DTCP Preparation
File: C_GSP_SYS_PREP.xls
Author: F. Keck

Procedure Summary

Objectives

Preparation of a routine DTCP for both Spacecrafts.

Summary of Constraints

All preparation activities for nominal DTCPs are performed by the SPACON. In case of additional manual commanding(s) the appropriate subsystem SOEs are required to prepare MSTK-2. This procedure assumes that the NCTRS is controlled by the SPACON.

Spacecraft Configuration

Start of Procedure

HPMCS operational.

End of Procedure

All command stacks prepared, DFT performed and (if required) pass briefing with ECC perfomed.

Reference File(s)

Input Command Sequences

Output Command Sequences

CGYPREP

Referenced Displays

ANDs	GRDs	SLDs
ZAZEA999		Printout

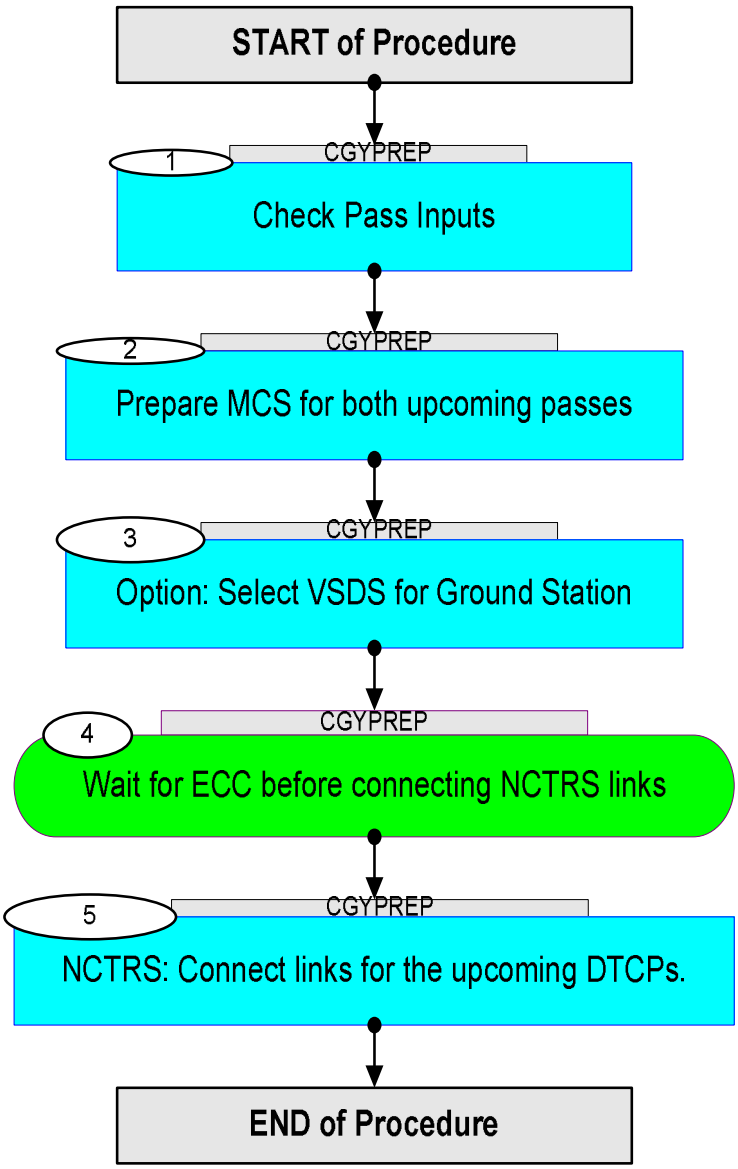
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
03/08/2008	1	1	Created	F. Keck	
05/11/2008		1.01	Validation : Update after SOVTs	F. Keck	
22/12/2008	2	1.02	Validation : Update	F. Keck	
04/03/2009	2.1	2	Update after Routine Ops simulations	F. Keck	
19/05/2009		3	Adding NCTRS-B Links and TM Flow Chart	F. Keck	
12/06/2009		4	Adding Scheduling Check	F. Keck	
17/09/2009		5	Added pass inputs, VSDS for CEB, connect VC-1/2 on both chains. Updated annex	F. Keck	
06/10/2009	2.5	6	Added step to bring up server MMI for monitoring server tasks	F. Keck	
27/10/2009		7	TM and TC SPACON screenshots added as annex	F. Keck	
09/03/2010	3	8	HP_CCR-495 implemented.	cmevi-hp	
09/07/2010		9	Re-adding removed comments by previous procedure update. The possible packet store dump anomaly (H_SC-49 and P_SC-47) is handled different on Herschel and Planck, therefore both ways must remain in this procedure.	F. Keck	

DTCP Preparation
File: C_GSP_SYS_PREP.xls
Author: F. Keck

11/08/2011		10	Updated comments. Removing unnecessary steps	F. Keck	
11/08/2011	3.1	11	Updating screenshots and recommending 6s for Propagation Delay	F. Keck	

Procedure Flowchart Overview



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name : () *TimeTag Type:* B *Sub Schedule ID:*		
1		*Check Pass Inputs*		Next Step: 2
1.1		*Check Scheduling Information*		
		Check pass times of today. See Scheduling Office web page: http://onfserver.dev.esoc.esa.int/fmi/xsl/Medium%20Term%20Schedule/home.xsl At BOA contact ECC for pass briefing BOT/EOT: Scheduled AOS/LOS		
1.2		*Check DTCP Sheet*		
		Is it complete? Does it contain all infos for today's DTCP? Is it signed?		
1.3		*Check SOI Folder*		
		Check for any Special Operations, which must be performed today.		
1.4		*Check Emails*		
		Check emails in SPACON group account.		
1.5		*Pass Briefing with ECC*		
		Inform ECC if deviations from normal activities are already planned.		
2		*Prepare MCS for both upcoming passes*		Next Step: 3
		Run this complete step twice (for Herschel and Planck).		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
2.1		*Check MCS configuration*		
2.1.1		*Check TC Spacon*		
		VC ID = 0 MAPI ID = 1 Setup - Propagation Delay - T1_Initial according to OWLT (see annex). Always round up the OWLT to get the Propagation Delay. In routine ops the OWLT is between 5 and 6s, so best to round up and use 6s for Propagation Delay (and therefore 27s for T1_Initial).		
		See annex (screenshots).		
2.1.2		*Check TM Spacon*		
		- MCS-A connected to NCTRS-A - MCS-B connected to NCTRS-B - All VCs enabled - Timestamping mode SP - TCO valid and accurate - RTSI enabled - Device selected		
		See annex (screenshots).		
2.1.3		*Start Server MMI Task-Launcher*		
		To monitor server tasks (and having the option to stop and restart them) the server MMI must remotely brought up on one client. Usually this is already setup on the SWS client. In this case skip this step.		
		Open a konsole: > xhost + > telnet hmca login: hmcsops (password: hmca.ops) (alternatives: hmcb, pmca, pmcb) > startMMI.csh		
		When restarting server tasks a special password is requested: sta		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
2.2		*Prepare Stacks*		
		ASTK and MSTK-1 shall be setup on the SPACON client. MSTK-2 (if required) shall be setup on a separate client.		
2.2.1		*Prepare ASTK for MTL Upload*		
		All MTL UUs are distributed from the MPS to the MCS server. 1) Select Load Stack 2) Click on Download to transfer the UUs from the server to the client (into .../STACKS/MPS/) 3) Load the ASTK with the MTL UU from: .../STACKS/MPS/ Pre-Select AD mode if possible (e.g. not possible if releaser was restarted and AD not initialised yet).		
2.2.2		*Prepare MSTK-1 for routine DTCP commanding*		
		Load the DTCP sequence HGYDTCP or PGYDTCP on MSTK-1. Depending on the planned ranging activity, delete the TCs for ranging at the start or at the end of the DTCP. The first pass of the day will do ranging at the end, the second pass will do ranging at the start. Select BD mode on MSTK-1 for the first connection test.		
2.2.3		*Preparations in case of aborted Dumps*		
		If in the previous DTCP one or more packet store dumps were aborted, the packet store pointers must be corrected. Use the packet store AND-Printout, which was done in previous DTCP before the dump was aborted (should be in the logbook). Following TM parameters show the time of the last dumped TM packet of each packet store. Use the one of the aborted dump.		
		Verify Telemetry **CUR_TIM_002** **XM367991**		Printout
		Verify Telemetry **CUR_TIM_003** **XM368991**		Printout

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **CUR_TIM_004** **XM369991**		Printout
		Use this time minus 5 minutes as the parameter for following TC:		
		Set Packet Store Dump Pointer Value **DownlinkTimeP_After** *Command Parameter(s) :* **Store_Id** **DH003160** **Storage_Time** **DH062160** *TC Control Flags :* **GBM IL DSE** **--Y -- ---** *Subsch. ID : 10* Det. descr. : Downlink Packets after Storage Time1 This Telecommand will not be included in the export	**DC166160** **<dec>** (Def) **<abs>** (Def)	
		Correct the pointers on both MMs. So prepare 2 TCs for the corresponding packet stores: MM-A -> MM-B 2 -> 130 3 -> 131 4 -> 132 Insert these TCs into the DTCP stack before starting the packet store dumps.		
		Attention: A possible packet store dump problem (anomaly reports H_SC-49 and P_SC-47) is treated different on Herschel and Planck. On Herschel it's handled during the DTCP by running SOI-29 when the problem occurs. On Planck obey following additional instructions:		
		Planck: **Because of a BSW problem (P_SC-47) command DC166160 can not be sent to move the SSMMA affected store pointer if the value of the corresponding synthetic parameter below is 1 when the command DC166160 needs to be sent.**		
		Verify Telemetry **Store1FIRSTPTR** **XD253991**		AND=ZAZEA999
		Verify Telemetry **Store2FIRSTPTR** **XD254991**		AND=ZAZEA999
		Verify Telemetry **Store3FIRSTPTR** **XD255991**		AND=ZAZEA999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **Store4FIRSTPTR XD256991**		AND=ZAZEA999
		EXAMPLE: If yesterday the dump of store 4 has been aborted and parameter XD256991 today has value 1 when I need to send command DC166160 below to move the store 4 pointers, I can NOT send the command. In this case we must (only for today) dump from the corresponding SSMMB store (Store 132). In this case procedure P_CRP_DHS_1009 must be executed in order to properly set the pointer for the corresponding SSMMB store. In case P_CRP_DHS_1009 has been executed command DC166160 below does not need to be sent because has been already sent when executing P_CRP_DHS_1009. In practise however, after an abort operation the SPACON will be provided with a stack to be sent in case everything is nominal (synthetic parameter has value 0 --> SSMMA store pointer can be moved) and another stack to be sent in case the pointers are in a "bad" position (synthetic parameter has value 1 --> SSMMB store pointer must be moved --> execute procedure P_CRP_DHS_1009)		
2.2.4		*Prepare MSTK-2 for Special Operations*		□
		Prepare MSTK-2 according to the SOIs. If the SPACON is not allowed to run a procedure alone, the appropriate SOE must prepare the stack.		
3		*Option: Select VSDS for Ground Station*		Next Step: 4
		To monitor the ground station status via VSDS: VSDS Source: ECC-?? (the ?? number is not fixed, so cycle through them until you see the ground station mimic on the VSDS)		
4		*Wait for ECC before connecting NCTRS links*		Next Step: 5

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		After configuring the ground station, ECC will inform the SPACON to connect the R/T TM links. Even not necessary (but as a safety issue) ECC will ask to connect the TC link later.		
5		*NCTRS: Connect links for the upcoming DTCPs.*		Next Step: END
		For the first S/C of today: **NCTRS-A** - TMTCS-1: Connect VC-0 onlt (process) - TMTCS-2: Connect VC-0 onlt (input) - TMTCS-1: Connect VC-4 onlt (process) - TMTCS-2: Connect VC-4 onlt (input) - TMTCS-1: Connect VC-1 onlc (process) - TMTCS-1: Connect VC-2 onlc (process) - TMTCS-1: Connect VC-3 onlc (process) - TMTCS-1: Connect ROCF (process, changed-based) - TMTCS-2: Connect ROCF (input, changed-based) - TMTCS-1: Connect TC link		
		For the first S/C of today: **NCTRS-B** - TMTCS-2: Connect VC-0 onlt (process) - TMTCS-1: Connect VC-0 onlt (input) - TMTCS-2: Connect VC-4 onlt (process) - TMTCS-1: Connect VC-4 onlt (input) - TMTCS-2: Connect VC-1 onlc (process) - TMTCS-2: Connect VC-2 onlc (process) - TMTCS-2: Connect ROCF (process, changed-based) - TMTCS-1: Connect ROCF (input, changed-based)		
		For the second S/C of today: **NCTRS-A** - TMTCS-1: Connect VC-0 onlt (process) - TMTCS-2: Connect VC-0 onlt (input) - TMTCS-1: Connect VC-4 onlt (process) - TMTCS-2: Connect VC-4 onlt (input) - TMTCS-1: Connect VC-1 onlc (process) - TMTCS-1: Connect VC-2 onlc (process) - TMTCS-1: Connect VC-3 onlc (process) - TMTCS-1: Connect ROCF (process, changed-based) - TMTCS-2: Connect ROCF (input, changed-based) - TMTCS-1: Connect TC link		
		For the second S/C of today: **NCTRS-B** - TMTCS-2: Connect VC-0 onlt (process) - TMTCS-1: Connect VC-0 onlt (input) - TMTCS-2: Connect VC-4 onlt (process) - TMTCS-1: Connect VC-4 onlt (input) - TMTCS-2: Connect VC-1 onlc (process) - TMTCS-2: Connect VC-2 onlc (process) - TMTCS-2: Connect ROCF (process, changed-based) - TMTCS-1: Connect ROCF (input, changed-based)		

End of Procedure

Propagation Delay and T1_Initial

Propagation Delay

The Propagation Delay (OWLT) must be set up manually in TC SPACON. The FD provided OWLT file needs to be checked when preparing for each DTCP.

T1_Initial

T1_Initial defines the maximum time after releasing a TC until a CLCW update must arrive at the MCS to confirm the arrival onboard (only required for the last TC of a MTL or a single command, because the loss of a TC in a group of TCs would be indicated by the retransmit flag of the CLCW).

Radiation Time for longest TC (125bps)	19.64	s
Radiation Time for longest TC (4kbps)	0.614	s
Maximum Number of released TCs waiting for Radiation Response	20	CLTUs
Radiation Time for TM Frame (500bps)	17.84	s
Radiation Time for TM Frame (5kbps)	1.784	s
Radiation Time for TM Frame (150kbps)	0.0595	s
Radiation Time for TM Frame (1.5Mbps)	0.00595	s
Propagation Delay (OWLT)	1 - 6	s
Sum of all processing delays	~3	s

Generic: T1_Initial = MaxTCwaiting*TC_time + 2*OWLT + 3*TM_time + Delays

T1_Initial for Propagation Delay = 6s		
TM \ TC	125 bps	4 kbps
500 bps	461	81
5 kbps	413	33
150 kbps	408	27
1.5 Mbps	408	27

T1_Initial for Propagation Delay = 3s		
TM \ TC	125 bps	4 kbps
500 bps	455	75
5 kbps	407	27
150 kbps	402	21
1.5 Mbps	402	21

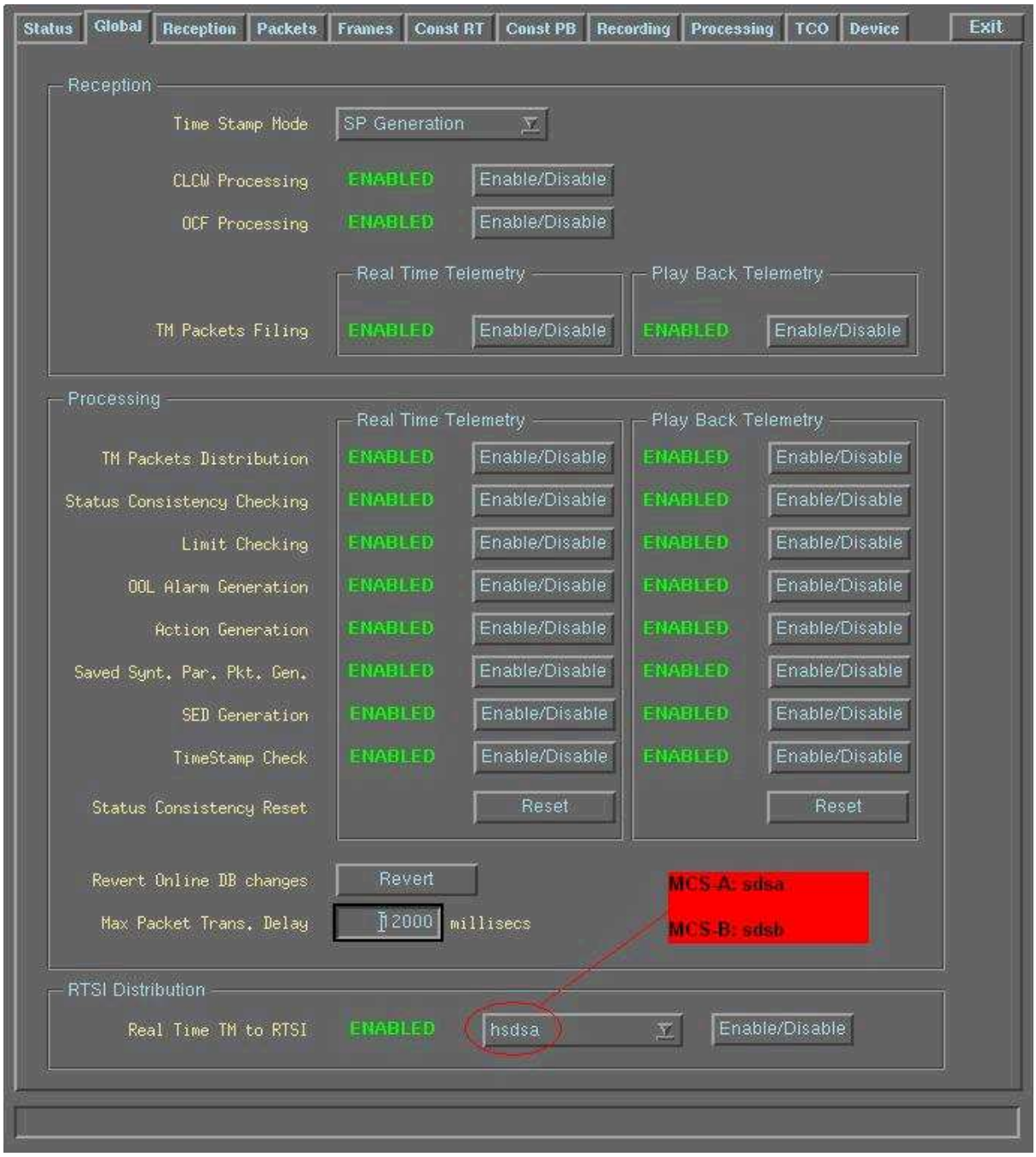
T1_Initial for Propagation Delay = 5s		
TM \ TC	125 bps	4 kbps
500 bps	459	79
5 kbps	411	31
150 kbps	406	25
1.5 Mbps	406	25

T1_Initial for Propagation Delay = 2s		
TM \ TC	125 bps	4 kbps
500 bps	453	73
5 kbps	405	25
150 kbps	400	19
1.5 Mbps	400	19

T1_Initial for Propagation Delay = 4s		
TM \ TC	125 bps	4 kbps
500 bps	457	77
5 kbps	409	29
150 kbps	404	23
1.5 Mbps	404	23

T1_Initial for Propagation Delay = 1s		
TM \ TC	125 bps	4 kbps
500 bps	451	71
5 kbps	403	23
150 kbps	398	17
1.5 Mbps	398	17

Configure TM SPACON

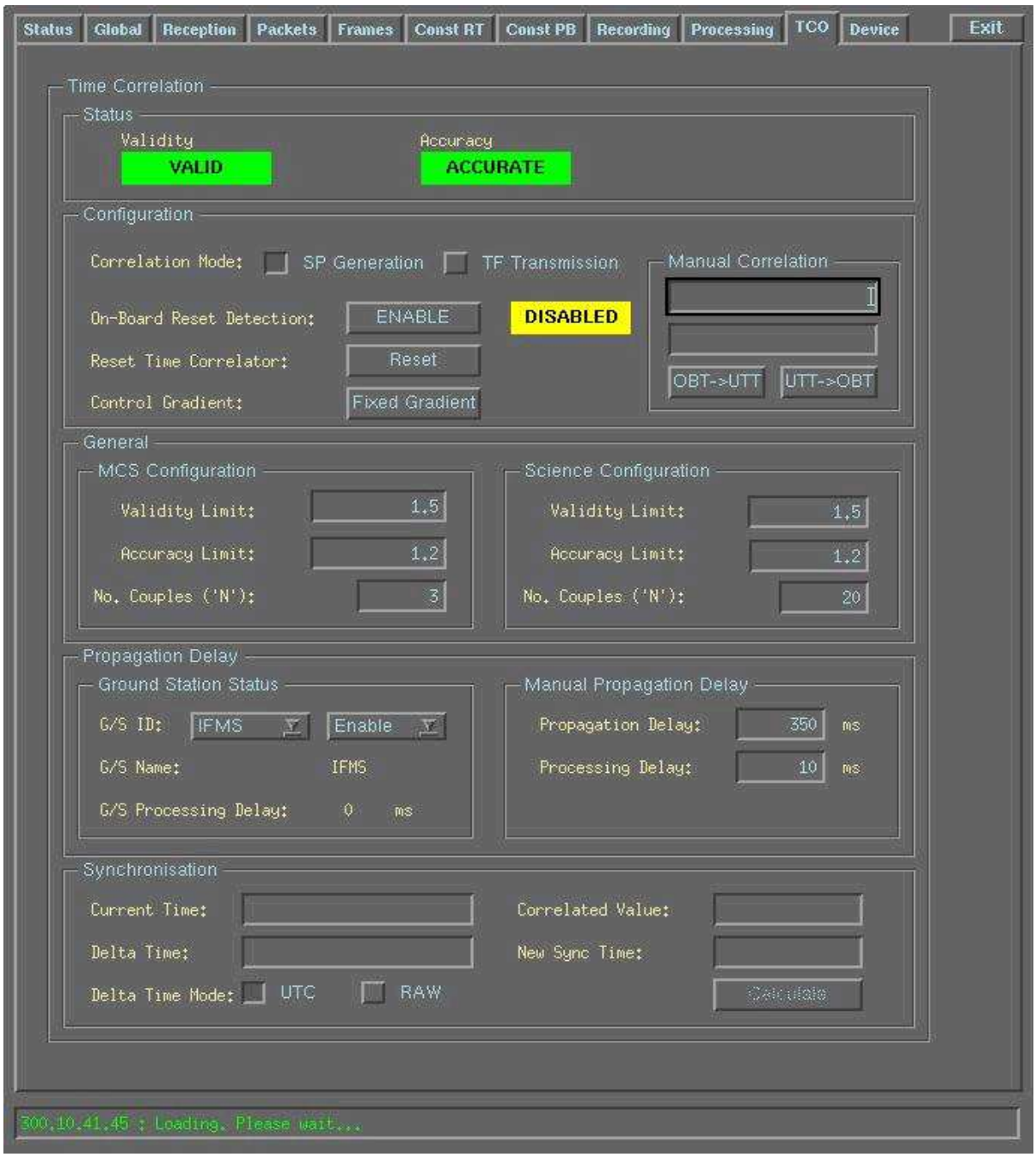


DTCP Preparation
File: C_GSP_SYS_PREP.xls
Author: F. Keck

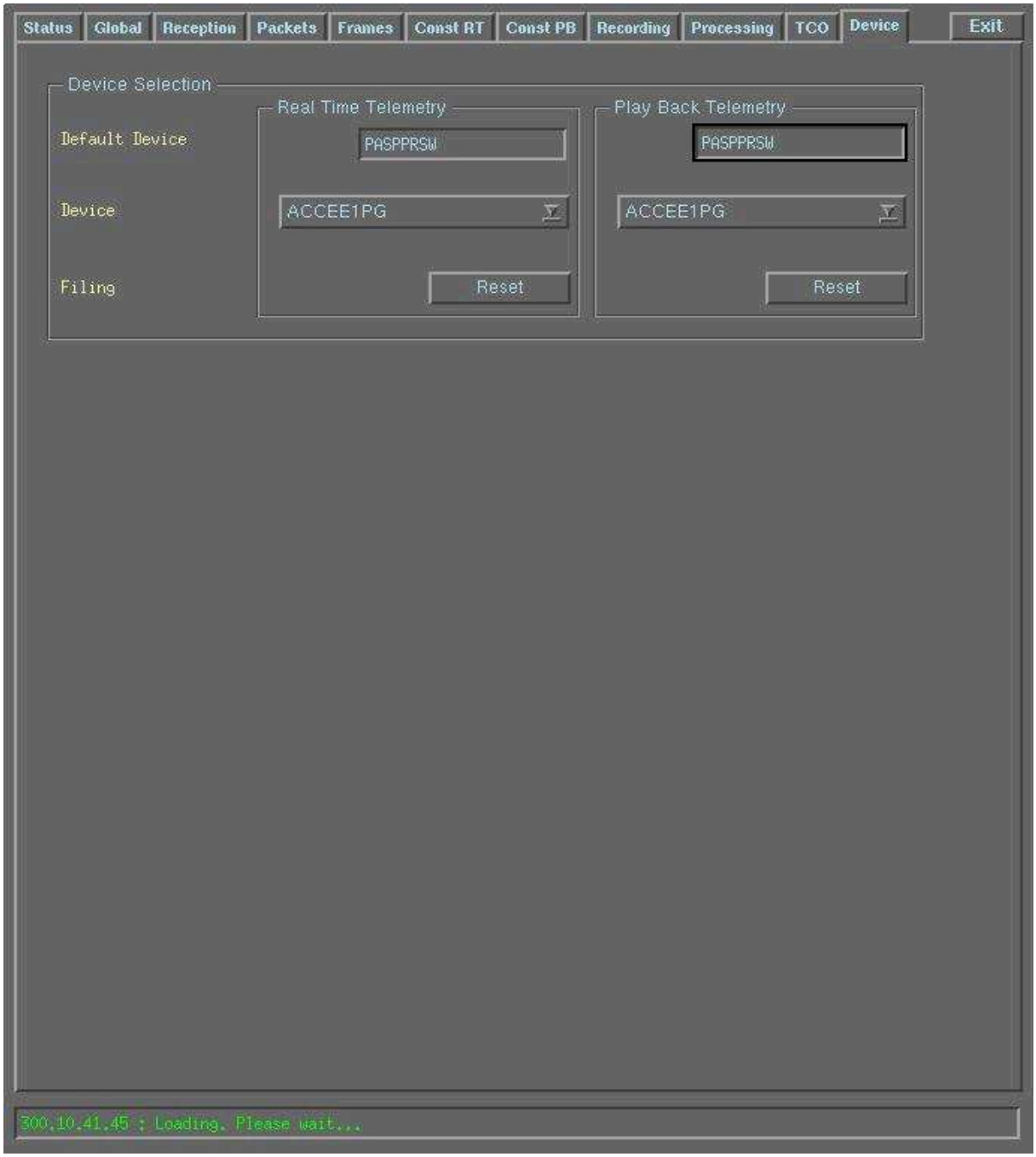
Configure TM SPACON

DTCP Preparation
File: C_GSP_SYS_PREP.xls
Author: F. Keck

Configure TM SPACON

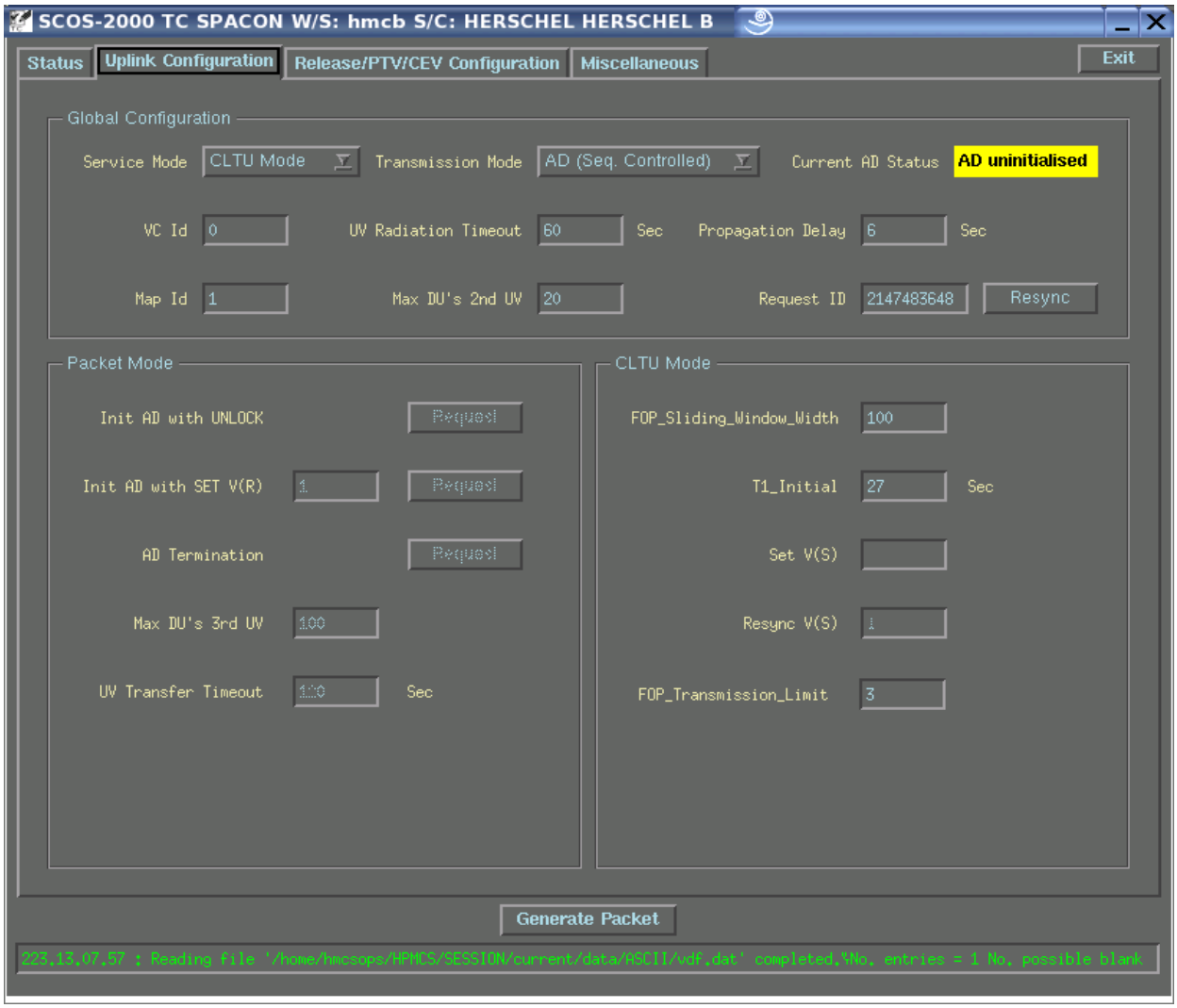


Configure TM SPACON



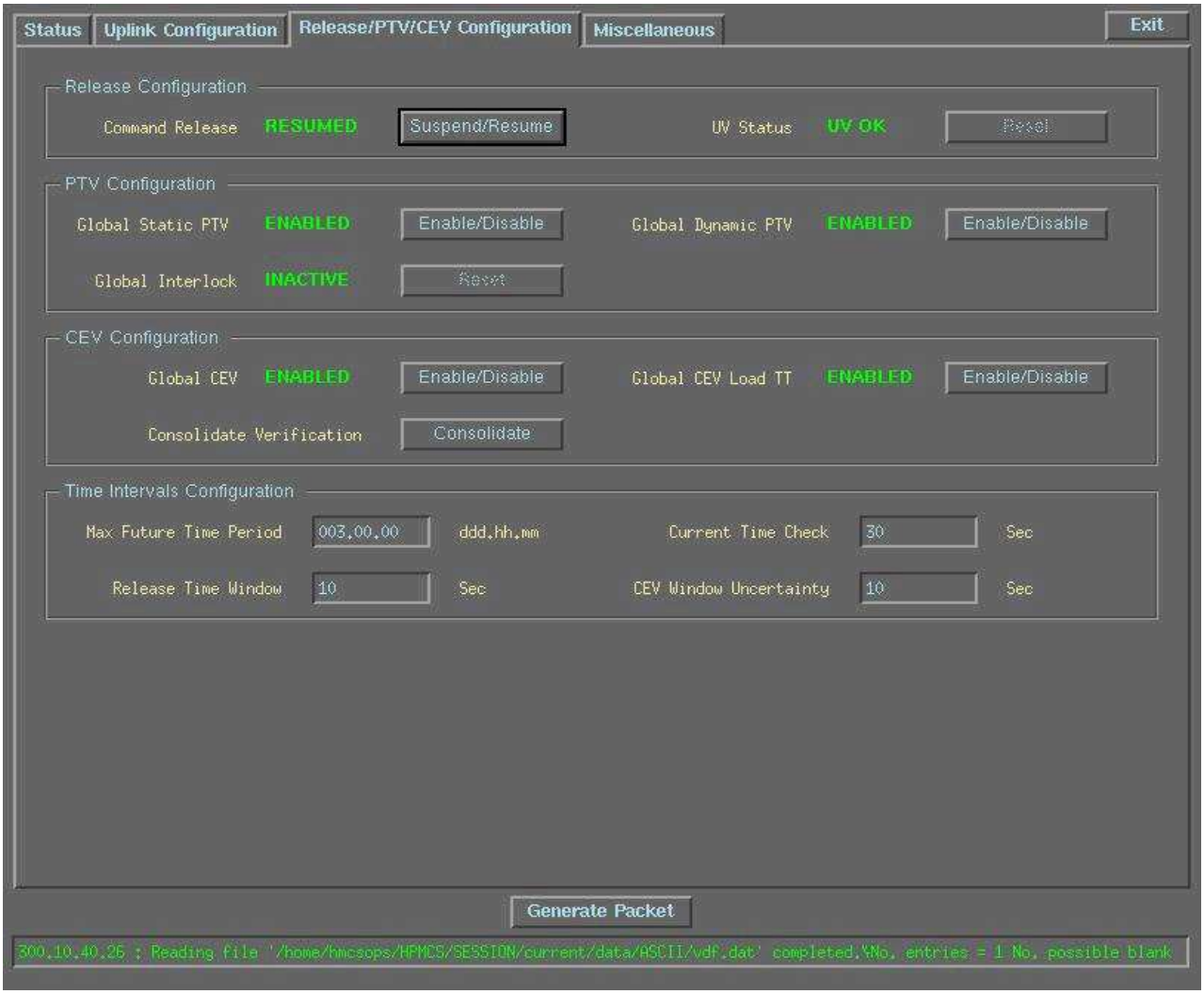
DTCP Preparation
File: C_GSP_SYS_PREP.xls
Author: F. Keck

Configure TC SPACON



DTCP Preparation
File: C_GSP_SYS_PREP.xls
Author: F. Keck

Configure TC SPACON



NCTRS Links and TM Flow Overview