ROSETTA - SESAME
TO
ESA PLANETARY SCIENCE ARCHIVE
INTERFACE CONTROL DOCUMENT

RLGS-SPEC-SONC_DPS-SCIE-9241-CNES

RO-LSE-DS-3102

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TBD Items

Section	Description

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1 Introduction

1.1 Purpose and Contents

The purpose of this EAICD (Experiment to Planetary Science Archive Interface Control Document) is twofold. First, it provides users of the SESAME experiment data with a detailed description of the data archive and a description of how it was generated, including data sources and storage destinations. Secondly, the EAICD is the official interface between the SESAME experiment team and the Philae science data archiving authority.

This document describes the data flow of the SESAME experiment on the *Rosetta* lander *Philae* from the spacecraft until the insertion into the PSA for ESA. It includes information on how data were processed, formatted, labeled and uniquely identified. The document discusses general naming schemes for data volumes, data sets, data and label files. Standards used to generate the product are explained. Software that may be used to access the product is explained further on. The design of the data set structure and of the data product is given.

The naming of levels of processing of SESAME housekeeping and science data is based on the CODMAC definition. For details of this definition and for a cross-reference to other schemes see appendix B of [AD4].

The data format presented in this document comprises the commands and data available in SESAME flight software FM-1 [AD7], FM-2 [AD8] and FM-3 [AD9].

1.2 Archiving Authorities

The Planetary Data System Standard is used as archiving standard by

- NASA for U.S. planetary missions, implemented by PDS
- ESA for European planetary missions, implemented by the Research and Scientific Support Department (RSSD) of ESA
- ESA's Planetary Science Archive (PSA)

ESA implements an online science archive, the PSA,

- to support and ease data ingestion,
- to offer additional services to the scientific user community and science operations teams as e.g. search queries that allow searches across instruments, missions and scientific disciplines,
- several data delivery options like
  - direct download of data products, linked files and data sets
  - ftp download of data products, linked files and data sets

The PSA aims for online ingestion of logical archive volumes and will offer the creation of physical archive volumes on request.

1.3 Intended Readership

The staff of the archiving authority (SONC and PSA (RSSD, ESA)) and any potential user of the SESAME data.

1.4 Applicable Documents

AD1 SESAME Flight Software User Manual, FM 1.0, RO-LSE-UG-3401, issue 1, revision 1, August 2001

AD2 SESAME Flight Software User Manual, FM 2.0, RO-LSE-UG-3401, issue 2, revision 4, February 2008

AD3 SESAME Flight Software User Manual, FM 3.0, RO-LSE-UG-3404, issue draft, revision 2, September 2009

AD4 Planetary Data System Preparation Workbook, 1. February 1995, Version 3.1, JPL, D-7669, Part 1

AD5 Planetary Data System Standards Reference, Aug. 1, 2003, Version 3.6, JPL, D-7669, Part 2

AD6 ROSETTA Archive Generation, Validation and Transfer Plan, RO-EST-PL-5011, Issue 2.3, 10 January 2006

AD7 Rosetta Time handling, RO-EST-TN-3165, Issue 1, Rev. 0, February 9, 2004

AD8 Command and Data Management System (CDMS) Subsystem Specification, RO-LCD-SP-3101, Issue 3, Rev. 5, 29/08/2001

AD9 ROSETTA Archive Conventions, RO-EST-TN-3372, Issue 8, Rev. 3, 19 August 2015

AD10 CDMS DDD, RO-LCD-SW-3610, Issue 6 and above

AD11 CDMS Command and Data Management System - Subsystem Specification, RO-LCD-SP-3101 29/08/2001, Issue 3, Rev. 5

AD12 CDMS Command and Data Management System - Operation Manual, RO-LCD-SW-3402, 12/02/2001, Issue 1, Rev. 2

AD13 Data Delivery Interface Document, RO-ESC-IF-5003, Issue B6, 23/10/2003

1.5 Acronyms and Abbreviations

CASSE	Comet Acoustic Surface Sounding Experiment
CDMS	Central Data Management System
CoI	Co-Investigator
DAWG	Data Archive Working Group
DDS	Data Distribution System
DIM	Dust Impact Monitor
EAICD	Experiment (planetary science) Archive Interface Control Document
EGSE	Electrical Ground Support Equipment
ESA	European Space Agency
HC	Health-check
HK	Housekeeping
LCC	Lander Control Centre
LOBT	Lander On-Board Time
LSB	Least Significant Bit
MSB	Most Significant Bit
OOBT	Orbiter On-Board Time
PC	Payload Check-out
PCB	Printed Circuit Board
PDS	Planetary Data System
PI	Principal Investigator
PP	Permittivity Probe
PSA	Planetary Science Archive (ESA)
RLGS	Rosetta Lander Ground Segment
RSOC	Rosetta Science Operations Center
RSSD	Research and Scientific Support Department of ESA
S/S	Sub-system(s)
SESAME	Surface Electric Sounding and Acoustic Monitoring Experiment
SFDU	Standard Formatted Data Unit
SIM	Lander simulator (software with some hardware)
SLR	SESAME Local Time
SONC	Scientific Operation and Navigation Center
TBC	To Be Confirmed
TBD	To Be Defined
TC	Telecommand

UTC Universal Time Coordinated

1.6 Contact Names and Addresses

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1.7 Acknowledgement

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2 Overview of Scientific Objectives, Experiment Design and Data Products

2.1 Scientific Objectives

The activity and evolution of comets is, apart from the magnitude of the solar radiation flux, strongly influenced by the properties of their surfaces. Measurements of surface parameters like composition as well as mechanical and electrical properties and their variation with rotational and orbital phase are of crucial importance. In addition, the knowledge of the local physical, structural and layering properties of cometary surfaces is needed to understand the present processes and the formation history.

These data are required for modeling the gas transport properties of cometary surfaces and related activity phenomena. Describing the gas transport is a necessary prerequisite for a solid interpretation of the gas measurements of, for example, elemental and molecular abundances that are of primary scientific importance for *Rosetta* providing information on the composition of the 'pristine' material of comet nuclei. The diurnal variation of this gas flux is strongly governed by the diffusion properties of upper cometary surface layers. Vice versa, erosion by and re-condensation of this gas flux steadily modifies the surface properties.

The *Surface Electric Sounding and Acoustic Monitoring Experiment* (SESAME, Seidensticker et al., 2007) on the lander *Philae* of the ESA *Rosetta* Mission has the goal to determine several of these parameters as well as the properties of released cometary particles. SESAME is a complex of three instruments: The *Comet Acoustic Surface Sounding Experiment* (CASSE), the *Dust Impact Monitor* (DIM) and the *Permittivity Probe* (PP). It is the goal of SESAME to contribute to the understanding of the vertical and lateral structure of a cometary surface and the acting processes by conducting in-situ measurements of mechanical, electrical and particle-related properties.

The analysis of elastic waves that will be generated and recorded by CASSE will allow deducing mechanical parameters as well as the vertical (layered) structure of the cometary surface.

The DIM instrument will measure the properties of impacting ice-dust grains. These data should help to improve our understanding of the lateral variations and how activity can be evoked or choked.

PP will determine the complex permittivity of the surface material beneath *Philae*, which is a measure for the water ice content, thereby constraining the mass fractions of refractory material and other ices.

These measurements shall be performed from touchdown until 67P/Churyumov-Gerasimenko, the target comet, reaches its perihelion. Combining observations from other instruments, both on *Philae* and the *Rosetta* orbiter, with the SESAME data should improve models of cometary activity, layering processes and of the heat and gas transport within cometary surfaces.

2.2 Experiment Design

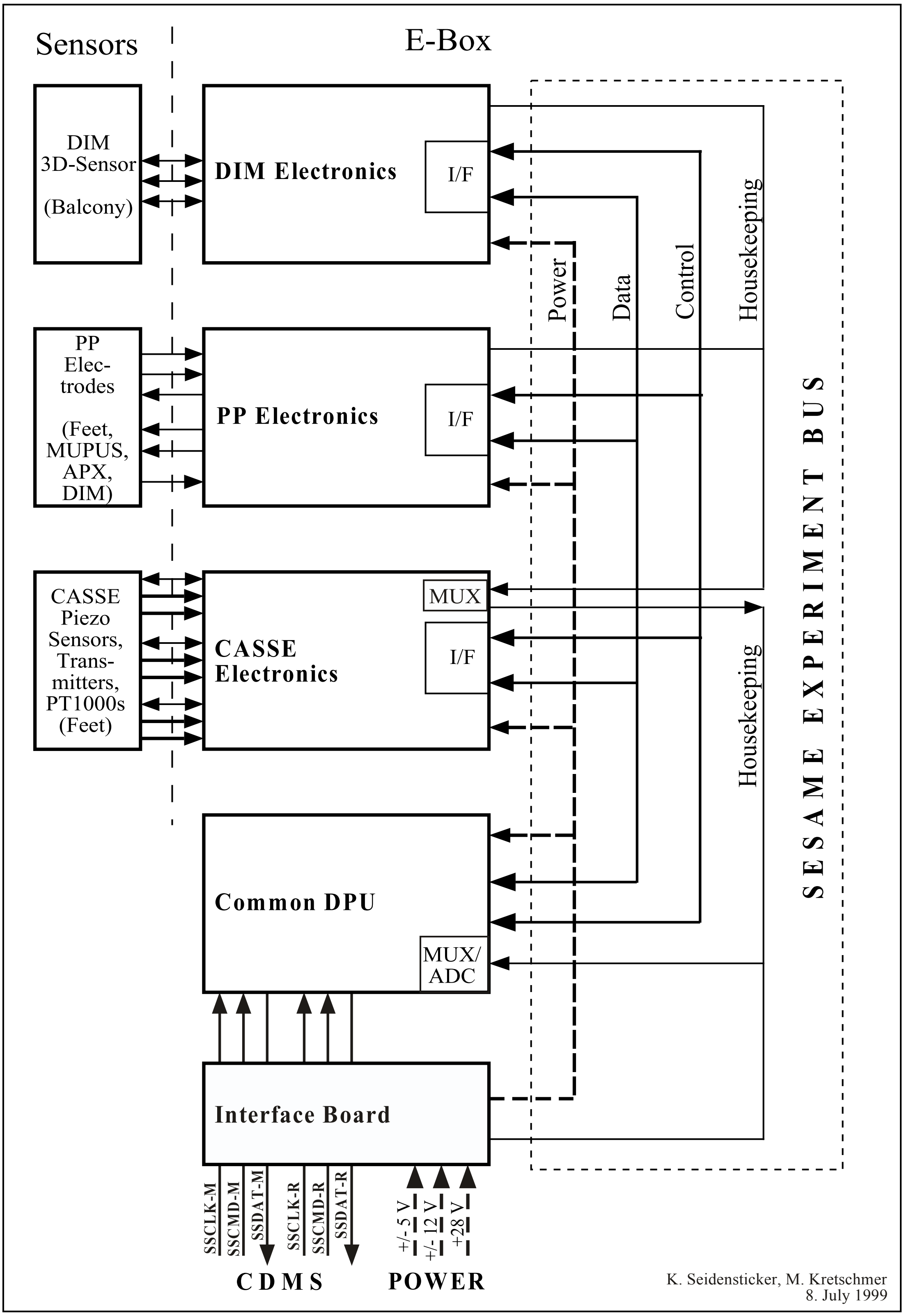

Figure 2.1: The SESAME electronics

2.2.1 CASSE

CASSE will investigate the outermost surface layers of comet 67P/Churyumov-Gerasimenko by transmitting and receiving vibrations in the range from 100 Hz to 10 kHz (audible frequency range). The elastic properties of the cometary surface will be investigated by recording compressional and shear waves. To guarantee sufficient ground contact in any foreseeable surface topography and composition (dust, sand, ice and their mixtures), the transmitters (actuators) and the receivers of stacked piezoceramics and triaxial piezoelectric accelerometers are integrated into the lander's six soles. The soles thus act as transmitting and receiving antennas. By switching between actuators and accelerometers, an analysis of the surface material and an in-depth sounding for detection of a layered structure or embedded local inhomogeneities are both possible. Two harpoons fired from *Philae* shall provide a fixation force of at least 5 N per sole in order to improve the ground contact of the soles and thereby the transmission and reception of vibrations.

Measuring principle

By measuring the propagation time between feet with triaxial accelerometers, the propagation velocities c_p and c_s of the acompressional and the shear waves can be derived. These velocities are related to the physical parameters and structural composition of the surface material. Identifying and measuring the thickness of subsurface layers, by detecting echoes from a steep gradient in reflectivity, is of great interest.

Physical parameters related to material properties are the elastic parameters Young's modulus E and Poisson number v. They are related to the velocities of the longitudinal and transverse elastic waves, described as compressional p- and shear s-waves in seismic terms, and the density ρ of the material. The elastic parameters can also be expressed by other mechanical parameters such as the compressional modulus and rigidity; these are related to other properties such as tensile strength and microstructure.

The interface between the soles and the cometary surface is mostly unknown. The required contact with the cometary surface strongly depends on the sole design and the final acoustic properties of the feet and landing gear. To cope with the unknown physical conditions on and in the comet, acoustic wave propagation experiments have been made in various materials simulating different cometary conditions. Laboratory studies of regolithic dust and sand, and hardened ice/dust mixtures demonstrated that acoustic sounding could be applied to cometary surfaces.

2.2.2 DIM

Most of the comet's surface is expected to be freely sublimating ice and embedded dust. When ice is exposed to solar radiation, sublimating gas molecules drag away embedded ice/dust grains of different sizes. The combined action of gas drag and gravitational forces means that the majority of the grains is either ejected into interplanetary space (smaller particles) or falls back to the nucleus (larger particles). DIM, mounted on *Philae*'s balcony, will observe those particles that fall back owing to their insufficient velocities.

DIM's data will help to monitor the downward flux of grains as a function of orbital position and cometary activity (along with daily variations). This will allow the development of better models for the distribution and flux of near-surface dust and small particles as a function of their size and velocity. The impact properties will allow the acoustic signals of external and internal origin to be separated. As a bonus, this experiment may help to identify the Lander vibration noise that needs to be removed from the acoustic and seismic measurements.

Instrument principle

DIM's piezoelectric sensor on the balcony will detect the impacts of particles having energies of 10^{-11}-10^{-7} J, radii of 50 µm - 6 mm and speeds of 2.5 cm/s - 0.25 m/s. The sensor's active area is about 75 cm^2. The low-level electrical output signals pass through a wideband logarithmic amplifier to retain their broad dynamic range. A data acquisition unit (DAU) measures the impact characteristics (peak amplitudes, contact times, averages). The DAU is connected to SESAME's Common Data Processing Unit (DPU) by the SESAME Experiment Bus.

The sensor output is a fast or slow decaying sinusoid transient electric signal (depending on the parameters of the impacting particles). An impact is detected by a threshold detector, where the threshold is the sum of the average of the signal and a margin. The margin is programmable in order to adjust the sensitivity of detection. As the impact rate increases, the average will be increased to reduce sensitivity so that the system is not saturated: fewer impacts will be detected.

Further, the average value of the amplified signal is sampled. In the case of very low impact rates, this is roughly equivalent to the electronic and background noise average. For very high impact rates, the individual impacts cannot be distinguished so only the average value of the signal is measured. This switchover from measuring individual impacts (Burst Mode) to the average (Continuous Mode) is automatic and is based on the measured average. The default is Burst Mode, but the Continuous Mode can be selected separately on command.

2.2.3 PP

The PP instrument is mainly a quadrupole detector using two transmitter and two receiver electrodes at any given time in so-called active mode. An AC-voltage, digitally generated by a sequencer inside the common electronics in the frequency range between 10 Hz and 20 kHz and amplitudes up to ±10V, is injected between two transmitter electrodes. The resulting current can be sampled with up to 180kHz sampling frequency on either of the two electrode's driver circuits. This current generates an electrical field inside the comet's surface material, which is picked up by the two receiver electrodes Rx1 and Rx2, placed inside the soles of the +Y and –Y landing gear leg, respectively.

Receiver

The measured potentials are amplified by preamplifiers, also inside these soles, by a factor of 8 and buffered to drive the long sensor cables into the Lander compartment. The PP electronics generates automatically the differential voltage between both signals, which is subsequently sampled at exactly the same moment as the corresponding current sample.

The resulting 8-bit values are stored in PP's on memory in alternating order, current values first, followed by the differential potential value. At the end of a measurement with given frequency and amplitude, the SESAME common DPU reads these data into the main memory, sorts them according to type (current or voltage) and places these vectors into the telemetry or use them for further on-board processing.

Transmitter

To achieve different geometries and thereby different penetration depths, three transmitter electrodes are implemented, which can be used in any combination. Tx1 is placed as metal mesh on the inside of the +X landing gear foot sole, Tx2 is implemented as an insulated ring lid to the APX detector, which is in contact with the comet surface once APX is lowered. Tx3 is a flexible mesh foil attached to the MUPUS PEN, lying on the comet surface the moment the PEN is deployed, from the beginning of the insertion process. In case none of the other detectors is deployed, an emergency measurement is possible using only the +X landing gear transmitter Tx1 and as return the grounding of the Lander through the harpoons. The precision of the measurements in this case would be severely reduced. The selection of the transmitter electrode pair is done by electronic switches under software control and are one of the active mode's configuration parameters.

The AC-signal is generated from a set of up to 256 8-bit values, stored before each measurement into PP's memory. The value 128 corresponds roughly to 0V, 255 to +10V and 0 to -10V. Using adjustable sequencer timing and a sine wave with different amplitudes as data set, the intended frequency and signal level can be defined. Amplitude control is used to optimize the returned current and potential signals for different material properties to the dynamic range of the digitalization module.

Passive mode

If the transmitter part is not used, the receivers are able to pick up potential variations caused e.g. by plasma waves in the vicinity of the Lander. In PP's passive mode, the potential difference is sampled with a fixed frequency of 20 kHz. The resulting data of a 1-second measurement can be sent directly via telemetry to ground for analysis. It is envisaged that a later flight software revision analyses the data directly on board and places only a logarithmic 10-bin power spectrum into the telemetry stream instead.

Plasma wave sensor (Langmuir Probe)

An additional sensor wire on top of the DIM sensor cube monitors the electrical field in the vicinity to help interpreting plasma wave like events. Field variations faster than a few Hertz cause a current flow through an integrator of the electronics. Once a minimum total charge is registered, a timer is activated and stopped again when a pre-set total charge is reached. The resulting timer value is transferred as Langmuir Probe value in the housekeeping part of SESAME's telemetry or as science part during a dedicated measurement. If no signal is detected, the timer stops at its maximum value of hexadecimal

FFFF, which then is transmitted. The timer frequency can be adjusted by command to increase the sensitivity of the sensor.

For power conservation, the three electronics groups, receiver, transmitter and Langmuir Probe are powered separately by electronic switches. Additionally, the sequencer's clock is disabled as long as no measurement is performed or the memory has to be accessed.

Housekeeping

All analog signals are routed through an 8-channel multiplexer to the same 8-bit Analog-to-Digital-Converter (ADC). The software controlled multiplexer channel selection defines, which analog parameter is digitized to be placed into the position of the first value of each sample pair mentioned above. During the health-check all eight channels are read out, providing information about the three transmitter electrodes' current monitors, the state of each receiver chain separately and the ±5V reference voltages defining the calibration of the analog electronics. Additionally the multiplexer can be disconnected, allowing characterizing the ADC separately. A series resister in the +5V power supply line for the digital part of PP's electronics not only serves as latch-up protection but allows also to monitor the power consumption of the digital part. The voltage after the resistor is divided by 2 and then monitored by the ADC on the CASSE board. The result is part of the SESAME housekeeping data set, the difference to the also returned input voltage is a direct measure for the current and thereby the health of the digital part of the PP electronics board.

2.3 Data Handling Process

SONC is responsible for the generation of the SESAME PDS data sets and the delivery to the PSA. The SESAME team will support this acitivity by delivering the relevant calibration information. The relevant contact information is provided in section 1.6. The SESAME PI is responsible for the distribution to the SESAME team.

2.3.1 Periods

Two operation periods must be distinguished in the SESAME data handling process:

I. The in-flight activity after the launch including the Commissioning and Cruise phases. Data produced during this period are in most cases (TBD) not scientifically relevant.
II. The in-flight scientific mission starting with the Close Observation Phase until Lander shutdown. Only this period produces scientific data.

Two data delivery periods to PSA should be distinguished:

A. Just after the proprietary period, raw data already available at SONC, i.e. up to Level 2.
B. When ready, calibrated SC data and reduced data (up to Level 5) will be generated and distributed to PSA.

2.3.2 Data Handling

The science data packets are retrieved in SFDU format from ESA's Data Distribution System (DDS) and archived at SONC in CDMS packets format, along with the housekeeping telemetry packets that are necessary to monitor the instruments.

The packet-specific fields are stripped out in order to reconstitute the science raw data, which are also time stamped in UTC, and stored in the SONC database. These data are furthermore converted to physical units.

All these data are electronically accessible to the PI's and Co-I's (http://soncv2-rosetta.cnes.fr) according to data distribution agreements between these people and enforced by access rights at SONC.

The elaboration of PDS files is handled by SONC:

As soon as the science (SC) and housekeeping (HK) data are available at SONC (starting with the commissioning data), the PDS files are directly produced from the archived data at SONC.

After this first formatting, these data are electronically available to the SESAME team in order to be analyzed, and possibly recalibrated under his control, as well as qualified according their quality. SONC will derive the geometry related keyword parameters from the adequate Spice kernel for data sets level 2 and above. Then, just after the proprietary period (six month as a minimum), the SONC team will provide the raw and calibrated data to the PSA.

At any rate, the long-term archive is constituted at SONC. SONC is responsible for the gathering of the necessary data from the SESAME team and the distribution of the PDS-formatted data to the archive team of the RSOC. The PI's are responsible for the organization of data and their scientific correctness.

The SONC controls the archive completeness before handing it over to the archive team of the RSOC, and generates the global indices.

2.4 Overview of Data Products

2.4.1 Pre-Flight Data Products

There are no pre-flight data archived to PSA.

2.4.2 Sub-System Tests

The various health-checks procedures, implemented e.g. in the SESAME Cruise Functional Test, will be used to check the status of each instrument and its sensor modifications with the changing environment:

CASSE Health Check (CAS-HC):
The CAS-HC will be used to follow-up the behavior of the CASSE transmitters and accelerometers with temperature and mechanical environment (in space or fixed to the cometary surface).

DIM Health Check (DIM-HC):
The DIM-HC consisting of several sub-tests (Power Check, Noise Test, Calibration and Sensor Test) will be used to check the actual properties of the sensor plates and the operating environment (noise).

PP Health Check (PP-HC):
The PP-HC monitors the functioning and long-term stability of all PP electronics sub-systems. The included LP-value shows plasma wave events in case they happened at the time the health-check was performed. The +5V value indicates the current consumption of the digital part, which might be a function of radiation degradation over time.

These tests are described in AD3.

2.4.3 Instrument Calibrations

Although most of the SESAME measurements are relative, the following information should be used to calibrate and correct the science data:

CASSE

Amplification factors to calculate the signal strength in voltage

Pre-launch Brüel & Kjaer calibration of CASSE accelerometers (transfer from voltage to acceleration)

PP

Calibration functions for digital current consumption in mA

Transmitter currents in mA

Potential values in mV

DIM

One sub-test (Calibration) of the DIM Health Check (DIM-HC) is for calibrating the log-amplifier (i.e. to determine the actual slope of the log-characteristic of the log-amplifier). The measured U, A values must be corrected according to the result of this calibration.

The SESAME team will provide and update relevant information so that the processing pipeline is up to date with the current understanding of the characteristics of SESAME.

The calibration files will be available at the SESAME laboratories and SONC. A release will be provided to PSA whenever they are refined. The delivery format is described in chap. 3.4.3.2 (Calibration directory).

2.4.4 In-Flight Data Products

Most In-Flight (science) data had been produced during mission phases "Post Hibernation Commissioning" to "First Science Sequence". But we intend to deliver also our in-flight sub-system tests (see chap. 2.4.2) as well as other cruise data, which are useful for SESAME calibration as well as monitoring of Lander and Orbiter vibration. In addition, we are checking whether science data (particle impacts and plasma waves) can be obtained during Cruise and or Fly-Bys.

In flight data products cover four data processing levels:

***Raw telemetry* (CODMAC level 1)**:

HK and SC SESAME packets (rolbin files) as received from DDS.
These data will be available at ESOC, SONC, SESAME and PSA. They will be delivered to PSA during period A (after the proprietary period).

***Raw data* (CODMAC level 2)**:

SC raw data (edited data) separated for each instrument (CASSE, DIM, PP).
The data will be available at SONC, SESAME and PSA. They will be delivered to PSA during period A (after the proprietary period).

***Calibrated HK data* (CODMAC level 3)**:

Housekeeping data in scientific units and time tagged.
The data will be available at SONC, SESAME and PSA. They will be delivered to PSA during period A (after the proprietary period).

***Calibrated SC data* (CODMAC level 3)**:

Calibrated science data, time-tagged and separated for the SESAME instruments CASSE and PP.
The data will be available at SONC, SESAME and PSA. They will be delivered to PSA in period B (when ready).

The data are produced during following mission phases (

Table 2.1).

Table 2.1: Mission phases

MISSION_PHASE_NAME	Abbreviation	**Start Date** (dd/mm/yyyy)	**End Date** (dd/mm/yyyy)	**SESAME data** (1)
Commissioning (part 1)	CVP1	05/03/2004	06/06/2004	**CASSE, DIM, PP**
Cruise 1	CR1	07/06/2004	05/09/2004	
Commissioning (part 2)	CVP2	06/09/2004	16/10/2004	**CASSE, DIM, PP**
Earth Swing-by 1 (including PC#0)	EAR1	17/10/2004	04/04/2005	**CASSE, DIM, PP**
Cruise 2 (including PC#1,2)	CR2	05/04/2005	28/07/2006	**CASSE, DIM, PP**
Mars Swing-by (including PC#3,4,5)	MARS	29/07/2006	28/05/2007	**CASSE, DIM, PP**
Cruise 3	CR3	29/05/2007	12/09/2007	
Earth Swing-by 2 (including PC#6, 7)	EAR2	13/09/2007	27/01/2008	**CASSE, DIM, PP**
Cruise 4-1 (including PC#8)	CR4A	28/01/2008	03/08/2008	**CASSE, DIM, PP**
Steins Flyby	AST1	04/08/2008	05/10/2008	**CASSE**
Cruise 4-2 (including PC#9)	CR4B	06/10/2008	13/09/2009	**CASSE, DIM, PP**
Earth Swing-by 3 (including PC#10)	EAR3	14/09/2009	13/12/2009	**CASSE, DIM, PP**
Cruise 5 (including PC#12)	CR5	14/12/2009	06/06/2010	**CASSE, DIM, PP**
Lutetia Flyby	AST2	07/06/2010	10/09/2010	
RV Manoeuver 1 (including PC#13)	RMV1	11/09/2010	13/07/2011	**CASSE, DIM, PP**
Cruise 6	CR6	14/07/2011	22/01/2014	
Post Hibernation Commissioning	PHC	09/04/2014	24/04/2014	**CASSE, DIM, PP**
Pre-delivery calibration Science	PDCS	25/04/2014	11/11/2014	**CASSE, DIM, PP**

(1) The last column indicates if SESAME data are available, the first one indicates if data can come from a Payload Checkout.

After the release of the Lander, we distinguish four phases, characterized by:

- The Start and Stop dates need to be expressed in seconds
- The Lander has its own Auxiliary data

Separation/Descent/Landing	SDL	2014/11/12 08:35:02	2014/11/12 16:15:00	**CASSE, DIM, PP**
Rebounds	RBD	2014/11/12 16:15:00	2014/11/12 17:30:20	
First Science Sequence	FSS	2014/11/12 17:30:21	2014/11/15 01:00:00	**CASSE, DIM, PP**
Long Term Science	LTS	N/A	N/A	N/A

SESAME data can come from three flight software versions (FM-1, FM-2 and FM-3) whose validity periods are given below:

Flight Software	Begin (Date Time)	End (Date Time)
FM-1	2004/03/02 00:00:00 (launch)	2007/09/24 19:39:59
FM-2	2007/09/24 19:40:01 (PC#6)	2009/09/24 01:59:59
FM-3	2009/09/24 02:00:01 (PC#10)	Today

2.4.5 Software

No SESAME software will be delivered.

2.4.6 Documentation

The documentation directory contains the following documents:

- EAICD (This document, PDF file)
- SES_CAS_CALIBRATION_DESC.ASC (ASCII file)
- SES_DIM_CALIBRATION_DESC.ASC (ASCII file)
- SES_PP_CALIBRATION_DESC.ASC (ASCII file)

- RL_SESAME_LOGBOOK.ASC, SESAME operations timeline ASCII file (ASCII file)

2.4.7 Derived and other Data Products

There are no derived products for SESAME.

2.4.8 Ancillary Data Usage

2.4.8.1 Combined Rosetta / Lander operation

Two periods should be distinguished:

The first period starts after the launch until the close Comet approach. During this period the Lander is fixed to the Orbiter and they share the same auxiliary data that is the FD (Flight Dynamic) files. In order to interpret temperature and vibration data the Orbiter / Lander geometry as well as operational details (e.g. Orbiter gyro operation) should be known.

The next period is the global mapping to close observation phase. In addition to the first period, the geometry w.r.t. the target comet as well as to sun should be known in order to interpret particle impacts on CASSE and DIM sensors. As well these data should support the analysis of PP passive and Langmuir mode measurements.

2.4.8.2 Lander delivery and relay

The third period is Lander delivery and relay (SSP). After the separation from the Orbiter, and particularly during the Comet activity phase, the Lander will have its own auxiliary data:

- Lander orientation
- Localization in space
- Sun direction
- Rosetta/Lander Timeline

The “Rosetta/Lander Timeline” is a text file describing the working context and scheduling (on-off of each experiment, performed commands etc.). This file will be produced by SONC from CDMS and HK telemetries.

2.4.8.3 On-comet operation

The final operation period is the On-comet operation (LOW to PERI). In addition to the data mentioned in chap. 2.4.8.2 the following paramters are needed for SESAME data processing:

- Orientation of the Lander / rotation angle
- Drill status: in contact with the surface or not
- Direction and incident angle of the Sun (separate for Landing Gear and the upper Lander (rotation!))

- Distance and position angle of the MUPUS PEN, once deployed

The Sun information is only needed for scientific evaluation of the data later on.

The Lander Auxiliary Data on the comet (Position / Orientation / Illumination at any time + Comet models + Ancillary Data from the instruments) are available in an ANCDR (Ancillary Data Record) data set.

The following special information is needed for processing SESAME instrument data:

CASSE

None.

DIM

None.

PP

- APXS status: extended or not
- Impact point of the harpoon(s)

Most of the listed information is needed to translate the measured current and potential values correctly into permittivity and conductivity of the comet surface material.

3 Archive Format and Content

3.1 Format and Conventions

Throughout this document, the SESAME data processing status will be indicated by the CODMAC code levels (see Table 3.1 and AD6 (Appendix B)).

Table 3.1: CODMAC code levels

1: *Raw Data*: Telemetry data with data embedded.
2: *Edited Data*: Corrected for telemetry errors and split or decommutated into a data set for a given instrument. Sometimes called Experimental Data Record. Data are also tagged with time and location of acquisition. Corresponds to NASA Level 0 data.
3: *Calibrated Data*: Edited data that are still in units produced by instrument, but that have been corrected so that values are expressed in or are proportional to some physical unit such as radiance. No re-sampling, so edited data can be reconstructed. Corresponds to NASA Level 1A.
4: *Re-sampled Data*: Data that have been re-sampled in the time or space domains in such a way that the original edited data cannot be reconstructed. Could be calibrated in addition to being re-sampled. Corresponds to NASA Level 1B.
5: *Derived Data*: Derived results, as maps, reports, graphics, etc. Corresponds to NASA Levels 2 through
6: *Ancillary Data:* Non-science data needed to generate calibrated or re-sampled data sets. Consists of instrument gains, offsets, pointing information for scan platforms etc.

3.1.1 Deliveries and Archive Volume Format

A data set will be delivered for each **simple mission phase.** Each data set will contain **only one level data processing**. The list of simple mission phases is given in AD9 (table 3).

A data set will be level-stamped as below:
Level 1 when it will contain raw telemetry data:

- SC and HK packets as received from DDS and mixed together in binary files (.rolbin).

Level 2 when it will contain raw science data:

- SC edited data (uncalibrated) separated by instrument in ASCII files (.TAB).
- PP SC data will also be separated according to operation mode.

Level 3 when it will contain calibrated data:

- HK calibrated data in ASCII file (.TAB)
- CASSE nominal calibrated time series (acceleration vs. time) (.TAB)
- PP:

  Calibrated Health-Check data in ASCII files (.TAB)

  Calibrated current / voltage time series for active test measurements in ASCII files (.TAB)

  Calibrated frequency / current amplitude / voltage amplitude / phase data sets for active measurements in ASCII files (.TAB)

  Calibrated electric field densities (electric field density vs. freqency bin) and calibrated potential difference time series (voltage vs time) (passive mode) in ASCII files (.TAB)

In addition a data set will contain:

- Software (in level 1 datasets)
- Calibration files (in level 3 datasets)
- Documents (see chapter 2.4.6)

A new data set release is provided when:

- The calibration information has been refined
- Additional data has been processed
- Data have been processed to a higher CODMAC level.

3.1.2 Data Set ID / Name Formation

The following naming formation scheme will be used for the SESAME data sets:

DATA_SET_ID = <INSTRUMENT_HOST_ID>-<target id>-<INSTRUMENT_ID>-<data processing level number>-<mission phase abbreviation>-<description>-<version>

DATA_SET_NAME = <INSTRUMENT_HOST_NAME> <target name> <INSTRUMENT_ID> <data processing level number> <mission phase abbreviation> <description> <version>

See AD9 (chaps. 2.1.1 and 2.1.2).

The target name will contain the name of the mission phase and the description field (optional) will be used to specify the name of the operation phase during the Cruise (swing-by and flyby).

Example of DATA_SET_ID and DATA_SET_NAME for the level 3 Comet phase data:

DATA_SET_ID = "RL-C-SESAME-3-COM-V1.0"

DATA_SET_NAME= "ROSETTA-LANDER 67P SESAME 3 COM V1.0"

Example of DATA_SET_ID and DATA_SET_NAME for the level 2 Mars swing-by data:

DATA_SET_ID = "RL-M-SESAME-2-MARS-V1.0"

DATA_SET_NAME= "ROSETTA-LANDER MARS SESAME 2 MARS PC#3-4-5 V1.0”

3.1.3 Data Directory Naming Convention

The DATA directory contains data obtained after Rosetta launch, i.e. either flight data or ground reference model data. The data are archived accordingly into two separate sub-directories FLIGHT and GRM. Furthermore, the data in the FLIGHT sub-directory are sorted into sub-directories according to the three SESAME instruments and their modes. An extra sub-directory (SESAME) is used for general SESAME-related data (mainly HK) where applicable.

The top-level sub-directories have names according to the instruments:

SESAME/

HK	SESAME general housekeeping data. Data might be extracted and duplicated to other data sets
SC	Health Check data (from COM_HK telecommand),
	Content of Backup RAM Buffer (from COM_RBUF TC),
	Messages in the science data stream: Ready Message and Error Messages

CASSE/

SC	First 16 words of Jobcard (from COM_RDJC TC)
LI	Data collected during Listening mode
TR	Data collected during Trigger mode
SN	Data collected during Sounding mode and CASSE Health Check mode
ST	Data collected during the Stacking mode

DIM/

AV	Data collected from Average Continuous and Average Continuous Test modes
	Continuous data: overlapping impacts (at high flux) gradually prohibit getting data of a single impact: therefore only the Average is measured. Transition limit can be defined between Burst_Continuous / Average_Continuous.
	A (Average), Selected Direction (X or Y or Z), Sampling time (i.e. the frequency of sampling from the averaged signal of the sensor.
	The Average Continuous Test mode is similar to the Average Continuous mode but raw voltage values of average samples are additionally included into TM stream
BC	Data collected during the Burst Continuous mode.
	Burst data (data of individual impacts): U (Peak amplitude), T (Contact time), selected Direction (X or Y or Z), selected Margin (i.e. selected sensitivity)
CAL	Data collected during the Calibration mode
HC	Data collected during the DIM Health Check
NT	Data collected during the Noise Test Mode
PC	Data collected during the Power Check mode
ST	Data collected during the Sensor Test mode

PP/

AM	Active mode data either from AMTEST or AM modes, permittivity data
HC	Data collected during PP Health Check mode
LM	Data collected during the Langmuir Probe Test mode
PM	Data collected during the Passive mode and Passive mode Test for plasma wave measurements

3.1.4 File naming Convention

The data levels 2 and 3 depend on instrument mode whereas data level 1 does not. Consequently, there are two different file naming schemes defined according to the data level as follows.

File naming scheme for **level 1**:

FILE_NAME = <experiment>_<data type>_<begin of observation>.<ext>

SES_XYZ_ yymmddhhmn.ext

<experiment> (3 characters) = **SES**

<data type> (3 characters) = XYZ

- X = **G** for Ground, **F** for Flight
- Y = **S** for Science Data, **H** for Housekeeping Data, **B for files with both data types mixed together**
- Z = CODMAC level: **1** (for raw packets)

<begin of observation> (10 characters) = start time of test or working session. Two sessions will be separated by at least 15 minutes.

yymmddhhmn

- yy = year
- mm = month
- dd = day
- hh = hour
- mn = minute

<ext> (file extension) = ROL

File naming scheme for **levels 2 and 3**:

FILE_NAME = <experiment>_<data type>_<mode>_<begin of observation>_<data description.<ext>

SES_<XYZ>_<imo>_<yymmddhhmn>_<desc>.ext

<experiment> (3 characters)**: SES**

< XYZ > (3 characters):

- X = **G** for Ground, **F** for Flight
- Y = **S** for Science Data, **H** for Housekeeping Data, **B** for files with both data types mixed together
- Z = CODMAC level: **2** for raw instrument data, **3** for calibrated data (SC or HK), **5** for derived data

< imo > (3 characters):

- **i** = instrument (1 character) : **S, C, D, P**
  S (SESAME) for common data, **C** for CASSE data, **D** for DIM data, **P** for PP data
- **mo** (2 characters) = mode (see Table 3.2)
  "__" for SESAME

< yymmddhhmn > (10 characters): start time of test or working session. A session corresponds to one instrument and one mode:

- yy = year
- mm = month
- dd = day
- hh = hour
- mn = minute

<desc> (4 characters maximum) = data description (see Table 3.2)

<ext> (file extension) = TAB

Table 3.2 Values of fields "mode" and "desc" in the SESAME filename

Instrument	Modes (mode field)	Description (desc field)
SESAME	-	HC, HK, RBUF, RDJC, RMES, EMES, WPENZ
CASSE	SN, LI, TR, ST, HC	JOBC, SEQP, DATA, STAT, TAFT
DIM	HC, PC, NT, ST, CA, AV, BC	Depends of DIM mode: HC, PC, NT, CA: ST : X, Y, Z BC : PAR, AM, BM BCTEST, AV, AVTEST: PAR, SIG
PP	HC, AM, AT, PM, PT, LM	HC, LM: AM: PAR, DATA AMTEST: TPAR, TTX, TRX, TDAC PM: PAR, POW PMTEST: TPAR, TPOW, TRX, TCH

Example: SES_FB1_0510040300.ROL
This file begins at 2005/10/04 03:00 and contains the SESAME (SC and HK) packets.

The corresponding level 2 data file for a CASSE sounding would be:
SES_FS2_CSN_0510040300_DATA.TAB

3.2 Standards Used in Data Product Generation

3.2.1 PDS Standards

The PDS standard for the cubes is that of PDS version 3.6 as described in AD5.

3.2.2 Time Standards

3.2.2.1 Generalities

This paragraph gives a summary of the different existing formats in the Rosetta Ground segment, from their generation by the instruments to their availability at SONC:

- The Lander CDMS requires the scientific instruments to transmit the data by bursts of 8 or 64 bytes (4 or 32 16-bit words)
- When sufficient data are received, the CDMS builds packets containing 256 bytes of instrument data. The CDMS adds 18 bytes header (unit PID, sequence count, OOBT: Orbiter OBT, data type) and a 2 bytes checksum (DECW) and creates packets with a fixed length of 276 bytes[1]. For transmission between Lander and Orbiter, a 4 bytes synchronization header and a 2 bytes trailing checksum (PECW) are added, increasing the packet size to 282 bytes. The extra bytes are removed by the ESS.

[1] The Lander CDMS header and the headers of the telemetry source packets from the Orbiter instruments are quite similar. There is a difference in the data field header. The byte containing PUS version, checksum flag and spare fields is set to zero in the CDMS header. Besides the last byte of the OOBT is set to zero in the CDMS header. The CDMS header has an additional word (2 bytes) after the data field header named "FORMAT ID". This word is mainly used for HK data and it contains the HK scanning period and the SID (structure identification).

To comply with ESA requirements, the time registered in the CDMS packets is the Orbiter On-Board Time (**OOBT)**. It is reconstituted from the Lander On-Board Time (LOBT), as shown in **Erreur ! Source du renvoi introuvable.**.

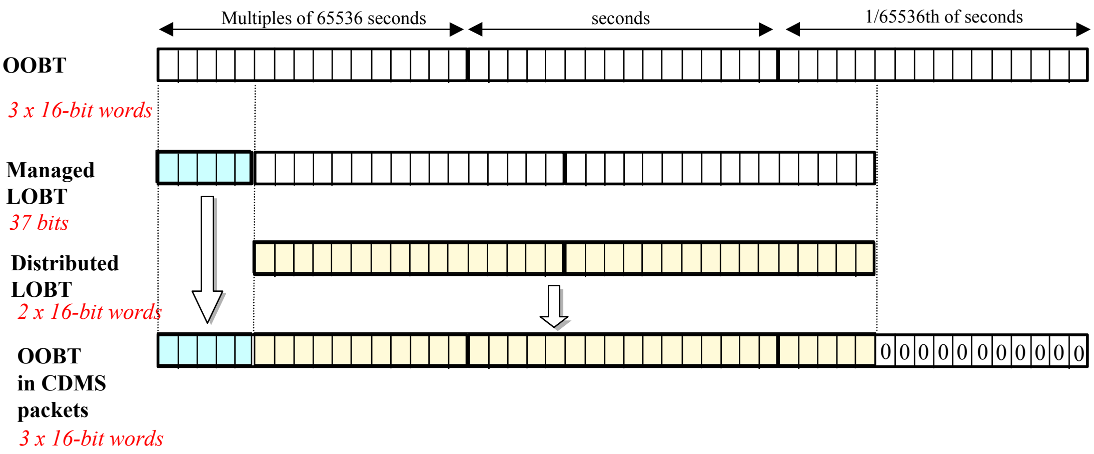

Figure 3.1: Reconstruction of on board time in CDMS packets

- The ESS groups together several packets and passes them to the Orbiter OBDH, which transmits them according to the Space/Ground interface. This part is transparent for the Lander ground segment.
- The data are delivered by the Rosetta Data Distribution System (DDS) to the SONC in SFDU format. A SFDU file is basically a collection of 276-byte packets interspersed with auxiliary information records. An 18 bytes SFDU header is added to the CDMS 276-byte packets. This header contains information added at the ground station (time correlated OBT, ground station id, virtual channel id, service channel, type of data, time quality)
- SONC processes the SFDU files to retrieve the 276-byte packets. This format is available in the SONC database.

- The relationship between both time formats (OOBT and LOBT) is given in AD10. Afterwards, SONC processes science raw packets in order to recompose the science measurement (e.g. an image or a spectrum). Figure 3.1 gives an overview of this data flow.

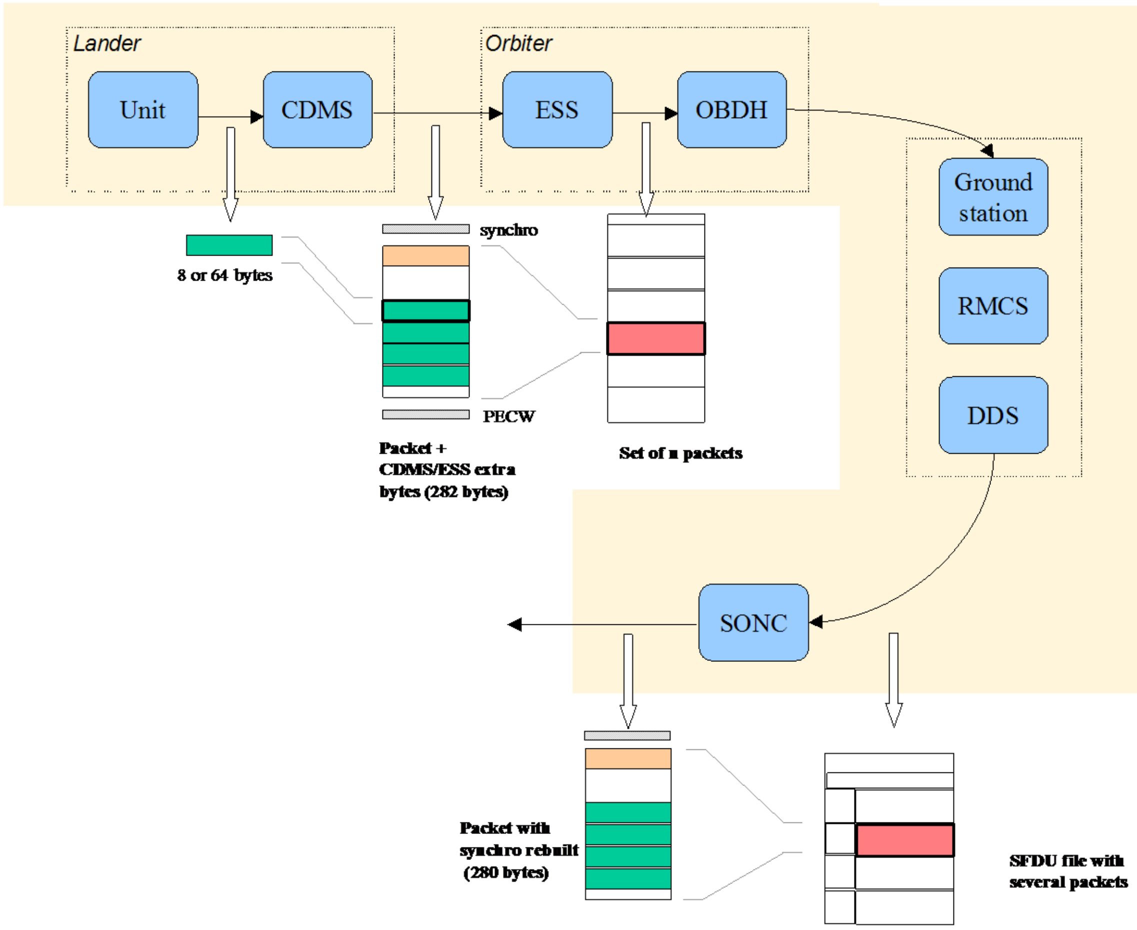

Figure 3.2: On board data flow

The following principles are applied:

- The packet wrapping is removed, and science frames that had to be split into several raw data packets are rebuilt. Basic error detection controls are applied, to recover from possible problems in the transmission chain.
- The Lander On-Board Time (LOBT) (synchronized with OOBT) extracted from the packet, and corresponding UTC time are added.
- UTC time is calculated from the On-Board time taking into account the On-Board clock drift as following:
- UTC (seconds since 01/01/1970) = LOBT (seconds) * Gradient + Offset

These coefficients are extracted from TCP packets delivered by DDS. LOBT is either the LOBT extracted from CDMS header or the experiment internal clock when it exists (CIVA, COSAC, PTOLEMY, ROMAP, ROLIS, SESAME). In the last case, it must be taken into account that the Internal clock (32 bits) resets all 4 years, 4 months, 3 days (first reset: 03/04/2007 10:42:07).

UTC time-stamped Science and HK data are available in the SONC database and used to generate PDS format.

3.2.2.2 SESAME Time standards

The time standards used in the SESAME data products are:

- SESAME Local Time
- Lander On-Board Time
- DDS header time correlated
- Universal Time Coordinated (UTC)

SESAME Local Time (SLT)

SESAME Local time is the only time available to the instrument during operation. It is synchronized with Lander On-board Time each time a CDMS RTIM message is received by SESAME. SESAME uses a timer with a resolution of 1/32 second to update this time between two successive CDMS RTIM messages. The SESAME flight software writes the SESAME Local Time at generation in the measurement header of each science measurement.

3.2.2.3 Lander On-Board Time (LOBT)

The instruments on board the spacecraft (Orbiter) generate telemetry source packets with an OOBT (orbiter on board time) time stamp in the header. The OOBT written into the packet header specifies the time, when CDMS can complete a packet.

In terms of HK packets this is the time of the last HK word. Using the HK scanning rate, which is given in word #9 of the packet, one can calculate the OBT of every individual word in this packet. Note that this is only valid if packets with SID (word #9) 1 or 2 are generated. Packets with SID 4 and 5 are "snapshots", which means you can apply the packet OOBT for every word in this packet. SID 3 packets have to be analyzed case by case.

In terms of SC packets this is the reception of the last 32 word block by CDMS, which also completes the SC packet. How often 32 word blocks are created (and sent) by the unit, and corresponding to this the delta time between each block, might be different for each unit. So, re-calculation of OOBT for SC words depends on this unit feature.

The Orbiter On-Board Time (OOBT) is a linear binary counter having a resolution of 1/65536 second stored in 3 16-bit words.

The Lander On-Board Time (LOBT) is a linear binary counter having a resolution of 1/32 sec, kept in 37 bits. Only the 32 least significant bits are distributed to the instruments, in 2 16-bit words. The 5 most significant bits are supposed constant during most of the mission; they are available through a specific service.

The LOBT is derived from the Orbiter On-Board Time (OOBT): the 11 least significant bits of the OOBT are discarded to obtain the LOBT, hence the reduced resolution. A re-synchronization between OOBT and LOBT is performed regularly (see AD11).

The Lander is synchronized prior to Separation and during every RF link after landing. So, during descent and the First Science Sequence this should not be a problem, since LOBT keeps synchronized as long as the Lander is powered.

For a description of time handling in the Rosetta project see AD7 "Rosetta Time handling **RO-EST-TN-3165**, issue 1, rev 0, February 9, 2004".

For a description of Lander on board time handling see AD11 (Command and Data Management System (CDMS) Subsystem Specification 29/08/2001, Issue 3, Rev. 5 **RO-LCD-SP-3101**):

§ 2.3.2.6 Synchronization and Adjustment of Lander On-board Time

§ 2.3.2.6.1 Absolute vs. relative time references

§ 2.3.2.6.2 On-board Time Failure Modes and Recovery Procedures

and AD12 (Command and Data Management System (CDMS) Operation Manual 12/02/2001, Issue 1, Rev. 2 **RO-LCD-SW-3402**): § 6. About Lander On-Board Time.

3.2.2.3.1 The DDS header time correlated

The OOBT is converted to UTC (Coordinated Universal Time) by means of time correlation and included in the additional DDS packet header when the packets are distributed via the DDS server.

The **DDS header time correlated** (SCET field in the DDS header) is the UTC of the start of measurement derived from the OOBT by time correlation.

Its format is the Sun Modified Julian Time (MJT) i.e. two 32 bit integers. The first (MSB) contains the number of seconds since 00:00:00 on 1. January 1970 and the second (LSB) integer the number of Microseconds from seconds in the first field.

Time correlation is described in AD13**Erreur ! Source du renvoi introuvable.** (Data Delivery Interface Document RO-ESC-IF-5003 Issue B6 23/10/2003, Appendix 18 § 18.1.2.1).

3.2.2.3.2 The UTC (Universal Time Coordinated)

The **UTC** is used as a time stamp for SC and HK SESAME data products (from level 2 to level 3).

3.2.2.3.3 Spacecraft Clock Count in PDS Labels

The PDS keywords SPACECRAFT_CLOCK_START_COUNT and SPACECRAFT_CLOCK_STOP_COUNT refer to LOBT. The LOBT is represented in the following format:

SPACECRAFT_CLOCK_START/STOP_COUNT = "<reset number>/<unit seconds>.<fractional seconds>"

The full stop character separates the unit seconds and the fractional seconds. **Note that this is not a decimal point.** The fractional seconds are expressed as multiples of 2^{-5} = 0.03125 seconds and count from 0 to 2^5 -1 = 31. E.g. in SPACECRAFT_CLOCK_START_COUNT = "3/356281394.21" the 21 fractional seconds correspond to 21 × 2^{-5} = 0.65625 decimal seconds.

The reset number is an integer starting at 1 and defines the epoch related to the counter value. E.g. "1/" means LOBT = 0 at 2003-01-01T00:00:00 UTC. The meaning of the other integer values is defined in the Rosetta time correlation file.

3.2.3 Cartographic Systems

SESAME uses Lander reference polar co-ordinates relative to the landing gear orientation. The center of the Landing Gear is the origin with the +X leg acting as reference direction for angle = 0 deg. The rotation angle increases clock-wise. Units are measured in cm and from 0 to 360 deg. As an example: the -Y leg is pointing in the 120 deg direction.

This Lander centric reference system has to be fixed into an appropriate topographic cometary system, in order to indicate external vibration / seismic sources.

Altitude above ground: TBD

3.3 Data Validation

The SESAME data products are delivered to PSA by SONC. The SESAME PI or the SESAME PDS responsible will validate the SC and HK data produced by SONC of all PDS CODMAC levels. These data will be distributed via the W3-SONC server.

3.4 Archive Content

3.4.1 Volume Set

One volume corresponds to one data set. The possible values of VOLUME keywords can be found in AD9. The volume keyword values for the Commissioning mission phase are given in the following example.

```
DESCRIPTION             = "This volume contains Rosetta SESAME
                           level 2 data products and supporting
                           documentation from the
                           Commissioning phase"
VOLUME_ID               = "RLSES2_1042"
VOLUME_NAME             = "SESAME RAW DATA FOR THE COMMISSIONING PHASE"
VOLUME_SERIES_NAME      = "ROSETTA SCIENCE ARCHIVE"
VOLUME_SET_ID           = "DE_DLR_PF_RLSES_10XX"
VOLUME_SET_NAME         = "ROSETTA SESAME DATA"
VOLUME_VERSION_ID       = "VERSION 1"
VOLUMES                 = 1
VOLUME_FORMAT           = "ISO-9660"
MEDIUM_TYPE             = "ELECTRONIC"
PUBLICATION_DATE        = YYYY-MM-DD
```

3.4.2 Data Set

The SESAME data will be archived in Data Sets corresponding to mission phase and data level processing. Data Sets will be named according to chap 3.1.2. Each component of the name will match the corresponding component of the Data Set ID. The data set name components are defined in Table 3.3.

Table 3.3: Data Set designation parameters

Name element	**Data Set ID**	**Data Set Name**
INSTRUMENT_HOST_ID / INSTRUMENT_HOST_NAME	RL (Rosetta Lander)	ROSETTA-LANDER
Target ID / Target name	See AD9	See AD9
INSTRUMENT_NAME	SESAME – SURFACE ELECTRIC SOUNDING AND ACOUSTIC MONITORING EXPERIMENT	
INSTRUMENT_ID	SESAME	
Data processing level number	Level 1 is delivered directly after the end of the proprietary period and contains level 1 Science and HK data Level 2 is delivered directly after the end of the proprietary period and contains level 2 Science data Level 3 is delivered after the stabilization of the calibration and contains level 3 science and HK data	
Mission phase abbreviation	See AD9	
Description	N/A	N/A
Version	The first version of any Data Set is V1.0	

For mission phases corresponding to Mars and Earth flybys the <description> field of the data set name will contain the name of the operation phase. For example, the operation phases PC#3, PC#4 and PC#5 (payload checkouts) are part of the mission phase “Mars swing-by”. Hence, the name of the SESAME data set containing data from operation phases PC#3, PC#4 and PC#5 would be:

ROSETTA-LANDER MARS SESAME 3 MARS PC#3-4-5 V1.0

3.4.3 Directories

The directory structure of SESAME data sets is shown in

Figure 3.3.

The content of each directory is described in §3.1.3.

Level 1 dataset:

```
                     |-CATALOG-----
                     |
                     |
                     |-DATA--------
|-root directory--   |
                     [
                     |
                     |
                     |-DOCUMENT----
                     |-GEOMETRY----
                     |-INDEX-------
                     |-LABEL-------
                     |-SOFTWARE----
```

Level 2 and 3 datasets:

```
                     |-CATALOG-----
                     |
                     |                          |-HC--
                     |               |-CASSE--  |-LI--
                     |               |          |-SN—
                     |               |          |-TR—
                     |               |
                     |               |          |-AV--
                     |               |          |-BC--
                     |               |          |-CAL-
                     |               |-DIM----  |-HC--
                     |               |          |-NT--
                     |-DATA-------------|       |-PC--
|-root directory--   |               |          |-ST--
                     [               |
                     |               |          |-AM--
                     |               |-PP-----  |-HC--
                     |               |          |-LM--
                     |               |          |-PM--
                     |               |
                     |               |-SESAME-  |-HK--
                     |                          |-SC--
                     |
                     |-DOCUMENT----
                     |-GEOMETRY----
                     |-INDEX-------
                     |-LABEL-------
                     |-SOFTWARE----
```

Figure 3.3: SESAME PDS directory structure

3.4.3.1 Root Directory

Files in the Root Directory include an overview of the archive, i.e. a description of the volume for the PDS Catalog. The files are contained in the Root Directory are given in Table 3.4.

Table 3.4: Files in the Root Directory

File Name	File Contents
AAREADME.TXT	Volume content and format information
VOLDESC.CAT	A description of the contents of this volume in a PDS format readable by both humans and computers

3.4.3.2 Calibration Directory

There are no calibration files provided in the calibration directory. However, the information needed for transfer from level 2 to level 3 data is provided, for each instrument, in the following files (DOCUMENT directory).

CASSE: CALIBRATION_DESC_CAS.TXT
DIM : CALIBRATION_DESC_DIM.TXT
PP: CALIBRATION_DESC_PP.TXT

3.4.3.3 Catalog Directory

The files in the Catalog Directory provide a top-level understanding of the mission, spacecraft, instruments, and data sets. The files in this directory are coordinated with the PSA team, who is responsible for loading them into the PDS catalog. The following files are found in the Catalog Directory.

Table 3.5: Files in the Catalog Directory

File Name	File Contents
CATINFO.TXT	A description of the contents of this directory
DATASET.CAT	Data Set description, one for each Data Set
INSTHOST.CAT	Instrument host (spacecraft) description, provided by the Project
INST.CAT	SESAME instruments description (CASSE,DIM and PP)
MISSION.CAT	Mission description, provided by the Project
PERSON.CAT	PDS personnel catalog information about the instrument team responsible for generating the data products.
REF.CAT	Full citations for references mentioned in any and all of the catalog files, or in any associated label files
SOFTWARE.CAT	Information about the software included in the SOFTWARE directory

3.4.3.4 Data Directory

DATA directory contains the subdirectories SESAME, CASSE, DIM and PP for SESAME housekeeping and the respective sensor data. Inside these subdirectories the data are organized by observation type. For naming convention, see chapter 3.1.3.

3.4.3.5 Document Directory

The DOCUMENT directory contains SESAME documentation listed in *Table 3.6*

Table 3.6 Files in document directory

File Name	**File Contents**
DOCINFO.TXT	A description of the contents of this directory
SES_EAICD.PDF	The SESAME Experiment Archive Interface Control Document (this document) as a PDF file
SES_EAICD.LBL	A PDS detached label for SES_EAICD.PDF
SES_FUM_FM1.PDF	SESAME Flight Software User Manual, FM 1.0, issue 1, revision 1, August 2001, RO-LSE-UG-3401
SES_FUM_FM1.LBL	PDS label for SESAME Flight Software User Manual, FM1
SES_FUM_FM2.PDF	SESAME Flight Software User Manual: Flight Software Version FM-2", RO-LSE-UG-3402, v1.0, 24 September 2008
SES_FUM_FM2.LBL	PDS label for SESAME Flight Software User Manual, FM2
SES_FUM_FM3.PDF	SESAME Flight Software User Manual, FM 3.0, issue draft, revision 2, September 2009, RO-LSE-UG-3404
SES_FUM_FM3.LBL	PDS label for SESAME Flight Software User Manual, FM3
SES_CAS_CALIBRATION_DESC.TXT	Description of CASSE calibration the transfer from level 2 to level 3
SES_CAS_CALIBRATION_DESC.LBL	PDS label for SES_CAS_CALIBRATION_DESC.TXT
SES_DIM_CALIBRATION_DESC.TXT	Description of DIM calibration the transfer from level 2 to level 3
SES_DIM_CALIBRATION_DESC.LBL	PDS label for SES_DIM_CALIBRATION_DESC.TXT
SES_PP_CALIBRATION_DESC.TXT	Description of PP calibration transfer from level 2 to level 3
SES_PP_CALIBRATION_DESC.LBL	PDS label for SES_PP_CALIBRATION_DESC.TXT

3.4.3.6 Index Directory

Files in the Index Directory are provided to help the user locate products on this archive volume and on previously released volumes in the archive. The following files are contained in the Index Directory.

Table 3.7: Files in the Index Directory

File Name	**File Contents**
INDXINFO.TXT	A description of the contents of this directory
INDEX.TAB	A tabular listing all data products on this volume
INDEX.LBL	A PDS detached label that describes INDEX.TAB

3.4.3.7 Software Directory

There is no software provided in the SOFTWARE directory.

3.4.3.8 Label Directory

The LABEL directory contains format container files (see

Table 3.8) used by SESAME labels.

Table 3.8: Files for levels 2 and 3 in the Label Directory.
The flight software versions are named FM1, FM2, FM3 and the CODMAC levels are named L2, L3.

File Name	File Contents
JOB_CARD.FMT	Data objects definitions for CASSE jobcard products (FM1, FM2, L2, L3)
JOB_CARD_FM3.FMT	Data objects definitions for CASSE jobcard products (FM3, L2, L3)
SEQ_PARAM_BURST2.FMT	Data objects definitions for CASSE sequence parameters products in burst mode (FM1, FM2, L2)
SEQ_PARAM_BURST3.FMT	Data objects definitions for CASSE sequence parameters products in burst mode (FM1, FM2, L3)
SEQ_PARAM_TRIG2.FMT	Data objects definitions for CASSE sequence parameters products in triggered mode (FM1, FM2, L2)
SEQ_PARAM_TRIG3.FMT	Data objects definitions for CASSE sequence parameters products in triggered mode (FM1, FM2, L3)
SEQ_PARAM_BURST2_FM3.FMT	Data objects definitions for CASSE sequence parameters products in burst mode (FM3, L2)
SEQ_PARAM_BURST3_FM3.FMT	Data objects definitions for CASSE sequence parameters products in burst mode (FM3, L3)
SEQ_PARAM_TRIG2_FM3.FMT	Data objects definitions for CASSE sequence parameters products in triggered mode (FM3, L2)
SEQ_PARAM_TRIG3_FM3.FMT	Data objects definitions for CASSE sequence parameters products in triggered mode (FM3, L3)
DATA2.FMT	Data objects definitions for CASSE data products (FM1, FM2, FM3, L2)
DATA3.FMT	Data objects definitions for CASSE data products (FM1, FM2, FM3, L3)
TAFT2.FMT	Data objects definitions for CASSE temperatures after measurement products (FM1, FM2, L2)
TAFT3.FMT	Data objects definitions for CASSE temperatures after measurement products (FM1, FM2, L3)
TAFT2_FM3.FMT	Data objects definitions for CASSE temperatures after measurement products (FM3, L2)
TAFT3_FM3.FMT	Data objects definitions for CASSE temperatures after measurement products (FM3, L3)
STAT2_FM3.FMT	Statistics block (FM3, L2 and L3)
DIM_BC_AM.FMT	Data objects definitions for DIM Burst Continuous Average Mode products (FM1, FM2, FM3)
DIM_BC_BM.FMT	Data objects definitions for DIM Burst Continuous Burst Mode products (FM1, FM2, FM3)
DIM_BC_BM_FM1.FMT	Data objects definitions for DIM Burst Continuous Burst Mode products (FM1)
DIM_BC_PAR.FMT	Data objects definitions for DIM Burst Continuous Parameters products (FM1, FM2, FM3)
DIM_BCT_PAR.FMT	Data objects definitions for DIM Burst Continuous Test Parameters products (FM1, FM2, FM3)
DIM_BCT_SIG.FMT	Burst Continuous Test (FM1, FM2)
DIM_BCTEST2_SIG_FM3.FMT	Burst Continuous Test 2 (FM3)
DIM_BCTEST2_PAR_FM3.FMT	Data objects definitions for DIM Burst Continuous Test 2 Parameters products (FM3)
DIM_AV_PAR.FMT	Data objects definitions for DIM Average Continuous

File Name	File Contents
	Parameters products (FM1, FM2, FM3)
DIM_AV_SIG.FMT	Data objects definitions for DIM Average mode products (FM1, FM2, FM3)
DIM_AVT_PAR.FMT	Data objects definitions for DIM Average Test mode parameters (FM1, FM2)
DIM_AVT_SIG.FMT	Data objects definitions for DIM Average Test mode products (FM1, FM2)
DIM_CA.FMT	Data objects definitions for DIM Health Check Calibration products (FM1, FM2, FM3)
DIM_NT.FMT	Data objects definitions for DIM Health Check Noise Test products (FM1, FM2, FM3)
DIM_PC.FMT	Data objects definitions for DIM Health Check Power Check products (FM1, FM2, FM3)
DIM_ST.FMT	Data objects definitions for DIM Health Check Sensor Test products (FM1, FM2, FM3)
PP_AM2_DATA.FMT	Data objects definitions for PP Active Mode products (FM2, FM3)
PP_AM2_PAR.FMT	Data objects definitions for PP Active Mode Parameters products (FM2, FM3)
PP_AMT_DAC.FMT	Data objects definitions for PP Active Mode Test DAC products (FM1, FM2, FM3)
PP_AMT_PAR.FMT	Calibrated data objects definitions for PP Active Mode Test Parameters products (FM1)
PP_AMT_PARC.FMT	Data objects definitions for PP Active Mode Test Parameters products (FM1)
PP_AMT2_PAR.FMT	Data objects definitions for PP Active Mode Test 2 Parameters products (FM2, FM3)
PP_AMT2_PARC.FMT	Calibrated data objects definitions for PP Active Mode Test 2 Parameters products (FM2, FM3)
PP_AMT_RX.FMT	Data objects definitions for PP Active Mode Test RX products (FM1, FM2, FM3)
PP_AMT_TX.FMT	Data objects definitions for PP Active Mode Test TX products (FM1, FM2, FM3)
PP_HC.FMT	Data objects definitions for PP Health Check products (FM1, FM2, FM3)
PP_LM.FMT	Data objects definitions for PP Langmuir Mode products (FM1, FM2, FM3)
PP_PM2_PAR.FMT	Data objects definitions for PP Passive Mode Parameters products (FM2, FM3)
PP_PM2_POW.FMT	Data objects definitions for PP Passive Mode Power spectrum products (FM2, FM3)
PP_PMT2_POW.FMT	Data objects definitions for PP Passive Mode Test 2 Power spectrum products (FM2, FM3)
PP_PMT2_POWC.FMT	Data objects definitions for PP Passive Mode Test 2 Power spectrum products (FM2, FM3)
PP_PMT2_PAR.FMT	Data objects definitions for PP Passive Mode Test Parameter products (FM2, FM3)
PP_PMT_RX.FMT	Data objects definitions for PP Passive Mode Test RX products (FM1, FM2, FM3)
PP_AM2_PARC.FMT	Calibrated data objects definitions for PP Active Mode parameters (FM2, FM3)
PP_AM2_DATAC.FMT	Calibrated data objects definitions for PP Active Mode products (FM2, FM3)
PP_AMT_TXC.FMT	Calibrated data objects definitions for PP Active Mode Test TX products (FM1, FM2, FM3)

File Name	File Contents
PP_AMT_RXC.FMT	Calibrated data objects definitions for PP Active Mode Test RX products (FM1, FM2, FM3)
PP_AMT_DACC	Calibrated data objects for PP Active Mode DAC values (FM1, FM2, FM3)
PP_PM2_PARC.FMT	Calibrated data objects definitions for PP Passive Mode Parameters products (FM2, FM3)
PP_PM2_POW.FMT	Calibrated data objects definitions for PP Passive Mode Power spectrum products (FM2, FM3)
PP_PMT2_PARC.FMT	Calibrated data objects definitions for PP Passive Test Mode Parameters products (FM2, FM3)
PP_PMT2_RXC.FMT	Calibrated data objects definitions for PP Passive Mode Test RX products (FM2, FM3)
PP_HCC.FMT	Calibrated data objects definitions for PP Health Check (FM1, FM2, FM3)
PP_LMC.FMT	Calibrated data objects definitions for PP LM (FM1, FM2, FM3)
SESAME_EMES.FMT	Data objects definitions for common SESAME products: error messages
SESAME_HK.FMT	Data objects definitions for common SESAME products: housekeeping
SESAME_HK_FM3.FMT	Data objects definitions for common SESAME products: housekeeping (FM3)
SESAME_HC.FMT	Data objects definitions for common SESAME products: health check
SESAME_HC_FM3.FMT	Data objects definitions for common SESAME products: health check (FM3)
SESAME_RBUF.FMT	Data objects definitions for common SESAME products: read backup RAM buffer
SESAME_RDJC.FMT	Data objects definitions for common SESAME products: read stored TC buffer
SESAME_RMES.FMT	Data objects definitions for common SESAME products: Ready Message (FM1, FM2, FM3)

4 Detailed Interface Specifications

This chapter gives detailed information on the dataset, directory and file naming of the SESAME archive design at instrument and detector/sensor level.

4.1 Structure and Organization Overview

The SESAME data files will be archived in a data set on the basis of the mission phase relative to the production of the data.

Each .ROL (rolbin) file containing the raw data (telemetry packets, CODMAC level 1) will be placed in the DATA directory of the corresponding dataset (with level 1 data files, HK and SC mixed).

Each .TAB file containing uncalibrated SC data (CODMAC level 2) will be archived in the DATA directory of the corresponding dataset (with level 2 SC data files).

Each .TAB file containing calibrated SC data (CODMAC level 3) and each .CSV file containing calibrated HK (CODMAC level 3) data will be archived in the DATA directory of the corresponding datasets (with level 3 HK data files and level 3 SC data files).

The file names and directories names follow the rules explained in this document (chap 3.1.4 and 3.1.3).

4.2 Data Sets, Definition and Content

The Table 4.1 gives the definition of the name and ID of the SESAME data sets.

Table 4.1: Name and ID of SESAME data sets

Data Set ID	Data Set Name
RL-CAL-SESAME-1-CVP1-V1.0	ROSETTA-LANDER CAL SESAME 1 CVP1 V1.0
RL-CAL-SESAME-1-CVP2-V1.0	ROSETTA-LANDER CAL SESAME 1 CVP2 V1.0
RL-CAL-SESAME-1-CR2-V1.0	ROSETTA-LANDER CAL SESAME 1 CR2 V1.0
RL-CAL-SESAME-1-CR4A-V1.0	ROSETTA-LANDER CAL SESAME 1 CR4A V1.0
RL-CAL-SESAME-1-CR4B-V1.0	ROSETTA-LANDER CAL SESAME 1 CR4B V1.0
RL-CAL-SESAME-1-CR5-V1.0	ROSETTA-LANDER CAL SESAME 1 CR5 V1.0
RL-E-SESAME-1-EAR1-V1.0	ROSETTA-LANDER EARTH SESAME 1 EAR1 V1.0
RL-E-SESAME-1-EAR2-V1.0	ROSETTA-LANDER EARTH SESAME 1 EAR2 V1.0
RL-E-SESAME-1-EAR3-V1.0	ROSETTA-LANDER EARTH SESAME 1 EAR3 V1.0
RL-M-SESAME-1-MARS-V1.0	ROSETTA-LANDER MARS SESAME 1 MARS V1.0
RL-A-SESAME-1-AST1-V1.0	ROSETTA-LANDER STEINS SESAME 1 AST1 V1.0
RL-CAL-SESAME-1-RVM1-V1.0	ROSETTA-LANDER CAL SESAME 1 RVM1 V1.0
RL-CAL-SESAME-1-PHC-V1.0	ROSETTA-LANDER CAL SESAME 1 PHC V1.0
RL-CAL-SESAME-1-PDCS-V1.0	ROSETTA-LANDER CAL SESAME 1 PDCS V1.0
RL-C-SESAME-1-SDL-V1.0	ROSETTA-LANDER 67P SESAME 1 SDL V1.0
RL-C-SESAME-1-FSS-V1.0	ROSETTA-LANDER 67P SESAME 1 FSS V1.0
RL-CAL-SESAME-2-CVP1-V1.0	ROSETTA-LANDER CAL SESAME 2 CVP1 V1.0
RL-CAL-SESAME-2-CVP2-V1.0	ROSETTA-LANDER CAL SESAME 2 CVP2 V1.0
RL-CAL-SESAME-2-CR2-V1.0	ROSETTA-LANDER CAL SESAME 2 CR2 V1.0
RL-CAL-SESAME-2-CR4A-V1.0	ROSETTA-LANDER CAL SESAME 2 CR4A V1.0
RL-CAL-SESAME-2-CR4B-V1.0	ROSETTA-LANDER CAL SESAME 2 CR4B V1.0
RL-CAL-SESAME-2-CR5-V1.0	ROSETTA-LANDER CAL SESAME 2 CR5 V1.0
RL-E-SESAME-2-EAR1-V1.0	ROSETTA-LANDER EARTH SESAME 2 EAR1 V1.0
RL-E-SESAME-2-EAR2-V1.0	ROSETTA-LANDER EARTH SESAME 2 EAR2 V1.0

Data Set ID	Data Set Name
RL-E-SESAME-2-EAR3-V1.0	ROSETTA-LANDER EARTH SESAME 2 EAR3 V1.0
RL-M-SESAME-2-MARS-V1.0	ROSETTA-LANDER MARS SESAME 2 MARS V1.0
RL-A-SESAME-2-AST1-V1.0	ROSETTA-LANDER STEINS SESAME 2 AST1 V1.0
RL-CAL-SESAME-2-RVM1-V1.0	ROSETTA-LANDER CAL SESAME 2 RVM1 V1.0
RL-CAL-SESAME-2-PHC-V1.0	ROSETTA-LANDER CAL SESAME 2 PHC V1.0
RL-CAL-SESAME-2-PDCS-V1.0	ROSETTA-LANDER CAL SESAME 2 PDCS V1.0
RL-C-SESAME-2-SDL-V1.0	ROSETTA-LANDER 67P SESAME 2 SDL V1.0
RL-C-SESAME-2-FSS-V1.0	ROSETTA-LANDER 67P SESAME 2 FSS V1.0
RL-CAL-SESAME-3-CVP1-V1.0	ROSETTA-LANDER CAL SESAME 3 CVP1 V1.0
RL-CAL-SESAME-3-CVP2-V1.0	ROSETTA-LANDER CAL SESAME 3 CVP2 V1.0
RL-CAL-SESAME-3-CR2-V1.0	ROSETTA-LANDER CAL SESAME 3 CR2 V1.0
RL-CAL-SESAME-3-CR4A-V1.0	ROSETTA-LANDER CAL SESAME 3 CR4A V1.0
RL-CAL-SESAME-3-CR4B-V1.0	ROSETTA-LANDER CAL SESAME 3 CR4B V1.0
RL-CAL-SESAME-3-CR5-V1.0	ROSETTA-LANDER CAL SESAME 3 CR5 V1.0
RL-E-SESAME-3-EAR1-V1.0	ROSETTA-LANDER EARTH SESAME 3 EAR1 V1.0
RL-E-SESAME-3-EAR2-V1.0	ROSETTA-LANDER EARTH SESAME 3 EAR2 V1.0
RL-E-SESAME-3-EAR3-V1.0	ROSETTA-LANDER EARTH SESAME 3 EAR3 V1.0
RL-M-SESAME-3-MARS-V1.0	ROSETTA-LANDER MARS SESAME 3 MARS V1.0
RL-A-SESAME-3-AST1-V1.0	ROSETTA-LANDER STEINS SESAME 3 AST1 V1.0
RL-CAL-SESAME-3-RVM1-V1.0	ROSETTA-LANDER CAL SESAME 3 RVM1 V1.0
RL-CAL-SESAME-3-PHC-V1.0	ROSETTA-LANDER CAL SESAME 3 PHC V1.0
RL-CAL-SESAME-3-PDCS-V1.0	ROSETTA-LANDER CAL SESAME 3 PDCS V1.0
RL-C-SESAME-3-SDL-V1.0	ROSETTA-LANDER 67P SESAME 3 SDL V1.0
RL-C-SESAME-3-FSS-V1.0	ROSETTA-LANDER 67P SESAME 3 FSS V1.0

4.3 Data Product Design

SESAME data products have PDS detached labels. Some of them have combined detached labels. Details are given in the following chapters.

4.3.1 SESAME raw data product (Level 1)

Level 1 contains mixed raw housekeeping and science data packets delivered by the Rosetta Lander with detached PDS labels.

4.3.1.1 File Characteristics Data Elements

PDS minimal detached labels describe the raw files (level 1). The file characteristic data elements are RECORD_TYPE, PRODUCT_TYPE and FILE_NAME. The PRODUCT_TYPE is UDR. The RECORD_TYPE for raw data is UNDEFINED, i.e. the structure of records is not described in the PDS labels since these data are intended to be processed with the EGSE software. The file contains telemetry packets, which are described in AD1.

4.3.1.2 Instrument and Detector Descriptive Data Elements

```
INSTRUMENT_HOST_NAME       = "ROSETTA-LANDER"
INSTRUMENT_HOST_ID         =  RL
INSTRUMENT_ID              =  SESAME
INSTRUMENT_NAME            = "SURFACE ELECTRIC SOUNDING AND ACOUSTIC
                              MONITORING EXPERIMENT"
INSTRUMENT_TYPE  = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
```

```
"PERMITTIVITY PROBE"}
```

4.3.1.3 Description of Instrument

The description of the instrument is done in above and as a brief overview in the INST.CAT catalog file.

4.3.1.4 Data quality definition (level 1)

The data quality is defined (in the label) by the DATA_QUALITY_ID keyword.

The criterion is the data loss (missing data or damaged data (zero packets)) by telemetry system compared to expected amount.

The DATA_QUALITY_ID scheme is described by the associated DATA_QUALITY_DESC element as follows:

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete, 0% telemetry loss
1: data loss < 5%
2: 5% ≤ data loss < 10%
3: 10% ≤ data loss < 20%
4: data loss ≥ 20%

4.3.2 SESAME science level 2 data product design

Level 2 contains raw (uncalibrated) CASSE and PP time series and DIM tables. The level 2 products have PDS detached labels and combined detached labels.

The SESAME subdirectory contains calibrated housekeeping (HK) and health check data all with the appropriate time-stamp.

4.3.2.1 File Characteristics Data Elements

PDS data product **labels** contain data element information that describes important attributes of the physical structure of a data product file. The PDS file characteristic data elements for SEAME science level 2 data are:

```
RECORD_TYPE  = FIXED_LENGTH
RECORD_BYTES = …
FILE_RECORDS = …
```

The RECORD_TYPE data element identifies the record characteristics of the data product file. Physical records are always fixed-length. The RECORD_BYTES data element identifies the number of bytes in each physical record in the data product file. The FILE_RECORDS data element identifies the number of physical records in the file.

4.3.2.2 Data Object Pointers Identification Data Elements

The SESAME data have combined detached labels. A single PDS detached data product label file is used to describe the contents of more than one data product file (the products belong to the same working session of a SESAME instrument). The combined detached label contains pointers to individual data products. The labels refer to FILE objects.

4.3.2.3 Instrument and Detector Descriptive Data Elements

The following data identification elements provide additional information about the SESAME data product.

```
INSTRUMENT_HOST_NAME       = "ROSETTA LANDER"
INSTRUMENT_HOST_ID         =  RL
INSTRUMENT_ID              =  SESAME
INSTRUMENT_NAME            = "SURFACE ELECTRIC SOUNDING AND ACOUSTIC
                              MONITORING EXPERIMENT"
INSTRUMENT_TYPE            = {"ACCELEROMETER", "DUST IMPACT DETECTOR",
                              "PERMITTIVITY PROBE", "UNK"}
FLIGHT_SOFTWARE_VERSION_ID =
CHANNELS                   =
```

4.3.2.4 Data Object Definition

There are 14 scientific data products defined for SESAME according to the instrument modes (see §3.1.3 and Table 3.2) and flight software version.

4.3.2.4.1 CASSE Data object definition

The CASSE data are organized as tables with 24 columns containing 12 times and 12 channel values (accelerometers or transmitters): time 1 channel1 time2 channel2 … time 12 channel12.

The association axis-channel is fixed and it is given in the label. The « Job cards » and « sequence parameters » are kept in separated files (combined detached labels).

The structures of CASSE measurements differ according to flight software version. The details concerning the telemetry formats can be found in [AD1] for flight software version 1, in [AD2] for flight software version 2 and in |AD3] for flight software version 3. The FM2 software was uploaded on 2007-09-24 at 19h40 UTC (during payload checkout #6). The FM3 software was uploaded on 2009-09-24 at 02h00 UTC (during PC#10).

Examples:

CASSE sounding, FM2, level 2 (1 label file pointing to 4 data files)

- **SES_FS2_CSN_0510040300.LBL** (label)
- SES_FS2_CSN_0510040300_JOBC.TAB (parameters of jobcard, described in JOBCARD.FMT)
- SES_FS2_CSN_0510040300_SEQP.TAB (sequence parameters, described in SEQ_PARAM_BURST_L2.FMT for BURST mode or SEQ_PARAM_TRIG2 for TRIGGER mode)
- SES_FS2_CSN_0510040300_DATA.TAB (data, ACC or TX described in DATA_L2.FMT)
- SES_FS2_CSN_0510040300_TAFT.TAB (foot temperatures, described in TAFT_L2.FMT)

CASSE sounding, FM3, level 2 (1 label file pointing to 5 data files)

- **SES_FS2_CSN_0510040300.LBL** (label)
- SES_FS2_CSN_0510040300_JOBC.TAB (parameters of jobcard, described in JOBCARD_FM3.FMT)
- SES_FS2_CSN_0510040300_SEQP.TAB (sequence parameters, described in SEQ_PARAM_BURST_L2_FM3.FMT for BURST mode or SEQ_PARAM_TRIG2_FM3 for TRIGGER mode)
- SES_FS2_CSN_0510040300_DATA.TAB (data, ACC or TX described in DATA_L2.FMT or DATA_STACKED_L2.FMT for STACKING mode)
- SES_FS2_CSN_0510040300_TAFT.TAB (foot temperatures, described in TAFT_L2_FM3.FMT)
- SES_FS2_CSN_0510040300_STAT.TAB (measurement statistics described in STAT_FM3.FMT)

The label contains the start and stop times as LOBT and UTC. The data files contain time in ms relative to the start time.

4.3.2.4.1.1 Flight software versions FM1 and FM2

4.3.2.4.1.1.1 CASSE Jobcard definition

A TABLE object describes the jobcard.

```
  OBJECT                = JOBC_TABLE
      NAME                = "JOB_CARD"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 1
      COLUMNS             = 29
      ROW_BYTES           = 176
      ^STRUCTURE          = "JOB_CARD_FM3.FMT"
   END_OBJECT            = JOBC_TABLE
```

The structure of the TABLE object is defined in the file JOB_CARD.FMT.

```
OBJECT                = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    DESCRIPTION  = "Sequence ID in the current data file"
END_OBJECT           = COLUMN

OBJECT                  = COLUMN
    NAME                = "JOB_ID"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 9
    BYTES               = 2
    FORMAT              = "A2"
    UNIT                = "N/A"
    DESCRIPTION  = "Jobcard identifier (hex value)"
 END_OBJECT    = COLUMN

OBJECT                  = COLUMN
    NAME                = "SAVE_FULL"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 13
    BYTES               = 1
    FORMAT              = "I1"
    UNIT                = "N/A"
    DESCRIPTION  = "Possible values :
                        0 : Save ID Only
                        1 : Save Full"
 END_OBJECT    = COLUMN

OBJECT                  = COLUMN
    NAME                = "MORE_JOBS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 15
    BYTES               = 1
```

```
    FORMAT              = "I1"
    UNIT                = "N/A"
    DESCRIPTION  = "Possible values :
                          0 : Last Job
                          1 : More Jobs"
 END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "SUB_ID"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 18
    BYTES               = 2
    FORMAT              = "A2"
    UNIT                = "N/A"
    DESCRIPTION         = "Hex value"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                = "START_CONDITION"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 23
    BYTES               = 2
    FORMAT              = "A2"
    UNIT                = "N/A"
    DESCRIPTION         = "Hex value"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "REPETITIONS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 27
    BYTES               = 3
    FORMAT              = "I3"
    UNIT                = "N/A"
    DESCRIPTION  = " Number of repetitions"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "SOUND_FREQ"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 31
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "HERTZ"
    DESCRIPTION          = " transmitter sound frequency"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "SND_DURATION"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 37
    BYTES               = 9
    FORMAT              = "F9.1"
```

```
    UNIT                  = "MILLISECOND"
    MISSING_CONSTANT      = 9999999.9
    DESCRIPTION           = "Sounding duration in sounding mode"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                  = "TRIGGER_TIMEOUT"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 47
    BYTES                 = 5
    FORMAT                = "I5"
    UNIT                  = "SECOND"
    MISSING_CONSTANT      = 99999
    DESCRIPTION           = "Time-out duration, after which listening stops
         if no trigger signal occured"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                  = "SAMPLING_FREQ"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 53
    BYTES                 = 6
    FORMAT                = "I6"
    UNIT                  = "HERTZ"
    DESCRIPTION  = "Sampling frequency per channel"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                  = "TX_STATUS"
    DATA_TYPE             = CHARACTER
    START_BYTE            = 61
    BYTES                 = 5
    FORMAT                = "A5"
    UNIT                  = "N/A"
    DESCRIPTION           = "Selection of transmitters to be used in
                             Sounding Mode. If TX_cycle is set, after a
                             measurement the transmitter selection is
                             (cyclically) shifted by one position up to
                             yield the transmitters to be used for the next
                             measurement. If Tx_reverse is additionally set,
                             the selection of active transmitters is shifted
                             one position downwards instead.
                             Bit field represented as 5 characters, the rightmost
                             character corresponds to bit #0 and the leftmost to
                             bit #4.
                             Each character can be 1 (active sensor or cycle on or
                             reversed on) or 0 (sensor not used) and have the
                             following meaning.
                             bit  0: TRM -Y
                             bit  1: TRM +X
                             bit  2: TRM +Y
                             bit  3: TX_cycle
                             bit  4: TX_reverse "
```

```
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "AGC"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 69
    BYTES               = 2
    FORMAT              = "A2"
    UNIT                = "N/A"
    DESCRIPTION  = "Amplification gain selection in hexadecimal format
         Value to be written to the Amplifier Gain
         Control register of CASSE electronics. Decimal value
         ranges from 0 (maximal gain) to 15 (minimal gain).
         Note (a) the gain is not a monotone function of the
         AGC value, (b) the actually adjusted gain can
         deviate, if automatic gain setting (AGS) is enabled."
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                = "TRIGGER_SRC"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 74
    BYTES               = 13
    FORMAT              = "A13"
    UNIT                = "N/A"
    DESCRIPTION  = "Subset of active sensor channels used as trigger
                        sources. Bit field represented as 12 characters,
                        the rightmost character corresponds to bit #0
                        and the leftmost to bit #11.
                        Each character can be 1 (active sensor used as a
                        trigger source) or 0 (sensor not used as a trigger
                        source) and have the following meaning.
                        bit  0: ACC -Y, x-axis
                        bit  1: ACC -Y, y-axis
                        bit  2: ACC -Y, z-axis
                        bit  3: ACC +X, x-axis
                        bit  4: ACC +X, y-axis
                        bit  5: ACC +X, z-axis
                        bit  6: ACC +Y, x-axis
                        bit  7: ACC +Y, y-axis
                        bit  8: ACC +Y, z-axis
                        bit  9: TRM -Y
                        bit 10: TRM +X
                        bit 11: TRM +Y
      bit 12: AUTO RANGE"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                = "TRIGGER_DELAY"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 89
    BYTES               = 9
    FORMAT              = "F9.1"
```

```
    UNIT                  = "MILLISECOND"
    DESCRIPTION  = " Determines the time range before (negative
                        value) or after (positive value) a trigger
                        event, which shall be included in the time series.
                        Absolute value of TrgDelay must be less or equal
                        LIS_DURATION."
END_OBJECT              = COLUMN

OBJECT                    = COLUMN
    NAME                  = "TRIGGER_LEVEL_POS"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 99
    BYTES                 = 4
    FORMAT                = "I4"
    UNIT                  = "N/A"
    DESCRIPTION  = "Positive trigger level.
                        Value to be written to the UTT hardware register,
                        which fixes the upper (always positive) trigger
                        threshold. Note that the actually adjusted value
                        can be different, if automatic trigger level setting
                        is enabled."
END_OBJECT              = COLUMN

OBJECT                    = COLUMN
    NAME                  = "TRIGGER_LEVEL_NEG"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE  = 104
    BYTES                 = 4
    FORMAT               = "I4"
    UNIT                  = "N/A"
    DESCRIPTION      = "Negative trigger level.
                        Value to be written to the LTT hardware register,
                        which fixes the lower (always negative) trigger
                        threshold. Note that the actually adjusted value
                        can be different, if automatic trigger level setting
                        is enabled."
END_OBJECT              = COLUMN

OBJECT                    = COLUMN
    NAME                  = "RX_DURATION"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 109
    BYTES                 = 9
    FORMAT                = "F9.1"
    UNIT                  = "MILLISECOND"
    DESCRIPTION  = "Measurement duration "
END_OBJECT              = COLUMN

OBJECT                    = COLUMN
    NAME                  = "RX_STATUS"
    DATA_TYPE             = CHARACTER
    START_BYTE            = 120
    BYTES                 = 16
```

```
    FORMAT              = "A16"
    UNIT                = "N/A"
    DESCRIPTION  = "Selection of sensor channels to be used. If cycle
                    is set, after a measurement the receiver selection
                    is (cyclically) shifted by one position (in the same
                    direction as the transmitters, as indicated in
                    TX_STATUS. If the reversed flag is additionally set,
                    the receiver cycling shall take place in the opposite
                    direction as the transmitter cycling.
                    Bit field represented as 15 characters, the rightmost
                    character corresponds to bit #0 and the leftmost to
                    bit #13.
                    Each character can be 1 (active sensor or cycle on or
                    reversed on) or 0 (sensor not used) and have the
                    following meaning.
                    bit  0: ACC -Y, x-axis
                    bit  1: ACC -Y, y-axis
                    bit  2: ACC -Y, z-axis
                    bit  3: ACC +X, x-axis
                    bit  4: ACC +X, y-axis
                    bit  5: ACC +X, z-axis
                    bit  6: ACC +Y, x-axis
                    bit  7: ACC +Y, y-axis
                    bit  8: ACC +Y, z-axis
                    bit  9: TRM -Y
                    bit 10: TRM +X
                    bit 11: TRM +Y
                    bit 12: cycle
                    bit 13: sort
      bit 14 : reversed
      bit 15 : custom seq "
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "GPW1"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 139
    BYTES               = 16
    FORMAT              = "A16"
    UNIT                = "N/A"
    DESCRIPTION       = "General Purpose Word 1, binary"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "GPW2"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 158
    BYTES               = 16
    FORMAT              = "A16"
    UNIT                = "N/A"
    DESCRIPTION  = "General Purpose Word 2, binary"
END_OBJECT            = COLUMN
```

```
OBJECT                 = COLUMN
    NAME                = "GPW3"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 177
    BYTES               = 16
    FORMAT              = "A16"
    UNIT                = "N/A"
    DESCRIPTION  = "General Purpose Word 3, in binary"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "FOOT_TEMP"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 196
    BYTES               = 8
    FORMAT              = "A8"
    UNIT                = "N/A"
    DESCRIPTION      = "Active foot temperature channels.
                        Bit field represented as 15 characters, the rightmost
                        character corresponds to bit #0 and the leftmost to
                        bit #6.
                        The Temperature and Radiation Dose Data Block will
                        be generated by flight software, if at least one foot
                        temperature channel is selected in FOOT_TEMP.
                        It will additionally be included at the end of a
                        measuring sequence, if the Additional after job flag
                        is set.
                        Each character can be 1 (channel selected) or
                        0 (channel not selected) and have the
                        following meaning.
                        bit  0: Temperature -Y, TRM
                        bit  1: Temperature -Y, ACC
                        bit  2: Temperature +X, TRM
                        bit  3: Temperature +X, ACC
                        bit  4: Temperature +Y, TRM
                        bit  5: Temperature +Y, ACC
                        bit  6: Additional after job temperatures
      bit 7 : Do additional housekeeping"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "OUTBUFFER_PAGE"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 207
    BYTES               = 2
 FORMAT                 = "A2"
    UNIT                = "N/A"
    DESCRIPTION          = "hex value"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME               = "OUTBUFFER_ADDRESS"
    DATA_TYPE          = CHARACTER
```

```
    START_BYTE          = 212
    BYTES               = 4
    FORMAT              = "A4"
    UNIT                = "N/A"
    DESCRIPTION         = "hex value"
END_OBJECT            = COLUMN
```

4.3.2.4.1.1.2 CASSE Sequence Parameters definition for burst mode

The sequence parameters are described by a TABLE object.

```
   OBJECT                = SEQ_PARAM_TABLE
      NAME                = "SEQ_PARAM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 6
      COLUMNS             = 17
      ROW_BYTES           = 149
      ^STRUCTURE          = "SEQ_PARAM_BURST2.FMT"
   END_OBJECT            = SEQ_PARAM_TABLE
```

The structure of the Sequence parameters TABLE object is defined in the file SEQ_PARAM_BURST2.FMT.

```
OBJECT                = COLUMN
    NAME              = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 1
    BYTES             = 6
    UNIT              = "N/A"
    FORMAT            = "I6"
    DESCRIPTION       = "Sequence ID in the current data file"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "MEAS_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 8
    BYTES             = 6
    FORMAT            = "I6"
    UNIT              = "N/A"
    DESCRIPTION       = "Measurement ID in the current sequence"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "UTC"
    DATA_TYPE         = TIME
    START_BYTE        = 15
    BYTES             = 23
    DESCRIPTION       = "Measurement start time (UTC in PDS standard
                          format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT    = COLUMN
```

```
OBJECT                    = COLUMN
    NAME                  = "SESAME_LOCAL_TIME_SEQ"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 39
    BYTES                 = 15
    FORMAT                = "I15"
    DESCRIPTION            = "Start time of sequence. SESAME local time
                             (SLT) runs with a resolution of 1/32 seconds.
                             SLT represents the least significant 32 bits of
                             LOBT. The most significant 5 bits are in
                             CDMS RSST (see SESAME Ready Message)"
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                   = "FREQUENCY_DIVIDER"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 55
    BYTES                  = 3
    FORMAT                 = "I3"
    UNIT                   = "N/A"
    DESCRIPTION            = "Adjusted transmitter frequency register value"
 END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "FREQUENCY_INCREMENT"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 59
    BYTES                 = 5
    FORMAT                = "I5"
    UNIT                  = "N/A"
    DESCRIPTION           = "Adjusted sampling rate registers value"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CHANNELS"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 65
    BYTES                 = 3
    FORMAT                = "I3"
    UNIT                  = "N/A"
    DESCRIPTION           = "Number of sensor channels minus one"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "ADJ_SOUND_FREQ"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 69
    BYTES                 = 5
    FORMAT                = "I5"
    UNIT                  = "HERTZ"
    DESCRIPTION           = "Transmitter frequency.
                            Equals zero in Listening mode"
END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "ADJ_SAMPLING_FREQ"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 75
    BYTES               = 10
    FORMAT              = "I10"
    UNIT                = "HERTZ"
    DESCRIPTION         = "Sampling frequency per sensor channel"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 86
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Start time of measurement. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits of
                           LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TOTAL_MEAS_LENGTH"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 103
    BYTES               = 8
    FORMAT              = "A8"
    UNIT                = "N/A"
    DESCRIPTION         = "FIFO RAM address when recording stopped
                           4 bytes, hexadecimal representation"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TEMP_FOOT-Y_TRM"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 113
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "N/A"
    DESCRIPTION         = "Foot temperature before measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TEMP_FOOT-Y_ACC"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 119
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "N/A"
    DESCRIPTION         = "Foot temperature before measurement"
```

```
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+X_TRM"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 125
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "N/A"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+X_ACC"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 131
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "N/A"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+Y_TRM"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 137
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "N/A"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+Y_ACC"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 143
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "N/A"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN
```

4.3.2.4.1.1.3 CASSE Sequence Parameters definition for trigger mode

The sequence parameters are described by a TABLE object.

```
   OBJECT                = SEQ_PARAM_TABLE
      NAME                = "SEQ_PARAM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 3
      COLUMNS             = 21
      ROW_BYTES           = 204
      ^STRUCTURE          = "SEQ_PARAM_TRIG2.FMT"
   END_OBJECT            = SEQ_PARAM_TABLE
```

The structure of the Sequence parameters TABLE object is defined in the file SEQ_PARAM_TRIG2.FMT.

```
OBJECT          = COLUMN
    NAME        = "SESAME_SEQ_ID"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 1
    BYTES       = 6
    FORMAT      = "I6"
    UNIT        = "N/A"
    DESCRIPTION = "Sequence ID in the current data file"
END_OBJECT      = COLUMN

OBJECT          = COLUMN
    NAME        = "MEAS_ID"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 8
    BYTES       = 6
    FORMAT      = "I6"
    UNIT        = "N/A"
    DESCRIPTION = "Measurement ID in the current sequence"
END_OBJECT      = COLUMN

OBJECT          = COLUMN
    NAME        = "UTC"
    DATA_TYPE   = TIME
    START_BYTE  = 15
    BYTES       = 23
    DESCRIPTION = "This column represents the UTC Time
                   for start of the sequence"
END_OBJECT      = COLUMN

OBJECT          = COLUMN
    NAME        = "SESAME_LOCAL_TIME"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 39
    BYTES       = 15
    FORMAT      = "I15"
    DESCRIPTION = "Start time of measurement. SESAME local time
                  (SLT) runs with a resolution of 1/32 seconds.
                  SLT represents the least significant 32 bits of
                  LOBT. The most significant 5 bits are in
                  CDMS RSST (see SESAME Ready Message)"
END_OBJECT      = COLUMN

OBJECT          = COLUMN
    NAME        = "ERROR_INIT"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 56
    BYTES       = 4
    FORMAT      = "A4"
    DESCRIPTION = "Error status after initialisation
                         in hexadecimal format (2 bytes).
```

```
       Possible values:
       0001  EB_FREQ Invalid frequency increment (adjustment of sampling
          frequency); default (= 1312) used.
      0002   EB_DIVRAT Invalid frequency divider (adjustment of sounding
          frequency); default (= 1) used.
      0004   EB_CDPU_ADC Error during temperature A/D conversion.
      4008   EB_NCHAN Fatal: Invalid number of sensor channels
      4010   EB_TIMEO Fatal: Time-out during triggered mode.
      4020   EB_NOSTRT Fatal: Measurement start condition not fulfilled.
      8040   EB_RAMOVR Fatal: Allocated SESAME SRAM space exhausted.
      4000   EB_FATAL_MES Fatal error or time-out; current measurement will be
          aborted.

      Columns are filled by missing_constant if the last case occurs (4000),
      for the concerned mesurement"
END_OBJECT      = COLUMN

OBJECT                 = COLUMN
    NAME              = "FREQUENCY_DIVIDER"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 62
    BYTES             = 3
    FORMAT            = "I3"
    UNIT              = "N/A"
    MISSING_CONSTANT = 999
    DESCRIPTION = "Adjusted transmitter frequency register value"
 END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "FREQUENCY_INCREMENT"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 66
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "N/A"
    MISSING_CONSTANT = 99999
    DESCRIPTION   = "Adjusted sampling rate registers value"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNELS"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 72
    BYTES              = 3
    FORMAT             = "I3"
    UNIT               = "N/A"
    MISSING_CONSTANT  = 999
    DESCRIPTION        = "Number of sensor channels minus one"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TRIGGER_STATUS"
    DATA_TYPE          = ASCII_INTEGER
```

```
    START_BYTE          = 76
    BYTES               = 4
    FORMAT              = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 9999
    DESCRIPTION         = "Contents of Trigger Status Register at
                         time of trigger (0 - 4095)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
 NAME                   = "TIME_BURST_ON"
 DATA_TYPE              = CHARACTER
 START_BYTE             = 82
 BYTES                  = 15
 FORMAT                 = "A15"
 MISSING_CONSTANT       = "999999999999999"
 DESCRIPTION            = "SESAME Local Time at start of recording
                          of measurement represented as :
                          Reset number (integer starting at 1) / seconds
                          The time resolution is 0.03125 s"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
 NAME                    = "TIME_TRIGGER"
 DATA_TYPE               = CHARACTER
 START_BYTE              = 100
 BYTES                   = 15
 FORMAT                  = "A15"
 MISSING_CONSTANT        = "999999999999999"
 DESCRIPTION             = "SESAME Local Time when trigger occurred
                            represented as :
                            Reset number (integer starting at 1) / seconds
                            The time resolution is 0.03125 s"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
 NAME                     = "TIME_BURST_OFF"
 DATA_TYPE                = CHARACTER
 START_BYTE               = 118
 BYTES                    = 15
 FORMAT                   = "A15"
 MISSING_CONSTANT         = "999999999999999"
 DESCRIPTION              = "SESAME Local Time at stop of recording
                              represented as :
                              Reset number (integer starting at 1) / seconds
                              The time resolution is 0.03125 s"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
 NAME                      = "FIFO_TRIGGER"
 DATA_TYPE                 = CHARACTER
 START_BYTE                = 136
 BYTES                     = 8
```

```
 FORMAT                    = "A8"
 MISSING_CONSTANT          = "99999999"
 DESCRIPTION               = "FIFO RAM address when trigger occurred
                              in hexadecimal format (4 bytes)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
 NAME                      = "FIFO_BURST_OFF"
 DATA_TYPE                 = CHARACTER
 START_BYTE                = 147
 BYTES                     = 8
 FORMAT                    = "A8"
 MISSING_CONSTANT          = "99999999"
 DESCRIPTION               = "FIFO RAM address when recording stopped
                              in hexadecimal format (4 bytes)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
 NAME                      = "FIFO_FIRST_DAT"
 DATA_TYPE                 = CHARACTER
 START_BYTE                = 158
 BYTES                     = 8
 FORMAT                    = "A8"
 MISSING_CONSTANT          = "99999999"
 DESCRIPTION               = "FIFO RAM address of very first channel data
                              in hexadecimal format (4 bytes)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TEMP_FOOT-Y_TRM"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 168
    BYTES                  = 5
    FORMAT                 = "I5"
    UNIT                   = "N/A"
    DESCRIPTION            = "Foot temperature before measurement"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TEMP_FOOT-Y_ACC"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 174
    BYTES                  = 5
    FORMAT                 = "I5"
    UNIT                   = "N/A"
    DESCRIPTION            = "Foot temperature before measurement"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TEMP_FOOT+X_TRM"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 180
    BYTES                  = 5
```

```
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    DESCRIPTION             = "Foot temperature before measurement"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "TEMP_FOOT+X_ACC"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 186
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    DESCRIPTION             = "Foot temperature before measurement"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "TEMP_FOOT+Y_TRM"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 192
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    DESCRIPTION             = "Foot temperature before measurement"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "TEMP_FOOT+Y_ACC"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 198
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    DESCRIPTION             = "Foot temperature before measurement"
END_OBJECT                  = COLUMN
```

4.3.2.4.1.1.4 CASSE Data definition

The data produced in sounding or listening modes are described by the following TABLE object.

```
   OBJECT                     = DATA_TABLE
      NAME                     = "DATA"
      INTERCHANGE_FORMAT       = ASCII
      ROWS                     = 3852
      COLUMNS                  = 26
      ROW_BYTES                = 231
      ^STRUCTURE               = "DATA2.FMT"
   END_OBJECT                 = DATA_TABLE
```

The structure of the measured data TABLE object is defined in the file DATA2.FMT.

```
   OBJECT             = COLUMN
    NAME              = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
```

```
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "MEAS_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 8
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    DESCRIPTION        = "Measurement ID in the current sequence"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_1"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 15
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 1 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_1"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 26
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                          The mode (stacked or regular) is given in the
                          job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_2"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 33
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
```

```
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 2 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_2"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 44
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                          The mode (stacked or regular) is given in the
                          job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_3"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 51
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 3 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_3"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 62
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                          The mode (stacked or regular) is given in the
                          job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_4"
```

```
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 69
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 4 time relative to
                           start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_4"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 80
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
                         - non-linear ADC units for regular (non-stacked)
                           channel data block
                         - linearized stacked ADC units for stacked channel
                           data block
                         The mode (stacked or regular) is given in the
                         job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_5"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 87
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 5 time relative to
                           start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_5"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 98
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
                         - non-linear ADC units for regular (non-stacked)
                           channel data block
                         - linearized stacked ADC units for stacked channel
                           data block
                         The mode (stacked or regular) is given in the
```

```
                           job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_6"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 105
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 6 time relative to
                            start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_6"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 116
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
                          - non-linear ADC units for regular (non-stacked)
                            channel data block
                          - linearized stacked ADC units for stacked channel
                            data block
                            The mode (stacked or regular) is given in the
                            job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_7"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 123
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 7 time relative to
                            start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_7"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 134
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
```

```
                          - non-linear ADC units for regular (non-stacked)
                            channel data block
                          - linearized stacked ADC units for stacked channel
                            data block
                           The mode (stacked or regular) is given in the
                           job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_8"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 141
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 8 time relative to
                            start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_8"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 152
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
                          - non-linear ADC units for regular (non-stacked)
                            channel data block
                          - linearized stacked ADC units for stacked channel
                            data block
                          The mode (stacked or regular) is given in the
                          job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_9"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 159
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 9 time relative to
                            start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_9"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 170
```

```
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                        The mode (stacked or regular) is given in the
                        job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_10"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 177
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 10 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_10"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 188
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                        The mode (stacked or regular) is given in the
                        job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_11"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 195
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 11 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN
```

```
OBJECT                 = COLUMN
    NAME               = "CHANNEL_11"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 206
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                        The mode (stacked or regular) is given in the
                        job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_12"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 213
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 12 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_12"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 224
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT = 999999
    DESCRIPTION        = "Channel data :
                        - non-linear ADC units for regular (non-stacked)
                          channel data block
                        - linearized stacked ADC units for stacked channel
                          data block
                        The mode (stacked or regular) is given in the
                        job card file (JOBC)"
END_OBJECT             = COLUMN
```

CASSE temperatures after measurement

The feet temperatures (accelerometers and transmitters) can be acquired also after a measurement (sounding or listening). They will be stored in ASCII table described by a TABLE object.

```
     OBJECT                      = TAFT_TABLE
      NAME                     = "TAFT"
```

```
      INTERCHANGE_FORMAT         = ASCII
      ROWS                       =
      COLUMNS                    = 8
      ROW_BYTES                  = 52
      ^STRUCTURE                 = "TAFT2.FMT"
   END_OBJECT                  = TAFT_TABLE
```

The structure of the “after measurement temperatures” TABLE object is defined in the file TAFT2.FMT.

```
OBJECT                    = COLUMN
    NAME                  = "SESAME_SEQ_ID"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 1
    BYTES                 = 6
    UNIT                  = "N/A"
    FORMAT                = "I6"
    DESCRIPTION           = "Sequence ID in the current data file"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "MEAS_ID"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 8
    BYTES                 = 6
    FORMAT                = "I6"
    UNIT                  = "N/A"
    DESCRIPTION           = "Measurement ID in the current sequence"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "TEMP_FOOT-Y_TRM"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 15
    BYTES                 = 5
    FORMAT                = "I5"
    UNIT                  = "N/A"
    DESCRIPTION           = "Foot temperature after measurement"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "TEMP_FOOT-Y_ACC"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 21
    BYTES                 = 5
    FORMAT                = "I5"
    UNIT                  = "N/A"
    DESCRIPTION           = "Foot temperature after measurement"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "TEMP_FOOT+X_TRM"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 27
```

```
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "N/A"
    DESCRIPTION     = "Foot temperature after measurement"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT+X_ACC"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 33
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "N/A"
    DESCRIPTION     = "Foot temperature after measurement"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT+Y_TRM"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 39
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "N/A"
    DESCRIPTION     = "Foot temperature after measurement"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT+Y_ACC"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 45
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "N/A"
    DESCRIPTION     = "Foot temperature after measurement"
END_OBJECT          = COLUMN
```

4.3.2.4.1.2 Flight software version FM3

4.3.2.4.1.2.1 CASSE job card definition

The job card is described by a TABLE object.

```
OBJECT                  = JOBC_TABLE
      NAME                = "JOB_CARD"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 12
      COLUMNS             = 29
      ROW_BYTES           = 176
      ^STRUCTURE          = "JOB_CARD_FM3.FMT"
   END_OBJECT           = JOBC_TABLE
```

The structure of the TABLE object is defined in the file JOB_CARD_FM3.FMT.

```
OBJECT                 = COLUMN
```

```
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
 FORMAT                  = "I6"
    UNIT                 = "N/A"
    DESCRIPTION          = "Sequence ID in the current data file"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "JOB_ID"
    DATA_TYPE            = CHARACTER
    START_BYTE           = 9
    BYTES                = 2
    FORMAT               = "A2"
    UNIT                 = "N/A"
    DESCRIPTION          = "Jobcard identifier (hex value)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "JOB_VERSION"
    DATA_TYPE            = CHARACTER
    START_BYTE           = 14
    BYTES                = 1
    FORMAT               = "A1"
    UNIT                 = "N/A"
    DESCRIPTION          = "The possible values are:
                           0 for FM-1 and FM-2
                           B for FM-3"
END_OBJECT               = COLUMN

OBJECT                  = COLUMN
    NAME                = "NMEAS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 17
    BYTES               = 3
    FORMAT              = "I3"
    UNIT                = "N/A"
    DESCRIPTION         = "Number of measurements (1 to 127)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "STACK"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 22
    BYTES               = 3
    FORMAT              = "A3"
    UNIT                = "N/A"
    DESCRIPTION         = "Indicates that the time series shall
                          be stacked on board. The possible
                          values are YES or NO."
END_OBJECT              = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "SOUND_FREQ"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 27
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "HERTZ"
    DESCRIPTION         = "Nominal sounding frequency"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SND_DURATION"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 33
    BYTES               = 9
    FORMAT              = "F9.1"
    UNIT                = "MILLISECOND"
    MISSING_CONSTANT    = 9999999.9
    DESCRIPTION         = "Sounding duration in sounding mode"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TRIGGER_TIMEOUT"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 43
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "SECOND"
    MISSING_CONSTANT    = 99999
    DESCRIPTION         = "Time-out duration, after which listening stops
                           if no trigger signal occurred"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SAMPLING_FREQ"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 49
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "HERTZ"
    DESCRIPTION         = "Sampling frequency per channel"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TX_STATUS"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 57
    BYTES               = 5
    FORMAT              = "A5"
    UNIT                = "N/A"
    DESCRIPTION         = "Selection of transmitters to be used in
                          Sounding Mode. If TX_cycle is set, after a
                          measurement the transmitter selection is
```

```
                            (cyclically) shifted by one position up to
                            yield the transmitters to be used for the next
                            measurement. If Tx_reverse is additionally set,
                            the selection of active transmitters is shifted
                            one position downwards instead.
                            Bit field represented as 5 characters, the rightmost
                            character corresponds to bit #0 and the leftmost to
                            bit #4.
                            Each character can be 1 (active sensor or cycle on or
                            reversed on) or 0 (sensor not used) and have the
                            following meaning:
                            bit  0: TRM -Y
                            bit  1: TRM +X
                            bit  2: TRM +Y
                            bit  3: TX_cycle
                            bit  4: TX_reverse"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "AGC"
    DATA_TYPE             = CHARACTER
    START_BYTE            = 65
    BYTES                 = 2
    FORMAT                = "A2"
    UNIT                  = "N/A"
    DESCRIPTION           = "Amplification gain selection (hex value)
                             Value to be written to the Amplifier Gain
                             Control register of CASSE electronics. Decimal value
                             ranges from 0 (maximal gain) to 15 (minimal gain).
                             Note (a) the gain is not a monotone function of the
                             AGC value, (b) the actually adjusted gain can
                             deviate, if automatic gain setting (AGS) is enabled."
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "TRIGGER_SRC"
    DATA_TYPE             = CHARACTER
    START_BYTE            = 70
    BYTES                 = 12
    FORMAT                = "A12"
    UNIT                  = "N/A"
    DESCRIPTION           = "Subset of active sensor channels used as trigger
                            sources. Bit field represented as 12 characters,
                            the rightmost character corresponds to bit #0
                            and the leftmost to bit #11.
                            Each character can be 1 (active sensor used as a
                            trigger source) or 0 (sensor not used as a trigger
                            source) and have the following meaning:
                            bit  0: ACC -Y, x-axis
                            bit  1: ACC -Y, y-axis
                            bit  2: ACC -Y, z-axis
                            bit  3: ACC +X, x-axis
                            bit  4: ACC +X, y-axis
```

```
                         bit  5: ACC +X, z-axis
                         bit  6: ACC +Y, x-axis
                         bit  7: ACC +Y, y-axis
                         bit  8: ACC +Y, z-axis
                         bit  9: TRM -Y
                         bit 10: TRM +X
                         bit 11: TRM +Y"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TRIGGER_DELAY"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 84
    BYTES               = 9
    FORMAT              = "F9.1"
    UNIT                = "MILLISECOND"
    DESCRIPTION         = "Determines the time range before (negative
                         value) or after (positive value) a trigger
                         event, which shall be included in the time series.
                         Absolute value of TrgDelay must be less or equal
                         LIS_DURATION."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TRIGGER_LEVEL_POS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 94
    BYTES               = 4
    FORMAT              = "I4"
    UNIT                = "N/A"
    DESCRIPTION         = "Positive trigger level.
                         Value to be written to the UTT hardware register,
                         which fixes the upper (always positive) trigger
                         threshold. Note that the actually adjusted value
                         can be different, if automatic trigger level setting
                         is enabled."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TRIGGER_LEVEL_NEG"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 99
    BYTES               = 4
    FORMAT              = "I4"
    UNIT                = "N/A"
    DESCRIPTION         = "Negative trigger level.
                         Value to be written to the LTT hardware register,
                         which fixes the lower (always negative) trigger
                         threshold. Note that the actually adjusted value
                         can be different, if automatic trigger level setting
                         is enabled."
END_OBJECT              = COLUMN
```

```
OBJECT                 = COLUMN
    NAME               = "LIS_DURATION"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 104
    BYTES              = 9
    FORMAT             = "F9.1"
    UNIT               = "MILLISECOND"
    DESCRIPTION        = "Listening duration"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RX_STATUS"
    DATA_TYPE          = CHARACTER
    START_BYTE         = 115
    BYTES              = 14
    FORMAT             = "A14"
    UNIT               = "N/A"
    DESCRIPTION        = "Selection of sensor channels to be used. If cycle
                        is set, after a measurement the receiver selection
                        is (cyclically) shifted by one position (in the same
                        direction as the transmitters, as indicated in
                        TX_STATUS. If the reversed flag is additionally set,
                        the receiver cycling shall take place in the opposite
                        direction as the transmitter cycling.
                        Bit field represented as 15 characters, the rightmost
                        character corresponds to bit #0 and the leftmost to
                        bit #13.
                        Each character can be 1 (active sensor or cycle on or
                        reversed on) or 0 (sensor not used) and have the
                        following meaning:
                        bit  0: ACC -Y, x-axis
                        bit  1: ACC -Y, y-axis
                        bit  2: ACC -Y, z-axis
                        bit  3: ACC +X, x-axis
                        bit  4: ACC +X, y-axis
                        bit  5: ACC +X, z-axis
                        bit  6: ACC +Y, x-axis
                        bit  7: ACC +Y, y-axis
                        bit  8: ACC +Y, z-axis
                        bit  9: TRM -Y
                        bit 10: TRM +X
                        bit 11: TRM +Y
                        bit 12: cycle
                        bit 13: reversed"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "G_GEN"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 131
    BYTES              = 1
    FORMAT             = "I1"
    UNIT               = "N/A"
```

```
    DESCRIPTION          = "Values 1 or 0
                            1: prepare data for automatic gain adjustment"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "G_COMP"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 133
    BYTES                = 1
    FORMAT               = "I1"
    UNIT                 = "N/A"
    DESCRIPTION          =  "0: Do not calculate optimized gain
                           1: Optimize for lower 1/3 of channels
                           2: Optimize for lower 2/3 of channels
                           3: Optimize for strongest channel"
END_OBJECT               = COLUMN

OBJECT                 = COLUMN
    NAME               = "TL_GEN"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 135
    BYTES              = 1
    FORMAT             = "I1"
    UNIT               = "N/A"
    DESCRIPTION        = "Values 1 or 0
                         1: prepare data for automatic trigger level
                            adjustment"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TL_COMP"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 137
    BYTES              = 1
    FORMAT             = "I1"
    UNIT               = "N/A"
    DESCRIPTION        = "Values 1 or 0
                         1: adjust optimized trigger levels"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "STATS"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 139
    BYTES              = 1
    FORMAT             = "I1"
    UNIT               = "N/A"
    DESCRIPTION        = "Values 1 or 0
                         1: include channels statistics for each
                            measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
```

```
    NAME                = "SKIP_TS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 141
    BYTES               = 1
    FORMAT              = "I1"
    UNIT                = "N/A"
    DESCRIPTION         = "Values 1 or 0
                           If 1 time series not included into telemetry
                           (ignored in Stacking Mode)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "G_TAR_VAL"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 143
    BYTES               = 3
    FORMAT              = "I3"
    UNIT                = "N/A"
    DESCRIPTION         = "Target value for automatic gain adjustment.
                          Linearized ADC units in the range 1 to 255.
                          In combination with the value of G_COMP,
                          gain is adjusted such that the absolute
                          values of the samples of 1/3, 2/3 or all
                          channels are close to, but below, G_TAR_VAL."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TL_FACTOR"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 147
    BYTES               = 4
    FORMAT              = I4
    UNIT                = "N/A"
    DESCRIPTION         = "Factor for calculating the trigger levels from
                          10 to 2550%.
                          Distance of trigger level from mean of time
                          series (of selected trigger channels) relative
                          to the distance between mean and the extreme
                          sample values; TL_FACTOR equals 10 (100 %)
                          means that  trigger level are set equal to the
                          maximum deviation from mean during the
                          pre-measurement.
                          A TLFactor value less than or equal 10 would
                          have caused a trigger signal during the
                          pre-measurement. For each sensor channel
                          marked as trigger channel, flight software
                          calculates preliminary trigger levels based on
                          statistical values (Max, Min, Mean) of a
                          pre-measurement with
                            trglevneg = (Min-Mean) * TLFactor / 10 + Mean
                            trglevpos = (Max-Mean) * TLFactor / 10 + Mean
                          The smallest value of the trglevneg obtained
                          this way is adjusted as negative trigger level
```

```
                           (TrgLevNeg), and the highest trglevpos as
                           positive trigger level (TrgLevPos), possible
                           after correcting different gain settings during
                           the pre-measurement and the Trigger Mode
                           measurement."
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "AMP_SETUP"
    DATA_TYPE            = ASCII_REAL
    START_BYTE           = 152
    BYTES                = 4
    FORMAT               = "F4.1"
    UNIT                 = "SECOND"
    DESCRIPTION          = "Amplifier setup time in sounding mode.
                          It represents the Duration after start
                          of time series recording used for amplifier
                          setup (to yield constant base lines). A value
                          of 1 s should normally be used, because
                          it enables the correct identification of sensor
                          channels for all possible sampling frequencies
                          (no wrap-around of FIFO buffer)."
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "FIFO_LAG"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 157
    BYTES                 = 4
    FORMAT                = I4
    UNIT                  = "N/A"
    DESCRIPTION           = "Optional corrective offset of the address of
                          the first sample to be transferred.
                          Range from -127 to 127"
END_OBJECT                = COLUMN


OBJECT                    = COLUMN
    NAME                  = "FOOT_TEMP"
    DATA_TYPE             = CHARACTER
    START_BYTE            = 163
    BYTES                 = 7
    FORMAT                = "A7"
    UNIT                  = "N/A"
    DESCRIPTION           = "Active foot temperature channels.
                           Bit field represented as 7 characters, the
                           rightmost character corresponds to bit #0
                           and the leftmost to bit #6.
                           The Temperature and Radiation Dose Data Block
                           will be generated by flight software, if at least
                           one foot temperature channel is selected in
                           FOOT_TEMP. It will additionally be included at
                           the end of a measuring sequence, if the
```

```
                                    additional 'after job temperature' flag is set.
                                   Each character can be 1 (channel selected) or
                                   0 (channel not selected) and have the
                                   following meaning:
                                   bit  0: Temperature -Y, TRM
                                   bit  1: Temperature -Y, ACC
                                   bit  2: Temperature +X, TRM
                                   bit  3: Temperature +X, ACC
                                   bit  4: Temperature +Y, TRM
                                   bit  5: Temperature +Y, ACC
                                   bit  6: Additional after job temperatures"
END_OBJECT                       = COLUMN

OBJECT                           = COLUMN
    NAME                         = "ADD_DELAY"
    DATA_TYPE                    = ASCII_INTEGER
    START_BYTE                   = 172
    BYTES                        = 3
    UNIT                         = "SECOND"
    FORMAT                       = I3
    DESCRIPTION                  = "Additional delay between measurements of
                                   a measurement sequence"
END_OBJECT                       = COLUMN
```

4.3.2.4.1.2.2 CASSE Sequence Parameters definition for burst mode (level 2, FM3)

The sequence parameters are described by a TABLE object.

```
   OBJECT                 = SEQ_PARAM_TABLE
      NAME                 = "SEQ_PARAM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                 = 12
      COLUMNS              = 22
      ROW_BYTES            = 189
      ^STRUCTURE           = "SEQ_PARAM_BURST2_FM3.FMT"
   END_OBJECT             = SEQ_PARAM_TABLE
```

The structure of the Sequence parameters TABLE object is defined in the file SEQ_PARAM_BURST2_FM3.FMT.

```
OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "MEAS_ID"
    DATA_TYPE           = ASCII_INTEGER
```

```
    START_BYTE        = 8
    BYTES             = 6
    FORMAT            = "I6"
    UNIT              = "N/A"
    DESCRIPTION       = "Measurement index, i.e. the number
                         of the measurement in the file.
                         Starts from 1."
END_OBJECT           = COLUMN

OBJECT                = COLUMN
 NAME                 = "UTC"
 DATA_TYPE            = TIME
 START_BYTE           = 15
 BYTES                = 23
    DESCRIPTION       = "Measurement start time (UTC in PDS standard
                         format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT             = COLUMN

OBJECT                = COLUMN
    NAME              = "SESAME_LOCAL_TIME"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 39
    BYTES             = 15
    FORMAT            = "I15"
    DESCRIPTION       = "Start time of measurement. SESAME local time
                         (SLT) runs with a resolution of 1/32 seconds.
                         SLT represents the least significant 32 bits of
                         LOBT. The most significant 5 bits are in
                         CDMS RSST (see SESAME Ready Message)"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "FREQUENCY_DIVIDER"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 55
    BYTES              = 3
    FORMAT             = "I3"
    UNIT               = "N/A"
    DESCRIPTION        = "Value of transmitter frequency control register"
 END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "FREQUENCY_INCREMENT"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 59
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "N/A"
    DESCRIPTION        = "Value of sampling rate control registers"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNELS"
```

```
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 65
    BYTES                = 3
    FORMAT               = "I3"
    UNIT                 = "N/A"
    DESCRIPTION         = "Number of sensor channels, derived from SLTLA
                           word (sensor lookup table length and address
                           register)"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "AGC"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 69
    BYTES                = 5
    FORMAT               = "I5"
    UNIT                 = "N/A"
    DESCRIPTION         = "Value of amplifier gain control register"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "POWER_SETTING"
    DATA_TYPE            = CHARACTER
    START_BYTE           = 76
    BYTES                = 8
    FORMAT               = "A8"
    UNIT                 = "N/A"
    DESCRIPTION          = "Power register setting /mode
                           (hex value):
                           Bits 0 to 3: value of power control register
                           Bits 4 to 7 = 0: power set during measurement
                           initialization
                           Bits 4 to 7 = 1: power set by previous
                           CAS_PWRSW command"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TIME_BURST_ON"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 86
    BYTES                = 10
    FORMAT               = "I10"
    UNIT                 = "N/A"
    DESCRIPTION          = "SESAME High Resolution Time at start of recording
                         with a resolution of 1/1024 s"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "TIME_BURST_OFF"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 97
    BYTES                = 10
    UNIT                 = "N/A"
```

```
    FORMAT              = "I10"
    DESCRIPTION         = "SESAME High Resolution Time when recording
                          with a resolution of 1/1024 s"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME                = "FIFO_BURST_OFF"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 109
    BYTES               = 8
    UNIT                = "N/A"
    FORMAT              = "A8"
    DESCRIPTION         = "FIFO address of the final sample after
                          recording stopped (hex value)"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "FIFO_FIRST_DAT"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 120
    BYTES               = 8
    UNIT                = "N/A"
    FORMAT              = "A8"
    DESCRIPTION         = "FIFO address of the first sample included
                         in telemetry (hex value)"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "NSAMP"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 130
    BYTES               = 10
    FORMAT              = "I10"
    UNIT                = "N/A"
    DESCRIPTION         = "Number of samples per channel in telemetry"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "TEMP_FOOT-Y_TRM"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 141
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "MILLIVOLT"
    MISSING_CONSTANT    = 99999
    DESCRIPTION         = "-Y_Foot TRM temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "TEMP_FOOT-Y_ACC"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 147
    BYTES               = 5
```

```
    FORMAT              = "I5"
    UNIT                = "MILLIVOLT"
    MISSING_CONSTANT    = 99999
    DESCRIPTION         = "-Y_Foot ACC temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "TEMP_FOOT+X_TRM"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 153
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "MILLIVOLT"
    MISSING_CONSTANT    = 99999
    DESCRIPTION         = "+X_Foot TRM temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME               = "TEMP_FOOT+X_ACC"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 159
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "MILLIVOLT"
    MISSING_CONSTANT   = 99999
    DESCRIPTION        = "+X_Foot ACC temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "TEMP_FOOT+Y_TRM"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 165
    BYTES              = 5
    FORMAT             = "I5"
    UNIT               = "MILLIVOLT"
    MISSING_CONSTANT   = 99999
    DESCRIPTION        = "+Y_Foot TRM temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "TEMP_FOOT+Y_ACC"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 171
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "MILLIVOLT"
    MISSING_CONSTANT    = 99999
    DESCRIPTION         = "+Y_Foot ACC temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "CASSE_PCB_TEMP"
    DATA_TYPE           = ASCII_INTEGER
```

```
    START_BYTE          = 177
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "MILLIVOLT"
    MISSING_CONSTANT    = 99999
    DESCRIPTION       = "CASSE PCB temperature"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "RADFET_VOLTAGE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 183
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "MILLIVOLT"
    MISSING_CONSTANT    = 99999
    DESCRIPTION       = "RadFET voltage (0.002 V/mV)"
END_OBJECT            = COLUMN
```

4.3.2.4.1.2.3 CASSE Sequence Parameters definition for trigger mode

The sequence parameters are described by a TABLE object.

```
  OBJECT                = SEQ_PARAM_TABLE
      NAME                = "SEQ_PARAM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 7
      COLUMNS             = 25
      ROW_BYTES           = 220
      ^STRUCTURE          = "SEQ_PARAM_TRIG2_FM3.FMT"
   END_OBJECT            = SEQ_PARAM_TABLE
```

The structure of the Sequence parameters TABLE object is defined in the file SEQ_PARAM_TRIG2_FM3.FMT.

```
OBJECT                = COLUMN
    NAME              = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 1
    BYTES             = 6
    FORMAT            = "I6"
    UNIT              = "N/A"
    DESCRIPTION       = "Sequence ID in the current data file"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "MEAS_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 8
    BYTES             = 6
    FORMAT            = "I6"
    UNIT              = "N/A"
    DESCRIPTION       = "Measurement index, i.e. the number
```

```
                        of the measurement in the file.
                        Starts from 1."
END_OBJECT   = COLUMN

OBJECT                = COLUMN
 NAME                 = "UTC"
 DATA_TYPE            = TIME
 START_BYTE           = 15
 BYTES                = 23
    DESCRIPTION       = "Measurement start time (UTC in PDS standard
                        format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME              = "SESAME_LOCAL_TIME"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 39
    BYTES             = 15
    FORMAT            = "I15"
    DESCRIPTION       = "Start time of measurement. SESAME local time
                        (SLT) runs with a resolution of 1/32 seconds.
                        SLT represents the least significant 32 bits of
                        LOBT. The most significant 5 bits are in
                        CDMS RSST (see SESAME Ready Message)"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "FREQUENCY_DIVIDER"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 55
    BYTES             = 3
    FORMAT            = "I3"
    UNIT              = "N/A"
    DESCRIPTION       = "Value of transmitter frequency control register"
 END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "FREQUENCY_INCREMENT"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 59
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "N/A"
    DESCRIPTION       = "Value of sampling rate control registers"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNELS"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 65
    BYTES             = 3
    FORMAT            = "I3"
    UNIT              = "N/A"
```

```
    DESCRIPTION       = "Number of sensor channels, derived from SLTLA
                        word (sensor lookup table length and address
                        register)"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "AGC"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 69
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "N/A"
    DESCRIPTION       = "Value of amplifier gain control register"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "POWER_SETTING"
    DATA_TYPE         = CHARACTER
    START_BYTE        = 76
    BYTES             = 8
    FORMAT            = "A8"
    UNIT              = "N/A"
    DESCRIPTION       = "Power register setting / mode (hex value):
                        Bits 0 to 3: value of power control register
                        Bits 4 to 7 = 0: power set during measurement
                         initialization
                        Bits 4 to 7 = 1: power set by previous
                         CAS_PWRSW command"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TRIGGER_STATUS"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 86
    BYTES             = 8
    FORMAT            = "I8"
    UNIT              = "N/A"
    MISSING_CONSTANT  = 16#FFFF#
    DESCRIPTION       = "Trigger status register indicating the channel(s)
                        which triggered (hex value as 16#xxxx#)"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TIME_BURST_ON"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 95
    BYTES             = 10
    UNIT              = "N/A"
    FORMAT            = "I10"
    DESCRIPTION       = "SESAME High Resolution Time at start of recording
                        with a resolution of 1/1024 s"
END_OBJECT            = COLUMN
```

```
OBJECT                  = COLUMN
 NAME                   = "TIME_TRIGGER"
 DATA_TYPE              = ASCII_INTEGER
 START_BYTE             = 106
 BYTES                  = 10
 FORMAT                 = "I10"
 UNIT                   = "N/A"
 DESCRIPTION            = "SESAME High Resolution Time when trigger
                          occurred with a resolution of 1/1024 s"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_BURST_OFF"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 117
    BYTES               = 10
    UNIT                = "N/A"
    FORMAT              = "I10"
    DESCRIPTION         = "SESAME High Resolution Time when recording
                          with a resolution of 1/1024 s"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
 NAME                   = "FIFO_TRIGGER"
 DATA_TYPE              = CHARACTER
 START_BYTE             = 129
 BYTES                  = 8
 FORMAT                 = "A8"
 DESCRIPTION            = "FIFO RAM address when trigger occurred
                            (hex value, 4 bytes)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "FIFO_BURST_OFF"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 140
    BYTES               = 8
    UNIT                = "N/A"
    FORMAT              = "A8"
DESCRIPTION             = "FIFO RAM address when recording stopped
                          (hex value, 4 bytes)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "FIFO_FIRST_DAT"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 151
    BYTES               = 8
    UNIT                = "N/A"
    FORMAT              = "A8"
DESCRIPTION             = "FIFO RAM address of very first channel
                         data (hex value, 4 bytes)"
END_OBJECT              = COLUMN
```

```
OBJECT              = COLUMN
    NAME            = "NSAMP"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 161
    BYTES           = 10
    FORMAT          = "I10"
    UNIT            = "N/A"
    DESCRIPTION     = "Number of samples per channel in telemetry"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT-Y_TRM"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 172
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "MILLIVOLT"
    MISSING_CONSTANT = 99999
    DESCRIPTION     = "-Y_Foot TRM temperature before measurement"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT-Y_ACC"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 178
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "MILLIVOLT"
    MISSING_CONSTANT = 99999
    DESCRIPTION     = "-Y_Foot ACC temperature before measurement"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT+X_TRM"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 184
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "MILLIVOLT"
    MISSING_CONSTANT = 99999
    DESCRIPTION     = "+X_Foot TRM temperature before measurement"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "TEMP_FOOT+X_ACC"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 190
    BYTES           = 5
    FORMAT          = "I5"
    UNIT            = "MILLIVOLT"
    MISSING_CONSTANT = 99999
    DESCRIPTION     = "+X_Foot ACC temperature before measurement"
```

```
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+Y_TRM"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 196
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "MILLIVOLT"
    MISSING_CONSTANT  = 99999
    DESCRIPTION       = "+Y_Foot TRM temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+Y_ACC"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 202
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "MILLIVOLT"
    MISSING_CONSTANT  = 99999
    DESCRIPTION       = "+Y_Foot ACC temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CASSE_PCB_TEMP"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 208
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "MILLIVOLT"
    MISSING_CONSTANT  = 99999
    DESCRIPTION       = "CASSE PCB temperature"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RADFET_VOLTAGE"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 214
    BYTES             = 5
    FORMAT            = "I5"
    UNIT              = "MILLIVOLT"
    MISSING_CONSTANT  = 99999
    DESCRIPTION       = "RadFET voltage (0.002 V/mV)"
END_OBJECT            = COLUMN
```

4.3.2.4.1.2.4 CASSE Data definition

The data produced in sounding or listening modes are described by the following TABLE object.

```
OBJECT                      = DATA_TABLE
   NAME                      = "DATA"
   INTERCHANGE_FORMAT        = ASCII
   ROWS                      = 16438
```

```
      COLUMNS                   = 26
      ROW_BYTES                 = 231
      ^STRUCTURE                = "DATA2.FMT"
   END_OBJECT                 = DATA_TABLE
```

The structure of the measured data TABLE object is defined in the file DATA2.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "MEAS_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 8
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    DESCRIPTION        = "Measurement ID in the current sequence"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_1"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 15
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 1 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_1"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 26
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
```

```
               job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_2"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 33
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 2 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_2"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 44
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_3"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 51
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 3 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_3"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 62
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
```

```
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_4"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 69
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 4 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_4"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 80
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_5"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 87
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 5 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_5"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 98
```

```
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
              - non-linear ADC units for regular (non-stacked)
                 channel data block
              - linearized stacked ADC units for stacked channel
                 data block
              The mode (stacked or regular) is given in the
              job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_6"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 105
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 6 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_6"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 116
    BYTES              = 6
    FORMAT             = "I6"
    UNIT               = "N/A"
    MISSING_CONSTANT   = 999999
    DESCRIPTION        = "Channel data :
              - non-linear ADC units for regular (non-stacked)
                 channel data block
              - linearized stacked ADC units for stacked channel
                 data block
              The mode (stacked or regular) is given in the
              job card file (JOBC)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_7"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 123
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 7 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "CHANNEL_7"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 134
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_8"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 141
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 8 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_8"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 152
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_9"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 159
    BYTES               = 10
    UNIT                = "MILLISECOND"
```

```
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 9 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_9"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 170
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                 channel data block
               - linearized stacked ADC units for stacked channel
                 data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_10"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 177
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 10 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_10"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 188
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 999999
    DESCRIPTION         = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                 channel data block
               - linearized stacked ADC units for stacked channel
                 data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
```

```
    NAME              = "RELATIVE_TIME_11"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 195
    BYTES             = 10
    UNIT              = "MILLISECOND"
    FORMAT            = "F10.3"
    MISSING_CONSTANT  = 99999.999
    DESCRIPTION       = "Channel 11 time relative to
                         start time of the measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_11"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 206
    BYTES             = 6
    FORMAT            = "I6"
    UNIT              = "N/A"
    MISSING_CONSTANT  = 999999
    DESCRIPTION       = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
               The mode (stacked or regular) is given in the
               job card file (JOBC)"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RELATIVE_TIME_12"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 213
    BYTES             = 10
    UNIT              = "MILLISECOND"
    FORMAT            = "F10.3"
    MISSING_CONSTANT  = 99999.999
    DESCRIPTION       = "Channel 12 time relative to
                         start time of the measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_12"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 224
    BYTES             = 6
    FORMAT            = "I6"
    UNIT              = "N/A"
    MISSING_CONSTANT  = 999999
    DESCRIPTION       = "Channel data :
               - non-linear ADC units for regular (non-stacked)
                  channel data block
               - linearized stacked ADC units for stacked channel
                  data block
```

```
                The mode (stacked or regular) is given in the
                job card file (JOBC)"
END_OBJECT            = COLUMN
```

4.3.2.4.2 DIM object definitions

The structures of DIM measurements differ according to flight software versions. The details concerning the telemetry formats can be found in [AD1] for flight software version 1 (FM1), in [AD2] for flight software version 2 (FM2) and in |AD3] for flight software version 3 (FM3). The FM2 software was uploaded on 2007-09-24 at 19h40 UTC (during Payload Checkout #6). The FM3 software was uploaded on 2009-09-24 at 02h00 UTC (during PC#10).

4.3.2.4.2.1 Flight software versions FM1 and FM2

4.3.2.4.2.1.1 DIM Health Check object definition

The DIM Health Check (HC) data are organized as tables corresponding to different modes: “calibration”, “noise test”, “power check” and “sensor test”.

4.3.2.4.2.1.1.1 DIM HC Calibration mode

The calibration mode is described by a TABLE object.

```
OBJECT                = CAL_TABLE
   NAME                = "CAL"
   INTERCHANGE_FORMAT = ASCII
   ROWS                = 4
   COLUMNS             = 9
   ROW_BYTES           = 74
   ^STRUCTURE          = "DIM_CA.FMT"
END_OBJECT            = CAL_TABLE
```

The structure of the TABLE object is defined in the file DIM_CA.FMT.

```
OBJECT                   = COLUMN
    NAME                 = "UTC"
    DATA_TYPE            = TIME
    START_BYTE           = 1
    BYTES                = 23
    DESCRIPTION          = "Measurement start time (UTC in PDS standard
                            format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "SESAME_LOCAL_TIME"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 25
    BYTES                = 15
    FORMAT               = "I15"
    DESCRIPTION          = "Measurement start time. SESAME local time
                            (SLT) runs with a resolution of 1/32 seconds.
                            SLT represents the least significant 32 bits
                            of LOBT. The most significant 5 bits are in
                            CDMS RSST (see SESAME Ready Message)"
END_OBJECT               = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "MARGIN"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 41
    BYTES               = 2
    FORMAT              = "I2"
    UNIT                = "DECIBEL"
    MISSING_CONSTANT    = 99
    DESCRIPTION         = "DIM calibration margin"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LEVEL"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 45
    BYTES               = 4
    FORMAT              = "A4"
    UNIT                = "N/A"
    MISSING_CONSTANT    = "9999"
    DESCRIPTION         = "DIM calibration level values can be: low or high"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                   = "COUNTS"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 51
    BYTES                  = 6
    FORMAT                 = "I6"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 999999
    DESCRIPTION            = "DIM calibration timer counts"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "PEAK_MV"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 58
    BYTES                  = 4
    UNIT                   = "MILLIVOLT"
    FORMAT                 = "I4"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Peak voltage in mV"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TIME_DB"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 63
    BYTES                  = 2
    UNIT                   = "DECIBEL"
    FORMAT                 = "I2"
    MISSING_CONSTANT       = 99
    DESCRIPTION            = "Timer counts in compressed format"
```

```
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "PEAK_DB"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 66
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    MISSING_CONSTANT        = 99
    DESCRIPTION             = "Peak voltage in dB"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "ERROR_CODE"
    DATA_TYPE               = CHARACTER
    START_BYTE              = 70
    BYTES                   = 2
    FORMAT                  = "A2"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = "99"
    DESCRIPTION             = "DIM calibration error code,
                               2 hexadecimal characters"
END_OBJECT                  = COLUMN
```

4.3.2.4.2.1.1.2 DIM HC Noise Test mode

The noise test mode is described by the following TABLE object.

```
OBJECT                 = NT_TABLE
   NAME                = "NT"
   INTERCHANGE_FORMAT  = ASCII
   ROWS                = 2
   COLUMNS             = 4
   ROW_BYTES           = 49
   ^STRUCTURE          = "DIM_NT.FMT"
END_OBJECT             = NT_TABLE
```

The structure of the “Noise Test” TABLE object is defined in the file DIM_NT.FMT.

```
OBJECT                      = COLUMN
    NAME                    = "UTC"
    DATA_TYPE               = TIME
    START_BYTE              = 1
    BYTES                   = 23
    DESCRIPTION             = "Measurement start time (UTC in PDS standard
                               format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "SESAME_LOCAL_TIME"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 25
```

```
    BYTES                    = 15
    FORMAT                   = "I15"
    DESCRIPTION              = "Measurement start time. SESAME local time
                                (SLT) runs with a resolution of 1/32 seconds.
                                SLT represents the least significant 32 bits
                                of LOBT. The most significant 5 bits are in
                                CDMS RSST (see SESAME Ready Message)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "MARGIN"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 41
    BYTES                    = 2
    FORMAT                   = "I2"
    UNIT                     = "DECIBEL"
    MISSING_CONSTANT         = 99
    DESCRIPTION              = "Noise test margin"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "ERROR_CODE"
    DATA_TYPE                = CHARACTER
    START_BYTE               = 45
    BYTES                    = 2
    FORMAT                   = "A2"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = "99"
    DESCRIPTION              = "DIM NT error code,  2 hexadecimal characters"
END_OBJECT                   = COLUMN
```

4.3.2.4.2.1.1.3 DIM HC Power Check mode

The data produced in power check mode are described by the following TABLE object.

```
OBJECT                 = PC_TABLE
   NAME                 = "PC"
   INTERCHANGE_FORMAT = ASCII
   ROWS                 = 2
   COLUMNS              = 5
   ROW_BYTES            = 64
   ^STRUCTURE           = "DIM_PC.FMT"
END_OBJECT             = PC_TABLE
```

The structure of the power check TABLE object is defined in the file DIM_PC.FMT.

```
OBJECT                       = COLUMN
    NAME                     = "UTC"
    DATA_TYPE                = TIME
    START_BYTE               = 1
    BYTES                    = 23
    DESCRIPTION              = "Measurement start time (UTC in PDS standard
                                format YYYY-MM-DDThh:mm:ss.sss)"
```

```
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "SESAME_LOCAL_TIME"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 25
    BYTES                   = 15
    FORMAT                  = "I15"
    DESCRIPTION             = "Measurement start time. SESAME local time
                               (SLT) runs with a resolution of 1/32 seconds.
                               SLT represents the least significant 32 bits
                               of LOBT. The most significant 5 bits are in
                               CDMS RSST (see SESAME Ready Message)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "+5V"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 41
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = VOLT
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "DIM +5V voltage"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "-5V"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 50
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = VOLT
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "DIM -5V voltage"
END_OBJECT    = COLUMN

OBJECT                      = COLUMN
    NAME                    = "ERROR_CODE"
    DATA_TYPE               = CHARACTER
    START_BYTE              = 60
    BYTES                   = 2
    FORMAT                  = "A2"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = "99"
    DESCRIPTION             = "DIM PC error code, 2 hexadecimal characters"
END_OBJECT                  = COLUMN
```

4.3.2.4.2.1.1.4 DIM HC Sensor Test mode

Data acquired during sensor tests (X segment, Y segment and Z segment) are stored in ASCII tables with a common format. The segment name (X, Y or Z) appears in the label name.

The data produced in sensor test modes are described by the following TABLE object.

```
OBJECT                = ST_TABLE
   NAME                = "ST"
   INTERCHANGE_FORMAT = ASCII
   ROWS                = 2
   COLUMNS             = 11
   ROW_BYTES           = 79
   ^STRUCTURE          = "DIM_ST.FMT"
END_OBJECT            = ST_TABLE
```

The structure (format) of the "sensor test mode" TABLE object is defined in the file DIM_ST.FMT.

```
OBJECT                     = COLUMN
    NAME                   = "UTC"
    DATA_TYPE              = TIME
    START_BYTE             = 1
    BYTES                  = 23
    DESCRIPTION            = "Measurement start time (UTC in PDS standard
                              format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 25
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Measurement start time. SESAME local time
                              (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "DIRECTION"
    DATA_TYPE              = CHARACTER
    START_BYTE             = 42
    BYTES                  = 1
    FORMAT                 = "A1"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = "9"
DESCRIPTION                = "DIM sensor direction, can be X, Y or Z.
                              Echoed command parameter."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "MARGIN"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 45
    BYTES                  = 2
    FORMAT                 = "I2"
```

```
    UNIT                      = "DECIBEL"
    MISSING_CONSTANT          = 99
    DESCRIPTION               = "DIM noise test margin"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "ERROR_CODE"
    DATA_TYPE                 = CHARACTER
    START_BYTE                = 49
    BYTES                     = 2
    FORMAT                    = "A2"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = "99"
    DESCRIPTION               = "DIM sensor test error code,
                                 2 hexadecimal characters"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "AVG_MV"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 53
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "MILLIVOLT"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "DIM Average signal in mV"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "PEAK_MV"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 58
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "MILLIVOLT"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "DIM Signal Peak voltage in mV"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "COUNTS"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 63
    BYTES                     = 6
    FORMAT                    = "I6"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 999999
    DESCRIPTION               = "DIM Timer counts"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "AVG_DB"
    DATA_TYPE                 = ASCII_INTEGER
```

```
    START_BYTE              = 70
    BYTES                   = 2
    FORMAT                  = "I2"
    UNIT                    = "DECIBEL"
    MISSING_CONSTANT        = 99
    DESCRIPTION             = "DIM Average signal in dB"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "PEAK_DB"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 73
    BYTES                   = 2
    FORMAT                  = "I2"
    UNIT                    = "DECIBEL"
    MISSING_CONSTANT        = 99
    DESCRIPTION             = "DIM Signal Peak voltage in dB"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "TIME_DB"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 76
    BYTES                   = 2
    FORMAT                  = "I2"
    UNIT                    = "DECIBEL"
    MISSING_CONSTANT        = 99
    DESCRIPTION             = "DIM impact time in compressed format"
END_OBJECT                  = COLUMN
```

4.3.2.4.2.1.2 DIM Average Test mode

During Average Test mode, average values of the signals for one sensor direction are taken at regular time intervals are stored in ASCII tables. The data are organized as ASCII tables. The measurement parameters are kept in a separate file (combined detached labels).

The measurement parameters in average test modes are described by the following TABLE object.

```
OBJECT                = DIM_AV_TEST_PAR_TABLE
  NAME                = "DIM_AV_TEST_PAR"
  INTERCHANGE_FORMAT  = ASCII
  ROWS                = 22
  COLUMNS             = 11
  ROW_BYTES           = 103
  ^STRUCTURE          = "DIM_AVT_PAR.FMT"
END_OBJECT            = DIM_AV_TEST_PAR_TABLE
```

The structure of the “average test mode” TABLE object is defined in the file DIM_AVT_PAR.FMT.

```
OBJECT                 = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
```

```
    FORMAT             = "I6"
    UNIT               = "N/A"
    DESCRIPTION      = "Sequence ID in the current data file"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
 NAME                = "UTC"
 DATA_TYPE           = TIME
 START_BYTE          = 8
 BYTES               = 23
 DESCRIPTION  = "This column represents the UTC Time
                         for start of measurement"
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME              = "SESAME_LOCAL_TIME"
    DATA_TYPE         = CHARACTER
    START_BYTE        = 33
    BYTES             = 15
    FORMAT            = "A15"
    UNIT              = "N/A"
 DESCRIPTION  = "Start time of measurement represented as :
                         Reset number (integer starting at 1) / seconds
                         The time resolution is 0.03125 s"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME             = "DIRECTION"
    DATA_TYPE        = CHARACTER
    START_BYTE       = 51
    BYTES            = 1
    UNIT             = "N/A"
    FORMAT           = "A1"
    DESCRIPTION  = "Direction in DIM coordinate system,
                         X, Y or Z.
                         Echoed command parameter."
END_OBJECT   = COLUMN

OBJECT     = COLUMN
    NAME             = "ENERGY_CTRL"
    DATA_TYPE        = CHARACTER
    START_BYTE       = 55
    BYTES            = 2
    UNIT             = "N/A"
    FORMAT           = "A2"
    DESCRIPTION  = "Energy control,
                         00, 01 or 02.
                         Echoed command parameter."
END_OBJECT   = COLUMN

OBJECT     = COLUMN
    NAME             = "MEAS_DURATION"
    DATA_TYPE        = ASCII_INTEGER
```

```
    START_BYTE        = 59
    BYTES             = 5
    UNIT              = "SECOND"
    FORMAT            = "I5"
    DESCRIPTION   = "Measurement duration.
                         Echoed command parameter."
END_OBJECT    = COLUMN

OBJECT      = COLUMN
    NAME              = "N_SAMPLES"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 65
    BYTES             = 5
    UNIT              = "N/A"
    FORMAT            = "I5"
    DESCRIPTION   = "Number of samples. "
END_OBJECT    = COLUMN

OBJECT      = COLUMN
    NAME              = "TIME_STEP_ECHOED"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 71
    BYTES             = 5
    UNIT              = "SECOND"
    FORMAT            = "I5"
    DESCRIPTION   = "Time step. Echoed parameter."
END_OBJECT    = COLUMN

OBJECT      = COLUMN
    NAME              = "TIME_STEP_USED"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 77
    BYTES             = 5
    UNIT              = "SECOND"
    FORMAT            = "I5"
    DESCRIPTION       = "Time step really used."
END_OBJECT    = COLUMN
```

The data produced in average test modes (signal) are described by the following TABLE object.

```
OBJECT                = DIM_AV_TEST_SIG_TABLE
  NAME                = "DIM_AVT_SIG"
  INTERCHANGE_FORMAT  = ASCII
  ROWS                =
  COLUMNS             =
  ROW_BYTES           =
  ^STRUCTURE          = " DIM_AVT_SIG.FMT"
END_OBJECT            = DIM_AV_TEST_SIG_TABLE
```

The structure of the “average test mode” TABLE object is defined in the file DIM_AVT_SIG.FMT.

```
OBJECT      = COLUMN
    NAME         = "SESAME_SEQ_ID"
```

```
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 1
    BYTES       = 6
    FORMAT      = "I6"
    UNIT        = "N/A"
    DESCRIPTION  = "Sequence ID in the current data file"
END_OBJECT           = COLUMN

OBJECT     = COLUMN
    NAME        = "DIM_AM_TIME"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 8
    BYTES       = 4
    UNIT        = "SECOND"
    FORMAT      = "I4"
    DESCRIPTION  = "Time relative to start time
                      in DIM_AV_PAR.FMT file"
END_OBJECT   = COLUMN

OBJECT     = COLUMN
    NAME        = "U_AV"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 13
    BYTES       = 3
    UNIT        = "DECIBEL"
    FORMAT      = "I3"
    DESCRIPTION  = "Average sample"
END_OBJECT   = COLUMN
```

4.3.2.4.2.1.3 DIM Average mode

During Average mode, samples of the average signal voltage of one sensor face are taken at specified time intervals. The data are organized as ASCII tables. The measurement parameters are kept in a separate file (combined detached labels).

The measurement parameters in average modes are described by the following TABLE object.

```
OBJECT               = DIM_AV_PAR_TABLE
  NAME               = "DIM_AV_PAR"
  INTERCHANGE_FORMAT = ASCII
  ROWS               =
  COLUMNS            =
  ROW_BYTES          =
  ^STRUCTURE         = "DIM_AV_PAR.FMT"
END_OBJECT           = DIM_AV_PAR_TABLE
```

The structure of the “average test mode” TABLE object is defined in the file DIM_AV_PAR.FMT.

```
OBJECT         = COLUMN
    NAME        = "SESAME_SEQ_ID"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 1
    BYTES       = 6
    FORMAT      = "I6"
```

```
    UNIT        = "N/A"
    DESCRIPTION  = "Sequence ID in the current data file"
END_OBJECT      = COLUMN

OBJECT           = COLUMN
 NAME            = "UTC"
 DATA_TYPE       = TIME
 START_BYTE      = 8
 BYTES           = 23
 DESCRIPTION  = "This column represents the UTC Time
        for start of measurement"
END_OBJECT   = COLUMN

OBJECT          = COLUMN
    NAME        = "SESAME_LOCAL_TIME"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 33
    BYTES       = 15
    FORMAT      = "A15"
    UNIT        = "N/A"
 DESCRIPTION      = "Start time of measurement represented as :
                         Reset number (integer starting at 1) / seconds
                         The time resolution is 0.03125 s"
END_OBJECT           = COLUMN

OBJECT     = COLUMN
    NAME     = "DIRECTION"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 51
    BYTES       = 1
    UNIT        = "N/A"
    FORMAT      = "A1"
    DESCRIPTION  = "Direction in DIM coordinate system,
                   X, Y or Z.
                   Echoed command parameter."
END_OBJECT   = COLUMN

OBJECT            = COLUMN
    NAME          = "ENERGY_CTRL"
    DATA_TYPE     = CHARACTER
    START_BYTE    = 55
    BYTES         = 2
    UNIT          = "N/A"
    FORMAT        = "A2"
    DESCRIPTION  = "Energy control,
                         00, 01 or 02.
                         Echoed command parameter."
END_OBJECT   = COLUMN

OBJECT              = COLUMN
    NAME              = "MEAS_DURATION"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 59
```

```
    BYTES             = 5
    UNIT              = "SECOND"
    FORMAT            = "I5"
    DESCRIPTION    = "Measurement duration.
                          Echoed command parameter."
END_OBJECT    = COLUMN

OBJECT              = COLUMN
    NAME            = "N_SAMPLES"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 65
    BYTES           = 5
    UNIT            = "N/A"
    FORMAT          = "I5"
    DESCRIPTION  = "Number of samples. "
END_OBJECT     = COLUMN

OBJECT                = COLUMN
    NAME              = "TIME_STEP_ECHOED"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 71
    BYTES             = 5
    UNIT              = "SECOND"
    FORMAT            = "I5"
    DESCRIPTION  = "Time step. Echoed parameter."
END_OBJECT     = COLUMN

OBJECT      = COLUMN
    NAME        = "TIME_STEP_USED"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 77
    BYTES       = 5
    UNIT        = "SECOND"
    FORMAT      = "I5"
    DESCRIPTION   = "Time step really used."
END_OBJECT     = COLUMN
```

The data produced in average modes (signal) are described by the following TABLE object.

```
OBJECT              = DIM_AV_SIG_TABLE
  NAME              = "DIM_AV_SIG"
  INTERCHANGE_FORMAT = ASCII
  ROWS                =
  COLUMNS             =
  ROW_BYTES           =
  ^STRUCTURE          = "DIM_AV_SIG.FMT"
END_OBJECT            = DIM_AV_SIG_TABLE
```

The structure of the “average mode” TABLE object is defined in the file DIM_AV_SIG.FMT.

```
OBJECT      = COLUMN
    NAME        = "SESAME_SEQ_ID"
    DATA_TYPE   = ASCII_INTEGER
```

```
    START_BYTE  = 1
    BYTES       = 6
    FORMAT      = "I6"
    UNIT        = "N/A"
    DESCRIPTION  = "Sequence ID in the current data file"
END_OBJECT           = COLUMN

OBJECT     = COLUMN
    NAME        = "DIM_AM_TIME"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 8
    BYTES       = 4
    UNIT        = "SECOND"
    FORMAT      = "I4"
    DESCRIPTION  = "Time relative to start time
                          in DIM_AV_PAR.FMT file"
END_OBJECT   = COLUMN

OBJECT     = COLUMN
    NAME        = "U_AV"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 13
    BYTES       = 3
    UNIT        = "DECIBEL"
    FORMAT      = "I3"
    DESCRIPTION  = "Average sample"
END_OBJECT   = COLUMN
```

4.3.2.4.2.1.4 DIM Burst Continuous mode

Single events on one sensor face are registered. Measured values (peak amplitude U and impact time T) are stored on-board in a compressed way. First they are logarithmically scaled to 1 <= U[dB] <= 90 dB and 10 <= T[dB] <= 70 (10 <= T[dB] <= 90 for version 1 of Flight Software). The counts for events with a particular (U[db], T[db]) combination are stored in memory cells of different sizes (one word, one byte, one nibble = 4 bit), depending on the expected frequency of such events. The resulting matrix of packed counts has a fixed size of 3585 Byte (independent of the actual number of events). Additionally average samples can be measured.

The DIM BC data are organized as (U,T) tables with dimensions (90,80), 1 to 90 for U and 10 to 90 for T. This corresponds to data produced with flight software version 1. For data obtained with versions 2 and 3 of flight software, the (U,T) table is filled with MISSING_CONSTANT (defined in DIM_BC_BM.FMT).

The parameter data (general parameters, average mode parameters and burst mode parameters) associated with the BC measurement are kept in a separate file (combined detached labels).

Example: Burst continuous measurement (1 label file pointing to 3 data files)

SES_FS3_DBC_070929214512.LBL	(label)
SES_FS3_DBC_070929214512_PAR.TAB	(general parameters)
SES_FS3_DBC_070929214512_AM.TAB	(average mode, Uav time series)
SES_FS3_DBC_070929214512_BM.TAB	((U,T) table)

The label contains the Start and Stop times of the measurement as LOBT and UTC.

DIM BC, Parameters table definition

The parameters table is the same for Burst Continuous Average mode and Burst mode.

The parameters are described in the following TABLE object.

```
   OBJECT                = BC_PAR_TABLE
      NAME                = "BC_PAR"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 3
      COLUMNS             = 11
      ROW_BYTES           = 71
      ^STRUCTURE          = "DIM_BC_PAR.FMT"
   END_OBJECT            = BC_PAR_TABLE
```

The structure of the TABLE object is defined in the file DIM_BC_PAR.FMT.

```
/* FILE_CONTENTS            = DIM Burst Continuous PAR data */
/*                            Flight software FM1, FM2, FM3, CODMAC level 2 */
/* FILE_NAME                = DIM_BC_PAR.FMT */
/* REVISION_NOTE            = H. Krueger, version 1, 2015-08-18 */
/*                            A. Hirn, version 2, 2015-11-20 */

OBJECT                      = COLUMN
    NAME                    = "SESAME_SEQ_ID"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 1
    BYTES                   = 6
    FORMAT                  = "I6"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 999999
    DESCRIPTION             = "Sequence ID in the current data file"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "SESAME_LOCAL_TIME"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 8
    BYTES                   = 15
    FORMAT                  = "I15"
    DESCRIPTION             = "Time at end of measuring period.
                               SESAME local time
                               (SLT) runs with a resolution of 1/32 seconds.
                               SLT represents the least significant 32 bits
                               of LOBT. The most significant 5 bits are in
                               CDMS RSST (see SESAME Ready Message)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "DIRECTION"
    DATA_TYPE               = CHARACTER
    START_BYTE              = 25
    BYTES                   = 1
    FORMAT                  = "A1"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = "9"
    DESCRIPTION             = "Direction in DIM coordinate system, X, Y or Z.
```

```
                               Echoed command parameter."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "MARGIN"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 28
    BYTES                    = 2
    FORMAT                   = "I2"
    UNIT                     = "DECIBEL"
    MISSING_CONSTANT         = 99
    DESCRIPTION              = "The margin determines the detection
                               threshold of the measuring amplifier.
                               Echoed command parameter. "
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "DECAY_TIME"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 31
    BYTES                    = 3
    FORMAT                   = "I3"
    UNIT                     = "MILLISECOND"
    MISSING_CONSTANT         = 999
    DESCRIPTION              = "Signal decay time.
                               Range from 0 to 255.
                               Echoed command parameter."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "SAMPLING_INTERVAL"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 35
    BYTES                    = 5
    FORMAT                   = "I5"
    UNIT                     = "SECOND"
    MISSING_CONSTANT         = 99999
    DESCRIPTION              = "Sampling time interval.
                               Echoed command parameter."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "MEAS_TIME"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 41
    BYTES                    = 5
    FORMAT                   = "I5"
    UNIT                     = "SECOND"
    MISSING_CONSTANT         = 99999
    DESCRIPTION              = "Measuring time.
                               Echoed command parameter."
END_OBJECT                   = COLUMN
```

```
OBJECT                      = COLUMN
    NAME                    = "NEVENT"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 47
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 99999
    DESCRIPTION             = "Number of events detected."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "N_FALSE_EVENTS"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 53
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 99999
    DESCRIPTION             = "Number of false events."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "N_LONG_EVENTS"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 59
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 99999
    DESCRIPTION             = "Number of long events."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "N_AV_SAMPLES"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 65
    BYTES                   = 5
    FORMAT                  = "I5"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 99999
    DESCRIPTION             = "Number of average samples."
END_OBJECT                  = COLUMN
```

DIM BC Average mode data definition

The average mode data are described in the following TABLE object.

```
   OBJECT                = BC_AM_TABLE
      NAME                = "BC_AM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 22
      COLUMNS             = 3
```

```
      ROW_BYTES           = 16
      ^STRUCTURE          = "DIM_BC_AM.FMT"
   END_OBJECT           = BC_AM_TABLE
```

The structure of the TABLE object is defined in the file DIM_BC_AM.FMT.

```
OBJECT                     = COLUMN
    NAME                   = "SESAME_SEQ_ID"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 1
    BYTES                  = 6
    FORMAT                 = "I6"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 999999
    DESCRIPTION            = "Sequence ID in the current data file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 8
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "SECOND"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Time relative to start time
                              in DIM_BM_PAR.FMT file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "U_AV"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 13
    BYTES                  = 2
    FORMAT                 = "I2"
    UNIT                   = "DECIBEL"
    MISSING_CONSTANT       = 99
    DESCRIPTION            = "Average sample."
END_OBJECT                 = COLUMN
```

DIM BC Burst mode data definition (FM 1)

The burst continuous data are described in the following TABLE object.

```
OBJECT                 = BURST_MODE_TABLE
  NAME                 = BURST_MODE
  INTERCHANGE_FORMAT   = ASCII
  ROWS                 = 3
  COLUMNS              = 66
  ROW_BYTES            = 247
  ^STRUCTURE           = "DIM_BC_BM_FM1.FMT"
END_OBJECT             = BURST_MODE_TABLE
```

The structure of the TABLE object is defined in the file DIM_BC_BM_FM1.FMT.

```
OBJECT                    = COLUMN
    NAME                  = "SESAME_SEQ_ID"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 1
    BYTES                 = 6
    UNIT                  = "N/A"
    FORMAT                = "I6"
    DESCRIPTION           = "Sequence ID in the current data file"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_1"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 8
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 1 dB
                             (time in compressed format)"
END_OBJECT   = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_2"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 11
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 2 dB
                             (time in compressed format)"
END_OBJECT   = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_3"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 14
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 3 dB
                              (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_4"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 17
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 4 dB
                              (time in compressed format)"
END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "CNT_5"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 20
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 5 dB
                           (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_6"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 23
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 6 dB
                           (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_7"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 26
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 7 dB
                           (time in compressed format)"
END_OBJECT    = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_8"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 29
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 8 dB
                           (time in compressed format)"
END_OBJECT    = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_9"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 9 dB
```

```
                          (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_10"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 35
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 10 dB
                             (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_11"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 38
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 11 dB
                            (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_12"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 41
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 12 dB
                            (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_13"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 44
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 13 dB
                            (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_14"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 47
    BYTES                 = 2
    UNIT                  = "DECIBEL"
```

```
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 14 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_15"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 50
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 15 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_16"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 53
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 16 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_17"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 56
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 17 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_18"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 59
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 18 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_19"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 62
```

```
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 19 dB
                           (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_20"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 65
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 20 dB
                           (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_21"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 68
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 21 dB
                           (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_22"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 71
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 22 dB
                           (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_23"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 74
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 23 dB
                           (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_24"
```

```
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 77
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 24 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_25"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 80
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 25 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_26"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 83
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 26 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_27"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 86
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 27 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_28"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 89
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 28 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN
```

```
OBJECT                     = COLUMN
    NAME                   = "CNT_29"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 92
    BYTES                  = 2
    UNIT                   = "DECIBEL"
    FORMAT                 = "I2"
    DESCRIPTION            = "Counts for impact time 29 dB
                          (time in compressed format)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_30"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 95
    BYTES                  = 2
    UNIT                   = "DECIBEL"
    FORMAT                 = "I2"
    DESCRIPTION            = "Counts for impact time 30 dB
                          (time in compressed format)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_31"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 98
    BYTES                  = 2
    UNIT                   = "DECIBEL"
    FORMAT                 = "I2"
    DESCRIPTION            = "Counts for impact time 31 dB
                           (time in compressed format)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_32"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 101
    BYTES                  = 2
    UNIT                   = "DECIBEL"
    FORMAT                 = "I2"
    DESCRIPTION            = "Counts for impact time 32 dB
                          (time in compressed format)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_33"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 104
    BYTES                  = 2
    UNIT                   = "DECIBEL"
    FORMAT                 = "I2"
    DESCRIPTION            = "Counts for impact time 33 dB
                          (time in compressed format)"
```

```
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_34"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 107
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 34 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_35"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 110
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 35 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_36"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 113
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 36 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_37"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 116
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 37 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_38"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 119
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
```

```
    DESCRIPTION              = "Counts for impact time 38 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_39"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 122
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 39 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_40"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 125
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 40 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_41"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 128
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 41 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_42"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 131
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 42 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_43"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 134
    BYTES                    = 2
```

```
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 43 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_44"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 137
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 44 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_45"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 140
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 45 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_46"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 143
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 46 dB
                            (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_47"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 146
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 47 dB
                            (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_48"
    DATA_TYPE                = ASCII_INTEGER
```

```
    START_BYTE              = 149
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 48 dB
                          (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_49"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 152
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 49 dB
                            (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_50"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 155
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 50 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_51"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 158
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 51 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_52"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 161
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 52 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
```

```
    NAME                        = "CNT_53"
    DATA_TYPE                   = ASCII_INTEGER
    START_BYTE                  = 164
    BYTES                       = 2
    UNIT                        = "DECIBEL"
    FORMAT                      = "I2"
    DESCRIPTION                 = "Counts for impact time 53 dB
                                   (time in compressed format)"
END_OBJECT                      = COLUMN

OBJECT                          = COLUMN
    NAME                        = "CNT_54"
    DATA_TYPE                   = ASCII_INTEGER
    START_BYTE                  = 167
    BYTES                       = 2
    UNIT                        = "DECIBEL"
    FORMAT                      = "I2"
    DESCRIPTION                 = "Counts for impact time 54 dB
                                   (time in compressed format)"
END_OBJECT                      = COLUMN

OBJECT                          = COLUMN
    NAME                        = "CNT_55"
    DATA_TYPE                   = ASCII_INTEGER
    START_BYTE                  = 170
    BYTES                       = 2
    UNIT                        = "DECIBEL"
    FORMAT                      = "I2"
    DESCRIPTION                 = "Counts for impact time 55 dB
                                   (time in compressed format)"
END_OBJECT                      = COLUMN

OBJECT                          = COLUMN
    NAME                        = "CNT_56"
    DATA_TYPE                   = ASCII_INTEGER
    START_BYTE                  = 173
    BYTES                       = 2
    UNIT                        = "DECIBEL"
    FORMAT                      = "I2"
    DESCRIPTION                 = "Counts for impact time 56 dB
                                   (time in compressed format)"
END_OBJECT                      = COLUMN

OBJECT                          = COLUMN
    NAME                        = "CNT_57"
    DATA_TYPE                   = ASCII_INTEGER
    START_BYTE                  = 176
    BYTES                       = 2
    UNIT                        = "DECIBEL"
    FORMAT                      = "I2"
    DESCRIPTION                 = "Counts for impact time 57 dB
                                   (time in compressed format)"
END_OBJECT                      = COLUMN
```

```
OBJECT                       = COLUMN
    NAME                     = "CNT_58"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 179
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 58 dB
                                 (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_59"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 182
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 59 dB
                                (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_60"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 185
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 60 dB
                                 (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_61"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 188
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 61 dB
                                (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_62"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 191
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 62 dB
```

```
                             (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_63"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 194
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 63 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_64"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 197
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 64 dB
                             (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_65"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 200
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 65 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_66"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 203
    BYTES                   = 2
    UNIT                    = "DECIBEL"
    FORMAT                  = "I2"
    DESCRIPTION             = "Counts for impact time 66 dB
                              (time in compressed format)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_67"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 206
    BYTES                   = 2
    UNIT                    = "DECIBEL"
```

```
    FORMAT                    = "I2"
    DESCRIPTION               = "Counts for impact time 67 dB
                                (time in compressed format)"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_68"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 209
    BYTES                     = 2
    UNIT                      = "DECIBEL"
    FORMAT                    = "I2"
    DESCRIPTION               = "Counts for impact time 68 dB
                              (time in compressed format)"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_69"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 212
    BYTES                     = 2
    UNIT                      = "DECIBEL"
    FORMAT                    = "I2"
    DESCRIPTION               = "Counts for impact time 69 dB
                               (time in compressed format)"
END_OBJECT   = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_70"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 215
    BYTES                     = 2
    UNIT                      = "DECIBEL"
    FORMAT                    = "I2"
    DESCRIPTION               = "Counts for impact time 70 dB
                              (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_71"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 218
    BYTES                    = 2
    UNIT                     = "DECIBEL"
    FORMAT                   = "I2"
    DESCRIPTION              = "Counts for impact time 71 dB
                               (time in compressed format)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_72"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 221
```

```
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 72 dB
                           (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_73"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 224
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 73 dB
                          (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_74"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 227
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 74 dB
                          (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_75"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 230
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 75 dB
                          (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_76"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 233
    BYTES                = 2
    UNIT                 = "DECIBEL"
    FORMAT               = "I2"
    DESCRIPTION          = "Counts for impact time 76 dB
                          (time in compressed format)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_77"
```

```
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 236
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 77 dB
                              (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_78"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 239
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 78 dB
                              (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_79"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 242
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 79 dB
                            (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_80"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 245
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 80 dB
                            (time in compressed format)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_81"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 248
    BYTES                 = 2
    UNIT                  = "DECIBEL"
    FORMAT                = "I2"
    DESCRIPTION           = "Counts for impact time 81 dB
                            (time in compressed format)"
END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "CNT_82"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 251
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 82 dB
                          (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_83"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 254
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 83 dB
                          (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_84"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 257
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 84 dB
                          (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_85"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 260
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 85 dB
                           (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_86"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 263
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 86 dB
                          (time in compressed format)"
```

```
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_87"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 266
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 87 dB
                           (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_88"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 269
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 88 dB
                           (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CNT_89"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 272
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "Counts for impact time 89 dB
                           (time in compressed format)"
END_OBJECT              = COLUMN

OBJECT                 = COLUMN
    NAME               = "CNT_90"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 275
    BYTES              = 2
    UNIT               = "DECIBEL"
    FORMAT             = "I2"
    DESCRIPTION        = "Counts for impact time 90 dB
                           (time in compressed format)"
END_OBJECT             = COLUMN
```

DIM BC Burst mode data definition (FM 2)

The burst continuous data are described in the following TABLE object.

```
   OBJECT                = BC_BM_TABLE
      NAME                 = "BC_BM"
      INTERCHANGE_FORMAT = ASCII
```

```
      ROWS                 = 270
      COLUMNS              = 62
      ROW_BYTES            = 318
      ^STRUCTURE           = "DIM_BC_BM.FMT"
   END_OBJECT             = BC_BM_TABLE
```

The structure of the TABLE object is defined in the file DIM_BC_BM.FMT.

```
OBJECT                        = COLUMN
    NAME                      = "SESAME_SEQ_ID"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 1
    BYTES                     = 6
    FORMAT                    = "I6"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 999999
    DESCRIPTION               = "Sequence ID in the current data file"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "ERROR_CODE"
    DATA_TYPE                 = CHARACTER
    START_BYTE                = 9
    BYTES                     = 2
    FORMAT                    = "A2"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = "99"
    DESCRIPTION               = "DIM BC error code, 2 hexadecimal characters"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_10"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 13
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 10 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_11"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 18
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 11 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
```

```
    NAME                 = "CNT_12"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 23
    BYTES                = 4
    FORMAT               = "I4"
    UNIT                 = "N/A"
    MISSING_CONSTANT     = 9999
    DESCRIPTION          = "Event counts for impact time 12 dB."
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_13"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 28
    BYTES                = 4
    FORMAT               = "I4"
    UNIT                 = "N/A"
    MISSING_CONSTANT     = 9999
    DESCRIPTION          = "Event counts for impact time 13 dB."
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_14"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 33
    BYTES                = 4
    FORMAT               = "I4"
    UNIT                 = "N/A"
    MISSING_CONSTANT     = 9999
    DESCRIPTION          = "Event counts for impact time 14 dB."
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_15"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 38
    BYTES                = 4
    FORMAT               = "I4"
    UNIT                 = "N/A"
    MISSING_CONSTANT     = 9999
    DESCRIPTION          = "Event counts for impact time 15 dB."
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CNT_16"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 43
    BYTES                = 4
    FORMAT               = "I4"
    UNIT                 = "N/A"
    MISSING_CONSTANT     = 9999
    DESCRIPTION          = "Event counts for impact time 16 dB."
END_OBJECT               = COLUMN
```

```
OBJECT                      = COLUMN
    NAME                    = "CNT_17"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 48
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 17 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_18"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 53
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 18 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_19"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 58
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 19 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_20"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 63
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 20 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_21"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 68
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
```

```
    DESCRIPTION              = "Event counts for impact time 21 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_22"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 73
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 22 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_23"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 78
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 23 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_24"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 83
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 24 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_25"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 88
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 25 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_26"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 93
    BYTES                    = 4
    FORMAT                   = "I4"
```

```
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 9999
    DESCRIPTION                = "Event counts for impact time 26 dB."
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CNT_27"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 98
    BYTES                      = 4
    FORMAT                     = "I4"
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 9999
    DESCRIPTION                = "Event counts for impact time 27 dB."
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CNT_28"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 103
    BYTES                      = 4
    FORMAT                     = "I4"
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 9999
    DESCRIPTION                = "Event counts for impact time 28 dB."
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CNT_29"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 108
    BYTES                      = 4
    FORMAT                     = "I4"
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 9999
    DESCRIPTION                = "Event counts for impact time 29 dB."
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CNT_30"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 113
    BYTES                      = 4
    FORMAT                     = "I4"
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 9999
    DESCRIPTION                = "Event counts for impact time 30 dB."
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CNT_31"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 118
```

```
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 31 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_32"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 123
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 32 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_33"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 128
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 33 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_34"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 133
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 34 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_35"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 138
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 35 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_36"
```

```
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 143
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 36 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_37"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 148
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 37 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_38"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 153
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 38 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_39"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 158
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 39 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_40"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 163
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 40 dB."
END_OBJECT                  = COLUMN
```

```
OBJECT                    = COLUMN
    NAME                  = "CNT_41"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 168
    BYTES                 = 4
    FORMAT                = "I4"
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 9999
    DESCRIPTION           = "Event counts for impact time 41 dB."
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_42"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 173
    BYTES                 = 4
    FORMAT                = "I4"
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 9999
    DESCRIPTION           = "Event counts for impact time 42 dB."
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_43"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 178
    BYTES                 = 4
    FORMAT                = "I4"
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 9999
    DESCRIPTION           = "Event counts for impact time 43 dB."
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_44"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 183
    BYTES                 = 4
    FORMAT                = "I4"
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 9999
    DESCRIPTION           = "Event counts for impact time 44 dB."
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "CNT_45"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 188
    BYTES                 = 4
    FORMAT                = "I4"
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 9999
    DESCRIPTION           = "Event counts for impact time 45 dB."
```

```
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_46"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 193
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 46 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_47"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 198
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 47 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_48"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 203
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 48 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_49"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 208
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
    MISSING_CONSTANT         = 9999
    DESCRIPTION              = "Event counts for impact time 49 dB."
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "CNT_50"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 213
    BYTES                    = 4
    FORMAT                   = "I4"
    UNIT                     = "N/A"
```

```
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 50 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_51"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 218
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 51 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_52"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 223
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 52 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_53"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 228
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 53 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_54"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 233
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 54 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_55"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 238
    BYTES                   = 4
```

```
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 55 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_56"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 243
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 56 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_57"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 248
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 57 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_58"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 253
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 58 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_59"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 258
    BYTES                     = 4
    FORMAT                    = "I4"
    UNIT                      = "N/A"
    MISSING_CONSTANT          = 9999
    DESCRIPTION               = "Event counts for impact time 59 dB."
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "CNT_60"
    DATA_TYPE                 = ASCII_INTEGER
```

```
    START_BYTE              = 263
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 60 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_61"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 268
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 61 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_62"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 273
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 62 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_63"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 278
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 63 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "CNT_64"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 283
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 64 dB."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
```

```
    NAME                   = "CNT_65"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 288
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 65 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_66"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 293
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 66 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_67"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 298
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 67 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_68"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 303
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 68 dB."
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CNT_69"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 308
    BYTES                  = 4
    FORMAT                 = "I4"
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 9999
    DESCRIPTION            = "Event counts for impact time 69 dB."
END_OBJECT                 = COLUMN
```

```
OBJECT                      = COLUMN
    NAME                    = "CNT_70"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 313
    BYTES                   = 4
    FORMAT                  = "I4"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 9999
    DESCRIPTION             = "Event counts for impact time 70 dB."
END_OBJECT                  = COLUMN
```

4.3.2.4.2.1.5 DIM Burst Continuous test mode

Single events on one sensor face are registered. In DIM_BCTEST mode measured values are not stored in a compressed way (as in DIM_BC mode), but for each event the peak voltage (in mV and dB) and the impact time (timer count and time [dB]) are included in telemetry. No average samples are measured.

The parameter data (general parameters, average mode parameters and burst mode parameters) associated with the BC Test measurement are kept in a separate file (combined detached labels).

DIM BC Test Parameters table

The parameters table is the same for Burst Continuous Average mode and Burst mode.

The parameters are described in the following TABLE object.

```
OBJECT                  = BCTEST_PARAM_TABLE
  NAME                  = BCTEST_PARAM
  INTERCHANGE_FORMAT    = ASCII
  ROWS                  =
  COLUMNS               =
  ROW_BYTES             =
  ^STRUCTURE            = "DIM_BCT_PAR.FMT"
END_OBJECT              = BCTEST_PARAM_TABLE
```

The structure of the TABLE object is defined in the file DIM_BCT_PAR.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
 NAME                  = "UTC"
 DATA_TYPE             = TIME
 START_BYTE            = 8
 BYTES                 = 23
 DESCRIPTION           = "This column represents the UTC Time"
END_OBJECT             = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 33
    BYTES               = 15
    FORMAT              = "A15"
 UNIT                   = "N/A"
 DESCRIPTION            = "Start time of measurement represented as :
                          Reset number (integer starting at 1) / seconds
                          The time resolution is 0.03125 s"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DIRECTION"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 51
    BYTES               = 1
    UNIT                = "N/A"
    FORMAT              = "A1"
    DESCRIPTION         = "Direction in DIM coordinate system,
                          X, Y or Z.
                          Echoed command parameter."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "MARGIN"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 54
    BYTES               = 2
    UNIT                = "DECIBEL"
    FORMAT              = "I2"
    DESCRIPTION         = "The margin determines the detection
                          threshold of the measuring amplifier.
                         Echoed command parameter. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DECAY_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 57
    BYTES               = 3
    UNIT                = "MILLISECOND"
    FORMAT              = "I3"
    DESCRIPTION         = "Decay time.
                          Range from 0 to 255.
                          Echoed command parameter."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "MEAS_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 61
    BYTES               = 5
```

```
    UNIT                    = "SECOND"
    FORMAT                  = "I5"
    DESCRIPTION             = "Measuring time.
                              Echoed command parameter."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "NEVENT"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 67
    BYTES                   = 5
    UNIT                    = "N/A"
    FORMAT                  = "I5"
    DESCRIPTION             = "Number of events detected."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "N_FALSE_EVENTS"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 73
    BYTES                   = 5
    UNIT                    = "N/A"
    FORMAT                  = "I5"
    DESCRIPTION             = "Number of false events."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "N_LONG_EVENTS"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 79
    BYTES                   = 5
    UNIT                    = "N/A"
    FORMAT                  = "I5"
    DESCRIPTION             = "Number of long events."
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "N_AV_SAMPLES"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 85
    BYTES                   = 5
    UNIT                    = "N/A"
    FORMAT                  = "I5"
    DESCRIPTION             = "Number of average samples."
END_OBJECT                 = COLUMN
```

DIM BC Test data

The average mode data are described in the following TABLE object.

```
OBJECT                     = BCTEST_SIG_TABLE
  NAME                     = AVERAGE_MODE
  INTERCHANGE_FORMAT       = ASCII
  ROWS                     = 7
```

```
  COLUMNS                = 8
  ROW_BYTES              = 87
  ^STRUCTURE             = "DIM_BCT_SIG.FMT"
END_OBJECT               = BCTEST_SIG_TABLE
```

The structure of the TABLE object is defined in the file DIM_BCT_SIG.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
 NAME                  = "UTC"
 DATA_TYPE             = TIME
 START_BYTE            = 8
 BYTES                 = 23
 DESCRIPTION           = "Measurement time (UTC in PDS standard format
                          YYYY-MM-DDThh:mm:ss.sss) "
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "S_LOCAL_TIME_START"
    DATA_TYPE          = CHARACTER
    START_BYTE         = 33
    BYTES              = 15
    FORMAT             = "A15"
    UNIT               = "N/A"
DESCRIPTION            = "Start time of measurement represented as :
                          Reset number (integer starting at 1) / seconds
                          The time resolution is 0.03125 s"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "S_LOCAL_TIME_END"
    DATA_TYPE          = CHARACTER
    START_BYTE         = 51
    BYTES              = 15
    FORMAT             = "A15"
    UNIT               = "N/A"
    DESCRIPTION        = "SESAME local time (1/32 s) for end of measurement
                          Reset number (integer starting at 1) / seconds
                          The time resolution is 0.03125 s"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TIMER_CNT"
    DATA_TYPE          = ASCII_INTEGER
```

```
    START_BYTE         = 68
    BYTES              = 5
    UNIT               = "N/A"
    FORMAT             = "I5"
    DESCRIPTION        = "Timer count at impact time.
                           The time resolution is 0.03125 s"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "PEAK_AMPLITUDE"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 74
    BYTES              = 5
    UNIT               = "MILLIVOLT"
    FORMAT             = "I5"
    DESCRIPTION        = "Event peak amplitude"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TIMER_CNT_CMPRS"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 80
    BYTES              = 2
    UNIT               = "DECIBEL"
    FORMAT             = "I2"
    DESCRIPTION        = "Event timer count at impact time,
                           in compressed format"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "PEAK_AMPLITUDE_CMPRS"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 83
    BYTES              = 2
    UNIT               = "DECIBEL"
    FORMAT             = "I2"
    DESCRIPTION        = "Event peak amplitude in compressed format"
END_OBJECT             = COLUMN
```

4.3.2.4.2.1.6 DIM Burst Continuous test mode 2

Additionally to the regular Burst Continuous Mode (which delivers the DIM (U, T_C)-matrix), a Burst Continuous Test Mode (DIM_BCTEST2) is implemented. DIM_BCTEST2 delivers for each single impact U[mV], U[dB], TC, T_C[dB] and – deviating from DIM_BCTEST in earlier flight software versions – additionally the Lander On-board Time (LOBT), when the impact was registered (event time). The LOBT is determined directly after the event was accepted as a real impact.

As for the Burst Continuous Test mode the parameter data (general parameters, average mode parameters and burst mode parameters) are kept in a separate file (combined detached labels).

DIM BC Test 2 parameters table

The parameters table for BC Test 2 mode is the same as for the BC Test mode (see § 4.3.2.4.2.1.5)

DIM BC Test 2 data

The BC Test 2 mode data are described in the following TABLE object.

```
OBJECT                  = BCTEST2_SIG_TABLE
  NAME                  = AVERAGE_MODE
  INTERCHANGE_FORMAT    = ASCII
  ROWS                  =
  COLUMNS               =
  ROW_BYTES             =
  ^STRUCTURE            = "DIM_BCTEST2_SIG_FM3.FMT"
END_OBJECT              = BCTEST2_SIG_TABLE
```

The structure of the TABLE object is defined in the file DIM_BCTEST2_SIG_FM3.FMT.

```
OBJECT                      = COLUMN
    NAME                    = "SESAME_SEQ_ID"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 1
    BYTES                   = 6
    FORMAT                  = "I6"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 999999
    DESCRIPTION             = "Sequence ID in the current data file"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "EVENT_TIME"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 8
    BYTES                   = 15
    FORMAT                  = "I15"
    DESCRIPTION             = "Event time. SESAME local time
                               (SLT) runs with a resolution of 1/32 seconds.
                               SLT represents the least significant 32 bits
                               of LOBT. The most significant 5 bits are in
                               CDMS RSST (see SESAME Ready Message)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "COUNTS"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 24
    BYTES                   = 6
    FORMAT                  = "I6"
    UNIT                    = "N/A"
    MISSING_CONSTANT        = 999999
    DESCRIPTION             = "DIM calibration timer counts"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "PEAK_MV"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 31
```

```
    BYTES                      = 4
    UNIT                       = "MILLIVOLT"
    FORMAT                     = "I4"
    MISSING_CONSTANT           = 9999
    DESCRIPTION                = "Peak voltage in mV"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "TIME_DB"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 36
    BYTES                      = 2
    UNIT                       = "DECIBEL"
    FORMAT                     = "I2"
    MISSING_CONSTANT           = 99
    DESCRIPTION                = "Timer counts in compressed format"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "PEAK_DB"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 39
    BYTES                      = 2
    UNIT                       = "DECIBEL"
    FORMAT                     = "I2"
    MISSING_CONSTANT           = 99
    DESCRIPTION                = "Peak voltage in dB"
END_OBJECT                     = COLUMN
```

4.3.2.4.3 PP object definitions

The structures of PP measurements differ according to flight software versions. The details concerning the telemetry formats can be found in [AD1] for flight software version 1 (FM1), in [AD2] for flight software version 2 (FM2) and in |AD3] for flight software version 3 (FM-3). The FM2 software was uploaded on 2007-09-24 at 19h40 UTC (during Payload Checkout #6). The FM3 software was uploaded on 2009-09-24 at 02h00 UTC (during PC#10).

4.3.2.4.3.1 Flight software version FM1

4.3.2.4.3.1.1 PP Active Mode Test

During an active mode test, one active PP measurement is performed. Adjusted and measured values (DAC table read back from PP memory, time series of transmitter current and receiver voltage samples) are sent to ground. Telemetry concludes with the results of the on-board data evaluation. Adjustable parameters of command active mode test are the configuration of electrodes, the transmitting frequency and the number of sine waves.

The PP AMTEST data are organized as tables containing parameters, the DAC table read back from PP memory, transmitter and receiver time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to four data files.

Following is an example of PDS files corresponding to an AMTEST measurement.

SES_FS2_PAM_070929214512_TEST.LBL (label)

SES_FS2_PAM_070929214512_TPAR.TAB (parameters)

SES_FS2_PAM_070929214512_TDAC.TAB (DAC table)

SES_FS2_PAM_070929214512_TTX.TAB (transmitter time series)

SES_FS2_PAM_070929214512_TRX.TAB (receiver time series)

The parameters are described by the following TABLE object.

```
   OBJECT                = AMT_PAR_TABLE
      NAME                = "AMT_PAR"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 2
      COLUMNS             = 8
      ROW_BYTES           = 82
      ^STRUCTURE          = "PP_AMT_PAR.FMT"
   END_OBJECT            = AMT_PAR_TABLE
```

The structure of the parameters table is described in the file PP_AMT_PAR.FMT.

```
/* PP AMTEST sensor settings, version 2, 2015-11-11 */

OBJECT              = COLUMN
    NAME            = "SESAME_SEQ_ID"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 1
    BYTES           = 6
    UNIT            = "N/A"
    FORMAT          = "I6"
    DESCRIPTION     = "Sequence ID in the current data file"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
  NAME              = "UTC"
  DATA_TYPE         = TIME
  START_BYTE        = 8
  BYTES             = 23
  DESCRIPTION       = "Measurement start time (UTC in PDS standard
                       format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "SESAME_LOCAL_TIME"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 32
    BYTES           = 15
    FORMAT          = "I15"
    DESCRIPTION     = "Measurement start time. SESAME local time
                      (SLT) runs with a resolution of 1/32 seconds.
                       SLT represents the least significant 32 bits
                       of LOBT. The most significant 5 bits are in
                      CDMS RSST (see SESAME Ready Message)"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "SENSOR_SETTINGS"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 48
    BYTES           = 7
    UNIT            = "N/A"
```

```
    DESCRIPTION    = "Commanded (echoed) electrode combination
     as 3-digit hexadecimal code 16#abi#
     with the following meaning:
    a: electrode connected to the TX A output.
       Possible values:
       0 [none],
       1 [+X leg],
       2 [MUPUS PEN]
    b: electrode connected to the TX B output.
       Possible values:
       0 [none],
       2 [MUPUS PEN],
       3 [APXS]
    i: input channel
       Possible values:
       0 [potential difference]
       1 [current at +X leg]
       2 [current at MUPUS PEN]
       3 [current at APXS]
       4 [direct measurement at +Y foot]
       5 [direct measurement at -Y foot]
       6 [reference voltage -2.5 V]
       7 [reference voltage +2.5 V] "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "TX_FREQ"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 56
    BYTES          = 5
    UNIT           = "HERTZ"
    FORMAT         = "I5"
    DESCRIPTION         = "Tx frequency "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "TX/RX_WAVES"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 62
    BYTES          = 3
    UNIT           = "N/A"
    FORMAT         = I3
    DESCRIPTION    = "Number of Tx/Rx waves "
END_OBJECT         = COLUMN

OBJECT          = COLUMN
    NAME          = "NUMBER_OF_SAMPLES"
    DATA_TYPE     = ASCII_INTEGER
    START_BYTE    = 66
    BYTES         = 5
    UNIT          = "N/A"
    FORMAT        = "I5"
    DESCRIPTION   = "Number of transmitter current and receiver voltage
```

```
     samples "
END_OBJECT       = COLUMN

OBJECT            = COLUMN
    NAME          = "ERROR_CODE"
    DATA_TYPE     = ASCII_INTEGER
    START_BYTE    = 72
    BYTES         = 8
    MISSING_CONSTANT = 16#0000#
    DESCRIPTION       = "Active mode results as Hex value 16#xxxx#
     The  possible values are:
     8001 Invalid register address.
     8002 Error verifying register write.
     8004 Error accessing power register.
     8008 MUX setting not allowed.
     8010 Error accessing PP RAM.
     8020 Tried to start measurement but a measurement
    is already running.
     0040 Error during writing to instrument.
     0080 Error during reading from instrument.
     0100 Error using ADC of C-DPU.
     0200 Error during DAC table generation.
     0400 Calculated number of samples > N_SAMP_MAX.
     8800 C-DPU memory exhausted.
     9000 Measurement time out.
     2000 Invalid command parameter.
     8000 Flag indicates fatal error. "
END_OBJECT         = COLUMN
```

The DAC table is described by the following TABLE object.

```
  OBJECT                   = AMTESTDAC_TABLE
    NAME                   = AMTESTDAC
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 256
    COLUMNS                = 5
    ROW_BYTES              = 57
    ^STRUCTURE             = "PP_AMT_DAC.FMT"
  END_OBJECT               = AMTESTDAC_TABLE
```

The structure of the DAC table is described in the file PP_AMT_DAC.FMT.

```
OBJECT                   = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT               = "I6"
    DESCRIPTION          = "Sequence ID in the current data file"
END_OBJECT               = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                          format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                          (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DAC_SAMPLE "
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "DAC sample number"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DAC_ADC_VALUE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 52
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "DAC ADC value "
END_OBJECT              = COLUMN
```

The receiver time series is described by the following TABLE object.

```
  OBJECT                  = AMTESTRX_TABLE
    NAME                  = AMTESTRX
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 8192
    COLUMNS               = 5
    ROW_BYTES             = 59
    ^STRUCTURE            = "PP_AMT_RX.FMT"
```

```
  END_OBJECT                = AMT_RX_TABLE
```

The structure of the receiver time series table is described in the file PP_AMT_RX.FMT.

```
/* PP AMTEST / AMTEST2 Rx table entry version 2, 2015-11-11*/

OBJECT                     = COLUMN
    NAME                   = "SESAME_SEQ_ID"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 1
    BYTES                  = 6
    UNIT                   = "N/A"
    FORMAT                 = "I6"
    DESCRIPTION            = "Sequence ID in the current data file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "UTC"
  DATA_TYPE                = TIME
  START_BYTE               = 8
  BYTES                    = 23
  DESCRIPTION              = "Measurement start time (UTC in PDS standard
                             format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 32
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Measurement start time. SESAME local time
                              (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "RX_SAMPLE "
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 48
    BYTES                  = 5
    UNIT                   = "N/A"
    FORMAT                 = "I5"
    DESCRIPTION            = "Rx sample number"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "RX_ADC_VALUE"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 54
    BYTES                  = 3
```

```
    UNIT                   = "N/A"
    FORMAT                 = "I3"
    DESCRIPTION            = "RX ADC value "
END_OBJECT                 = COLUMN
```

The transmitter time series is described by the following TABLE object.

```
  OBJECT                     = AMTESTTX_TABLE
    NAME                     = AMTESTTX
    INTERCHANGE_FORMAT       = ASCII
    ROWS                     = 8192
    COLUMNS                  = 5
    ROW_BYTES                = 59
    ^STRUCTURE               = "PP_AMT_TX.FMT"
  END_OBJECT                 = AMTESTTX_TABLE
```

The structure of the transmitter TABLE object is defined in the file PP_AMT_TX.FMT.

```
OBJECT                     = COLUMN
    NAME                   = "SESAME_SEQ_ID"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 1
    BYTES                  = 6
    UNIT                   = "N/A"
    FORMAT                 = "I6"
    DESCRIPTION            = "Sequence ID in the current data file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "UTC"
  DATA_TYPE                = TIME
  START_BYTE               = 8
  BYTES                    = 23
  DESCRIPTION              = "Measurement start time (UTC in PDS standard
                             format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 32
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Measurement start time. SESAME local time
                             (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TX_SAMPLE "
    DATA_TYPE              = ASCII_INTEGER
```

```
    START_BYTE          = 48
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Tx sample number"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TX_ADC_VALUE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 54
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "Tx ADC value "
END_OBJECT              = COLUMN
```

4.3.2.4.3.1.2 PP Health Check (HC) data

Following is an example of PDS files corresponding to an HC measurement.

SES_FS2_PHC_070929214512_HC.LBL (label)
SES_FS2_PAM_070929214512_HC.TAB (parameters)

The HC data are described in the following TABLE object (simple detached label).

```
  OBJECT                  = SES_PHC_TABLE
    NAME                  = "SES_PHC"
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 1
    COLUMNS               = 14
    ROW_BYTES             = 100
    ^STRUCTURE            = "PP_HC.FMT"
  END_OBJECT              = SES_PHC_TABLE
```

The structure of the TABLE object is defined in the file PP_HC.FMT.

```
/* PP Health Check, version 2, 2015-11-11 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
```

```
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_VALUE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Result count of Langmuir probe measurement "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ADC_OFFSET"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 54
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "Should be close to 128
                           (128 represents zero with bipolar ADC)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "-2.5V REF"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 58
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "-2.5V REF and +2.5V REF should be nearly
                           symmetrical to ADC offset"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "+2.5V_REF"
    DATA_TYPE           = ASCII_INTEGER
```

```
    START_BYTE           = 62
    BYTES                = 3
    UNIT                 = "N/A"
    FORMAT               = "I3"
    DESCRIPTION          = "-2.5V REF and +2.5V REF should be nearly
                            symmetrical to ADC offset"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "DELTA"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 66
    BYTES                = 3
    UNIT                 = "N/A"
    FORMAT               = "I3"
    DESCRIPTION          = "Differential value RX2 - RX1"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "LEG+Y_RX1"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 70
    BYTES                = 3
    UNIT                 = "N/A"
    FORMAT               = "I3"
    DESCRIPTION          = "Direct voltage from receiver 1 at +Y leg"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "LEG-Y_RX2"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 74
    BYTES                = 3
    UNIT                 = "N/A"
    FORMAT               = "I3"
    DESCRIPTION          = "Direct voltage from receiver 2 at -Y leg"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "LEG+X_TX1"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 78
    BYTES                = 3
    UNIT                 = "N/A"
    FORMAT               = "I3"
    DESCRIPTION          = "Transmitter current at electrode 1.
                            No voltage applied.
                            Should be close to ADC offset."
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "MUPUS_PEN_TX2"
    DATA_TYPE            = ASCII_INTEGER
```

```
    START_BYTE          = 82
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "Transmitter current at electrode 2.
                           No voltage applied.
                           Should be close to ADC offset."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "APXS_TX3"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 86
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "Transmitter current at electrode 3.
                           No volatge applied.
                           Should be close to ADC offset."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ERROR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 90
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Hex value as 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN
```

4.3.2.4.3.1.3 PP Langmuir Probe Test (LM) data

This measurement sequence is mainly used for ground tests and is not a regular flight measurement. Following is an example of PDS files corresponding to an LM measurement.

SES_FS2_PLM_070929214512_LM.LBL (label)
SES_FS2_PLM_070929214512_LM.TAB (parameters)

The LM data are described in the following TABLE object (simple detached label).

```
  OBJECT                  = SES_PLM_TABLE
    NAME                  = "SES_LM"
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 17
    COLUMNS               = 6
    ROW_BYTES             = 61
    ^STRUCTURE            = "PP_LM.FMT"
  END_OBJECT              = SES_PLM_TABLE
```

The structure of the TABLE object is defined in the file PP_LM.FMT.

```
/* PP Langmuir Probe measurement, version 2, 2015-11-11 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NOM_CLK_DIV"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 2
```

```
    UNIT                  = "N/A"
    FORMAT                = "I2"
    DESCRIPTION           = "Nominal clock divider"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "ACT_CLK_DIV"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 51
    BYTES                 = 2
    UNIT                  = "N/A"
    FORMAT                = "I2"
    DESCRIPTION           = "Actual clock divider"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "LP_VALUE"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 54
    BYTES                 = 5
    UNIT                  = "N/A"
    FORMAT                = "I5"
    DESCRIPTION           = "Result count of Langmuir probe measurement "
END_OBJECT                = COLUMN
```

4.3.2.4.3.1.4 PP Passive Mode Test (PMTEST)

The PMTEST was not used during flight.

4.3.2.4.3.2 Flight software version FM2

4.3.2.4.3.2.1 PP Active Mode Test

During an active mode test, one active PP measurement is performed. Adjusted and measured values (DAC table read back from PP memory, time series of transmitter current and receiver voltage samples) are sent to ground. Telemetry concludes with the results of the on-board data evaluation. Adjustable parameters of command active mode test are the configuration of electrodes, the transmitting frequency and amplitude and the number of sine waves. Because telemetry contains the raw time series data and the results of the on-board evaluation it is possible to check both, details of the time series and the correct working of the data evaluation.

The PP AMTEST2 data are organized as tables containing parameters including the on-board evaluation results, the DAC table read back from PP memory, transmitter and receiver time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to four data files.

Following is an example of PDS files corresponding to an AMTEST2 measurement.

SES_FS2_PAM_070929214512_TEST.LBL (label)
SES_FS2_PAM_070929214512_TPAR.TAB (parameters)
SES_FS2_PAM_070929214512_TDAC.TAB (DAC table)
SES_FS2_PAM_070929214512_TTX.TAB (transmitter time series)
SES_FS2_PAM_070929214512_TRX.TAB (receiver time series)

The parameters are described by the following TABLE object.

```
   OBJECT                  = AMT_PAR_TABLE
      NAME                 = "AMT_PAR"
```

```
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 2
      COLUMNS            = 14
      ROW_BYTES          = 137
      ^STRUCTURE         = "PP_AMT2_PAR.FMT"
   END_OBJECT            = AMT_PAR_TABLE
```

The structure of the parameters table is described in the file PP_AMT2_PAR.FMT.

```
OBJECT              = COLUMN
    NAME            = "SESAME_SEQ_ID"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 1
    BYTES           = 6
    UNIT            = "N/A"
    FORMAT          = "I6"
    DESCRIPTION     = "Sequence ID in the current data file"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
  NAME              = "UTC"
  DATA_TYPE         = TIME
  START_BYTE        = 8
  BYTES             = 23
  DESCRIPTION       = "Measurement start time (UTC in PDS standard
                       format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "SESAME_LOCAL_TIME"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 32
    BYTES           = 15
    FORMAT          = "I15"
    DESCRIPTION     = "Measurement start time. SESAME local time
                       (SLT) runs with a resolution of 1/32 seconds.
                       SLT represents the least significant 32 bits
                       of LOBT. The most significant 5 bits are in
                       CDMS RSST (see SESAME Ready Message)"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "SENSOR_SETTINGS_CMD"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 48
    BYTES           = 7
    UNIT            = "N/A"
    DESCRIPTION     = "Commanded (echoed) electrode combination
        as 3-digit hexadecimal value 16#abi#
        with the following meaning:
       a: electrode connected to the TX A output.
          Possible values:
          0 [none],
```

```
          1 [+X leg],
          2 [MUPUS PEN]
       b: electrode connected to the TX B output.
          Possible values:
          0 [none],
          2 [MUPUS PEN],
          3 [APXS]
       i: input channel
          Possible values:
          0 [potential difference]
          1 [current at +X leg]
          2 [current at MUPUS PEN]
          3 [current at APXS]
          4 [direct measurement at +Y foot]
          5 [direct measurement at -Y foot]
          6 [reference voltage -2.5 V]
          7 [reference voltage +2.5 V] "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "TX_FREQ"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 56
    BYTES          = 5
    UNIT           = "HERTZ"
    FORMAT         = "I5"
    DESCRIPTION    = "Tx frequency "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "TX/RX_WAVES"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 62
    BYTES          = 3
    UNIT           = "N/A"
    FORMAT         = "I3"
    DESCRIPTION    = "Number of Tx/Rx waves "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "PTS_PER_WAVE"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 66
    BYTES          = 3
    UNIT           = "N/A"
    FORMAT         = "I3"
    DESCRIPTION    = "Points per wave "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "TX_OUT_DAMPING"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 70
```

```
    BYTES           = 1
    UNIT            = "N/A"
    FORMAT          = "I1"
    DESCRIPTION     = "TX Voltage Amplitude Reduction. The possible values are:
        0 maximum amplitude.
        1 half amplitude.
        2 quarter amplitude.
        3 1/8 amplitude.
        4 1/16 amplitude."
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "ADC_DIV"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 72
    BYTES           = 4
    UNIT            = "N/A"
    FORMAT          = "I4"
    DESCRIPTION     = "Sampling frequency is generated as 5 MHz / this parameter"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "ADC_ADDR"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 77
    BYTES           = 5
    UNIT            = "N/A"
    FORMAT          = "I5"
    MISSING_CONSTANT = 99999
    DESCRIPTION       = "Adjusted last address in PP memory "
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "DAC_DIV"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 83
    BYTES           = 4
    UNIT            = "N/A"
    FORMAT          = "I4"
    DESCRIPTION     = "Tx voltage update frequency is 5 MHz / this parameter"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "DAC_ADDR"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 88
    BYTES           = 3
    UNIT            = "N/A"
    FORMAT          = "I3"
    DESCRIPTION     = "Last used address in DAC table"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
```

```
    NAME             = "ERROR_CODE"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 92
    BYTES            = 8
    MISSING_CONSTANT = 16#0000#
    DESCRIPTION      = "Active mode results as hexa 16#xxxx#
        The  possible values are:
        8001  Invalid register address.
        8002  Error verifying register write.
        8004  Error accessing power register.
        8008  MUX setting not allowed.
        8010  Error accessing PP RAM.
        8020  Tried to start measurement but a measurement
        is already running.
        0040  Error during writing to instrument.
        0080  Error during reading from instrument.
        0100  Error using ADC of C-DPU.
        0200  Error during DAC table generation.
        0400  Calculated number of samples > N_SAMP_MAX.
        8800  C-DPU memory exhausted.
        9000  Measurement time out.
        2000  Invalid command parameter.
        8000  Flag indicates fatal error. "
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "QUAL_FLAG_CL"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 101
    BYTES          = 1
    FORMAT         = "I1"
    UNIT           = "N/A"
    DESCRIPTION    = "PP quality flags. The possible values are:
                      0 OK
                      1 at least one sample equals 0 in
                       current (transmitter) time series"
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "QUAL_FLAG_VH"
    DATA_TYPE      = ASCII_INTEGER
    START_BYTE     = 103
    BYTES          = 1
    FORMAT         = "I1"
    UNIT           = "N/A"
    DESCRIPTION    = "PP quality flags. The possible values are:
        0 OK
        1 at least one sample equals 255 in
         voltage (receiver) time series"
END_OBJECT         = COLUMN

OBJECT             = COLUMN
    NAME           = "QUAL_FLAG_VL"
```

```
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 105
    BYTES           = 1
    FORMAT          = "I1"
    UNIT            = "N/A"
    DESCRIPTION     = "PP quality flags. The possible values are:
        0 OK
        1 at least one sample equals 0 in
         voltage (receiver) time series"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "POINTS_PER_WAVE"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 107
    BYTES           = 3
    UNIT            = "N/A"
    FORMAT          = "I3"
    MISSING_CONSTANT = 999
    DESCRIPTION     = "Number of points per wave used by receiver"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "PHASE"
    DATA_TYPE       = ASCII_REAL
    START_BYTE      = 111
    BYTES           = 8
    UNIT            = "DEGREE"
    FORMAT          = "F8.4"
    DESCRIPTION     = "Phase difference potential-current"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "CURRENT_AMPLITUDE"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 120
    BYTES           = 3
    UNIT            = "N/A"
    FORMAT          = "I3"
    DESCRIPTION     = "Scaling as raw data without offset
       128 = max. ADC value for current"
END_OBJECT          = COLUMN

OBJECT              = COLUMN
    NAME            = "VOLTAGE_AMPLITUDE"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 124
    BYTES           = 3
    UNIT            = "N/A"
    FORMAT          = "I3"
    DESCRIPTION     = "Scaling as raw data without offset
       128 = max. ADC value for Rx voltage diff."
END_OBJECT          = COLUMN
```

```
OBJECT              = COLUMN
    NAME            = "MATH_ERR"
    DATA_TYPE       = CHARACTER
    START_BYTE      = 128
    BYTES           = 8
    MISSING_CONSTANT = 16#0000#
    DESCRIPTION     = "Hex value as 16#xxxx#
        0001  Reduce: number of vector elements odd or less
        than 2; fatal.
        0002  Expand: less than four elements in input
        vector; fatal.
        0004  Too much data for analysis; truncating.
        0008  Too few data for analysis; padding with 128
        0010  Used number of waves is not a power of 2;
        truncated.
        0020  Not the expected number of elements in
        filtered arrays; fatal.
        0040  Argument for sine_table() not in valid range
        0<= deg2 <=720.
        0080  Overflow in divsin() or result inexact.
        0100  Too few data for trimmed mean calculation;
        regular mean used.
        0200  No data for warr.mean; particular: analysis
        yields no data.
        0400  Passive mode: not enough data in bin.
        0800  Not enough memory for data reduction."
END_OBJECT          = COLUMN
```

The DAC table is identical to the FM1 version and is described by the following TABLE object.

```
  OBJECT                  = AMTESTDAC_TABLE
    NAME                  = AMTESTDAC
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 256
    COLUMNS               = 5
    ROW_BYTES             = 57
    ^STRUCTURE            = "PP_AMT_DAC.FMT"
  END_OBJECT              = AMTESTDAC_TABLE
```

The structure of the DAC table is described in the file PP_AMT_DAC.FMT.

```
/* PP AMTEST / AMTEST2 DAC table entry version 2, 2015-11-11 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN
```

```
OBJECT                 = COLUMN
  NAME                 = "UTC"
  DATA_TYPE            = TIME
  START_BYTE           = 8
  BYTES                = 23
  DESCRIPTION          = "Measurement start time (UTC in PDS standard
                         format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                 = COLUMN
    NAME               = "SESAME_LOCAL_TIME"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 32
    BYTES              = 15
    FORMAT             = "I15"
    DESCRIPTION        = "Measurement start time. SESAME local time
                         (SLT) runs with a resolution of 1/32 seconds.
                          SLT represents the least significant 32 bits
                          of LOBT. The most significant 5 bits are in
                          CDMS RSST (see SESAME Ready Message)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "DAC_SAMPLE "
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 48
    BYTES              = 3
    UNIT               = "N/A"
    FORMAT             = "I3"
    DESCRIPTION        = "DAC sample number"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "DAC_ADC_VALUE"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 52
    BYTES              = 3
    UNIT               = "N/A"
    FORMAT             = "I3"
    DESCRIPTION        = "DAC ADC value "
END_OBJECT             = COLUMN
```

The receiver time series is identical to the FM1 version and is described by the following TABLE object.

```
  OBJECT                 = AMTESTRX_TABLE
    NAME                 = AMTESTRX
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 = 8192
    COLUMNS              = 5
```

```
    ROW_BYTES                = 59
    ^STRUCTURE               = "PP_AMT_RX.FMT"
  END_OBJECT                 = AMT_RX_TABLE
```

The structure of the receiver time series table is described in the file PP_AMT_RX.FMT.

```
/* PP AMTEST / AMTEST2 Rx table entry version 2, 2015-11-11*/

OBJECT                     = COLUMN
    NAME                   = "SESAME_SEQ_ID"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 1
    BYTES                  = 6
    UNIT                   = "N/A"
    FORMAT                 = "I6"
    DESCRIPTION            = "Sequence ID in the current data file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "UTC"
  DATA_TYPE                = TIME
  START_BYTE               = 8
  BYTES                    = 23
  DESCRIPTION              = "Measurement start time (UTC in PDS standard
                             format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 32
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Measurement start time. SESAME local time
                              (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "RX_SAMPLE "
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 48
    BYTES                  = 5
    UNIT                   = "N/A"
    FORMAT                 = "I5"
    DESCRIPTION            = "Rx sample number"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "RX_ADC_VALUE"
    DATA_TYPE              = ASCII_INTEGER
```

```
    START_BYTE          = 54
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "RX ADC value "
END_OBJECT              = COLUMN
```

The transmitter time series is identical to the FM1 version and is described by the following TABLE object.

```
  OBJECT                  = AMTESTTX_TABLE
    NAME                  = AMTESTTX
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 8192
    COLUMNS               = 5
    ROW_BYTES             = 59
    ^STRUCTURE            = "PP_AMT_TX.FMT"
  END_OBJECT              = AMTESTTX_TABLE
```

The structure of the transmitter TABLE object is defined in the file PP_AMT_TX.FMT.

```
/* PP AMTEST / AMTEST2 Tx table entry ,version 2, 2015-11-11 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                          format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                          (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN
```

```
OBJECT                 = COLUMN
    NAME               = "TX_SAMPLE "
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 48
    BYTES              = 5
    UNIT               = "N/A"
    FORMAT             = "I5"
    DESCRIPTION        = "Tx sample number"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TX_ADC_VALUE"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 54
    BYTES              = 3
    UNIT               = "N/A"
    FORMAT             = "I3"
    DESCRIPTION        = "Tx ADC value "
END_OBJECT             = COLUMN
```

4.3.2.4.3.2.2 PP Health Check (HC) data

Same as FM1

4.3.2.4.3.2.3 PP Langmuir Probe Test (LM) data

Same as FM1

4.3.2.4.3.2.4 PP Passive Mode (PM) data

The PP PM data are organized as tables containing parameters and power spectra. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to two data files.

Following is an example of PDS files corresponding to a PM measurement.

SES_FS2_PPM_070929214512_PM.LBL (label)
SES_FS2_PPM_070929214512_PAR.TAB (parameters)
SES_FS2_PPM_070929214512_POW.TAB (power spectrum)

The parameters are described by the following TABLE object.

```
  OBJECT                   = PM2PAR_TABLE
    NAME                   = PM2PAR
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 1
    COLUMNS                = 11
    ROW_BYTES              = 100
    ^STRUCTURE             = "PP_PM2_PAR.FMT"
  END_OBJECT               = PM2PAR_TABLE
```

The structure of the parameters TABLE object is described in the file PP_PM2_PAR.FMT.

```
/* PP PM2 parameter settings, version 2, 2015-11-11 */

OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
```

```
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_INT_CLK_DIV"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 2
    UNIT                = "N/A"
    FORMAT              = "I2"
    DESCRIPTION         = "The LP integrator clock divider determines
                          integrating time of Langmuir Probe (LP)
                          measurement "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_VALUE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 51
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Result count of Langmuir probe measurement "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
```

```
    NAME                = "LP_MEAS_ERR"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 57
    BYTES               = 8
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Error code for LP measurement.
                           Hex value as 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ADC_CLK_DIV"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 66
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "ADC clock divider used when generating the
                           receiver sampling frequency: 5 MHz / this
                           parameter "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NB_SAMPLES"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 72
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Number of used samples (excluding skipped samples) "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ERROR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 78
    BYTES               = 8
    UNIT                = "N/A"
```

```
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Hex value as 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NB_FREQ_BINS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 87
    BYTES               = 2
    UNIT                = "N/A"
    FORMAT              = "I2"
    DESCRIPTION         = "Number of frequency bins "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "MATH_ERR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 90
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Indicates errors, which can only occur during
                           on-board data reduction (hex value as 16#xxxx#).
                           0001  Reduce: number of vector elements odd or less
                                 than 2; fatal.
                           0002  Expand: less than four elements in input
                                 vector; fatal.
                           0004  Too much data for analysis; truncating.
                           0008  Too few data for analysis; padding with 128
                           0010  Used number of waves is not a power of 2;
                                 truncated.
                           0020  Not the expected number of elements in
                                 filtered arrays; fatal.
                           0040  Argument for sine_table() not in valid range
                                 0<= deg2 <=720.
                           0080  Overflow in divsin() or result inexact.
                           0100  Too few data for trimmed mean calculation;
```

```
                                regular mean used.
                          0200  No data for warr.mean; particular: analysis
                                yields no data.
                          0400  Passive mode: not enough data in bin.
                          0800  Not enough memory for data reduction."
END_OBJECT              = COLUMN
```

The power spectrum is described by the following TABLE object.

```
  OBJECT                  = PM2POW_TABLE
    NAME                  = PM2POW
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 1
    COLUMNS               = 5
    ROW_BYTES             = 63
    ^STRUCTURE            = "PP_PM2_POW.FMT"
  END_OBJECT              = PM2POW_TABLE
```

The structure of the power spectrum TABLE object is described in the file PP_PM2_POW.FMT.

```
OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "UTC"
    DATA_TYPE           = TIME
    START_BYTE          = 8
    BYTES               = 23
    DESCRIPTION         = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                            (SLT) runs with a resolution of 1/32 seconds.
                            SLT represents the least significant 32 bits
                            of LOBT. The most significant 5 bits are in
                            CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN
```

```
OBJECT                 = COLUMN
    NAME               = "FREQ_BIN"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 48
    BYTES              = 2
    FORMAT             = "I2"
    UNIT               = "N/A"
    DESCRIPTION        = "Frequency bins meaning:
                           1 20000-10000 Hz
                           2 10000-5000 Hz
                           3 5000-2500 Hz
                           4 2500-1250 Hz
                           5 1250-625 Hz
                           6 625-312 Hz
                           7 312-156 Hz
                           8 156-78 Hz
                           9 78-39 Hz
                          10 39-20 Hz "
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "POWER"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 51
    BYTES              = 10
    FORMAT             = "I10"
    UNIT               = "N/A"
    DESCRIPTION        = "Raw power"
END_OBJECT             = COLUMN
```

4.3.2.4.3.2.5 PP Passive Mode Test (PMTEST) data

The PP PMTEST2 data are organized as tables containing parameters, power spectra and receiver (Rx) time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to three data files.

Following is an example of PDS files corresponding to a PMTEST measurement.

SES_FS2_PPM_070929214512_TEST.LBL (label)
SES_FS2_PPM_070929214512_TPAR.TAB (parameters)
SES_FS2_PPM_070929214512_TPOW.TAB (power spectrum)
SES_FS2_PPM_070929214512_TRX.TAB (receiver time series)

The parameters are described by the following TABLE object.

```
  OBJECT                  = PM2TPAR_TABLE
    NAME                  = PM2TPAR
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 1
    COLUMNS               = 11
    ROW_BYTES             = 100
    ^STRUCTURE            = "PP_PMT2_PAR.FMT"
  END_OBJECT              = PM2TPAR_TABLE
```

The structure of the parameters TABLE object is described in the file PP_PMT2_PAR.FMT.

```
/* PP PMTEST2 parameter settings, version 2, 2015-11-11 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_INT_CLK_DIV"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 2
    UNIT                = "N/A"
    FORMAT              = "I2"
    DESCRIPTION         = "The LP integrator clock divider determines
                          integrating time of Langmuir Probe (LP)
                          measurement "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_VALUE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 51
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
```

```
    DESCRIPTION          = "Result count of Langmuir probe measurement "
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "LP_MEAS_ERR"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 57
    BYTES                = 8
    MISSING_CONSTANT     = 16#0000#
    DESCRIPTION          = "Error code for LP measurement.
                            Hex value as 16#xxxx#. The  possible values are:
                            8001  Invalid register address.
                            8002  Error verifying register write.
                            8004  Error accessing power register.
                            8008  MUX setting not allowed.
                            8010  Error accessing PP RAM.
                            8020  Tried to start measurement but a measurement
                                  is already running.
                            0040  Error during writing to instrument.
                            0080  Error during reading from instrument.
                            0100  Error using ADC of C-DPU.
                            0200  Error during DAC table generation.
                            0400  Calculated number of samples > N_SAMP_MAX.
                            8800  C-DPU memory exhausted.
                            9000  Measurement time out.
                            2000  Invalid command parameter.
                            8000  Flag indicates fatal error. "
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "ADC_CLK_DIV"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 66
    BYTES                = 5
    UNIT                 = "N/A"
    FORMAT               = "I5"
    DESCRIPTION          = "ADC clock divider used when generating the
                            receiver sampling frequency: 5 MHz / this
                            parameter "
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "NB_SAMPLES"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 72
    BYTES                = 5
    UNIT                 = "N/A"
    FORMAT               = "I5"
    DESCRIPTION          = "Number of used samples (excluding skipped samples) "
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "ERROR_CODE"
```

```
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 78
    BYTES                  = 8
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 16#0000#
    DESCRIPTION            = "Hex value as 16#xxxx#. The  possible values are:
                               8001  Invalid register address.
                               8002  Error verifying register write.
                               8004  Error accessing power register.
                               8008  MUX setting not allowed.
                               8010  Error accessing PP RAM.
                               8020  Tried to start measurement but a measurement
                                     is already running.
                               0040  Error during writing to instrument.
                               0080  Error during reading from instrument.
                               0100  Error using ADC of C-DPU.
                               0200  Error during DAC table generation.
                               0400  Calculated number of samples > N_SAMP_MAX.
                               8800  C-DPU memory exhausted.
                               9000  Measurement time out.
                               2000  Invalid command parameter.
                               8000  Flag indicates fatal error. "
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "NB_FREQ_BINS"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 87
    BYTES                  = 2
    UNIT                   = "N/A"
    FORMAT                 = "I2"
    DESCRIPTION            = "Number of frequency bins "
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "MATH_ERR_CODE"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 90
    BYTES                  = 8
    MISSING_CONSTANT       = 16#0000#
    DESCRIPTION            = "Indicates errors, which can only occur during
                               on-board data reduction (hex value as 16#xxxx#).
                               0001  Reduce: number of vector elements odd or less
                                     than 2; fatal.
                               0002  Expand: less than four elements in input
                                     vector; fatal.
                               0004  Too much data for analysis; truncating.
                               0008  Too few data for analysis; padding with 128
                               0010  Used number of waves is not a power of 2;
                                     truncated.
                               0020  Not the expected number of elements in
                                     filtered arrays; fatal.
                               0040  Argument for sine_table() not in valid range
```

```
                          0<= deg2 <=720.
                    0080  Overflow in divsin() or result inexact.
                    0100  Too few data for trimmed mean calculation;
                          regular mean used.
                    0200  No data for warr.mean; particular: analysis
                          yields no data.
                    0400  Passive mode: not enough data in bin.
                    0800  Not enough memory for data reduction."
END_OBJECT               = COLUMN
```

The un-calibrated power spectrum is described by the following TABLE object.

```
  OBJECT                   = PM2TPOW_TABLE
    NAME                   = PM2TPOW
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 1
    COLUMNS                = 5
    ROW_BYTES              = 63
    ^STRUCTURE             = "PP_PM2_POW.FMT"
  END_OBJECT               = PM2TPOW_TABLE
```

The structure of the parameters TABLE object is identical to PM (FM2, FM3) and is described in the file PP_PM2_POW.FMT.

```
/* PP raw power values, version 2, 2015-11-11 */

OBJECT                   = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT               = "I6"
    DESCRIPTION          = "Sequence ID in the current data file"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "UTC"
    DATA_TYPE            = TIME
    START_BYTE           = 8
    BYTES                = 23
    DESCRIPTION          = "Measurement start time (UTC in PDS standard
                            format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "SESAME_LOCAL_TIME"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 32
    BYTES                = 15
    FORMAT               = "I15"
    DESCRIPTION          = "Measurement start time. SESAME local time
```

```
                      (SLT) runs with a resolution of 1/32 seconds.
                      SLT represents the least significant 32 bits
                      of LOBT. The most significant 5 bits are in
                      CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "FREQ_BIN"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 2
    FORMAT              = "I2"
    UNIT                = "N/A"
    DESCRIPTION         = "Frequency bins meaning:
                           1 20000-10000 Hz
                           2 10000-5000 Hz
                           3 5000-2500 Hz
                           4 2500-1250 Hz
                           5 1250-625 Hz
                           6 625-312 Hz
                           7 312-156 Hz
                           8 156-78 Hz
                           9 78-39 Hz
                          10 39-20 Hz "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "POWER"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 51
    BYTES               = 10
    FORMAT              = "I10"
    UNIT                = "N/A"
    DESCRIPTION         = "Raw power"
END_OBJECT              = COLUMN
```

The receiver data are described by the following TABLE object.

```
  OBJECT                   = PM2TRX_TABLE
    NAME                   = PM2TRX
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 8192
    COLUMNS                = 5
    ROW_BYTES              = 59
    ^STRUCTURE             = "PP_PMT_RX.FMT"
  END_OBJECT               = PM2TRX_TABLE
```

The structure of the receiver data TABLE object is identical to PMTEST (FM1) and is described in the file PP_PMT_RX.FMT.

```
/* PP PMTEST / PMTEST2 Rx table entry ,version 2, 2015-11-11 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
```

```
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 1
    BYTES                 = 6
    UNIT                  = "N/A"
    FORMAT                = "I6"
    DESCRIPTION           = "Sequence ID in the current data file"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "UTC"
  DATA_TYPE               = TIME
  START_BYTE              = 8
  BYTES                   = 23
  DESCRIPTION             = "Measurement start time (UTC in PDS standard
                             format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "SESAME_LOCAL_TIME"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 32
    BYTES                 = 15
    FORMAT                = "I15"
    DESCRIPTION           = "Measurement start time. SESAME local time
                               (SLT) runs with a resolution of 1/32 seconds.
                               SLT represents the least significant 32 bits
                               of LOBT. The most significant 5 bits are in
                               CDMS RSST (see SESAME Ready Message)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "RX_SAMPLE "
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 48
    BYTES                 = 5
    UNIT                  = "N/A"
    FORMAT                = "I5"
    DESCRIPTION           = "Rx sample number"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "RX_ADC_VALUE"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 54
    BYTES                 = 3
    UNIT                  = "N/A"
    FORMAT                = "I3"
    DESCRIPTION           = "RX ADC value "
END_OBJECT                = COLUMN
```

4.3.2.4.3.2.6 PP Control Table (RCTL) data

The Control Table is sent only on request, usually as verification after changes to the frequency definitions for mode FM_AM2. The data files will be stored in the PP AM sub-directory as they define the details of the PP_AM2 measurement sequence. The request command was planned for the LTS phase and was never be used.

4.3.2.4.3.3 Flight software version FM3

4.3.2.4.3.3.1 PP Active Mode Test

Same as FM2

4.3.2.4.3.3.2 PP Health Check (HC) data

Same as FM1

4.3.2.4.3.3.3 PP Langmuir Probe Test (LM) data

Same as FM1

4.3.2.4.3.3.4 PP Passive Mode (PM) data

Same as FM2

4.3.2.4.3.3.5 PP Passive Mode Test (PMTEST) data

Same as FM2

4.3.2.5 Description of Instrument

The description of the instrument can be found in chapter 2.2 and as a brief overview in the INST.CAT catalog file.

4.3.2.6 Mission Specific Keywords

ROSETTA: CASSE_CHANNEL

- **Type** : ordered sequence
- **Description**: The CASSE_CHANNEL ROSETTA mission specific keyword gives the type of measurement of each multiplexer channel.

  The CASSE instrument is made of 3 piezoelectric transmitters and 3 triaxial accelerometers, and the respective electronics.

  The transmitters and the 3 axes of each accelerometer are connected to an analogue 12-channel multiplexer.

  It is possible to select any combination of 12 sensor channels, which can be the x, y, and z axes of each accelerometer and the 3 transmitters.

  The sequence contains 12 elements representing the channel correspondence for CASSE measurements. These elements are flags that indicate if a channel is used or not. To increase readability, designations of used channels are given explicitly.

  The sequence takes the following form: (channel 1, channel 2, ..., channel 12).
- **Standard values**: -YACCX, -YACCY, -YACCZ, +XACCX, +XACCY, +XACCZ, +YACCX, +YACCY, +YACCZ, -YTRM, +XTRM, +YTRM.

  The unused channels take the value "-1".
- **Unit**: none

  Explanation of acronym composition:

  Characters 1,2: Philae foot (-Y, +X, +Y)

  Characters 3,4,5: Sensor type (ACC: accelerometer; TRM: transmitter)

  Character 6: ACC axis (X, Y, Z), if a triaxial accelerometer is used.
- **Examples**

  Example 1:

  CASSE_CHANNEL = (-YACCX, -YACCY, -YACCZ, -1, -1,-1, -1, -1, -1, -1, -1, -1)

This means that all three channels of the accelerometer in the -Y foot are used.

Example 2:
CASSE_CHANNEL = (-1, -1, -1, -1, -1, -1, -1, -1, -1, -YTRM, +XTRM, +YTRM)
This means that no accelerometer channel is used, but the transmitters of all three feet.

4.3.2.7 Data quality definition (level 2)

4.3.2.7.1 CASSE

The DATA_QUALITY_ID for CASSE is defined according to the fraction of time series with lost data (see level 1) and with ADC values of ±127 compared to expected data volume.

The DATA_QUALITY_ID scheme is described by the associated DATA_QUALITY_DESC element as follows.

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete, 0% data loss
1: data loss < 5%
2: 5% ≤ data loss < 10%
3: 10% ≤ data loss < 20%
4: data loss ≥ 20%

4.3.2.7.2 DIM

The DATA_QUALITY_ID for DIM is defined according to the operating mode, the number of warnings or errors and the fraction of data loss.

The following DATA_QUALITY_ID scheme is defined for the modes DIM_HC, DIM_AV and DIM_BSTEST2.

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete
1: One or more Warnings
2: One or more Fatal Errors
3: N/A
4: N/A

The DATA_QUALITY_ID scheme for the DIM_BC mode is calculated as follows.

If the number of "Detected Events" > 0 then
"Data loss" = (No. "Long Events" and no. "False Events") / (No. "Detected Events")

The following DATA_QUALITY_ID scheme is defined for the DIM_BC mode.

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete
1: data loss or Warnings < 10%
2: 10% ≤ data loss < 30%
3: 30% ≤ data loss < 60%
4: data loss or Fatal Errors ≥ 60 %

The data from DIM_MES will be handled like DIM_BC or DIM_AV, whatever is appropriate.

4.3.2.7.3 PP

The DATA_QUALITY_ID for PP is defined according to the operating mode as follows.

4.3.2.7.3.1 PP Health Check

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: Disturbed signal: any raw parameter = 255 or 0
2: One or more Fatal Errors
3: N/A
4: N/A

4.3.2.7.3.2 PP Active Mode and Active Mode Test (PP_AM2, PP_AMTEST2)

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: All QUAL-flags = 0x0F, limited use
2: One or more Fatal Errors
3: N/A
4: N/A

4.3.2.7.3.3 PP Passive Mode and Passive Mode Test (PP_PM2, PP_PMTEST2)

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: Math Error code not equal 0, limited use
2: One or more Fatal Errors
3: N/A
4: N/A

4.3.2.7.4 SESAME Health-Check

The criterion for the DATA_QUALITY_ID definition is the data loss versus expected data volume.

DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: data loss < 5%
2: 5% ≤ data loss < 10%
3: 10% ≤ data loss < 20%
4: data loss ≥ 20%

4.3.2.7.5 SESAME common data object definition

The SESAME error messages are described by the following TABLE object.

```
  OBJECT                  = EMES_TABLE
    NAME                  = EMES
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 1
    COLUMNS               = 6
    ROW_BYTES             = 73
    ^STRUCTURE            = "SESAME_EMES.FMT"
  END_OBJECT              = EMES_TABLE
```

The structure of the receiver data TABLE object is described in the file SESAME_EMES.FMT.

```
OBJECT                 = COLUMN
    NAME               = "UTC"
    DATA_TYPE          = TIME
    START_BYTE         = 1
```

```
    BYTES                  = 23
    DESCRIPTION            = "Measurement start time (UTC in PDS standard
                              format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 25
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Start time of measurement. SESAME local time
                              (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "ERR_MSG_ID"
    DATA_TYPE              = CHARACTER
    START_BYTE             = 42
    BYTES                  = 14
    FORMAT                 = "A14"
    DESCRIPTION            = "Identifying character string:
                              Error Message"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "ERR_CODE"
    DATA_TYPE              = CHARACTER
    START_BYTE             = 59
    BYTES                  = 4
    FORMAT                 = "A4"
    DESCRIPTION            = "Error code word (hex value):
                              1101 Tried to start A/D conversion, but ADC of
                                   C-DPU is in use
                              1102 Unknown HK parameter ID, HK value set to
                                   HK_MISVAL
                              1103 Tried to read A/D converted value, but
                                   conversion is not ready
                              1406 Received CDMS message, which is not
                                   addressed to SESAME and is not a broadcast
                                   message; message ignored
                              140A Received unknown CDMS data message (msgDATA)
                              140C Unknown Action Code (newCDMSmsg!)
                              140E Unknown Action Code (NewCDMSmsg?)
                              1412 Wrong Word Count (rcvTRG)
                              1414 Wrong parameters (check_actc)
                              1601 Unknown command category, TC ignored
                              1617 Unknown common TC
                              1A01 Wrong temperature channel, set to default
                              1A11 Unknown CASSE TC
                              1B01 Invalid margin, set margin to 0
                              1B02 Invalid direction, set direction to X
                              1D01 Could not allocate memory (COM_MEM)
                              1D03 Could not allocate memory (COM_HK)
                              1D08 Error reading Backup RAM Buffer
                              1D09 Error reading  Stored TC Buffer
                              E106 Could not allocate memory (COM_RBUF)
                              E402 SESAME request buffer full
                              E4D0 Received CDMS Error Code Word with contents 0
                              E4D1 Received CDMS Error Code Word with contents 1
                              E4D2 Received CDMS Error Code Word with contents 2
                              E4D3 Received CDMS Error Code Word with contents 3
                              E4D4 Received CDMS Error Code Word with contents 4
                              E4D5 Received CDMS Error Code Word with contents 5
```

```
                           E4D6 Received CDMS Error Code Word with contents 6
                           E4D7 Received CDMS Error Code Word with contents 7
                           E4D8 Received CDMS Error Code Word with contents 8
                           E4D9 Received CDMS Error Code Word with contents 9
                           E4DA Received CDMS Error Code Word with contents A
                           E4DB Received CDMS Error Code Word with contents B
                           E4DC Received CDMS Error Code Word with contents C
                           E4DD Received CDMS Error Code Word with contents D
                           E4DE Received CDMS Error Code Word with contents E
                           E4DF Received CDMS Error Code Word with contents F
                           E501 Invalid case in module SDOUT
                           EA20 Could not allocate memory (CAS_HC)
                           EA22 Could not submit measurement (CAS_HC)
                           EA24 Could not allocate memory (CAS_MES)
                           EA26 Could not submit SD (CAS_MES)
                           EAFF Allocated memory space exhausted
                           EB20 Could not allocate memory (DIM_CA)
                           EB21 Could not submit SD (DIM_CA)
                           EB22 Could not allocate memory (DIM_NT)
                           EB23 Could not submit SD (DIM_NT)
                           EB24 Could not allocate memory (DIM_ST)
                           EB25 Could not submit SD (DIM_ST)
                           EB26 Could not allocate memory (DIM_PC)
                           EB27 Could not submit SD (DIM_PC)
                           EB28 Survey: Bad instrument health
                           EB2A Could not allocate memory (DIM_AV, DIM_AVTEST)
                           EB2B Could not submit SD (DIM_AV, DIM_AVTEST)
                           EB2C Could not allocate memory (DIM_BC, DIM_BCTEST)
                           EB2D Could not submit SD (DIM_BC, DIM_BCTEST)
                           EB2E Autonomous Mode: Computed measurement
                                duration for one AV- or BC-measurement
                                derived from total measurement duration
                                (TC parameter) is too small
                           EB2F Autonomous Mode: Bad instrument health
                           EB31 Survey: Allocated SRAM memory exhausted
                           EB32 Survey: Excessive overcurrent interrupts
                           EBF1 Unknown DIM TC
                           EC30 Could not allocate memory (PP_HC)
                           EC31 Could not submit SD (PP_HC)
                           EC32 Could not allocate memory (PP_DA)
                           EC33 Could not submit SD (PP_DA)
                           EC52 Could not allocate memory (PP_LM)
                           EC53 Could not submit SD (PP_LM)
                           EC54 Could not allocate memory (PP_AM)
                           EC55 Could not submit SD (PP_AM2)
                           EC57 Could not allocate memory (PP_AMTEST2)
                           EC58 Could not submit SD (PP_AMTEST2)
                           EC5C Could not allocate memory (PP_PM2)
                           EC5D Could not submit SD (PP_PM2)
                           EC5E Could not allocate memory (PP_PMTEST2)
                           EC5F Could not submit SD (PP_PMTEST2)
                           ECE1 Unknown PP TC
                           ED02 Could not submit SD (COM_MEM)
                           ED04 Could not submit SD (COM_HK)
                           ED05 Could not submit SD (COM_RBUF)
                           ED07 Timeout during Backup Buffer RAM reading
                           ED0A Timeout during Stored TC Buffer reading
                           ED0B Could not allocate memory (COM_RDJC)
                           ED0C Could not submit SD (COM_RDJC)
                           ED0D Could not allocate memory (COM_WPENZ)
                           ED0E Could not submit SD (COM_WPENZ)"
END_OBJECT            = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "ERR_LEVEL"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 66
    BYTES               = 1
    FORMAT              = "A1"
    DESCRIPTION         = "Error level (hex value):
                           0 Information for debugging, no error
                           1 Warning
                           E Error
                           F Fatal error, reboot required"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ERR_SUBSYSTEM"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 70
    BYTES               = 1
    FORMAT              = "A1"
    DESCRIPTION         = "Subsystem (hex value):
                           0 Global routines
                           1 ADC, HK
                           4 CDMS I/F
                           5 Science data processing
                           6 Telecommand processing
                           A CASSE S/W
                           B DIM S/W
                           C PP S/W
                           D Common actions"
END_OBJECT              = COLUMN
```

The SESAME health check parameters are described by the following TABLE object.

```
  OBJECT                    = HC_TABLE
    NAME                    = HC
    INTERCHANGE_FORMAT      = ASCII
    ROWS                    = 1
    COLUMNS                 = 69
    ROW_BYTES               = 621
    ^STRUCTURE              = "SESAME_HC.FMT"
  END_OBJECT                = HC_TABLE
```

The structure of the receiver data TABLE object for FM1 and FM2 is described in the file SESAME_HC.FMT.

```
OBJECT                   = COLUMN
 NAME                   = "UTC"
 DATA_TYPE   = TIME
 START_BYTE  = 1
 BYTES                  = 23
 DESCRIPTION = "Measurement start time (UTC in PDS standard
         format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT   = COLUMN

OBJECT          = COLUMN
    NAME        = "SESAME_LOCAL_TIME"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 25
    BYTES       = 15
```

```
    FORMAT      = "I15"
    DESCRIPTION = "Measurement start time. SESAME local time
                   (SLT) runs with a resolution of 1/32 seconds.
                   SLT represents the least significant 32 bits
                   of LOBT. The most significant 5 bits are in
                   CDMS RSST (see SESAME Ready Message)"
END_OBJECT      = COLUMN

OBJECT                  = COLUMN
    NAME                = "CE_U+5"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 41
    BYTES               = 5
    FORMAT              = "F5.3"
    UNIT                 = "VOLT"
    DESCRIPTION        = "Common electronics +5V voltage "
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "CE_U-5"
    DATA_TYPE          = ASCII_REAL
    START_BYTE  = 47
    BYTES               = 6
    FORMAT              = "F6.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "Common electronics -5V voltage"
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CE_U+12"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 54
    BYTES               = 6
    FORMAT              = "F6.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "Common electronics +12V voltage "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CE_U-12"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 61
    BYTES               = 7
    FORMAT    = "F7.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "Common electronics -12V voltage "
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "CE_U+28"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 69
    BYTES               = 6
```

```
    FORMAT    = "F6.3"
    UNIT                   = "VOLT"
    DESCRIPTION = "Common electronics +28V voltage"
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_UCDP"
    DATA_TYPE           = ASCII_REAL
    START_BYTE  = 76
    BYTES                = 5
    FORMAT               = "F5.3"
    UNIT                   = "VOLT"
    DESCRIPTION = "Common electronics
                Common DPU +5V voltage"
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_I+5"
    DATA_TYPE           = ASCII_REAL
    START_BYTE  = 82
    BYTES     = 6
    FORMAT               = "F6.2"
    UNIT                   = "MILLIAMPERE"
    DESCRIPTION = "Common electronics +5V current "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_I-5"
    DATA_TYPE           = ASCII_REAL
    START_BYTE  = 89
    BYTES                = 6
    FORMAT               = "F6.2"
    UNIT                   = "MILLIAMPERE"
    DESCRIPTION = "Common electronics -5V current "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_I+12"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 96
    BYTES                = 6
    FORMAT               = "F6.2"
    UNIT                   = "MILLIAMPERE"
    DESCRIPTION = "Common electronics +12V current "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_I-12"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 103
    BYTES                = 6
    FORMAT               = "F6.2"
    UNIT                   = "MILLIAMPERE"
```

```
    DESCRIPTION = "Common electronics -12V current "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_I+28"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 110
    BYTES                = 6
    FORMAT               = "F6.2"
    UNIT                  = "MILLIAMPERE"
    DESCRIPTION = "Common electronics +28V current "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_SUPS"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 118
    BYTES                = 4
    FORMAT    = "A4"
    UNIT                  = "N/A"
    DESCRIPTION = "Common electronics
                   SRAM usage/power status (hex value) "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_TBO"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE  = 124
    BYTES                = 6
    FORMAT               = "I6"
    UNIT                  = "SECOND"
    DESCRIPTION = "Common electronics
                   Time since boot "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                 = "CE_ERRF"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 132
    BYTES                = 4
    FORMAT               = "A4"
    UNIT                  = "N/A"
    DESCRIPTION = "Common electronics
                   Error flags (hex value) "
END_OBJECT   = COLUMN

OBJECT                   = COLUMN
    NAME                = "CE_CEID"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 139
    BYTES                = 4
    FORMAT               = "A4"
    UNIT                  = "N/A"
```

```
    DESCRIPTION = "Common electronics
                   SESAME ID (hex value:B5E5) "
END_OBJECT   = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CE_CLTC"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 146
    BYTES                  = 4
    FORMAT                 = "A4"
    UNIT                    = "N/A"
    DESCRIPTION = "Common electronics
                   Last received TC (hex value) "
END_OBJECT   = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CE_CBTC"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 153
    BYTES                  = 4
    FORMAT                 = "A4"
    UNIT                    = "N/A"
    DESCRIPTION = "Common electronics
                   Last but one TC (hex value) "
END_OBJECT   = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CASSE_TT-Y"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 159
    BYTES                  = 7
    FORMAT                 = "F7.2"
    UNIT                    = "KELVIN"
    DESCRIPTION = "CASSE
                   Foot -Y/TRM temperature
                   The temperature range is limited by the range
                   of the ADC of the C-DPU to (-104.52, 173.55)
                   deg Celsius "
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                   = "CASSE_TA-Y"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 167
    BYTES                  = 7
    FORMAT                = "F7.2"
    UNIT                    = "KELVIN"
    DESCRIPTION = "CASSE
                   Foot -Y/ACC temperature
                   The temperature range is limited by the range
                   of the ADC of the C-DPU to (-104.52, 173.55)
                   deg Celsius  "
END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "CASSE_TT+X"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 175
    BYTES               = 7
    FORMAT    = "F7.2"
    UNIT                 = "KELVIN"
    DESCRIPTION = "CASSE
                   Foot +X/TRM temperature
                   The temperature range is limited by the range
                   of the ADC of the C-DPU to (-104.52, 173.55)
                   deg Celsius  "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CASSE_TA+X"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 183
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    DESCRIPTION = "CASSE
                   Foot +X/ACC temperature
                   The temperature range is limited by the range
                   of the ADC of the C-DPU to (-104.52, 173.55)
                   deg Celsius  "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CASSE_TT+Y"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 191
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    DESCRIPTION = "CASSE
                   Foot +Y/TRM temperature
                   The temperature range is limited by the range
                   of the ADC of the C-DPU to (-104.52, 173.55)
                   deg Celsius  "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CASSE_TA+Y"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 199
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    DESCRIPTION = "CASSE
                   Foot +Y/ACC temperature
                   The temperature range is limited by the range
```

```
                   of the ADC of the C-DPU to (-104.52, 173.55)
                   deg Celsius  "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CASSE_TPCB"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 207
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    DESCRIPTION = "CASSE board temperature "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CASSE_UFPG"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 215
    BYTES               = 6
    FORMAT              = "F6.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "CASSE FPGA 3.3V "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "CASSE_URAD_1S"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 222
    BYTES               = 6
    FORMAT              = "F6.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "CASSE total dose (RADFET) "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "DIM_UD_+5"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 229
    BYTES               = 5
    FORMAT              = "F5.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "DIM +5V voltage "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "DIM_UD_-5"
    DATA_TYPE          = ASCII_REAL
    START_BYTE  = 235
    BYTES               = 6
    FORMAT              = "F6.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "DIM -5V voltage "
END_OBJECT   = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "PP_UP_+5"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 242
    BYTES               = 5
    FORMAT              = "F5.3"
    UNIT                 = "VOLT"
    DESCRIPTION = "PP +5V voltage "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "PP_D"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 248
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                 = "N/A"
    DESCRIPTION = "PP electron density "
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "PP_IP_-5"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 254
    BYTES               = 6
    FORMAT              = "F6.3"
    UNIT                 = "MILLIAMPERE"
    DESCRIPTION = "PP  the current consumption of the PP digital
                   electronics. The difference between UP+5 and
                   the incoming +5 V supply voltage (U+05) is the
                   voltage drop caused by the current (IP-5) through
                   a 11.1 Ohm resistor. "
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME_MEAS"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 262
    BYTES               = 8
    FORMAT    = "A8"
    MISSING_CONSTANT = "99999999"
    DESCRIPTION = "Start time of each measurement. SESAME
            local time runs with a resolution of 31.25 ms
            represented in hexa value.
            Does not exist for Software Version FM1"
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-HK_CHANNEL1"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 272
    BYTES               = 7
```

```
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
                regular HK measurement, for Foot -Y/TRM
                Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I1_CHANNEL1"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 280
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 1, for Foot -Y/TRM
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL1"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 288
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                   for Foot -Y/TRM
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I2_CHANNEL1"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 296
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 2, for Foot -Y/TRM
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL1"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 304
```

```
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                  for Foot -Y/TRM
                  Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-HK_CHANNEL2"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 312
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
                  regular HK measurement, for Foot -Y/ACC
                  Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I1_CHANNEL2"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 320
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
           switching from temperature channel to to reference
           channel 1, for Foot -Y/ACC
           Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL2"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 328
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                  for Foot -Y/ACC
                  Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I2_CHANNEL2"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 336
```

```
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 2, for Foot -Y/ACC
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL2"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 344
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                   for Foot -Y/ACC
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-HK_CHANNEL3"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 352
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
                   regular HK measurement, for Foot +X/TRM
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I1_CHANNEL3"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 360
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 1, for Foot +X/TRM
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL3"
    DATA_TYPE   = ASCII_REAL
```

```
    START_BYTE  = 368
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                  for Foot +X/TRM
                  Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I2_CHANNEL3"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 376
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
           switching from temperature channel to to reference
           channel 2, for Foot +X/TRM
           Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL3"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 384
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                  for Foot +X/TRM
                  Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-HK_CHANNEL4"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 392
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
                  regular HK measurement, for Foot +X/ACC
                  Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I1_CHANNEL4"
    DATA_TYPE   = ASCII_REAL
```

```
    START_BYTE  = 400
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 1, for Foot +X/ACC
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL4"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 408
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                   for Foot +X/ACC
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I2_CHANNEL4"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 416
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 2, for Foot +X/ACC
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL4"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 424
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                   for Foot +X/ACC
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-HK_CHANNEL5"
```

```
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 432
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
                   regular HK measurement, for Foot +Y/TRM
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I1_CHANNEL5"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 440
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 1, for Foot +Y/TRM
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL5"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 448
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                   for Foot +Y/TRM
                   Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I2_CHANNEL5"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 456
    BYTES               = 7
    FORMAT             = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 2, for Foot +Y/TRM
            Does not exist for Software Version FM1"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
```

```
    NAME                = "T-R1_CHANNEL5"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 464
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                   for Foot +Y/TRM
                   Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-HK_CHANNEL6"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 472
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
                   regular HK measurement, for Foot +Y/ACC
                   Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-I1_CHANNEL6"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 480
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 1, for Foot +Y/ACC
            Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "T-R1_CHANNEL6"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 488
    BYTES               = 7
    FORMAT              = "F7.2"
    UNIT                 = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                   for Foot +Y/ACC
                   Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
```

```
    NAME                 = "T-I2_CHANNEL6"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 496
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 2, for Foot +Y/ACC
            Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                 = "T-R1_CHANNEL6"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 504
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                   for Foot +Y/ACC
                   Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                 = "T-HK_CHANNEL7"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 512
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Voltage of temperature channel using
      regular HK measurement, for CASSE PCB temperature
      Does not exist for Software Version FM1  "
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                 = "T-I1_CHANNEL7"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 520
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
      switching from temperature channel to to reference
      channel 1, for CASSE PCB temperature
      Does not exist for Software Version FM1 "
END_OBJECT              = COLUMN
```

```
OBJECT                   = COLUMN
    NAME                 = "T-R1_CHANNEL7"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 528
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 1 = UCDP,
                   for CASSE PCB temperature
                   Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                 = "T-I2_CHANNEL7"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 536
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "Intermediate voltage measured shortly after
            switching from temperature channel to to reference
            channel 2, for CASSE PCB temperature
            Does not exist for Software Version FM1"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                 = "T-R1_CHANNEL7"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 544
    BYTES                = 7
    FORMAT              = "F7.2"
    UNIT                  = "KELVIN"
    MISSING_CONSTANT = 9999.99
    DESCRIPTION = "voltage of reference channel 2 = U + 28,
                   for CASSE PCB temperature
                   Does not exist for Software Version FM1"
END_OBJECT              = COLUMN
```

The structure of the receiver data TABLE object for FM3 is described in the file SESAME_HC_FM3.FMT.

```
/* FILE_CONTENTS            = SESAME Health Check */
/*                            Flight software FM3, CODMAC level 3 */
/* FILE_NAME                = SESAME_HC_FM3.FMT */
/* REVISION_NOTE            = SESAME/DIM team, version 1, 2015-11-04 */
/*                            K. Seidensticker, version 2, 2015-11-04 */
/*                            W. Schmidt, version 4, 2015-11-11 */

OBJECT                      = COLUMN
    NAME                    = "UTC"
    DATA_TYPE               = TIME
    START_BYTE              = 1
```

```
    BYTES                   = 23
    DESCRIPTION             = "Measurement start time (UTC in PDS standard
                               format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "SESAME_LOCAL_TIME"
    DATA_TYPE               = ASCII_INTEGER
    START_BYTE              = 25
    BYTES                   = 15
    FORMAT                  = "I15"
    DESCRIPTION             = "Measurement start time. SESAME local time
                               (SLT) runs with a resolution of 1/32 seconds.
                               SLT represents the least significant 32 bits
                               of LOBT. The most significant 5 bits are in
                               CDMS RSST (see SESAME Ready Message)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "U+05"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 41
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Common electronics +5V voltage"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "U-05"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 50
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Common electronics -5V voltage"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "U+12"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 59
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Common electronics +12V voltage"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "U-12"
```

```
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 68
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Common electronics -12V voltage"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "U+28"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 77
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Common electronics +28V voltage"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "UCDP"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 86
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Common electronics
                                Common DPU +5V voltage"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "I+05"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 95
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "MILLIAMPERE"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Common electronics +5V current"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "I-05"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 104
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "MILLIAMPERE"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Common electronics -5V current"
END_OBJECT                   = COLUMN
```

```
OBJECT                     = COLUMN
    NAME                   = "I+12"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 113
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "MILLIAMPERE"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Common electronics +12V current"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "I-12"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 122
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "MILLIAMPERE"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Common electronics -12V current"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "I+28"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 131
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "MILLIAMPERE"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Common electronics +28V current"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SUPS"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 140
    BYTES                  = 8
    UNIT                   = "N/A"
    MISSING_CONSTANT       = 16#FFFF#
    DESCRIPTION            = "Common electronics; SRAM usage/
                              power status (hex value as 16#xxxx#)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "TIBO"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 149
    BYTES                  = 6
    FORMAT                 = "I6"
    UNIT                   = "SECOND"
    MISSING_CONSTANT       = 999999
```

```
    DESCRIPTION                = "Common electronics
                                  Time since boot"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "ERRF"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 156
    BYTES                      = 8
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 16#FFFF#
    DESCRIPTION                = "Common electronics
                                  Error flags (hex value as 16#xxxx#)"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CEID"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 165
    BYTES                      = 8
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 16#FFFF#
    DESCRIPTION                = "Common electronics; SESAME flight
                                  software ID (hex value, FM3: 16#C5E5#)"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CLTC"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 174
    BYTES                      = 8
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 16#FFFF#
    DESCRIPTION                = "Common electronics; Last received TC
                                  (hex value as 16#xxxx#)"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "CBTC"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 183
    BYTES                      = 8
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 16#FFFF#
    DESCRIPTION                = "Common electronics; Last but one TC
                                  (hex value as 16#xxxx#)"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "TT-Y"
    DATA_TYPE                  = ASCII_REAL
    START_BYTE                 = 192
    BYTES                      = 8
```

```
    FORMAT                    = "F8.3"
    UNIT                      = "KELVIN"
    MISSING_CONSTANT          = 9999.999
    DESCRIPTION               = "CASSE
                                 Foot -Y/TRM temperature"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "TA-Y"
    DATA_TYPE                 = ASCII_REAL
    START_BYTE                = 201
    BYTES                     = 8
    FORMAT                    = "F8.3"
    UNIT                      = "KELVIN"
    MISSING_CONSTANT          = 9999.999
    DESCRIPTION               = "CASSE
                                 Foot -Y/ACC temperature"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "TT+X"
    DATA_TYPE                 = ASCII_REAL
    START_BYTE                = 210
    BYTES                     = 8
    FORMAT                    = "F8.3"
    UNIT                      = "KELVIN"
    MISSING_CONSTANT          = 9999.999
    DESCRIPTION               = "CASSE
                                 Foot +X/TRM temperature"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "TA+X"
    DATA_TYPE                 = ASCII_REAL
    START_BYTE                = 219
    BYTES                     = 8
    FORMAT                    = "F8.3"
    UNIT                      = "KELVIN"
    MISSING_CONSTANT          = 9999.999
    DESCRIPTION               = "CASSE
                                 Foot +X/ACC temperature"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "TT+Y"
    DATA_TYPE                 = ASCII_REAL
    START_BYTE                = 228
    BYTES                     = 8
    FORMAT                    = "F8.3"
    UNIT                      = "KELVIN"
    MISSING_CONSTANT          = 9999.999
    DESCRIPTION               = "CASSE
                                 Foot +Y/TRM temperature"
```

```
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "TA+Y"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 237
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "KELVIN"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "CASSE
                               Foot +Y/ACC temperature"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "TPCB"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 246
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "KELVIN"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "CASSE board temperature"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "UFPG"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 255
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "CASSE FPGA 3.3V voltage"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "URAD"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 264
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "CASSE total dose (RadFET)"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "UD+5"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 273
    BYTES                   = 8
    FORMAT                  = "F8.3"
```

```
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "DIM +5V voltage"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "UD-5"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 282
    BYTES                 = 8
    FORMAT                = "F8.3"
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "DIM -5V voltage"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "UP+5"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 291
    BYTES                 = 8
    FORMAT                = "F8.3"
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "PP +5V voltage"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "PPD"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 300
    BYTES                 = 5
    FORMAT                = "I5"
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 99999
    DESCRIPTION           = "PP electron density"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "LMID"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 306
    BYTES                 = 5
    FORMAT                = "I5"
    MISSING_CONSTANT      = 99999
    DESCRIPTION           = "Common electronics
                             SLT mid word"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "LLOW"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 312
```

```
    BYTES                   = 5
    FORMAT                  = "I5"
    MISSING_CONSTANT        = 99999
    DESCRIPTION             = "Common electronics
                               SLT low word"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-HK_CHANNEL1"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 318
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of temperature channel using
                               regular HK measurement, for Foot -Y/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I1_CHANNEL1"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 327
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 1, for Foot -Y/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R1_CHANNEL1"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 336
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 1 = UCDP,
                               for Foot -Y/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I2_CHANNEL1"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 345
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
```

```
                               switching from temperature channel to reference
                               channel 2, for Foot -Y/TRM"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "T-R2_CHANNEL1"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 354
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Voltage of reference channel 2 = U + 28,
                               for Foot -Y/TRM"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "T-HK_CHANNEL2"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 363
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Voltage of temperature channel using
                               regular HK measurement, for Foot -Y/ACC"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "T-I1_CHANNEL2"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 372
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.999
    DESCRIPTION              = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 1, for Foot -Y/ACC"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "T-R1_CHANNEL2"
    DATA_TYPE                = ASCII_REAL
    START_BYTE               = 381
    BYTES                    = 8
    FORMAT                   = "F8.3"
    UNIT                     = "VOLT"
    MISSING_CONSTANT         = 9999.99
    DESCRIPTION              = "voltage of reference channel 1 = UCDP,
                               for Foot -Y/ACC"
END_OBJECT                   = COLUMN
```

```
OBJECT                      = COLUMN
    NAME                    = "T-I2_CHANNEL2"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 390
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 2, for Foot -Y/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R2_CHANNEL2"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 399
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 2 = U + 28,
                               for Foot -Y/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-HK_CHANNEL3"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 408
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of temperature channel using
                               regular HK measurement, for Foot +X/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I1_CHANNEL3"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 417
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               from temperature channel to reference
                               channel 1, for Foot +X/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R1_CHANNEL3"
```

```
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 426
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 1 = UCDP,
                               for Foot +X/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I2_CHANNEL3"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 435
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 2, for Foot +X/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R2_CHANNEL3"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 444
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 2 = U + 28,
                               for Foot +X/TRM"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-HK_CHANNEL4"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 453
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of temperature channel using
                               regular HK measurement, for Foot +X/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I1_CHANNEL4"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 462
    BYTES                   = 8
    FORMAT                  = "F8.3"
```

```
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 1, for Foot +X/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R1_CHANNEL4"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 471
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 1 = UCDP,
                               for Foot +X/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I2_CHANNEL4"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 480
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 2, for Foot +X/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R2_CHANNEL4"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 489
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 2 = U + 28,
                               for Foot +X/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-HK_CHANNEL5"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 498
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of temperature channel using
```

```
                           regular HK measurement, for Foot +Y/TRM"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "T-I1_CHANNEL5"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 507
    BYTES                 = 8
    FORMAT                = "F8.3"
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "Intermediate voltage measured shortly after
                           switching from temperature channel to reference
                           channel 1, for Foot +Y/TRM"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "T-R1_CHANNEL5"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 516
    BYTES                 = 8
    FORMAT                = "F8.3"
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "Voltage of reference channel 1 = UCDP,
                           for Foot +Y/TRM"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "T-I2_CHANNEL5"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 525
    BYTES                 = 8
    FORMAT                = "F8.3"
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "Intermediate voltage measured shortly after
                           switching from temperature channel to reference
                           channel 2, for Foot +Y/TRM"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "T-R2_CHANNEL5"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 534
    BYTES                 = 8
    FORMAT                = "F8.3"
    UNIT                  = "VOLT"
    MISSING_CONSTANT      = 9999.999
    DESCRIPTION           = "Voltage of reference channel 2 = U + 28,
                           for Foot +Y/TRM"
END_OBJECT                = COLUMN
```

```
OBJECT                     = COLUMN
    NAME                   = "T-HK_CHANNEL6"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 543
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "VOLT"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Voltage of temperature channel using
                              regular HK measurement, for Foot +Y/ACC"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "T-I1_CHANNEL6"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 552
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "VOLT"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Intermediate voltage measured shortly after
                              switching from temperature channel to reference
                              channel 1, for Foot +Y/ACC"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "T-R1_CHANNEL6"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 561
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "VOLT"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Voltage of reference channel 1 = UCDP,
                              for Foot +Y/ACC"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "T-I2_CHANNEL6"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 570
    BYTES                  = 8
    FORMAT                 = "F8.3"
    UNIT                   = "VOLT"
    MISSING_CONSTANT       = 9999.999
    DESCRIPTION            = "Intermediate voltage measured shortly after
                              switching from temperature channel to reference
                              channel 2, for Foot +Y/ACC"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "T-R2_CHANNEL6"
    DATA_TYPE              = ASCII_REAL
```

```
    START_BYTE              = 579
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 2 = U + 28,
                               for Foot +Y/ACC"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-HK_CHANNEL7"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 588
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of temperature channel using
                               regular HK measurement, for CASSE PCB
                               temperature"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I1_CHANNEL7"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 597
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Intermediate voltage measured shortly after
                               switching from temperature channel to reference
                               channel 1, for CASSE PCB temperature"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-R1_CHANNEL7"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 606
    BYTES                   = 8
    FORMAT                  = "F8.3"
    UNIT                    = "VOLT"
    MISSING_CONSTANT        = 9999.999
    DESCRIPTION             = "Voltage of reference channel 1 = UCDP,
                               for CASSE PCB temperature"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "T-I2_CHANNEL7"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 615
    BYTES                   = 8
    FORMAT                  = "F8.3"
```

```
    UNIT                       = "VOLT"
    MISSING_CONSTANT           = 9999.999
    DESCRIPTION                = "Intermediate voltage measured shortly after
                                  switching from temperature channel to reference
                                  channel 2, for CASSE PCB temperature"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "T-R2_CHANNEL7"
    DATA_TYPE                  = ASCII_REAL
    START_BYTE                 = 624
    BYTES                      = 8
    FORMAT                     = "F8.3"
    UNIT                       = "VOLT"
    MISSING_CONSTANT           = 9999.999
    DESCRIPTION                = "Voltage of reference channel 2 = U + 28,
                                  for CASSE PCB temperature"
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "URAD-2"
    DATA_TYPE                  = ASCII_REAL
    START_BYTE                 = 633
    BYTES                      = 8
    FORMAT                     = "F8.3"
    UNIT                       = "VOLT"
    MISSING_CONSTANT           = 9999.999
    DESCRIPTION                = "CASSE total dose (RadFET),
                                  second measurement"
END_OBJECT                     = COLUMN
```

The SESAME housekeeping parameters are described by the following TABLE object.

```
OBJECT                        = FILE
  RECORD_TYPE                 = FIXED_LENGTH
  FILE_RECORDS                =
  ^HK =
  OBJECT                      = HK_TABLE
    NAME                      = HK
    INTERCHANGE_FORMAT        = ASCII
    ROWS                      = 1
    COLUMNS                   = 35
    ROW_BYTES                 = 302
    ^STRUCTURE                = "SESAME_HK.FMT"
  END_OBJECT                  = HK_TABLE
END_OBJECT                    = FILE
```

The structure of the receiver data TABLE object is described in the file SESAME_HK.FMT.

The SESAME reading of Backup RAM Buffer are described by the following TABLE object.

```
OBJECT                   = RBUF_TABLE
  NAME                   = RBUF
  INTERCHANGE_FORMAT     = ASCII
  ROWS                   = 1
  COLUMNS                = 5
  ROW_BYTES              = 221
  ^STRUCTURE             = "SESAME_RBUF.FMT"
END_OBJECT               = RBUF_TABLE
```

The structure of the receiver data TABLE object is described in the file SESAME_RBUF.FMT.

```
/* FILE_CONTENTS              = SESAME Read Backup RAM Buffer */
/* FILE_NAME                  = SESAME_RBUF.FMT */
/* REVISION_NOTE              = K. Seidensticker, version 3, 2015-11-05 */
/* REVISION_NOTE              = W. Schmidt, version 4, 2015-11-11 */

OBJECT                        = COLUMN
    NAME                      = "UTC"
    DATA_TYPE                 = TIME
    START_BYTE                = 1
    BYTES                     = 23
    DESCRIPTION               = "Measurement start time (UTC in PDS standard
                                 format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "SESAME_LOCAL_TIME"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 25
    BYTES                     = 15
    FORMAT                    = "I15"
    DESCRIPTION               = "Start time of measurement. SESAME local time
                                 (SLT) runs with a resolution of 1/32 seconds.
                                 SLT represents the least significant 32 bits
                                 of LOBT. The most significant 5 bits are in
                                 CDMS RSST (see SESAME Ready Message)"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "RBUF_SUBSYS"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 41
    BYTES                     = 8
     DESCRIPTION               = "Unit subsystem address (echoed TC
                                 parameter, hex value 16#xxxx#)"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "RBUF_OFFSET"
    DATA_TYPE                 = ASCII_INTEGER
    START_BYTE                = 50
    BYTES                     = 8
    DESCRIPTION               = "Offset in backup RAM buffer (echoed
                                 TC parameter, hex value 16#xxxx#)"
END_OBJECT                    = COLUMN

OBJECT                        = COLUMN
    NAME                      = "RBUF_RECORD"
    DATA_TYPE                 = CHARACTER
    START_BYTE                = 60
    BYTES                     = 159
    FORMAT                    = "A159"
    DESCRIPTION               = "Contents of backup RAM buffer record:
                                 64 bytes displayed as groups of 4 characters
```

```
                              (hex values) separated by blanks"
END_OBJECT                 = COLUMN
```

The SESAME Read Stored TC buffer data (to be stored into CASSE jobcard) are described by the following TABLE object.

```
  OBJECT                   = RDJC_TABLE
    NAME                   = RDJC
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 1
    COLUMNS                = 4
    ROW_BYTES              = 130
    ^STRUCTURE             = "SESAME_RDJC.FMT"
  END_OBJECT               = RDJC_TABLE
```

The structure of the receiver data TABLE object is described in the file SESAME_RDJC.FMT.

```
OBJECT                  = COLUMN
    NAME                = "UTC"
    DATA_TYPE           = TIME
    START_BYTE          = 1
    BYTES               = 23
    DESCRIPTION         = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 25
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Start time of measurement. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RDJC_OFFSET"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 42
    BYTES               = 4
    FORMAT              = "A4"
    DESCRIPTION         = "Offset in Stored TC Buffer (echoed
                           command parameter, hex value)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RDJC_RECORD"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 49
    BYTES               = 79
    FORMAT              = "A79"
    DESCRIPTION         = "First 16 words of STC record:
                           16 words displayed as groups of 4 characters
                           (hex values) separated by blanks"
END_OBJECT              = COLUMN
```

The SESAME first to tenth command word of CDMS RSST message are described by the following TABLE object.

```
  OBJECT                     = RMES_TABLE
    NAME                     = RMES
    INTERCHANGE_FORMAT       = ASCII
    ROWS                     = 1
    COLUMNS                  = 5
    ROW_BYTES                = 137
    ^STRUCTURE               = "SESAME_RMES.FMT"
  END_OBJECT                 = RMES_TABLE
```

The structure of the receiver data TABLE object is described in the file SESAME_RMES.FMT.

```
/* FILE_CONTENTS             = SESAME Ready Message */
/* FILE_NAME                 = SESAME_RMES.FMT */
/* REVISION_NOTE             = K. Seidensticker and W. Schmidt, */
/*                             version 5, 2015-11-05 */

OBJECT                       = COLUMN
    NAME                     = "UTC"
    DATA_TYPE                = TIME
    START_BYTE               = 1
    BYTES                    = 23
    DESCRIPTION              = "Measurement start time (UTC in PDS standard
                                format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "SESAME_LOCAL_TIME"
    DATA_TYPE                = ASCII_INTEGER
    START_BYTE               = 25
    BYTES                    = 15
    FORMAT                   = "I15"
    DESCRIPTION              = "Start time of measurement. SESAME local time
                                (SLT) runs with a resolution of 1/32 seconds.
                                SLT represents the least significant 32 bits of
                                LOBT. The most significant 5 bits are in
                                CDMS RSST (see SESAME Ready Message)"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "SESAME_SYS_MSG"
    DATA_TYPE                = CHARACTER
    START_BYTE               = 42
    BYTES                    = 30
    FORMAT                   = "A30"
    DESCRIPTION              = "SESAME ready message:
                                SESAME Flight S/W  - Ready"
END_OBJECT                   = COLUMN

OBJECT                       = COLUMN
    NAME                     = "SESAME_SW_VER"
```

```
    DATA_TYPE               = CHARACTER
    START_BYTE              = 75
    BYTES                   = 8
    FORMAT                  = "A8"
    MISSING_CONSTANT        = "FM1     "
    DESCRIPTION             = "SESAME flight software version,
                               8 characters, padded with trailing blanks,
                               e.g. 'FM3.00  ';
                               does not exist for software version FM1"
END_OBJECT                  = COLUMN

OBJECT                      = COLUMN
    NAME                    = "SESAME_RSST"
    DATA_TYPE               = CHARACTER
    START_BYTE              = 86
    BYTES                   = 49
    FORMAT                  = "A49"
    DESCRIPTION         = "First to tenth command word of CDMS RSST
                          message (system status table); hex representation;
                          cf. CDMS specification (RO-LCD-SP-3101);
                          does not exist for software version FM1"
END_OBJECT              = COLUMN
```

4.3.3 *Science level 3 data product design*

Level 3 contains calibrated and corrected CASSE and PP time series and DIM tables. The level 3 products have PDS detached labels and combined detached labels. The SESAME subdirectory contains calibrated housekeeping (HK) and health-check data all with the appropriate time-stamp. The calibration is described in SES_CAS_CALIBRATION_DESC.TXT, SES_DIM_CALIBRATION_DESC.TXT and SES_PP_CALIBRATION_DESC.TXT (DOCUMENT directory).

4.3.3.1 File Characteristics Data Elements

PDS data product **labels** contain data element information that describes important attributes of the physical structure of a data product file. The PDS file characteristic data elements for SEAME science level 3 data are:

```
RECORD_TYPE
RECORD_BYTES
FILE_RECORDS
```

The RECORD_TYPE data element identifies the record characteristics of the data product file. Physical records are always fixed-length. The RECORD_BYTES data element identifies the number of bytes in each physical record in the data product file. The FILE_RECORDS data element identifies the number of physical records in the file.

4.3.3.2 Data Object Pointers Identification Data Elements

The SESAME data have combined detached labels. A single PDS detached data product label file is used to describe the contents of more than one data product file (the products belong to the same working session of a SESAME instrument). The combined detached label contains pointers to individual data products. The labels refer to FILE objects.

4.3.3.3 Instrument and Detector Descriptive Data Elements

The following data identification elements provide additional information about the SESAME data product.

```
INSTRUMENT_HOST_NAME        = "ROSETTA-LANDER"
```

```
INSTRUMENT_HOST_ID          = RL
INSTRUMENT_ID               = SESAME
INSTRUMENT_NAME             = "SURFACE ELECTRIC SOUNDING AND ACOUSTIC MONITORING
                                 EXPERIMENT"
INSTRUMENT_TYPE            = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
                          "PERMITTIVITY PROBE"}
```

4.3.3.4 Data Object Definition

4.3.3.4.1 CASSE Data object definition

The CASSE data are organized as tables with 24 columns containing 12 times and 12 channel values (accelerometers or transmitters): time1 channel1 time2 channel2 … time12 channel12.

The association axis-channel is fixed and it is given in the label. The « Jobcards » and « sequence parameters » are kept in separated files (combined detached labels)

Example: CASSE sounding (1 label file pointing to 4 data files)

SES_FS3_CSN_0510040300.LBL	(label)
SES_FS3_CSN_0510040300_JOBC.TAB	(parameters of jobcard)
SES_FS3_CSN_0510040300_SEQP.TAB	(sequence parameters)
SES_FS3_CSN_0510040300_DATA.TAB	(DATA: ACC or TX)
SES_FS3_CSN_0510040300_TAFT.TAB	(foot temperatures)

The label contains the Start and Stop times as LOBT and UTC. The data files contain time in ms relative to the start time.

4.3.3.4.1.1 CASSE Jobcard definition (level 3)

The jobcard is described by a TABLE object.

```
  OBJECT                    = JOBC_TABLE
    NAME                    = DATA
    INTERCHANGE_FORMAT      = ASCII
    ROWS                    =
    COLUMNS                 =
    ROW_BYTES               =
    ^STRUCTURE              = "JOBCARD_FM3.FMT"
  END_OBJECT                = JOBC_TABLE
```

The structure of the TABLE object is defined in the file JOBCARD_FM3.FMT.

```
OBJECT                  = COLUMN
    NAME                  = "SESAME_SEQ_ID"
    DATA_TYPE    = ASCII_INTEGER
    START_BYTE   = 1
    BYTES                 = 6
 FORMAT              = "I6"
    UNIT                  = "N/A"
    DESCRIPTION   = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                    = COLUMN
    NAME                  = "JOB_ID"
    DATA_TYPE    = CHARACTER
```

```
    START_BYTE  = 9
    BYTES              = 2
    FORMAT             = "A2"
    UNIT                = "N/A"
    DESCRIPTION       = "Jobcard identifier (hex value)"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME               = "JOB_VERSION"
    DATA_TYPE         = CHARACTER
    START_BYTE  = 14
    BYTES              = 1
    FORMAT             = "A1"
    UNIT                = "N/A"
    DESCRIPTION  = "The possible values are:
                     0 for FM-1 and FM-2
                     B for FM-3"
END_OBJECT           = COLUMN

OBJECT              = COLUMN
    NAME               = "NMEAS"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 17
    BYTES              = 3
    FORMAT            = "I3"
    UNIT               = "N/A"
    DESCRIPTION  = "Number of measurements (1 to 127)"
END_OBJECT           = COLUMN

OBJECT              = COLUMN
    NAME               = "STACK"
    DATA_TYPE         = CHARACTER
    START_BYTE  = 22
    BYTES              = 3
    FORMAT            = "A3"
    UNIT               = "N/A"
    DESCRIPTION  = "Indicates that the time series shall
                    be stacked on board. The possible
                    values are YES or NO."
END_OBJECT           = COLUMN

OBJECT              = COLUMN
    NAME               = "SOUND_FREQ"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE  = 27
    BYTES              = 5
    FORMAT            = "I5"
    UNIT               = "HERTZ"
    DESCRIPTION  = "Nominal sounding frequency"
END_OBJECT           = COLUMN

OBJECT              = COLUMN
    NAME               = "SND_DURATION"
```

```
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 33
    BYTES              = 9
    FORMAT            = "F9.1"
    UNIT               = "MILLISECOND"
    MISSING_CONSTANT = 9999999.9
    DESCRIPTION  = "Sounding duration in sounding mode"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "TRIGGER_TIMEOUT"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 43
    BYTES              = 5
    FORMAT            = "I5"
    UNIT               = "SECOND"
    MISSING_CONSTANT = 99999
    DESCRIPTION  = "Time-out duration, after which listening stops
         if no trigger signal occurred"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "SAMPLING_FREQ"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 49
    BYTES              = 6
    FORMAT            = "I6"
    UNIT               = "HERTZ"
    DESCRIPTION  = "Sampling frequency per channel"
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME               = "TX_STATUS"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 57
    BYTES              = 5
    FORMAT            = "A5"
    UNIT               = "N/A"
    DESCRIPTION  = "Selection of transmitters to be used in
                    Sounding Mode. If TX_cycle is set, after a
                    measurement the transmitter selection is
                    (cyclically) shifted by one position up to
                    yield the transmitters to be used for the next
                    measurement. If Tx_reverse is additionally set,
                    the selection of active transmitters is shifted
                    one position downwards instead.
                    Bit field represented as 5 characters, the rightmost
                    character corresponds to bit #0 and the leftmost to
                    bit #4.
                    Each character can be 1 (active sensor or cycle on or
                    reversed on) or 0 (sensor not used) and have the
                    following meaning:
                    bit  0: TRM -Y
```

```
                         bit  1: TRM +X
                         bit  2: TRM +Y
                         bit  3: TX_cycle
                         bit  4: TX_reverse"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "AGC"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 65
    BYTES               = 2
    FORMAT             = "A2"
    UNIT                = "N/A"
    DESCRIPTION       = "Amplification gain selection (hex value)
         Value to be written to the Amplifier Gain
         Control register of CASSE electronics. Decimal value
         ranges from 0 (maximal gain) to 15 (minimal gain).
         Note (a) the gain is not a monotone function of the
         AGC value, (b) the actually adjusted gain can
         deviate, if automatic gain setting (AGS) is enabled."
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "TRIGGER_SRC"
    DATA_TYPE          = CHARACTER
    START_BYTE  = 70
    BYTES               = 12
    FORMAT             = "A12"
    UNIT                = "N/A"
    DESCRIPTION  = "Subset of active sensor channels used as trigger
                         sources. Bit field represented as 12 characters,
                         the rightmost character corresponds to bit #0
                         and the leftmost to bit #11.
                         Each character can be 1 (active sensor used as a
                         trigger source) or 0 (sensor not used as a trigger
                         source) and have the following meaning:
                         bit  0: ACC -Y, x-axis
                         bit  1: ACC -Y, y-axis
                         bit  2: ACC -Y, z-axis
                         bit  3: ACC +X, x-axis
                         bit  4: ACC +X, y-axis
                         bit  5: ACC +X, z-axis
                         bit  6: ACC +Y, x-axis
                         bit  7: ACC +Y, y-axis
                         bit  8: ACC +Y, z-axis
                         bit  9: TRM -Y
                         bit 10: TRM +X
                         bit 11: TRM +Y"
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "TRIGGER_DELAY"
    DATA_TYPE   = ASCII_REAL
```

```
    START_BYTE  = 84
    BYTES              = 9
    FORMAT            = "F9.1"
    UNIT               = "MILLISECOND"
    DESCRIPTION      = "Determines the time range before (negative
                        value) or after (positive value) a trigger
                        event, which shall be included in the time series.
                        Absolute value of TrgDelay must be less or equal
                        LIS_DURATION."
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "TRIGGER_LEVEL_POS"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 94
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    DESCRIPTION  = "Positive trigger level.
                        Value to be written to the UTT hardware register,
                        which fixes the upper (always positive) trigger
                        threshold. Note that the actually adjusted value
                        can be different, if automatic trigger level setting
                        is enabled."
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME               = "TRIGGER_LEVEL_NEG"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 99
    BYTES              = 4
    FORMAT    = "I4"
    UNIT               = "N/A"
    DESCRIPTION  = "Negative trigger level.
                        Value to be written to the LTT hardware register,
                        which fixes the lower (always negative) trigger
                        threshold. Note that the actually adjusted value
                        can be different, if automatic trigger level setting
                        is enabled."
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME               = "LIS_DURATION"
    DATA_TYPE         = ASCII_REAL
    START_BYTE  = 104
    BYTES              = 9
    FORMAT            = "F9.1"
    UNIT               = "MILLISECOND"
    DESCRIPTION  = "Listening duration"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "RX_STATUS"
```

```
    DATA_TYPE   = CHARACTER
    START_BYTE  = 115
    BYTES              = 14
    FORMAT            = "A14"
    UNIT               = "N/A"
    DESCRIPTION  = "Selection of sensor channels to be used. If cycle
                    is set, after a measurement the receiver selection
                    is (cyclically) shifted by one position (in the same
                    direction as the transmitters, as indicated in
                    TX_STATUS. If the reversed flag is additionally set,
                    the receiver cycling shall take place in the opposite
                    direction as the transmitter cycling.
                    Bit field represented as 15 characters, the rightmost
                    character corresponds to bit #0 and the leftmost to
                    bit #13.
                    Each character can be 1 (active sensor or cycle on or
                    reversed on) or 0 (sensor not used) and have the
                    following meaning:
                    bit  0: ACC -Y, x-axis
                    bit  1: ACC -Y, y-axis
                    bit  2: ACC -Y, z-axis
                    bit  3: ACC +X, x-axis
                    bit  4: ACC +X, y-axis
                    bit  5: ACC +X, z-axis
                    bit  6: ACC +Y, x-axis
                    bit  7: ACC +Y, y-axis
                    bit  8: ACC +Y, z-axis
                    bit  9: TRM -Y
                    bit 10: TRM +X
                    bit 11: TRM +Y
                    bit 12: cycle
                    bit 13: reversed"
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME               = "G_GEN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 131
    BYTES              = 1
    FORMAT            = "I1"
    UNIT               = "N/A"
    DESCRIPTION  = "Values 1 or 0
                   1: prepare data for automatic gain adjustment"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "G_COMP"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 133
    BYTES              = 1
    FORMAT            = "I1"
    UNIT               = "N/A"
    DESCRIPTION  =  "0: Do not calculate optimized gain
```

```
                         1: Optimize for lower 1/3 of channels
                         2: Optimize for lower 2/3 of channels
                         3: Optimize for strongest channel"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "TL_GEN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 135
    BYTES              = 1
    FORMAT            = "I1"
    UNIT               = "N/A"
    DESCRIPTION  = "Values 1 or 0
                       1: prepare data for automatic trigger level
                          adjustment"
END_OBJECT   = COLUMN

OBJECT                = COLUMN
    NAME               = "TL_COMP"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 137
    BYTES              = 1
    FORMAT            = "I1"
    UNIT               = "N/A"
    DESCRIPTION  = "Values 1 or 0
                       1: adjust optimized trigger levels"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "STATS"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 139
    BYTES              = 1
    FORMAT            = "I1"
    UNIT               = "N/A"
    DESCRIPTION  = "Values 1 or 0
                       1: include channels statistics for each
                          measurement"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "SKIP_TS"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 141
    BYTES              = 1
    FORMAT            = "I1"
    UNIT               = "N/A"
    DESCRIPTION      = "Values 1 or 0
                        If 1 time series not included into telemetry
                        (ignored in Stacking Mode)"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
```

```
    NAME                = "G_TAR_VAL"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE  = 143
    BYTES               = 3
    FORMAT    = "I3"
    UNIT                = "N/A"
    DESCRIPTION        = "Target value for automatic gain adjustment.
                          Linearized ADC units in the range 1 to 255.
                          In combination with the value of G_COMP,
                          gain is adjusted such that the absolute
                          values of the samples of 1/3, 2/3 or all
                          channels are close to, but below, G_TAR_VAL."
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "TL_FACTOR"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 147
    BYTES               = 4
    FORMAT    = I4
    UNIT                = "N/A"
    DESCRIPTION  = "Factor for calculating the trigger levels from
                          10 to 2550%.
                          Distance of trigger level from mean of time
                          series (of selected trigger channels) relative
                          to the distance between mean and the extreme
                          sample values; TL_FACTOR equals 10 (100 %)
                          means that  trigger level are set equal to the
                          maximum deviation from mean during the
                          pre-measurement.
                          A TLFactor value less than or equal 10 would
                          have caused a trigger signal during the
                          pre-measurement. For each sensor channel
                          marked as trigger channel, flight software
                          calculates preliminary trigger levels based on
                          statistical values (Max, Min, Mean) of a
                          pre-measurement with
                            trglevneg = (Min-Mean) * TLFactor / 10 + Mean
                            trglevpos = (Max-Mean) * TLFactor / 10 + Mean
                          The smallest value of the trglevneg obtained
                          this way is adjusted as negative trigger level
                          (TrgLevNeg), and the highest trglevpos as
                          positive trigger level (TrgLevPos), possible
                          after correcting different gain settings during
                          the pre-measurement and the Trigger Mode
                          measurement."
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "AMP_SETUP"
    DATA_TYPE   = ASCII_REAL
    START_BYTE  = 152
    BYTES               = 4
```

```
    FORMAT             = "F4.1"
    UNIT                = "SECOND"
    DESCRIPTION  = "Amplifier setup time in sounding mode.
                        It represents the Duration after start
                        of time series recording used for amplifier
                        setup (to yield constant base lines). A value
                        of 1 s should normally be used, because
                        it enables the correct identification of sensor
                        channels for all possible sampling frequencies
                        (no wrap-around of FIFO buffer)."
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "FIFO_LAG"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 157
    BYTES               = 4
    FORMAT             = I4
    UNIT                = "N/A"
    DESCRIPTION  = "Optional corrective offset of the address of
                        the first sample to be transferred.
                        Range from -127 to 127"
END_OBJECT   = COLUMN


OBJECT                 = COLUMN
    NAME                = "FOOT_TEMP"
    DATA_TYPE   = CHARACTER
    START_BYTE  = 163
    BYTES               = 7
    FORMAT             = "A7"
    UNIT                = "N/A"
    DESCRIPTION  = "Active foot temperature channels.
                         Bit field represented as 7 characters, the
                         rightmost character corresponds to bit #0
                         and the leftmost to bit #6.
                         The Temperature and Radiation Dose Data Block
                         will be generated by flight software, if at least
                         one foot temperature channel is selected in
                         FOOT_TEMP. It will additionally be included at
                         the end of a measuring sequence, if the
                         additional 'after job temperature' flag is set.
                        Each character can be 1 (channel selected) or
                        0 (channel not selected) and have the
                        following meaning:
                        bit  0: Temperature -Y, TRM
                        bit  1: Temperature -Y, ACC
                        bit  2: Temperature +X, TRM
                        bit  3: Temperature +X, ACC
                        bit  4: Temperature +Y, TRM
                        bit  5: Temperature +Y, ACC
                        bit  6: Additional after job temperatures"
END_OBJECT   = COLUMN
```

```
OBJECT                = COLUMN
    NAME               = "ADD_DELAY"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE  = 172
    BYTES              = 3
    UNIT               = "SECOND"
    FORMAT            = I3
    DESCRIPTION  = "Additional delay between measurements of
                         a measurement sequence"
END_OBJECT   = COLUMN
```

4.3.3.4.1.2 CASSE Sequence Parameters in burst mode definition (level3)

The sequence parameters are described by a TABLE object.

```
OBJECT                 = SEQ_PARAM_BURST
    NAME                 = SEQ_PARAM_BURST3
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 =
    COLUMNS              =
    ROW_BYTES            =
    ^STRUCTURE           = "SEQ_PARAM_BURST3.FMT"
  END_OBJECT             = SEQ_PARAM_BURST
```

The structure of the Sequence parameters TABLE object is defined in the file SEQ_PARAM_BURST3.FMT.

```
OBJECT               = COLUMN
    NAME             = "SESAME_SEQ_ID"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 1
    BYTES            = 6
    UNIT             = "N/A"
    FORMAT           = "I6"
    DESCRIPTION      = "Sequence ID in the current data file"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME             = "MEAS_ID"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 8
    BYTES            = 6
    FORMAT           = "I6"
    UNIT             = "N/A"
    DESCRIPTION      = "Measurement ID in the current sequence"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME             = "UTC"
    DATA_TYPE        = TIME
    START_BYTE       = 15
```

```
    BYTES            = 23
    DESCRIPTION      = "Measurement start time (UTC in PDS standard
                        format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT   = COLUMN

OBJECT               = COLUMN
    NAME             = "SESAME_LOCAL_TIME_SEQ"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 39
    BYTES            = 15
    FORMAT           = "I15"
    DESCRIPTION      = "Start time of measurement. SESAME local time
                       (SLT) runs with a resolution of 1/32 seconds.
                       SLT represents the least significant 32 bits of
                       LOBT. The most significant 5 bits are in
                       CDMS RSST (see SESAME Ready Message)"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME             = "FREQUENCY_DIVIDER"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 55
    BYTES            = 3
    FORMAT           = "I3"
    UNIT             = "N/A"
    DESCRIPTION      = "Adjusted transmitter frequency register value"
 END_OBJECT          = COLUMN

OBJECT               = COLUMN
    NAME             = "FREQUENCY_INCREMENT"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 59
    BYTES            = 5
    FORMAT           = "I5"
    UNIT             = "N/A"
    DESCRIPTION      = "Adjusted sampling rate registers value"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME             = "CHANNELS"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 65
    BYTES            = 3
    FORMAT           = "I3"
    UNIT             = "N/A"
    DESCRIPTION      = "Number of sensor channels minus one"
END_OBJECT           = COLUMN

OBJECT               = COLUMN
    NAME             = "ADJ_SOUND_FREQ"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE       = 69
    BYTES            = 5
```

```
    FORMAT              = "I5"
    UNIT                = "HERTZ"
    DESCRIPTION         = "Transmitter frequency.
                           Equals zero in Listening mode"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ADJ_SAMPLING_FREQ"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 75
    BYTES               = 10
    FORMAT              = "I10"
    UNIT                = "HERTZ"
    DESCRIPTION         = "Sampling frequency per sensor channel"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 86
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Start time of measurement. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits of
                           LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TOTAL_MEAS_LENGTH"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 103
    BYTES               = 8
    FORMAT              = "A8"
    UNIT                = "N/A"
    DESCRIPTION         = "FIFO RAM address when recording stopped
                           4 bytes, hexadecimal representation"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TEMP_FOOT-Y_TRM"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 113
    BYTES               = 6
    FORMAT              = "F6.2"
    UNIT                = "KELVIN"
    DESCRIPTION         = "Foot temperature before measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TEMP_FOOT-Y_ACC"
    DATA_TYPE           = ASCII_REAL
```

```
    START_BYTE        = 120
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+X_TRM"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 127
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+X_ACC"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 134
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+Y_TRM"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 141
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+Y_ACC"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 148
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN
```

4.3.3.4.1.3 CASSE Sequence Parameters in trigger mode definition (level3)

The sequence parameters are described by a TABLE object.

```
OBJECT                  = SEQ_PARAM_TRIG
    NAME                  = SEQ_PARAM_BURST3
```

```
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 =
    COLUMNS              =
    ROW_BYTES            =
    ^STRUCTURE           = "SEQ_PARAM_TRIG3.FMT"
  END_OBJECT             = SEQ_PARAM_TRIG
```

The structure of the Sequence parameters TABLE object for FM2 is defined in the file SEQ_PARAM_TRIG3.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "MEAS_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 8
    BYTES               = 6
    FORMAT              = "I6"
    UNIT                = "N/A"
    DESCRIPTION         = "Measurement index, i.e. the number
                           of the measurement in the file.
                           Starts from 1."
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "UTC"
    DATA_TYPE           = TIME
    START_BYTE          = 15
    BYTES               = 23
    DESCRIPTION  = "This column represents the UTC Time
        for start of the sequence"
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 39
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Start time of measurement. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits of
                           LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "ERROR_INIT"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 56
    BYTES               = 4
    FORMAT              = "A4"
    DESCRIPTION         = "Error status after initialisation
                          in hexadecimal format (2 bytes).
      Possible values:
      0001  EB_FREQ Invalid frequency increment (adjustment of sampling
          frequency); default (= 1312) used.
      0002   EB_DIVRAT Invalid frequency divider (adjustment of sounding
          frequency); default (= 1) used.
      0004   EB_CDPU_ADC Error during temperature A/D conversion.
      4008   EB_NCHAN Fatal: Invalid number of sensor channels
      4010   EB_TIMEO Fatal: Time-out during triggered mode.
      4020   EB_NOSTRT Fatal: Measurement start condition not fulfilled.
      8040   EB_RAMOVR Fatal: Allocated SESAME SRAM space exhausted.
      4000   EB_FATAL_MES Fatal error or time-out; current measurement
          will be aborted.
      Columns are filled by missing_constant if the last case occurs (4000),
      for the concerned mesurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "FREQUENCY_DIVIDER"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 62
    BYTES               = 3
    FORMAT              = "I3"
    UNIT                = "N/A"
    DESCRIPTION         = "Adjusted transmitter frequency register value"
 END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                = "FREQUENCY_INCREMENT"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 66
    BYTES               = 5
    FORMAT              = "I5"
    UNIT                = "N/A"
    DESCRIPTION         = "Adjusted sampling rate registers value"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNELS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 72
    BYTES               = 3
    FORMAT              = "I3"
    UNIT                = "N/A"
    DESCRIPTION         = "Number of sensor channels minus one"
```

```
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TRIGGER_STATUS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 76
    BYTES               = 4
    FORMAT              = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT    = 9999
    DESCRIPTION         = "Contents of Trigger Status Register at
                          time of trigger"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_BURST_ON"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 82
    BYTES               = 15
    FORMAT              = "A15"
    MISSING_CONSTANT    = 999999999999999
DESCRIPTION             = "SESAME Local Time at start of recording
                           of measurement represented as :
                           Reset number (integer starting at 1) / seconds
                           The time resolution is 0.03125 s"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_TRIGGER"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 100
    BYTES               = 15
    FORMAT              = "A15"
    MISSING_CONSTANT    = 999999999999999
DESCRIPTION             = "SESAME Local Time when trigger occurred
                          represented as :
                          Reset number (integer starting at 1) / seconds
                          The time resolution is 0.03125 s"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_BURST_OFF"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 118
    BYTES               = 15
    FORMAT              = "A15"
    MISSING_CONSTANT    = 999999999999999
DESCRIPTION             = "SESAME Local Time at stop of recording
                          represented as :
                          Reset number (integer starting at 1) / seconds
                          The time resolution is 0.03125 s"
END_OBJECT              = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "FIFO_TRIGGER"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 136
    BYTES               = 8
    FORMAT              = "A8"
    MISSING_CONSTANT    = 99999999
DESCRIPTION             = "FIFO RAM address when trigger occurred
                          in hexadecimal format (4 bytes)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "FIFO_BURST_OFF"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 147
    BYTES               = 8
    FORMAT              = "A8"
    MISSING_CONSTANT    = 99999999
DESCRIPTION             = "FIFO RAM address when recording stopped
                          in hexadecimal format (4 bytes)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "FIFO_FIRST_DAT"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 158
    BYTES               = 8
    FORMAT              = "A8"
    MISSING_CONSTANT    = 99999999
DESCRIPTION             = "FIFO RAM address of very first channel data
                          in hexadecimal format (4 bytes)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TEMP_FOOT-Y_TRM"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 168
    BYTES               = 6
    FORMAT              = "F6.2"
    UNIT                = "KELVIN"
    DESCRIPTION         = "Foot temperature before measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TEMP_FOOT-Y_ACC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 175
    BYTES               = 6
    FORMAT              = "F6.2"
    UNIT                = "KELVIN"
    DESCRIPTION         = "Foot temperature before measurement"
END_OBJECT              = COLUMN
```

```
OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+X_TRM"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 182
    BYTES              = 6
    FORMAT             = "F6.2"
    UNIT               = "KELVIN"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+X_ACC"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 189
    BYTES              = 6
    FORMAT             = "F6.2"
    UNIT               = "KELVIN"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+Y_TRM"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 196
    BYTES              = 6
    FORMAT             = "F6.2"
    UNIT               = "KELVIN"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TEMP_FOOT+Y_ACC"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 203
    BYTES              = 6
    FORMAT             = "F6.2"
    UNIT               = "KELVIN"
    DESCRIPTION        = "Foot temperature before measurement"
END_OBJECT             = COLUMN
```

The structure of the Sequence parameters TABLE object for FM3 is defined in the file SEQ_PARAM_TRIG3_FM3.FMT.

```
OBJECT                  = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
    FORMAT               = "I6"
    UNIT                 = "N/A"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                 = "MEAS_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 8
    BYTES                = 6
    FORMAT               = "I6"
    UNIT                 = "N/A"
    DESCRIPTION        = "Measurement ID in the current sequence"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
  NAME                   = "UTC"
  DATA_TYPE              = TIME
  START_BYTE             = 15
  BYTES                  = 23
    DESCRIPTION         = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 39
    BYTES                = 15
 FORMAT                 = "I15"
 DESCRIPTION  = "Start time of measurement. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits of
                           LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "FREQUENCY_DIVIDER"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 55
    BYTES                = 3
    FORMAT               = "I3"
    UNIT                 = "N/A"
    DESCRIPTION  = "Value of transmitter frequency control register"
 END_OBJECT   = COLUMN

OBJECT                  = COLUMN
    NAME                 = "FREQUENCY_INCREMENT"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 59
    BYTES                = 5
    FORMAT               = "I5"
    UNIT                 = "N/A"
    DESCRIPTION  = "Value of sampling rate control registers"
END_OBJECT   = COLUMN

OBJECT                  = COLUMN
```

```
    NAME                 = "CHANNELS"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 65
    BYTES                = 3
    FORMAT               = "I3"
    UNIT                 = "N/A"
    DESCRIPTION  = "Number of sensor channels, derived from SLTLA word
                        (sensor lookup table length and address register)"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "AGC"
    DATA_TYPE            = ASCII_REAL
    START_BYTE           = 69
    BYTES                = 6
    FORMAT               = "F6.2"
    UNIT                 = "N/A"
    DESCRIPTION         = "Nominal amplifier gain; calculated by
                           multiplying the gains of the active
                           amplification stages indicated by the
                           control register settings. An active
                           amplifier stage is signified by the
                           corresponding bit set to 0.
                           Bits are counted from right to left
                           Bit 1 nominal gain factor: 3.13
                           Bit 2 nominal gain factor: 2.13
                           Bit 3 nominal gain factor: 4.55
                           Bit 4 nominal gain factor: 5.55
                           Bit pattern 1010 represents a nominal
                           gain of 5.55 * 2.13 = 11.82"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "POWER_SETTING"
    DATA_TYPE            = CHARACTER
    START_BYTE           = 77
    BYTES                = 8
    FORMAT              = "A8"
    UNIT                 = "N/A"
    DESCRIPTION        = "Power register setting /mode
                           This is a character string where each
                           character represents one bit.
                Bits 0 to 3: value of power control register
                Bits 4 to 7 = 0: power set during measurement initialization
                Bits 4 to 7 = 1: power set by previous CAS_PWRSW command "
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TRIGGER_STATUS"
    DATA_TYPE            = CHARACTER
    START_BYTE           = 88
    BYTES                = 12
    FORMAT               = "A12"
```

```
    UNIT                 = "N/A"
    DESCRIPTION        = "This is a Bit Pattern indicating which of the
                           selected trigger channels triggered the
                           recording bit field represented as 12 characters,
                           the rightmost character corresponds to bit #0
                           and the leftmost to bit #11.
                           Each character can be 1 (active sensor used as a
                           trigger source) or 0 (sensor not used as a
                           trigger source) and have the following meaning.
                           bit  0: ACC -Y, x-axis
                           bit  1: ACC -Y, y-axis
                           bit  2: ACC -Y, z-axis
                           bit  3: ACC +X, x-axis
                           bit  4: ACC +X, y-axis
                           bit  5: ACC +X, z-axis
                           bit  6: ACC +Y, x-axis
                           bit  7: ACC +Y, y-axis
                           bit  8: ACC +Y, z-axis
                           bit  9: TRM -Y
                           bit 10: TRM +X
                           bit 11: TRM +Y"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TIME_BURST_ON"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 102
    BYTES                = 10
    UNIT                 = "N/A"
    FORMAT               = "I10"
    DESCRIPTION        = "SESAME High Resolution Time at start of recording
                         with a resolution of 1/1024 s"
END_OBJECT             = COLUMN

OBJECT                  = COLUMN
 NAME                    = "TIME_TRIGGER"
 DATA_TYPE               = ASCII_INTEGER
 START_BYTE              = 113
 BYTES                   = 10
 FORMAT                  = "I10"
 UNIT                  = "N/A"
 DESCRIPTION            = "SESAME High Resolution Time when trigger
                           event occurred with a resolution of 1/1024 s"
END_OBJECT     = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TIME_BURST_OFF"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 124
    BYTES                = 10
    UNIT                 = "N/A"
    FORMAT               = "I10"
    DESCRIPTION        = "SESAME High Resolution Time when recording
```

```
                         was stopped with a resolution of 1/1024 s"
END_OBJECT           = COLUMN

OBJECT                 = COLUMN
 NAME                   = "FIFO_TRIGGER"
 DATA_TYPE              = CHARACTER
 START_BYTE             = 136
 BYTES                  = 8
 FORMAT                 = "A8"
 DESCRIPTION        = "FIFO RAM address when trigger occurred
                         (hex value, 4 bytes)"
END_OBJECT   = COLUMN

OBJECT                    = COLUMN
    NAME                  = "FIFO_BURST_OFF"
    DATA_TYPE             = CHARACTER
    START_BYTE            = 147
    BYTES                 = 8
    UNIT                  = "N/A"
    FORMAT               = "A8"
DESCRIPTION   = "FIFO RAM address when recording stopped
                         (hex value, 4 bytes)"
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "FIFO_FIRST_DAT"
    DATA_TYPE           = CHARACTER
    START_BYTE          = 158
    BYTES               = 8
    UNIT                = "N/A"
    FORMAT              = "A8"
DESCRIPTION            = "FIFO RAM address of very first channel
                         data (hex value, 4 bytes)"
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "NSAMP"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 168
    BYTES               = 10
    FORMAT              = "I10"
    UNIT                = "N/A"
    DESCRIPTION       = "Number of samples per channel in telemetry"
END_OBJECT   = COLUMN

OBJECT                 = COLUMN
    NAME                = "TEMP_FOOT-Y_TRM"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 179
    BYTES               = 6
    FORMAT              = "F6.2"
    UNIT                = "KELVIN"
    DESCRIPTION        = "Sensor temperature before measurement"
```

```
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                    = "TEMP_FOOT-Y_ACC"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 186
    BYTES                   = 6
    FORMAT                 = "F6.2"
    UNIT                    = "KELVIN"
    DESCRIPTION            = "Sensor temperature before measurement"
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                    = "TEMP_FOOT+X_TRM"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 193
    BYTES                   = 6
    FORMAT                  = "F6.2"
    UNIT                    = "KELVIN"
    DESCRIPTION            = "Sensor temperature before measurement"
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                    = "TEMP_FOOT+X_ACC"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 200
    BYTES                   = 6
    FORMAT                  = "F6.2"
    UNIT                    = "KELVIN"
    DESCRIPTION            = "Sensor temperature before measurement"
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                    = "TEMP_FOOT+Y_TRM"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 207
    BYTES                   = 6
    FORMAT                  = "F6.2"
    UNIT                    = "KELVIN"
    DESCRIPTION            = "Sensor temperature before measurement"
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
    NAME                    = "TEMP_FOOT+Y_ACC"
    DATA_TYPE               = ASCII_REAL
    START_BYTE              = 214
    BYTES                   = 6
    FORMAT                  = "F6.2"
    UNIT                    = "KELVIN"
    DESCRIPTION            = "Sensor temperature before measurement"
END_OBJECT                = COLUMN

OBJECT                     = COLUMN
```

```
    NAME                  = "CASSE_PCB_TEMP"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 221
    BYTES                 = 6
    FORMAT                = "F6.2"
    UNIT                  = "KELVIN"
    DESCRIPTION         = "CASSE PCB temperature"
END_OBJECT              = COLUMN

OBJECT                   = COLUMN
    NAME                  = "RADFET_VOLTAGE"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 228
    BYTES                 = 6
    FORMAT                = "F6.3"
    UNIT                  = "MILLIVOLT"
    DESCRIPTION         = "RadFET voltage (0.002 V/mV)"
END_OBJECT              = COLUMN
```

4.3.3.4.1.4 CASSE Data definition

The data produced in sounding or listening modes are described by the following TABLE object.

```
  OBJECT                   = DATA
    NAME                   = DATA
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   =
    COLUMNS                =
    ROW_BYTES              =
    ^STRUCTURE             = "DATA3.FMT"
  END_OBJECT               = ACC
```

The format of the table object for CASSE sounding and listening modes is described in the file DATA3.FMT.

```
OBJECT                   = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT               = "I6"
    DESCRIPTION          = "Sequence ID in the current data file"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "MEAS_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 8
    BYTES                = 6
    FORMAT               = "I6"
    UNIT                 = "N/A"
    DESCRIPTION          = "Measurement ID in the current sequence"
```

```
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_1"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 15
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 1 time relative to
                         start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_1"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 26
    BYTES              = 9
    FORMAT             = "F9.4"
    UNIT               = "METER PER SECOND SQUARED"
    MISSING_CONSTANT   = 9999.9999
    DESCRIPTION        = "Acceleration data"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_2"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 36
    BYTES              = 10
    UNIT               = "MILLISECOND"
    FORMAT             = "F10.3"
    MISSING_CONSTANT   = 99999.999
    DESCRIPTION        = "Channel 2 time relative to
                          start time of the measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CHANNEL_2"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 47
    BYTES              = 9
    FORMAT             = "F9.4"
    UNIT               = "METER PER SECOND SQUARED"
    MISSING_CONSTANT   = 99999.9999
    DESCRIPTION        = "Acceleration data"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RELATIVE_TIME_3"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 57
    BYTES              = 10
```

```
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 3 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_3"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 68
    BYTES               = 9
    FORMAT              = "F9.4"
    UNIT                = "METER PER SECOND SQUARED"
    MISSING_CONSTANT    = 9999.9999
    DESCRIPTION         = "Acceleration data"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_4"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 78
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 4 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_4"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 89
    BYTES               = 9
    FORMAT              = "F9.4"
    UNIT                = "METER PER SECOND SQUARED"
    MISSING_CONSTANT    = 9999.9999
    DESCRIPTION         = "Acceleration data"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_5"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 99
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 5 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN
```

```
OBJECT                = COLUMN
    NAME              = "CHANNEL_5"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 110
    BYTES             = 9
    FORMAT            = "F9.4"
    UNIT              = "METER PER SECOND SQUARED"
    MISSING_CONSTANT  = 9999.9999
    DESCRIPTION       = "Acceleration data"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RELATIVE_TIME_6"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 120
    BYTES             = 10
    UNIT              = "MILLISECOND"
    FORMAT            = "F10.3"
    MISSING_CONSTANT  = 99999.999
    DESCRIPTION       = "Channel 6 time relative to
                         start time of the measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_6"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 131
    BYTES             = 9
    FORMAT            = "F9.4"
    UNIT              = "METER PER SECOND SQUARED"
    MISSING_CONSTANT  = 9999.9999
    DESCRIPTION       = "Acceleration data"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RELATIVE_TIME_7"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 141
    BYTES             = 10
    UNIT              = "MILLISECOND"
    FORMAT            = "F10.3"
    MISSING_CONSTANT  = 99999.999
    DESCRIPTION       = "Channel 7 time relative to
                         start time of the measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_7"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 152
    BYTES             = 9
    FORMAT            = "F9.4"
    UNIT              = "METER PER SECOND SQUARED"
```

```
    MISSING_CONSTANT  = 9999.9999
    DESCRIPTION       = "Acceleration data"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RELATIVE_TIME_8"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 162
    BYTES             = 10
    UNIT              = "MILLISECOND"
    FORMAT            = "F10.3"
    MISSING_CONSTANT  = 99999.999
    DESCRIPTION       = "Channel 8 time relative to
                         start time of the measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_8"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 173
    BYTES             = 9
    FORMAT            = "F9.4"
    UNIT              = "METER PER SECOND SQUARED"
    MISSING_CONSTANT  = 9999.9999
    DESCRIPTION       = "Acceleration data"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RELATIVE_TIME_9"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 183
    BYTES             = 10
    UNIT              = "MILLISECOND"
    FORMAT            = "F10.3"
    MISSING_CONSTANT  = 99999.999
    DESCRIPTION       = "Channel 9 time relative to
                         start time of the measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_9"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 194
    BYTES             = 9
    FORMAT            = "F9.4"
    UNIT              = "METER PER SECOND SQUARED"
    MISSING_CONSTANT  = 9999.9999
    DESCRIPTION       = "Acceleration data"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "RELATIVE_TIME_10"
    DATA_TYPE         = ASCII_REAL
```

```
    START_BYTE          = 204
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 10 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_10"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 215
    BYTES               = 9
    FORMAT              = "F9.4"
    UNIT                = "METER PER SECOND SQUARED"
    MISSING_CONSTANT    = 9999.9999
    DESCRIPTION         = "Acceleration data"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_11"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 225
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 11 time relative to
                           start time of the measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "CHANNEL_11"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 236
    BYTES               = 9
    FORMAT              = "F9.4"
    UNIT                = "METER PER SECOND SQUARED"
    MISSING_CONSTANT    = 9999.9999
    DESCRIPTION         = "Acceleration data"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "RELATIVE_TIME_12"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 246
    BYTES               = 10
    UNIT                = "MILLISECOND"
    FORMAT              = "F10.3"
    MISSING_CONSTANT    = 99999.999
    DESCRIPTION         = "Channel 12 time relative to
                           start time of the measurement"
```

```
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_12"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 257
    BYTES             = 9
    FORMAT            = "F9.4"
    UNIT              = "METER PER SECOND SQUARED"
    MISSING_CONSTANT  = 9999.9999
    DESCRIPTION       = "Acceleration data"
END_OBJECT            = COLUMN
```

4.3.3.4.1.5 CASSE temperatures after measurement (level 3)

The feet temperatures (accelerometers and transmitters) can be acquired also after a measurement (sounding or listening). They will be stored in ASCII table described by a TABLE object.

```
  OBJECT                 = TAFT
    NAME                 = TAFT
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 =
    COLUMNS              =
    ROW_BYTES           =
    ^STRUCTURE           = "TAFT3.FMT"
  END_OBJECT             = TAFT
```

The structure of the “after measurement temperatures” TABLE object for FM2 is defined in the file TAFT3.FMT.

```
OBJECT                = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT            = "I6"
    DESCRIPTION       = "Sequence ID in the current data file"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME                = "MEAS_ID"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE        = 8
    BYTES               = 6
    FORMAT            = "I6"
    UNIT                = "N/A"
    DESCRIPTION       = "Measurement ID in the current sequence"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT-Y_TRM"
    DATA_TYPE         = ASCII_REAL
```

```
    START_BYTE        = 15
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT-Y_ACC"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 22
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+X_TRM"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 29
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+X_ACC"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 36
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+Y_TRM"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 43
    BYTES             = 6
    FORMAT            = "F6.2"
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "TEMP_FOOT+Y_ACC"
    DATA_TYPE         = ASCII_REAL
    START_BYTE        = 50
    BYTES             = 6
    FORMAT            = "F6.2"
```

```
    UNIT              = "KELVIN"
    DESCRIPTION       = "Foot temperature before measurement"
END_OBJECT            = COLUMN
```

The structure of the “after measurement temperatures” TABLE object for FM3 is defined in the file TAFT3_FM3.FMT.

```
OBJECT                 = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "MEAS_ID"
    DATA_TYPE    = ASCII_INTEGER
    START_BYTE         = 8
    BYTES                = 6
    FORMAT             = "I6"
    UNIT                 = "N/A"
    DESCRIPTION        = "Measurement ID in the current sequence"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "TEMP_FOOT-Y_TRM"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 15
    BYTES                = 6
    FORMAT             = "F6.2"
    UNIT                 = "KELVIN"
    DESCRIPTION          = "Sensor temperature after measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "TEMP_FOOT-Y_ACC"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 22
    BYTES                = 6
    FORMAT             = "F6.2"
    UNIT                 = "KELVIN"
    DESCRIPTION          = "Sensor temperature after measurement"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "TEMP_FOOT+X_TRM"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 29
    BYTES                = 6
    FORMAT             = "F6.2"
```

```
    UNIT                 = "KELVIN"
    DESCRIPTION         = "Sensor temperature after measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TEMP_FOOT+X_ACC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 36
    BYTES                = 6
    FORMAT              = "F6.2"
    UNIT                 = "KELVIN"
    DESCRIPTION         = "Sensor temperature after measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TEMP_FOOT+Y_TRM"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 43
    BYTES                = 6
    FORMAT              = "F6.2"
    UNIT                 = "KELVIN"
    DESCRIPTION         = "Sensor temperature after measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                 = "TEMP_FOOT+Y_ACC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 50
    BYTES                = 6
    FORMAT              = "F6.2"
    UNIT                 = "KELVIN"
    DESCRIPTION         = "Sensor temperature after measurement"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                 = "CASSE_PCB_TEMP"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 57
    BYTES                = 6
    FORMAT              = "F6.2"
    UNIT                 = "KELVIN"
    DESCRIPTION         = "CASSE PCB temperature"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                 = "RADFET_VOLTAGE"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 64
    BYTES                = 6
    FORMAT              = "F6.3"
    UNIT                 = "VOLT"
    DESCRIPTION         = "RadFET voltage"
END_OBJECT              = COLUMN
```

4.3.3.4.1.6 Structure of FM-3 Statistics data (level 3)

The channel statistics data are described by a TABLE object.

```
OBJECT                  = STAT
    NAME                  = STAT
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  =
    COLUMNS               =
    ROW_BYTES             =
    ^STRUCTURE            = "STAT2_FM3.FMT"
  END_OBJECT              = STAT
```

The structure of the Sequence parameters TABLE object is defined in the file STAT2_FM3.FMT.

```
OBJECT                 = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "MEAS_ID"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE         = 8
    BYTES                = 6
    FORMAT             = "I6"
    UNIT                 = "N/A"
    DESCRIPTION        = "Measurement ID in the current sequence"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "CHANNEL_1_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 15
    BYTES                = 4
    FORMAT             = "I4"
    UNIT                 = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION        = "Channel 1 minimal sample value in
                          ADC non-linear format"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME                 = "CHANNEL_1_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE         = 20
    BYTES                = 4
```

```
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 1 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_1_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 25
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 1 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_2_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 32
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 2 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_2_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 37
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 2 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_2_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 42
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 2 mean of linearized ADC sample values"
END_OBJECT           = COLUMN
```

```
OBJECT                 = COLUMN
    NAME                = "CHANNEL_3_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 49
    BYTES               = 4
    FORMAT             = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 3 minimal sample value in
                        ADC non-linear format"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "CHANNEL_3_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 54
    BYTES               = 4
    FORMAT             = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 3 maximal sample value in
                        ADC non-linear format"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "CHANNEL_3_MEAN"
    DATA_TYPE          = ASCII_REAL
    START_BYTE       = 59
    BYTES               = 6
    FORMAT             = "F6.1"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 3 mean of linearized ADC sample values"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "CHANNEL_4_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 66
    BYTES               = 4
    FORMAT             = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 4 minimal sample value in
                        ADC non-linear format"
END_OBJECT            = COLUMN

OBJECT                 = COLUMN
    NAME                = "CHANNEL_4_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 71
    BYTES               = 4
    FORMAT             = "I4"
```

```
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 4 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME                = "CHANNEL_4_MEAN"
    DATA_TYPE          = ASCII_REAL
    START_BYTE       = 76
    BYTES               = 6
    FORMAT             = "F6.1"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 4 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME                = "CHANNEL_5_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 83
    BYTES               = 4
    FORMAT             = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 5 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME                = "CHANNEL_5_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 88
    BYTES               = 4
    FORMAT             = "I4"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 5 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME                = "CHANNEL_5_MEAN"
    DATA_TYPE          = ASCII_REAL
    START_BYTE       = 93
    BYTES               = 6
    FORMAT             = "F6.1"
    UNIT                = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 5 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
```

```
    NAME              = "CHANNEL_6_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 100
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 6 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_6_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 105
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 6 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_6_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 110
    BYTES             = 6
    FORMAT           = "F6.1"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 6 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_7_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 117
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 7 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_7_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 122
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
```

```
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 7 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_7_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 127
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 7 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_8_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 134
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 8 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_8_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 139
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 8 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_8_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 144
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 8 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_9_MIN"
```

```
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 151
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 9 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_9_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 156
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 9 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_9_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 161
    BYTES             = 6
    FORMAT           = "F6.1"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 9 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_10_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 168
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 10 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME              = "CHANNEL_10_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 173
    BYTES             = 4
    FORMAT           = "I4"
    UNIT              = "N/A"
    MISSING_CONSTANT = 9999
```

```
    DESCRIPTION      = "Channel 10 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_10_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 178
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 10 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_11_MIN"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE  = 185
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 11 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_11_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 190
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 11 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_11_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 195
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 11 mean of linearized ADC sample values"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_12_MIN"
    DATA_TYPE   = ASCII_INTEGER
```

```
    START_BYTE  = 202
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 12 minimal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_12_MAX"
    DATA_TYPE   = ASCII_INTEGER
    START_BYTE       = 207
    BYTES              = 4
    FORMAT            = "I4"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999
    DESCRIPTION      = "Channel 12 maximal sample value in
                        ADC non-linear format"
END_OBJECT           = COLUMN

OBJECT                = COLUMN
    NAME               = "CHANNEL_12_MEAN"
    DATA_TYPE         = ASCII_REAL
    START_BYTE       = 212
    BYTES              = 6
    FORMAT            = "F6.1"
    UNIT               = "N/A"
    MISSING_CONSTANT = 9999.9
    DESCRIPTION      = "Channel 12 mean of linearized ADC sample values"
END_OBJECT           = COLUMN
```

4.3.3.4.2 PP Data object definition (level 3)

4.3.3.4.2.1 PP Active mode test

During an active mode test, one active PP measurement is performed. Adjusted and measured values (DAC table read back from PP memory, time series of transmitter current and receiver voltage samples) are sent to ground. Telemetry concludes with the results of the on-board data evaluation. Adjustable parameters of command active mode test are the configuration of electrodes, the transmitting frequency and the number of sine waves. Parameters are calibrated to voltages and currents where possible. For time series the relative offset from the first sample is given as fractions of a second.

The PP AMTEST data are organized as tables containing parameters, the DAC table read back from PP memory, transmitter and receiver time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to four data files.

Following is an example of PDS files corresponding to an AMTEST measurement.

SES_FS3_PAM_070929214512_TEST.LBL (label)
SES_FS3_PAM_070929214512_TPAR.TAB (parameters)
SES_FS3_PAM_070929214512_TDAC.TAB (DAC table)
SES_FS3_PAM_070929214512_TTX.TAB (transmitter time series)
SES_FS3_PAM_070929214512_TRX.TAB (receiver time series)

The parameters are described by the following TABLE object.

```
  OBJECT                   = AMTESTPARC_TABLE
    NAME                   = AMTESTPARC
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 1
    COLUMNS                = 9
    ROW_BYTES              = 90
    ^STRUCTURE             = "PP_AMT_PARC.FMT"
  END_OBJECT               = AMTESTPAR_TABLE
```

The structure of the parameters table is described in the file PP_AMT_PARC.FMT.

```
/* PP AMTEST sensor settings / calibrated, version 2, 2015-11-14 */

OBJECT          = COLUMN
    NAME         = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 1
    BYTES         = 6
    UNIT         = "N/A"
    FORMAT         = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT         = COLUMN

OBJECT          = COLUMN
  NAME          = "UTC"
  DATA_TYPE         = TIME
  START_BYTE         = 8
  BYTES          = 23
  DESCRIPTION         = "Measurement start time (UTC in PDS standard
    format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT         = COLUMN

OBJECT          = COLUMN
    NAME         = "SESAME_LOCAL_TIME"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 32
    BYTES         = 15
    FORMAT         = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
    (SLT) runs with a resolution of 1/32 seconds.
     SLT represents the least significant 32 bits
     of LOBT. The most significant 5 bits are in
     CDMS RSST (see SESAME Ready Message)"
END_OBJECT         = COLUMN

OBJECT          = COLUMN
    NAME         = "SENSOR_SETTINGS"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 48
    BYTES         = 7
    UNIT         = "N/A"
    DESCRIPTION         = "Commanded (echoed) electrode combination
     as 3-digit hexadecimal code 16#abi#
```

```
     with the following meaning:
    a: electrode connected to the TX A output.
       Possible values:
       0 [none],
       1 [+X leg],
       2 [MUPUS PEN]
    b: electrode connected to the TX B output.
       Possible values:
       0 [none],
       2 [MUPUS PEN],
       3 [APXS]
    i: input channel
       Possible values:
       0 [potential difference]
       1 [current at +X leg]
       2 [current at MUPUS PEN]
       3 [current at APXS]
       4 [direct measurement at +Y foot]
       5 [direct measurement at -Y foot]
       6 [reference voltage -2.5 V]
       7 [reference voltage +2.5 V] "
END_OBJECT        = COLUMN

OBJECT          = COLUMN
    NAME        = "NOMINAL_FREQUENCY"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 56
    BYTES        = 5
    UNIT        = "HZ"
    FORMAT        = "I5"
    DESCRIPTION         = "Nominal transmitter frequency "
END_OBJECT        = COLUMN

OBJECT          = COLUMN
    NAME        = "CORRECTED_FREQUENCY"
    DATA_TYPE         = ASCII_REAL
    START_BYTE         = 62
    BYTES        = 8
    UNIT        = "HZ"
    FORMAT        = "F8.2"
    DESCRIPTION         = "Corrected transmitter frequency"
END_OBJECT        = COLUMN

OBJECT          = COLUMN
    NAME        = "NUMBER_OF_WAVES"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 71
    BYTES        = 2
    UNIT        = "N/A"
    FORMAT        = I2
    DESCRIPTION         = "Number of generated transmitter sine waves "
END_OBJECT        = COLUMN
```

```
OBJECT          = COLUMN
    NAME        = "NUMBER_OF_SAMPLES"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE        = 74
    BYTES        = 5
    UNIT        = "N/A"
    FORMAT        = "I5"
    DESCRIPTION        = "Number of transmitter current and receiver voltage
     samples "
END_OBJECT        = COLUMN

OBJECT          = COLUMN
    NAME        = "ERROR_CODE"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE        = 80
    BYTES        = 8
    UNIT        = "N/A"
    MISSING_CONSTANT   = 16#0000#
    DESCRIPTION        = "Active mode results
     Hex value as 16#xxxx#. The  possible values are:
     8001 Invalid register address.
     8002 Error verifying register write.
     8004 Error accessing power register.
     8008 MUX setting not allowed.
     8010 Error accessing PP RAM.
     8020 Tried to start measurement but a measurement
    is already running.
     0040 Error during writing to instrument.
     0080 Error during reading from instrument.
     0100 Error using ADC of C-DPU.
     0200 Error during DAC table generation.
     0400 Calculated number of samples > N_SAMP_MAX.
     8800 C-DPU memory exhausted.
     9000 Measurement time out.
     2000 Invalid command parameter.
     8000 Flag indicates fatal error. "
END_OBJECT        = COLUMN
```

The DAC table is described by the following TABLE object.

```
  OBJECT                   = AMTESTDAC_TABLE
    NAME                   = AMTESTDAC
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 256
    COLUMNS                = 5
    ROW_BYTES              = 60
    ^STRUCTURE             = "PP_AMT_DACC.FMT"
  END_OBJECT               = AMTESTDAC_TABLE
```

The structure of the DAC table is described in the file PP_AMT_DACC.FMT.

```
OBJECT                   = COLUMN
```

```
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                          format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                          (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DAC_TIME_OFFSET"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 48
    BYTES               = 7
    UNIT                = "MILLISECOND"
    FORMAT              = "F7.3"
    DESCRIPTION         = "DAC time offset from start of wave"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DAC_VOLTAGE"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 56
    BYTES               = 7
    UNIT                = "VOLT"
    FORMAT              = "F7.3"
    DESCRIPTION         = "Transmitter electrode difference voltage "
END_OBJECT              = COLUMN
```

The receiver time series is described by the following TABLE object.

```
  OBJECT                   = AMTESTRX_TABLE
    NAME                   = AMTESTRX
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 8192
    COLUMNS                = 5
    ROW_BYTES              = 77
    ^STRUCTURE             = "PP_AMT_RXC.FMT"
  END_OBJECT               = AMT_RX_TABLE
```

The structure of the receiver time series table is described in the file PP_AMT_RXC.FMT.

```
OBJECT                   = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT               = "I6"
    DESCRIPTION          = "Sequence ID in the current data file"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
  NAME                   = "UTC"
  DATA_TYPE              = TIME
  START_BYTE             = 8
  BYTES                  = 23
  DESCRIPTION            = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "SESAME_LOCAL_TIME"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 32
    BYTES                = 15
    FORMAT               = "I15"
    DESCRIPTION          = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                            SLT represents the least significant 32 bits
                            of LOBT. The most significant 5 bits are in
                            CDMS RSST (see SESAME Ready Message)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "RX_TIME "
    DATA_TYPE            = ASCII_REAL
    START_BYTE           = 48
    BYTES                = 8
    UNIT                 = "MILLISECOND"
    FORMAT               = "F8.3"
    DESCRIPTION          = "Relative to start time"
END_OBJECT               = COLUMN
```

```
OBJECT                    = COLUMN
    NAME                  = "RX_POTENTIAL_DIFFERENCE"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 57
    BYTES                 = 8
    UNIT                  = "VOLT"
    FORMAT                = "F8.3"
    DESCRIPTION           = "RX potential difference "
END_OBJECT                = COLUMN
```

The transmitter time series is described by the following TABLE object.

```
  OBJECT                    = AMTESTTX_TABLE
    NAME                    = AMTESTTX
    INTERCHANGE_FORMAT      = ASCII
    ROWS                    = 8192
    COLUMNS                 = 5
    ROW_BYTES               = 68
    ^STRUCTURE              = "PP_AMT_TXC.FMT"
  END_OBJECT                = AMTESTTX_TABLE
```

The structure of the transmitter TABLE object is defined in the file PP_AMT_TXC.FMT.

```
OBJECT                    = COLUMN
    NAME                  = "SESAME_SEQ_ID"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 1
    BYTES                 = 6
    UNIT                  = "N/A"
    FORMAT                = "I6"
    DESCRIPTION           = "Sequence ID in the current data file"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "UTC"
  DATA_TYPE               = TIME
  START_BYTE              = 8
  BYTES                   = 23
  DESCRIPTION             = "Measurement start time (UTC in PDS standard
                            format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "SESAME_LOCAL_TIME"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 32
    BYTES                 = 15
    FORMAT                = "I15"
    DESCRIPTION           = "Measurement start time. SESAME local time
                            (SLT) runs with a resolution of 1/32 seconds.
                             SLT represents the least significant 32 bits
                             of LOBT. The most significant 5 bits are in
```

```
                            CDMS RSST (see SESAME Ready Message)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TX_TIME "
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 48
    BYTES              = 8
    UNIT               = "MILLISECOND"
    FORMAT             = "F8.3"
    DESCRIPTION        = "Relative to start time"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TX_CURRENT"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 57
    BYTES              = 9
    UNIT               = "MILLIAMPERE"
    FORMAT             = "F9.6"
    DESCRIPTION        = "Tx current at electronics' transmitter output "
END_OBJECT             = COLUMN
```

4.3.3.4.2.2 PP Health Check (HC) data

Following is an example of PDS files corresponding to an HC measurement.

SES_FS3_PHC_070929214512_HC.LBL (label)
SES_FS3_PHC_070929214512_HC.TAB (parameters)

The HC data are described in the following TABLE object (simple detached label). All values are given as voltages or currents.

```
  OBJECT                 = SES_PHC_TABLE
    NAME                 = "SES_PHC"
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 = 1
    COLUMNS              = 14
    ROW_BYTES            = 144
    ^STRUCTURE           = "PP_HCC.FMT"
  END_OBJECT             = SES_PHC_TABLE
```

The structure of the TABLE object is defined in the file PP_HCC.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                          (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_VALUE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 48
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Result count of Langmuir probe measurement/not
                           calibrated "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ADC_OFFSET"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 54
    BYTES               = 7
    UNIT                = "VOLT"
    FORMAT              = "F7.4"
    DESCRIPTION         = "Should be close to 0 V"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "-2.5V REF"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 62
    BYTES               = 7
    UNIT                = "VOLT"
    FORMAT              = "F7.4"
    DESCRIPTION         = "-2.5V REF and +2.5V REF should be nearly
                           symmetrical to ADC offset"
END_OBJECT              = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "+2.5V_REF"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 70
    BYTES               = 7
    UNIT                = "VOLT"
    FORMAT              = "F7.4"
    DESCRIPTION         = "-2.5V REF and +2.5V REF should be nearly
                           symmetrical to ADC offset"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "DELTA"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 78
    BYTES               = 7
    UNIT                = "VOLT"
    FORMAT              = "F7.4"
    DESCRIPTION         = "Differential value -Y foot - +Y foot"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LEG+Y_RX1"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 86
    BYTES               = 8
    UNIT                = "MILLIVOLT"
    FORMAT              = "F8.3"
    DESCRIPTION         = "Direct voltage from receiver 1 at +Y leg (at 20C)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LEG-Y_RX2"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 95
    BYTES               = 8
    UNIT                = "MILLIVOLT"
    FORMAT              = "F8.3"
    DESCRIPTION         = "Direct voltage from receiver 2 at -Y leg (at 20C)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LEG+X_TX1"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 104
    BYTES               = 9
    UNIT                = "MILLIAMPERE"
    FORMAT              = "F9.6"
    DESCRIPTION         = "Transmitter current at electrode 1.
                           No voltage applied.
                           Should be close to 0 mA"
END_OBJECT              = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "MUPUS_PEN_TX2"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 114
    BYTES               = 9
    UNIT                = "MILLIAMPERE"
    FORMAT              = "F9.6"
    DESCRIPTION         = "Transmitter current at electrode 2.
                           No voltage applied.
                           Should be close to 0 mA"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "APXS_TX3"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 124
    BYTES               = 9
    UNIT                = "MILLIAMPERE"
    FORMAT              = "F9.6"
    DESCRIPTION         = "Transmitter current at electrode 3.
                           No voltage applied.
                           Should be close to 0 mA"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ERROR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 134
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT     = 16#0000#
    DESCRIPTION         = "Hex value as 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN
```

4.3.3.4.2.3 PP Langmuir Probe Test (LM) data

This measurement sequence is mainly used for ground tests and is not a regular flight measurement.
Following is an example of PDS files corresponding to an LM measurement.

SES_FS3_PLM_070929214512_LM.LBL (label)
SES_FS3_PLM_070929214512_LM.TAB (parameters)

The LM data are described in the following TABLE object (simple detached label).

```
  OBJECT                  = SES_PLM_TABLE
    NAME                  = "SES_LM"
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 17
    COLUMNS               = 5
    ROW_BYTES             = 64
    ^STRUCTURE            = "PP_LMC.FMT"
  END_OBJECT              = SES_PLM_TABLE
```

The structure of the TABLE object is defined in the file PP_LMC.FMT.

```
/* PP Langmuir Probe measurement /calibrated, version 2, 2015-11-14*/

OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
  NAME                 = "UTC"
  DATA_TYPE            = TIME
  START_BYTE           = 8
  BYTES                = 23
  DESCRIPTION          = "Measurement start time (UTC in PDS standard
                          format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "SESAME_LOCAL_TIME"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 32
    BYTES              = 15
    FORMAT             = "I15"
    DESCRIPTION        = "Measurement start time. SESAME local time
                         (SLT) runs with a resolution of 1/32 seconds.
                          SLT represents the least significant 32 bits
                          of LOBT. The most significant 5 bits are in
                          CDMS RSST (see SESAME Ready Message)"
END_OBJECT             = COLUMN
```

```
OBJECT                 = COLUMN
    NAME               = "INTEGRATION_TIME"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 48
    BYTES              = 8
    UNIT               = "MILLISECOND"
    FORMAT             = "F8.4"
    DESCRIPTION        = "Integration time until trigger limit reached"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "PLASMA_WAVE_AMPLITUDE"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 57
    BYTES              = 5
    UNIT               = "MILLIVOLT"
    FORMAT             = "F5.2"
    MISSING_CONSTANT   = "99.99"
    DESCRIPTION        = "Plasmawave amplitude at LP-detector "
END_OBJECT             = COLUMN
```

4.3.3.4.2.4 PP Passive Mode Test (PMTEST)

The PP PMTEST data are organized as tables containing parameters, selectable analog channel time series and receiver (Rx) time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to three data files. The parameters are given as calibrated voltages or frequencies where possible, the time series are given with a time offset relative to the first sample and voltages for each time series values, calibrated for pre-amplifier temperatures of +20°C. For actual temperatures the values have to be reduced according to the ratio of the preamplifier amplification, nominally 8.1, but at temperatures of -160°C close to 6.

Following is an example of PDS files corresponding to a PMTEST measurement.

SES_FS3_PPM_070929214512_TEST.LBL (label)
SES_FS3_PPM_070929214512_TPAR.TAB (parameters)
SES_FS3_PPM_070929214512_TCH.TAB (parameters)
SES_FS3_PPM_070929214512_TRX.TAB (receiver time series)

The PMTEST parameters are described in the following TABLE object (simple detached label).

```
OBJECT               = PMTEST_PAR_TABLE
  NAME               = "PMTEST_PAR"
  INTERCHANGE_FORMAT = ASCII
  ROWS               = 12
  COLUMNS            = 11
  ROW_BYTES          = 114
  ^STRUCTURE         = "PP_PMT2_PARC.FMT"
END_OBJECT           = PMTEST_PAR_TABLE
```

The structure of the parameters table is described in the file PP_PMT2_PARC.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
```

```
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 1
    BYTES                 = 6
    UNIT                  = "N/A"
    FORMAT                = "I6"
    DESCRIPTION           = "Sequence ID in the current data file"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "UTC"
  DATA_TYPE               = TIME
  START_BYTE              = 8
  BYTES                   = 23
  DESCRIPTION             = "Measurement start time (UTC in PDS standard
                             format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "SESAME_LOCAL_TIME"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 32
    BYTES                 = 15
    FORMAT                = "I15"
    DESCRIPTION           = "Measurement start time. SESAME local time
                            (SLT) runs with a resolution of 1/32 seconds.
                             SLT represents the least significant 32 bits
                             of LOBT. The most significant 5 bits are in
                             CDMS RSST (see SESAME Ready Message)"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "LP_INT_INC"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 48
    BYTES                 = 9
    UNIT                  = "SECOND"
    FORMAT                = "F9.7"
    DESCRIPTION           = "Time increment duration per integrator unit "
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "LP_VALUE"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 58
    BYTES                 = 9
    UNIT                  = "SECOND"
    FORMAT                = "F9.7"
    DESCRIPTION           = "Integration time of Langmuir probe measurement "
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "LP_MEAS_ERR"
    DATA_TYPE             = ASCII_INTEGER
```

```
    START_BYTE          = 68
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Error code for LP measurement.
                          Hex value as 16#xxxx#. The  possible values are:
                          8001  Invalid register address.
                          8002  Error verifying register write.
                          8004  Error accessing power register.
                          8008  MUX setting not allowed.
                          8010  Error accessing PP RAM.
                          8020  Tried to start measurement but a measurement
                                is already running.
                          0040  Error during writing to instrument.
                          0080  Error during reading from instrument.
                          0100  Error using ADC of C-DPU.
                          0200  Error during DAC table generation.
                          0400  Calculated number of samples > N_SAMP_MAX.
                          8800  C-DPU memory exhausted.
                          9000  Measurement time out.
                          2000  Invalid command parameter.
                          8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_INC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 77
    BYTES               = 9
    UNIT                = "SECOND"
    FORMAT              = "F9.7"
    DESCRIPTION         = "Time increment between samples"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NB_SAMPLES"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 87
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Number of used samples (excluding skipped samples) "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ERROR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 93
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Hex value as 16#xxxx#. The  possible values are:
                          8001  Invalid register address.
```

```
                                 8002  Error verifying register write.
                                 8004  Error accessing power register.
                                 8008  MUX setting not allowed.
                                 8010  Error accessing PP RAM.
                                 8020  Tried to start measurement but a measurement
                                       is already running.
                                 0040  Error during writing to instrument.
                                 0080  Error during reading from instrument.
                                 0100  Error using ADC of C-DPU.
                                 0200  Error during DAC table generation.
                                 0400  Calculated number of samples > N_SAMP_MAX.
                                 8800  C-DPU memory exhausted.
                                 9000  Measurement time out.
                                 2000  Invalid command parameter.
                                 8000  Flag indicates fatal error. "
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "NB_FREQ_BINS"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 102
    BYTES                      = 2
    UNIT                       = "N/A"
    FORMAT                     = "I2"
    DESCRIPTION                = "Number of frequency bins "
END_OBJECT                     = COLUMN

OBJECT                         = COLUMN
    NAME                       = "MATH_ERR_CODE"
    DATA_TYPE                  = ASCII_INTEGER
    START_BYTE                 = 105
    BYTES                      = 8
    UNIT                       = "N/A"
    MISSING_CONSTANT           = 16#0000#
    DESCRIPTION                = "Indicates errors, which can only occur during
                                 on-board data reduction (hex value as 16#xxxx#).
                                 0001  Reduce: number of vector elements odd or less
                                       than 2; fatal.
                                 0002  Expand: less than four elements in input
                                       vector; fatal.
                                 0004  Too much data for analysis; truncating.
                                 0008  Too few data for analysis; padding with '128'
                                 0010  Used number of waves is not a power of 2;
                                       truncated.
                                 0020  Not the expected number of elements in
                                       filtered arrays; fatal.
                                 0040  Argument for sine_table() not in valid range
                                       0<= deg2 <=720.
                                 0080  Overflow in divsin() or result inexact.
                                 0100  Too few data for trimmed mean calculation;
                                       regular mean used.
                                 0200  No data for warr.mean; particular: analysis
                                       yields no data.
```

```
                         0400  Passive mode: not enough data in bin.
                         0800  Not enough memory for data reduction."
END_OBJECT             = COLUMN
```

The PMTEST receiver data are described in the following TABLE object (simple detached label).

```
  OBJECT                 = PMT_RX_TABLE
    NAME                 = PMT_RX
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 = 8192
    COLUMNS              = 5
    ROW_BYTES            = 66
    ^STRUCTURE           = "PP_PMT2_RXC.FMT"
  END_OBJECT             = PMT_RX_TABLE
```

The structure of the receiver time series table is described in the file PP_PMT2_RXC.FMT.

```
OBJECT                 = COLUMN
    NAME               = "SESAME_SEQ_ID"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 1
    BYTES              = 6
    UNIT               = "N/A"
    FORMAT             = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
  NAME                 = "UTC"
  DATA_TYPE            = TIME
  START_BYTE           = 8
  BYTES                = 23
  DESCRIPTION          = "Measurement start time (UTC in PDS standard
                         format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "SESAME_LOCAL_TIME"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 32
    BYTES              = 15
    FORMAT             = "I15"
    DESCRIPTION        = "Measurement start time. SESAME local time
                         (SLT) runs with a resolution of 1/32 seconds.
                          SLT represents the least significant 32 bits
                          of LOBT. The most significant 5 bits are in
                          CDMS RSST (see SESAME Ready Message)"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "TIME_OFFSET "
    DATA_TYPE          = ASCII_REAL
```

```
    START_BYTE          = 48
    BYTES               = 7
    UNIT                = "MILLISECOND"
    FORMAT              = "F7.3"
    DESCRIPTION         = "Time offset from first sample"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "POTENTIAL_DIFF"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 56
    BYTES               = 8
    UNIT                = "MILLIVOLT"
    FORMAT              = "F8.3"
    DESCRIPTION         = "Potential Difference between +Y and -Y foot "
END_OBJECT              = COLUMN
```

4.3.3.4.3 Flight software version FM2

4.3.3.4.3.1 PP Active mode test

During an active mode test, one active PP measurement is performed. Adjusted and measured values (DAC table read back from PP memory, time series of transmitter current and receiver voltage samples) are sent to ground. All values are calibrated according to frequencies or voltages where possible. Telemetry concludes with the results of the on-board data evaluation. Adjustable parameters of command active mode test are the configuration of electrodes, the transmitting frequency and amplitude and the number of sine waves. Because telemetry contains the raw time series data and the results of the on-board evaluation it is possible to check both, details of the time series and the correct working of the data evaluation.

The PP AMTEST2 data are organized as tables containing parameters including the on-board evaluation results, the DAC table read back from PP memory, transmitter and receiver time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to four data files.

Following is an example of PDS files corresponding to an AMTEST2 measurement.

SES_FS3_PAM_070929214512_TEST.LBL (label)
SES_FS3_PAM_070929214512_TPAR.TAB (parameters)
SES_FS3_PAM_070929214512_TDAC.TAB (DAC table)
SES_FS3_PAM_070929214512_TTX.TAB (transmitter time series)
SES_FS3_PAM_070929214512_TRX.TAB (receiver time series)

The parameters are described by the following TABLE object.

```
  OBJECT                  = AMT2_PARC_TABLE
    NAME                  = AMT2_PARC
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 1
    COLUMNS               = 13
    ROW_BYTES             = 111
    ^STRUCTURE            = "PP_AMT2_PARC.FMT"
  END_OBJECT              = AMT2_PARC_TABLE
```

The structure of the parameters table is described in the file PP_AMT2_PARC.FMT.

```
/* PP AMTEST2 parameter settings / calibrated, version 3, 2015-12-16 */
```

```
OBJECT              = COLUMN
    NAME            = "SESAME_SEQ_ID"
    DATA_TYPE       = ASCII_INTEGER
    START_BYTE      = 1
    BYTES           = 6
    UNIT            = "N/A"
    FORMAT          = "I6"
    DESCRIPTION     = "Sequence ID in the current data file"
END_OBJECT          = COLUMN

OBJECT                = COLUMN
  NAME                = "UTC"
  DATA_TYPE           = TIME
  START_BYTE          = 8
  BYTES               = 23
  DESCRIPTION         = "Measurement start time (UTC in PDS standard
                         format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "SESAME_LOCAL_TIME"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 32
    BYTES             = 15
    FORMAT            = "I15"
    DESCRIPTION       = "Measurement start time. SESAME local time
                        (SLT) runs with a resolution of 1/32 seconds.
                         SLT represents the least significant 32 bits
                         of LOBT. The most significant 5 bits are in
                         CDMS RSST (see SESAME Ready Message)"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
    NAME              = "SENSOR_SETTINGS_USED"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 48
    BYTES             = 7
    UNIT              = "N/A"
    DESCRIPTION       = "Used electrode combination as 3-digit
                          hexadecimal code 16#abi# with the
                          following meaning:
                        a: electrode connected to the TX A output.
                           Possible values:
                           0 [none],
                           1 [+X leg],
                           2 [MUPUS PEN]
                        b: electrode connected to the TX B output.
                           Possible values:
                           0 [none],
                           2 [MUPUS PEN],
                           3 [APX]
                        i: input channel
                           Possible values:
```

```
                          0 [potential difference]
                          1 [current at +X leg]
                          2 [current at MUPUS PEN]
                          3 [current at APX]
                          4 [direct measurement at +Y foot]
                          5 [direct measurement at - foot]
                          6 [reference voltage -2.5 V]
                          7 [reference voltage +2.5 V] "
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "NOMINAL_FREQUENCY"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 56
    BYTES              = 5
    UNIT               = "HZ"
    FORMAT             = "I5"
    DESCRIPTION        = "Nominal transmitter frequency"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "CORRECTED_FREQUENCY"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 62
    BYTES              = 8
    UNIT               = "HZ"
    FORMAT             = "F8.2"
    DESCRIPTION        = "Corrected transmitter frequency"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "NUMBER_OF_WAVES"
    DATA_TYPE          = ASCII_INTEGER
    START_BYTE         = 71
    BYTES              = 2
    UNIT               = "N/A"
    FORMAT             = "I2"
    DESCRIPTION        = "Number of generated transmitter sine waves"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RX_SAMPLING_FREQUENCY"
    DATA_TYPE          = ASCII_REAL
    START_BYTE         = 74
    BYTES              = 8
    UNIT               = "HZ"
    FORMAT             = "F8.1"
    DESCRIPTION        = "Receiver sampling frequency"
END_OBJECT             = COLUMN

OBJECT                 = COLUMN
    NAME               = "RX_SAMPLING_FREQUENCY"
    DATA_TYPE          = ASCII_REAL
```

```
    START_BYTE          = 83
    BYTES               = 8
    UNIT                = "HZ"
    FORMAT              = "F8.1"
    DESCRIPTION         = "Transmitter DAC sampling frequency"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NO_OF_DAC_VALUES"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 92
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    DESCRIPTION         = "DAC vector length"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TX_OUT_DAMPING"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 96
    BYTES               = 1
    UNIT                = "N/A"
    FORMAT              = "I1"
    DESCRIPTION         = "TX Voltage Amplitude Reduction.
                             The possible values are:
                           0 maximum amplitude.
                           1 half amplitude.
                           2 quarter amplitude.
                           3 1/8 amplitude.
                           4 1/16 amplitude."
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "POINTS_PER_WAVE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 98
    BYTES               = 3
    UNIT                = "N/A"
    FORMAT              = "I3"
    MISSING_CONSTANT    = 999
    DESCRIPTION         = "Number of points per wave used by receiver "
END_OBJECT              = COLUMN
```

The DAC table is identical to the FM1 version and is described by the following TABLE object.

```
  OBJECT                  = AMT_DACC_TABLE
    NAME                  = AMTESTDACC
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 256
    COLUMNS               = 5
    ROW_BYTES             = 65
    ^STRUCTURE            = "PP_AMT_DACC.FMT"
```

```
  END_OBJECT               = AMT_DACC_TABLE
```

The structure of the DAC table is described in the file PP_AMT_DACC.FMT.

```
/* PP AMTEST / AMTEST2 DAC table entry, version 2, 2015-11-14 */

OBJECT                     = COLUMN
    NAME                   = "SESAME_SEQ_ID"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 1
    BYTES                  = 6
    UNIT                   = "N/A"
    FORMAT                 = "I6"
    DESCRIPTION            = "Sequence ID in the current data file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "UTC"
  DATA_TYPE                = TIME
  START_BYTE               = 8
  BYTES                    = 23
  DESCRIPTION              = "Measurement start time (UTC in PDS standard
                             format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 32
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Measurement start time. SESAME local time
                             (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "DAC_TIME_OFFSET"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 48
    BYTES                  = 7
    UNIT                   = "MILLISECOND"
    FORMAT                 = "F7.3"
    DESCRIPTION            = "DAC time offset from start of wave"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "DAC_VOLTAGE"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 56
    BYTES                  = 7
```

```
    UNIT                 = "VOLT"
    FORMAT               = "F7.3"
    DESCRIPTION          = "Transmitter electrode difference voltage "
END_OBJECT               = COLUMN
```

The receiver time series is identical to the FM1 version and is described by the following TABLE object.

```
  OBJECT                   = AMT_RXC_TABLE
    NAME                   = AMTESTRXC
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 8192
    COLUMNS                = 5
    ROW_BYTES              = 67
    ^STRUCTURE             = "PP_AMT_RXC.FMT"
  END_OBJECT               = AMT_RXC_TABLE
```

The structure of the receiver time series table is described in the file PP_AMT_RXC.FMT.

```
OBJECT                   = COLUMN
    NAME                 = "SESAME_SEQ_ID"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 1
    BYTES                = 6
    UNIT                 = "N/A"
    FORMAT               = "I6"
    DESCRIPTION          = "Sequence ID in the current data file"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
  NAME                   = "UTC"
  DATA_TYPE              = TIME
  START_BYTE             = 8
  BYTES                  = 23
  DESCRIPTION            = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "SESAME_LOCAL_TIME"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 32
    BYTES                = 15
    FORMAT               = "I15"
    DESCRIPTION          = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                            SLT represents the least significant 32 bits
                            of LOBT. The most significant 5 bits are in
                            CDMS RSST (see SESAME Ready Message)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "RX_TIME "
```

```
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 48
    BYTES                 = 8
    UNIT                  = "MILLISECOND"
    FORMAT                = "F8.3"
    DESCRIPTION           = "Relative to start time"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "RX_POTENTIAL_DIFFERENCE"
    DATA_TYPE             = ASCII_REAL
    START_BYTE            = 57
    BYTES                 = 8
    UNIT                  = "VOLT"
    FORMAT                = "F8.3"
    DESCRIPTION           = "RX potential difference "
END_OBJECT                = COLUMN
```

The transmitter time series is identical to the FM1 version and is described by the following TABLE object.

```
  OBJECT                    = AMT_TX_TABLE
    NAME                    = AMT_TXC
    INTERCHANGE_FORMAT      = ASCII
    ROWS                    = 8192
    COLUMNS                 = 5
    ROW_BYTES               = 68
    ^STRUCTURE              = "PP_AMT_TXC.FMT"
  END_OBJECT                = AMT_TX_TABLE
```

The structure of the transmitter TABLE object is defined in the file PP_AMT_TXC.FMT.

```
/* PP AMTEST2 Tx table entry, version 2, 2015-11-14 */

OBJECT                    = COLUMN
    NAME                  = "SESAME_SEQ_ID"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 1
    BYTES                 = 6
    UNIT                  = "N/A"
    FORMAT                = "I6"
    DESCRIPTION           = "Sequence ID in the current data file"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "UTC"
  DATA_TYPE               = TIME
  START_BYTE              = 8
  BYTES                   = 23
  DESCRIPTION             = "Measurement start time (UTC in PDS standard
                            format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                          (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TX_TIME "
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 48
    BYTES               = 8
    UNIT                = "MILLISECOND"
    FORMAT              = "F8.3"
    DESCRIPTION         = "Relative to start time"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TX_CURRENT"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 57
    BYTES               = 9
    UNIT                = "MILLIAMPERE"
    FORMAT              = "F9.6"
    DESCRIPTION         = "Tx current at electronics' transmitter output "
END_OBJECT              = COLUMN
```

4.3.3.4.3.2 PP Health Check (HC) data

Same as FM1

4.3.3.4.3.3 PP Langmuir Probe Test (LM) data

Same as FM1

4.3.3.4.3.4 PP Passive Mode (PM) data

The PP PM data are organized as tables containing parameters and power spectra. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to two data files.

Following is an example of PDS files corresponding to a PM measurement.

SES_FS3_PPM_070929214512_PM.LBL (label)

SES_FS3_PPM_070929214512_PAR.TAB (parameters)

SES_FS3_PPM_070929214512_POW.TAB (power spectrum)

The parameters are described by the following TABLE object.

```
  OBJECT                    = PM2_PAR_TABLE
    NAME                    = PM2PAR
```

```
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 1
    COLUMNS                = 11
    ROW_BYTES              = 115
    ^STRUCTURE             = "PP_PM2_PARC.FMT"
  END_OBJECT               = PM2_PAR_TABLE
```

The structure of the parameters TABLE object is described in the file PP_PM2_PARC.FMT.

```
OBJECT                     = COLUMN
    NAME                   = "SESAME_SEQ_ID"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 1
    BYTES                  = 6
    UNIT                   = "N/A"
    FORMAT                 = "I6"
    DESCRIPTION            = "Sequence ID in the current data file"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "UTC"
  DATA_TYPE                = TIME
  START_BYTE               = 8
  BYTES                    = 23
  DESCRIPTION              = "Measurement start time (UTC in PDS standard
                              format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "SESAME_LOCAL_TIME"
    DATA_TYPE              = ASCII_INTEGER
    START_BYTE             = 32
    BYTES                  = 15
    FORMAT                 = "I15"
    DESCRIPTION            = "Measurement start time. SESAME local time
                             (SLT) runs with a resolution of 1/32 seconds.
                              SLT represents the least significant 32 bits
                              of LOBT. The most significant 5 bits are in
                              CDMS RSST (see SESAME Ready Message)"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "LP_INT_INC"
    DATA_TYPE              = ASCII_REAL
    START_BYTE             = 48
    BYTES                  = 9
    UNIT                   = "SECOND"
    FORMAT                 = "F9.7"
    DESCRIPTION            = "Time increment duration per integrator unit "
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
    NAME                   = "LP_VALUE"
```

```
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 58
    BYTES               = 9
    UNIT                = "SECOND"
    FORMAT              = "F9.7"
    DESCRIPTION         = "Integration time of Langmuir probe measurement "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_MEAS_ERR"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 68
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Error code for LP measurement as
                           Hex value 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_INC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 77
    BYTES               = 9
    UNIT                = "SECOND"
    FORMAT              = "F9.7"
    DESCRIPTION         = "Time increment between samples"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NB_SAMPLES"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 87
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Number of used samples (excluding skipped samples) "
```

```
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "ERROR_CODE"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 93
    BYTES                 = 8
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 16#0000#
    DESCRIPTION           = "Hex value AS 16#XXXX#. The  possible values are:
                            8001  Invalid register address.
                            8002  Error verifying register write.
                            8004  Error accessing power register.
                            8008  MUX setting not allowed.
                            8010  Error accessing PP RAM.
                            8020  Tried to start measurement but a measurement
                                  is already running.
                            0040  Error during writing to instrument.
                            0080  Error during reading from instrument.
                            0100  Error using ADC of C-DPU.
                            0200  Error during DAC table generation.
                            0400  Calculated number of samples > N_SAMP_MAX.
                            8800  C-DPU memory exhausted.
                            9000  Measurement time out.
                            2000  Invalid command parameter.
                            8000  Flag indicates fatal error. "
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "NB_FREQ_BINS"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 102
    BYTES                 = 2
    UNIT                  = "N/A"
    FORMAT                = "I2"
    DESCRIPTION           = "Number of frequency bins "
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
    NAME                  = "MATH_ERR_CODE"
    DATA_TYPE             = ASCII_INTEGER
    START_BYTE            = 105
    BYTES                 = 8
    UNIT                  = "N/A"
    MISSING_CONSTANT      = 16#0000#
    DESCRIPTION           = "Indicates errors, which can only occur during
                            on-board data reduction (hex value).
                            0001  Reduce: number of vector elements odd or less
                                  than 2; fatal.
                            0002  Expand: less than four elements in input
                                  vector; fatal.
                            0004  Too much data for analysis; truncating.
                            0008  Too few data for analysis; padding with '128'
```

```
                          0010  Used number of waves is not a power of 2;
                                truncated.
                          0020  Not the expected number of elements in
                                filtered arrays; fatal.
                          0040  Argument for sine_table() not in valid range
                                0<= deg2 <=720.
                          0080  Overflow in divsin() or result inexact.
                          0100  Too few data for trimmed mean calculation;
                                regular mean used.
                          0200  No data for warr.mean; particular: analysis
                                yields no data.
                          0400  Passive mode: not enough data in bin.
                          0800  Not enough memory for data reduction."
END_OBJECT             = COLUMN
```

The power spectrum is described by the following TABLE object.

```
  OBJECT                   = PM2_POWC_TABLE
    NAME                   = PM2_POWC
    INTERCHANGE_FORMAT     = ASCII
    ROWS                   = 10
    COLUMNS                = 5
    ROW_BYTES              = 68
    ^STRUCTURE             = "PP_PM2_POWC.FMT"
  END_OBJECT               = PM2_POWC_TABLE
```

The structure of the power spectrum TABLE object is described in the file PP_PM2_POWC.FMT

```
/* PP calibrated power values, version 2, 2015-11-14 */

OBJECT         = COLUMN
    NAME        = "SESAME_SEQ_ID"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE        = 1
    BYTES        = 6
    UNIT        = "N/A"
    FORMAT        = "I6"
    DESCRIPTION        = "Sequence ID in the current data file"
END_OBJECT        = COLUMN

OBJECT         = COLUMN
  NAME         = "UTC"
  DATA_TYPE        = TIME
  START_BYTE        = 8
  BYTES        = 23
  DESCRIPTION        = "Measurement start time (UTC in PDS standard
     format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT        = COLUMN

OBJECT         = COLUMN
    NAME        = "SESAME_LOCAL_TIME"
    DATA_TYPE        = ASCII_INTEGER
    START_BYTE        = 32
```

```
    BYTES        = 15
    FORMAT        = "I15"
    DESCRIPTION        = "Measurement start time. SESAME local time
    (SLT) runs with a resolution of 1/32 seconds.
     SLT represents the least significant 32 bits
     of LOBT. The most significant 5 bits are in
     CDMS RSST (see SESAME Ready Message)"
END_OBJECT        = COLUMN

OBJECT         = COLUMN
    NAME        = "CENTER_FREQ"
    DATA_TYPE         = ASCII_REAL
    START_BYTE         = 48
    BYTES        = 7
    FORMAT        = "F7.1"
    UNIT        = "Hz"
    DESCRIPTION        = "Frequency bins Center Frequency +/- 1/3"
END_OBJECT        = COLUMN

OBJECT         = COLUMN
    NAME        = "VOLTAGE_DENSITY"
    DATA_TYPE         = ASCII_REAL
    START_BYTE         = 56
    BYTES        = 10
    FORMAT        = "F10.2"
    UNIT        = "<mV*(Hz**-1/2)>"
    DESCRIPTION        = "Voltage Density"
END_OBJECT        = COLUMN
```

4.3.3.4.3.5 PP Passive Mode Test (PMTEST) data

The PP PMTEST2 data are organized as tables containing parameters, power spectra and receiver (Rx) time series. The tables are kept in separate data files (combined detached labels). Consequently there will be one PDS label pointing to three data files.

Following is an example of PDS files corresponding to an PMTEST measurement.

SES_FS3_PPM_070929214512_TEST.LBL (label)
SES_FS3_PPM_070929214512_TPAR.TAB (parameters)
SES_FS3_PPM_070929214512_TPOW.TAB (power spectrum)
SES_FS3_PPM_070929214512_TRX.TAB (receiver time series)

The parameters are described by the following TABLE object.

```
  OBJECT                  = PMT2_PARC_TABLE
    NAME                  = PMT2_PARC
    INTERCHANGE_FORMAT    = ASCII
    ROWS                  = 1
    COLUMNS               = 11
    ROW_BYTES             = 115
    ^STRUCTURE            = "PP_PMT2_PACR.FMT"
  END_OBJECT              = PMT2_PARC_TABLE
```

The structure of the parameters TABLE object is described in the file PP_PMT2_PARC.FMT.

```
/* PP PM2 calibrated parameters, version 2, 2015-11-14 */

OBJECT                  = COLUMN
    NAME                = "SESAME_SEQ_ID"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 1
    BYTES               = 6
    UNIT                = "N/A"
    FORMAT              = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "UTC"
  DATA_TYPE             = TIME
  START_BYTE            = 8
  BYTES                 = 23
  DESCRIPTION           = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "SESAME_LOCAL_TIME"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 32
    BYTES               = 15
    FORMAT              = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
                          (SLT) runs with a resolution of 1/32 seconds.
                           SLT represents the least significant 32 bits
                           of LOBT. The most significant 5 bits are in
                           CDMS RSST (see SESAME Ready Message)"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_INT_INC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 48
    BYTES               = 9
    UNIT                = "SECOND"
    FORMAT              = "F9.7"
    DESCRIPTION         = "Time increment duration per integrator unit "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "LP_VALUE"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 58
    BYTES               = 9
    UNIT                = "SECOND"
    FORMAT              = "F9.7"
    DESCRIPTION         = "Integration time of Langmuir probe measurement "
END_OBJECT              = COLUMN
```

```
OBJECT                  = COLUMN
    NAME                = "LP_MEAS_ERR"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 68
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Error code for LP measurement.
                           Hex value as 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "TIME_INC"
    DATA_TYPE           = ASCII_REAL
    START_BYTE          = 77
    BYTES               = 9
    UNIT                = "SECOND"
    FORMAT              = "F9.7"
    DESCRIPTION         = "Time increment between samples"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NB_SAMPLES"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 87
    BYTES               = 5
    UNIT                = "N/A"
    FORMAT              = "I5"
    DESCRIPTION         = "Number of used samples (excluding skipped samples) "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "ERROR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 93
    BYTES               = 8
```

```
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Hex value as 16#xxxx#. The  possible values are:
                           8001  Invalid register address.
                           8002  Error verifying register write.
                           8004  Error accessing power register.
                           8008  MUX setting not allowed.
                           8010  Error accessing PP RAM.
                           8020  Tried to start measurement but a measurement
                                 is already running.
                           0040  Error during writing to instrument.
                           0080  Error during reading from instrument.
                           0100  Error using ADC of C-DPU.
                           0200  Error during DAC table generation.
                           0400  Calculated number of samples > N_SAMP_MAX.
                           8800  C-DPU memory exhausted.
                           9000  Measurement time out.
                           2000  Invalid command parameter.
                           8000  Flag indicates fatal error. "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "NB_FREQ_BINS"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 102
    BYTES               = 2
    UNIT                = "N/A"
    FORMAT              = "I2"
    DESCRIPTION         = "Number of frequency bins "
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
    NAME                = "MATH_ERR_CODE"
    DATA_TYPE           = ASCII_INTEGER
    START_BYTE          = 105
    BYTES               = 8
    UNIT                = "N/A"
    MISSING_CONSTANT    = 16#0000#
    DESCRIPTION         = "Indicates errors, which can only occur during
                           on-board data reduction (hex value as 16#xxxx#).
                           0001  Reduce: number of vector elements odd or less
                                 than 2; fatal.
                           0002  Expand: less than four elements in input
                                 vector; fatal.
                           0004  Too much data for analysis; truncating.
                           0008  Too few data for analysis; padding with '128'
                           0010  Used number of waves is not a power of 2;
                                 truncated.
                           0020  Not the expected number of elements in
                                 filtered arrays; fatal.
                           0040  Argument for sine_table() not in valid range
                                 0<= deg2 <=720.
                           0080  Overflow in divsin() or result inexact.
```

```
                         0100  Too few data for trimmed mean calculation;
                               regular mean used.
                         0200  No data for warr.mean; particular: analysis
                               yields no data.
                         0400  Passive mode: not enough data in bin.
                         0800  Not enough memory for data reduction."
END_OBJECT             = COLUMN
```

The calibrated power spectrum is described by the following TABLE object.

```
  OBJECT                    = PMT2_POWC_TABLE
    NAME                    = PMT2_POWC
    INTERCHANGE_FORMAT      = ASCII
    ROWS                    = 10
    COLUMNS                 = 5
    ROW_BYTES               = 68
    ^STRUCTURE              = "PP_PM2_POWC.FMT"
  END_OBJECT                = PMT2_POWC_TABLE
```

The structure of the power TABLE object is identical to PM2C and is described in the file PP_PM2_POWC.FMT

```
/* PP calibrated power values, version 2, 2015-11-14 */

OBJECT          = COLUMN
    NAME         = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 1
    BYTES         = 6
    UNIT         = "N/A"
    FORMAT         = "I6"
    DESCRIPTION         = "Sequence ID in the current data file"
END_OBJECT         = COLUMN

OBJECT          = COLUMN
  NAME          = "UTC"
  DATA_TYPE         = TIME
  START_BYTE         = 8
  BYTES         = 23
  DESCRIPTION         = "Measurement start time (UTC in PDS standard
     format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT         = COLUMN

OBJECT          = COLUMN
    NAME         = "SESAME_LOCAL_TIME"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE         = 32
    BYTES         = 15
    FORMAT         = "I15"
    DESCRIPTION         = "Measurement start time. SESAME local time
    (SLT) runs with a resolution of 1/32 seconds.
     SLT represents the least significant 32 bits
     of LOBT. The most significant 5 bits are in
```

```
     CDMS RSST (see SESAME Ready Message)"
END_OBJECT        = COLUMN

OBJECT         = COLUMN
    NAME        = "CENTER_FREQ"
    DATA_TYPE        = ASCII_REAL
    START_BYTE        = 48
    BYTES        = 7
    FORMAT        = "F7.1"
    UNIT        = "Hz"
    DESCRIPTION        = "Frequency bins Center Frequency +/- 1/3"
END_OBJECT        = COLUMN

OBJECT         = COLUMN
    NAME        = "VOLTAGE_DENSITY"
    DATA_TYPE        = ASCII_REAL
    START_BYTE        = 56
    BYTES        = 10
    FORMAT        = "F10.2"
    UNIT        = "<mV*(Hz**-1/2)>"
    DESCRIPTION        = "Voltage Density"
END_OBJECT        = COLUMN
```

The receiver data are described by the following TABLE object.

```
  OBJECT                 = PMT2RXC_TABLE
    NAME                 = PM2TRXC
    INTERCHANGE_FORMAT   = ASCII
    ROWS                 = 8192
    COLUMNS              = 5
    ROW_BYTES            = 66
    ^STRUCTURE           = "PP_PMT2_RXC.FMT"
  END_OBJECT             = PMT2RX_TABLE
```

The structure of the receiver data TABLE object is described in the file PP_PMT2_RXC.FMT.

```
/* PP AMTEST2 Calibrated Rx table entry, version 2, 2015-11-14 */

OBJECT                = COLUMN
    NAME              = "SESAME_SEQ_ID"
    DATA_TYPE         = ASCII_INTEGER
    START_BYTE        = 1
    BYTES             = 6
    UNIT              = "N/A"
    FORMAT            = "I6"
    DESCRIPTION       = "Sequence ID in the current data file"
END_OBJECT            = COLUMN

OBJECT                = COLUMN
  NAME                = "UTC"
  DATA_TYPE           = TIME
  START_BYTE          = 8
  BYTES               = 23
```

```
  DESCRIPTION            = "Measurement start time (UTC in PDS standard
                           format YYYY-MM-DDThh:mm:ss.sss)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "SESAME_LOCAL_TIME"
    DATA_TYPE            = ASCII_INTEGER
    START_BYTE           = 32
    BYTES                = 15
    FORMAT               = "I15"
    DESCRIPTION          = "Measurement start time. SESAME local time
                           (SLT) runs with a resolution of 1/32 seconds.
                            SLT represents the least significant 32 bits
                            of LOBT. The most significant 5 bits are in
                            CDMS RSST (see SESAME Ready Message)"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "TIME_OFFSET "
    DATA_TYPE            = ASCII_REAL
    START_BYTE           = 48
    BYTES                = 7
    UNIT                 = "MILLISECOND"
    FORMAT               = "F7.3"
    DESCRIPTION          = "Time offset from first sample"
END_OBJECT               = COLUMN

OBJECT                   = COLUMN
    NAME                 = "POTENTIAL_DIFF"
    DATA_TYPE            = ASCII_REAL
    START_BYTE           = 56
    BYTES                = 8
    UNIT                 = "MILLIVOLT"
    FORMAT               = "F8.3"
    DESCRIPTION          = "Potential Difference between +Y and -Y foot "
END_OBJECT               = COLUMN
```

4.3.3.4.4 SESAME common data object definition

Same as level 2 (see §4.3.2.7.5).

4.3.3.5 Description of Instrument

The description of the instrument can be found in chapter 2.2 and as a brief overview in the INST.CAT catalogue file.

4.3.3.6 Parameters Index File Definition

N/A

4.3.3.7 Mission Specific Keywords

N/A

4.3.3.8 Data quality definition (level 3)

4.3.3.8.1 CASSE

Same definition as for level 2 (see §4.3.2.7.1)

4.3.3.8.2 DIM
Same definition as for level 2 (see 4.3.2.7.2)

4.3.3.8.3 PP
The DATA_QUALITY_ID for PP is defined according to the operating mode as follows.

4.3.3.8.3.1 PP Health Check
DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: At least one value is replaced by placeholder due to distorted raw data (= "0" or "255")
2: N/A
3: N/A
4: N/A

4.3.3.8.3.2 PP Active Mode and Active Mode Test (PP_AM2, PP_AMTEST2)
DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: <50% QUAL-flags = 0x0F, a few errors
2: 50% to 100% QUAL-flags = 0x0F, many errors
3: N/A
4: N/A

4.3.3.8.3.3 PP Passive Mode and Passive Mode Test (PP_PM2, PP_PMTEST2)
DATA_QUALITY_DESC = -1: NOT QUALIFIED
0: Data complete; no errors
1: Data distorted; level 2: ID = "1"
2: N/A
3: N/A
4: N/A

4.3.3.8.4 SESAME Health-Check
Same definition as for level 2 (see § 4.3.2.7.4)

5 Appendix

5.1 SESAME and PDS Glossary

Archive – An archive consists of one or more data sets along with all the documentation and ancillary information needed to understand and use the data. An archive is a logical construct independent of the medium on which it is stored.

Archive Volume, Archive Volume Set – A volume is a unit of media on which data products are stored; for example, one CD-ROM or DVD-ROM. An *archive volume* is a volume containing all or part of an archive; that is, data products plus documentation and ancillary files. When an archive spans multiple volumes, they are called an *archive volume set*. Usually the documentation and some ancillary files are repeated on each volume of the set, so that a single volume can be used alone.

Catalog Information – Descriptive information about a data set (e.g. mission description, spacecraft description, instrument description), expressed in Object Description Language (ODL), which is suitable for loading into a PDS catalog.

Central Electronics (CE) - Complete SESAME electronics in E-Box: *Common Electronics* and the 3 instrument PCBs

Common Electronics - Common SESAME electronics in E-Box: Interface board, Common DPU and SESAME Experiment bus.

Data Product – A labeled grouping of data resulting from a scientific observation, usually stored in one file. A product label identifies, describes, and defines the structure of the data. An example of a data product is a planetary image, a spectrum table, or a time series table.

Data Set – An accumulation of data products. A data set together with supporting documentation and ancillary files is an archive.

E-Box - Common container for the PCBs of most ROSETTA Lander sub-units and experiments

Experiment - The SESAME experiment set-up, consisting of Common Electronics and the three instruments (CASSE, DIM and PP)

Health-Check - Procedure to check the status of a SESAME instrument by dedicated tests, calibrations, and measurements of health-relevant parameters. Health-Checks are solely controlled by the Common DPU. The time duration of health data acquisition is not critical. The whole parameter set may be determined in one cycle within milliseconds or more. The resulting parameter values are fed into the science data stream.

Housekeeping - Procedure to check the status of a SESAME instrument by periodic calls of the CDMS, asking SESAME to read out single health-relevant key parameters in a pre-defined cycle. The resulting parameter value is delivered to the CDMS and included in the Lander housekeeping data stream.
A subset of the SESAME housekeeping parameters is extracted by the CDMS to form part of the Lander "Health Status Report" provided for Mission Control. The set of housekeeping parameters form a subset of the health-check parameters.

Instrument - The SESAME sub-units CASSE, DIM and PP, each with its own sensor / actuator assembly, the harness and a PCB within the *Central Electronics* (CE).

Jobcard, Job Card - Data structure of 32 byte length, especially developed for the CASSE instrument to completely control a CASSE measurement. A CASSE *Jobcard* contains all necessary parameter values (e.g. sampling frequency, "ping" frequency and duration, etc.) defining the complete performance of a measurement.

5.2 Example of PDS label for CASSE level 2 data product

```
PDS_VERSION_ID                = PDS3
LABEL_REVISION_NOTE  = "2017-02-13, SONC, version 1.0"

/* Edited SC data from CASSE Sounding Mode (SONC Level 2) */

DATA_SET_ID             = "RL-C-SESAME-2-FSS-V1.0"
DATA_SET_NAME           = "ROSETTA-LANDER 67P SESAME 2 FSS V1.0"
PRODUCT_ID              = "SES_FS2_CSN_1411140016"
PRODUCT_CREATION_TIME = 2017-02-13T17:41:41
MISSION_NAME             = "INTERNATIONAL ROSETTA MISSION"
MISSION_PHASE_NAME      = "FIRST SCIENCE SEQUENCE"
MISSION_ID               = ROSETTA
INSTRUMENT_HOST_NAME     = "ROSETTA-LANDER"
INSTRUMENT_HOST_ID       = RL

PRODUCT_TYPE            = EDR
START_TIME              = 2014-11-14T00:16:05.068
STOP_TIME               = 2014-11-14T00:25:42.381
SPACECRAFT_CLOCK_START_COUNT = "3/374544893.26"
SPACECRAFT_CLOCK_STOP_COUNT  = "3/374545471.04"

PRODUCER_ID              = "SONC"
PRODUCER_FULL_NAME       = "SCIENCE OPERATIONS AND NAVIGATION CENTER"
PRODUCER_INSTITUTION_NAME = "CNES"

INSTRUMENT_ID            = SESAME
INSTRUMENT_NAME          = "SURFACE ELECTRIC SOUNDING AND
                         ACOUSTIC MONITORING EXPERIMENT"
INSTRUMENT_TYPE          = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
                         "PERMITTIVITY PROBE"}
TARGET_NAME             = "67P/CHURYUMOV-GERASIMENKO 1 (1969 R1)"
TARGET_TYPE             = "COMET"

PROCESSING_LEVEL_ID   = "2"
DATA_QUALITY_ID          = "-1"
DATA_QUALITY_DESC        = "-1 : NOT QUALIFIED"

/* DATA OBJECT DEFINITION  */

OBJECT                 = FILE
  RECORD_TYPE            = FIXED_LENGTH
  RECORD_BYTES           =  176
  FILE_RECORDS           = 2
  ^JOBC_TABLE            = "SES_FS2_CSN_1411140016_JOBC.TAB"
  OBJECT                 = JOBC_TABLE
      NAME                 = "JOB_CARD"
      INTERCHANGE_FORMAT = ASCII
      ROWS                 = 2
      COLUMNS              = 29
      ROW_BYTES            = 176
```

```
      ^STRUCTURE          = "JOB_CARD_FM3.FMT"
   END_OBJECT           = JOBC_TABLE
END_OBJECT            = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 189
   FILE_RECORDS                  = 2
   ^SEQ_PARAM_TABLE      =  "SES_FS2_CSN_1411140016_SEQP.TAB"
   OBJECT               = SEQ_PARAM_TABLE
      NAME                = "SEQ_PARAM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 2
      COLUMNS             = 22
      ROW_BYTES           = 189
      ^STRUCTURE          = "SEQ_PARAM_BURST2_FM3.FMT"
   END_OBJECT           = SEQ_PARAM_TABLE
END_OBJECT            = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 231
   FILE_RECORDS                  = 42144
   ^DATA_TABLE                  = "SES_FS2_CSN_1411140016_DATA.TAB"
   OBJECT                      = DATA_TABLE
      NAME                      = "DATA"
      INTERCHANGE_FORMAT        = ASCII
      ROWS                      = 42144
      COLUMNS                   = 26
      ROW_BYTES                 = 231
      ^STRUCTURE                = "DATA2.FMT"
   END_OBJECT                  = DATA_TABLE
END_OBJECT                  = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 219
   FILE_RECORDS                  = 2
   ^STAT_TABLE                  = "SES_FS2_CSN_1411140016_STAT.TAB"
   OBJECT                      = STAT_TABLE
      NAME                      = "STAT"
      INTERCHANGE_FORMAT        = ASCII
      ROWS                      = 2
      COLUMNS                   = 38
      ROW_BYTES                 = 219
      ^STRUCTURE                = "STAT2_FM3.FMT"
   END_OBJECT                  = STAT_TABLE
END_OBJECT                  = FILE



END
```

5.3 Example of PDS label for DIM BC level 2 data product

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE  = "2017-02-13, SONC, version 1.0"

/* Edited SC data from DIM Burst Continuous Mode (SONC Level 2) */

DATA_SET_ID            = "RL-C-SESAME-2-FSS-V1.0"
DATA_SET_NAME          = "ROSETTA-LANDER 67P SESAME 2 FSS V1.0"
PRODUCT_ID             = "SES_FS2_DBC_1411130702"
PRODUCT_CREATION_TIME = 2017-02-13T17:41:17
MISSION_NAME            = "INTERNATIONAL ROSETTA MISSION"
MISSION_PHASE_NAME     = "FIRST SCIENCE SEQUENCE"
MISSION_ID              = ROSETTA
INSTRUMENT_HOST_NAME    = "ROSETTA-LANDER"
INSTRUMENT_HOST_ID      = RL

PRODUCT_TYPE           = EDR
START_TIME             = 2014-11-13T07:02:21.677
STOP_TIME              = 2014-11-13T07:53:08.397
SPACECRAFT_CLOCK_START_COUNT = "3/374482870.14"
SPACECRAFT_CLOCK_STOP_COUNT  = "3/374485917.05"

PRODUCER_ID             = "SONC"
PRODUCER_FULL_NAME      = "SCIENCE OPERATIONS AND NAVIGATION CENTER"
PRODUCER_INSTITUTION_NAME = "CNES"

INSTRUMENT_ID           = SESAME
INSTRUMENT_NAME         = "SURFACE ELECTRIC SOUNDING AND
                        ACOUSTIC MONITORING EXPERIMENT"
INSTRUMENT_TYPE         = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
                        "PERMITTIVITY PROBE"}
TARGET_NAME            = "67P/CHURYUMOV-GERASIMENKO 1 (1969 R1)"
TARGET_TYPE            = "COMET"

PROCESSING_LEVEL_ID    = "2"
DATA_QUALITY_ID         = "-1"
DATA_QUALITY_DESC       = "-1 : NOT QUALIFIED"


/* DATA OBJECT DEFINITION  */

OBJECT                        = FILE
   RECORD_TYPE                 = FIXED_LENGTH
   RECORD_BYTES                = 71
   FILE_RECORDS                = 6
   ^BC_PAR_TABLE               = "SES_FS2_DBC_1411130702_PAR.TAB"
   OBJECT                = BC_PAR_TABLE
      NAME                = "BC_PAR"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 6
      COLUMNS             = 11
      ROW_BYTES           = 71
```

```
      ^STRUCTURE         = "DIM_BC_PAR.FMT"
   END_OBJECT           = BC_PAR_TABLE
END_OBJECT                    = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 16
   FILE_RECORDS                  = 60
   ^BC_AM_TABLE                  = "SES_FS2_DBC_1411130702_AM.TAB"
   OBJECT               = BC_AM_TABLE
      NAME               = "BC_AM"
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 60
      COLUMNS            = 3
      ROW_BYTES          = 16
      ^STRUCTURE         = "DIM_BC_AM.FMT"
   END_OBJECT           = BC_AM_TABLE
END_OBJECT                    = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 318
   FILE_RECORDS                  = 540
   ^BC_BM_TABLE                  = "SES_FS2_DBC_1411130702_BM.TAB"
   OBJECT               = BC_BM_TABLE
      NAME               = "BC_BM"
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 540
      COLUMNS            = 62
      ROW_BYTES          = 318
      ^STRUCTURE         = "DIM_BC_BM.FMT"
   END_OBJECT           = BC_BM_TABLE
END_OBJECT                    = FILE

END
```

5.4 Example of PDS label for PP PM level 2 data product

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE  = "2017-02-13, SONC, version 1.0"

/* Edited SC data from PP Passive Mode (SONC Level 2) */

DATA_SET_ID           = "RL-C-SESAME-2-FSS-V1.0"
DATA_SET_NAME         = "ROSETTA-LANDER 67P SESAME 2 FSS V1.0"
PRODUCT_ID            = "SES_FS2_PPM_1411130810"
PRODUCT_CREATION_TIME = 2017-02-13T17:41:35
MISSION_NAME           = "INTERNATIONAL ROSETTA MISSION"
MISSION_PHASE_NAME    = "FIRST SCIENCE SEQUENCE"
MISSION_ID             = ROSETTA
INSTRUMENT_HOST_NAME   = "ROSETTA-LANDER"
INSTRUMENT_HOST_ID     = RL
```

```
PRODUCT_TYPE          = EDR
START_TIME            = 2014-11-13T08:10:28.554
STOP_TIME             = 2014-11-13T08:13:40.085
SPACECRAFT_CLOCK_START_COUNT = "3/374486957.10"
SPACECRAFT_CLOCK_STOP_COUNT  = "3/374487148.27"

PRODUCER_ID            = "SONC"
PRODUCER_FULL_NAME     = "SCIENCE OPERATIONS AND NAVIGATION CENTER"
PRODUCER_INSTITUTION_NAME = "CNES"

INSTRUMENT_ID          = SESAME
INSTRUMENT_NAME        = "SURFACE ELECTRIC SOUNDING AND
                       ACOUSTIC MONITORING EXPERIMENT"
INSTRUMENT_TYPE        = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
                       "PERMITTIVITY PROBE"}
TARGET_NAME           = "67P/CHURYUMOV-GERASIMENKO 1 (1969 R1)"
TARGET_TYPE           = "COMET"

PROCESSING_LEVEL_ID   = "2"
DATA_QUALITY_ID        = "-1"
DATA_QUALITY_DESC      = "-1 : NOT QUALIFIED"


/* DATA OBJECT DEFINITION  */

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 99
   FILE_RECORDS                  = 2
   ^PM_PAR_TABLE                  = "SES_FS2_PPM_1411130810_PAR.TAB"
   OBJECT                 = PM_PAR_TABLE
      NAME                 = "PM_PAR"
      INTERCHANGE_FORMAT = ASCII
      ROWS                 = 2
      COLUMNS              = 11
      ROW_BYTES            = 99
      ^STRUCTURE           = "PP_PM2_PAR.FMT"
   END_OBJECT             = PM_PAR_TABLE
END_OBJECT                  = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 62
   FILE_RECORDS                  = 20
   ^PM_POW_TABLE                  = "SES_FS2_PPM_1411130810_POW.TAB"
   OBJECT                 = PM_POW_TABLE
      NAME                 = "PM_POW"
      INTERCHANGE_FORMAT = ASCII
      ROWS                 = 20
      COLUMNS              = 5
      ROW_BYTES            = 62
      ^STRUCTURE           = "PP_PM2_POW.FMT"
```

```
   END_OBJECT            = PM_POW_TABLE
END_OBJECT                   = FILE

END
```

5.5 Example of PDS label for CASSE level 3 data product

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE  = "2017-02-13, SONC, version 1.0"

/* Edited SC data from CASSE Sounding Mode (SONC Level 3)  */

DATA_SET_ID           = "RL-C-SESAME-3-FSS-V1.0"
DATA_SET_NAME         = "ROSETTA-LANDER 67P SESAME 3 FSS V1.0"
PRODUCT_ID            = "SES_FS3_CSN_1411140016"
PRODUCT_CREATION_TIME = 2017-02-13T17:42:29
MISSION_NAME            = "INTERNATIONAL ROSETTA MISSION"
MISSION_PHASE_NAME    = "FIRST SCIENCE SEQUENCE"
MISSION_ID              = ROSETTA
INSTRUMENT_HOST_NAME    = "ROSETTA-LANDER"
INSTRUMENT_HOST_ID      = RL

PRODUCT_TYPE          = RDR
START_TIME            = 2014-11-14T00:16:05.068
STOP_TIME             = 2014-11-14T00:25:42.381
SPACECRAFT_CLOCK_START_COUNT = "3/374544893.26"
SPACECRAFT_CLOCK_STOP_COUNT  = "3/374545471.04"

PRODUCER_ID             = "SONC"
PRODUCER_FULL_NAME      = "SCIENCE OPERATIONS AND NAVIGATION CENTER"
PRODUCER_INSTITUTION_NAME = "CNES"

INSTRUMENT_ID           = SESAME
INSTRUMENT_NAME         = "SURFACE ELECTRIC SOUNDING AND
                        ACOUSTIC MONITORING EXPERIMENT"
INSTRUMENT_TYPE         = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
                        "PERMITTIVITY PROBE"}
TARGET_NAME           = "67P/CHURYUMOV-GERASIMENKO 1 (1969 R1)"
TARGET_TYPE           = "COMET"

PROCESSING_LEVEL_ID   = "3"
DATA_QUALITY_ID         = "-1"
DATA_QUALITY_DESC       = "-1 : NOT QUALIFIED"


/* DATA OBJECT DEFINITION  */

OBJECT                = FILE
  RECORD_TYPE           = FIXED_LENGTH
  RECORD_BYTES          =  176
  FILE_RECORDS          = 2
  ^JOBC_TABLE           = "SES_FS3_CSN_1411140016_JOBC.TAB"
```

```
  OBJECT                = JOBC_TABLE
      NAME                = "JOB_CARD"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 2
      COLUMNS             = 29
      ROW_BYTES           = 176
      ^STRUCTURE          = "JOB_CARD_FM3.FMT"
   END_OBJECT            = JOBC_TABLE
END_OBJECT            = FILE

OBJECT                         = FILE
   RECORD_TYPE                    = FIXED_LENGTH
   RECORD_BYTES                   = 198
   FILE_RECORDS                   = 2
   ^SEQ_PARAM_TABLE      =  "SES_FS3_CSN_1411140016_SEQP.TAB"
   OBJECT                = SEQ_PARAM_TABLE
      NAME                = "SEQ_PARAM"
      INTERCHANGE_FORMAT = ASCII
      ROWS                = 2
      COLUMNS             = 22
      ROW_BYTES           = 198
      ^STRUCTURE          = "SEQ_PARAM_BURST3_FM3.FMT"
   END_OBJECT            = SEQ_PARAM_TABLE
END_OBJECT            = FILE

OBJECT                         = FILE
   RECORD_TYPE                    = FIXED_LENGTH
   RECORD_BYTES                   = 267
   FILE_RECORDS                   = 42144
   ^DATA_TABLE                  = "SES_FS3_CSN_1411140016_DATA.TAB"
   OBJECT                       = DATA_TABLE
      NAME                      = "DATA"
      INTERCHANGE_FORMAT        = ASCII
      ROWS                      = 42144
      COLUMNS                   = 26
      ROW_BYTES                 = 267
      ^STRUCTURE                = "DATA3.FMT"
   END_OBJECT                   = DATA_TABLE
END_OBJECT                   = FILE

OBJECT                         = FILE
   RECORD_TYPE                    = FIXED_LENGTH
   RECORD_BYTES                   = 219
   FILE_RECORDS                   = 2
   ^STAT_TABLE                  = "SES_FS3_CSN_1411140016_STAT.TAB"
   OBJECT                       = STAT_TABLE
      NAME                      = "STAT"
      INTERCHANGE_FORMAT        = ASCII
      ROWS                      = 2
      COLUMNS                   = 38
      ROW_BYTES                 = 219
      ^STRUCTURE                = "STAT2_FM3.FMT"
   END_OBJECT                   = STAT_TABLE
```

```
END_OBJECT                  = FILE

END
```

5.6 Example of PDS label for PP level 3 data product

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE  = "2017-02-13, SONC, version 1.0"

/* Edited SC data from PP Active Test Mode (SONC Level 3) */

DATA_SET_ID            = "RL-C-SESAME-3-FSS-V1.0"
DATA_SET_NAME          = "ROSETTA-LANDER 67P SESAME 3 FSS V1.0"
PRODUCT_ID             = "SES_FS3_PAT_1411130810"
PRODUCT_CREATION_TIME = 2017-02-13T17:42:48
MISSION_NAME            = "INTERNATIONAL ROSETTA MISSION"
MISSION_PHASE_NAME     = "FIRST SCIENCE SEQUENCE"
MISSION_ID              = ROSETTA
INSTRUMENT_HOST_NAME    = "ROSETTA-LANDER"
INSTRUMENT_HOST_ID      = RL

PRODUCT_TYPE           = RDR
START_TIME             = 2014-11-13T08:10:49.054
STOP_TIME              = 2014-11-13T08:13:07.335
SPACECRAFT_CLOCK_START_COUNT = "3/374486977.26"
SPACECRAFT_CLOCK_STOP_COUNT  = "3/374487116.03"

PRODUCER_ID             = "SONC"
PRODUCER_FULL_NAME      = "SCIENCE OPERATIONS AND NAVIGATION CENTER"
PRODUCER_INSTITUTION_NAME = "CNES"

INSTRUMENT_ID           = SESAME
INSTRUMENT_NAME         = "SURFACE ELECTRIC SOUNDING AND
                        ACOUSTIC MONITORING EXPERIMENT"
INSTRUMENT_TYPE         = {"ACOUSTIC SENSOR", "DUST IMPACT DETECTOR",
                        "PERMITTIVITY PROBE"}
TARGET_NAME            = "67P/CHURYUMOV-GERASIMENKO 1 (1969 R1)"
TARGET_TYPE            = "COMET"

PROCESSING_LEVEL_ID    = "3"
DATA_QUALITY_ID         = "-1"
DATA_QUALITY_DESC       = "-1 : NOT QUALIFIED"


/* DATA OBJECT DEFINITION  */

OBJECT                          = FILE
   RECORD_TYPE                     = FIXED_LENGTH
   RECORD_BYTES                    = 102
   FILE_RECORDS                    = 11
   ^AMT_PAR_TABLE                    = "SES_FS3_PAT_1411130810_PARC.TAB"
   OBJECT                = AMT_PAR_TABLE
```

```
      NAME               = "AMT_PAR"
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 11
      COLUMNS            = 12
      ROW_BYTES          = 102
      ^STRUCTURE         = "PP_AMT2_PARC.FMT"
   END_OBJECT           = AMT_PAR_TABLE
END_OBJECT                  = FILE

OBJECT                        = FILE
RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 64
   FILE_RECORDS                  = 2161
   ^AMT_DAC_TABLE                  = "SES_FS3_PAT_1411130810_DACC.TAB"
   OBJECT               = AMT_DAC_TABLE
      NAME               = "AMT_DAC"
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 2161
      COLUMNS            = 5
      ROW_BYTES          = 64
      ^STRUCTURE         = "PP_AMT_DACC.FMT"
   END_OBJECT           = AMT_DAC_TABLE
END_OBJECT                  = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 67
   FILE_RECORDS                  = 9792
   ^AMT_TX_TABLE                  = "SES_FS3_PAT_1411130810_TXC.TAB"
   OBJECT               = AMT_TX_TABLE
      NAME               = "AMT_TX"
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 9792
      COLUMNS            = 5
      ROW_BYTES          = 67
      ^STRUCTURE         = "PP_AMT_TXC.FMT"
   END_OBJECT           = AMT_TX_TABLE
END_OBJECT                  = FILE

OBJECT                        = FILE
   RECORD_TYPE                   = FIXED_LENGTH
   RECORD_BYTES                  = 66
   FILE_RECORDS                  = 9792
   ^AMT_RX_TABLE                  = "SES_FS3_PAT_1411130810_RXC.TAB"
   OBJECT               = AMT_RX_TABLE
      NAME               = "AMT_RX"
      INTERCHANGE_FORMAT = ASCII
      ROWS               = 9792
      COLUMNS            = 5
      ROW_BYTES          = 66
      ^STRUCTURE         = "PP_AMT_RXC.FMT"
   END_OBJECT           = AMT_RX_TABLE
END_OBJECT                  = FILE
```

END