

HIFI Telemetry Packet Structure ICD

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Document Change Record

Issue	Date	Changed Section	Description of Change
1.0			First issue
1.1	2003-05-20		Format of tables changed The Name, position and length of a parameter are now as in table plf.dat
		4.3.3.2.9, 4.5, 4.6	Several APIDS corrected to 1024, service 6, 9, 14
		4.2.3	Essential HK added
		0	Some notes added on WBS-science data
			Parameter length and names of IV scan report
			LCU-IV curve added
		4.3.1.2.1 & 4.3.2.2	Specification of Event-reports
1.2		2004-06-10	4.8
	4.8.5		SID correction (typos)
	4.9.1.1		Removed IF power measurement report
			Add HRS tune report
			Add WBS tune report
1.3		4.9.1.10	Add Mixer magnet current tuner reports
1.4			HRS rshift fixed to 0
		4.9.1.2	Group-repeater added to scan-reports
		4.9.1.3	Group-repeater moved in scan-reports
		4.3.1.2.1	Specified event-ID peakup event Specified autonomous events
1.5			LO vector scan report
		4.3.1.2.1	Alarm counter added to peakup event
1.6			FID/AID changed of Configure LCU reports
		4.9.1.5	Typo in LCU IV report
		4.9.1.3	Specification of diplexer scan reports
		4.9.1.4	
			Added comment on latched time
		4.8.1	Added section on frame-integration
			References to 16 bits HRS science data removed
			Tables specifying APID/type/subtype are deleted, as they are duplication the table in section 1
1.7		4.5	Removal of TM(9,8) Correction of TM(9,9)
		4.9.1.14	Introduction of HIFI_engineering_scan_report
		4.8.3	Frame counters added to start-packets
		4.8.4	
			HRS tune report aligned with OBS-implementation
		4.9.1.3	Correction of Diplexer scan report to solve SPR1167
		4.3.3.2	Addition of n_param to event-reports

1.8	4.9.1.14	SID of HIFI_engineering_scan_report changed
	4.9.1.12	Addition of vector scan reports fro LCU-QM
	0 4.9	To solve SPR 834 the type and subtype of several reports have changed from (21,3) to (3,25)
	4.9.1.2 4.9.1.3 4.9.1.4 4.9.1.10 4.9.1.11	Mixer bias current parameter for band 5 is overlapping with the mixer bias current parameter for the other bands
1.9		
	4.3.1.2.1	Microrot parameters in peakup event corrected to 16 bits
	4.3.3.2.1 through 4.3.3.2.8	Added additional fields to runtime error
	4.3.3.2.1 through 4.3.3.2.8	Event-ID has been differentiated for several events
	4.3.4	Specification memory dump reports
	4.8.3 4.8.4	HK-parameters added to start packets
	4.9.1.2 4.9.1.3 4.9.1.4 4.9.1.10 4.9.1.11	Two mixer bias current parameters (one for band 5 and one for the other 6) are replaced by zeven (one for each band)
	4.9.1.5	Correction of LCU_IV report
	4.9.1.14	Specification of engineering scan reports: <ul style="list-style-type: none"> - HIFI_diplexer_H_fast_scan_report - HIFI_diplexer_V_fast_scan_report - HIFI_chopper_scan_report - HIFI_mixer_current_H_fast_scan_report - HIFI_mixer_current_V_fast_scan_report
	Annex A	Added list of packet identifiers
	Annex B	Added list of packets and SPIDs
1.10	4.3.3.2.9	Added HIFI_LOU_T_OOL
	4.3.3.2	Runtime errors changed from (5,4) to (5,1)
	4.9.1.15	Added Peakup acquisition reports
1.11	4.3.3.2.10	Added HIFI_LCU_nonresponsse
	4.3.3.2.11	Added: HIFI_LCU_in_standby0
	4.3.3.2.12	Added: HIFI_LCUCRC_mismatch

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1 INTRODUCTION

The purpose of this document is to specify the structure of all Telemetry Packets generated by the HIFI on-board software.

This document specifies the following TM packets

Notice that the name of a prime packet (APID=1024 or 1026) starts with HIFI_ where the name of a redundant packet (APID=1025 or 1027) starts with HIFI_R_.

When the prime and the redundant packet are identical they have the same SPID. The SPIDs are listed in Annex B.

Telecommand verification						
Name	APID-P	APID-R	Type	Subtype		
TC acceptance succes	1024	1025	1	1		
TC acceptance failure	1024	1025	1	2		
TC execution completed	1024	1025	1	7		
TC execution completed - failure	1024	1025	1	8		
Housekeeping						
Name	APID-P	APID-R	Type	Subtype	SID	
HIFI_essential_HK	1024	1025	3	25	1	
HIFI_Periodic_HK	1026	1027	3	25	1025	
HIFI_Non_periodic_FCU	1026	1027	3	25	17	
HIFI_Non_periodic_LCU	1026	1027	3	25	18-22	
HIFI_HRS_H_IF_POWER_phase1	1026	1027	3	25	25	
HIFI_HRS_H_IF_POWER_phase2	1026	1027	3	25	26	
HIFI_HRS_V_IF_POWER_phase1	1026	1027	3	25	27	
HIFI_HRS_V_IF_POWER_phase2	1026	1027	3	25	28	
HIFI_WBS_H_IF_POWER_phase1	1026	1027	3	25	29	
HIFI_WBS_H_IF_POWER_phase2	1026	1027	3	25	30	
HIFI_WBS_V_IF_POWER_phase1	1026	1027	3	25	31	
HIFI_WBS_V_IF_POWER_phase2	1026	1027	3	25	32	
Events						
Name	APID-P	APID-R	Type	Subtype	SID	Event-ID
Exception reports	1024	1025	5	1		
o HIFI_ready_event						0x8008
Alarm reports						
o HIFI_PM_test_event	1024	1025	5	4		0x8001
o HIFI_Data_memory_event	1024	1025	5	4		0x8002
o HIFI_EEPROM_memory_event	1024	1025	5	4		0x8003
o HIFI_TC_verification_event	1024	1025	5	4		0x8004
o HIFI_Load_EEPROM_PM_event	1024	1025	5	4		0x8005
o HIFI_Load_DM_PM_event	1024	1025	5	4		0x8006
o HIFI_boot_DM_PM_event	1024	1025	5	4		0x8007
o HIFI_OBS_runtime_error	1024	1025	5	1		0xA000
HIFI_autonomy_events						
o HIFI_AH1_DHTR_C_OOL	1024	1025	5	1	0xB001	0xB001
o HIFI_AV1_DHTR_C_OOL	1024	1025	5	1	0xB002	0xB002
o HIFI_WH_Laser_T_OOL	1024	1025	5	1	0xB003	0xB003
o HIFI_WV_Laser_T_OOL	1024	1025	5	1	0xB004	0xB004
o HIFI_MX_H_nonresponse	1024	1025	5	1	0xB005	0xB005
o HIFI_MX_V_nonresponse	1024	1025	5	1	0xB006	0xB006
o HIFI_Chop_nonresponse	1024	1025	5	1	0xB007	0xB007
o HIFI_LOU_T_OOL	1024	1025	5	1	0xB008	0xB008
o <u>HIFI_LCU_nonresponse</u>	1024	1025	5	1	0xB009	0xB009
o <u>HIFI_LCU_in_standby0</u>	1024	1025	5	1	0xB00A	0xB00A

o HIFI_LCUCRC_mismatch	1024	1025	5	1	0xB00B	0xB00B
HIFI_peakup_request	1024	1025	5	1	0xC000	0xC000
Memory reports						
Name	APID-P	APID-R	Type	Subtype		
HIFI_memory_dump_report	1024	1025	6	6		
HIFI_memory_check_report	1024	1025	6	10		
Function status reports						
Name	APID-P	APID-R	Type	Subtype	FID-AID	SID
HIFI_Configure_FCU_report	1024	1025	8	6	3073	
HIFI_Configure_FCU_power_report	1024	1025	8	6	3083	
HIFI_Conf_HRS_H_att_lo_report	1024	1025	8	6	3079	
HIFI_Conf_HRS_H_blocks_report	1024	1025	8	6	3080	
HIFI_Conf_HRS_V_att_lo_report	1024	1025	8	6	3081	
HIFI_Conf_HRS_V_blocks_report	1024	1025	8	6	3082	
HIFI_Configure_WBS_H_report	1024	1025	8	6	3076	
HIFI_Configure_WBS_V_report	1024	1025	8	6	3077	
HIFI_HL_switch_off_report	1024	1025	8	6	3084	
HIFI_Conf_LCU_internal_report	1024	1025	8	6	3085	
HIFI_Configure_LSU_report	1024	1025	8	6	3086	
HIFI_single_report	1024	1025	8	6	3098	
HIFI_H_DHTR_C_report	1024	1025	8	6	3099	
HIFI_V_DHTR_C_report	1024	1025	8	6	3100	
HIFI_LCU_single_report	1024	1025	8	6	3101	
HIFI_Conf_LCU_normal_report	1024	1025	8	6	3102	
HIFI_Conf_LCU_diag_report	1024	1025	8	6	3103	
HIFI_Conf_LCU_table_report	1024	1025	8	6	3104	
HIFI_Config_mxbias_dpact_report	1024	1025	8	6	3105	
HIFI_Config_spectroscopy_report	1024	1025	8	6	2833	
HIFI_Spectr_slow_chop_report	1024	1025	8	6	2819	
HIFI_Spectr_fast_chop_report	1024	1025	8	6	2818	
Time service						
Name	APID-P	APID-R	Type	Subtype		
HIFI_time_verification_report	1024	1025	9	9		
Packet transmission						
Name	APID-P	APID-R	Type	Subtype		
HIFI_TM_generation_status_report	1024	1025	14	4		
Test						
Name	APID-P	APID-R	Type	Subtype		
HIFI_Connection_report	1024	1025	17	2		

Science					
Name	APID	Type	Subtype	SID	
o HIFI_HRS_H1_start	1028	21	1	1	
o HIFI_HRS_H1_science24	1028	21	1	17	
o HIFI_HRS_H2_start	1028	21	1	2	
o HIFI_HRS_H2_science24	1028	21	1	18	
o HIFI_HRS_V1_start	1029	21	1	3	
o HIFI_HRS_V1_science24	1029	21	1	19	
o HIFI_HRS_V2_start	1029	21	1	4	
o HIFI_HRS_V2_science24	1029	21	1	20	
o HIFI_WBS_H1_start	1030	21	1	5	
o HIFI_WBS_H1_science16	1030	21	1	13	
o HIFI_WBS_H1_science24	1030	21	1	21	
o HIFI_WBS_H2_start	1030	21	1	6	
o HIFI_WBS_H2_science16	1030	21	1	14	
o HIFI_WBS_H2_science24	1030	21	1	22	
o HIFI_WBS_V1_start	1031	21	1	7	
o HIFI_WBS_V1_science16	1031	21	1	15	
o HIFI_WBS_V1_science24	1031	21	1	23	
o HIFI_WBS_V2_start	1031	21	1	8	
o HIFI_WBS_V2_science16	1031	21	1	16	
o HIFI_WBS_V2_science24	1031	21	1	24	

Reports	APID-P	APID-R	Type	Subtype	SID
HIFI_FCU_parameter_scan_report	1026	1027	3	25	266
HIFI_diplexer_scan_report_with_IF	1026	1027	3	25	258
HIFI_diplexer_scan_report	1026	1027	3	25	270
HIFI_LCU_IV	1026	1027	3	25	259
HIFI_HRS_H_tune_report	1026	1027	3	25	260
HIFI_HRS_V_tune_report	1026	1027	3	25	261
HIFI_WBS_H_tune_report	1026	1027	3	25	262
HIFI_WBS_V_tune_report	1026	1027	3	25	263
HIFI_MX_MGC_useHRS_report	1026	1027	3	25	267
HIFI_MX_MGC_useWBS_report	1026	1027	3	25	268
HIFI_Vector_scan_report	1026	1027	3	25	269
HIFI_engineering_scan_report	1026	1027	3	25	271
HIFI_Vector_scan_report_nom_1a	1026	1027	3	25	269
HIFI_Vector_scan_report	1026	1027	3	25	269
HIFI_peakup_acquire_report	1026	1027	3	25	289
HIFI_peakup_chop_corr_report	1026	1027	3	25	290
HIFI_peakup_aocs_corr_report_rev1	1026	1027	3	25	291

Obsolete SIDs:

Name	APID	Type	Subtype	SID
Periodic HK	1026	3	25	1, 1024...
Non-periodic FCU	1026	3	25	16
IF power measurement	1026	21	3	256
FCU parameter scan	1026	21	3	257
mixMagnetCurrent_useHRS report	1026	21	3	264
mixMagnetCurrent_useWBS report	1026	21	3	265
HIFI_Vector_scan_report	1026	3	25	269

2 DOCUMENT REFERENCES

2.1 Applicable Documents

- AD 1. Packet Structure ICD SCI-PT-ICD-7527
- AD 2. Herschel Science Ground Segment to Instruments ICD FIRST-FSC-DOC-0200 issue 1.0

2.2 Reference Documents

- RD 1. HIFI HK packet ICD SRON-U/HIFI/SP/2001-003
- RD 2. HIFI Command specification SRON-U/HIFI/SP/2001-004
- RD 3. DPU-MA-CGS-004 Switch on procedure TM packets user manual
- RD 4. IFSI/OBS/MA/2005-001 Herschel HIFI HIFI ICU OBS software User Manual

3 TM PACKET DEFINITION

The structure of a TM packet is as follows:

Table 3-1 TM packet structure

Source packet header						Packet data field			
Packet ID				seq control		length	Data Field header	Source data	PEC
version	Type	flag	APID	segm	count				
3	1	1	11	2	14				
16 bits				16 bits		16 bits	80 bits	N*16 bits	16 bits

Table 3-2 Source packet header

Position	Field	Length	value
0,1	Version	3 bit	0
	Type	1 bit	0
	Header flag	1 bit	
	APID	11 bit	
2,3	Segmentation flag	2 bit	11
	Source sequence counter	14 bit	
4,5	packet length	16 bit	

- The position indicates the position of the field expressed in bytes with respect to the start of the source packet header.
- The packet length C indicates the number of octets in the packet data field, minus 1. As the number of octets in the packet is even, C is always an odd number.
- Only selfstanding packets are used. Segmentation flags are 11.
- The Application ID of the HIFI OBS can assume the values listed in section 0.

Table 3-3 Data header field

Position	Field	Length	value
6	Spare	1 bit	0
	PUS version	3 bit	0
	Spare	4 bit	0
7	Packet type:	8 bit	
8	Packet subtype:	8 bit	
9	Spare	8 bit	0
10-13	Course On-board Time [s]	32 bit	
14,15	Fine on-board time [sub-seconds]	16 bit	

The **PEC** field contains the checksum of all preceding fields (Header, data field header and source data).

4 TM PACKET SOURCE DATA

This chapter describes the datafield of the Telemetry source packets. The position indicates the position of the field expressed in bytes with respect to the start of the source packet header.

4.1 Telecommand verification

Notice that the APID of a TC-verification packet is 1024 (Prime) or 1025 (Redundant). The APID of the TC is always 1024.

As the error code is used to identify a packet, a different error-code implies a different packet.

4.1.1 Telecommand acceptance report - success

Position	Length	Monitor Parameter
16	16	TC packet ID
18	16	Packet sequence control

4.1.2 Telecommand acceptance report- failure

Position	Length	Monitor Parameter
16	16	TC packet ID
18	16	Packet sequence control
20	16	Error code
22	16	Number of parameters to follow
24- 24+2N	16	Parameter value

Table 4.1.2-1 Error codes

Code	Phase	Description
0	acceptance	Illegal APID
1	acceptance	Incomplete or illegal length packet
2	acceptance	Incorrect checksum
3	acceptance	Illegal packet type
4	acceptance	Illegal packet subtype
5	acceptance	Illegal or inconsistent application data
16	execution	Error Memory uplink

Refer to Annex B.1 for a complete error-code overview

4.1.3 Telecommand execution completed

Position	Length	Monitor Parameter
16	16	TC packet ID
18	16	Packet sequence control

4.1.4 Telecommand execution failure

Position	Length	Monitor Parameter
16	16	TC packet ID
18	16	Packet sequence control
20	16	Error code
22	16	Number of parameters to follow
24- 24+2N	16	Parameter value

Refer to Annex B.1 for a complete error-code overview

4.2 Housekeeping and diagnostic reports

House-keeping packets are used to telemeter HK-data..

The content of the HK-packet data block is described in RD 1

4.2.1 Periodic HK packets

Position	Length	Monitor Parameter
16	16	Structure ID
18	32	Observation ID
22	32	Building block ID
26		Refer to RD 1

4.2.2 Non-periodic HK packets

Position	Length	Monitor Parameter
16	16	Structure ID
18	32	Observation ID
22	32	Building block ID
26		Refer to RD 1

4.2.3 HIFI_essential_HK

Position	Length	Monitor Parameter
16	16	Structure ID
18	32	Observation ID
22	32	Building block ID
26		Refer to RD 1

4.2.4 Spectrometer IF housekeeping

Position	Length	Monitor Parameter
16	16	Structure ID
18	32	Observation ID
22	32	Building block ID
26		Refer to RD 1

4.3 Event reports

The following categories of event reports are defined:

- subtype=1: asynchronous event or warning.
The CDMU may decide to react on such an event.
- subtype=2: non-nominal event for which an unscheduled on-board recovery action is required.
- subtype=4: non-nominal event which requires ground intervention.

The general structure of an event report generated by the Application SW is:

Position	Length	Monitor Parameter	value
16	16	Event ID	
18	16	Structure ID	
20	32	Observation ID	
24	32	Building block ID	
28	16	Event counter	
30		Parameters	

4.3.1 Event report

4.3.1.1 Event reports generated by Boot-SW

EVENT-ID	Event-description
0x8008	Ready to accept Telecommands
0x8111	Telecommand acknowledge

Refer to RD 3

4.3.1.2 Event reports generated by Application SW

4.3.1.2.1 HIFI_peakup_request

Position	Length	Monitor Parameter	Description	value
16	16	Event_ID	Event Identifier	0xC000
18	16	Structure_ID	Structure Identifier	0xC000
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	HI_peakup_instr	Peakup request: Instrument identifier	1
32	16	HI_microrot_y	Peakup request: microrotation in y-direction	
33	16	HI_microrot_z	Peakup request: microrotation in z-direction	

4.3.2 Exception report

4.3.2.1 Exception reports generated by the Boot SW:

No exception reports reports (5,2) are foreseen for the Boot SW.

4.3.2.2 Exception reports generated by the Application SW

No exception reports reports (5,2) are foreseen for the Application SW.

4.3.3 Error/Alarm report

4.3.3.1 Events generated by the Boot SW

EVENT-ID	Event-description
0x8001	Program memory test report
0x8002	DATA memory test report
0x8003	EEPROM memory test report
0x8004	Telecommand rejection
0x8005	Loading EEPROM to PM
0x8006	Loading DM to PM
0x8007	Program FCS error during the DM to PM immediate boot

Refer to RD 3

Error codes in TC-rejection events

Error Code	Error description
0x0007	Telecommand memory management data memory wrong format
0x0008	telecommand FCS error or Telecommand application data FCS error
0x0009	data memory page lost
0x000B	telecommand packet subtype error
0x000C	telecommand apid error
0x000E	telecommand packet type error
0x0010	telecommand wrong function id
0x0011	telecommand wrong activity id

4.3.3.2 Alarm reports generated by the Application SW:

EVENT-ID	Event-description
0xA000	Runtime errors
0xB000	Autonomy_report

4.3.3.2.1 Runtime errors

Position	Length		Monitor Parameter	value
16	16		Event ID	0xA000
18	16		Structure ID	0
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Alarm counter	
30	16	HI_runtime_err	Error code	
32	16	HIF_Npoints	Number of additional fields	
34	16	HI_runtime_inf	Additional fields	

Refer to table 6 of RD 4.

4.3.3.2.2 HIFI_AH1_DHTR_C_OOL

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB001
18	16		Structure ID	0xB001
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	3
32	16	HICU_H_DHTR_OOL	OOL-value of H-DHTR current	
34	32	HICU_issuedCmd1	LS-command issued by function	

Mixer chain H was switched off due to too high Heater-current

4.3.3.2.3 HIFI_AV1_DHTR_C_OOL

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB002
18	16		Structure ID	0xB002
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	3
32	16	HICU_V_DHTR_OOL	OOL-value of V-DHTR current	
34	32	HICU_issuedCmd1	LS-command issued by function	

Mixer chain H was switched off due to too high Heater-current

4.3.3.2.4 HIFI_WH_Laser_T_OOL

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB003
18	16		Structure ID	0xB003
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	5
32 bit 2	14	HICU_HLaser_OOL	OOL-value of WBS H laser temperature	
34	32	HICU_issuedCmd1	LS-command issued by function	
38	32	HICU_issuedCmd2	LS-command issued by function	

WBS-H laser was switched off due to too high HWH_Laser_T

4.3.3.2.5 HIFI_WV_Laser_T_OOL

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB004
18	16		Structure ID	0xB004
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	5
32 bit: 2	14	HICU_VLaser_OOL	OOL-value of WBS V laser temperature	
34	32	HICU_issuedCmd1	LS-command issued by function	
38	32	HICU_issuedCmd2	LS-command issued by function	

WBS-V laser was switched off due to too high HWV_Laser_T

4.3.3.2.6 HIFI_MX_H_nonresponse

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB005
18	16		Structure ID	0xB005
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	3
32	16	HICU_nonresp_nr	Autonomous function: Number of FCU-nonresponses	
34	32	HICU_issuedCmd1	Autonomous function: LS-command issued by function	

Mixer chain H was switched off due to too non-response

4.3.3.2.7 HIFI_MX_V_nonresponse

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB006
18	16		Structure ID	0xB006
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	3
32	16	HICU_nonresp_nr	Autonomous function: Number of FCU-nonresponses	
34	32	HICU_issuedCmd1	Autonomous function: LS-command issued by function	

Mixer chain V was switched off due to too non-response

4.3.3.2.8 HIFI_Chop_nonresponse

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB007
18	16		Structure ID	0xB007
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	3
32	16	HICU_nonresp_nr	Autonomous function: Number of FCU-nonresponses	
34	32	HICU_issuedCmd1	Autonomous function: LS-command issued by function	

Chopper board was switched off due to too non-response

4.3.3.2.9 HIFI_LOU_T_OOL

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB008
18	16		Structure ID	0xB008
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	
32	16	HICU_LOU_OOL	OOL-value of LOU temperature	

4.3.3.2.10 HIFI_LCU_nonresponsse

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB009
18	16		Structure ID	0xB009
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	1
32	16	HICU_nonresp_nr	Autonomous function: Number of LCU-nonresponses	

LCU did not respond after HK-requests

 4.3.3.2.11 HIFI_LCU_in_standby0

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB00A
18	16		Structure ID	0xB00A
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	0

LCU was found in standby0, i.e HL_mode_s was equal to 0.

 4.3.3.2.12 HIFI_LCUCRC_mismatch

Position	Length	Monitor Parameter	Description	Value
16	16		Event ID	0xB00B
18	16		Structure ID	0xB00B
20	32	OBS_ID	Observation ID	
24	32	BB_ID	Building block ID	
28	16	HICU_event_nr1	Event counter in (5,1) event reports	
30	16	Field counter	Number of 2-byte fields to follow	2
32	16	HL_checksum_exp	Expected value	
34	16	HL_checksum	Read value	

Checksum generated by LCU is unequal to expected value.

Memory management

- Start address is expressed in smallest addressable units (SAU)
- HI_dump_length is expressed in SAU to be dumped.

The following memory devices are known:

Device	MID	SAU
ICU PRAM	0	6 bytes
ICU DRAM	1	4 bytes
LCU RAM	4	2 bytes

4.3.4 HIFI_memory_dump_report

Position	Length	Monitor Parameter	Description
16	8	HI_dump_mem_id	Memory ID for memory dump request
17	24	HI_dump_start	Start address of requested dump-region
20	16	HI_dump_length	Length in SAU of requested dump-region
22+Len(SAU) i	32	HI_dump_data	HI_dump_length dumped memory words
22+ Len(SAU)*HI_dump_length	16	data Checksum	CRC calculated over dumped area

4.3.4.1 HIFI_PRAM_memory_dump

Position	Length	Monitor Parameter	Description
16	8	HI_dump_mem_id	MID= 0
17	24	HI_dump_start	Start address of requested dump-region
20	16	HI_dump_length	Length in SAU of requested dump-region
22+6i	16	HI_dump_data	HI_dump_length dumped memory words
24+6i	16	HI_dump_data	
26+6i	16	HI_dump_data	
22+6 * HI_dump_length	16	data Checksum	CRC calculated over dumped area

4.3.4.2 HIFI_DRAM_memory_dump

Position	Length	Monitor Parameter	Description
16	8	HI_dump_mem_id	MID= 1
17	24	HI_dump_start	Start address of requested dump-region
20	16	HI_dump_length	Length in SAU of requested dump-region
22+4i	32	HI_dump_data	HI_dump_length dumped memory words
22+4 * HI_dump_length	16	data Checksum	CRC calculated over dumped area

4.3.4.3 HIFI_LCU_memory_dump

Position	Length	Monitor Parameter	Description
16	8	HI_dump_mem_id	MID= 4
17	24	HI_dump_start	Start address of requested dump-region
20	16	HI_dump_length	Length in SAU of requested dump-region
22+2i	16	HI_dump_data	HI_dump_length dumped memory words
22+4 * HI_dump_length	16	data Checksum	CRC calculated over dumped area

4.3.5 HIFI_memory_check_report

Position	Length	Monitor Parameter	Description
16	8	HI_check_mem_id	Memory identifier for memory check request
17	24	HI_check_start	Start address of requested check-region
20	16	HI_check_length	Length in SAU of requested check-region
22	16	HI_check_crc	reported CRC

4.4 Function status reports

Upon receipt of a Perform-Activity TC a Function status report is generated. These reports are specified in RD 1.

Position	Length	Monitor Parameter
16	8	Function_ID
17	8	Activity_ID
18	16	Structure ID
20	32	Observation ID
24	32	Building block ID
26		Refer to RD 1

4.5 Time management

4.5.1 Central time reference

Not applicable to instruments

4.5.2 HIFI_time_verification_report

Position	Length	Monitor Parameter	Description
16	48	HI_verify_time	Time verification: OBT at next synchronization

4.6 Packet transmission control

4.6.1 HIFI_TM_generation_status_report

Position	Length	Monitor Parameter	
16	16	HI_N_TX_packets	Number of packet identifiers in report
18 +4 i	32	HI_TX_packet_ID	HI_N_TX_packets enabled packet identifiers

The parameter HI_TX_packet_ID can be broken down to

Length	Monitor Parameter
8	Type
8	Subtype
16	SID

The packet-identifiers are listed in Annex **Error! Reference source not found.**

4.7 Test command

4.7.1 HIFI_Connection_report

The Link connection report has no application data field

4.8 Science data transfer

4.8.1 Integration to frames and timing

4.8.1.1 Total power WBS

A measurement consists of HIF_N_WBS_START WBS data transfers.

A frame is the result of HIF_N_WBS_INTEGR integrations

All transfers from the WBS are sequentially numbered (0,1,2,... HIF_N_WBS_START-1)

The frames are transferred as phase-A. Phase B does not exist.

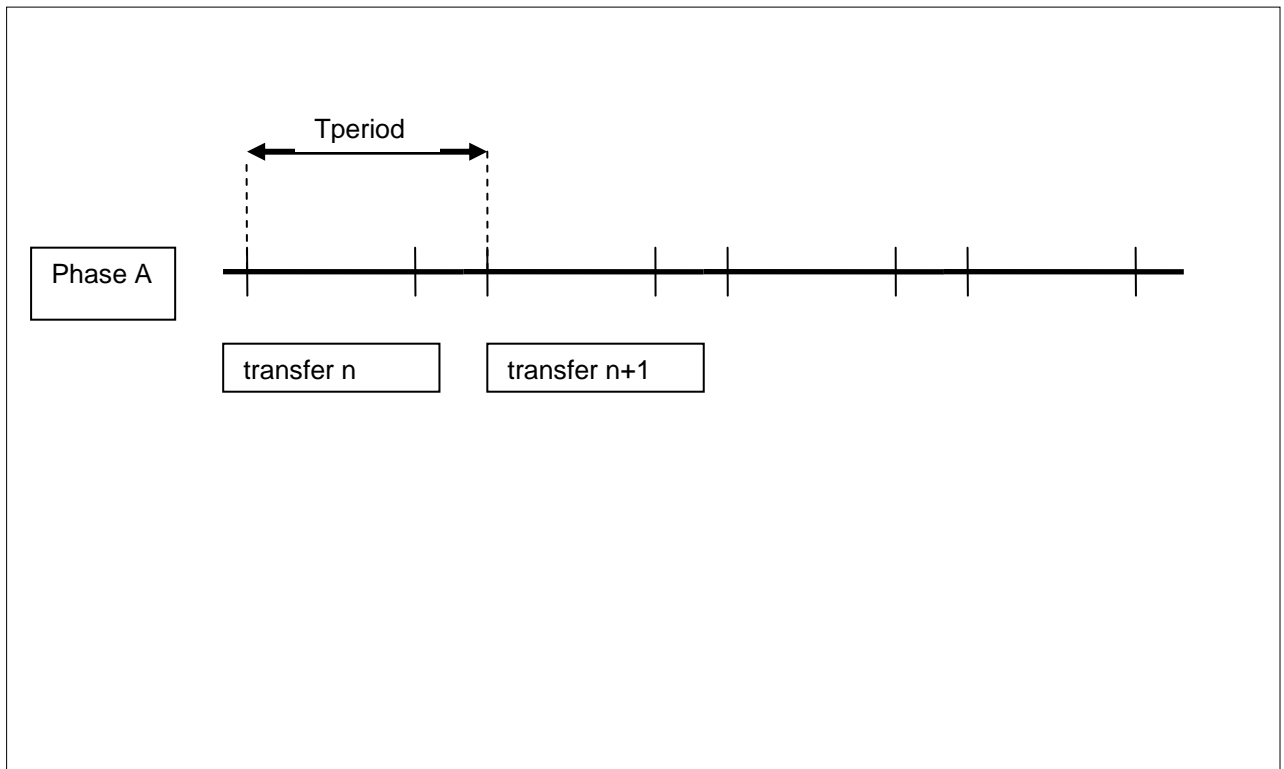
Assume the IntegrationSequenceNumber of a frame is SeqNr

A frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + n$$

where $0 \leq n < \text{HIF_N_WBS_INTEGR}$.

The time that the integration started of each “transfer” is $T_{\text{lat}} + n * T_{\text{period}}$ where n is the transfer-number. How T_{period} relates to HIF_T_ACC_WBS will be documented in OBS-UM



4.8.1.2 Total power HRS

A measurement consists of $HIF_N_WBS_START * HIF_R_HRS$ HRS data transfers.

A frame is the result of $HIF_N_HRS_INTEGR$ integrations.

All transfers from the HRS are sequentially numbered starting at 0.

The frames are transferred as phase-A. Phase B does not exist.

Assume the IntegrationSequenceNumber of a frame is $SeqNr$

A frame consists of transfers:

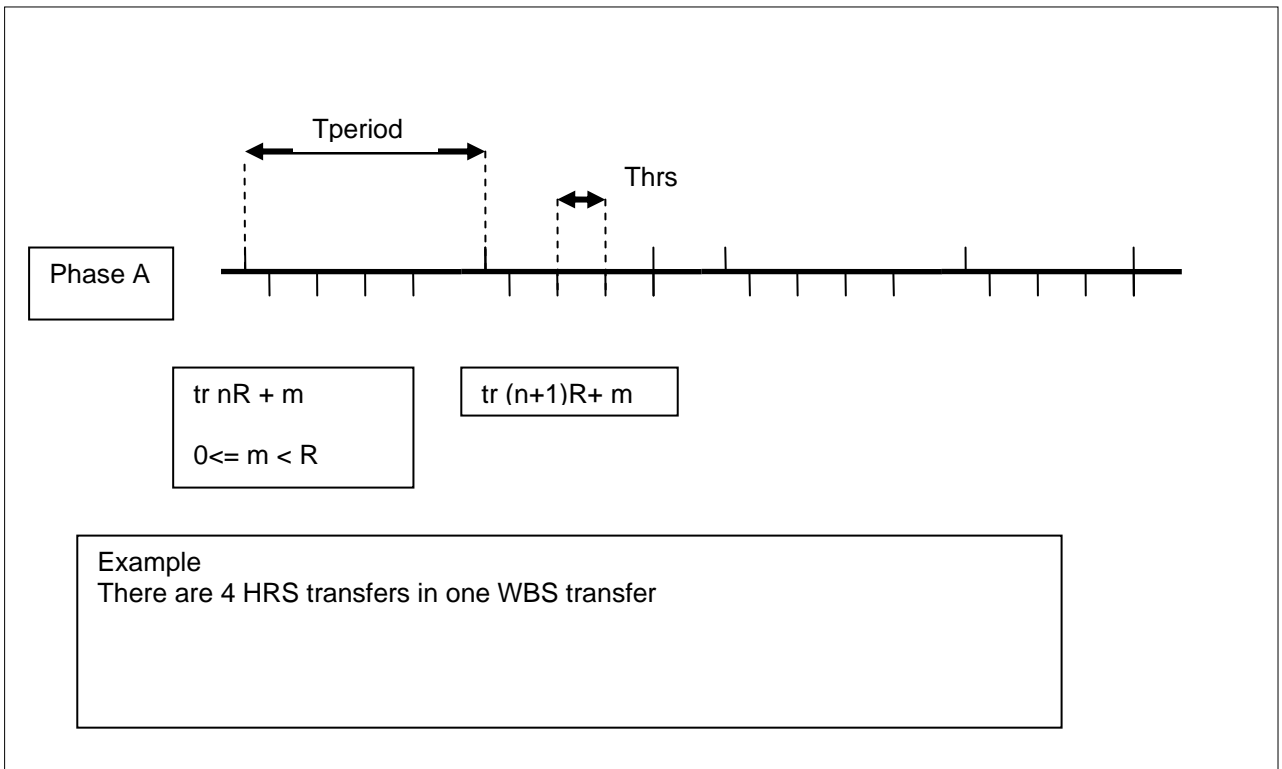
$$SeqNr * HIF_N_HRS_INTEGR + n$$

where $0 \leq n < HIF_N_HRS_INTEGR$.

The time that the integration started of each "transfer" is:

$$Tlatched + (n / HIF_R_HRS) * Tperiod + (n \bmod HIF_R_HRS) * Thr$$

where n is the transfer-number. How $Tperiod$ relates to $HIF_T_ACC_WBS$ will be documented in OBS-UM



4.8.1.3 Slow chop WBS

In slow chop mode, the measurement can be divided in groups of four frames, that belong to the modulation phase, A-B-B-A. (Refer to the command-specification section 3.8.11.4.)

A measurement consists of HIF_N_WBS_START WBS data transfers.

A frame is the result of HIF_N_WBS_INTEGR integrations.

All transfers from the WBS are sequentially numbered (0,1,2,... HIF_N_WBS_START-1) .

The transfers numbered $4n$ and $4n+3$ are integrated as Phase-A frames.

The transfers numbered $4n+1$ and $4n+2$ are integrated as Phase-B frames.

Assume the IntegrationSequenceNumber of a frame is SeqNr

A phase-A frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + 4n$$

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + 4n + 3$$

where $0 \leq n < \text{HIF_N_WBS_INTEGR} / 2$.

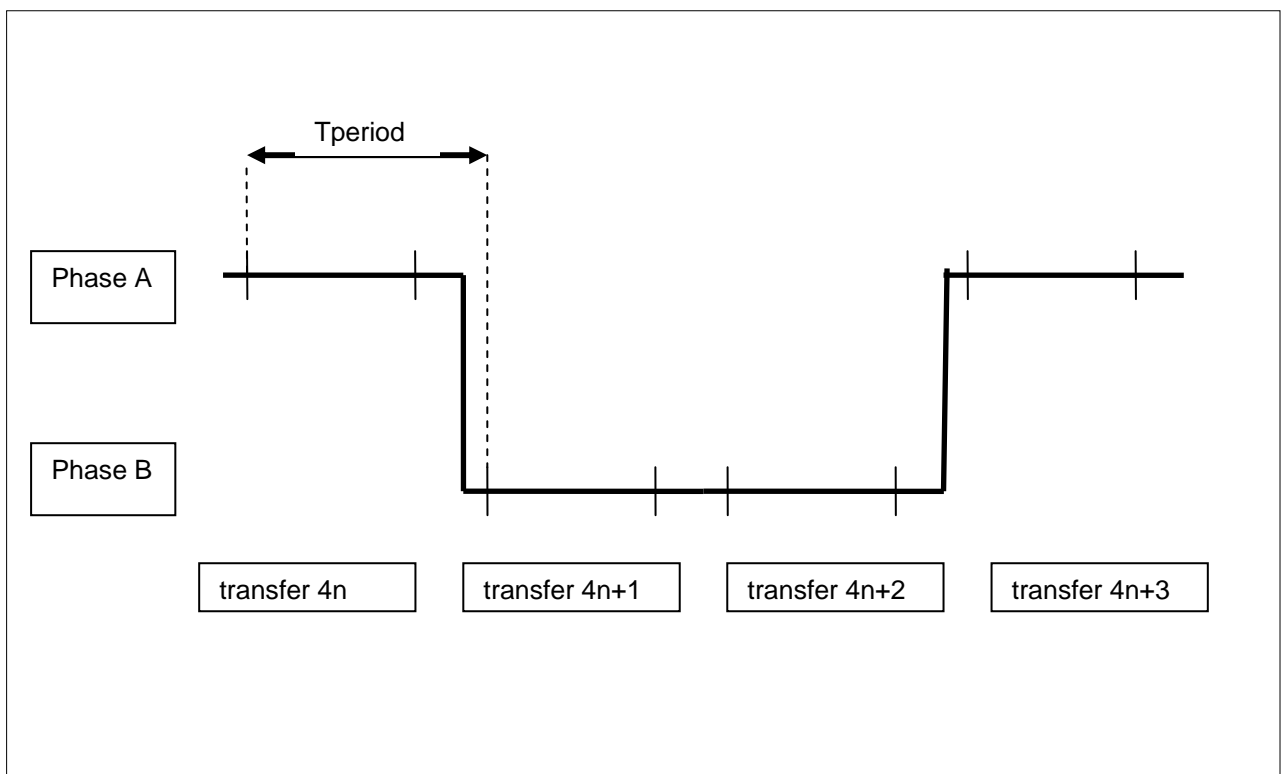
A phase-B frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + 4n + 1$$

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + 4n + 2$$

where $0 \leq n < \text{HIF_N_WBS_INTEGR} / 2$.

The time that the integration started of each “transfer” is $T_{\text{lat}} + n * T_{\text{period}}$ where n is the transfer-number. How T_{period} relates to HIF_T_ACC_WBS and HIF_T_ACC_HRS will be documented in OBS-UM.



4.8.1.4 Slow chop HRS

A measurement consists of $HIF_N_WBS_START * HIF_R_HRS$ HRS data-transfers
 All transfers from HRS are sequentially numbered, starting at 0.

The transfers numbered $4nR+$ and $4nR+3+m$ are integrated as Phase-A frames.
 The transfers numbered $4nR+1+m$ and $4nR+2+m$ are integrated as Phase-B frames.

Assume the IntegrationSequenceNumber of a frame is SeqNr

A phase-A frames with integrationSequenceNumber SeqNr consist of transfers:

$$SeqNr * HIF_N_HRS_INTEGR + 4 * HIF_R_HRS * n + m$$

$$SeqNr * HIF_N_HRS_INTEGR + 4 * HIF_R_HRS * n + 3 + m$$

Where $0 \leq n < HIF_N_HRS_INTEGR / (2 * HIF_R_HRS)$.
 and $0 \leq m < HIF_R_HRS$

The phase B frames consist of transfers:

$$SeqNr * HIF_N_HRS_INTEGR + 4 * HIF_R_HRS * n + 1 + m$$

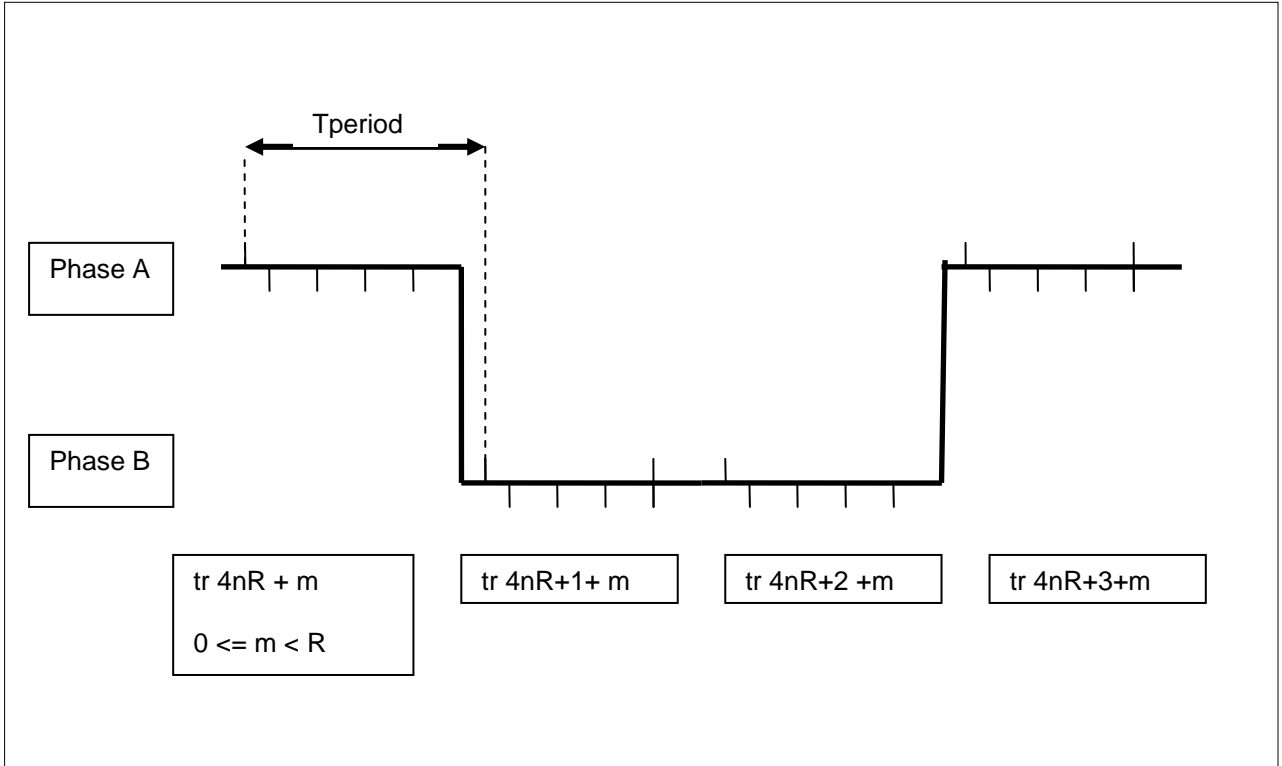
$$SeqNr * HIF_N_HRS_INTEGR + 4 * HIF_R_HRS * n + 2 + m$$

Where $0 \leq n < HIF_N_HRS_INTEGR / (2 * HIF_R_HRS)$.
 and $0 \leq m < HIF_R_HRS$

The time that the integration started of each “transfer” is
 $Thrs = Tlatched + (n / HIF_R_HRS) * Tperiod + (n \bmod HIF_R_HRS) * Thrs$
 where n is the transfer-number.

How Tperiod relates to HIF_T_ACC_WBS will be documented in OBS-UM

How Thrs relates to HIF_T_ACC_HRS and HIF_DEL_HRS will be documented in OBS-UM



4.8.1.5 Fast chop WBS

In fast chop mode, the measurement can be divided in groups of two frames, that belong to the modulation phase, A-B. (Refer to the command-specification section 3.8.11.4.)

A measurement consists of HIF_N_WBS_START WBS data transfers.

A frame is the result of HIF_N_WBS_INTEGR integrations.

All transfers from the WBS are sequentially numbered (0,1,2,... HIF_N_WBS_START-1).

A transfer is the result of HIF_N_WBS_ACC accumulations. (Accumulations are made inside WBS).

The transfers numbered 2n are integrated as Phase-A frames.

The transfers numbered 2n+1 are integrated as Phase-B frames.

Assume the IntegrationSequenceNumber of a frame is SeqNr

A phase-A frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + 2n$$

where $0 \leq n < \text{HIF_N_WBS_INTEGR}$.

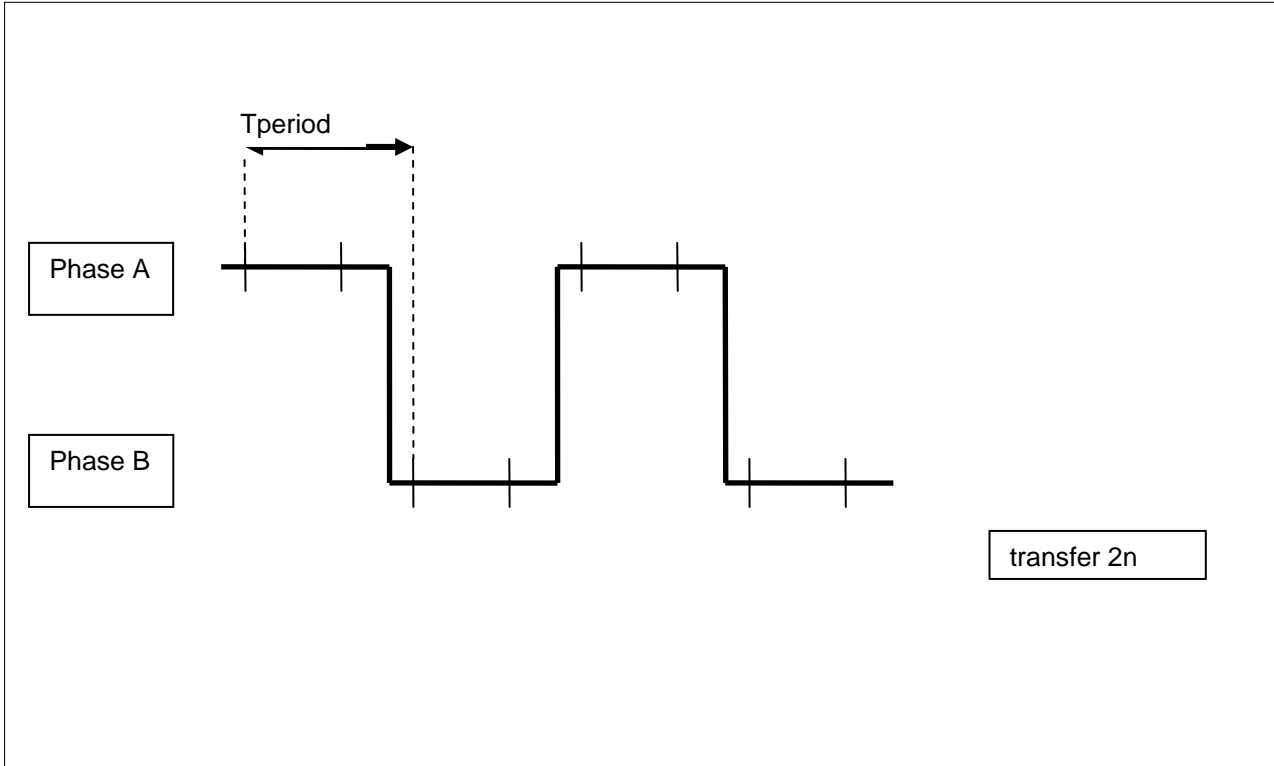
A phase-B frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_WBS_INTEGR} + 2n + 1$$

where $0 \leq n < \text{HIF_N_WBS_INTEGR}$.

The time that the integration started of each “transfer” is Tlatched + n * Tperiod where n is the transfer-number.

How Tperiod relates to HIF_T_ACC_WBS, and HIF_N_ACC_WBS will be documented in OBS-UM



4.8.1.6 Fast chop HRS

In fast chop mode, the measurement can be divided in groups of two frames, that belong to the modulation phase, A-B. (Refer to the command-specification section 3.8.11.4.)

A measurement consists of HIF_N_WBS_START WBS / HIF_N_WBS_ACC data transfers.

A frame is the result of HIF_N_HRS_INTEGR integrations.

All transfers from the HRS are sequentially numbered (0,1,2,...).

After stop-integration, the data is transferred to ICU.

The transfers numbered 2n are integrated as Phase-A frames.

The transfers numbered 2n+1 are integrated as Phase-B frames.

Assume the IntegrationSequenceNumber of a frame is SeqNr

A phase-A frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_HRS_INTEGR} + 2n$$

where $0 \leq n < \text{HIF_N_HRS_INTEGR}$.

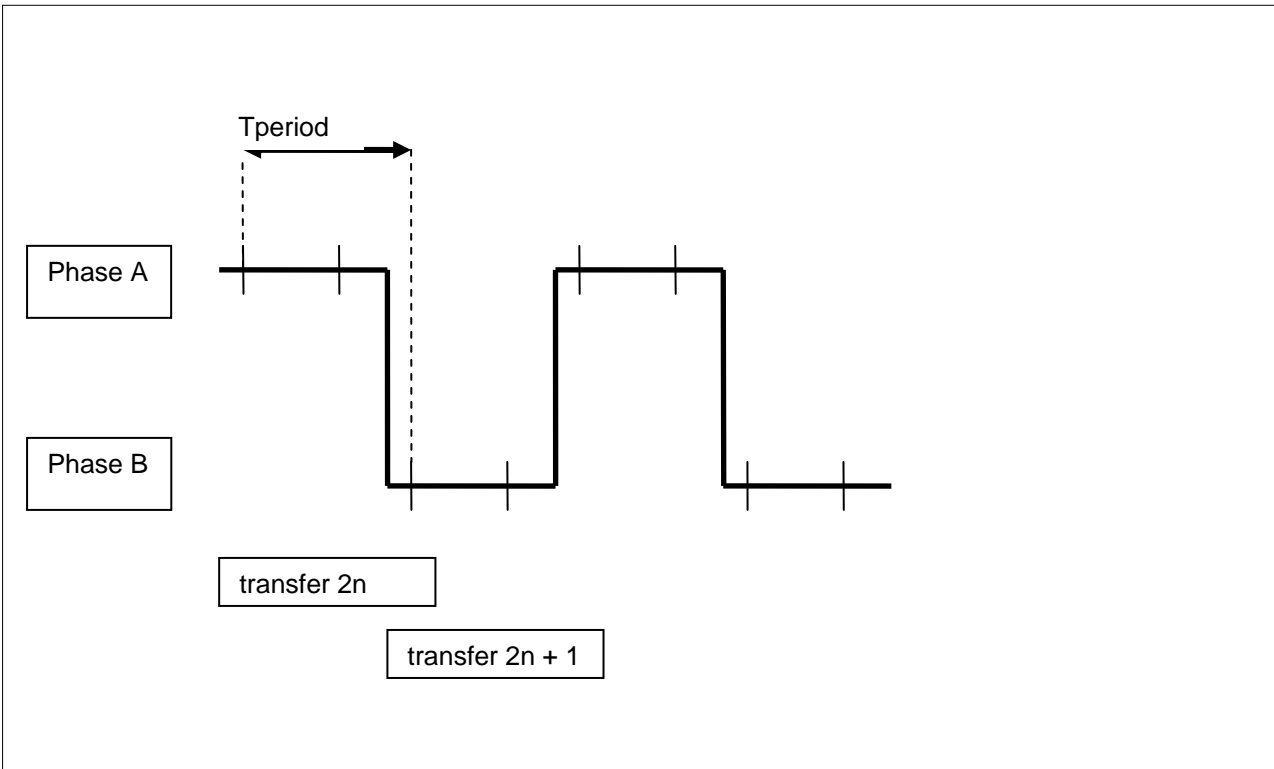
A phase-B frame consists of transfers:

$$\text{SeqNr} * \text{HIF_N_HRS_INTEGR} + 2n + 1$$

where $0 \leq n < \text{HIF_N_HRS_INTEGR}$.

The time that the integration started of each “transfer” is Tlatched + n * Tperiod where n is the transfer-number.

How Tperiod relates to HIF_T_ACC_WBS, and HIF_N_ACC_WBS will be documented in OBS-UM.



4.8.2 Frame specification

1. The selected data of one of the Integration Buffers is packed in a *Frame*. The Structure-ID (SID) defines from which Integration Buffer and from which Spectrometer the data originates (The integration buffer is an array inside the ICU. Do not confuse with the accumulation buffer inside the spectrometers)
2. One frame consists of a *Start Science Dataframe* packet followed by *NumberOfPacketsInFrame Science Data Report Packets*.
3. The *IntegrationSequenceNumber* counts the number of times the Integration Buffer is packed and down-linked.
4. The *IntegrationSequenceNumber* starts at 0, at the beginning of each measurement
5. All packets of one frame have the same *IntegrationSequenceNumber*.
6. All *Science Data Report Packets* of one frame have the same SID.
7. Together with a *Start Science Dataframe* an *IF power level* packet is generated. This packet is specified in RD 1.
8. The latched time is the time at the start of the measurement. This time is therefore constant throughout the measurement The start time of the frame can be derived from the spectroscopy mode, the *IntegrationSequenceNumber* and the duration.
9. To associate the science frame with HK-packets a frame-counter is introduced for each spectrometer. This counter is increased by 1, each time that a frame-transfer is commanded. The counter is reset at the reception of a set-OBS-ID telecommand. This counter occurs in the HK-packet (WBS-V transfer_nr, WBS-H transfer_nr, HRS-V transfer_nr and HRS-H transfer_nr)

Source	APID
HRS-H	1028
HRS-V	1029
WBS-H	1030
WBS-V	1031

Identifier	value
Type	21
Subtype	1

Table 4.8.2-1 Structure Identifiers for Science packets

		Start frame	16 bits	24 bits	IF HK
HRS-H integration buffer #1	Phase-A	1		17	25
HRS-H integration buffer #2	Phase-B	2		18	26
HRS-V integration buffer #1	Phase-A	3		19	27
HRS-V integration buffer #2	Phase-B	4		20	28
WBS-H integration buffer #1	Phase-A	5	13	21	29
WBS-H integration buffer #2	Phase-B	6	14	22	30
WBS-V integration buffer #1	Phase-A	7	15	23	31
WBS-V integration buffer #2	Phase-B	8	16	24	32

4.8.3 Start HRS science dataframe

Position	Length	Monitor Parameter	Value / remark
16	16	Structure ID	H: 1, 2 V: 3, 4
18	32	Observation ID	
22	32	Building block ID	
26	16	IntegrationSequenceNumber	
28	16	NumberOfPacketsInFrame	
30	35	Latched time	
36	16	HIF_N_HRS_INTEGR	
38	16	Spare	0
40	16	HIF_HRSH_SEL / HIF_HRSV_SEL	
42	24	HRS word #1 + n*258	n=0
45	24	HRS word #2 + n*258	n=0
48	24	HRS word #3 + n*258	n=0
42 + n*9	24	HRS word #1 + n*258	n=1-14
45 + n*9	24	HRS word #2 + n*258	n=1-14
48 + n*9	24	HRS word #3 + n*258	n=1-14
177	24	HRS word #1 + n*258	n=15
180	24	HRS word #2 + n*258	n=15
183	24	HRS word #3 + n*258	n=15
186	16	HRS transfer_nr	
188	16	HF_APR_CH_ROT	Chopper rotation 8F50
190	16	HF_DPR_CH_ROT2	Commanded Chopper rotation 8F10
192	1	HL_Frequency_E	Invalid-flag LSU_FREQ_TLMY B086
192 bit: 1	15	HL_Frequency_V	LSU Frequency monitor
194	24	HL_LSU_f_main	Last value for F_main sent to LSU; cleared to FFFF at operation changing subband F30A CC7A B33A F30A CC7A B33C
197	24	HL_LSU_f_offset	Last value for F_offset sent to LSU; cleared to FFFF at operation changing subband F30A CC7A B33E

Notes:

10. HIF_N_HRS_INTEGR is an echoed command parameter. This is the number of integrations in HRS-Integration buffer per packetization.

4.8.4 Start WBS science dataframe

Position	Length	Monitor Parameter	Value / remark	
16	16	Structure ID	H: 5, 6 V: 7, 8	
18	32	Observation ID		
22	32	Building block ID		
26	16	IntegrationSequenceNumber		
28	16	NumberOfPacketsInFrame		
30	48	Latched time		
36	16	HIF_N_WBS_INTEGR		
38	16	HIF_WBS_RSHIFT		
40	16	HIF_WBSH_OFFSET1 / HIF_WBSV_OFFSET1		
42	16	HIF_WBSH_WIDTH1 / HIF_WBSV_WIDTH1		
44	16	HIF_WBSH_OFFSET2 / HIF_WBSV_OFFSET2		
46	16	HIF_WBSH_WIDTH2 / HIF_WBSV_WIDTH2		
48	16	HIF_WBSH_OFFSET3 / HIF_WBSV_OFFSET3		
50	16	HIF_WBSH_WIDTH3 / HIF_WBSV_WIDTH3		
52	16	HIF_WBSH_OFFSET4 / HIF_WBSV_OFFSET4		
54	16	HIF_WBSH_WIDTH4 / HIF_WBSV_WIDTH4		
56	16	IntegratedScanCount WBS word 8192 (8193)		
58	24	WBS word 0 (1)	Dark Pixels CCD1	
61	24	WBS word 1 (3)		
64	24	WBS word 2 (5)		
67	24	WBS word 3 (7)		
70	24	WBS word 2048 (2)	Dark Pixels CCD2	
73	24	WBS word 2049 (4)		
76	24	WBS word 2050 (6)		
79	24	WBS word 2051 (8)		
82	24	WBS word 4096 (4097)	Dark Pixels CCD3	
85	24	WBS word 4097 (4099)		
88	24	WBS word 4098 (4101)		
91	24	WBS word 4099 (4103)		
94	24	WBS word 6144 (4098)	Dark Pixels CCD4	
97	24	WBS word 6145 (4100)		
100	24	WBS word 6146 (4102)		
103	24	WBS word 6147 (4104)		
106	16	WBS transfer_nr		
108	16	HF_APR_CH_ROT	Chopper rotation	8F50
110	16	HF_DPR_CH_ROT2	Commanded Chopper rotation	8F10
112	1	HL_Frequency_E	Invalid-flag LSU FREQ TLMY	B086
112 bit: 1	15	HL_Frequency_V	LSU Frequency monitor	
114	24	HL_LSU_f_main	Last value for F_main sent to LSU; cleared to FFFF at operation changing subband	F30A CC7A B33A F30A CC7A
117	24	HL_LSU_f_offset	Last value for F_offset sent to LSU; cleared to FFFF at operation changing subband	B33C F30A CC7A B33E

Notes:

11. The Dark pixels are integrated as all other data words. The dark pixels will be packed always in 24 bits. The OBS stores the WBS-datawords in a different order than they are transmitted by the WBS. The WBS-coordinate of each dataword is as follows:
 - The datawords of CCD#1 are $1+2n$, with n counts from 0 up to 2047
 - The datawords of CCD#2 are $2+2n$, with n counts from 0 up to 2047
 - The datawords of CCD#3 are $4097+2n$, with n counts from 0 up to 2047
 - The datawords of CCD#4 are $4098+2n$, with n counts from 0 up to 2047The OBS- coordinate of each dataword is as follows:
 - The datawords of CCD#1 are numbered from 0 up to 2047
 - The datawords of CCD#2 are numbered from 2048 up to 4095
 - The datawords of CCD#3 are numbered from 4096 up to 6143
 - The datawords of CCD#4 are numbered from 6144 up to 8191
12. The selected regions are expressed in OBS-coordinates.
13. The numbers of the dark-pixels are expressed in OBS-coordinates with WBS-coordinates in ellipses.
14. The darkpixels may appear in both the start-frame packet and in the data-report.
15. The order of the TM packets is: 1 start-frame, followed by CCD1, 2, 3, 4. The packets with the lowest coordinates are transmitted first.

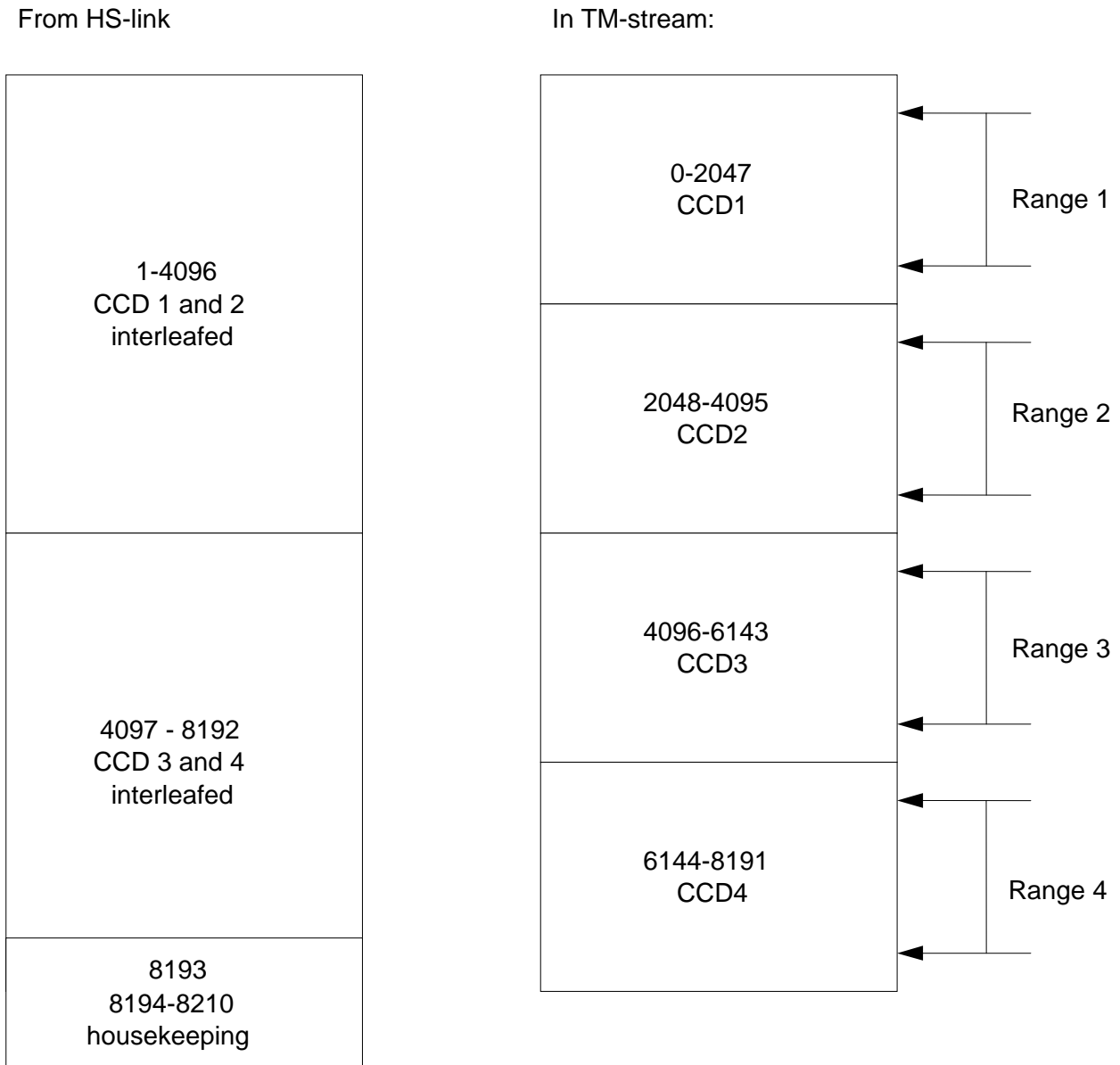


Figure 4.8.4-1 Word-numbering in WBS-HS stream and TM stream

4.8.5 Science data reports

The format of the science packets is identical for HRS and WBS data

4.8.5.1 Science packet 24 bits

Position	Length	Monitor Parameter	Value / remark
16	16	Structure ID	17-24
18	32	Observation ID	
22	32	Building block ID	
26	16	Integration sequence number	
28	16	NumberOfPacketsInFrame	
30	16	PacketNumberInFrame	
32	16	FirstChannelNumber	
34 +3i	24	Data	Nch * 3 octets Nch is max 329

4.8.5.2 Science packet 16 bits

Position	Length	Monitor Parameter	Value / remark
16	16	Structure ID	13-16
18	32	Observation ID	
22	32	Building block ID	
26	16	Integration sequence number	
28	16	NumberOfPacketsInFrame	
30	16	PacketNumberInFrame	
32	16	FirstChannelNumber	
34 + 2i	16	Data	Nch * 2 octets Nch is max 494

Notes:

16. The PacketNumberInFrame starts counting at 0 and counts up to NumberOfPacketsInFrame-1.

For HRS:

- 17. The size of a HRS science packet is fixed: The words of one GaAs fit in one Science packet.
- 18. The FirstChannelNumber is the word-number of the first data-word in the packet minus 1. Hence it assumes values $n * 258$ ($n=0,15$)
- 19. The first three words of each GaAs appear in both the start frame packet and the data reports.
- 20. The order in which the TM-packets appear in the stream is shown in Table 4.8.5-1:

Table 4.8.5-1 FirstChannelNumber for the 16 GaAs-packets

Packet	n
1. Start Frame	
2. Block 8 GaAs1	0
3. Block 8 GaAs2	258
4. Block 7 GaAs1	516
5. Block 7 GaAs2	774
6. Block 6 GaAs1	1032
7. Block 6 GaAs2	1290
8. Block 5 GaAs1	1548
9. Block 5 GaAs2	1806
10. Block 4 GaAs1	2064
11. Block 4 GaAs2	2322
12. Block 3 GaAs1	2580
13. Block 3 GaAs2	2838
14. Block 2 GaAs1	3096
15. Block 2 GaAs2	3354
16. Block 1 GaAs1	3612
17. Block 1 GaAs2	3870

For WBS:

21. The FirstChannelNumber is the OBS-coordinate of the first dataword in the packet.

4.9 Scan and tune reports

Diagnostic science packets are used to telemeter parameter scan reports.

Identifier	value
APID-P	1026
APID-R	1027
Type	3
Subtype	25

4.9.1.1 IF power measurement report
deleted

4.9.1.2 HIFI_FCU_Parameter_Scan_report

Position	Length	Monitor Parameter		Value/remark
16	16	Structure_ID		266
18	32	OBS_ID		
22	32	BB_ID		
26	16	HIF_Nvoltage		Copy of command parameters
28	16	HIF_Nmagnet		
30	16	HIF_step_time		
32	16	HIF_ch1_mx0_V		
34	16	HIF_cv1_mx0_V		
36	16	HIF_mx_step_V		
38	16	HIF_ch1_mx_mg0_C		
40	16	HIF_cv1_mx_mg0_C		
42	16	HIF_mx_mg_step_C		
44	16	HF_DH1_MXBAND	Active mixer band H1	
46	16	HF_DV1_MXBAND	Active mixer band V1	
48	16	HIF_Npoints	Number of measurements.	HIF_Nvoltage * HIF_Nmagnet
50 + 12i	16	HF_AH1_BIAS_V	Mixer junction voltage H	Repeat HIF_Npoints times
52 + 12i	16	HF_AH1_MXJNC1_C	Mixer junction current H band 1	
52 + 12i	16	HF_AH1_MXJNC2_C	Mixer junction current H band 2	
52 + 12i	16	HF_AH1_MXJNC3_C	Mixer junction current H band 3	
52 + 12i	16	HF_AH1_MXJNC4_C	Mixer junction current H band 4	
52 + 12i	16	HF_AH1_MXJNC5_C	Mixer junction current H band 5	
52 + 12i	16	HF_AH1_MXJNC6_C	Mixer junction current H band 6	
52 + 12i	16	HF_AH1_MXJNC7_C	Mixer junction current H band 7	
54 + 12i	16	HF_IVH_MXMG_C	Magnet current H	
56 + 12i	16	HF_AV1_BIAS_V	Mixer junction voltage V	
58 + 12i	16	HF_AV1_MXJNC1_C	Mixer junction current V band 1	
58 + 12i	16	HF_AV1_MXJNC2_C	Mixer junction current V band 2	
58 + 12i	16	HF_AV1_MXJNC3_C	Mixer junction current V band 3	
58 + 12i	16	HF_AV1_MXJNC4_C	Mixer junction current V band 4	
58 + 12i	16	HF_AV1_MXJNC5_C	Mixer junction current V band 5	
58 + 12i	16	HF_AV1_MXJNC6_C	Mixer junction current V band 6	
58 + 12i	16	HF_AV1_MXJNC7_C	Mixer junction current V band 7	
60 + 12i	16	HF_AV1_MXMG_C	Magnet current V	

4.9.1.3 HIFI_Diplexer_Scan_Report_with_IF

Position	Length	Monitor Parameter	Description	Value / remark
16	16	Structure ID		258
18	32	Observation ID		
22	32	Building block ID		
26	16	HIF_step_time		
28	16	HIF_CH1_DPACT0_C		
30	16	HIF_CH2_DPACT0_C		
32	16	HIF_DPACT_step_C		
34	16	HF_DH1_MXBAND	Active mixer band H1	
36	16	HF_DV1_MXBAND	Active mixer band V1	
38	16	HIF_Npoints	Number of measurements.	
40 +48i	16	HF_AH1_DPACT_C	Diplexer H actuator current	Repeat HIF_Npoints times
42 +48i	16	HF_AH1_MXBIAS_V	Mixer junction voltage H	
44 +48i	16	HF_AH1_MXJNC1_C	Mixer junction current H band 1	
44 +48i	16	HF_AH1_MXJNC2_C	Mixer junction current H band 2	
44 +48i	16	HF_AH1_MXJNC3_C	Mixer junction current H band 3	
44 +48i	16	HF_AH1_MXJNC4_C	Mixer junction current H band 4	
44 +48i	16	HF_AH1_MXJNC5_C	Mixer junction current H band 5	
44 +48i	16	HF_AH1_MXJNC6_C	Mixer junction current H band 6	
44 +48i	16	HF_AH1_MXJNC7_C	Mixer junction current H band 7	
46 +48i	16	HF_AH1_MXMG_C	Magnet current H	
48 +48i	16	HF_AV1_DPACT_C	Diplexer V actuator current	
50 +48i	16	HF_AV1_MXBIAS_V	Mixer junction voltage V	
52 +48i	16	HF_AV1_MXJNC1_C	Mixer junction current V band 1	
52 +48i	16	HF_AV1_MXJNC2_C	Mixer junction current V band 2	
52 +48i	16	HF_AV1_MXJNC3_C	Mixer junction current V band 3	
52 +48i	16	HF_AV1_MXJNC4_C	Mixer junction current V band 4	
52 +48i	16	HF_AV1_MXJNC5_C	Mixer junction current V band 5	
52 +48i	16	HF_AV1_MXJNC6_C	Mixer junction current V band 6	
52 +48i	16	HF_AV1_MXJNC7_C	Mixer junction current V band 7	
54 +48i	16	HF_AV1_MXMG_C	Magnet current V	
56 +48i	16	HRH_ifpwr_1_8_1	IF power in GaAs 8_1	
58 +48i	16	HRH_ifpwr_1_7_1	IF power in GaAs 7_1	
60 +48i	16	HRH_ifpwr_1_6_1	IF power in GaAs 6_1	
62 +48i	16	HRH_ifpwr_1_5_1	IF power in GaAs 5_1	
64 +48i	16	HRH_ifpwr_1_4_1	IF power in GaAs 4_1	
66 +48i	16	HRH_ifpwr_1_3_1	IF power in GaAs 3_1	
68 +48i	16	HRH_ifpwr_1_2_1	IF power in GaAs 2_1	
70 +48i	16	HRH_ifpwr_1_1_1	IF power in GaAs 1_1	
72 +48i	16	HRV_ifpwr_1_8_1	IF power in GaAs 8_1	
74 +48i	16	HRV_ifpwr_1_7_1	IF power in GaAs 7_1	
76 +48i	16	HRV_ifpwr_1_6_1	IF power in GaAs 6_1	
78 +48i	16	HRV_ifpwr_1_5_1	IF power in GaAs 5_1	
80 +48i	16	HRV_ifpwr_1_4_1	IF power in GaAs 4_1	
82 +48i	16	HRV_ifpwr_1_3_1	IF power in GaAs 3_1	
84 +48i	16	HRV_ifpwr_1_2_1	IF power in GaAs 2_1	

86 +48i	16	HRV_ifpwr_1_1_1	IF power in GaAs 1_1	
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4.9.1.4 HIFI_Diplexer_Scan_Report

Position	Length	Monitor Parameter	Description	Value / remark
16	16	Structure ID		270
18	32	Observation ID		
22	32	Building block ID		
26	16	HIF_step_time		
28	16	HIF_CH1_DPACT0_C		
30	16	HIF_CH2_DPACT0_C		
32	16	HIF_DPACT_step_C		
34	16	HF_DH1_MXBAND	Active mixer band H1	
36	16	HF_DV1_MXBAND	Active mixer band V1	
38	16	HIF_Npoints	Number of measurements.	
40 +16i	16	HF_AH1_DPACT_C	Diplexer H actuator current	Repeat HIF_Npoints times
42 +16i	16	HF_AH1_MXBIAS_V	Mixer junction voltage H	
44 +16i	16	HF_AH1_MXJNC1_C	Mixer junction current H band 1	
44 +16i	16	HF_AH1_MXJNC2_C	Mixer junction current H band 2	
44 +16i	16	HF_AH1_MXJNC3_C	Mixer junction current H band 3	
44 +16i	16	HF_AH1_MXJNC4_C	Mixer junction current H band 4	
44 +16i	16	HF_AH1_MXJNC5_C	Mixer junction current H band 5	
44 +16i	16	HF_AH1_MXJNC6_C	Mixer junction current H band 6	
44 +16i	16	HF_AH1_MXJNC7_C	Mixer junction current H band 7	
46 +16i	16	HF_AH1_MXMG_C	Magnet current H	
48 +16i	16	HF_AV1_DPACT_C	Diplexer V actuator current	
50 +16i	16	HF_AV1_MXBIAS_V	Mixer junction voltage V	
52 +16i	16	HF_AV1_MXJNC1_C	Mixer junction current V band 1	
52 +16i	16	HF_AV1_MXJNC2_C	Mixer junction current V band 2	
52 +16i	16	HF_AV1_MXJNC3_C	Mixer junction current V band 3	
52 +16i	16	HF_AV1_MXJNC4_C	Mixer junction current V band 4	
52 +16i	16	HF_AV1_MXJNC5_C	Mixer junction current V band 5	
52 +16i	16	HF_AV1_MXJNC6_C	Mixer junction current V band 6	
52 +16i	16	HF_AV1_MXJNC7_C	Mixer junction current V band 7	
54 +16i	16	HF_AV1_MXMG_C	Magnet current V	

4.9.1.5 HIFI_LCU_IV_Report

Position	Length	Monitor Parameter	Value
16	16	Structure ID	259
18	32	Observation ID	
22	32	Building block ID	
26	32	LCU command	Copy of command parameters
30	16	Wait time	
32	16	HL_RD_LASTIV (HK at 0xB330)	stage/band in last measured IV curve
34	16	C1 (HK at 0xB328)	
36	16	C2 (HK at 0xB32A)	
38	16	C3 (HK at 0xB32C)	
40	16	C4 (HK at 0xB32E)	
42	16	V1 (HK at 0xB320)	
44	16	V2 (HK at 0xB322)	
46	16	V3 (HK at 0xB324)	
48	16	V4 (HK at 0xB326)	

Notes:

- Before the 8 parameters can be read, the RAMPAGE is set by: 0xF30ACC7A
- LCU command = F06n-m000, where n= channel number and m= m1, m2, m3

Position	Length	Monitor Parameter	Description
16	16	Structure ID	
18	32	Observation ID	
22	32	Building block ID	
26	32	HIF_LCU_IV_cmd	received command
27 bit: 4	8	HIF_LCU_diode	diode for which the IV curve is measured
34 bit: 1	15	HL_IV_M1_1A_C	current calibrated for diode M1_1A
42 bit: 1	15	HL_IV_M1_1A_V	voltage calibrated for diode M1_1A
34 bit: 1	15	HL_IV_M1_1B_C	current calibrated for diode M1_1B
42 bit: 1	15	HL_IV_M1_1B_V	voltage calibrated for diode M1_1B
34 bit: 1	15	HL_IV_M1_2A_C	current calibrated for diode M1_2A
42 bit: 1	15	HL_IV_M1_2A_V	voltage calibrated for diode M1_2A
34 bit: 1	15	HL_IV_M1_2B_C	current calibrated for diode M1_2B
42 bit: 1	15	HL_IV_M1_2B_V	voltage calibrated for diode M1_2B
34 bit: 1	15	HL_IV_M1_3A_C	current calibrated for diode M1_3A
42 bit: 1	15	HL_IV_M1_3A_V	voltage calibrated for diode M1_3A
34 bit: 1	15	HL_IV_M1_3B_C	current calibrated for diode M1_3B
42 bit: 1	15	HL_IV_M1_3B_V	voltage calibrated for diode M1_3B
34 bit: 1	15	HL_IV_M1_4A_C	current calibrated for diode M1_4A
42 bit: 1	15	HL_IV_M1_4A_V	voltage calibrated for diode M1_4A
34 bit: 1	15	HL_IV_M1_4B_C	current calibrated for diode M1_4B
42 bit: 1	15	HL_IV_M1_4B_V	voltage calibrated for diode M1_4B
34 bit: 1	15	HL_IV_M1_5A_C	current calibrated for diode M1_5A
42 bit: 1	15	HL_IV_M1_5A_V	voltage calibrated for diode M1_5A
34 bit: 1	15	HL_IV_M1_5B_C	current calibrated for diode M1_5B

Position	Length	Monitor Parameter	Description
42 bit: 1	15	HL_IV_M1_5B_V	voltage calibrated for diode M1_5B
34 bit: 1	15	HL_IV_M1_6A_C	current calibrated for diode M1_6A
42 bit: 1	15	HL_IV_M1_6A_V	voltage calibrated for diode M1_6A
34 bit: 1	15	HL_IV_M1_6B_C	current calibrated for diode M1_6B
42 bit: 1	15	HL_IV_M1_6B_V	voltage calibrated for diode M1_6B
34 bit: 1	15	HL_IV_M1_7A_C	current calibrated for diode M1_7A
42 bit: 1	15	HL_IV_M1_7A_V	voltage calibrated for diode M1_7A
34 bit: 1	15	HL_IV_M1_7B_C	current calibrated for diode M1_7B
42 bit: 1	15	HL_IV_M1_7B_V	voltage calibrated for diode M1_7B
34 bit: 1	15	HL_IV_M2_1A_C	current calibrated for diode M2_1A
42 bit: 1	15	HL_IV_M2_1A_V	voltage calibrated for diode M2_1A
34 bit: 1	15	HL_IV_M2_1B_C	current calibrated for diode M2_1B
42 bit: 1	15	HL_IV_M2_1B_V	voltage calibrated for diode M2_1B
34 bit: 1	15	HL_IV_M2_2A_C	current calibrated for diode M2_2A
42 bit: 1	15	HL_IV_M2_2A_V	voltage calibrated for diode M2_2A
34 bit: 1	15	HL_IV_M2_2B_C	current calibrated for diode M2_2B
42 bit: 1	15	HL_IV_M2_2B_V	voltage calibrated for diode M2_2B
34 bit: 1	15	HL_IV_M2_3A_C	current calibrated for diode M2_3A
42 bit: 1	15	HL_IV_M2_3A_V	voltage calibrated for diode M2_3A
34 bit: 1	15	HL_IV_M2_3B_C	current calibrated for diode M2_3B
42 bit: 1	15	HL_IV_M2_3B_V	voltage calibrated for diode M2_3B
34 bit: 1	15	HL_IV_M2_4A_C	current calibrated for diode M2_4A
42 bit: 1	15	HL_IV_M2_4A_V	voltage calibrated for diode M2_4A
34 bit: 1	15	HL_IV_M2_4B_C	current calibrated for diode M2_4B
42 bit: 1	15	HL_IV_M2_4B_V	voltage calibrated for diode M2_4B
34 bit: 1	15	HL_IV_M2_5A_C	current calibrated for diode M2_5A
42 bit: 1	15	HL_IV_M2_5A_V	voltage calibrated for diode M2_5A
34 bit: 1	15	HL_IV_M2_5B_C	current calibrated for diode M2_5B
42 bit: 1	15	HL_IV_M2_5B_V	voltage calibrated for diode M2_5B
34 bit: 1	15	HL_IV_M2_6A_C	current calibrated for diode M2_6A
42 bit: 1	15	HL_IV_M2_6A_V	voltage calibrated for diode M2_6A
34 bit: 1	15	HL_IV_M2_6B_C	current calibrated for diode M2_6B
42 bit: 1	15	HL_IV_M2_6B_V	voltage calibrated for diode M2_6B
34 bit: 1	15	HL_IV_M2_7A_C	current calibrated for diode M2_7A
42 bit: 1	15	HL_IV_M2_7A_V	voltage calibrated for diode M2_7A
34 bit: 1	15	HL_IV_M2_7B_C	current calibrated for diode M2_7B
42 bit: 1	15	HL_IV_M2_7B_V	voltage calibrated for diode M2_7B
34 bit: 1	15	HL_IV_M3_2A_C	current calibrated for diode M3_2A
42 bit: 1	15	HL_IV_M3_2A_V	voltage calibrated for diode M3_2A
34 bit: 1	15	HL_IV_M3_2B_C	current calibrated for diode M3_2B
42 bit: 1	15	HL_IV_M3_2B_V	voltage calibrated for diode M3_2B
34 bit: 1	15	HL_IV_M3_3A_C	current calibrated for diode M3_3A
42 bit: 1	15	HL_IV_M3_3A_V	voltage calibrated for diode M3_3A
34 bit: 1	15	HL_IV_M3_3B_C	current calibrated for diode M3_3B
42 bit: 1	15	HL_IV_M3_3B_V	voltage calibrated for diode M3_3B
34 bit: 1	15	HL_IV_M3_6A_C	current calibrated for diode M3_6A
42 bit: 1	15	HL_IV_M3_6A_V	voltage calibrated for diode M3_6A

4.9.1.6 HIFI_HRS_H_tune_report

Position	Length	Monitor Parameter	Description	Value
16	16	Structure ID		260
18	32	Observation ID		
22	32	Building block ID		
26	16	HRH_C_star_8	C* parameter as used during tuning	
28	16	HRH_C_star_7	C* parameter as used during tuning	
30	16	HRH_C_star_6	C* parameter as used during tuning	
32	16	HRH_C_star_5	C* parameter as used during tuning	
34	16	HRH_C_star_4	C* parameter as used during tuning	
36	16	HRH_C_star_3	C* parameter as used during tuning	
38	16	HRH_C_star_2	C* parameter as used during tuning	
40	16	HRH_C_star_1	C* parameter as used during tuning	
43	8	HRH_E1L_ATT	commanded attenuator setting 1l	
45	8	HRH_E2L_ATT	commanded attenuator setting 2l	
47	8	HRH_E3L_ATT	commanded attenuator setting 3l	
49	8	HRH_E4L_ATT	commanded attenuator setting 4l	
51	8	HRH_E4U_ATT	commanded attenuator setting 4u	
53	8	HRH_E3U_ATT	commanded attenuator setting 3u	
55	8	HRH_E2U_ATT	commanded attenuator setting 2u	
57	8	HRH_E1U_ATT	commanded attenuator setting 1u	

4.9.1.7 HIFI_HRS_V_tune_report

Position	Length	Monitor Parameter	Description	Value
16	16	Structure ID		261
18	32	Observation ID		
22	32	Building block ID		
26	16	HRV_C_star_8	C* parameter as used during tuning	
28	16	HRV_C_star_7	C* parameter as used during tuning	
30	16	HRV_C_star_6	C* parameter as used during tuning	
32	16	HRV_C_star_5	C* parameter as used during tuning	
34	16	HRV_C_star_4	C* parameter as used during tuning	
36	16	HRV_C_star_3	C* parameter as used during tuning	
38	16	HRV_C_star_2	C* parameter as used during tuning	
40	16	HRV_C_star_1	C* parameter as used during tuning	
43	8	HRV_E1L_ATT	commanded attenuator setting 1l	
45	8	HRV_E2L_ATT	commanded attenuator setting 2l	
47	8	HRV_E3L_ATT	commanded attenuator setting 3l	
49	8	HRV_E4L_ATT	commanded attenuator setting 4l	
51	8	HRV_E4U_ATT	commanded attenuator setting 4u	
53	8	HRV_E3U_ATT	commanded attenuator setting 3u	
55	8	HRV_E2U_ATT	commanded attenuator setting 2u	
57	8	HRV_E1U_ATT	commanded attenuator setting 1u	

4.9.1.8 HIFI_WBS_H_tune_report

Position	Length	Monitor Parameter		Value
16	16	Structure ID		262
18	32	Observation ID		
22	32	Building block ID		
26	32	HWH_if_ccd1_1	IF power in CCD 1	
30	32	HWH_if_ccd2_1	IF power in CCD 2	
34	32	HWH_if_ccd3_1	IF power in CCD 3	
38	32	HWH_if_ccd4_1	IF power in CCD 4	
42	32	Command		E4xx xxxx
43 bit: 3	3	HWH_EATT_Band_4	commanded band 4 attenuator setting	
43 bit: 6	3	HWH_EATT_Band_3	commanded band 3 attenuator setting	
44 bit: 1	3	HWH_EATT_Band_2	commanded band 2 attenuator setting	
44 bit: 4	3	HWH_EATT_Band_1	commanded band 1 attenuator setting	
44 bit: 7	4	HWH_EATT_IN	commanded input-attenuator setting	

4.9.1.9 HIFI_WBS_V_tune_report

Position	Length	Monitor Parameter		Value
16	16	Structure ID		263
18	32	Observation ID		
22	32	Building block ID		
26	32	HWV_if_ccd1_1	IF power in CCD 1	
30	32	HWV_if_ccd2_1	IF power in CCD 2	
34	32	HWV_if_ccd3_1	IF power in CCD 3	
38	32	HWV_if_ccd4_1	IF power in CCD 4	
42	32	Command		E8xx xxxx
43 bit: 3	3	HWV_EATT_Band_4	commanded band 4 attenuator setting	
43 bit: 6	3	HWV_EATT_Band_3	commanded band 3 attenuator setting	
44 bit: 1	3	HWV_EATT_Band_2	commanded band 2 attenuator setting	
44 bit: 4	3	HWV_EATT_Band_1	commanded band 1 attenuator setting	
44 bit: 7	4	HWV_EATT_IN	commanded input-attenuator setting	

4.9.1.10 HIFI_MX_MGC_useHRS_tune_report

Position	Length	Monitor Parameter	Description	Value / remark
16	16	Structure ID		267
18	32	Observation ID		
22	32	Building block ID		
26	16	HIF_step_time		
28	16	HIF_ch1_mxmg0_C		
30	16	HIF_cv1_mxmg0_C		
32	16	HIF_mxmg_step_C		
34	16	HF_DH1_MXBAND		
36	16	HF_DV1_MXBAND		
38	16	HF_H_opt_MXMG_C		
40	16	HF_V_opt_MXMG_C		
42	16	HIF_Nmagnet		
44 +20i	16	HF_AH1_MXMG_C	Magnet current H	Repeat HIF_Nmagnet times Leave IF-power 0 where not applicable
46 +20i	16	HF_AH1_MXMG_V	Magnet voltage H	
48 +20i	16	HF_AH1_MXBIAS_V	Mixer junction voltage H	
50 +20i	16	HF_AH1_MXJNC1_C	Mixer junction current H band 1	
50 +20i	16	HF_AH1_MXJNC2_C	Mixer junction current H band 2	
50 +20i	16	HF_AH1_MXJNC3_C	Mixer junction current H band 3	
50 +20i	16	HF_AH1_MXJNC4_C	Mixer junction current H band 4	
50 +20i	16	HF_AH1_MXJNC5_C	Mixer junction current H band 5	
50 +20i	16	HF_AH1_MXJNC6_C	Mixer junction current H band 6	
50 +20i	16	HF_AH1_MXJNC7_C	Mixer junction current H band 7	
52 +20i	16	HF_AV1_MXMG_C	Magnet current V	
54 +20i	16	HF_AV1_MXMG_V	Magnet voltage V	
56 +20i	16	HF_AV1_MXBIAS_V	Mixer junction voltage V	
58 +20i	16	HF_AV1_MXJNC1_C	Mixer junction current V band 1	
58 +20i	16	HF_AV1_MXJNC2_C	Mixer junction current V band 2	
58 +20i	16	HF_AV1_MXJNC3_C	Mixer junction current V band 3	
58 +20i	16	HF_AV1_MXJNC4_C	Mixer junction current V band 4	
58 +20i	16	HF_AV1_MXJNC5_C	Mixer junction current V band 5	
58 +20i	16	HF_AV1_MXJNC6_C	Mixer junction current V band 6	
58 +20i	16	HF_AV1_MXJNC7_C	Mixer junction current V band 7	
60 +20i	16	HRH_if_power		
62 +20i	16	HRV_if_power		

4.9.1.11 HIFI_MX_MGC_useWBS_tune_report

Position	Length	Monitor Parameter	Description	Value / remark
16	16	Structure ID		268
18	32	Observation ID		
22	32	Building block ID		
26	16	HIF_step_time		
28	16	HIF_ch1_mxmg0_C		
30	16	HIF_cv1_mxmg0_C		
32	16	HIF_mxmg_step_C		
34	16	HF_DH1_MXBAND		
36	16	HF_DV1_MXBAND		
38	16	HF_H_opt_MXMG_C		
40	16	HF_V_opt_MXMG_C		
42	16	HIF_Nmagnet		
44 + 20i	16	HF_AH1_MXMG_C	Magnet current H	Repeat HIF_Nmagnet times Leave IF-power 0 where not applicable
46 + 20i	16	HF_AH1_MXMG_V	Magnet voltage H	
50 + 20i	16	HF_AH1_MXBIAS_V	Mixer junction voltage H	
52 + 20i	16	HF_AH1_MXJNC1_C	Mixer junction current H band 1	
52 + 20i	16	HF_AH1_MXJNC2_C	Mixer junction current H band 2	
52 + 20i	16	HF_AH1_MXJNC3_C	Mixer junction current H band 3	
52 + 20i	16	HF_AH1_MXJNC4_C	Mixer junction current H band 4	
52 + 20i	16	HF_AH1_MXJNC5_C	Mixer junction current H band 5	
52 + 20i	16	HF_AH1_MXJNC6_C	Mixer junction current H band 6	
52 + 20i	16	HF_AH1_MXJNC7_C	Mixer junction current H band 7	
54 + 20i	16	HF_AV1_MXMG_C	Magnet current V	
56 + 20i	16	HF_AV1_MXMG_V	Magnet voltage V	
58 + 20i	16	HF_AV1_MXBIAS_V	Mixer junction voltage V	
60 + 20i	16	HF_AV1_MXJNC1_C	Mixer junction current V band 1	
60 + 20i	16	HF_AV1_MXJNC2_C	Mixer junction current V band 2	
60 + 20i	16	HF_AV1_MXJNC3_C	Mixer junction current V band 3	
60 + 20i	16	HF_AV1_MXJNC4_C	Mixer junction current V band 4	
60 + 20i	16	HF_AV1_MXJNC5_C	Mixer junction current V band 5	
60 + 20i	16	HF_AV1_MXJNC6_C	Mixer junction current V band 6	
60 + 20i	16	HF_AV1_MXJNC7_C	Mixer junction current V band 7	
62 + 20i	16	HWH_if_power		
64 + 20i	16	HWV_if_power		

4.9.1.12 HIFI_vector_scan_report LCU-FM

The vector scan report consists of an repeated block. The block starts with an echo of the 14 LS-commands released at each step, followed by a block of Housekeeping data

Position	Length	Monitor Parameter	HK-address	Value / remark
16	16	Structure ID		273-286
18	32	Observation ID		
22	32	Building block ID		
26	16	HIF_step_time		
28	16	HIF_N		
30	32	Echo start macro		Repeated block HIF_N times Block size = 90 bytes Macro = 14 * 4 bytes HK= 17 * 2 bytes
34	32	Echo band		
39 bit 4	20	HL_ELSU_Main		
43 bit 4	20	HL_ELSU_Offset		
46	32	Echo d2		
52 bit 4	32	HL_EPL		
56 bit 4	32	HL_EM1		
60 bit 4	32	HL_EM2		
64 bit 4	32	HL_EM3		
68 bit 4	32	HL_EG1		
72 bit 4	32	HL_EG2		
76 bit 4	32	HL_ED1		
80 bit 4	32	HL_ED2		
82	32	Echo last		
86	1	HL_M1_V_E	B041	
86 bit 1	15	HL_M1_V		
88	1	HL_M2_V_E	B042	
88 bit 1	15	HL_M2_V		
90	1	HL_M3_V_E	B043	
90 bit 1	15	HL_M3_V		
92	1	HL_Gate1_V_E	B044	
92 bit 1	15	HL_Gate1_V		
94	1	HL_Gate2_V_E	B045	
94 bit 1	15	HL_Gate2_V		
96	1	HL_Drain1_V_E	B046	
96 bit 1	15	HL_Drain1_V		
98	1	HL_Drain2_V_E	B047	
98 bit 1	15	HL_Drain2_V		
100	1	HL_M1_C_E	B051	
100 bit 1	15	HL_M1_C		
102	1	HL_M2_C_E	B052	
102 bit 1	15	HL_M2_C		
104	1	HL_M3_C_E	B053	
104 bit 1	15	HL_M3_C		
106	1	HL_Gate1_C_E	B054	
106 bit 1	15	HL_Gate1_C		

Position	Length	Monitor Parameter	HK-address	Value / remark
108	1	HL_Gate2_C_E	B055	
108 bit 1	15	HL_Gate2_C		
110	1	HL_Drain1_C_E	B056	
110 bit 1	15	HL_Drain1_C		
112	1	HL_Drain2_C_E	B057	
112 bit 1	15	HL_Drain2_C		
114	1	HL_RF_power_E	B080	
114 bit 1	15	HL_RF_power		
116	16	HF_AH1_MXBIAS_C	8C61	
118	16	HF_AV1_MXBIAS_C	8D61	

Notice:

- The analog LCU-measurements are valid when the corresponding error-flag is 0. The error-flag ends with “_E”.
- The error flag is valid when the HI_LCU_HK_S is "VALID".
- The error flag of prime parameter is valid when HI_LCU_P_HK_S is ON.
- The error flag of redundant parameter is valid when HI_LCU_R_HK_S is ON.
- HI_LCU_P_HK_S is valid in when the APID is even.
- HI_LCU_R_HK_S is valid when th APID is odd.
- The bias-current parameters are valid when HI_FCU_HK_S is ON.

In the tables below all these error and status-bits have been omitted.

In the SCOS-2000 MIB-datafiles the status bits HI_FCU_HK_S, HI_LCU_HK_S, HI_LCU_P_HK_S and HI_LCU_R_HK_S refer to fixed data and are always ON.

In the SCOS-2000 MIB-datafiles not all echoed parameters are included due to the maximum number of parameters allowed in a VPD-packet.

4.9.1.12.1 HIFI_vector_scan_report_nom_1a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 273	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_1A_V	commanded M1 voltage calibrated for band 1A
60 bit 4 (+ 90i)	12	HL_EM2_1A_V	commanded M2 voltage calibrated for band 1A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_1A_V	M1 voltage calibrated for band 1A
88 bit 1 (+ 90i)	15	HL_M2_1A_V	M2 voltage calibrated for band 1A
92 bit 1 (+ 90i)	15	HL_Gate1_1A_V	Gate1 voltage calibrated for band 1A
94 bit 1 (+ 90i)	15	HL_Gate2_1A_V	Gate2 voltage calibrated for band 1A
96 bit 1 (+ 90i)	15	HL_Drain1_1A_V	Drain1 voltage calibrated for band 1A
98 bit 1 (+ 90i)	15	HL_Drain2_1A_V	Drain2 voltage calibrated for band 1A
100 bit 1 (+ 90i)	15	HL_M1_1A_C	M1 Current calibrated for band 1A
102 bit 1 (+ 90i)	15	HL_M2_1A_C	M2 Current calibrated for band 1A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.2 HIFI_R_vector_scan_report_nom_1a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 273	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_1A_V	commanded M1 voltage calibrated for band 1A
60 bit 4 (+ 90i)	12	HL_EM2_1A_V	commanded M2 voltage calibrated for band 1A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_1A_V	M1 voltage calibrated for band 1A
88 bit 1 (+ 90i)	15	HL_R_M2_1A_V	M2 voltage calibrated for band 1A
92 bit 1 (+ 90i)	15	HL_R_Gate1_1A_V	Gate1 voltage calibrated for band 1A
94 bit 1 (+ 90i)	15	HL_R_Gate2_1A_V	Gate2 voltage calibrated for band 1A
96 bit 1 (+ 90i)	15	HL_R_Drain1_1A_V	Drain1 voltage calibrated for band 1A
98 bit 1 (+ 90i)	15	HL_R_Drain2_1A_V	Drain2 voltage calibrated for band 1A
100 bit 1 (+ 90i)	15	HL_R_M1_1A_C	M1 Current calibrated for band 1A
102 bit 1 (+ 90i)	15	HL_R_M2_1A_C	M2 Current calibrated for band 1A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.3 HIFI_vector_scan_report_nom_1b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 274	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_1B_V	commanded M1 voltage calibrated for band 1B
60 bit 4 (+ 90i)	12	HL_EM2_1B_V	commanded M2 voltage calibrated for band 1B
68 bit 4 (+ 90i)	12	HL_Egate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_Egate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_Edrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_Edrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_1B_V	M1 voltage calibrated for band 1B
88 bit 1 (+ 90i)	15	HL_M2_1B_V	M2 voltage calibrated for band 1B
92 bit 1 (+ 90i)	15	HL_Gate1_1B_V	Gate1 voltage calibrated for band 1B
94 bit 1 (+ 90i)	15	HL_Gate2_1B_V	Gate2 voltage calibrated for band 1B
96 bit 1 (+ 90i)	15	HL_Drain1_1B_V	Drain1 voltage calibrated for band 1B
98 bit 1 (+ 90i)	15	HL_Drain2_1B_V	Drain2 voltage calibrated for band 1B
100 bit 1 (+ 90i)	15	HL_M1_1B_C	M1 Current calibrated for band 1B
102 bit 1 (+ 90i)	15	HL_M2_1B_C	M2 Current calibrated for band 1B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.4 HIFI_R_vector_scan_report_nom_1b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 274	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_1B_V	commanded M1 voltage calibrated for band 1B
60 bit 4 (+ 90i)	12	HL_EM2_1B_V	commanded M2 voltage calibrated for band 1B
68 bit 4 (+ 90i)	12	HL_Egate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_Egate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_Edrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_Edrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_1B_V	M1 voltage calibrated for band 1B
88 bit 1 (+ 90i)	15	HL_R_M2_1B_V	M2 voltage calibrated for band 1B
92 bit 1 (+ 90i)	15	HL_R_Gate1_1B_V	Gate1 voltage calibrated for band 1B
94 bit 1 (+ 90i)	15	HL_R_Gate2_1B_V	Gate2 voltage calibrated for band 1B
96 bit 1 (+ 90i)	15	HL_R_Drain1_1B_V	Drain1 voltage calibrated for band 1B
98 bit 1 (+ 90i)	15	HL_R_Drain2_1B_V	Drain2 voltage calibrated for band 1B
100 bit 1 (+ 90i)	15	HL_R_M1_1B_C	M1 Current calibrated for band 1B
102 bit 1 (+ 90i)	15	HL_R_M2_1B_C	M2 Current calibrated for band 1B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.5 HIFI_vector_scan_report_nom_2a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 275	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_2A_V	commanded M1 voltage calibrated for band 2A
60 bit 4 (+ 90i)	12	HL_EM2_2A_V	commanded M2 voltage calibrated for band 2A
64 bit 4 (+ 90i)	12	HL_EM3_2A_V	commanded M3 voltage calibrated for band 2A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_2A_V	M1 voltage calibrated for band 2A
88 bit 1 (+ 90i)	15	HL_M2_2A_V	M2 voltage calibrated for band 2A
90 bit 1 (+ 90i)	15	HL_M3_2A_V	M3 voltage calibrated for band 2A
92 bit 1 (+ 90i)	15	HL_Gate1_2A_V	Gate1 voltage calibrated for band 2A
94 bit 1 (+ 90i)	15	HL_Gate2_2A_V	Gate2 voltage calibrated for band 2A
96 bit 1 (+ 90i)	15	HL_Drain1_2A_V	Drain1 voltage calibrated for band 2A
98 bit 1 (+ 90i)	15	HL_Drain2_2A_V	Drain2 voltage calibrated for band 2A
100 bit 1 (+ 90i)	15	HL_M1_2A_C	M1 Current calibrated for band 2A
102 bit 1 (+ 90i)	15	HL_M2_2A_C	M2 Current calibrated for band 2A
104 bit 1 (+ 90i)	15	HL_M3_2A_C	M3 Current calibrated for band 2A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.6 HIFI_R_vector_scan_report_nom_2a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 275	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_2A_V	commanded M1 voltage calibrated for band 2A
60 bit 4 (+ 90i)	12	HL_EM2_2A_V	commanded M2 voltage calibrated for band 2A
64 bit 4 (+ 90i)	12	HL_EM3_2A_V	commanded M3 voltage calibrated for band 2A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_2A_V	M1 voltage calibrated for band 2A
88 bit 1 (+ 90i)	15	HL_R_M2_2A_V	M2 voltage calibrated for band 2A
90 bit 1 (+ 90i)	15	HL_R_M3_2A_V	M3 voltage calibrated for band 2A
92 bit 1 (+ 90i)	15	HL_R_Gate1_2A_V	Gate1 voltage calibrated for band 2A
94 bit 1 (+ 90i)	15	HL_R_Gate2_2A_V	Gate2 voltage calibrated for band 2A
96 bit 1 (+ 90i)	15	HL_R_Drain1_2A_V	Drain1 voltage calibrated for band 2A
98 bit 1 (+ 90i)	15	HL_R_Drain2_2A_V	Drain2 voltage calibrated for band 2A
100 bit 1 (+ 90i)	15	HL_R_M1_2A_C	M1 Current calibrated for band 2A
102 bit 1 (+ 90i)	15	HL_R_M2_2A_C	M2 Current calibrated for band 2A
104 bit 1 (+ 90i)	15	HL_R_M3_2A_C	M3 Current calibrated for band 2A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.7 HIFI_vector_scan_report_nom_2b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 276	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_2B_V	commanded M1 voltage calibrated for band 2B
60 bit 4 (+ 90i)	12	HL_EM2_2B_V	commanded M2 voltage calibrated for band 2B
64 bit 4 (+ 90i)	12	HL_EM3_2B_V	commanded M3 voltage calibrated for band 2B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_2B_V	M1 voltage calibrated for band 2B
88 bit 1 (+ 90i)	15	HL_M2_2B_V	M2 voltage calibrated for band 2B
90 bit 1 (+ 90i)	15	HL_M3_2B_V	M3 voltage calibrated for band 2B
92 bit 1 (+ 90i)	15	HL_Gate1_2B_V	Gate1 voltage calibrated for band 2B
94 bit 1 (+ 90i)	15	HL_Gate2_2B_V	Gate2 voltage calibrated for band 2B
96 bit 1 (+ 90i)	15	HL_Drain1_2B_V	Drain1 voltage calibrated for band 2B
98 bit 1 (+ 90i)	15	HL_Drain2_2B_V	Drain2 voltage calibrated for band 2B
100 bit 1 (+ 90i)	15	HL_M1_2B_C	M1 Current calibrated for band 2B
102 bit 1 (+ 90i)	15	HL_M2_2B_C	M2 Current calibrated for band 2B
104 bit 1 (+ 90i)	15	HL_M3_2B_C	M3 Current calibrated for band 2B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.8 HIFI_R_vector_scan_report_nom_2b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 276	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_2B_V	commanded M1 voltage calibrated for band 2B
60 bit 4 (+ 90i)	12	HL_EM2_2B_V	commanded M2 voltage calibrated for band 2B
64 bit 4 (+ 90i)	12	HL_EM3_2B_V	commanded M3 voltage calibrated for band 2B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_2B_V	M1 voltage calibrated for band 2B
88 bit 1 (+ 90i)	15	HL_R_M2_2B_V	M2 voltage calibrated for band 2B
90 bit 1 (+ 90i)	15	HL_R_M3_2B_V	M3 voltage calibrated for band 2B
92 bit 1 (+ 90i)	15	HL_R_Gate1_2B_V	Gate1 voltage calibrated for band 2B
94 bit 1 (+ 90i)	15	HL_R_Gate2_2B_V	Gate2 voltage calibrated for band 2B
96 bit 1 (+ 90i)	15	HL_R_Drain1_2B_V	Drain1 voltage calibrated for band 2B
98 bit 1 (+ 90i)	15	HL_R_Drain2_2B_V	Drain2 voltage calibrated for band 2B
100 bit 1 (+ 90i)	15	HL_R_M1_2B_C	M1 Current calibrated for band 2B
102 bit 1 (+ 90i)	15	HL_R_M2_2B_C	M2 Current calibrated for band 2B
104 bit 1 (+ 90i)	15	HL_R_M3_2B_C	M3 Current calibrated for band 2B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.9 HIFI_vector_scan_report_nom_3a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 277	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_3A_V	commanded M1 voltage calibrated for band 3A
60 bit 4 (+ 90i)	12	HL_EM2_3A_V	commanded M2 voltage calibrated for band 3A
64 bit 4 (+ 90i)	12	HL_EM3_3A_V	commanded M3 voltage calibrated for band 3A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_3A_V	M1 voltage calibrated for band 3A
88 bit 1 (+ 90i)	15	HL_M2_3A_V	M2 voltage calibrated for band 3A
90 bit 1 (+ 90i)	15	HL_M3_3A_V	M3 voltage calibrated for band 3A
92 bit 1 (+ 90i)	15	HL_Gate1_3A_V	Gate1 voltage calibrated for band 3A
94 bit 1 (+ 90i)	15	HL_Gate2_3A_V	Gate2 voltage calibrated for band 3A
96 bit 1 (+ 90i)	15	HL_Drain1_3A_V	Drain1 voltage calibrated for band 3A
98 bit 1 (+ 90i)	15	HL_Drain2_3A_V	Drain2 voltage calibrated for band 3A
100 bit 1 (+ 90i)	15	HL_M1_3A_C	M1 Current calibrated for band 3A
102 bit 1 (+ 90i)	15	HL_M2_3A_C	M2 Current calibrated for band 3A
104 bit 1 (+ 90i)	15	HL_M3_3A_C	M3 Current calibrated for band 3A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.10HIFI_R_vector_scan_report_nom_3a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 277	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_3A_V	commanded M1 voltage calibrated for band 3A
60 bit 4 (+ 90i)	12	HL_EM2_3A_V	commanded M2 voltage calibrated for band 3A
64 bit 4 (+ 90i)	12	HL_EM3_3A_V	commanded M3 voltage calibrated for band 3A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_3A_V	M1 voltage calibrated for band 3A
88 bit 1 (+ 90i)	15	HL_M2_3A_V	M2 voltage calibrated for band 3A
90 bit 1 (+ 90i)	15	HL_M3_3A_V	M3 voltage calibrated for band 3A
92 bit 1 (+ 90i)	15	HL_Gate1_3A_V	Gate1 voltage calibrated for band 3A
94 bit 1 (+ 90i)	15	HL_Gate2_3A_V	Gate2 voltage calibrated for band 3A
96 bit 1 (+ 90i)	15	HL_Drain1_3A_V	Drain1 voltage calibrated for band 3A
98 bit 1 (+ 90i)	15	HL_Drain2_3A_V	Drain2 voltage calibrated for band 3A
100 bit 1 (+ 90i)	15	HL_R_M1_3A_C	M1 Current calibrated for band 3A
102 bit 1 (+ 90i)	15	HL_R_M2_3A_C	M2 Current calibrated for band 3A
104 bit 1 (+ 90i)	15	HL_R_M3_3A_C	M3 Current calibrated for band 3A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.11 HIFI_vector_scan_report_nom_3b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 278	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_3B_V	commanded M1 voltage calibrated for band 3B
60 bit 4 (+ 90i)	12	HL_EM2_3B_V	commanded M2 voltage calibrated for band 3B
64 bit 4 (+ 90i)	12	HL_EM3_3B_V	commanded M3 voltage calibrated for band 3B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_3B_V	M1 voltage calibrated for band 3B
88 bit 1 (+ 90i)	15	HL_M2_3B_V	M2 voltage calibrated for band 3B
90 bit 1 (+ 90i)	15	HL_M3_3B_V	M3 voltage calibrated for band 3B
92 bit 1 (+ 90i)	15	HL_Gate1_3B_V	Gate1 voltage calibrated for band 3B
94 bit 1 (+ 90i)	15	HL_Gate2_3B_V	Gate2 voltage calibrated for band 3B
96 bit 1 (+ 90i)	15	HL_Drain1_3B_V	Drain1 voltage calibrated for band 3B
98 bit 1 (+ 90i)	15	HL_Drain2_3B_V	Drain2 voltage calibrated for band 3B
100 bit 1 (+ 90i)	15	HL_M1_3B_C	M1 Current calibrated for band 3B
102 bit 1 (+ 90i)	15	HL_M2_3B_C	M2 Current calibrated for band 3B
104 bit 1 (+ 90i)	15	HL_M3_3B_C	M3 Current calibrated for band 3B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.12HIFI_R_vector_scan_report_nom_3b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 278	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_3B_V	commanded M1 voltage calibrated for band 3B
60 bit 4 (+ 90i)	12	HL_EM2_3B_V	commanded M2 voltage calibrated for band 3B
64 bit 4 (+ 90i)	12	HL_EM3_3B_V	commanded M3 voltage calibrated for band 3B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_3B_V	M1 voltage calibrated for band 3B
88 bit 1 (+ 90i)	15	HL_R_M2_3B_V	M2 voltage calibrated for band 3B
90 bit 1 (+ 90i)	15	HL_R_M3_3B_V	M3 voltage calibrated for band 3B
92 bit 1 (+ 90i)	15	HL_R_Gate1_3B_V	Gate1 voltage calibrated for band 3B
94 bit 1 (+ 90i)	15	HL_R_Gate2_3B_V	Gate2 voltage calibrated for band 3B
96 bit 1 (+ 90i)	15	HL_R_Drain1_3B_V	Drain1 voltage calibrated for band 3B
98 bit 1 (+ 90i)	15	HL_R_Drain2_3B_V	Drain2 voltage calibrated for band 3B
100 bit 1 (+ 90i)	15	HL_R_M1_3B_C	M1 Current calibrated for band 3B
102 bit 1 (+ 90i)	15	HL_R_M2_3B_C	M2 Current calibrated for band 3B
104 bit 1 (+ 90i)	15	HL_R_M3_3B_C	M3 Current calibrated for band 3B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.13HIFI_vector_scan_report_nom_4a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 279	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_4A_V	commanded M1 voltage calibrated for band 4A
60 bit 4 (+ 90i)	12	HL_EM2_4A_V	commanded M2 voltage calibrated for band 4A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_4A_V	M1 voltage calibrated for band 4A
88 bit 1 (+ 90i)	15	HL_M2_4A_V	M2 voltage calibrated for band 4A
92 bit 1 (+ 90i)	15	HL_Gate1_4A_V	Gate1 voltage calibrated for band 4A
94 bit 1 (+ 90i)	15	HL_Gate2_4A_V	Gate2 voltage calibrated for band 4A
96 bit 1 (+ 90i)	15	HL_Drain1_4A_V	Drain1 voltage calibrated for band 4A
98 bit 1 (+ 90i)	15	HL_Drain2_4A_V	Drain2 voltage calibrated for band 4A
100 bit 1 (+ 90i)	15	HL_M1_4A_C	M1 Current calibrated for band 4A
102 bit 1 (+ 90i)	15	HL_M2_4A_C	M2 Current calibrated for band 4A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.14HIFI_R_vector_scan_report_nom_4a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 279	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_4A_V	commanded M1 voltage calibrated for band 4A
60 bit 4 (+ 90i)	12	HL_EM2_4A_V	commanded M2 voltage calibrated for band 4A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_4A_V	M1 voltage calibrated for band 4A
88 bit 1 (+ 90i)	15	HL_R_M2_4A_V	M2 voltage calibrated for band 4A
92 bit 1 (+ 90i)	15	HL_R_Gate1_4A_V	Gate1 voltage calibrated for band 4A
94 bit 1 (+ 90i)	15	HL_R_Gate2_4A_V	Gate2 voltage calibrated for band 4A
96 bit 1 (+ 90i)	15	HL_R_Drain1_4A_V	Drain1 voltage calibrated for band 4A
98 bit 1 (+ 90i)	15	HL_R_Drain2_4A_V	Drain2 voltage calibrated for band 4A
100 bit 1 (+ 90i)	15	HL_R_M1_4A_C	M1 Current calibrated for band 4A
102 bit 1 (+ 90i)	15	HL_R_M2_4A_C	M2 Current calibrated for band 4A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.15HIFI_vector_scan_report_nom_4b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 280	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_4B_V	commanded M1 voltage calibrated for band 4B
60 bit 4 (+ 90i)	12	HL_EM2_4B_V	commanded M2 voltage calibrated for band 4B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_4B_V	M1 voltage calibrated for band 4B
88 bit 1 (+ 90i)	15	HL_M2_4B_V	M2 voltage calibrated for band 4B
92 bit 1 (+ 90i)	15	HL_Gate1_4B_V	Gate1 voltage calibrated for band 4B
94 bit 1 (+ 90i)	15	HL_Gate2_4B_V	Gate2 voltage calibrated for band 4B
96 bit 1 (+ 90i)	15	HL_Drain1_4B_V	Drain1 voltage calibrated for band 4B
98 bit 1 (+ 90i)	15	HL_Drain2_4B_V	Drain2 voltage calibrated for band 4B
100 bit 1 (+ 90i)	15	HL_M1_4B_C	M1 Current calibrated for band 4B
102 bit 1 (+ 90i)	15	HL_M2_4B_C	M2 Current calibrated for band 4B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.16HIFI_R_vector_scan_report_nom_4b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 280	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_4B_V	commanded M1 voltage calibrated for band 4B
60 bit 4 (+ 90i)	12	HL_EM2_4B_V	commanded M2 voltage calibrated for band 4B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_4B_V	M1 voltage calibrated for band 4B
88 bit 1 (+ 90i)	15	HL_R_M2_4B_V	M2 voltage calibrated for band 4B
92 bit 1 (+ 90i)	15	HL_R_Gate1_4B_V	Gate1 voltage calibrated for band 4B
94 bit 1 (+ 90i)	15	HL_R_Gate2_4B_V	Gate2 voltage calibrated for band 4B
96 bit 1 (+ 90i)	15	HL_R_Drain1_4B_V	Drain1 voltage calibrated for band 4B
98 bit 1 (+ 90i)	15	HL_R_Drain2_4B_V	Drain2 voltage calibrated for band 4B
100 bit 1 (+ 90i)	15	HL_R_M1_4B_C	M1 Current calibrated for band 4B
102 bit 1 (+ 90i)	15	HL_R_M2_4B_C	M2 Current calibrated for band 4B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.17HIFI_vector_scan_report_nom_5a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 281	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_5A_V	commanded M1 voltage calibrated for band 5A
60 bit 4 (+ 90i)	12	HL_EM2_5A_V	commanded M2 voltage calibrated for band 5A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_5A_V	M1 voltage calibrated for band 5A
88 bit 1 (+ 90i)	15	HL_M2_5A_V	M2 voltage calibrated for band 5A
92 bit 1 (+ 90i)	15	HL_Gate1_5A_V	Gate1 voltage calibrated for band 5A
94 bit 1 (+ 90i)	15	HL_Gate2_5A_V	Gate2 voltage calibrated for band 5A
96 bit 1 (+ 90i)	15	HL_Drain1_5A_V	Drain1 voltage calibrated for band 5A
98 bit 1 (+ 90i)	15	HL_Drain2_5A_V	Drain2 voltage calibrated for band 5A
100 bit 1 (+ 90i)	15	HL_M1_5A_C	M1 Current calibrated for band 5A
102 bit 1 (+ 90i)	15	HL_M2_5A_C	M2 Current calibrated for band 5A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH_MXBIAS5_C	Mixer junction current H
118 (+ 90i)	16	HF_AV_MXBIAS5_C	Mixer junction current V

4.9.1.12.18HIFI_R_vector_scan_report_nom_5a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 281	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_5A_V	commanded M1 voltage calibrated for band 5A
60 bit 4 (+ 90i)	12	HL_EM2_5A_V	commanded M2 voltage calibrated for band 5A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_5A_V	M1 voltage calibrated for band 5A
88 bit 1 (+ 90i)	15	HL_R_M2_5A_V	M2 voltage calibrated for band 5A
92 bit 1 (+ 90i)	15	HL_R_Gate1_5A_V	Gate1 voltage calibrated for band 5A
94 bit 1 (+ 90i)	15	HL_R_Gate2_5A_V	Gate2 voltage calibrated for band 5A
96 bit 1 (+ 90i)	15	HL_R_Drain1_5A_V	Drain1 voltage calibrated for band 5A
98 bit 1 (+ 90i)	15	HL_R_Drain2_5A_V	Drain2 voltage calibrated for band 5A
100 bit 1 (+ 90i)	15	HL_R_M1_5A_C	M1 Current calibrated for band 5A
102 bit 1 (+ 90i)	15	HL_R_M2_5A_C	M2 Current calibrated for band 5A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH_MXBIAS5_C	Mixer junction current H
118 (+ 90i)	16	HF_AV_MXBIAS5_C	Mixer junction current V

4.9.1.12.19HIFI_vector_scan_report_nom_5b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 282	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_5B_V	commanded M1 voltage calibrated for band 5B
60 bit 4 (+ 90i)	12	HL_EM2_5B_V	commanded M2 voltage calibrated for band 5B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_5B_V	M1 voltage calibrated for band 5B
88 bit 1 (+ 90i)	15	HL_M2_5B_V	M2 voltage calibrated for band 5B
92 bit 1 (+ 90i)	15	HL_Gate1_5B_V	Gate1 voltage calibrated for band 5B
94 bit 1 (+ 90i)	15	HL_Gate2_5B_V	Gate2 voltage calibrated for band 5B
96 bit 1 (+ 90i)	15	HL_Drain1_5B_V	Drain1 voltage calibrated for band 5B
98 bit 1 (+ 90i)	15	HL_Drain2_5B_V	Drain2 voltage calibrated for band 5B
100 bit 1 (+ 90i)	15	HL_M1_5B_C	M1 Current calibrated for band 5B
102 bit 1 (+ 90i)	15	HL_M2_5B_C	M2 Current calibrated for band 5B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH_MXBIAS5_C	Mixer junction current H
118 (+ 90i)	16	HF_AV_MXBIAS5_C	Mixer junction current V

4.9.1.12.20HIFI_R_vector_scan_report_nom_5b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 282	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_5B_V	commanded M1 voltage calibrated for band 5B
60 bit 4 (+ 90i)	12	HL_EM2_5B_V	commanded M2 voltage calibrated for band 5B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_5B_V	M1 voltage calibrated for band 5B
88 bit 1 (+ 90i)	15	HL_R_M2_5B_V	M2 voltage calibrated for band 5B
92 bit 1 (+ 90i)	15	HL_R_Gate1_5B_V	Gate1 voltage calibrated for band 5B
94 bit 1 (+ 90i)	15	HL_R_Gate2_5B_V	Gate2 voltage calibrated for band 5B
96 bit 1 (+ 90i)	15	HL_R_Drain1_5B_V	Drain1 voltage calibrated for band 5B
98 bit 1 (+ 90i)	15	HL_R_Drain2_5B_V	Drain2 voltage calibrated for band 5B
100 bit 1 (+ 90i)	15	HL_R_M1_5B_C	M1 Current calibrated for band 5B
102 bit 1 (+ 90i)	15	HL_R_M2_5B_C	M2 Current calibrated for band 5B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH_MXBIAS5_C	Mixer junction current H
118 (+ 90i)	16	HF_AV_MXBIAS5_C	Mixer junction current V

4.9.1.12.21HIFI_vector_scan_report_nom_6a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 283	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_6A_V	commanded M1 voltage calibrated for band 6A
60 bit 4 (+ 90i)	12	HL_EM2_6A_V	commanded M2 voltage calibrated for band 6A
64 bit 4 (+ 90i)	12	HL_EM3_6A_V	commanded M3 voltage calibrated for band 6A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_6A_V	M1 voltage calibrated for band 6A
88 bit 1 (+ 90i)	15	HL_M2_6A_V	M2 voltage calibrated for band 6A
90 bit 1 (+ 90i)	15	HL_M3_6A_V	M3 voltage calibrated for band 6A
92 bit 1 (+ 90i)	15	HL_Gate1_6A_V	Gate1 voltage calibrated for band 6A
94 bit 1 (+ 90i)	15	HL_Gate2_6A_V	Gate2 voltage calibrated for band 6A
96 bit 1 (+ 90i)	15	HL_Drain1_6A_V	Drain1 voltage calibrated for band 6A
98 bit 1 (+ 90i)	15	HL_Drain2_6A_V	Drain2 voltage calibrated for band 6A
100 bit 1 (+ 90i)	15	HL_M1_6A_C	M1 Current calibrated for band 6A
102 bit 1 (+ 90i)	15	HL_M2_6A_C	M2 Current calibrated for band 6A
104 bit 1 (+ 90i)	15	HL_M3_6A_C	M3 Current calibrated for band 6A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.22HIFI_R_vector_scan_report_nom_6a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 283	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_6A_V	commanded M1 voltage calibrated for band 6A
60 bit 4 (+ 90i)	12	HL_EM2_6A_V	commanded M2 voltage calibrated for band 6A
64 bit 4 (+ 90i)	12	HL_EM3_6A_V	commanded M3 voltage calibrated for band 6A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_6A_V	M1 voltage calibrated for band 6A
88 bit 1 (+ 90i)	15	HL_R_M2_6A_V	M2 voltage calibrated for band 6A
90 bit 1 (+ 90i)	15	HL_R_M3_6A_V	M3 voltage calibrated for band 6A
92 bit 1 (+ 90i)	15	HL_R_Gate1_6A_V	Gate1 voltage calibrated for band 6A
94 bit 1 (+ 90i)	15	HL_R_Gate2_6A_V	Gate2 voltage calibrated for band 6A
96 bit 1 (+ 90i)	15	HL_R_Drain1_6A_V	Drain1 voltage calibrated for band 6A
98 bit 1 (+ 90i)	15	HL_R_Drain2_6A_V	Drain2 voltage calibrated for band 6A
100 bit 1 (+ 90i)	15	HL_R_M1_6A_C	M1 Current calibrated for band 6A
102 bit 1 (+ 90i)	15	HL_R_M2_6A_C	M2 Current calibrated for band 6A
104 bit 1 (+ 90i)	15	HL_R_M3_6A_C	M3 Current calibrated for band 6A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.23HIFI_vector_scan_report_nom_6b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 284	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_6B_V	commanded M1 voltage calibrated for band 6B
60 bit 4 (+ 90i)	12	HL_EM2_6B_V	commanded M2 voltage calibrated for band 6B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_6B_V	M1 voltage calibrated for band 6B
88 bit 1 (+ 90i)	15	HL_M2_6B_V	M2 voltage calibrated for band 6B
92 bit 1 (+ 90i)	15	HL_Gate1_6B_V	Gate1 voltage calibrated for band 6B
94 bit 1 (+ 90i)	15	HL_Gate2_6B_V	Gate2 voltage calibrated for band 6B
96 bit 1 (+ 90i)	15	HL_Drain1_6B_V	Drain1 voltage calibrated for band 6B
98 bit 1 (+ 90i)	15	HL_Drain2_6B_V	Drain2 voltage calibrated for band 6B
100 bit 1 (+ 90i)	15	HL_M1_6B_C	M1 Current calibrated for band 6B
102 bit 1 (+ 90i)	15	HL_M2_6B_C	M2 Current calibrated for band 6B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.24HIFI_R_vector_scan_report_nom_6b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 284	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_6B_V	commanded M1 voltage calibrated for band 6B
60 bit 4 (+ 90i)	12	HL_EM2_6B_V	commanded M2 voltage calibrated for band 6B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_6B_V	M1 voltage calibrated for band 6B
88 bit 1 (+ 90i)	15	HL_R_M2_6B_V	M2 voltage calibrated for band 6B
92 bit 1 (+ 90i)	15	HL_R_Gate1_6B_V	Gate1 voltage calibrated for band 6B
94 bit 1 (+ 90i)	15	HL_R_Gate2_6B_V	Gate2 voltage calibrated for band 6B
96 bit 1 (+ 90i)	15	HL_R_Drain1_6B_V	Drain1 voltage calibrated for band 6B
98 bit 1 (+ 90i)	15	HL_R_Drain2_6B_V	Drain2 voltage calibrated for band 6B
100 bit 1 (+ 90i)	15	HL_R_M1_6B_C	M1 Current calibrated for band 6B
102 bit 1 (+ 90i)	15	HL_R_M2_6B_C	M2 Current calibrated for band 6B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.25HIFI_vector_scan_report_nom_7a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 285	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_7A_V	commanded M1 voltage calibrated for band 7A
60 bit 4 (+ 90i)	12	HL_EM2_7A_V	commanded M2 voltage calibrated for band 7A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_7A_V	M1 voltage calibrated for band 7A
88 bit 1 (+ 90i)	15	HL_M2_7A_V	M2 voltage calibrated for band 7A
92 bit 1 (+ 90i)	15	HL_Gate1_7A_V	Gate1 voltage calibrated for band 7A
94 bit 1 (+ 90i)	15	HL_Gate2_7A_V	Gate2 voltage calibrated for band 7A
96 bit 1 (+ 90i)	15	HL_Drain1_7A_V	Drain1 voltage calibrated for band 7A
98 bit 1 (+ 90i)	15	HL_Drain2_7A_V	Drain2 voltage calibrated for band 7A
100 bit 1 (+ 90i)	15	HL_M1_7A_C	M1 Current calibrated for band 7A
102 bit 1 (+ 90i)	15	HL_M2_7A_C	M2 Current calibrated for band 7A
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.26HIFI_R_vector_scan_report_nom_7a

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 285	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_7A_V	commanded M1 voltage calibrated for band 7A
60 bit 4 (+ 90i)	12	HL_EM2_7A_V	commanded M2 voltage calibrated for band 7A
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_7A_V	M1 voltage calibrated for band 7A
88 bit 1 (+ 90i)	15	HL_R_M2_7A_V	M2 voltage calibrated for band 7A
92 bit 1 (+ 90i)	15	HL_R_Gate1_7A_V	Gate1 voltage calibrated for band 7A
94 bit 1 (+ 90i)	15	HL_R_Gate2_7A_V	Gate2 voltage calibrated for band 7A
96 bit 1 (+ 90i)	15	HL_R_Drain1_7A_V	Drain1 voltage calibrated for band 7A
98 bit 1 (+ 90i)	15	HL_R_Drain2_7A_V	Drain2 voltage calibrated for band 7A
100 bit 1 (+ 90i)	15	HL_R_M1_7A_C	M1 Current calibrated for band 7A
102 bit 1 (+ 90i)	15	HL_R_M2_7A_C	M2 Current calibrated for band 7A
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.27HIFI_vector_scan_report_nom_7b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 286	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_7B_V	commanded M1 voltage calibrated for band 7B
60 bit 4 (+ 90i)	12	HL_EM2_7B_V	commanded M2 voltage calibrated for band 7B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_M1_7B_V	M1 voltage calibrated for band 7B
88 bit 1 (+ 90i)	15	HL_M2_7B_V	M2 voltage calibrated for band 7B
92 bit 1 (+ 90i)	15	HL_Gate1_7B_V	Gate1 voltage calibrated for band 7B
94 bit 1 (+ 90i)	15	HL_Gate2_7B_V	Gate2 voltage calibrated for band 7B
96 bit 1 (+ 90i)	15	HL_Drain1_7B_V	Drain1 voltage calibrated for band 7B
98 bit 1 (+ 90i)	15	HL_Drain2_7B_V	Drain2 voltage calibrated for band 7B
100 bit 1 (+ 90i)	15	HL_M1_7B_C	M1 Current calibrated for band 7B
102 bit 1 (+ 90i)	15	HL_M2_7B_C	M2 Current calibrated for band 7B
106 bit 1 (+ 90i)	15	HL_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.12.28HIFI_R_vector_scan_report_nom_7b

Position	Length	Monitor Parameter	Description
16	16	Structure_ID = 286	
18	32	OBS_ID	
22	32	BB_ID	Building block ID
26	16	HIF_step_time	
28	16	HIF_Npoints	
52 bit 4 (+ 90i)	12	HL_EPLEVEL_C	commanded p-level current
56 bit 4 (+ 90i)	12	HL_EM1_7B_V	commanded M1 voltage calibrated for band 7B
60 bit 4 (+ 90i)	12	HL_EM2_7B_V	commanded M2 voltage calibrated for band 7B
68 bit 4 (+ 90i)	12	HL_EGate1_V	commanded Gate 1 voltage
72 bit 4 (+ 90i)	12	HL_EGate2_V	commanded Gate 2 voltage
76 bit 4 (+ 90i)	10	HL_EDrain1_V	commanded Drain 1 voltage
80 bit 4 (+ 90i)	10	HL_EDrain2_V	commanded Drain 2 voltage
86 bit 1 (+ 90i)	15	HL_R_M1_7B_V	M1 voltage calibrated for band 7B
88 bit 1 (+ 90i)	15	HL_R_M2_7B_V	M2 voltage calibrated for band 7B
92 bit 1 (+ 90i)	15	HL_R_Gate1_7B_V	Gate1 voltage calibrated for band 7B
94 bit 1 (+ 90i)	15	HL_R_Gate2_7B_V	Gate2 voltage calibrated for band 7B
96 bit 1 (+ 90i)	15	HL_R_Drain1_7B_V	Drain1 voltage calibrated for band 7B
98 bit 1 (+ 90i)	15	HL_R_Drain2_7B_V	Drain2 voltage calibrated for band 7B
100 bit 1 (+ 90i)	15	HL_R_M1_7B_C	M1 Current calibrated for band 7B
102 bit 1 (+ 90i)	15	HL_R_M2_7B_C	M2 Current calibrated for band 7B
106 bit 1 (+ 90i)	15	HL_R_Gate1_C	Gate1 calibrated for band Current
108 bit 1 (+ 90i)	15	HL_R_Gate2_C	Gate2 calibrated for band Current
110 bit 1 (+ 90i)	15	HL_R_Drain1_C	Drain1 calibrated for band Current
112 bit 1 (+ 90i)	15	HL_R_Drain2_C	Drain2 calibrated for band Current
114 bit 1 (+ 90i)	15	HL_R_RF_power	LSU RF power
116 (+ 90i)	16	HF_AH1_MXBIAS_C	Mixer junction current H
118 (+ 90i)	16	HF_AV1_MXBIAS_C	Mixer junction current V

4.9.1.13 Final setting LO-scan

The final setting of the vector scan and the final setting after LO tuning will be reported by means of a Function status report, as specified in the HK-ICD. The first command starts at bit 32. (this is because the configure LCU telecommands contain a reset-command which is omitted in the vector scan)

In general the structure of this packet is:

Type, subtype = 8, 6.

The SID is fixed at 3102.

4.9.1.14 HIFI_engineering_scan_report

16	16	Structure ID			271
18	32	Observation ID			
22	32	Building block ID			
26	16	HI_N_Packets			number of packets in scan
28	16	HI_packetNr			packet number in scan
30	16	HIF_interval [ms]			
32	16	HIF_HK_address_1			
34	16	HIF_HK_address_2			
36	16	HIF_HK_address_3			
38	32	HIF_command			
42	16	HIF_N_samples_1			
	16	HK_value_1			
	16	HK_value_2			
	16	HK_value_3			
	16	HIF_N_samples_2			
	16	HK_value_1			
	16	HK_value_2			
	16	HK_value_3			

Notice:

- The SID is copied from the TC-packet
- If the total number of samples does not fit in one TM more packets of the same structure shall be used. In packet #2 e.v. HIF_N_samples_1 shall be set to 0. In all packets HIF_N_samples_2 shall indicate the number of triplets **in this** packet
- In case an HK-address is void (0x0FFF) the corresponding HK-will be left out

4.9.1.14.1 HIFI_diplexer_H_fast_scan_report

Position	Length	Monitor Parameter	Description
16	16	Structure ID	287
18	32	Observation ID	
22	32	Building block ID	
26	16	HI_N_Packets	number of packets in scan
28	16	HI_packetNr	packet number in scan
30	16	HIF_interval [ms]	
32	16	HIF_HK_address_1	8c50
34	16	HIF_HK_address_2	8c51
36	16	HIF_HK_address_3	fff
38	32	HIF_command	CC10 pppp
42	16	HIF_N_samples_1 / 2	Repeated 2 times
44 +4i	16	HF_AH1_DPACT_C	
46 +4i	16	HF_AH1_DPACT_V	

4.9.1.14.2 HIFI_diplexer_V_fast_scan_report

Position	Length	Monitor Parameter	Description
16	16	Structure ID	288
18	32	OBS_ID	
22	32	BB_ID	
26	16	HI_N_packets	number of packets in scan
28	16	HI_packetNr	packet number in scan
30	16	HI_interval_ms	
32	16	HIF_HK_address_1	8d50
34	16	HIF_HK_address_2	8d51
36	16	HIF_HK_address_3	fff
38	32	HIF_command	CD10 pppp
42	16	HIF_N_samples_1 / 2	Repeated 2 times
44 +4i	16	HF_AV1_DPACT_C	
46 +4i	16	HF_AV1_DPACT_V	

4.9.1.14.3 HIFI_chopper_scan_report

Position	Length	Monitor Parameter	Description
16	16	Structure ID	288
18	32	OBS_ID	
22	32	BB_ID	
26	16	HI_N_packets	number of packets in scan
28	16	HI_packetNr	packet number in scan
30	16	HI_interval_ms	
32	16	HIF_HK_address_1	8f50
34	16	HIF_HK_address_2	Fff
36	16	HIF_HK_address_3	Fff
38	32	HIF_command	CF10 pppp
42	16	HIF_N_samples_1 / 2	Repeated 2 times
44 +2i	16	HF_APR_CH_ROT	

4.9.1.14.4 HIFI_mixer_current_H_fast_scan_report

Position	Length	Monitor Parameter	Description
16	16	Structure ID	292
18	32	OBS_ID	
22	32	BB_ID	
26	16	HI_N_packets	number of packets in scan
28	16	HI_packetNr	packet number in scan
30	16	HI_interval_ms	
32	16	HIF_HK_address_1	8c61
34	16	HIF_HK_address_2	fff
36	16	HIF_HK_address_3	fff
38	32	HIF_command	ffffff
42	16	HIF_N_samples_1 / 2	Repeated 2 times
44 +2i	16	HF_AH1_MXJNC1_C	
44 +2i	16	HF_AH1_MXJNC2_C	
44 +2i	16	HF_AH1_MXJNC3_C	
44 +2i	16	HF_AH1_MXJNC4_C	
44 +2i	16	HF_AH1_MXJNC5_C	
44 +2i	16	HF_AH1_MXJNC6_C	
44 +2i	16	HF_AH1_MXJNC7_C	

4.9.1.14.5 HIFI_mixer_current_V_fast_scan_report

Position	Length	Monitor Parameter	Description
16	16	Structure ID	293
18	32	OBS_ID	
22	32	BB_ID	
26	16	HI_N_packets	number of packets in scan
28	16	HI_packetNr	packet number in scan
30	16	HI_interval_ms	
32	16	HIF_HK_address_1	8d61
34	16	HIF_HK_address_2	fff
36	16	HIF_HK_address_3	fff
38	32	HIF_command	ffffff
42	16	HIF_N_samples_1	Repeated 2 times
44 +2i	16	HF_AV1_MXJNC1_C	
44 +2i	16	HF_AV1_MXJNC2_C	
44 +2i	16	HF_AV1_MXJNC3_C	
44 +2i	16	HF_AV1_MXJNC4_C	
44 +2i	16	HF_AV1_MXJNC5_C	
44 +2i	16	HF_AV1_MXJNC6_C	
44 +2i	16	HF_AV1_MXJNC7_C	

4.9.1.15 Peakup reports

4.9.1.15.1 HIFI_peakup_acquire_report

Position	Length	Monitor Parameter	Description
16	16	Structure_ID	289
18	32	OBS_ID	
22	32	BB_ID	
26	16	HIF_peakup_fifo	
28	16	HIF_peakup_seq	
30	16	HIF_acquired_IF	

4.9.1.15.2 HIFI_peakup_chop_corr_report

Position	Length	Monitor Parameter	Description
16	16	Structure_ID	290
18	32	OBS_ID	
22	32	BB_ID	
26	16	HF_DPR_CH_ROT2	
28	16	HIF_acquired_IF	
30	16	HF_EPR_CH_ROT	

4.9.1.15.3 HIFI_peakup_aocs_corr_report_rev1

Position	Length	Monitor Parameter	Description
16	16	Structure_ID	291
18	32	OBS_ID	
22	32	BB_ID	
26	16	HIF_acquired_IF	
44	16	HI_microrot_y	
46	16	HI_microrot_z	
48	16	HI_peakup_scl_y	
50	16	HI_peakup_scl_z	
52	16	HI_peakup_off_y	
54	16	HI_peakup_off_z	

A Packet Identifiers

The packet transmission report (service type 14) identifies the TM-packets with the following packet-IDs:
The column description shows the short name is specified in the SCOS-2000 tcpf-table.

TM-packet	description	Packet_ID
HIFI_TC_acceptance_OK	H_Accepted	0x01010000
HIFI_TC_acceptance_NOK	H_ACC_NOK	0x01020000
HIFI_TC_execution_OK	H_Completed	0x01070000
HIFI_TC_execution_NOK	H_EXEC_NOK	0x01080000
HIFI_essential_HK	H_essential	0x03190001
HIFI_single_FCU_rev1	H_FCU_HK	0x03190011
HIFI_LCU_safetyTables	H_LCUtable	0x03190012
HIFI_LCU_RAM_HK	H_LCU_mem	0x03190013
HIFI_LCU_macro_buffers	H_LCU_macro	0x03190014
HIFI_LCU_5_RAM_HK	H_LCU_5_mem	0x03190015
HIFI_LCU_RAMPAGE_7A_HK	H_LCU_page7a	0x03190016
HIFI_HRS_H_IF_POWER_phase1	H_HRSH1_IF	0x03190019
HIFI_HRS_H_IF_POWER_phase2	H_HRSH2_IF	0x0319001A
HIFI_HRS_V_IF_POWER_phase1	H_HRSV1_IF	0x0319001B
HIFI_HRS_V_IF_POWER_phase2	H_HRSV2_IF	0x0319001C
HIFI_WBS_H_IF_POWER_phase1	H_WBSH1_IF	0x0319001D
HIFI_WBS_H_IF_POWER_phase2	H_WBSH2_IF	0x0319001E
HIFI_WBS_V_IF_POWER_phase1	H_WBSV1_IF	0x0319001F
HIFI_WBS_V_IF_POWER_phase2	H_WBSV2_IF	0x03190020
HIFI_diplexer_scan_report_with_if	H_Diplex_IF	0x03190102
HIFI_LCU_IV	H_LCU_IV	0x03190103
HIFI_HRS_H_tune_report	H_HRSH_tune	0x03190104
HIFI_HRS_V_tune_report	H_HRSV_tune	0x03190105
HIFI_WBS_H_tune_report	H_WBSH_tune	0x03190106
HIFI_WBS_V_tune_report	H_WBSV_tune	0x03190107
HIFI_FCU_parameter_scan_report	H_HIFI_IV	0x0319010A
HIFI_MX_MGC_useHRS_tune_report	H_MGtunehrs	0x0319010B
HIFI_MX_MGC_useWBS_tune_report	H_MGtunewbs	0x0319010C
HIFI_diplexer_scan_report	H_Diplex	0x0319010E
HIFI_chopper_scan_report	H_ChoppScan	0x0319010F
HIFI_vector_scan_report_nom_1a	H_Vector_1a	0x03190111
HIFI_vector_scan_report_nom_1b	H_Vector_1b	0x03190112
HIFI_vector_scan_report_nom_2a	H_Vector_2a	0x03190113
HIFI_vector_scan_report_nom_2b	H_Vector_2b	0x03190114
HIFI_vector_scan_report_nom_3a	H_Vector_3a	0x03190115
HIFI_vector_scan_report_nom_3b	H_Vector_3b	0x03190116
HIFI_vector_scan_report_nom_4a	H_Vector_4a	0x03190117
HIFI_vector_scan_report_nom_4b	H_Vector_4b	0x03190118
HIFI_vector_scan_report_nom_5a	H_Vector_5a	0x03190119
HIFI_vector_scan_report_nom_5b	H_Vector_5b	0x0319011A
HIFI_vector_scan_report_nom_6a	H_Vector_6a	0x0319011B
HIFI_vector_scan_report_nom_6b	H_Vector_6b	0x0319011C
HIFI_vector_scan_report_nom_7a	H_Vector_7a	0x0319011D
HIFI_vector_scan_report_nom_7b	H_Vector_7b	0x0319011E

TM-packet	description	Packet_ID
HIFI_diplexer_H_fast_scan_report	H_HDiplFast	0x0319011F
HIFI_diplexer_V_fast_scan_report	H_VDiplFast	0x03190120
HIFI_peakup_acquire_report	H_PU_acq	0x03190121
HIFI_peakup_chop_corr_report	H_PU_chop	0x03190122
HIFI_peakup_aocs_corr_report_rev1	H_PU_aocs	0x03190123
HIFI_mixer_current_H_fast_scan_report	H_HJNCC_Fast	0x03190124
HIFI_mixer_current_V_fast_scan_report	H_VJNCCFast	0x03190125
HIFI_HK_rev_7	H_period_HK	0x03190404
HIFI_peakup_request	H_peakup	0x0501C000
HIFI_OBS_runtime_error	H_runtime	0x0501A000
HIFI_AH1_DHTR_C_OOL	H_DHTRH_OOL	0x0501B001
HIFI_AV1_DHTR_C_OOL	H_DHTRV_OOL	0x0501B002
HIFI_WH_Laser_T_OOL	H_LSRH_OOL	0x0501B003
HIFI_WV_Laser_T_OOL	H_LSRV_OOL	0x0501B004
HIFI_MX_H_nonresponse	H_MXH_nores	0x0501B005
HIFI_MX_V_nonresponse	H_MXV_nores	0x0501B006
HIFI_Chop_nonresponse	H_CHP_nores	0x0501B007
HIFI_LOU_T_OOL	H_LOU_T_OOL	0x0501B008
HIFI_memory_dump	H_mem_dump	0x06060000
HIFI_PRAM_memory_dump	H_PRAM_dump	0x06060000
HIFI_DRAM_memory_dump	H_DRAM_dump	0x06060000
HIFI_LCU_memory_dump	H_LCU_dump	0x06060000
HIFI_memory_check	H_mem_check	0x060A0000
HIFI_Spectr_fast_chop_report	H_Spectfast	0x08060B02
HIFI_Spectr_slow_chop_report	H_Spectslow	0x08060B03
HIFI_Config_spectroscopy_report	H_Spectr	0x08060B11
HIFI_Configure_FCU_report	H_FCU_rep	0x08060C01
HIFI_Configure_WBS_H_report	H_WBSH_rep	0x08060C04
HIFI_Configure_WBS_V_report	H_WBSV_rep	0x08060C05
HIFI_Conf_HRS_H_att_lo_report	H_HRH_attlo	0x08060C07
HIFI_Conf_HRS_H_blocks_report	H_HRH_bcks	0x08060C08
HIFI_Conf_HRS_V_att_lo_report	H_HRV_attlo	0x08060C09
HIFI_Conf_HRS_V_blocks_report	H_HRV_bcks	0x08060C0A
HIFI_Configure_FCU_power_report	H_FCU_power	0x08060C0B
HIFI_HL_switch_off_report	H_HL_off	0x08060C0C
HIFI_Conf_LCU_internal_report	H_LCU_int	0x08060C0D
HIFI_Configure_LSU_report	H_LSU_rep	0x08060C0E
HIFI_single_report	H_single	0x08060C1A
HIFI_H_DHTR_C_report	H_DHTR_H	0x08060C1B
HIFI_V_DHTR_C_report	H_DHTR_V	0x08060C1C
HIFI_LCU_single_report	H_LCUsingle	0x08060C1D
HIFI_Conf_LCU_normal_report	H_LCU_norm	0x08060C1E
HIFI_Conf_LCU_diag_report	H_LCU_diag	0x08060C1F
HIFI_Conf_LCU_table_report	H_table_rep	0x08060C20
HIFI_Config_mxbias_dpact_report	H_MX_DIPL	0x08060C21
HIFI_time_verification_report	H_Timeverif	0x09090000
HIFI_TM_generation_status_report	H_TMgenstat	0x0E040000

TM-packet	description	Packet_ID
HIFI_Connection_report	H_HIFI_Conn	0x11020000
HIFI_HRS_H1_start	H_HRSH1_st	0x15010001
HIFI_HRS_H2_start	H_HRSH2_st	0x15010002
HIFI_HRS_V1_start	H_HRSV1_st	0x15010003
HIFI_HRS_V2_start	H_HRSV2_st	0x15010004
HIFI_WBS_H1_start	H_WBSH1_st	0x15010005
HIFI_WBS_H2_start	H_WBSH2_st	0x15010006
HIFI_WBS_V1_start	H_WBSV1_st	0x15010007
HIFI_WBS_V2_start	H_WBSV2_st	0x15010008
HIFI_WBS_H1_science16	H_WBSH1_S16	0x1501000D
HIFI_WBS_H2_science16	H_WBSH2_S16	0x1501000E
HIFI_WBS_V1_science16	H_WBSV1_S16	0x1501000F
HIFI_WBS_V2_science16	H_WBSV2_S16	0x15010010
HIFI_HRS_H1_science24	H_HRSH1_S24	0x15010011
HIFI_HRS_H2_science24	H_HRSH2_S24	0x15010012
HIFI_HRS_V1_science24	H_HRSV1_S24	0x15010013
HIFI_HRS_V2_science24	H_HRSV2_S24	0x15010014
HIFI_WBS_H1_science24	H_WBSH1_S24	0x15010015
HIFI_WBS_H2_science24	H_WBSH2_S24	0x15010016
HIFI_WBS_V1_science24	H_WBSV1_S24	0x15010017
HIFI_WBS_V2_science24	H_WBSV2_S24	0x15010018

B Packet overview

This annex lists the SPID (SCOS-2000 identifiers) of all HIFI telemetry-packets.

The packet structure is identical when the SPID is identical. In the majority of the cases the redundant packet structure is identical to the prime packet structure.

The SPID of those redundant packets that are different start with 802 or 803

B.1 Telecommand verification (Service type 1)

As specified in 4.1.2 and 4.1.4 the error-code of a TC-acceptance failure and a TX-execution failure report is on byte 20 and 21 of the source packet. The field is used by the Herschel-CCS to identify the packet. This implies that a separate pid-entry needs to be specified for each individual error-code.

type	subtype	apid		spid	name
1	1	1024		80113289	HIFI_TC_acceptance_OK
1	1	1025		80113289	HIFI_R_TC_acceptance_OK

type	subtype	apid	error	spid	name
1	2	1024	0	80114289	HIFI_TC_acceptance_NOK_ILLEGAL_APID
1	2	1025	0	80114289	HIFI_R_TC_acceptance_NOK_ILLEGAL_APID
1	2	1024	1	80114289	HIFI_TC_acceptance_NOK_INVALID_LENGTH
1	2	1025	1	80114289	HIFI_R_TC_acceptance_NOK_INVALID_LENGTH
1	2	1024	2	80114289	HIFI_TC_acceptance_NOK_INVALID_CRC
1	2	1025	2	80114289	HIFI_R_TC_acceptance_NOK_INVALID_CRC
1	2	1024	3	80114289	HIFI_TC_acceptance_NOK_ILLEGAL_PACKET_TYPE
1	2	1025	3	80114289	HIFI_R_TC_acceptance_NOK_ILLEGAL_PACKET_TYPE
1	2	1024	4	80114289	HIFI_TC_acceptance_NOK_ILLEGAL_PACKET_SUBTYPE
1	2	1025	4	80114289	HIFI_R_TC_acceptance_NOK_ILLEGAL_PACKET_SUBTYPE
1	2	1024	5	80114289	HIFI_TC_acceptance_NOK_ILLEGAL_APPLICATION_DATA
1	2	1025	5	80114289	HIFI_R_TC_acceptance_NOK_ILLEGAL_APPLICATION_DATA
1	2	1024	17	80114289	HIFI_TC_acceptance_NOK_OBSOLETE_AID
1	2	1025	17	80114289	HIFI_R_TC_acceptance_NOK_OBSOLETE_AID

type	subtype	apid		spid	name
1	7	1024		80122289	HIFI_TC_execution_OK
1	7	1025		80122289	HIFI_R_TC_execution_OK

type	subtype	apid	error	spid	name
1	8	1024	18	80123289	HIFI_TC_execution_NOK_EXF_CMDSEQ_UNKNOWN_ERROR
1	8	1025	18	80123289	HIFI_R_TC_execution_NOK_EXF_CMDSEQ_UNKNOWN_ERROR
1	8	1024	774	80123289	HIFI_TC_execution_NOK_EXF_HS1_DELIVER_SD_PKT
1	8	1025	774	80123289	HIFI_R_TC_execution_NOK_EXF_HS1_DELIVER_SD_PKT
1	8	1024	1025	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_FIFOPUT_HK_TM_QUEUE
1	8	1025	1025	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_FIFOPUT_HK_TM_QUEUE
1	8	1024	1028	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_HK_RATE_INDEX_OOL
1	8	1025	1028	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_HK_RATE_INDEX_OOL
1	8	1024	1030	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_SINGLE_HK_LCU_INVALID_DATA
1	8	1025	1030	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_SINGLE_HK_LCU_INVALID_DATA
1	8	1024	1031	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_ERROR_LS_HP_QUEUE
1	8	1025	1031	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_ERROR_LS_HP_QUEUE
1	8	1024	1032	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_LCU_OFF
1	8	1025	1032	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_LCU_OFF
1	8	1024	1033	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_FCU_OFF
1	8	1025	1033	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_FCU_OFF
1	8	1024	1035	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_MEM_HK_LCU_INVALID_DATA
1	8	1025	1035	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_MEM_HK_LCU_INVALID_DATA
1	8	1024	1037	80123289	HIFI_TC_execution_NOK_EXF_HK_ASK_SINGLE_HK_LCU_DBG_MSG
1	8	1025	1037	80123289	HIFI_R_TC_execution_NOK_EXF_HK_ASK_SINGLE_HK_LCU_DBG_MSG
1	8	1024	1536	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_TRX_CTRL_LENGTH_CHECK
1	8	1025	1536	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_TRX_CTRL_LENGTH_CHECK
1	8	1024	1540	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_TRX_CTRL_TC_WRONG_DATA
1	8	1025	1540	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_TRX_CTRL_TC_WRONG_DATA
1	8	1024	1541	80123289	HIFI_TC_execution_NOK_EXF_CMDEX_PAR_SCAN_WRONG_STEP_NUMBER
1	8	1025	1541	80123289	HIFI_R_TC_execution_NOK_EXF_CMDEX_PAR_SCAN_WRONG_STEP_NUMBER
1	8	1024	1542	80123289	HIFI_TC_execution_NOK_EXF_CMDEX_PAR_SCAN_WRONG_NVOLTAGE
1	8	1025	1542	80123289	HIFI_R_TC_execution_NOK_EXF_CMDEX_PAR_SCAN_WRONG_NVOLTAGE

type	subtype	apid	error	spid	name
1	8	1024	1574	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_ILLEGAL_WBS_ACC_TIME
1	8	1025	1574	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_ILLEGAL_WBS_ACC_TIME
1	8	1024	1575	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_ERROR_LS_HP_QUEUE
1	8	1025	1575	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_ERROR_LS_HP_QUEUE
1	8	1024	1576	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_NYI_TC_ERR
1	8	1025	1576	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_NYI_TC_ERR
1	8	1024	1577	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_GET_EV_POOL
1	8	1025	1577	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_GET_EV_POOL
1	8	1024	1578	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_PUT_EV_TM_QUEUE
1	8	1025	1578	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_PUT_EV_TM_QUEUE
1	8	1024	1579	80123289	HIFI_TC_execution_NOK_NOK_CMDEX_PUT_HK_TM_QUEUE
1	8	1025	1579	80123289	HIFI_R_TC_execution_NOK_NOK_CMDEX_PUT_HK_TM_QUEUE
1	8	1024	1580	80123289	HIFI_TC_execution_NOK_EXF_CMDEX_PUT_LS_HDL_QUEUE
1	8	1025	1580	80123289	HIFI_R_TC_execution_NOK_EXF_CMDEX_PUT_LS_HDL_QUEUE
1	8	1024	1582	80123289	HIFI_TC_execution_NOK_EXF_CMDEX_PUT_HS_HDL_QUEUE
1	8	1025	1582	80123289	HIFI_R_TC_execution_NOK_EXF_CMDEX_PUT_HS_HDL_QUEUE
1	8	1024	1583	80123289	HIFI_TC_execution_NOK_EXF_CMDEX_GET_BLOCK_TC_POOL
1	8	1025	1583	80123289	HIFI_R_TC_execution_NOK_EXF_CMDEX_GET_BLOCK_TC_POOL
1	8	1024	1584	80123289	HIFI_TC_execution_NOK_EXF_CMDEX_GET_BLOCK_HK_POOL
1	8	1025	1584	80123289	HIFI_R_TC_execution_NOK_EXF_CMDEX_GET_BLOCK_HK_POOL
1	8	1024	1792	80123289	HIFI_TC_execution_NOK_EXF_DATA_HDL_INVALID_SUBSYS_ID
1	8	1025	1792	80123289	HIFI_R_TC_execution_NOK_EXF_DATA_HDL_INVALID_SUBSYS_ID
1	8	1024	1800	80123289	HIFI_TC_execution_NOK_EXF_DATA_HDL_FIFOPUT_HSHDL_QUEUE
1	8	1025	1800	80123289	HIFI_R_TC_execution_NOK_EXF_DATA_HDL_FIFOPUT_HSHDL_QUEUE
1	8	1024	2057	80123289	HIFI_TC_execution_NOK_EXF_HS_HDL_ERROR_LS_HP_QUEUE
1	8	1025	2057	80123289	HIFI_R_TC_execution_NOK_EXF_HS_HDL_ERROR_LS_HP_QUEUE
1	8	1024	2064	80123289	HIFI_TC_execution_NOK_EXF_HS_HDL_HRS_SUB_OFF
1	8	1025	2064	80123289	HIFI_R_TC_execution_NOK_EXF_HS_HDL_HRS_SUB_OFF

type	subtype	apid	error	spid	name
1	8	1024	2065	80123289	HIFI_TC_execution_NOK_EXF_HS_HDL_FCU_SUB_OFF
1	8	1025	2065	80123289	HIFI_R_TC_execution_NOK_EXF_HS_HDL_FCU_SUB_OFF
1	8	1024	2066	80123289	HIFI_TC_execution_NOK_EXF_HS_HDL_WRONG_SPECT_AID
1	8	1025	2066	80123289	HIFI_R_TC_execution_NOK_EXF_HS_HDL_WRONG_SPECT_AID
1	8	1024	2309	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ERROR_LS_HP_QUEUE
1	8	1025	2309	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ERROR_LS_HP_QUEUE
1	8	1024	2310	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_HRS_SUB_OFF
1	8	1025	2310	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_HRS_SUB_OFF
1	8	1024	2311	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_UPLOAD_VM_PARAM_TYPE
1	8	1025	2311	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_UPLOAD_VM_PARAM_TYPE
1	8	1024	2312	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_UPLOAD_VM_CODE_AREA
1	8	1025	2312	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_UPLOAD_VM_CODE_AREA
1	8	1024	2313	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_UPLOAD_VM_INCONSISTENT_TC
1	8	1025	2313	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_UPLOAD_VM_INCONSISTENT_TC
1	8	1024	2320	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_START_VM_INVALID_INDEX
1	8	1025	2320	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_START_VM_INVALID_INDEX
1	8	1024	2321	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_WBS_SUB_OFF
1	8	1025	2321	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_WBS_SUB_OFF
1	8	1024	2322	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_QUEUE
1	8	1025	2322	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_QUEUE
1	8	1024	2323	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_FCU_SUB_OFF
1	8	1025	2323	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_FCU_SUB_OFF
1	8	1024	2324	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_DIPSCAN_NUM_STEP
1	8	1025	2324	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_DIPSCAN_NUM_STEP
1	8	1024	2325	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_MIXMAG_DATA
1	8	1025	2325	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_MIXMAG_DATA
1	8	1024	2326	80123289	HIFI_TC_execution_NOK_NOK_HS_LIB_WRONG_INPUT_PARAM
1	8	1025	2326	80123289	HIFI_R_TC_execution_NOK_NOK_HS_LIB_WRONG_INPUT_PARAM

type	subtype	apid	error	spid	name
1	8	1024	2327	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_NO_INSTRU_INVOLVED
1	8	1025	2327	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_NO_INSTRU_INVOLVED
1	8	1024	2338	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_POLAR_TYPE_PAR
1	8	1025	2338	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_POLAR_TYPE_PAR
1	8	1024	2339	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_SEQ_NUMBER_PAR
1	8	1025	2339	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_SEQ_NUMBER_PAR
1	8	1024	2340	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_WRONG_PEAKUP_TYPE
1	8	1025	2340	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_WRONG_PEAKUP_TYPE
1	8	1024	2341	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_INCOMPLETE
1	8	1025	2341	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_INCOMPLETE
1	8	1024	2355	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_INVALID_INTERVAL
1	8	1025	2355	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_INVALID_INTERVAL
1	8	1024	2356	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_INVALID_NSAMP_1
1	8	1025	2356	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_INVALID_NSAMP_1
1	8	1024	2357	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_INVALID_NSAMP_2
1	8	1025	2357	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_INVALID_NSAMP_2
1	8	1024	2358	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_NO_VALID_ADDR
1	8	1025	2358	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_NO_VALID_ADDR
1	8	1024	2359	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ERROR_LS_LP_QUEUE
1	8	1025	2359	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ERROR_LS_LP_QUEUE
1	8	1024	2360	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_WRONG_ADDR
1	8	1025	2360	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_WRONG_ADDR
1	8	1024	2361	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_WRONG_CMD
1	8	1025	2361	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_ENGSCAN_WRONG_CMD
1	8	1024	2368	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_WRONG_WBS_ACCTIME
1	8	1025	2368	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_WRONG_WBS_ACCTIME
1	8	1024	2371	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_INVALID_DATA
1	8	1025	2371	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_INVALID_DATA

type	subtype	apid	error	spid	name
1	8	1024	2374	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_LCU_NON_INTERACTION
1	8	1025	2374	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_LCU_NON_INTERACTION
1	8	1024	2377	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_NEGATIVE_POWER
1	8	1025	2377	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_NEGATIVE_POWER
1	8	1024	2384	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_FOUND_MINIMUM
1	8	1025	2384	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_FOUND_MINIMUM
1	8	1024	2385	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_OUT_OF_GRID
1	8	1025	2385	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_OUT_OF_GRID
1	8	1024	2386	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_FOUND_NEGATIVE_PEAK
1	8	1025	2386	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_FOUND_NEGATIVE_PEAK
1	8	1024	2387	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_Z_OVERFLOW
1	8	1025	2387	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_Z_OVERFLOW
1	8	1024	2388	80123289	HIFI_TC_execution_NOK_EXF_HS_LIB_PEAKUP_Y_OVERFLOW
1	8	1025	2388	80123289	HIFI_R_TC_execution_NOK_EXF_HS_LIB_PEAKUP_Y_OVERFLOW
1	8	1024	4096	80123289	HIFI_TC_execution_NOK_EXF_MEM_INVALID_MEMLength
1	8	1025	4096	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_INVALID_MEMLength
1	8	1024	4097	80123289	HIFI_TC_execution_NOK_EXF_MEM_INVALID_ADDRESS
1	8	1025	4097	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_INVALID_ADDRESS
1	8	1024	4098	80123289	HIFI_TC_execution_NOK_EXF_MEM_INVALID_MEMID
1	8	1025	4098	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_INVALID_MEMID
1	8	1024	4099	80123289	HIFI_TC_execution_NOK_EXF_MEM_INVALID_CRC1
1	8	1025	4099	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_INVALID_CRC1
1	8	1024	4100	80123289	HIFI_TC_execution_NOK_EXF_MEM_INVALID_CRC2
1	8	1025	4100	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_INVALID_CRC2
1	8	1024	4103	80123289	HIFI_TC_execution_NOK_EXF_MEM_BOOT_OVERWRITE
1	8	1025	4103	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_BOOT_OVERWRITE
1	8	1024	4104	80123289	HIFI_TC_execution_NOK_EXF_MEM_UNKNOWN_RET_CODE
1	8	1025	4104	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_UNKNOWN_RET_CODE

type	subtype	apid	error	spid	name
1	8	1024	4106	80123289	HIFI_TC_execution_NOK_EXF_MEM_EEPROM_WRITE_OVERFLOW
1	8	1025	4106	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_EEPROM_WRITE_OVERFLOW
1	8	1024	4107	80123289	HIFI_TC_execution_NOK_EXF_MEM_EEPROM_COPY_FAILED
1	8	1025	4107	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_EEPROM_COPY_FAILED
1	8	1024	4108	80123289	HIFI_TC_execution_NOK_EXF_MEM_EEPROM_WRONG_PARTITION
1	8	1025	4108	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_EEPROM_WRONG_PARTITION
1	8	1024	4109	80123289	HIFI_TC_execution_NOK_EXF_MEM_EEPROM_WRONG_NUM_BAD_PAGES
1	8	1025	4109	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_EEPROM_WRONG_NUM_BAD_PAGES
1	8	1024	4110	80123289	HIFI_TC_execution_NOK_EXF_MEM_HSHDL_QUEUE
1	8	1025	4110	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_HSHDL_QUEUE
1	8	1024	4111	80123289	HIFI_TC_execution_NOK_EXF_MEM_COPY_OBS
1	8	1025	4111	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_COPY_OBS
1	8	1024	4112	80123289	HIFI_TC_execution_NOK_EXF_MEM_CHECK_PM_CRC
1	8	1025	4112	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_CHECK_PM_CRC
1	8	1024	4113	80123289	HIFI_TC_execution_NOK_EXF_MEM_EEPROM_WRONG_BAD_PAGE_ID
1	8	1025	4113	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_EEPROM_WRONG_BAD_PAGE_ID
1	8	1024	4114	80123289	HIFI_TC_execution_NOK_EXF_MEM_LCU_INVALID_DATA
1	8	1025	4114	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_LCU_INVALID_DATA
1	8	1024	4115	80123289	HIFI_TC_execution_NOK_EXF_MEM_LCU_OFF
1	8	1025	4115	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_LCU_OFF
1	8	1024	4116	80123289	HIFI_TC_execution_NOK_EXF_MEM_ERROR_LS_HP_QUEUE
1	8	1025	4116	80123289	HIFI_R_TC_execution_NOK_EXF_MEM_ERROR_LS_HP_QUEUE
1	8	1024	4864	80123289	HIFI_TC_execution_NOK_EXF_ERR_HDL_MEASUREMENT_ABORTED
1	8	1025	4864	80123289	HIFI_R_TC_execution_NOK_EXF_ERR_HDL_MEASUREMENT_ABORTED
1	8	1024	8193	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_FCU_OFF
1	8	1025	8193	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_FCU_OFF
1	8	1024	8194	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_LCU_OFF
1	8	1025	8194	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_LCU_OFF

type	subtype	apid	error	spid	name
1	8	1024	8195	80123289	HIFI_TC_execution_NOK_ERR_LS_HDL_WRONG_CMD
1	8	1025	8195	80123289	HIFI_R_TC_execution_NOK_ERR_LS_HDL_WRONG_CMD
1	8	1024	8196	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VEC_SCAN_TABLE
1	8	1025	8196	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VEC_SCAN_TABLE
1	8	1024	8197	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_GEN_REP_FAIL
1	8	1025	8197	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_GEN_REP_FAIL
1	8	1024	8198	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_ERROR_LS_HP_QUEUE
1	8	1025	8198	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_ERROR_LS_HP_QUEUE
1	8	1024	8199	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_FCU_SUB_OFF
1	8	1025	8199	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_FCU_SUB_OFF
1	8	1024	8200	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VSCAN_REP_GET_HK_BLOCK
1	8	1025	8200	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VSCAN_REP_GET_HK_BLOCK
1	8	1024	8201	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VSCAN_REP_PUT_HK_QUEUE
1	8	1025	8201	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VSCAN_REP_PUT_HK_QUEUE
1	8	1024	8202	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VSCAN_OVFL
1	8	1025	8202	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VSCAN_OVFL
1	8	1024	8203	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VSCAN_SYSOFF
1	8	1025	8203	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VSCAN_SYSOFF
1	8	1024	8204	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_DIPSCAN_NUM_STEP
1	8	1025	8204	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_DIPSCAN_NUM_STEP
1	8	1024	8212	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_PUT_LS_HDL_QUEUE
1	8	1025	8212	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_PUT_LS_HDL_QUEUE
1	8	1024	8214	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VEC_SCAN_CONF_EXPIRED
1	8	1025	8214	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VEC_SCAN_CONF_EXPIRED
1	8	1024	8216	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VEC_SCAN_INTERNAL
1	8	1025	8216	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VEC_SCAN_INTERNAL
1	8	1024	8217	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_VSCAN_REPORT_PROBLEMS
1	8	1025	8217	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_VSCAN_REPORT_PROBLEMS

type	subtype	apid	error	spid	name
1	8	1024	8225	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_LCU_NOT_NORM
1	8	1025	8225	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_LCU_NOT_NORM
1	8	1024	8226	80123289	HIFI_TC_execution_NOK_EXF_LS_HDL_LAST_INVALID
1	8	1025	8226	80123289	HIFI_R_TC_execution_NOK_EXF_LS_HDL_LAST_INVALID

B.2 Housekeeping packets (service type 3)

type	subtype	apid	SID	spid	name
3	25	1024	1	80001289	HIFI_essential_HK
3	25	1025	1	80201289	HIFI_R_essential_HK
3	25	1026	17	80010289	HIFI_single_FCU_rev1
3	25	1027	17	80010289	HIFI_R_single_FCU_rev1
3	25	1026	18	80011289	HIFI_LCU_safetyTables
3	25	1027	18	80211289	HIFI_R_LCU_safetyTables
3	25	1026	19	80012289	HIFI_LCU_RAM_HK
3	25	1027	19	80212289	HIFI_R_LCU_RAM_HK
3	25	1026	20	80013289	HIFI_LCU_macro_buffers
3	25	1027	20	80013289	HIFI_R_LCU_macro_buffers
3	25	1026	21	80135289	HIFI_LCU_5_RAM_HK
3	25	1027	21	80335289	HIFI_R_LCU_5_RAM_HK
3	25	1026	22	80147289	HIFI_LCU_RAMPAGE_7A_HK
3	25	1027	22	80147289	HIFI_R_LCU_RAMPAGE_7A_HK
3	25	1026	25	80002289	HIFI_HRS_H_IF_POWER_phase1
3	25	1027	25	80002289	HIFI_R_HRS_H_IF_POWER_phase1
3	25	1026	26	80003289	HIFI_HRS_H_IF_POWER_phase2
3	25	1027	26	80003289	HIFI_R_HRS_H_IF_POWER_phase2
3	25	1026	27	80004289	HIFI_HRS_V_IF_POWER_phase1

type	subtype	apid	SID	spid	name
3	25	1027	27	80004289	HIFI_R_HRS_V_IF_POWER_phase1
3	25	1026	28	80005289	HIFI_HRS_V_IF_POWER_phase2
3	25	1027	28	80005289	HIFI_R_HRS_V_IF_POWER_phase2
3	25	1026	29	80006289	HIFI_WBS_H_IF_POWER_phase1
3	25	1027	29	80006289	HIFI_R_WBS_H_IF_POWER_phase1
3	25	1026	30	80007289	HIFI_WBS_H_IF_POWER_phase2
3	25	1027	30	80007289	HIFI_R_WBS_H_IF_POWER_phase2
3	25	1026	31	80008289	HIFI_WBS_V_IF_POWER_phase1
3	25	1027	31	80008289	HIFI_R_WBS_V_IF_POWER_phase1
3	25	1026	32	80009289	HIFI_WBS_V_IF_POWER_phase2
3	25	1027	32	80009289	HIFI_R_WBS_V_IF_POWER_phase2
3	25	1026	258	80027289	HIFI_diplexer_scan_report_with_if
3	25	1027	258	80027289	HIFI_R_diplexer_scan_report_with_if
3	25	1026	259	80019289	HIFI_LCU_IV
3	25	1027	259	80019289	HIFI_R_LCU_IV
3	25	1026	260	80014289	HIFI_HRS_H_tune_report
3	25	1027	260	80014289	HIFI_R_HRS_H_tune_report
3	25	1026	261	80015289	HIFI_HRS_V_tune_report
3	25	1027	261	80015289	HIFI_R_HRS_V_tune_report
3	25	1026	262	80016289	HIFI_WBS_H_tune_report
3	25	1027	262	80016289	HIFI_R_WBS_H_tune_report
3	25	1026	263	80017289	HIFI_WBS_V_tune_report
3	25	1027	263	80017289	HIFI_R_WBS_V_tune_report
3	25	1026	266	80020289	HIFI_FCU_parameter_scan_report
3	25	1027	266	80020289	HIFI_R_FCU_parameter_scan_report
3	25	1026	267	80021289	HIFI_MX_MGC_useHRS_tune_report
3	25	1027	267	80021289	HIFI_R_MX_MGC_useHRS_tune_report
3	25	1026	268	80025289	HIFI_MX_MGC_useWBS_tune_report

type	subtype	apid	SID	spid	name
3	25	1027	268	80025289	HIFI_R_MX_MGC_useWBS_tune_report
3	25	1026	269	80018289	HIFI_vector_scan_report
3	25	1027	269	80018289	HIFI_R_vector_scan_report
3	25	1026	270	80026289	HIFI_diplexer_scan_report
3	25	1027	270	80026289	HIFI_R_diplexer_scan_report
3	25	1026	271	80022289	HIFI_chopper_scan_report
3	25	1027	271	80022289	HIFI_R_chopper_scan_report
3	25	1026	272	80028289	HIFI_vector_scan_report_nom
3	25	1027	272	80028289	HIFI_R_vector_scan_report_nom
3	25	1026	273	80029289	HIFI_vector_scan_report_nom_1a
3	25	1027	273	80229289	HIFI_R_vector_scan_report_nom_1a
3	25	1026	274	80030289	HIFI_vector_scan_report_nom_1b
3	25	1027	274	80230289	HIFI_R_vector_scan_report_nom_1b
3	25	1026	275	80031289	HIFI_vector_scan_report_nom_2a
3	25	1027	275	80231289	HIFI_R_vector_scan_report_nom_2a
3	25	1026	276	80032289	HIFI_vector_scan_report_nom_2b
3	25	1027	276	80232289	HIFI_R_vector_scan_report_nom_2b
3	25	1026	277	80033289	HIFI_vector_scan_report_nom_3a
3	25	1027	277	80233289	HIFI_R_vector_scan_report_nom_3a
3	25	1026	278	80034289	HIFI_vector_scan_report_nom_3b
3	25	1027	278	80234289	HIFI_R_vector_scan_report_nom_3b
3	25	1026	279	80035289	HIFI_vector_scan_report_nom_4a
3	25	1027	279	80235289	HIFI_R_vector_scan_report_nom_4a
3	25	1026	280	80036289	HIFI_vector_scan_report_nom_4b
3	25	1027	280	80236289	HIFI_R_vector_scan_report_nom_4b
3	25	1026	281	80037289	HIFI_vector_scan_report_nom_5a
3	25	1027	281	80237289	HIFI_R_vector_scan_report_nom_5a
3	25	1026	282	80038289	HIFI_vector_scan_report_nom_5b

type	subtype	apid	SID	spid	name
3	25	1027	282	80238289	HIFI_R_vector_scan_report_nom_5b
3	25	1026	283	80039289	HIFI_vector_scan_report_nom_6a
3	25	1027	283	80239289	HIFI_R_vector_scan_report_nom_6a
3	25	1026	284	80040289	HIFI_vector_scan_report_nom_6b
3	25	1027	284	80240289	HIFI_R_vector_scan_report_nom_6b
3	25	1026	285	80041289	HIFI_vector_scan_report_nom_7a
3	25	1027	285	80241289	HIFI_R_vector_scan_report_nom_7a
3	25	1026	286	80042289	HIFI_vector_scan_report_nom_7b
3	25	1027	286	80242289	HIFI_R_vector_scan_report_nom_7b
3	25	1026	287	80023289	HIFI_diplexer_H_fast_scan_report
3	25	1027	287	80023289	HIFI_R_diplexer_H_fast_scan_report
3	25	1026	288	80024289	HIFI_diplexer_V_fast_scan_report
3	25	1027	288	80024289	HIFI_R_diplexer_V_fast_scan_report
3	25	1026	289	80110289	HIFI_peakup_acquire_report
3	25	1027	289	80110289	HIFI_R_peakup_acquire_report
3	25	1026	290	80111289	HIFI_peakup_chop_corr_report
3	25	1027	290	80111289	HIFI_R_peakup_chop_corr_report
3	25	1026	291	80133289	HIFI_peakup_aocs_corr_report_rev1
3	25	1027	291	80133289	HIFI_R_peakup_aocs_corr_report_rev1
3	25	1026	292	80136289	HIFI_mixer_current_H_fast_scan_report
3	25	1027	292	80136289	HIFI_R_mixer_current_H_fast_scan_report
3	25	1026	293	80137289	HIFI_mixer_current_V_fast_scan_report
3	25	1027	293	80137289	HIFI_R_mixer_current_V_fast_scan_report
3	25	1026	1028	80000289	HIFI_HK_rev_7
3	25	1027	1028	80200289	HIFI_R_HK_rev_7

B.3 Events (service type 5)

type	subtype	apid	Key1	Key 2	spid	name
5	1	1024	32776	3	80043289	HIFI_ready_event
5	1	1025	32776	3	80043289	HIFI_R_ready_event
5	1	1024	33041	3	80044289	HIFI_BSW_TC_acknowledge_event
5	1	1025	33041	3	80044289	HIFI_R_BSW_TC_acknowledge_event
5	1	1024	49152	49152	80060289	HIFI_peakup_request
5	1	1025	49152	49152	80060289	HIFI_R_peakup_request
5	4	1024	32769	255	80045289	HIFI_BSW_PM_test_failed
5	4	1025	32769	255	80045289	HIFI_R_BSW_PM_test_failed
5	4	1024	32770	255	80046289	HIFI_BSW_DM_test_failed
5	4	1025	32770	255	80046289	HIFI_R_BSW_DM_test_failed
5	4	1024	32771	255	80047289	HIFI_BSW_EEPROM_test_failed
5	4	1025	32771	255	80047289	HIFI_R_BSW_EEPROM_test_failed
5	4	1024	32772	9	80048289	HIFI_BSW_TC_verification_failed
5	4	1025	32772	9	80048289	HIFI_R_BSW_TC_verification_failed
5	4	1024	32773	1	80049289	HIFI_BSW_Load_EEPROM_PM_failed
5	4	1025	32773	1	80049289	HIFI_R_BSW_Load_EEPROM_PM_failed
5	4	1024	32774	1	80050289	HIFI_BSW_Load_DM_PM_failed
5	4	1025	32774	1	80050289	HIFI_R_BSW_Load_DM_PM_failed
5	4	1024	32775	1	80051289	HIFI_BSW_boot_DM_PM_failed
5	4	1025	32775	1	80051289	HIFI_R_BSW_boot_DM_PM_failed
5	1	1024	40960	0	80052289	HIFI_OBS_runtime_error
5	1	1025	40960	0	80052289	HIFI_R_OBS_runtime_error
5	1	1024	45057	45057	80053289	HIFI_AH1_DHTR_C_OOL
5	1	1025	45057	45057	80053289	HIFI_R_AH1_DHTR_C_OOL
5	1	1024	45058	45058	80054289	HIFI_AV1_DHTR_C_OOL
5	1	1025	45058	45058	80054289	HIFI_R_AV1_DHTR_C_OOL
5	1	1024	45059	45059	80055289	HIFI_WH_Laser_T_OOL
5	1	1025	45059	45059	80055289	HIFI_R_WH_Laser_T_OOL

5	1	1024	45060	45060	80056289	HIFI_WV_Laser_T_OOL
5	1	1025	45060	45060	80056289	HIFI_R_WV_Laser_T_OOL
5	1	1024	45061	45061	80057289	HIFI_MX_H_nonresponse
5	1	1025	45061	45061	80057289	HIFI_R_MX_H_nonresponse
5	1	1024	45062	45062	80058289	HIFI_MX_V_nonresponse
5	1	1025	45062	45062	80058289	HIFI_R_MX_V_nonresponse
5	1	1024	45063	45063	80059289	HIFI_Chop_nonresponse
5	1	1025	45063	45063	80059289	HIFI_R_Chop_nonresponse
5	1	1024	45064	45064	80138289	HIFI_LOU_T_OOL
5	1	1025	45064	45064	80138289	HIFI_R_LOU_T_OOL

B.4 Memory management (service type 6)

type	subtype	apid	MEM-ID	spid	name
6	6	1024	0	80062289	HIFI_PRAM_memory_dump
6	6	1025	0	80062289	HIFI_R_PRAM_memory_dump
6	6	1024	1	80063289	HIFI_DRAM_memory_dump
6	6	1025	1	80063289	HIFI_R_DRAM_memory_dump
6	6	1024	4	80064289	HIFI_LCU_memory_dump
6	6	1025	4	80064289	HIFI_R_LCU_memory_dump
6	10	1024		80065289	HIFI_memory_check
6	10	1025		80065289	HIFI_R_memory_check

B.5 Function status reports (service type 8)

type	subtype	apid	Key1	Key 2	spid	name
8	6	1024	2818	0	80084289	HIFI_Spectr_fast_chop_report
8	6	1025	2818	0	80084289	HIFI_R_Spectr_fast_chop_report
8	6	1024	2819	0	80085289	HIFI_Spectr_slow_chop_report
8	6	1025	2819	0	80085289	HIFI_R_Spectr_slow_chop_report
8	6	1024	2833	0	80083289	HIFI_Config_spectroscopy_report

type	subtype	apid	Key1	Key 2	spid	name
8	6	1024	2818	0	80084289	HIFI_Spectr_fast_chop_report
8	6	1025	2818	0	80084289	HIFI_R_Spectr_fast_chop_report
8	6	1024	2819	0	80085289	HIFI_Spectr_slow_chop_report
8	6	1025	2819	0	80085289	HIFI_R_Spectr_slow_chop_report
8	6	1024	2833	0	80083289	HIFI_Config_spectroscopy_report
8	6	1025	2833	0	80083289	HIFI_R_Config_spectroscopy_report
8	6	1024	3073	512	80071289	HIFI_Configure_FCU_report
8	6	1025	3073	512	80071289	HIFI_R_Configure_FCU_report
8	6	1024	3076	517	80076289	HIFI_Configure_WBS_H_report
8	6	1025	3076	517	80076289	HIFI_R_Configure_WBS_H_report
8	6	1024	3077	518	80077289	HIFI_Configure_WBS_V_report
8	6	1025	3077	518	80077289	HIFI_R_Configure_WBS_V_report
8	6	1024	3079	513	80072289	HIFI_Conf_HRS_H_att_lo_report
8	6	1025	3079	513	80072289	HIFI_R_Conf_HRS_H_att_lo_report
8	6	1024	3080	514	80073289	HIFI_Conf_HRS_H_blocks_report
8	6	1025	3080	514	80073289	HIFI_R_Conf_HRS_H_blocks_report
8	6	1024	3081	515	80074289	HIFI_Conf_HRS_V_att_lo_report
8	6	1025	3081	515	80074289	HIFI_R_Conf_HRS_V_att_lo_report
8	6	1024	3082	516	80075289	HIFI_Conf_HRS_V_blocks_report
8	6	1025	3082	516	80075289	HIFI_R_Conf_HRS_V_blocks_report
8	6	1024	3083	533	80078289	HIFI_Configure_FCU_power_report
8	6	1025	3083	533	80078289	HIFI_R_Configure_FCU_power_report
8	6	1024	3084	536	80066289	HIFI_HL_switch_off_report
8	6	1025	3084	536	80066289	HIFI_R_HL_switch_off_report
8	6	1024	3085	537	80067289	HIFI_Conf_LCU_internal_report
8	6	1025	3085	537	80067289	HIFI_R_Conf_LCU_internal_report
8	6	1024	3086	538	80068289	HIFI_Configure_LSU_report
8	6	1025	3086	538	80068289	HIFI_R_Configure_LSU_report

type	subtype	apid	Key1	Key 2	spid	name
8	6	1024	3098	0	80079289	HIFI_single_report
8	6	1025	3098	0	80079289	HIFI_R_single_report
8	6	1024	3099	0	80081289	HIFI_H_DHTR_C_report
8	6	1025	3099	0	80081289	HIFI_R_H_DHTR_C_report
8	6	1024	3100	0	80082289	HIFI_V_DHTR_C_report
8	6	1025	3100	0	80082289	HIFI_R_V_DHTR_C_report
8	6	1024	3101	0	80080289	HIFI_LCU_single_report
8	6	1025	3101	0	80080289	HIFI_R_LCU_single_report
8	6	1024	3102	534	80069289	HIFI_Conf_LCU_normal_report
8	6	1025	3102	534	80069289	HIFI_R_Conf_LCU_normal_report
8	6	1024	3103	535	80070289	HIFI_Conf_LCU_diag_report
8	6	1025	3103	535	80070289	HIFI_R_Conf_LCU_diag_report
8	6	1024	3104	0	80086289	HIFI_Conf_LCU_table_report
8	6	1025	3104	0	80086289	HIFI_R_Conf_LCU_table_report
8	6	1024	3105	539	80134289	HIFI_Config_mxbias_dpact_report
8	6	1025	3105	539	80134289	HIFI_R_Config_mxbias_dpact_report

B.6 Time verification (service type 9)

Type	subtype	apid	spid	name
9	9	1024	80087289	HIFI_time_verification_report
9	9	1025	80087289	HIFI_R_time_verification_report

B.7 Packet transmission reports (service type 14)

Type	subtype	apid	spid	name
14	4	1024	80088289	HIFI_TM_generation_status_report
14	4	1025	80088289	HIFI_R_TM_generation_status_report

B.8 Connection reports (service type 17)

type	subtype	apid	spid	name
17	2	1024	80089289	HIFI_Connection_report
17	2	1025	80089289	HIFI_R_Connection_report

B.9 Science (service type 21)

type	subtype	apid	SID	spid	name
21	1	1028	1	80090289	HIFI_HRS_H1_start
21	1	1028	2	80092289	HIFI_HRS_H2_start
21	1	1029	3	80094289	HIFI_HRS_V1_start
21	1	1029	4	80096289	HIFI_HRS_V2_start
21	1	1030	5	80098289	HIFI_WBS_H1_start
21	1	1030	6	80101289	HIFI_WBS_H2_start
21	1	1031	7	80104289	HIFI_WBS_V1_start
21	1	1031	8	80107289	HIFI_WBS_V2_start
21	1	1030	13	80099289	HIFI_WBS_H1_science16
21	1	1030	14	80102289	HIFI_WBS_H2_science16
21	1	1031	15	80105289	HIFI_WBS_V1_science16
21	1	1031	16	80108289	HIFI_WBS_V2_science16
21	1	1028	17	80091289	HIFI_HRS_H1_science24
21	1	1028	18	80093289	HIFI_HRS_H2_science24
21	1	1029	19	80095289	HIFI_HRS_V1_science24
21	1	1029	20	80097289	HIFI_HRS_V2_science24
21	1	1030	21	80100289	HIFI_WBS_H1_science24
21	1	1030	22	80103289	HIFI_WBS_H2_science24
21	1	1031	23	80106289	HIFI_WBS_V1_science24
21	1	1031	24	80109289	HIFI_WBS_V2_science24