TERMA
SPACE DIVISION

# Herschel Planck

## Central Checkout System
## External Interface Control Document

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|---|---|
| **Document No.:** | H-P-4-TE-ID-8020 |
| **Date:** | 18-01-2006 |
| **Issue:** | 1 |
| **Revision:** | 8 |
| **Distribution:** | All |
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## Document Change Record

| Issue | Date | Change |
|---|---|---|
| Draft A | 22-April-2002 | Initial Version |
| Draft B | 24-April-2002 | Version for initial agreement with Vitrociset |
| Draft C | 08-May-2002 | Version for final agreement with Siemens and Vitrociset |
| Draft D | 14-May-2002 | Version for final review before PDR |
| 1.0 | 17-May-2002 | Issue 1.0, for the PDR |
| 1.1 | 02-July-2002 | Updated after the PDR for the following RID's:<br>PDR-CCS-ENG-037: Page 2<br>PDR-CCS-ENG-040: Page 6<br>PDR-CCS-ENG-041: Page 7<br>PDR-CCS-ENG-042: Page 7<br>PDR-CCS-ENG-043: Page 7<br>PDR-CCS-ENG-044: Page 8<br>PDR-CCS-ENG-046: Page 8<br>PDR-CCS-ENG-047: Page 9<br>PDR-CCS-ENG-048: Page 9<br>PDR-CCS-ENG-051: Pages 5 and 15<br>Minor corrections: Page 17 |
| 1.2 | 20-09-2002 | The allowed values for the SPID has been modified, Page 8 |
| 1.3 | 15-11-2002 | Updated for AI#32 of MoM H-P-MI-AI-0156: Page 2 and 3<br>Updated after CDR for the following RID's:<br>CDR-CCS-ENG-027: Page 9<br>CDR-CCS-ENG-028: Page 13<br>CDR-CCS-ENG-032: Page 8 |
| 1.4 | 14-05-2003 | Updated to Move the Extrapolation Flag from the PCF Table to the CAF Table, on Pages 5, 9 and 16 |
| 1.5 | 25-07-2003 | Updated to reflect changes due to ECP#1 and ECP#3 |
| 1.6 | 23-09-2003 | Minor change to PCF_CURTX<br>Type = k in Update files removed.l |
| 1.7 | 26-03-2004 | Old reference to Table spp removed: Page 17 |
| 1.8 | 18-01-2006 | Added new fields for subschedule ID to CCF and CSF<br>Bug #2393: corrected section 9.10.7<br>Bug#2395, overruled statement about OCF_INTER=C |

## Document Status Sheet

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## List of Figures

# 1 Introduction

## 1.1 Purpose

This document specifies the Herschel-Plank CCS External Interfaces.

## 1.2 Scope

This Interface is fully defined in document [AD-002], with the explicit exceptions and additions described in this document.

# 2 References

## 2.1 Applicable Documents

The documents, which are applicable for this document, are:

| | |
|---|---|
| [AD-001] | Herschel Plank EGSE Interface Requirement Specification<br>H-P-1-ASPI-IS-0121 |
| [AD-002] | SCOS-2000 Database Import ICD<br>S2K-MCS-ICD-0001-TOS-GCI Issue 5.1 |
| [AD-003] | Herschel-Planck Central Checkout System Packet Analysis Tools<br>H-P-4-TE-TN-9002 |
| [RB] | Herschel Plank Central Checkout System, Requirements Baseline<br>H-P-4-TE-RB-0010 |

## 2.2 Reference Documents

| | |
|---|---|
| [RD-001] | Herschel Plank Central Checkout System Glossary, Definitions and Acronyms<br>H-P-4-TE-TN-9001 |

# 3 Abbreviations, Terms and Definitions

## 3.1 Abbreviations

See [RD-001]

## 3.2 Terms and Definitions

See [RD-001]

# 4 Interface Overview

The external interfaces of the Central Checkout System**,** built for the Herschel-Plank project, are shown in Figure 3.2-1.

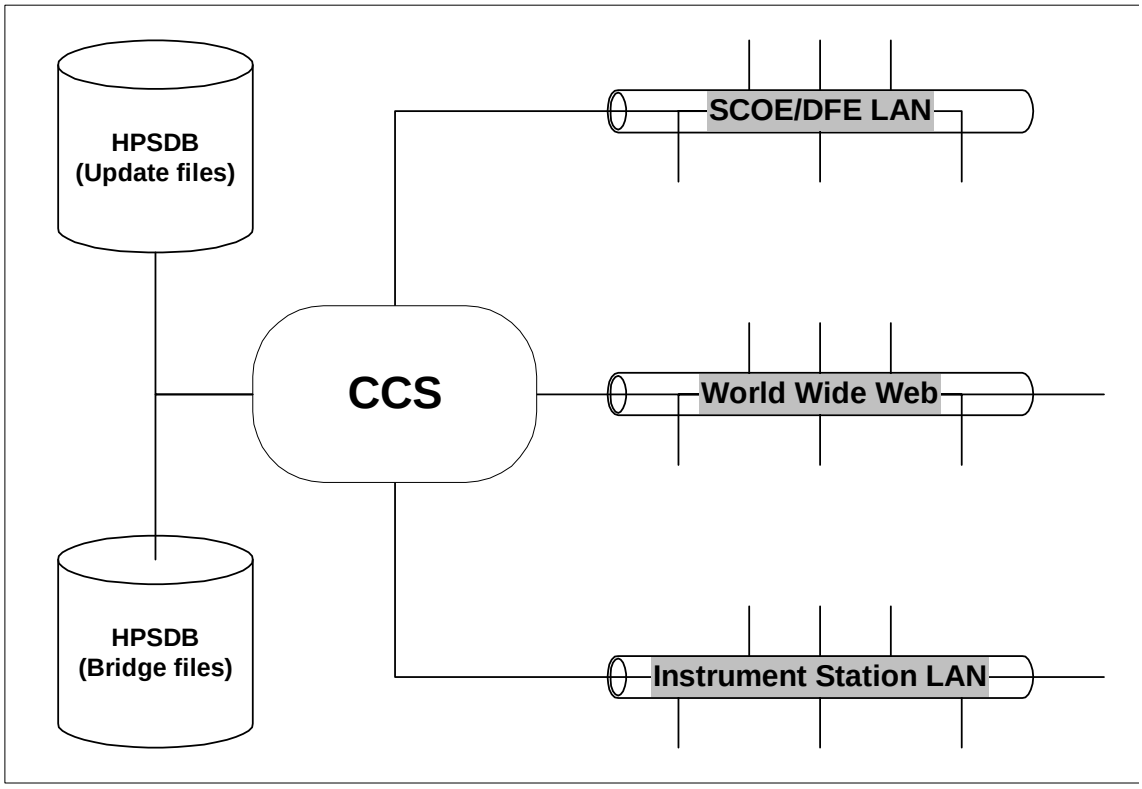


**Figure 3.2-1 Interface Overview**

The interface between the CCS and the SCOE/DFE LAN is defined in [AD-001].

The interface between the CCS and the Instrument Station LAN is defined [AD-001].

The interface between the CCS and the WWW Station is defined [AD-001].

The interface between the CCS and the Herschel-Plank Database files is defined in [AD-002] with the specific modifications defined in this document.

# 5 Interface Herschel-Plank CCS - SCOE's

The CCS implements the PIPE Protocol for interfacing with the SCOE's and the TM/TC DFE over the SCOE/DFE LAN.

This interface also handles the TM/TC DFE - TM-Dump telemetry. For details on the handling of TM-Dumps, please refer to [AD-003]

The PIPE Protocol is defined in [AD-001].

# 6 Interface Herschel-Plank CCS - Instrument EGSE's

The CCS implements the PIPE Protocol for interfacing with the Instrument EGSE's over the Instrument Station LAN.

The PIPE Protocol is defined in [AD-001].

# 7 Interface Herschel-Plank CCS - World Wide Web

This interface is defined in [AD-001].

# 8 Interface Herschel Plank Update files - Herschel-Plank CCS

The HPSDB update files are simple ASCII files containing lines with the names of HPSDB objects together with a time stamp, as follows:

<datetime><TAB><type><TAB><name><TAB><tseq name><TAB><tseq issue><TAB><host>
where:

| | |
|---|---|
| <datetime> = | YYYY.DDD.HH.MM.SS.mmm (SCOS standard Julian time format) |
| <type> = | c=telecommand \| p=parameter |
| <name> = | name of the HPSDB object |
| <tseq name> = | name of the test sequence which performed the validation |
| <tseq issue> = | issue number of the test sequence which performed the validation |
| <host> = | name of the host system where the update file was written |

e.g.

```
2002.123.20.16.32.43.123 c BATTERY03_ON   battest1 12 hp0-s
2002.123.20.16.41.11.101 p BATT03_CURRENT battest1 12 hp0-s
2002.123.20.16.55.42.521 p BATT03_VOLTAGE battest1 12 hp0-s
```

Notes:

- This is in tab separated value format, the same as all the MIB files, which should be easily processed by the HPSDB.

The MIB database issue is given by the vdf.dat file. This should be read in conjunction the HPSDB update files when updating the HPSDB

# 9 Interface Herschel Plank Bridge-Files - Herschel-Plank CCS

The Interface defined in document [AD-002] is fully applicable to the Herschel-Plank Central Checkout System, with the explicitly exceptions and additions described in this document.

## 9.1 Changes due to Danger Actions

The Danger Actions will not require any modifications to the MIB files, It should however be noted that the Danger Action always consists in the starting of a Test Sequence.

The name of the Danger Sequence being started as the result of a particular parameter exceeding its Danger Limits, is "danger_<parname>" (case sensitive):

Example:

Parameter Name = "PAR_A"
Associated Danger Sequence Name = "danger_PAR_A"

## 9.2 Changes due to Delta Limits

Modifications required to handle the Delta Limits are described in this section.

The modification simply consists in adding a new type of limit, the 'Delta' limit, with its associated value field being defined in the already existing OCF_LVALU field.

### 9.2.1 Changes to ASCII Table OCP

Modifications to Field OCP_TYPE and OCF_LVALU

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 3 | OCP_TYPE | Char(1) | Flag identifying the type of monitoring check:<br>'S' = Soft OOL<br>'H' = Hard OOL<br>'D' = Delta OOL (The Delta value shall be stored in field OCP_LVALU)<br>'C' = Status Consistency (in which case the field PCF_USCON for the parameter OCP_NAME must be set to 'Y')<br>'E' - Event generation only (no OOL) | M |
| 4 | OCP_LVALU | Char(14) | Parameter value to be expressed in a format compatible with OCF_CODIN. It is used as the low limit value (for numerical parameters i.e. if PCF_CATEG = 'N') or as expected status value (for status parameters i.e. if PCF_CATEG = 'S') or as delta limit value (for numerical parameters where PCF_CATEG = 'N' and OCP_TYPE = 'D') | |

**Table 9.2-1 Modification to Table OCP**

## 9.3 Changes due to Calibration Selection

Modifications required to handle the Calibration Selection are described in this section.

This modification consists in adding a new table between the Parameter Definition and the Calibration Definition. This table is defining the selection criteria for each parameter requiring Calibration Selection.

### 9.3.1 Changes to ASCII Table PCF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 12 | PCF_CURTX | Char(10) | Parameter calibration identification name. Depending on parameter category, this field stores the numerical calibration curve identification name or the textual calibration identification name, for the following cases:<br>1. If NO Calibration Selection is defined, this specifies the calibration to perform<br>2. If Calibration Selection IS defined, this field must be NULL<br>Integer value matching with TXF_NUMBR (if PCF_CATEG = 'S') or with CAF_NUMBR/MCF_IDENT of the corresponding calibration (textual, numerical or polynomial, respectively).<br>This field must be left null for textual parameters (PCF_CATEG = 'T'), for string parameters (PCF_PTC = 7 or 8) and for time parameters (PCF_PTC = 9 or 10). | |
| 13 | PCF_INTER | Char(1) | Flag controlling the extrapolation behaviour for parameters calibrated using a numerical calibration curve.<br>'P' – using this option, if a raw value outside the calibration curve is received, a valid engineering value is calculated by extrapolating the first two calibration points (in case the raw value is outside the calibration range on the lower side) or the last two calibration points (in case the raw value is outside the calibration range on the upper side)<br>'F' – using this option, if a raw value outside the calibration curve is received, an invalid engineering value is returned.<br>This field is only relevant if:<br>PCF_CATEG='N' and PCF_CURTX is not null<br>OR<br>PCF_CATEG = "N" AND one or more entries exist in table CUR for the parameter<br>In case of textual calibration (i.e. PCF_CATEG = 'S'), if a raw value not associated to any text string is received, an invalid engineering value set to all stars '****' is returned.<br>Note that SCOS-2000 associates the extrapolation flag to the calibration curve specified in PCF_CURTX and not to each individual parameter. This implies that, in case several parameters use the same calibration curve, they will all be displayed using the value of PCF_INTER for the last imported one. In case two different extrapolation flags are required to be used, two distinct calibration curves have to be defined.<br>**This field is ignored in the HPCCS implementation of SCOS-2000** | 'F' |

**Table 9.3-1 Modification to Table PCF**

Note that in the ASCII MIB ICD description of OCF_INTER, it is stated that when "C" option is used (meaning limit values are calibrated) then PCF_CURTX must not be null. If calibration curve selection is active, then PCF_CURTX is allowed to be null, also when OCF_INTER has the value "C".

### 9.3.2 New ASCII Table CUR

A new table is required to hold the conditional selection items for Calibration.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CUR_PNAME | Char(8) | Name of the parameter.<br>Alphanumeric string matching with PCF_NAME of the parameter to be calibrated | M |
| 2 * | CUR_POS | Number(2) | Used to determine the order in which the expressions are evaluated.<br>The CUR table is expected to be sorted by CUR_PNAME and CUR_POS.<br>The expressions are evaluated in the order of CUR_POS, starting from the lowest. Only the first selection where CUR_RLCHK = CUR_VALPAR is true, will be activated, the rest will be ignored. | M |
| 3 | CUR_RLCHK | Char(8) | Name of the parameter to be used to determine the applicability of this calibration selection. Only parameters of type INTEGER (signed or unsigned) can be used as applicability parameters. The field CUR_VALPAR provides the applicability value to be checked against. | M |
| 4 | CUR_VALPAR | Number(5) | Raw value of the applicability parameter (CUR_RLCHK). This is used to evaluate the applicability check expression (CUR_RLCHK = CUR_VALPAR) | M |
| 5 | CUR_SELECT | Char(10) | This is the calibration identification name to be applied if the current applicability check evaluates to TRUE. | M |

**Note:** The CUR Table shall be sorted by ascending CUR_PNAME and ascending CUR_POS order.

**Table 9.3-2 Definition of new Table CUR**

## 9.4 Changes due to Grouping of Parameters and Packets

Modifications required to handle the Grouping of Parameters and Packets are described in the following paragraphs.

This modification creates a set of tables defining the grouping of parameters and packets.

There are two types of groups;

- Parameter Groups containing only parameters
- Packets Groups containing only packets.

These tables allow the selection of the group members from already defined parameters and packets.

### 9.4.1 New ASCII Table GRP

This table constitutes the Group description file.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | GRP_NAME | Char(14) | This is the Name of the Group. Must be unique | M |
| 2 | GRP_DESCR | Char(24) | Textural description of the Group | M |
| 3 | GRP_GTYPE | Char(2) | Flag identifying the type of this group:<br>'PA' = Parameter Group<br>'PK' = Packet Group | M |

**Table 9.4-1 Definition of new Table GRP**

### 9.4.2 New ASCII Table GRPA

This table constitutes the Group Member description file for parameter groups.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | GRPA_GNAME | Char(14) | Name of the Group to which this item belongs. Must be defined in GRP.GRP_NAME with GRP_GTYPE = 'PA' | M |
| 2 * | GRPA_PANAME | Char(8) | Name of the parameter belonging to this group. Must be defined in PCF.PCF_NAME | M |

**Table 9.4-2 Definition of new Table GRPA**

### 9.4.3 New ASCII Table GRPK

This table constitutes the Group Member description file for packet groups.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | GRPK_GNAME | Char(14) | Name of the Group to which this packet belongs. Must be defined in GRP.GRP_NAME with GRP_GTYPE = 'PK' | M |
| 2 * | GRPK_PKSPID | Number(10) | SPID of the packet belonging to this group. Must be defined in PID.PID_SPID | M |

**Table 9.4-3 Definition of new Table GRPK**

## 9.5 Changes due to System Parameters

The modifications required to handle System Parameters are described in this section.

### 9.5.1 Changes to ASCII Table PCF

The field PCF_NAME definition is changed to read as follows:

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | PCF_NAME | Char(8) | Name of the parameter<br>Alphanumeric string uniquely identifying the monitoring parameter.<br>Note that the OL syntax uses the start character(s) of OL components in order to identify their nature. As a consequence, no monitoring parameter name is allowed to start with the strings "VAR", "GVAR" or "$"<br>For Herschel Plank no parameter name is allowed to have the first and second character = "YZ", the “Y” as first character identifies the EGSE Subsystem, the "Z" as second character is used to identifies System Parameters. | M |

**Table 9.5-1 Modification to Table PCF**

### 9.5.2 Changes to ASCII Table PID

The field PID_SPID definition is changed to read as follows:

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 6 * | PID_SPID | Number(10) | The SCOS-2000 Telemetry Packet Number (also referred to as the SCOS-2000 Packet Id). This field uniquely identifies the structure of TM packets defined in the PLF (see [AD-002] Section 3.3.2.5.1) and determines the history file in which this packet is archived.<br>Unsigned integer number within the following ranges:<br>less than 100 OR greater than 999 AND less than 4294967296.<br>Allowed Decimal values: 0 to 99<br>AND: 1000 to 4294967295<br>Values 100 through 999 is reserved internal EGSE usage. | M |

**Table 9.5-2 Modification to Table PID**

## 9.6 Changes due to EGSE's and SCOE's

The changes required to cover for the definition of EGSE's and SCOE's are described in this section.

### 9.6.1 New ASCII Table SCO

This table constitutes the equipment definition file.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | SCO_NAME | Char(14) | Name of the equipment. Must be unique. | M |
| 2 | SCO_HOST | Char(10) | The name of the machine where the equipment runs. Must be unique in combination with SCO_PORT. | M |
| 3 | SCO_PORT | Number(5) | The port number where the equipment is listening. Must be unique in combination with SCO_HOST. | M |

**Table 9.6-1 Definition of new Table SCO**

## 9.7 Changes due to TC Distribution

The changes required for TC-Packet distribution is described in this section.

### 9.7.1 New ASCII Table TCD

This table constitutes the TC-Packet distribution definition file.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | TCD_APID | Number(4) | APID to be distributed | M |
| 2 | TCD_DNAME | Char(14) | Name of equipment to receive packets with APID = TCD_APID<br>Name must be defined in SCO.SCO_NAME | M |

**Note:** The TCD Table shall be sorted by ascending TCD_APID order.

**Table 9.7-1 Definition of new Table TCD**

## 9.8 Changes due to TM Packet distribution

The changes required for TM-Packet distribution is described in this section.

### 9.8.1 New ASCII Table TMD

This table constitutes the TM-Packet distribution definition file.

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | TMD_SPID | Number(10) | SPID of packet to be distributed. Must be defined in PID.PID_SPID<br>(See Table PID for more information on the SPID) | M |
| 2 * | TMD_DNAME | Char(14) | Name of equipment to receive packets with SPID = TMD_SPID<br>Name must be defined in SCO.SCO_NAME | M |

**Note:** The TMD Table shall be sorted by ascending TMD_SPID order.

**Table 9.8-1 Definition of new Table TMD**

## 9.9 New Field in Table CAF

| | | | | |
|---|---|---|---|---|
| 8 | CAF_INTER | Char(1) | Flag controlling the extrapolation behaviour for the numerical calibration curve.<br>'P' – using this option, if a raw value outside the calibration curve is received, a valid engineering value is calculated by extrapolating the first two calibration points (in case the raw value is outside the calibration range on the lower side) or the last two calibration points (in case the raw value is outside the calibration range on the upper side)<br>'F' – using this option, if a raw value outside the calibration curve is received, an invalid engineering value is returned. | 'F' |

## 9.10 Changes due to ECP #1and ECP #3

The changes required due to ECP #1 comprises:

- Change Curve ID (identifier for calibration curves) from NUM(4) to CHAR(10)

- Change Range Set ID (used for TC parameter checks) from NUM(4) to CHAR(10)

- Change CVS ID (used for Command Execution Verification) from NUM(5) to NUM(10)

The changes required due to ECP #3 comprises:

Provide a new type of calibration curve similar to the existing polynomial curve, except that the coefficients should be used in the formula

T (R) = 1 / [log_a0 + (log_a1 * ln(R)) + (log_a2 * (ln(R) ** 2))]

### 9.10.1 Modified field in ASCII Table CUR

See field CUR_SELECT in Table CUR on page 6

### 9.10.2 Modified field in ASCII Table CAF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CAF_NUMBR | Char(10) | Numerical calibration curve identification name.<br>Character string uniquely identifying the numerical calibration curve. | M |

### 9.10.3 Modified field in ASCII Table CAP

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CAP_NUMBR | Char(10) | Calibration curve identification name.<br>Character string matching with CAF_NUMBR of the corresponding calibration curve. | M |

### 9.10.4 Modified field in ASCII Table TXF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | TXF_NUMBR | Char(10) | Textual calibration identification name.<br>Character string uniquely identifying the textual calibration. | M |

### 9.10.5 Modified field in ASCII Table TXP

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | TXP_NUMBR | Char(10) | Textual calibration identification name.<br>Character string matching with TXF_NUMBR of the corresponding textual calibration. | M |

### 9.10.6 Modified field in ASCII Table MCF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | MCF_IDENT | Char(10) | Polynomial calibration curve identification name.<br>Character string uniquely identifying the polynomial calibration. | M |

### 9.10.7 Modified field in ASCII Table PCF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 12 | PCF_CURTX | Char(10) | Parameter calibration identification name. Depending on parameter category, this field stores the numerical calibration curve identification name or the textual calibration identification name, for the following cases:<br>3. If NO Calibration Selection is defined, this specifies the calibration to perform<br>4. If Calibration Selection IS defined, this field must be NULL<br>Character string matching with TXF_NUMBR (if PCF_CATEG = 'S') or with CAF_NUMBR/MCF_IDENT/LGF_IDENT of the corresponding calibration (textual, numerical or polynomial, respectively).<br>This field cannot be null for status parameters (PCF_CATEG = 'S'). It must be left null for textual parameters (PCF_CATEG = 'T'), for string parameters (PCF_PTC = 7 or 8) and for time parameters (PCF_PTC = 9 or 10).<br><br>Note: This represents a modification to definition in section 9.3.1 | |

### 9.10.8 Modified fields in ASCII Table CPC

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 9 | CPC_PRFREF | Char(8) | This field contains the Name of an existing parameter range set (PRF_NUMBR) to which the parameter will be associated. The ranges defined within the set will determine the possible values for the parameter. The format of the selected range set (PRF_DSPFMT) must be compatible with the type of the command parameter (described by CPC_PTC or CPC_DISPFMT depending on the used representation i.e. PRF_INTER). | |
| 10 | CPC_CCAREF | Char(10) | This field contains the Name of an existing numeric calibration curve set (CCA_NUMBR) to which the parameter will be associated. The value formats of the selected curve set (CCA_RAWFMT and CCA_ENGFMT) must be compatible with the type of the command parameter (described by CPC_PTC) and its engineering format (CPC_DISPFMT).<br>It must be Null if CPC_CATEG is Null, 'N' or 'T'. It cannot be Null if CPC_CATEG is 'C' or 'B'. | |
| 11 | CPC_PAFREF | Char(10) | This field contains the Name of an existing textual calibration set (PAF_NUMBR) to which the parameter will be associated. The aliases contained within the set may be used as default values for the parameter. The selected alias set (PAF_RAWFMT) must be compatible with the type of the command parameter (described by CPC_PTC).<br>It must be Null if CPC_CATEG is Null, 'N' or 'C'. It cannot be Null if CPC_CATEG is 'T' or 'B'. | |

### 9.10.9 Modified fields in ASCII Table CSP

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 13 | CSP_PRFREF | Char(8) | This field contains the Name of an existing parameter range set (PRF_NUMBR) to which the parameter will be associated. The ranges defined within the set will determine the possible values for the parameter. The format of the selected range set (PRF_DSPFMT) must be compatible with the type of the command parameter (described by CSP_PTC or CSP_DISPFMT depending on the used representation i.e. PRF_INTER).<br>*This field must be Null if CSP_TYPE is 'C' or 'S'*<br>Note that the selected range set does not necessarily need to be the same one as specified for any associated element parameter. However, it should be considered that it is only safe to associate different range sets if they are more restrictive i.e. if the associated allowed ranges of values are all permitted for any associated element parameter. | |
| 14 | CSP_CCAREF | Char(10) | This field contains the Name of an existing numeric calibration curve set (CCA_NUMBR) to which the parameter will be associated. The value formats of the selected curve set (CCA_RAWFMT and CCA_ENGFMT) must be compatible with the type of the command parameter (described by CSP_PTC) and its engineering format (CSP_DISPFMT).<br>It must be Null if CSP_CATEG is Null, 'N' or 'T'. It cannot be Null if CSP_CATEG is 'C' or 'B'. *It must be Null if CSP_TYPE is 'C' or 'S'.*<br>If not Null, this field must reference the same calibration curve as used by any associated element parameter (CPC_CCAREF/ CSP_CCAREF). | |

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 15 | CSP_PAFREF | Char(10) | This field contains the Name of an existing textual calibration set (PAF_NUMBR) to which the parameter will be associated. The aliases contained within the set may be used as default values for the parameter. The selected alias set (PAF_RAWFMT) must be compatible with the type of the parameter (described by CSP_PTC).<br>It must be Null if CSP_CATEG is Null, 'N' or 'C'. It cannot be Null if CSP_CATEG is 'T' or 'B'. *It must be Null if CSP_TYPE is 'C' or 'S'.*<br>If not Null, this field must reference the same textual calibration as used by any associated element parameter (CPC_PAFREF/ CSP_PAFREF). | |

### 9.10.10 Modified fields in ASCII Table CCA

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CCA_NUMBR | Char(10) | Numerical (de-)calibration curve identification name.<br>Character string uniquely identifying the commanding numerical (de-)calibration curve. | M |

### 9.10.11 Modified fields in ASCII Table CCS

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CCS_NUMBR | Char(10) | Identification name (CCA_NUMBR) of the (de-)calibration curve to which this value pair belongs. | M |

### 9.10.12 Modified fields in ASCII Table PAF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | PAF_NUMBR | Char(10) | Textual (de-)calibration set identification name.<br>Character string uniquely identifying the commanding textual (de-)calibration set. | M |

### 9.10.13 Modified fields in ASCII Table PAS

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | PAS_NUMBR | Char(10) | Identification name (PAF_NUMBR) of the textual (de-)-calibration set to which this string/value pair belongs. | M |

### 9.10.14 Modified fields in ASCII Table PRF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | PRF_NUMBR | Char(8) | Unique identification name of the parameter range set.<br>Character string. | M |

### 9.10.15 Modified fields in ASCII Table PRV

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | PRV_NUMBR | Char(8) | Identification name (PRF_NUMBR) of the range set to which this allowed value range belongs. | M |

### 9.10.16 Modified fields in ASCII Table CVP

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 3 * | CVP_CVSID | Number(10) | This field contains the ID (CVS_ID) of the stage associated to the task. Note that there must be at most one verification stage of a specified type (e.g. CVS_TYPE = 'A' or 'C') associated to each command. | M |

### 9.10.17 Modified fields in ASCII Table CVS

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CVS_ID | Number(10) | Unique ID of the verification stage.<br>Integer value in the range (0....2147483647). | M |

### 9.10.18 Modified fields in ASCII Table CVE

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | CVE_CVSID | Number(10) | ID of the verification stage (CVS_ID) this expression belongs to. It can only be a stage associated to parameter based verification checks (CVS_SOURCE = 'V'). | M |

### 9.10.19 New ASCII Table LGF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 1 * | LGF_IDENT | Char(10) | Logarithmic calibration curve identification name.<br>Character string uniquely identifying the Logarithmic calibration. | M |
| 2 | LGF_DESCR | Char(32) | Description of the polynomial calibration | |
| 3 | LGF_POL1 | Char(14) | Logarithmic coefficient $A_0$.<br>Numerical value expressed in real format (see below). | M |
| 4 | LGF_POL2 | Char(14) | Logarithmic coefficient of the 1st order ($A_1$)<br>Numerical value expressed in real format (see below). | '0' |
| 5 | LGF_POL3 | Char(14) | Logarithmic coefficient of the 2nd order ($A_2$)<br>Numerical value expressed in real format (see below). | '0' |
| 6 | LGF_POL4 | Char(14) | Logarithmic coefficient of the 3rd order ($A_3$)<br>Numerical value expressed in real format (see below). | '0' |
| 7 | LGF_POL5 | Char(14) | Logarithmic coefficient of the 4th order ($A_4$).<br>Numerical value expressed in real format (see below). | '0' |

The logarithmic calibration is calculated as follows:

Y (X) = 1 / (LGF_POL1 + (LGF_POL2 * ln(X)) + (LGF_POL3 * (ln(X) ^ 2)) + (LGF_POL4 * (ln(X) ^ 3)) + (LGF_POL5 * (ln(X) ^ 4)))

## 9.11 Changes due to ECP#9 - #12

The CCF and CSF tables are modified to include the sub-schedule ID.

### 9.11.1 New field in ASCII Table CCF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 21 * | CCF_SUBSCHEDID | Number(5) | Identifier of the default on-board sub-schedule to be used when loading this command as execution time-tagged. In case no default sub-schedule ID is associated to this sequence, the value specified in the field CSF_SUBSYS will be used as default.<br>Integer value in the range of (1....65535), although the full range is not permitted for Herschel Planck (refer to PSICD) | |

### 9.11.2 New field in ASCII Table CSF

| Fi. Nr | Field Name | Field Type | Description | Ma/ Def |
|---|---|---|---|---|
| 21 * | CSF_SUBSCHEDID | Number(5) | Identifier of the default on-board sub-schedule to be used when loading this sequence as execution time-tagged (all execution time-tagged commands within the sequence are associated to the same default sub-schedule ID). In case no default sub-schedule ID is associated to this sequence, the value specified in the field CSF_SUBSYS will be used as default.<br>Integer value in the range of (1....65535), although the full range is not permitted for Herschel Planck (refer to PSICD) | |

## 9.12 Relationships

This section describes the relationships between already existing tables and the new specific Herschel-Plank tables.

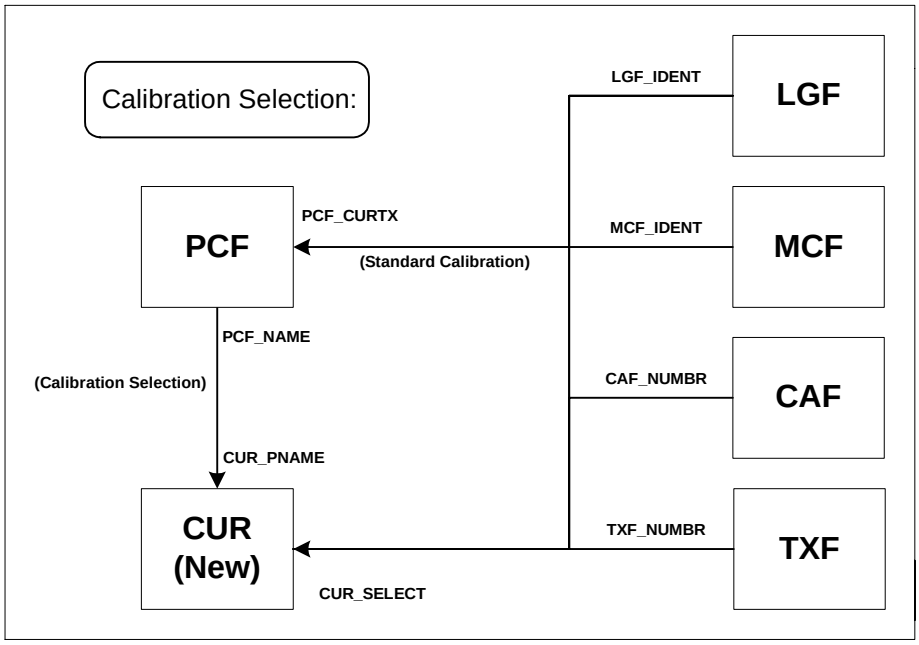


**Figure 9.12-1 Relationships for Calibration Selection**

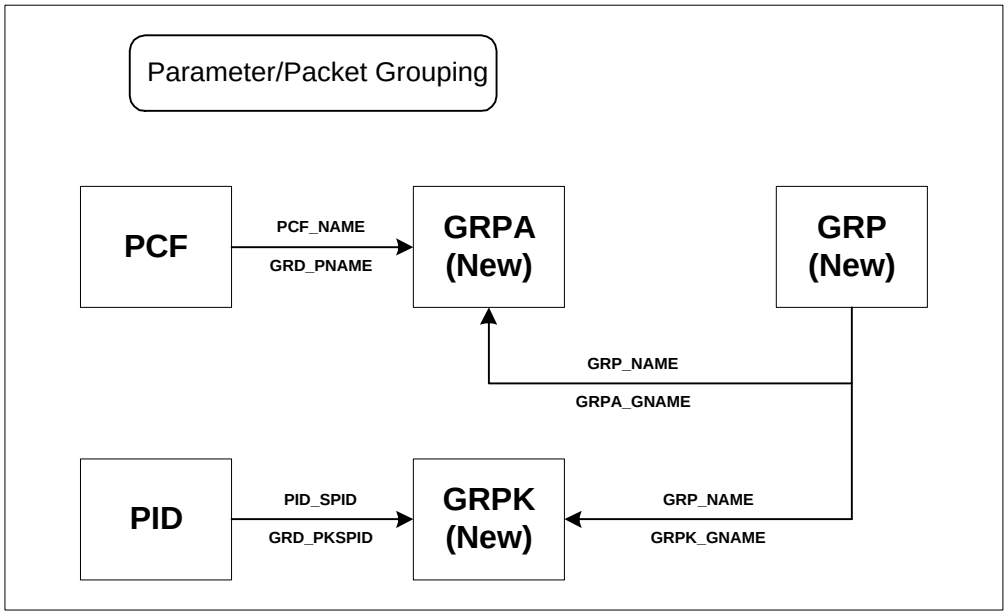


**Figure 9.12-2 Relationships for Parameter and Packet Grouping**

## 9.13 Affected Table summary

The following table summarises the changes required to [AD-002] in order to support the Herschel Plank Central Checkout System.

| Table | MIB File Name | Status |
|---|---|---|
| CAF | caf.dat | New field CAF_INTER<br>Modification to field:<br>CAF_NUMBR (See above) |
| CAP | cap.dat | Modification to field:<br>CAP_NUMBR (See above) |
| CCA | cca.dat | Modification to field:<br>CCA_NUMBR (See above) |
| CCS | ccs.dat | Modification to field:<br>CCS_NUMBR (See above) |
| CPC | cpc.dat | Modification to fields:<br>CPC_CCAREF (See above)<br>CPC_PAFREF (See above)<br>CPC_PRFREF (See above) |
| CSP | csp.dat | Modification to fields:<br>CSP_CCAREF (See above)<br>CSP_PAFREF (See above)<br>CSP_PRFREF (See above) |
| CUR | cur.dat | New table definition |
| CVE | cve.dat | Modification to field:<br>CVE_CVSID (See above) |
| CVP | cvp.dat | Modification to field:<br>CVP_CVSID (See above) |
| CVS | cvs.dat | Modification to field:<br>CVS_ID (See above) |
| GRP | grp.dat | New table definition |
| GRPA | grpa.dat | New table definition |
| GRPK | grpk.dat | New table definition |
| LGF | lgf.dat | New table definition |
| OCP | ocp.dat | Modifications to field:<br>OCP_TYPE (See above) |
| PAF | paf.dat | Modification to field:<br>PAF_NUMBR (See above) |

| Table | MIB File Name | Status |
|---|---|---|
| PAS | pas.dat | Modification to field:<br>PAS_NUMBR (See above) |
| PCF | pcf.dat | Modifications to fields:<br>PCF_NAME (See above)<br>PCF_CURTX (See above)<br>PCF_INTER (Ignored) |
| PID | pid.dat | Modifications to field:<br>PID_SPID (See above) |
| PRF | prf.dat | Modification to field:<br>PRF_NUMBR (See above) |
| PRV | prv.dat | Modification to field:<br>PRV_NUMBR (See above) |
| SCO | sco.dat | New table definition |
| TCD | tcd.dat | New table definition |
| TMD | tmd.dat | New table definition |

**Table 9.13-1 Affected Tables**

All tables defined in [AD-002], which are not mentioned in Table 9.13-1 are unchanged from the definition in [AD-002]