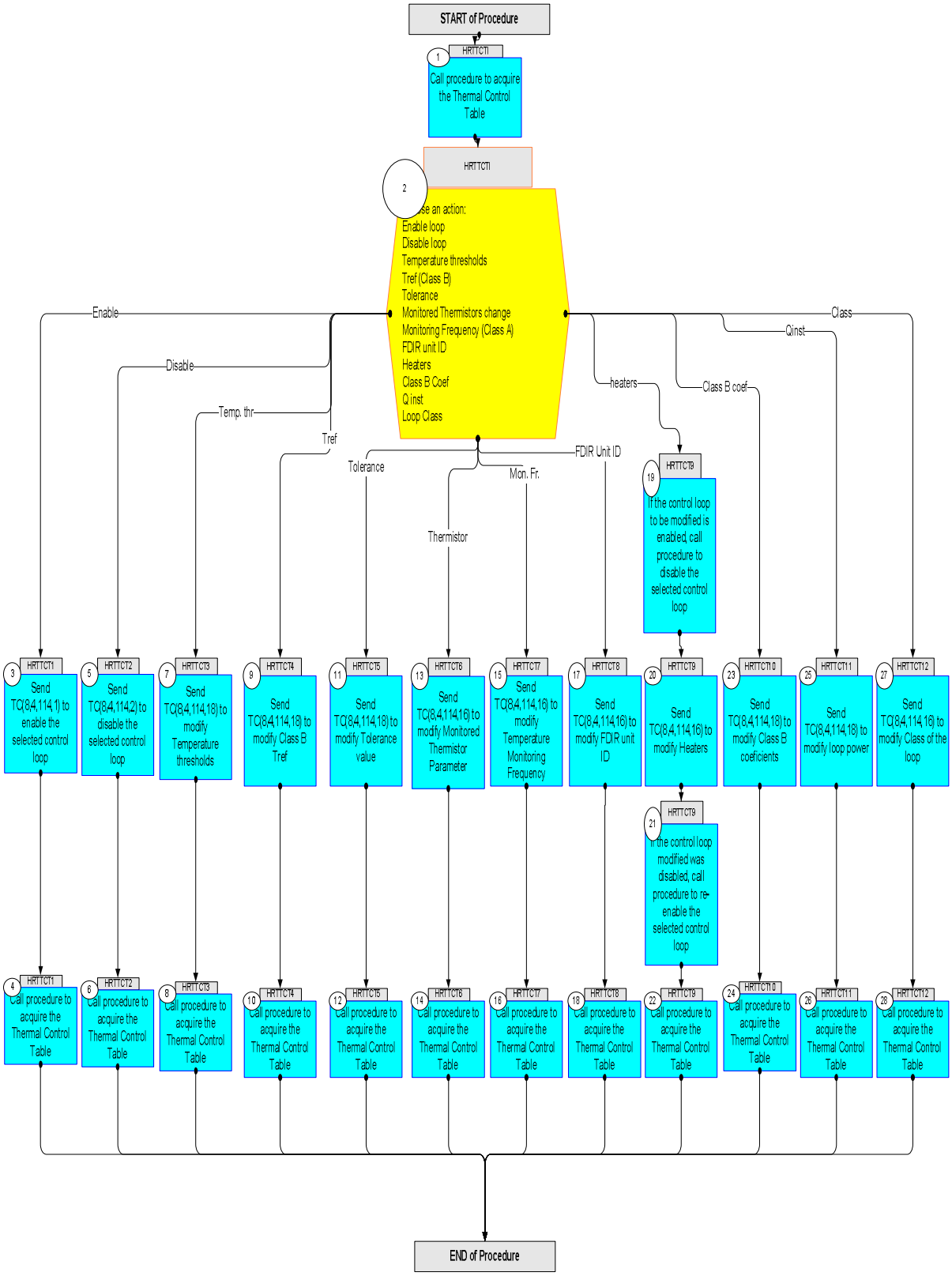
Procedure Flowchart Overview



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :HRTTCTI (TCT maintenance) Thermal Control Table maintenance *TimeTag Type:* *Sub Schedule ID:*		
1		*Call procedure to acquire the Thermal Control Table*		Next Step: 2
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
2		*Choose an action:* *Enable loop* *Disable loop* *Temperature thresholds* *Tref (Class B)* *Tolerance* *Monitored Thermistors change* *Monitoring Frequency (Class A)* *FDIR unit ID* *Heaters* *Class B Coef* *Q inst* *Loop Class*		Next Step: Enable 3 Disable 5 Temp. thr 7 Tref 9 Tolerance 11 Thermistor 13 Mon. Fr. 15 FDIR Unit ID 17 heaters 19 Class B coef 23 Qinst 25 Class 27
		TC Seq. Name :HRTTCT1 (Enable control loop) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* H_ThCtrlLoopInd Loop_ID=		
3		*Send TC(8,4,114,1) to enable the selected control loop*		Next Step: 4
		Select the control loop index (1--54) to be enabled (passed as a formal parameter to the sequence). **Note the value of the TC parameter H_ThCtrlLoopInd in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		Spare loops, i.e. with Monitoring Frequency set to 0, cannot be enabled and in that case a TM(1,8) with failure code 0x8E05 will be issued.		
		For performance reasons the maximum of 5 Class B loops should be enabled at the same time.		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **H_EnableCtrllLoop** *Command Parameter(s) :* **N_Repetition DH041170** **H_ThCtrlLoopInd DH162171** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Herschel Enable Termal Control loop TC(8,4,114,1)	**DCN60159** **1 <dec>** (Def) **Loop_ID**	
		Notice that The TC(8,4,114,1) to change loop status only set a request to change status and the actual change is done when this loop is processed the next time. So the loop status change might take up to the control loop period seconds from the reception of the TC by the ASW.		
4		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
		TC Seq. Name :HRTTCT2 (Disable control loop) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* H_ThCtrlLoopInd Loop_ID=		
5		*Send TC(8,4,114,2) to disable the selected control loop*		Next Step: 6
		Select the control loop index (1--54) to be disabled (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopInd in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		Spare loops, i.e. with Monitoring Frequency set to 0, cannot be disabled and in that case a TM(1,8) with failure code 0x8E06 will be issued.		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **H_DisableCtrlLoop** *Command Parameter(s) :* **N_Repetition** **DH041170** **H_ThCtrlLoopInd** **DH162171** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Herschel Disable Termal Control loop TC(8,4,114,2)	**DCN62159** **1 <dec>** (Def) **Loop_ID**	
		Please notice that The TC(8,4,114,2) to change loop status only set a request to change status and the actual change is done when this loop is processed the next time. So the loop status change might take up to the control loop period seconds from the reception of the TC by the ASW.		
		When the loop is disabled, the related HCS is switched OFF by 1553B command.		
6		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
		TC Seq. Name :HRTTCT3 (Modify Temp.threshol) Modify Temperature thresholds *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= ThCtrlParVal32 TmionLoT= <dec> ThCtrlParVal32 TmaonHiT= <dec> ThCtrlParVal32 Tmin-off= <dec> ThCtrlParVal32 Tmax-off= <dec>		
7		*Send TC(8,4,114,18) to modify Temperature thresholds*		Next Step: 8
		Select the control loop index (1--54) and the temperature thresholds to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Temperatures be modified are: **- Tmin-on (class A) or LowClassB (class B TrefMin)** **- Tmax-on (class A) or HighClassB (class B TrefMax)** **- Tmin-Off** **- Tmax-Off** **The temperature raw value correspond to degree Celsius**.		
		Class A loops requires two pairs of thresholds values based on the relevant unit status [Tmin-on, Tmax-on] and [Tmin-off, Tmax-off]. **Class B loops requires additionally the following two thresholds : [LowClassB, HighClassB]. Thus if Tref has to be changed most likely both LowClassB and HighClassB should be changed accordingly** **Note Class B also require TmaxOff and TminOff as these are used by the Class A implemented when the linked unit is OFF**.		
		Check the consistency of the new temperatures values: **New TMIN_ON < New TMAX_ON** **New TMIN_OFF < New TMAX_OFF** **Check the consistency of the new temperatures values with respect to the current ones in the TCT :** **New TMIN_ON < Current TMAX_ON** **Current TMIN_ON < New TMAX_ON** **New TMIN_OFF < Current TMAX_OFF** **Current TMIN_OFF < New TMAX_OFF** **Re-arrange the order of the TC to be sent (if needed) to be compliant with the reported on-board checks.**		
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **Loop_ID** **1 <dec>** (Def) **ClATmionClBLoT** (Def) **TmionLoT**	

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **Loop_ID** **1 <dec>** (Def) **ClATmaoClBHiT** **TmaonHiT**	
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **Loop_ID** **1 <dec>** (Def) **Tmin-off** **Tmin-off**	
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **Loop_ID** **1 <dec>** (Def) **Tmax-off** **Tmax-off**	
8		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRTTCT4 (Modify Class B Tref) Modify Class B Tref *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex LoopID= ThCtrlParVal32 Tref=	<dec>	
9		*Send TC(8,4,114,18) to modify Class B Tref*		Next Step: 10
		Select the control loop index (1--54) and the class B Tref to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		Tref provides the refrence temperature (set point) for the class B control loops.		
		Note: Class B loops requires additionally the following two thresholds : [LowClassB, HighClassB]. Thus if Tref has to be changed most likely the Temperature thresholds LowClassB and HighClassB should be changed accordingly		
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **LoopID** **1 <dec>** (Def) **TREF** **Tref**	
10		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRTTCT5 (Modify Tolerance) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= ThCtrlParVal32 Toleranc=	 <dec>	
11		*Send TC(8,4,114,18) to modify Tolerance value*		Next Step: 12
		Select the control loop index (1--54) and the tolerance threshold to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		The tolerance provides for each control loop, the reference tolerance to be applied to the algorothm applied in order to detect the thermistor failures. **The temperature raw value correspond to degree Celsius**.		
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **Loop_ID** **1 <dec>** (Def) **Tolerance** **Toleranc**	
12		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRTTCT6 (Modify Thermistor) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= CntrLoopThmId Thermis1= CntrLoopThmId Thermis2= CntrLoopThmId Thermis3=		
13		*Send TC(8,4,114,16) to modify Monitored Thermistor Parameter*		Next Step: 14
		Select the control loop index (1--54) and the TH datapool IDs to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		The monitor Thermistors 1/2/3 provide the 3 thermistors associated to TCS control loop.		
		Execute Telecommand **TCTModCntrLoopThmId** *Command Parameter(s) :* **ThCtrlLoopIndex XH086992** **CntrLoopThmId XH092992** **CntrLoopThmId XH092992** **CntrLoopThmId XH092992** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TC(8,4,114,16) Modify Control Loop Thermistors Id	**XC008992** **Loop_ID** **Thermis1** **Thermis2** **Thermis3**	
14		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRTTCT7 (Modify Monitor Freq) Temperature Monitoring Frequency (Class A loops) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= CntrLoopMonFreq MonFreq=		
15		*Send TC(8,4,114,16) to modify Temperature Monitoring Frequency*		Next Step: 16
		Select the control loop index (1--54) and the Temperature Monitoring Frequency to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		The Temperature Monitoring Frequency (Class A loops) is set in seconds. **if set to 0, the loop will not be monitored at all and the control loop is considered as spare)**.		
		If for an enabled loop the Monitoring Frequency is set to 0, a TM(1,8) with failure code 0x8E07 will be issued. Therefore it is necessary to first disable the loop before setting it to spare.		
		Note that the monitoring frequency affects only Class A loops, since for Class B the frequency is implicit from the algorithm. However Class B loops requires also a Monitoring Frequency as it is used by the Class A implemented when the linked unit is OFF.		
		Execute Telecommand **TCTModCntrLoopMonFreq** *Command Parameter(s) :* **ThCtrlLoopIndex XH086992** **CntrLoopMonFreq XH093992** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TC(8,4,114,16) Modify Control Loop Monitoring Frequency	**XC009992** **Loop_ID** **MonFreq**	
16		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRTTCT8 (Modify FDIRUnitID) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= CntrLoopUnitId UnitId=		
17		*Send TC(8,4,114,16) to modify FDIR unit ID*		Next Step: 18
		Select the control loop index (1--54) and the FDIR Unit Id to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		The FDIR Unit ID for the loop provides the link between the TCT and the UIU Table, providing the TCS controlled units on/off status to correctly select the heater thresholds [Tmin-on, Tmax-on] and [Tmin-off, Tmax-off]. **- If set to 0x0317 while in the S/C Mode Survival the OFF thresholds will be used otherwise the ON ones will be used** **- If set to 0x0000 the ON thresholds will always be used** **- If set to 0xFFFF the OFF thresholds will always be used**		
		Execute Telecommand **TCTModCntrLoopUnitId** *Command Parameter(s) :* **ThCtrlLoopIndex XH086992** **CntrLoopUnitId XH094992** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TC(8,4,114,16) Modify Control Loop Unit Id	**XC010992** **Loop_ID** **UnitId**	
18		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HRTTCT9 (Modify Heaters) Modify Nominal and Redundant Heaters *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Looop_ID= CntrLoopHPS NomHPS= CntrLoopHCS NomHCS= CntrLoopHPS RedHPS= CntrLoopHCS RedHCS=		
19		*If the control loop to be modified is enabled, call procedure to disable the selected control loop*		Next Step: 20
		The heaters can be modified only if the loop is disabled.		
		If for an enabled loop the Nominal / Redundant Heater is modified, a TM(1,8) with failure code 0x8E07 will be issued. Therefore it is necessary to first disable the loop before modifying the related Heater.		
		Call procedure H_CRP_TCS_TCT to disable the control loop (select the same control loop index as the one passed as formal parameter)		
20		*Send TC(8,4,114,16) to modify Heaters*		Next Step: 21
		Select the control loop index (1--54) and the Nominal & Redundant Heater Ids to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		Provides the indication of the heater that is associated to the nominal/redundant control loop. **- The Nominal Heater HPS (1--18) HCS (1--6).** **- The Redundant Heater : HPS (1--18) HCS (1--6).**		
		Execute Telecommand **TCTModCntrLoopHeater** *Command Parameter(s) :* **ThCtrlLoopIndex XH086992** **CntrLoopHPS XH095992** **CntrLoopHCS XH096992** **CntrLoopHPS XH095992** **CntrLoopHCS XH096992** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TC(8,4,114,16) Modify Control Loop Heaters	**XC011992** **Looop_ID** **NomHPS** **NomHCS** **RedHPS** **RedHCS**	

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
21		*If the control loop modified was disabled, call procedure to re-enable the selected control loop*		Next Step: 22
		Call procedure H_CRP_TCS_TCT to enable the control loop (select the same control loop index as the one passed as formal parameter)		
22		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
		TC Seq. Name :HRTTCT10 (Modify Class B coef) Modify Class B coeficients *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= ThCtrlParVal32 Alpha= ThCtrlParVal32 Beta= ThCtrlParVal32 Delta= ThCtrlParVal32 Gamma= ThCtrlParVal32 Lambda=	 <dec> <dec> <dec> <dec> <dec>	
23		*Send TC(8,4,114,18) to modify Class B coeficients*		Next Step: 24
		Select the control loop index (1--54) and the class B Coefficients to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		The Class B coeficients to be modified are: **ALPHA** **BETA** **GAMMA** **DELTA** **LAMBDA**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **Loop_ID** **5 <dec>** **ALPHA** **Alpha** **BETA** **Beta** **DELTA** **Delta** **GAMMA** **Gamma** **LAMBDA** **Lambda**	
24		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
		TC Seq. Name :HRTTCT11 (Modify Qinst) *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex LoopID= ThCtrlParVal32 Q_inst=	<dec>	
25		*Send TC(8,4,114,18) to modify loop power*		Next Step: 26
		Select the control loop index (1--54) and the loop installed power to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter H_ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		Qinst provides the power installed on each TCS loop.		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand **ModifyTctEntry32_Templ** *Command Parameter(s) :* **ThCtrlLoopIndex DH069170** **N_Repet_8bit DH070170** **ThCtrlParam32Id DH082170** **ThCtrlParVal32 DH079170** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TEMPLATE Modify Thermal Control Table 32bit entry TC(8,4,114,18)	**DCT51170** **LoopID** **1 <dec>** (Def) **Q_Inst** **Q_inst**	
26		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
		TC Seq. Name :HRTTCT12 (Modify Loop Class) Class of the Control loop *TimeTag Type: N* *Sub Schedule ID:* *Formal Parameter List :* ThCtrlLoopIndex Loop_ID= CntrLoopClass Class=		
27		*Send TC(8,4,114,16) to modify Class of the loop*		Next Step: 28
		Select the control loop index (1--54) and the Class to be used (passed as a formal parameter to the sequence) **Note the value of the TC parameter ThCtrlLoopIndex in RAW correponds to TCT loop index. The corresponding calibrated value identifies the TCS line number.**		
		Whenever the loop class is changed it has to be ensured that their value is consistent with the new class: **· Class A: Tmin-on / Tmax-on** **· Class B: LowClassBThreshold / HighClassBThreshold**		
		If the class of a loop is changed, Ground should also make sure that the corresponding entry in the Event/Action table is also modified to perform the recovery of the correct class in case of TCS FDIR triggers for the modified loop.		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		For performance reasons the maximum of 5 Class B loops should be enabled at the same time. TC will be rejected if there already is the maximum number of 5 class B loops.		
		Execute Telecommand **TCTModCntrLoopClass** *Command Parameter(s) :* **ThCtrlLoopIndex XH086992** **CntrLoopClass XH091992** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : TC(8,4,114,16) Modify Control Loop Class	**XC007992** **Loop_ID** **Class**	
28		*Call procedure to acquire the Thermal Control Table*		Next Step: END
		Execute Procedure: **H_FCP_TCS_REPO** **Thermal Control Status Report**		
		End of Procedure		