GIADA FS
EXPERIMENT USER MANUAL

	NAME	FUNCTION	SIGNATURE	DATE
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DOCUMENT CHANGE RECORD

ISSUE	DATE	AFFECTED PAGES	CHANGE DESCRIPTION
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1	04/09/2002	Only the pages marked with lateral bar	Document completely reviewed after delivery GIADA FS model. All NCR dispositions have been included, refer to the following sections: GIA-GAL-NCR-D016 refers to Section 7.5.1 GIA-GAL-NCR-D027 refers to Section 4.3.5 GIA-GAL-NCR-D028 refers to Section 6.2.1 GIA-GAL-NCR-D029 refers to Section 7.4.1 GIA-GAL-NCR-D034 and GIA-GAL-NCR-D019 refer to Section 5.2.2.1 GIA-GAL-NCR-D035 refers to Section 3.2.1.1 Annex 7 and Annex 8 have been updated The RSDB has been completely updated according to DCR 189.
2	09/01/2003	Only the pages marked with the lateral bar	1. Corrected typing errors in document headings 2. Added remarks to section 6.3. 3. Updated 'Opt' steps in sections 6.3.1, 6.3.2 and 6.3.3 4. Modified steps 2, 4 and 8 in FCP_040 (section 6.3.5) 5. Modified steps 1, 8 and 9 in FCP_070 (section 6.3.9) 6. Modified steps 1, 7 and 8 in FCP_090 (section 6.3.12) 7. Modified step 3, 6, 9, 13, 16, 20 and 23 in FCP_100 (section 6.3.13) 8. Added section 7.4.2
3	05/12/2005	Only the pages marked with the lateral bar	1. Corrected typing errors in document 2. Up-dated sequences for different in-flight activities 3. Included new FCP's 4. Included additional information based on lesson learnt during activities already performed
4	15/09/2006		Corrections as suggested by ESA review
4 - R1	28/05/2007		Refinement based on interactions with ESA

LIST OF VALID PAGES

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1. INTRODUCTION

1.1 Scope

This document is the User Manual for GIADA FS instrument.

1.2 Documents

1.2.1 Applicable documents

AD1	RO-EST-RS-3001/EID A Issue 2, Rev. 1	ROSETTA Experiment Interface Document Part A
AD2	RO-EST-RS-3009/EID B Latest issue	ROSETTA – GIADA Experiment Interface Document Part B
AD3	CEI EN 60825-1 (third edition) September 1995	Safety of laser products – Part 1: Equipment classification, requirements and user's guide
AD4	GIA-GAL-TN-507 Issue 2	GIADA Laser safety classification
AD5	RO-ESC-PL-5026 Latest Issue	ROSETTA Mission Calendar
AD6	RO-DSS-RS-1031 Issue 1H	GIADA Experiment OBCP URD
AD7	RO-DSS-LI-1018 Issue 2	RSDB TM / TC DATA (Data Version 7.0)
AD8	RO-ESC-PL-5000 Latest Issue	Rosetta Flight Operation Plan Archive
AD9	RO-ESC-IF-5003 Latest Issue	Data Distribution Interface Document

1.2.2 Reference documents

RD1	RO-GIA-MA-006 Issue 4	GIADA PFM Experiment User Manual
RD2	RO-DSS-PL-1015 Issue 1 (Information only copy)	Payload Testing Implementation Plan
RD3	GIA-GAL-TN-511 Issue 2	GIADA Experiment PFM – Inputs to I&T and IST System Level Tests
RD4	GIA-GAL-MA-503 Issue 4	User Manual for GIADA Instrument Workstation
RD5	GIA-GAL-TN-519 Issue 3	GIADA (FS) Scale Factors From TM Raw Data to Physical Quantities
RD6	RO-GIA-TN-002 Issue 2	FMECA of GIADA-2
RD7	GIA-GAL-TN-503 Issue 2	GIADA Thermal Analysis
RD8	RO-MEX-VEX-ESC-IF-5004 Issue C0	RMCS Command Request Interface Document
RD9	RO-EST-PL-3510 Draft 1	ROSETTA Commissioning & Verification Plan
RD10	GIA-GAL-ED-503	PFM model Acceptance Data Package
RD11	GIA-GAL-ED-505	FS model Acceptance Data Package

1.3 Abbreviations and acronyms

ADP	Acceptance Data Package
AIV	Assembly, Integration and Verification
ALS	Alenia Spazio
CCS	Central Check-out System
CREP	Cover Report
DC	Direct Current
DCR	Database Change Request
EGSE	Electrical Ground Support Equipment
ESA	European Space Agency
FAT	File Allocation Table
FMECA	Failure Mode Effects Criticality Analysis
GA	Galileo Avionica
GDS	Grain Detection System
GES	GIADA EGSE SoftWare
GIADA	Grain Impact Analyser and Dust Accumulator
GSE	Ground Support Equipment
H/W	Hardware
HK	House Keeping
IS	Impact Sensor
IWS	Instrument Workstation
KAL	Keep Alive Line
Kbps	Kilobytes per second
LCL	Latching Current Limiter
MBS	Micro Balance Sensor
MCBT	Mass Counter Balance Tool
ME	Main Electronics
MLI	Multi Layer Insulator
MPE	Maximum Permissible Exposure
MPR	Memory Patch Request
NA	Not Applicable
NOHD	Nominal Ocular Hazard Distance
NVRAM	Not Volatised Random Address Memory
OBCP	On Board Control Procedure
OBT	On Board Time
OOL	Out Of Limit
PE	Proximity Electronics
PSU	Power Supply Unit
RMCS	ROSETTA Mission Control System
RSDB	ROSETTA Data Base
S/C	Spacecraft
S/W	Software
SPT	Specific Performance Test
SIS	Spacecraft Interface Simulator
TB	Thermal Balance Test
TBC	To Be Confirmed
TBD	To Be Defined
TC	Telecommand
TM	Telemetry
TV	Thermal Vacuum Test
URD	User Requirements Document
w.r.t.	With Respect To
Vdisk	GIADA Virtual Disk

2. GENERAL DESCRIPTION

2.1 Scientific Objectives (AD2, Section 1.1)

The primary scientific objectives of **GIADA** (**G**rain **I**mpact **A**nalyser and **D**ust **A**ccumulator) are:

- Dust flux measurement for "direct" and "reflected" grains

Two populations of cometary grains do exist: "direct" (coming directly from the nucleus) and "reflected" grains (coming from the sun direction, under the action of the solar radiation pressure). The two populations have extremely different dynamic evolution in the coma and ejection times from the nucleus. In the case of ROSETTA, "direct" and "reflected" grains can be collected simultaneously. The relative amount will depend on the probe position along its orbit. GIADA will be able to monitor grain fluxes coming from different directions and will allow for the first time to discriminate the two dust populations**.** This task is fundamental to determine the original dust size distribution. In turn, this determination is mandatory to define the dust mass loss rate.

- Analysis of the dust velocity distribution

The dust ejection velocity depends both on the grain size and on time. Moreover, grains with a given size have a wide dust velocity distribution. GIADA will allow us to measure scalar velocity and momentum for grains coming from the nucleus direction so to give mass and impact velocity of each analysed "direct" grain. From this information it will be possible to derive grain mass and ejection velocity from the nucleus surface. For the first time we will obtain:

a) the size dependence of the dust ejection velocity;
b) the relation between most probable dust velocity and dust mass;
c) the velocity distribution for each dust mass;
d) the link between velocity dispersion and dust mass.

- Study of dust evolution in the coma

Once ejected from the nucleus, grains may change their physical properties due to several processes (e.g. fragmentation). These modifications may alter the grain size distribution. The size distribution of grains collected by GIADA in the nucleus direction should not be affected by the dust velocity dispersion. Thus, changes in the dust distribution at different nucleus distances can be linked directly to actual variations in the dust size distribution and correlation can be found with dust fragmentation and/or with emission from active areas on the nucleus.

- Correlation of dust changes with nucleus evolution and emission anisotropy

The dust environment characteristics depend on the comet-sun distance and on the time evolution of the nucleus. The continuous monitoring by GIADA of dust flux and dynamic properties will offer the best opportunity to characterise the time evolution of the dust environment as a function of heliocentric distance. Nucleus imaging will allow us to link observed changes to the nucleus evolution and to its spin state.

♦ Determination of dust to gas ratio

One of the crucial parameters characterising the comet nucleus is the dust to gas ratio. The dust flux monitoring by GIADA is absolutely needed to estimate the dust to gas ratio. This will be possible in combination with results of other experiments (e.g. the mass spectrometer).

♦ Other objectives

Moreover, the data provided by GIADA about dust fluxes and grain dynamic properties are very important to correctly interpret images of coma and nucleus and mass spectrometer data.

GIADA will help in the selection of the surface science package landing site. The characterisation of dust emitting areas, and possibly of the dust population of different active areas, is necessary to choose the site according to a proper balance between safety and scientific interest.

GIADA will play an important role for the health and the safety of various experiments as well as of the S/C itself, as it will be able to provide information about dust flux along several directions. Optical surfaces of experiments, and in general all the devices pointing to the nucleus, will be polluted by the dust flux. GIADA data will allow us to predict the deposition rates and to take appropriate decisions about the operation and the mission planning. Data from GIADA will be the only resource to predict and, thus, to control the degradation of performances of critical devices, such as passive radiators and solar panels.

The sensitivity of GIADA sensors is compatible with the expected cometary grain physical and dynamic characteristics and dust abundance, despite the change of target comet. Various estimates about expected events are available, depending on the comet - S/C distance and the adopted model parameters (e.g. Fulle et al. A&A Suppl. 126, 183, 1997, RO-ESC-TA-5501 and Fulle et al. A&A 422, 357, 2004). In all cases, GIADA will ensure a statistically meaningful number of detections. It is worth noting that model results mainly apply to the outer coma; higher fluxes are expected when the S/C will move within the inner coma.

The characteristics and performances of GIADA are summarised in Table 2.1.

Module	Sub-systems	Measured quantities	Sensitivity
GIADA 1	Grain Detection System (GDS) Impact Sensor (IS)	Scalar velocity Size Momentum Flux and fluence	1 m s^{-1} 30 μm ∅ 6.5 x 10^{-10} kg m s^{-1}
GIADA 2	Main Electronics (ME)	--	
GIADA 3	5 Micro-Balance Sensors (MBS's)	Flux and fluence	1 x 10^{-10} g

Table 2.1. Characteristics and performances of GIADA

We conclude that GIADA is perfectly compliant with the ROSETTA AO scientific objectives concerning dust flux and grain dynamic properties.

The achievement of the GIADA goals critically depends on the implementation of proper operation procedures (see Section 6) and the respect of constraints/requirements due to operation conditions (see Section 4.2.7 and 4.4) and to interference with other elements/experiments of Rosetta (see Section 4.2.6).

2.2 Experiment Overview

GIADA is a single box shaped instrument, 230 mm x 270 mm x 250 mm in cruising mode, when the cover is closed, and 230 mm x 322 mm x 250 mm in operational mode (box only, without feet). Refer to Figure 2.1. for a 3-D view of the experiment in its open configuration.

Three modules compose the instrument: **GIADA 1** measures momentum, scalar velocity and mass of single grains entering the instrument by the Grain Detection System (GDS) and the Impact Sensor (IS); it also hosts the cover that protects this module and **GIADA 3** during off phases. The **GIADA 2** module contains the Main Electronics (ME); it controls the acquisition of data from the sensors and the operation of the other subsystems. It also provides the power supply for the whole experiment. The **GIADA 3** module measures the cumulative dust flux and fluence from different directions by 5 microbilances (MBS's). One points towards the nucleus, while the other four cover the widest possible solid angle.

The **MLI** that thermally insulates the experiment from the environment and the sun covers all the external surfaces of the experiment.

The upper part of the **GIADA 1** box houses, together with GDS and IS, the locking mechanism and the protective ***cover*** with associated PEs. The bottom part of the box contains **GIADA 2**, while the top plate supports the five MBS's with associated PE (**GIADA 3**).

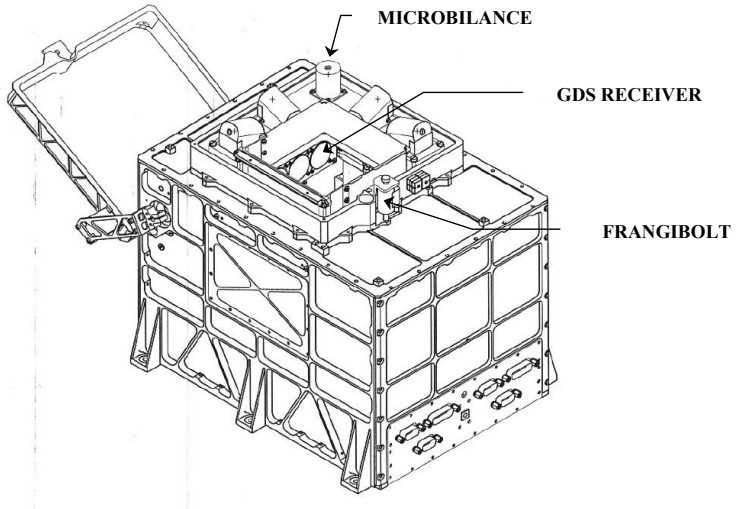


Figure 2.1. External view of GIADA with cover open

A functional scheme of GIADA, with measurements performed by each detection element, is reported in Figure 2.2, while a sketch of the GIADA internal configuration is shown in Figure 2.3, where the GDS and IS placed in cascade can be seen.

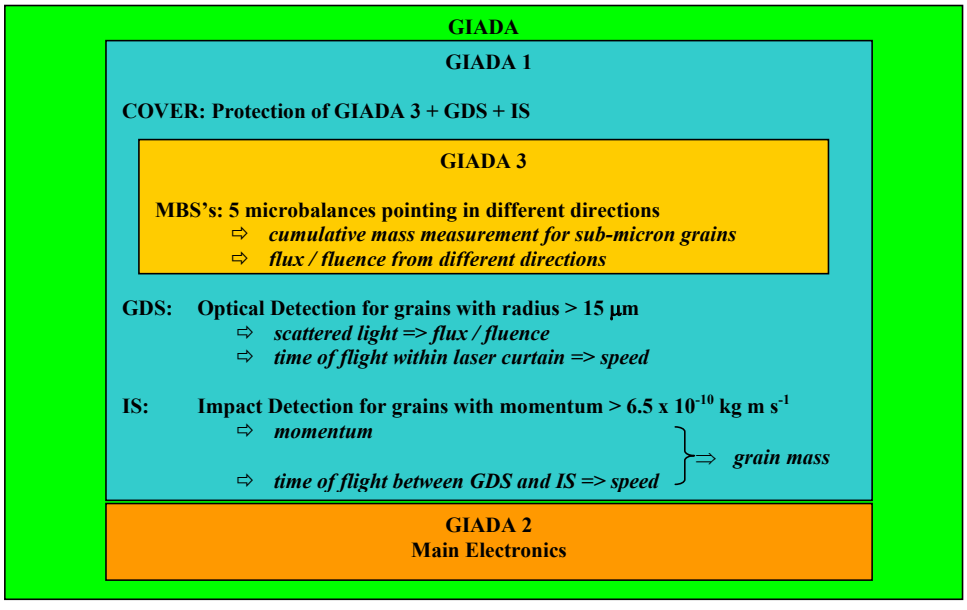


Figure 2.2. Block diagram of GIADA and performed measurements

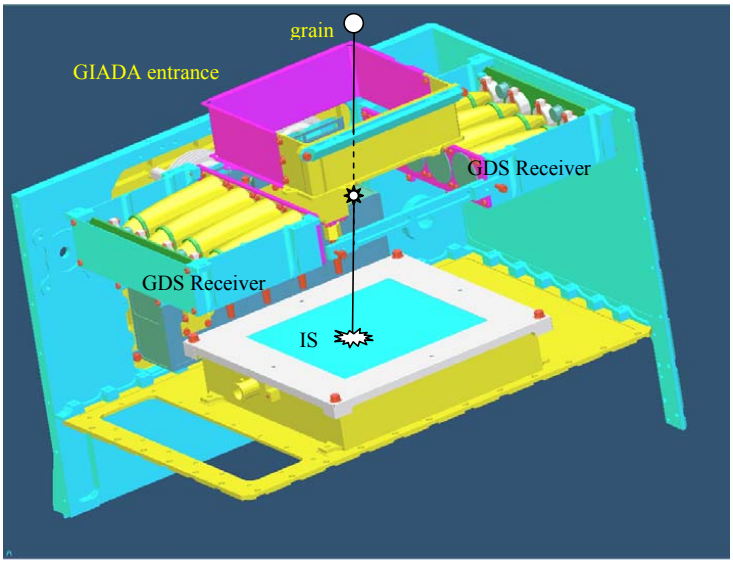


Figure 2.3. Sketch of the internal configuration of GIADA, where entrance, GDS receiver groups and IS are shown. The typical path of a grain (sphere) entering GIADA is shown, with GDS detection event (sun) and impact on IS (splash)

The ***Grain Detection System*** is formed by an illuminator and two receiver groups (see Figure 2.4). In the illuminator, four laser diodes with their fore-optics are used to form a thin (3 mm) light curtain (100 cm^2). For each grain passing through it, the scattered/reflected light is detected by the

two receiver groups: 2 series of four detectors (photodiodes) placed at 90 deg (left and right sides of the light curtain) with respect to the sources. In front of each photodiode a Winston cone is placed to achieve a uniform sensitivity in the detection area.

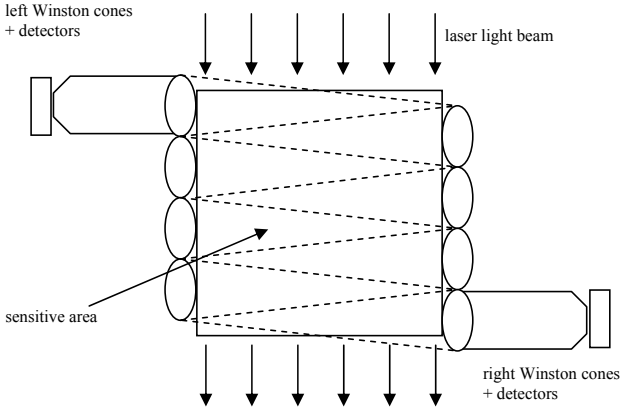


Figure 2.4. Top schematic view of the 10 x 10 cm^2 wide and 3 mm thick GDS sensing area. Each of the receiver groups is formed by 4 photodiodes with a Winston cone in front (only one per side is shown in the figure for simplicity). The detection sensitivity is uniform in each of the triangles in front of each cone

The ***Impact Sensor*** is a thin (0.5 mm) aluminium square diaphragm (sensitive area 100 cm^2) equipped with five piezoelectric sensors, placed below the corners and its centre. When a grain impacts the sensing plate, flexural waves are generated on the plate, and are detected by the piezoelectric crystals. The maximum displacement of these systems is directly proportional to the impulse imparted, and the displacement of the crystal produces a proportional potential. Through calibration, a known impulse may be equated with a specific charge produced on the electrodes of the PZT crystals. The detected signal is proportional to the momentum of the incident grain through the factor $(1+e)$, with e = coefficient of restitution.

When a grain enters GIADA 1, the GDS gives a first estimate of the grain speed and starts a time counter that is stopped when the IS detects the grain impact and the momentum is measured. In this way for each entering grain, *speed, time-of-flight, momentum* and, therefore, *mass* are measured.

Each ***Micro-balance*** consists in two (sensor and reference) quartz crystals oscillating at a frequency of about 15 MHz, with a shift of some kHz. The measured physical quantity is the beat frequency between the two crystals. The resonance frequency of the sensor quartz oscillator, exposed to the dust environment, changes due to the variation of its mass, as a result of material accretion, while the reference crystal is not exposed to the dust flux. Thus, the output signal is proportional to the mass deposited on the sensor and dust *flux* and *fluence* are measured in time. The use of a reference crystal ensures extremely small dependence on temperature and power supply fluctuations and, thus, high sensitivity.

A block diagram of the ***Main Electronics*** is shown in Figure 2.5. The whole operational sequence of GIADA is supervised and executed under microprocessor control (RH-80C86) by means of

dedicated on-board S/W. Four different operative modes of the instrument exist. These modes can be selected autonomously by the S/C control system as well as by means of ground TCs.

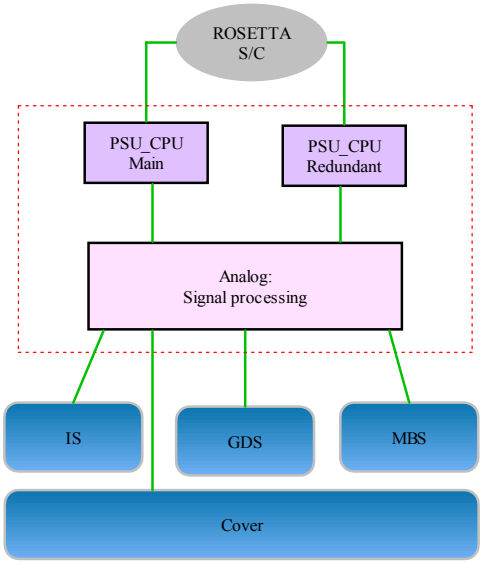


Figure 2.5. Block diagram of the GIADA Main Electronics

2.2.1 GIADA Redundancy concept

GIADA is a cold-redundant instrument. Therefore the GIADA Main Electronics is based on two complete sets of S/C interfaces (data and power) including microprocessor, memory and some digital-analogue circuits, which are in cold redundancy for low power operation. The switch over to the redundant unit is under control of the S/C by switching from the Main to the Redundant power lines. The main and redundant S/C interfaces, CPU and Power supplies are physically separated in two boards (CPU-PSU) located side by side at the bottom of the GIADA 2.

The other analogue and digital functions that interface the sensors are redounded circuitry and are located in a single board (the so-called ANALOGUE BOARD). This board is mechanically mounted over the two CPU-PSU boards. The three boards are inter-connected by internal cabling (connectors and wires).

The measurement sensors are intrinsically redundant. In fact, each GIADA subsystem (GDS, IS and MBS's) includes various sources/detectors in parallel. For example, the GDS is still active even if two of the four laser light sources or some of the eight-photodiode detectors fail (although the sensitive area will be reduced). Similarly, the IS is equipped with 5 PZT sensors, but the detection by only three of them is sufficient to obtain the particle momentum measurement. Finally, 5 micro-balances are used; in case of failure of one or more of them, the dust flux is still measured, although on a reduced number of different directions.

3. EXPERIMENT CONFIGURATION

3.1 Physical

The GIADA mechanical interface drawing (MICD) for the Proto-Flight and Flight Spare Models (PFM and FS) is shown in Figure 3.1. to Figure 3.6. and is reported in ANNEX 1: PFM and FS Mechanical Assembly Drawings. In particular, there are three experiment configurations:

- **Ground testing**, in which the cover can be either closed or open. When the cover is open, the Frangibolt is either not installed, or it is released. The MLI is present and the Mass Counter Balance Tool (MCBT, the tool provides a correct balancing at motor shaft of the cover momentum of inertia) is also installed. This configuration is used both during experiment and S/C test campaigns, when it is foreseen to open/close the cover without having to actually release the Frangibolt.
- **Launch till Commissioning**, in which the cover is kept locked in the closed position by the Frangibolt; the MCBT is not present and the MLI is installed. This configuration is also used during experiment and S/C campaigns, when it is foreseen to simulate the launch environment (e.g. during vibration tests). During the Commissioning, the Frangibolt will be released at the first available opportunity.
- **Operative,** in which the cover can be either open or closed, but the Frangibolt has been released. The MLI is installed, but the MCBT is not present. This configuration cannot be used on ground, since the cover can be neither opened nor closed when the Mass Counter Balance is not installed.

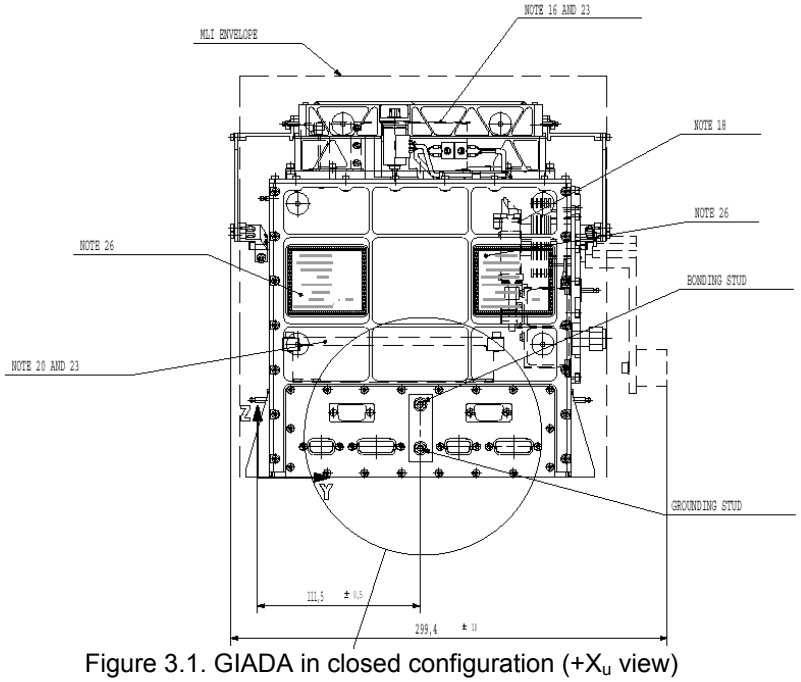


Figure 3.1. GIADA in closed configuration (+X_u view)

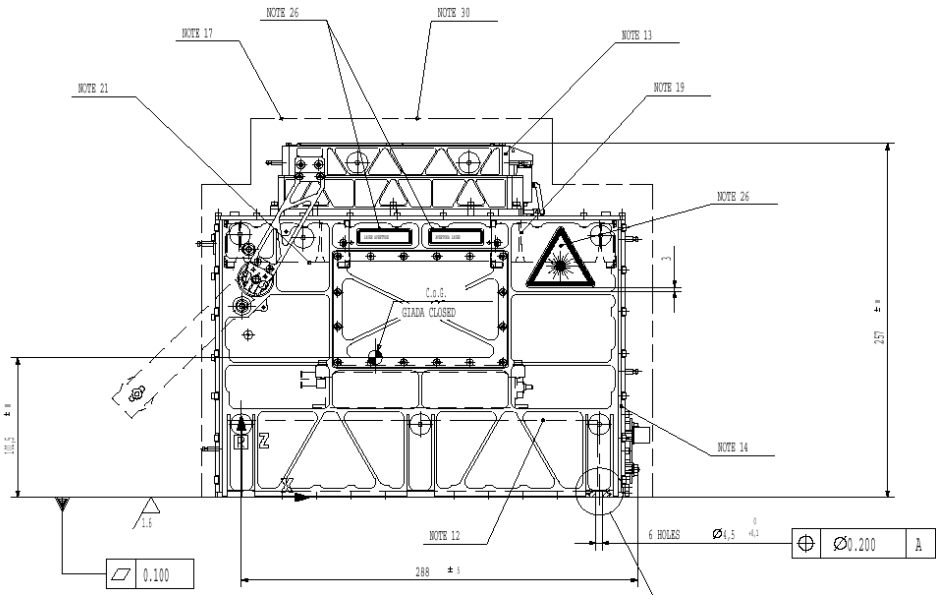


Figure 3.2. GIADA in closed configuration (-Y_u view)

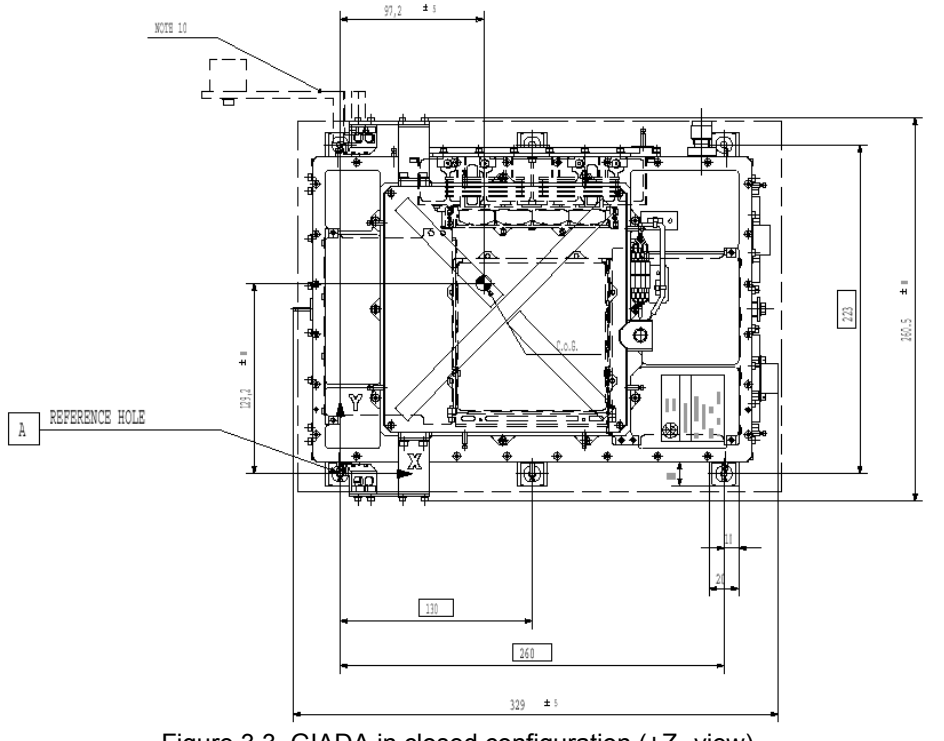


Figure 3.3. GIADA in closed configuration (+Z_u view)

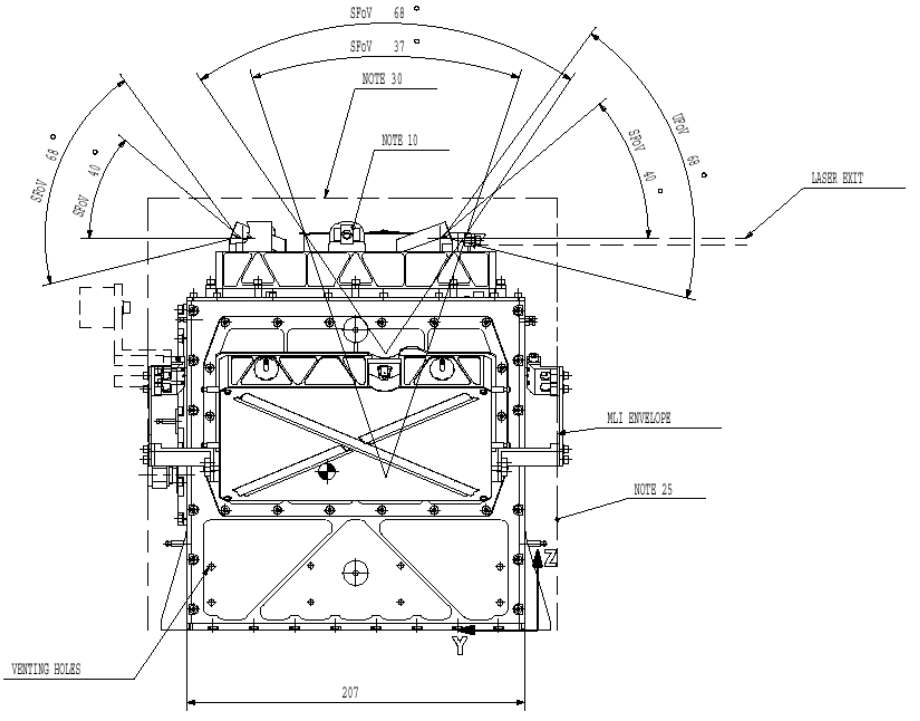


Figure 3.4. GIADA in open configuration and FoV's ($-X_{u\ view}$)

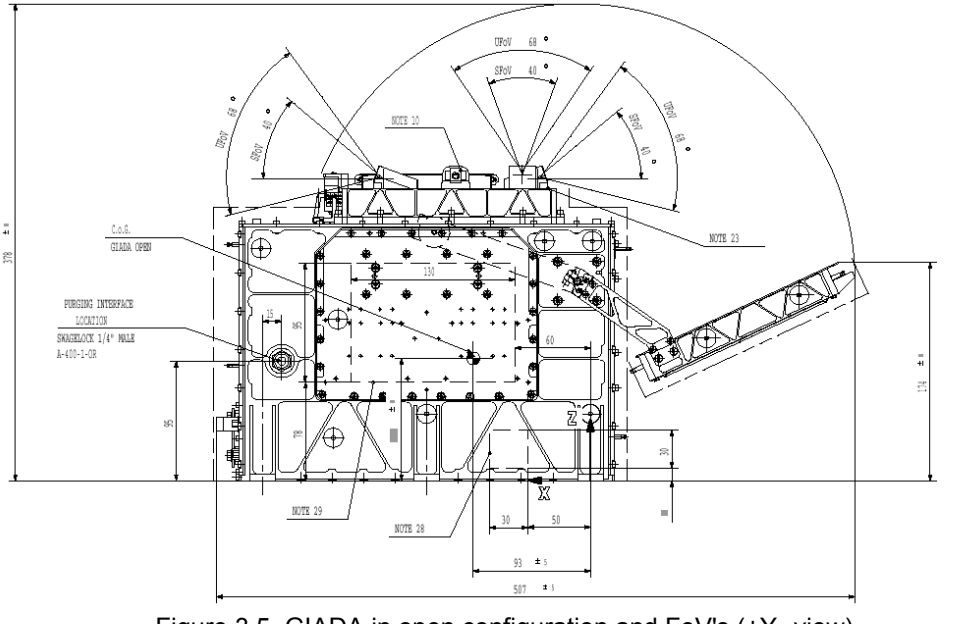


Figure 3.5. GIADA in open configuration and FoV's ($+Y_u$ view)

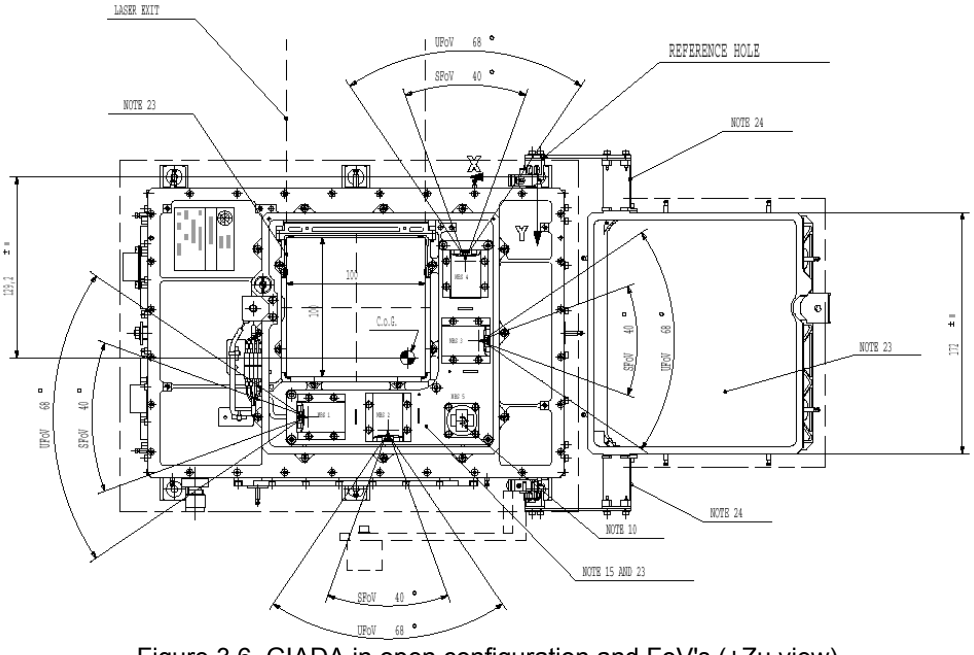


Figure 3.6. GIADA in open configuration and FoV's (+Zu view)

3.2 Electrical

3.2.1 Power Interface Circuits (AD2, Section 2.4)

The primary power (+28 V) is derived from the S/C main bus via one main and one redundant interface. The experiment operational status can be stored in a NVRAM when the payload is switched off for operational reasons; to this aim the low power "Keep Alive" line is used. The actual approach to memory use is described in Section 5.2.1

Figure 3.7. represents the power supply main distribution inside GIADA. The main and redundant lines are directly connected to each converter without cross-strapping. Soft-start and EMI filter provide the electrical interface directly to two isolated DC/DC converters which respectively generate +5V and ±15V. Each DC/DC converter is based on hi-rel Interpoint components. The isolation between primary and secondary circuits (>1 MΩ minimum at DC) is provided with a transformer in the forward path and a temperature-compensated optical link in the feedback control loop.

The DC-DC converters operate in the free-running mode at 524kHz (tolerance ± 5%).

The generated supply voltage buses are distributed inside GIADA by means of hi-rel bi-stable relays; exception is made for the CPU, which is directly powered from the +5V output of the DC-DC converter. For safety reasons, the laser power is also distributed by a separated, non-latching relay, connected in series with the one that allows digital control of the GDS Laser Driver power level. Each relay is commanded directly by CPU. Few milliseconds after start-up, a hardware generated signal resets the status of all bi-stable relays to switch-off all the power lines.

To avoid excessive in-rush current when switching on a measuring subsystem, a soft-start circuit has been series-connected after each relay output.

Both main and redundant voltage lines supply the loads; a series diode on each line avoids unwanted current flow inside the not powered DC/DC converters.

The Frangibolt device, needed to lock the cover in the closed position during the launch, is directly powered from the primary +28V lines, after the EMI filter. The control signal issued by CPU is opto-coupled in order to ensure the galvanic isolation between primary and secondary.

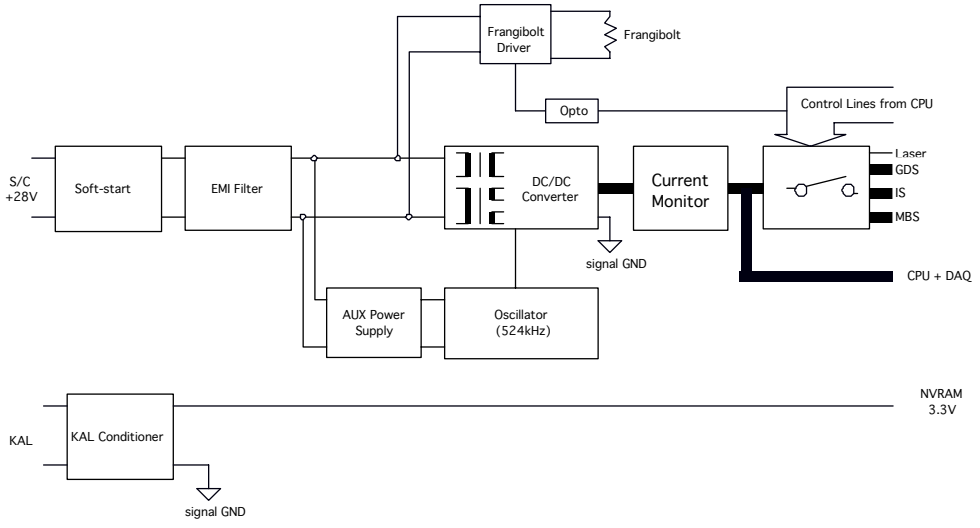


Figure 3.7. Power Interface & Distribution Block Diagram

The GIADA grounding concept is based on a single point ground concept.

The power supply interface requirements are summarised in Table 3.1.. The power distribution scheme (only one chain) is shown in Figure 3.7..

Function	Number of Required Main Lines	Number of Required Redundant Lines	LCL Class
+ 28 V MAIN BUS (Switched and current limited)	1	1	C
Keep-Alive Supply	1	1	

Table 3.1. Power supply interface requirements

The characteristics of the power interface are summarised in Table 3.2..

INTERFACE:	PRIMARY INSTRUMENT POWER
Maximum Average Input Current (@ 28 V)	
Safe mode	0.154 A
Cover mode	0.950 A (during Frangibolt Activation) 0.700 A (during closed/open Cover operation)
Flux mode	0.240 A
Normal mode	0.740 A (Laser Nominal power, i.e. Medium power)
Inrush Current (@ 28V)	
First peak of current after 800 μs	I ≈ 1.70 A, dI/dt ≈ 9 mA/μs
Second peak current after 3 ms	I ≈ 1.80 A, dI/dt ≈ 40.0 mA/μs
Third peak current after 12 ms	I ≈ 1.70 A, dI/dt ≈ 30.0 mA/μs
Current after14 ms	0.140 A
Isolation	
28 V hot to chassis	> 100 MΩ, 49 nF
28 V return to chassis	> 100 MΩ, 7.6 nF
28 V return to secondary return	> 100 MΩ, 7.7 nF
Secondary return to chassis	> 100 MΩ, 3.34 μF

Table 3.2. Operational Power Interface Characteristics

The higher capacitance value w.r.t. the one expected for the secondary return to chassis isolation is due to the need of improved noise rejection, implemented on the PEs by using filtering capacitors connected between the secondary ground and chassis.

3.2.1.1 MBS heating power profile at cold temperature

During the GIADA science operations (in Flux and Normal mode, refer to Section 4.1.1), the MBS may saturate and require heating processing. A ground TC will activate this operation. The MBS heating is performed by means of an internal devoted heater supplied by the +5V line. When the command arrives, the corresponding heater is switched on for a period that is programmed in the Context Table. After that period the heater is switched off automatically.

After data analysis of the TV test, it has been detected that the GIADA current did not fall in the expected time from ≈0.5A (nominal value when MBS heater is ON) to the expected nominal value (≈0.23A, Flux mode or Normal mode with only MBS S/S ON) immediately after switching off the MBS heating (refer to GIA-GAL-NCR-D035 in **RD11**). This happened only after about 10 ÷ 30s (refer to Figure 3.8.). The phenomenon was observed during MBS heating (on each MBS) performed at ***COLD*** dwell time on both Main and Redundant I/Fs.

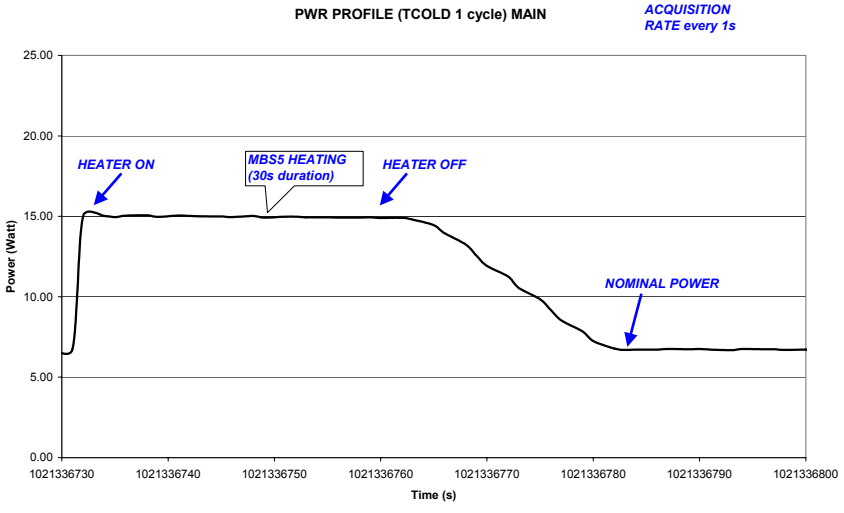


Figure 3.8. GIADA Power profile during the MBS heating – cold temperature

The implications on operations of this behaviour are reported in Section 4.2.7.4.2**.**

3.2.2 OBDH Interface Circuits (AD2, Section 2.7)

GIADA data interfaces to the S/C are shown in Table 3.3.. All interfaces are connected to the S/C RTU.

Interface	Signal Type or Function	Main	Redundant
Telecommand Channels	Memory Load Commands	1	1
	High Power ON/OFF Commands	0	0
Telemetry Channels	16 Bit Serial Digital Channel	1	1
	High Speed Interface	0	0
Monitor Channels	Spacecraft Powered Thermistors	0	0
	Bi-level Channels	0	0
	Analogic Channels	0	0
Timing Channels	High Frequency Clock	0	0
	Timer Synchronisation Pulse	1	1

Table 3.3. Experiment OBDH Interface Channels/Functions.

The data exchange between DPU and spacecraft is done using two FIFO buffer memories (one for input and the other for output): the FIFO is a single address in the I/O mapped memory. The output FIFO will be filled with the available telemetry data by the S/W. The input FIFO will be filled by the telecommands coming from the OBDH bus; the S/W will then proceed to read the buffered information.

The TC HW FIFO buffer is 4Kwords (4096 x 16 bits). There, the TC's are stored and executed sequentially in the queue of execution, but for the prioritised TCs (Accept Time Update and Safe Mode) that are executed ASAP. In the case GIADA has buffered the two prioritised TCs, the TC Safe Mode is executed before (see ANNEX 2: GIADA-2 FS Software User Manual – Section 3.1.1).

Remark 3.1: Maximum commanding rate

The maximum sustained commanding rate shall not exceed 4 kbit/s, corresponding to about 2 commands (with maximum size) within 1 s (see ANNEX 2: GIADA-2 FS Software User Manual – Section 3.1.1).

GIADA will receive a serial bit stream of data along with the MLC Sample pulse and the Clock. After a conversion to the 16-bit parallel word format, the telecommands or broadcast data (i.e. TSY pulse) will be transferred into the input FIFO and an interrupt request will be generated by the interface to the microprocessor. The FIFO memory prevents a conflict between the data update and data readout.

The data interface functional block diagram is presented in Figure 3.9..

GIADA does not have an internal mass memory and the acquired data will be processed on-line.

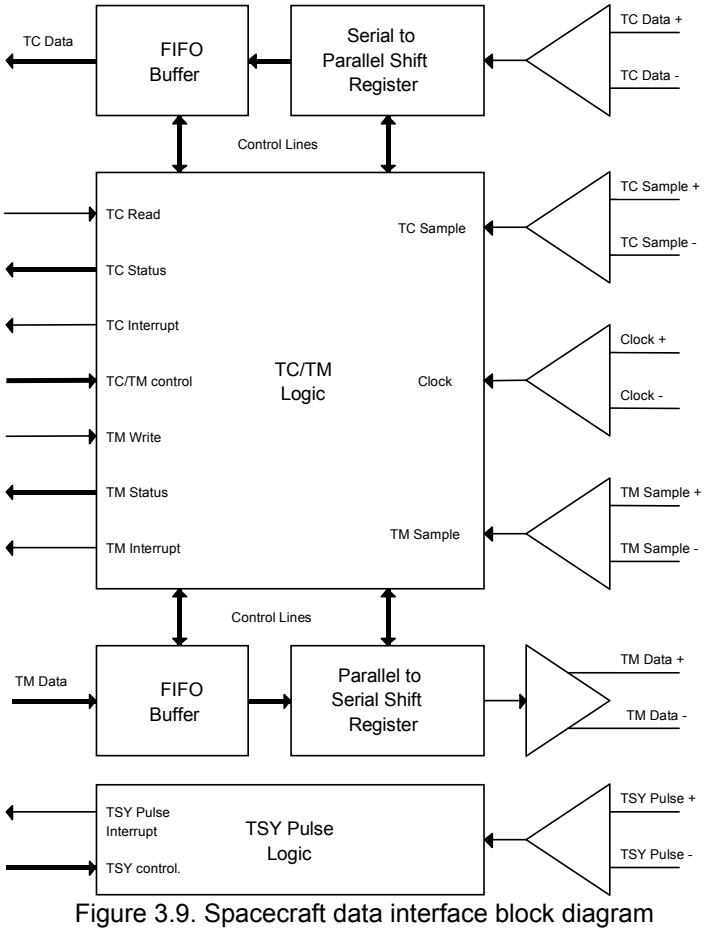


Figure 3.9. Spacecraft data interface block diagram

3.3 Software

Detailed information on GIADA Software is reported in ANNEX 2: GIADA-2 FS Software User Manual.

No On-board Monitoring Requirements are issued by GIADA to DMS, as all health and housekeeping tasks are performed autonomously.

In addition, some of the GIADA OBCPs (Power_On, Close_Cover, Switch_On_Lasers) are triggered through **event monitoring by the S/C** (see Table 6.1). In particular, the Close_Cover_OBCP can be triggered in case of detected thermal contingencies (see Section 4.3.4).

3.4 Budgets

3.4.1 Mass

GIADA has an estimated mass of 6.250 kg, including margins.

3.4.2 Operating Power (AD2, Section 2.4.3)

The power requirements for each mode are reported in Table 3.4.. Only the maximum power for each mode is indicated. Long and short power peaks are indicated where applicable. No margin has been considered. The modes and the procedures to activate them are described in detail in Sections 5 and 4, respectively.

Experiment Interface: +28 V power I/F				
Mode	**Ave. Power BOL (W) ([1])**	**Ave. Power EOL (W) ([1])**	**Long Peak Power (W) ([3])**	**Short Peak Power (W)**
0) Safe	4.5	4.5	-	28 ([2])
1) Cover	24.7	24.7	< 33.6	-
2) Flux	10.7	10.7	-	-
3) Normal	20.7 ([4])	20.7 ([4])	-	-

Table 3.4. Experiment Main Bus Power Consumption

([1]) At S/C; efficiency = 0.75;

([2]) This short peak power is only at power-on. At power-on GIADA will go to Safe Mode. GIADA will not exhibit this short peak power switching from any other mode to Safe mode.

([3]) This long peak power, caused by the Frangibolt device actuation, will be applicable only at the first opportunity after the launch and during AIV a few times.

([4]) Refer to 3.2.1.1, when MBS heating is performed and nominal operation will be resumed.

Remark 3.2: GIADA Power Consumption in different modes and with temperature

The power consumption on the +5V, +15V and -15V lines depends on operation mode and status (on-off) of sub-systems in each mode and may vary with temperature. Please, refer to data obtained during on-ground environmental tests and during in-flight commissioning for the different consumptions monitored for GIADA.

As an example, Figure 3.10 shows the behaviour of the Power consumption during the in flight Payload Passive Checkout n. 1 (PC1) Test. The figure shows the current levels (in mA) for the +15, -15 and +5 V lines. The coloured lines show the status of some GIADA parameters:

- OP_MODE_nn = Operation Mode = 0 (Safe), 0.3 (Cover), 0.6 (Flux), 1 (Normal)
- EV_REP_TM_OFW_nn = Event Report TM Overflow Status = 0 (No), 1 (Yes)
- SCI_TM_OFW_nn = Scientific TM Overflow Status = 0 (No), 1 (Yes)
- SCI_TM_EN = Scientific TM Enable Status = 0 (No), 1 (Yes)
- FRANGIBOLT = Frangibolt Activation Status = 0 (No), 1 (Yes)
- MOTOR = Motor Activation Status = 0 (No), 1 (Yes)
- OPEN_RS = Status of Reed Switch of Open Cover Position = 0 (Open), 1 (Closed)
- CLOSED_RS = Status of Reed Switch of Closed Cover Position = 0 (Open), 1 (Closed)
- HEAT_3 = Status of Heater n. 3 = 0 (Off), 1 (On)
- HEAT_2 = Status of Heater n. 2 = 0 (Off), 1 (On)
- HEAT_1 = Status of Heater n. 1 = 0 (Off), 1 (On)

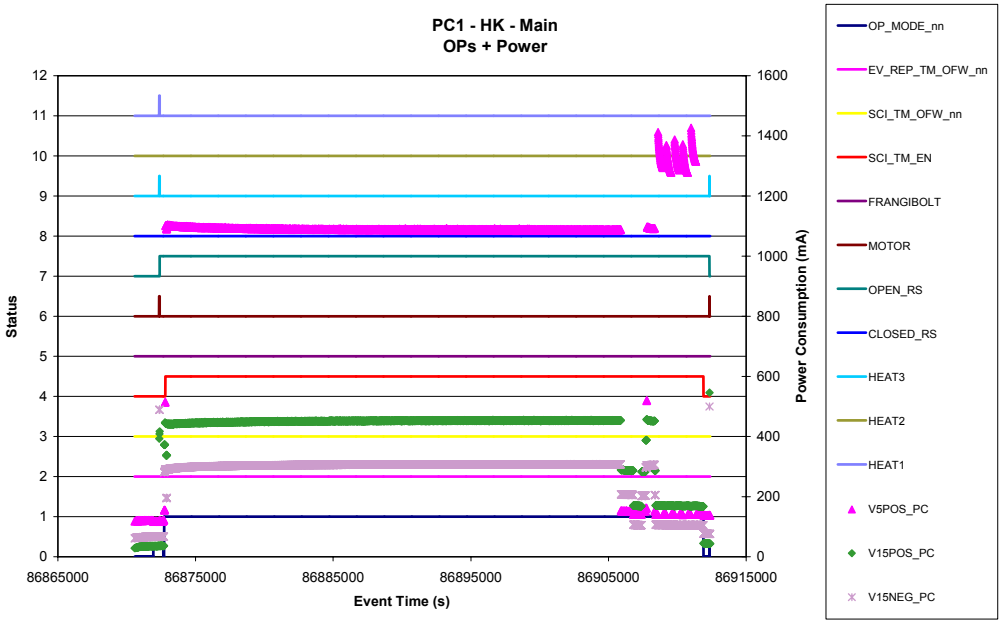


Figure 3.10. Power consumption (current in mA) during Payload Passive Checkout PC1 on the Main Interface.

From these data we derive the values reported in Table 3.5. The data reported in the Table are indicative of a specific case and do not account of possible variations due to thermal effects that, however, may introduce a difference of a few percent.

To compute the Power consumption reported in Table 3.5 it has been considered that the actually ***typical efficiency*** of the DC/DC converters is 75% for the 5V and 82% for the ±15V, respectively. However, if the consumption is too low, these values decrease and the ***minimum efficiency*** in the specifications are 73% and 74%, respectively.

Mode	**+15 V**	**-15 V**	**+5 V**	**Total consuption**	
				Min	**Typ.**
Safe – Cover with motor and heaters OFF	51	62	134	3.0	3.2
Cover with motor -heaters ON	500	470	119	18.5	20.5
Normal with MBS ON (GDS and IS OFF)	177	86	139	5.7	6.3
Normal with MBS and IS ON (GDS OFF)	294	183	145	9.7	10.6
Normal with all sub-systems ON	455	280	1078	20.6	22.3
MBS Heating in Normal Mode (GDS and IS OFF)	177	86	1330	13.7	14.4

Table 3.5. Measured current (mA) on the ±15V and +5V lines and Power Consumption (W) computed assuming *minimum* and *typical* efficiencies of the converters, as reported in the text. Results are in line with power measured in flight by S/C PDU

3.4.3 Data Rates (Housekeeping and Science)

In Nominal condition, during operation at the comet, GIADA-1 (i.e. GDS+IS sub-systems) is event driven, while the MBSs (GIADA-3) are periodically (every 300 s) read. When the cover is open, each grain entering GIADA-1 is detected by the GDS and/or the IS sub-systems, if the produced signals overcome the pre-set thresholds. Different thresholds are foreseen for GDS left and right channels and for the five IS detector channels. Nominally, each detection of a 'scientific event' provides outputs from the left and right GDS detectors and from the five IS PZTs. Detections from the Left (GDS-L) and Right (GDS-R) channels of GDS are considered different, so that GDS-L and GDS-R detections are 2 GDS events for GIADA; on the contrary, the signals given by one particle on the 5 PZTs form 1 single IS event. These data are packed and inserted in a TM block either when the data field of a science report is full (maximum packet data field length is about 520 bytes by default), or in case a timeout is reached (i.e. after about 1 minute). If available, the periodic output reading from MBS is also added to the same packet. Both the maximum data field length and scientific packets timeout values can be changed by patching the proper fields in the Configuration Table (the copy of the Context File held in RAM; see Section 5.2.1).

The science TM report includes calibration data coming from the periodic internal sub-system monitoring; for the IS sub-system, an internal stimulator (a piezoelectric device) is present, providing a calibrated impulse to the IS plate.

In case no grains are detected by GIADA-1 (this is the case of normal Ground testing), the only science TM reports produced by GIADA are those linked to the MBS reading and calibration data.

A general rule about relation between scientific Data Rate (DR) in bytes and Event Rate (ER) s^{-1} is:

$$DR = ER * (46 + 5) + 0.5 \qquad [bytes\ s^{-1}]$$

This comes from:

- 46 = 34 + 12 bytes
  34 bytes for each GDS+IS event
  12 bytes for each GDS event (usually associated with the GDS+IS event)
- 5 = overhead on each TM (20,3) packet due to Header (20 bytes) + Scientific HK data (20 bytes) + CRC (2 bytes) with aproximately 10 event per packet.
- 0.5 = due to periodic (period of reading = 300 sec) reading of MBS (14 bytes * 5 MBS's plus the overhead).

Note that the relation above is approximated and could deviate for very low or very high event rates.

The maximum number of events that GIADA can record in TM is set by 2 parameters in the Configuration Table: **MaxGDSEvents** and **MaxISEvents**, which correspond to the max number of events detected by GDS and IS. These parameters can be set, but it is not recommended to increase them above the nominal value, which is **40 events s^{-1}**. If the maximum value of IS or GDS events accepted per second is over the specified limit the HK Parameter "Science TM overflow" is set = 1. This flag is reset every second (see also Section 3.2.6 in ANNEX 2: GIADA-2 FS Software User Manual). We recall that, nominally, each detected grain produces one GDS-L, one GDS-R and one IS detection event. Thus, as a rule, for each grain GIADA counts 2 GDS detection events and 1 IS detection event, while it generates in TM one GDS+IS event and one GDS event. This also means that in the equation reported above the Event Rate (ER) shall be considered according to this rule; to translate this number into real particle rate it shall be divided by 2, on average. This value also gives the average data rate (science TM) that can be produced in normal mode; the values have also been measured in laboratory and are reported in Table 3.6.

In addition to the science TM report, other types of TM packets are produced by GIADA: periodic HK packets and Event Report packets. An Event Report is created internally to GIADA whenever the instrument software detects an anomaly, according to the definitions given in AD1.

The data rates applicable for the various operative modes of GIADA are summarised in Table 3.6.

Mode	Active Sub-system	Average Data Rate [Kbit/s]	Peak Data Rate (1) [Kbit/s]	Comments
Safe	ME	0.1	1.3	Only HK reports are delivered (tipically with a period of 10 s) in Safe Mode. The HK rate is the same whatever is the operation mode. Other contributions could come from specific events (e.g. memory dump) and are considered in the peak rate
Cover	ME + Cover or Frangibolt	0.1	5.1 (**)	Only HK reports are delivered (tipically with a period of 10 s). Other contributions come from specific events (e.g. Cover Status Trace Event Report) and are considered in the peak rate
Flux	ME + MBS	0.1	4.7	In the average, MBS reading every 300 s and HK are considered. Peak rate considers also data production due to MBS heating
Normal	ME + any combination of GDS, IS and/or MBS	6 (****)	8 (64 max)	8 Kbit/s corresponds to the maximum number of events recordable (nominal setting is 40 events/s); peak rate takes into account HK data. 64 Kbit/s is the maximum peak rate that might occur with high event rate (FIFO TM buffer of 4 kwords full) coupled with low S/C polling rate (8 s polling interval).

Table 3.6. Data rates for the different GIADA operative modes

Note: Reported values refer to nominal conditions; TM events related to specific TC's are considered negligible with respect to the overall rate.

(1) Computed as the maximum data volume that GIADA is expected to produce in 1 s (and deliver to the S/C in a single data transmission for 1 Hz polling rate).

The TM HW FIFO buffer is 4Kwords (4096 x 16 bits). It is important to remark that all data rate calculations are based on the experiment foreseen performances (i.e. maximum number of grain events that can be processed in 1 s), and not on the foreseen event rate coming from the comet models, which leads to a much lower rate of about 0.2 Kbps.

Remark 3.3: Margins on SSMM on-board Rosetta S/C allocated for GIADA

It is necessary to apply some margins on the Solid State Mass Memory (SSMM) on-board the Rosetta S/C allocated for GIADA. In case unexpected large amounts of GIADA data are produced, the saturation of the SSMM implies its overwriting, starting from the beginning of the allocated memory, with consequent loss of GIADA data. This effect has been faced during the Commissioning, due to the generation of GDS stray-light events. Therefore, the final size allocated to GIADA Science in the SSMM has been set up to 71 Mbytes. This figure allows us to cope with nominal data rates and most of unexpected peaks of data with enough margin.

3.4.4 Non Operational Heaters (AD2, Section 2.3.3.2)

Non operational heaters are required during the hibernation phase of the mission. The power required in order to maintain the TRP inside the temperature range is under responsibility of ESA.

2 S/C NON-OP heaters are applied to GIADA.

For location of S/C NON-OP heaters on GIADA see Note 29 in ANNEX 1: PFM and FS Mechanical Assembly Drawings. NON-OP heaters are placed close to the GDS lasers. As these components are sensitive to high temperature in terms of both mean time before failure and efficiency during operation, the risk of overheating in case of heater line failure does exist (as stated in EID A Sect. 2.3.4.5). For this reason, GIADA requests a thermostat on this line.

3.4.5 S/C Powered Thermistors (AD2, Section 2.3.3.4)

The S/C will monitor the GIADA instrument TRP. One primary and one redundant thermistors are installed close to TRP.

For location of S/C thermistors on GIADA see Notes 28 in ANNEX 1: PFM and FS Mechanical Assembly Drawings.

3.4.6 Internal GIADA heaters and thermistors (AD2, Section 2.3)

Locations of GIADA experiment powered heaters are indicated in Table 3.7.

Experiment element	N. of heaters	Location
MBS	5	1 for each MBS
FRANGIBOLT	2 (1)	on the frangibolt
MOTOR	1 (2)	motor body
COVER	3 (2)	on the mechanical bracket supporting the cover (one of them is close to frangibolt)

(1) one for Main and one for Redundant line

(2) Motor and 1 of the Cover heaters are connected and operate together, as well as the other 2 Cover heaters. This is done for balancing power consumption.

Table 3.7. GIADA heaters

Locations of GIADA monitored thermistors are listed in Table 3.8.

Experiment element	Exp. Powered thermistors	Temperature range (°C)	Location
GIADA	-	-60 ÷ +70	TRP
GDS (1)	4	-40 ÷ +100	each laser diode
IS	2 (2)	-50 ÷ +100	IS plate
GIADA 2	2 (2)	-50 ÷ +100	main el. boards
ANALOG BOARD (3)	2 (2)	-50 ÷ +100	near CAL network
MBS	5	-40 ÷ +120	each MBS
FRANGIBOLT	2 (2)	-75 ÷ +120	on the frangibolt

(1) read only when the GDS lasers are ON

(2) one for Main and one for Redundant lines

(3) read during calibration (so-called ADC_Temperature)

Table 3.8. GIADA temperature sensors

3.4.7 Pyro Lines (AD2, Section 2.5)

N/A

3.4.8 OBDH Channels (AD2, Section 2.7)

The GIADA instrument communicates with the OBDH telecommand and telemetry systems via Main and Redundant interfaces. The clock line to transfer bits (Serial Data Transfer Clock) is shared with the Memory Load Command and Serial Digital acquisition [see Figure 3.9, Table 3.3. and **AD2** (Section 2.7)].

4. EXPERIMENT OPERATIONS

4.1 Operating Principles

The operation of GIADA during ROSETTA mission is divided into six types of operations:

1. Primary scientific observation, that is distinguished into:
   - The mapping phase
   - The rest of the mission
2. Frangibolt activation
3. Aliveness / Functional tests
4. Cover opening
5. Cover closing
6. In-flight calibration

4.1.1 Primary scientific observation

GIADA will be operated for scientific data acquisition starting from the approach phase to the comet and until the end of the ROSETTA mission. This means that during the long cruise phase GIADA is generally switched off but for limited periods of time, that are needed to check periodically the health status of the experiment and to test the functionality of its sub-systems. The science operation of GIADA will start since the ***mapping phase*** and will continue for the ***rest of the mission***.

The data collected by GIADA will be important not only for their intrinsic scientific value. In fact, GIADA will be the only experiment expressly devoted to the study of the dust flux; an important element for the safety of the S/C and of several sensitive surfaces. Moreover, the GIADA data will be useful in connection with the determination of the landing site for the SSP. In fact, the dust flux monitoring from different surface areas can be used to select the landing site according to surface activity and safety criteria.

4.1.1.1 The mapping phase

The ***mapping phase*** begins at heliocentric distances < about 4 AU. According to the simulation of comet dust production (see Section 2.1), it may be not required to operate the GDS+IS sub-systems, which are aimed at single grain velocity and momentum measurements. On the other hand, it will be of paramount importance to monitor the dust flux with the MBS's sub-system.

For this reason, until the heliocentric distance will become smaller than about 3.2 AU, GIADA should be operated in the ***Flux Mode***. This operation mode will imply a limited power demand (see Section 3.4.2). The typical operational procedure will be as sketched in Figure 4.1.. In this condition, the MBS might saturate and require heating processing. A TC, solicited from ground, will activate this operation.

Remark 4.1: Synergy with ROSINA

In order to achieve the best results about comet dust and gas production, the data received from GIADA shall be integrated with those produced by ROSINA, i.e. both P/Ls should be powered on at the same time during the mapping phase.

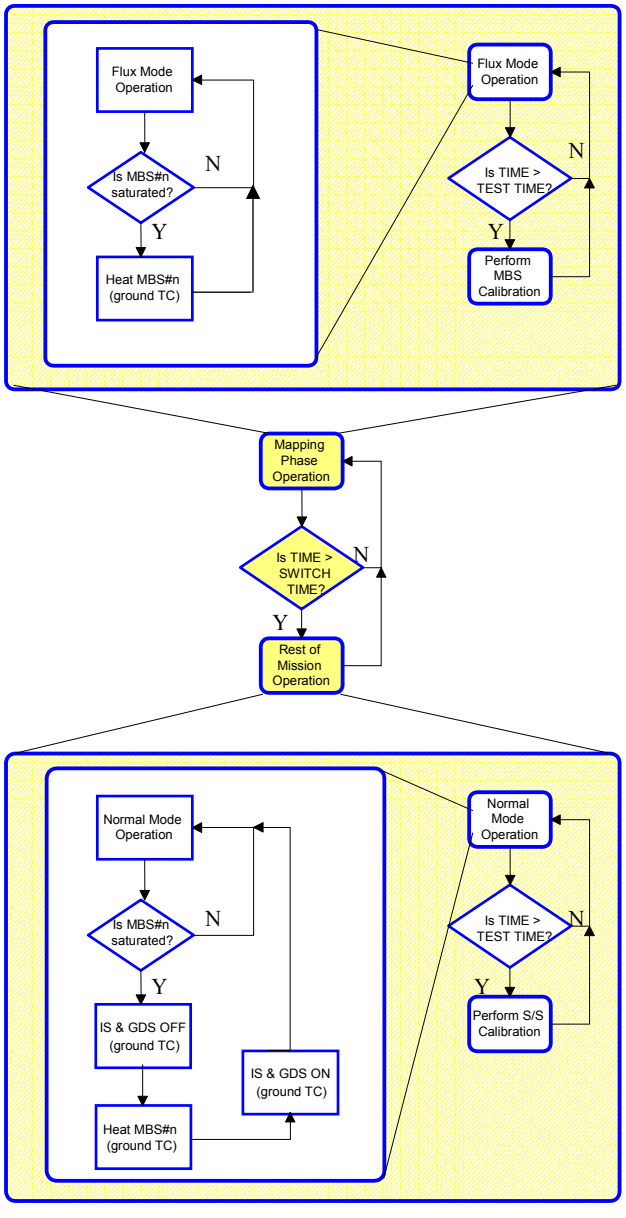


Figure 4.1. Operations and transitions between baseline modes

4.1.1.2 Rest of the mission

For all the remaining mission phases, GIADA will work in ***Normal Mode*** with all the sensors active. The typical operational procedure is sketched in Figure 4.1. too.

In Normal mode the procedure to perform MSB heating is slightly different. Refer to Section 4.2.7.4.1 for operational constraints.

4.1.2 Frangibolt activation

The first operation to be undertaken after launch (i.e., in commissioning phase) is a complete test procedure. Then, the launch lock (i.e., Frangibolt) must be removed, by execution of the Activate_Frangibolt_OBCP.

Remark 4.2: CF to be uploaded for Frangibolt operation

As a result of GIA-GAL-NCR-C011 in RD10, issued for PFM and confirmed in the FS model test campaign, a different Context File shall be uploaded to GIADA, depending on the powered I/F at the moment of the intended Frangibolt activation. In any case the nominal I/F to be used during the Frangibolt activation is the Redundant one.

4.1.3 Aliveness / Functional Tests

The Aliveness / Functional Tests are geared towards switching on and functionally checking the instrument after any prolonged period in which the instrument has been off. Such periods would include the launch and cruise phases of the mission. These tests will be repeated also at commissioning.

These tests consist in turning-on the experiment and in sending some TCs. The test is divided in two parts, one automatically performed by the instrument at power-on and the second that depends on the TC sequence.

4.1.3.1 Self-test procedure at power-on / reset

At every power-on or reset, the ME will start a **self-test procedure** in order to check its health status. Any anomalous situation (e.g. corrupted Vdisk, etc.) will be reported to ground by means of the proper event report - see **AD2** (Section 2.8) and ANNEX 2: GIADA-2 FS Software User Manual (Section 3.3).

In particular, there are two Event Reports Subtype 3 that can be generated by GIADA after a power on or a reset. The Event ID 42309 “Previous execution reset by watchdog” (YGD42309) will be generated after an unexpected reset caused by the watchdog circuit, while the Event ID 42310 “EDAC error during S/W start and dump” will be generated if, during the NVRAM check that is performed immediately after copying the executable code from ROM to RAM, the NVRAM contents are found inconsistent w.r.t. their respective Hamming code correction bits.

4.1.3.2 Sub-system test procedure in flight

All subsystems will be switched off and then on, following a specific sequence, that allows verifying the amount of noise induced in a given subsystem by the switch on of the others. As a result of switching on a subsystem, a science TM calibration report as defined in **AD2** (Section 2.8) will be generated (see also ANNEX 2: GIADA-2 FS Software User Manual – Section 3). These self-tests are not autonomous operations (i.e. they need at least a TC to run) and thus will be executed when requested by earth command.

4.1.4 Cover Opening

At the switch on of GIADA, before starting the science observations, the protective cover shall be open. A proper procedure (Open_Cover_OBCP) will be executed. Once the cover has been opened, the detection sub-systems may be switched-on to be ready for the observation.

This procedure is also part of the first switch on of GIADA at the commissioning phase, to check the operation and finally to validate the Frangibolt activation.

4.1.5 Cover Closing

The protective cover shall be closed every time that GIADA is to be switched off, or in case GIADA S/W detects a thermal contingency, as described in Section 4.3.4.

This procedure is also part of the first switch on of GIADA during the commissioning phase, obviously after execution of Cover Opening. The configuration for cruise until the operative phase is with the cover closed.

4.1.6 In-flight Calibration Observations

The **self-test procedure** of sub-systems is performed periodically during science operation (**AD2** Section 6.5). Only the IS sub-system is equipped with a built-in calibration device. Thus, actual in-flight calibration is possible only on this sub-system. For GDS and IS a test of the noise level is performed to set (by ground TC) the thresholds for signals detection. Functional tests are performed to check the health status of the experiment. As a result of the self-test procedure on a subsystem, a science TM calibration report as defined in **AD2** (Section 2.8) will be generated (see also ANNEX 2: GIADA-2 FS Software User Manual – Section 3).

4.1.7 Auxiliary Data Requirements

In order to correctly interpret the data coming from GIADA, the following auxiliary information, coming from the S/C and correlated w.r.t. UTC, are required (see **AD9 – Appendix H**):

- time relation history (OBT/UTC);
- GIADA LCL current and GIADA TRP temperatures
- steering wheel(s) speed and dumping time planning;
- S/C ephemeris w.r.t. Sun and Earth, planet (at swing-by), asteroid (at fly-by) and comet (starting before detection);
- navigation products (e.g. comet shape model);
- S/C attitude prediction/reconstruction;
- command history data;
- mission planning information;
- thrusters use prediction/reconstruction;
- solar panel degradation history;
- S/C thermal status.

4.2 Nominal Operational Plans

4.2.1 Ground test plan for GIADA

The ground test plan for GIADA is as described in **AD2** (Volume IV). More details for each of the test phases can be found in **RD3** and in ANNEX 3: GIADA Ground Test Sequences.

4.2.1.1 GIADA laser product classification

The GIADA experiment is classified as a Class 4 Laser product according to **AD3** and **AD4**. Therefore, since GA is the manufacturer of GIADA, the mandatory safety devices, listed in Table 4.1., must be supplied to the end user along with the H/W of the experiment itself:

Device	Description/Function
Key Control	A removable item that, when plugged in the laser product, allows switching on of the laser source(s). Removal of the key control from the laser product ensures no unintentional switching on of the laser source(s) is possible.
Remote Interlock Connector	A connector that permits remote switching off of the laser source.
Beam Stopper/Attenuator	A device, which terminates a laser beam path.

Table 4.1. GIADA Laser safety devices

The implementation on GIADA of the devices described in Table 4.1. is as follows:

- **Key Control**: it is implemented by open circuiting, on the laser key connector J05 present on GIADA, the +5 V power supply V_R to the non-latching relay that allows, when closed, the actual sourcing of current to the laser diodes. The relay supply circuit is physically interrupted at the return of the V_R line. However, to switch the relay in the closed position (i.e. 'Laser On' TC, to power the non-latching relay), a sequence of two telecommands received in a well-defined time relationship is needed. Three versions of the **Key Control** will be delivered with GIADA to S/C: the **Arm** version **(Green tag item),** the **Safe** version **(Red tag item)** and the **Ground** version **(Red tag item, which will be used during SPT test)**. The **Arm** version is the real Key Control; when it is plugged in, it enables the power supply to the non-latching relay and therefore the lasers can be switched on. The **Safe** version is fully representative of the **Arm** one from the structural and thermal point of view, but does not enable the power supply to the non-latching relay when it is plugged in. The difference between the **Arm** and **Ground** Key Control is that the **Ground** version does not enable the power supply to the non-latching relay unless it is connected to a remote control device (refer to next point on remote interlock connector).
- **Remote interlock connector**: the receptacle (J05 connector) for the key control is used as a remote interlock connector; this, along with the usage of the Ground version of the key control, allows connection to a remote control device, that shall be supplied by the end user (i.e. S/C).
- **Beam stopper/attenuator**: the protective cover of GIADA is used to implement this device and it is active when the locking mechanism is installed. It prevents human access to the direct laser radiation.

4.2.2 Commissioning plan

The GIADA plan for the first commissioning phase is summarised in Table 4.2. The activities required by GIADA during this phase are: releasing the Frangibolt and performing an in-flight checkout in order to verify the status of each sub-system. The execution of these procedures consists mainly in the execution of the self-test calibration procedures (autonomously operated by GIADA S/W) and in a sequence of pre-defined TCs, followed by checks on the received TM packet contents (HK and science packets). Furthermore, some TM Event reports are expected; they will be interpreted in near real time. The cover opening/closing procedure shall be executed when out-gassing from S/C is minimum. See also COMMISSIONING CVP-0 in ANNEX 6: Commissioning sequences of procedures.

A **Stray light – Pointing test** is foreseen that is aimed at checking the signal detected by the GDS sub-system with GIADA in Normal Mode, as a function of the pointing direction during Sun sluing (see Table 4.3). See also GD_POINTING_STRAY_LIGHT__OBS07A.itl and GD_POINTING_STRAY_LIGHT__OBS10A.itl in ANNEX 6: Commissioning sequences of procedures.

GIADA will be also switched on to participate to the **Interference test** and will be put in the most sensitive and the most noisy conditions (in Normal Mode) to check interference with payload and sub-systems of ROSETTA (see Table 4.4). See also GD_INTERFER_COMP_EVF_OPS01A.itl and GD_INTERFER_PART2____OPS01A.itl in ANNEX 6: Commissioning sequences of procedures.

GIADA Plan for Commissioning – Commissioning Part 1			
Step N.	**Time (relative to event)**	**Activity**	**Procedure Number**
10	CVP + 30 days Apr 03 2004 @ 22:05:26	Switch ON (Main)	GD-FCP-001
20	@ 22:22:03	Go to Normal mode and perform functional test	GD-FCP-020
40	@ 22:44:02	Go to SAFE Mode and await for power-off	GD-FCP-060
50	@ 23:00:30	Switch ON (Redundant)	GD-FCP-002
60	@ 23:24:24	Go to COVER Mode	GD-FCP-030
70	@ 23:28:32	Activate Frangibolt	GD-FCP-040
80	@ 23:36:23	Perform Cover Opening	GD-FCP-090
89	Apr 04 2004 @ 00:04:57	Go to SAFE Mode	
90	@ 00:09:44	Go to Normal mode and perform functional test	GD-FCP-020
100		Perform Normal Mode Self-Interference check	GD-FCP-100
102	@ 01:32:14	Perform MBS heating	GD-FCP-055
104	@ 02:30:36	Go to SAFE Mode	
105	@ 02:32:39	Go to COVER Mode	GD-FCP-030
110	@ 02:35:54	Perform Cover Closing	GD-FCP-070
120	@ 02:51:02	Go to SAFE mode and await for power-off	GD-FCP-060
130	@ 03:04:22	Switch ON (Main)	New sequence of SW patches
140	@ 03:20:01	Go to SAFE mode and await for power-off	GD-FCP-060

Table 4.2. GIADA First commissioning plan

GIADA Plan for Stray light – Pointing tests – Commissioning Part 2			
See GD_POINTING_STRAY_LIGHT__OBS07A.itl in ANNEX 6: Commissioning sequences of procedures Stray-light test from 180 to 90 degrees			
10	23 Sep. 2004 @ 06:21:14	Switch to SAFE Mode (Main)	GD-FCP-001
20	@ 06:44:02	Go to Cover Mode	GD-SEQ-035
30	@ 06:51:33	Perform Cover Opening	GD-FCP-090
40	@ 06:56:01	Go to SAFE Mode	GD-SEQ-065
50 *	@ 06:56:30	Set PZT Threshold, IS Ops Mode	GD-SEQ-036

GIADA Plan for Stray light – Pointing tests – Commissioning Part 2			
60	@ 06:58:01	Go to Normal Mode	GD-FCP-110
70	@ 06:59:05 (repeat)	Calibrate IS, GDS, MBS	GD-FCP-120
80	@16:45:01	Go to SAFE Mode	GD-SEQ-065
90	@ 16:46:02	Go to Cover mode	GD-SEQ-035
100	@ 16:53:03	Close cover	GD-FCP-070
110	@ 16:57:01	Go to safe mode and off	GD-FCP-060
**			
See GD_POINTING_STRAY_LIGHT__OBS10A.itl in ANNEX 6: Commissioning sequences of procedures Stray-light test from 45 to 20 degrees			
10	30-Sep-2004 @ 04:21:14	Switch to SAFE Mode (Main)	GD-FCP-001
20	@ 04:44:02	Go to Cover Mode	GD-SEQ-035
30	@ 04:51:01	Perform Cover Opening	GD-FCP-090
40	@ 04:56:01	Go to SAFE Mode	GD-SEQ-065
50	***	Set PZT Threshold, IS Ops Mode	GD-SEQ-036
60	@ 04:58:01	Go to Normal Mode	GD-FCP-110
70	@ 04:59:06 (repeat)	Calibrate IS, GDS, MBS	GD-FCP-120
80	@ 08:35:01	Go to SAFE Mode	GD-SEQ-065
90	@ 08:54:05	Go to Cover mode	GD-SEQ-035
100	@ 08:54:09	Close cover	GD-FCP-070
110	@ 08:54:18	Go to safe mode and off	GD-FCP-060

Table 4.3. Stray-light – Pointing test plan

* Note that this command could not be executed in the actual OP model, as expected

** Note that a cover close recovery action was needed after this procedure as the cover did not close as expected.

*** Not executed (skipped) to avoid the problem encountered during obs_7

GIADA Plan for Interference tests – Interference 1A & B – Commissioning Part 2			
See GD_INTERFER_COMP_EVF_OPS01A.itl in ANNEX 6: Commissioning sequences of procedures			
10	20 Sept. 2004 @ 10^h40^m	Switch GIADA on main, patch CF with default, patch SW (one patch at a time) and dump	AGDF001A, B and C
20	11^h10^m	Go to Cover Mode	AGDS035A
30	11^h11^m	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	11^h21^m	Go to SAFE	AGDS065A
50	11^h22^m	Go to NORMAL and enable Science TM	AGDS110A
60	11^h55^m	Go to SAFE	AGDS065A
70	11^h56^m	Go to COVER	AGDS035A
80	11^h57^m	Cover closing OBCP [arm cover, close cover without heaters]	AGDS070A
90	12^h10^m	Go to SAFE	AGDS065A
100	12^h11^m	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
10	21^h00^m	Switch GIADA on main, patch CF with default, patch SW (one patch at a time) and dump	AGDF001A, B and C
20	21^h30^m	Go to Cover Mode	AGDS035A
30	21^h31^m	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	21^h41^m	Go to SAFE	AGDS065A
50	21^h42^m	Go to NORMAL and enable Science TM	AGDS110A
60	22^h10^m	Go to SAFE	AGDS065A
70	22^h46^m	Go to NORMAL and enable Science TM	AGDS110A
80	23^h00^m (last 01^h24^m)	Calibrate GDS, IS and MBS Repeated 25 times, every 6 minutes	AGDS120A
90	21 Sept. 2004 @ 01^h30^m	Go to SAFE	AGDS065A
100	01^h31^m	Go to Cover Mode	AGDS035A
110	01^h32^m	Cover closing OBCP [arm cover, close cover without heaters]	AGDS070A

120	01^h45^m	Go to SAFE	AGDS065A
130	02^h00^m	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
10	17^h00^m	Switch GIADA on main, patch CF with default, patch SW (one patch at a time) and dump	AGDF001A, B and C
20	17^h30^m	Go to Cover Mode	AGDS035A
30	17^h31^m	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	17^h41^m	Go to SAFE	AGDS065A
50	17^h46^m	Go to NORMAL and enable Science TM	AGDS110A
60	22^h54^m (last 01^h24^m)	Calibrate GDS, IS and MBS Repeated 50 times, every 6 minutes	AGDS120A
70	23^h00^m	Go to SAFE	AGDS065A
80	22 Sept. 2004 @ 00^h12^m	Go to NORMAL and enable Science TM	AGDS110A
90	00^h40^m	Go to SAFE	AGDS065A
100	01^h16^m	Go to NORMAL and enable Science TM	AGDS110A
110	01^h30^m (last 01^h36^m)	Calibrate GDS, IS and MBS Repeated 2 times, every 6 minutes	AGDS120A
120	01^h45^m	Go to SAFE	AGDS065A
130	01^h46^m	Go to Cover Mode	AGDS035A
140	01^h47^m	Cover closing OBCP [arm cover, close cover without heaters]	AGDS070A
150	02^h00^m	Go to SAFE	AGDS065A
160	02^h01^m	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
END of interference 1A & B			

GIADA Plan for Interference tests – Interference 2A & B – Commissioning Part 2			
INTERFERENCE Part 2a			
See GD_INTERFER_PART2		OPS01A.itl in ANNEX 6: Commissioning sequences of procedures	
10	12 Oct. 2004 @ 17:00:00	Switch GIADA on main, patch CF with default, patch SW (one patch at a time) and dump	AGDF001A, B and C
20	17:30:00	Go to Cover Mode	AGDS035A
30	17:31:00	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	17:41:00	Go to SAFE	AGDS065A
50	17:42:00	Go to NORMAL and enable Science TM	AGDS110A
60	17:44:00	Set GDS L and R Thresholds	AGDS038A
70	17:44:30	Set IS Off	AGDS037A
80	17:45:00	Set IS Status	AGDS036A
90	17:45:30	Set IS On	AGDS037A
100	17:46:00	Calibrate GDS, IS and MBS - Several times, every 5 minutes until 13-October @ 001_06:00:00	AGDS120A
110	13 Oct. 2004 @ 06:00:00	Go to SAFE	AGDS065A
120	06:01:00	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
10	13 Oct. 2004 @ 06:16:00	Switch GIADA on redundant, patch CF with default, patch SW (one patch at a time) and dump	AGDF002A, B and C
20	06:36:00	Go to COVER	AGDS035A
30	06:37:00	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	06:47:00	Go to SAFE	AGDS065A
50	06:48:00	Go to NORMAL and enable Science TM	AGDS110A
60	06:50:00	Set GDS L and R Thresholds	AGDS038A
70	06:50:30	Set IS Off	AGDS037A
80	06:51:00	Set IS Status	AGDS036A
90	06:51:30	Set IS On	AGDS037A
100	06:52:00	Calibrate GDS, IS and MBS - Several times, every 5 minutes until 13-October @ 001_08:40:00	AGDS120A

GIADA Plan for Interference tests – Interference 2A & B – Commissioning Part 2			
110	08:40:00	Go to SAFE	AGDS065A
120	08:41:00	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
INTERFERENCE Part 2b			
10	17:00:00	Switch GIADA on main, patch CF with default, patch SW (one patch at a time) and dump	AGDF001A, B and C
20	17:30:00	Go to COVER	AGDS035A
30	17:31:00	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	17:41:00	Go to SAFE	AGDS065A
50	17:42:00	Go to NORMAL and enable Science TM	AGDS110A
60	17:44:00	Set GDS L and R Thresholds	AGDS038A
70	17:44:30	Set IS Off	AGDS037A
80	17:45:00	Set IS Status	AGDS036A
90	17:45:30	Set IS On	AGDS037A
110	17:46:00	Calibrate GDS, IS and MB - Several times, every 5 minutes until 001_18:30:00	AGDS120A
120	18:30:00	Go to SAFE	AGDS065A
130	18:31:00	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
INTERFERENCE Part 2c			
10	14 Oct. 2004 07:30:00	Switch GIADA on main, patch CF with default, patch SW (one patch at a time) and dump	AGDF001A, B and C
20	08:00:00	Go to COVER	AGDS035A
30	08:01:00	Cover opening OBCP [arm cover, open cover with heaters 5+6+4 on]	AGDS090A
40	08:11:00	Go to SAFE	AGDS065A
50	08:12:00	Go to NORMAL and enable Science TM	AGDS110A
60	08:14:00	Set GDS L and R Thresholds	AGDS038A
70	08:14:30	Set IS Off	AGDS037A
80	08:15:00	Set IS Status	AGDS036A
90	08:15:30	Set IS On	AGDS037A
110	08:16:00	Calibrate GDS, IS and MBS - Several times, every 5 minutes until 002_09:00:00	AGDS120A
110	09:00:00	Heat all MBSs	AGDS055A
120	10:10:00	Go to SAFE	AGDS065A
130	10:11:00	Go to NORMAL and enable Science TM	AGDS110A
140	10:13:00	Set GDS L and R Thresholds	AGDS038A
150	10:13:30	Set IS Off	AGDS037A
160	10:14:00	Set IS Status	AGDS036A
170	10:14:30	Set IS On	AGDS037A
180	10:15:00	Calibrate GDS, IS and MBS - Several times, every 5 minutes until 002_10:59:00	AGDS120A
190	10:59:00	Go to SAFE	AGDS065A
200	11:00:00	Go to SAFE, dump memory CF, switch off OBCP [close cover OBCP with heaters 6+4 on, go to SAFE, Report context, Reset VD .... switch off]	AGDF060A
END of Interference 2			

Table 4.4. Interference test plan

4.2.3 Cruise checkout/maintenance plans

During the cruise phase GIADA in-flight checkouts shall be carried on, in order to verify the health of each sub-system. The execution of this procedure is mainly a sequence of TCs and a check of the TM packet contents (HK and Science packets). Furthermore some TM Event reports are expected and in near real time interpreted. The cover opening/closing procedure during this phase is required.

Remark 4.3: Checkouts on Main and Red I/F

The checkouts foresee the verification of both GIADA interfaces.

Table 4.5 lists the activities for GIADA to be applied at P/L **Passive Checkout n. 0**, while Table 4.6. lists the activities for GIADA to be applied at all other P/L **Passive Checkouts (n. 1 – 13)** (See GIADA MAIN for PC1 - OIOR_PIHRSO_D_0000_GD_PCA___00011.ROS and GIADA REDUNDANT FOR PC1 - OIOR_PIHRSO_D_0000_GD_PCB___00012.ROS in ANNEX 6: Commissioning sequences of procedures for sequences used during PC1). The value of 'Y' in Table 4.6. will depend on how the P/L checkouts will be scheduled during the various cruise phases.

During **Active Checkouts**, the baseline procedure will be as **Passive Checkouts** (Table 4.5), but it could be changed/up-dated including parts of Pointing (Table 4.3) and/or Interference (Table 4.4) Test Plans. The decision will be taken on the basis of previous checkout results and S/C attitude and other operational parameters foreseen by ESA during the test.

GIADA Plan for P/L checkout n. 0			
See GIADA for PC0 - OIOR_PIHRSO_D_0000_GD_PC____00010.ROS in ANNEX 6: Commissioning sequences of procedures			
Step No.	**Time (relative to event)**	**Activity**	**Procedure number**
10	P/L checkout 0 – 28 Mar 2005 @ 04:01:09	Switch to Safe mode (Main)	AGDF001A, B and C
20	+24 min	Go to Cover Mode	AGDS035A
30	+ 2 min	Open cover	AGDF090A
40	+ 10 min	Go to Safe mode	AGDS065A
50	+ 1 min	Go to Normal mode	AGDS110A
60	+ 2 min	Set GDS L and R thresholds	AGDS038A
70	+ 0.5 min	Set IS On/Off	AGDS037A
80	+ 0.5 min	Set IS status and thresholds	AGDS036A
90	+ 0.5 min	Set IS On/Off	AGDS037A
100	+ 4.5 min	Calibrate GDS, IS and MB - Several times, every 5 minutes	AGDS120A
110	+ 6 h 45 min	Set GDS L and R thresholds	AGDS038A
120	+ 0.5 min	Set IS On/Off	AGDS037A
130	+ 0.5 min	Set IS status and thresholds	AGDS036A
140	+ 0.5 min	Set IS On/Off	AGDS037A
150	+ 4.5 min	Calibrate GDS, IS and MB - Several times, every 5 minutes	AGDS120A
160	+ 2 h 55 min	Set GDS L and R thresholds	AGDS038A
170	+ 0.5 min	Set IS On/Off	AGDS037A
180	+ 0.5 min	Set IS status and thresholds	AGDS036A
190	+ 0.5 min	Set IS On/Off	AGDS037A
200	+ 4.5 min	Calibrate GDS, IS and MB - Several times, every 5 minutes	AGDS120A
210	+ 2h 55 min	Self-interference test	AGDF100A
220	+ 1 h	MBS heating	AGDF055A
230	+ 1 h	Go to safe mode & off	AGDF060A
240	+ 30 min	Switch to Safe mode (Redundant)	AGDF002A, B and C
250	+ 24 min	Go to Cover Mode	AGDS035A
260	+ 2 min	Open cover	AGDF090A
270	+ 10 min	Go to Safe mode	AGDS065A
280	+ 1 min	Go to Normal mode	AGDS110A
290	+ 2 min	Set GDS L and R thresholds	AGDS038A
300	+ 0.5 min	Set IS On/Off	AGDS037A
310	+ 0.5 min	Set IS status and thresholds	AGDS036A
320	+ 0.5 min	Set IS On/Off	AGDS037A

GIADA Plan for P/L checkout n. 0			
See GIADA for PC0 - OIOR_PIHRSO_D_0000_GD_PC____00010.ROS in ANNEX 6: Commissioning sequences of procedures			
Step No.	**Time (relative to event)**	**Activity**	**Procedure number**
330	+ 4.5 min	Calibrate GDS, IS and MB - Several times, every 5 minutes	AGDS120A
340	+ 6 h 45 min	Go to safe mode & off	AGDF060A

Table 4.5. GIADA plan for P/L checkout phase 0

GIADA Plan for P/L checkouts n. = 1 to 13			
Step No.	**Time (relative to event)**	**Activity**	**Procedure number**
10	P/L checkout I + Y days	Switch to Safe mode (Main)	AGDF001A or AGDS001A ([1])
12	+ 1 min	Upload patches	AGDF001B or AGDS002A ([1])
14	+ 5 min	Upload patches	AGDF001C or AGDS003A ([1])
15	+18 min	Go to COVER Mode	AGDS035A
20	+ 2 min	Perform Cover Opening	AGDF090A
25	+ 10 min	Go to SAFE Mode	AGDS065A
30	+ 1 min	Go to NORMAL Mode	AGDS110A
40	+ 2 min	Set GDS L and R thresholds	AGDS038A
50	+ 0.5 min	Set IS Off	AGDS037A
60	+ 0.5 min	Set IS status and thresholds	AGDS036A
70	+ 0.5 min	Set IS On	AGDS037A
80	+ 4.5 min	Calibrate GDS, IS and MB - Several times, every 5 minutes	AGDS120A
90	+ 8 h 45 min	Self-interference test	AGDF100A
100	+ 1 h	MBS heating	AGDF055A
110	+ 1 h	Go to safe mode & off	AGDF060A
120	+ 30 min	Switch to Safe mode (Red.)	AGDF002A or AGDS001A ([1])
122	+ 1 min	Upload patches	AGDF002B or AGDS002A ([1])
124	+ 5 min	Upload patches	AGDF002C or AGDS003A ([1])
125	+18 min	Go to COVER Mode	AGDS035A
130	+ 2 min	Perform Cover Opening	AGDF090A
135	+ 10 min	Go to SAFE Mode	AGDS065A
140	+ 1 min	Go to NORMAL Mode	AGDS110A
150	+ 2 min	Set GDS L and R thresholds	AGDS038A
160	+ 0.5 min	Set IS Off	AGDS037A
170	+ 0.5 min	Set IS status and thresholds	AGDS036A
180	+ 0.5 min	Set IS On	AGDS037A
190	+ 4.5 min	Calibrate GDS, IS and MB - Several times, every 5 minutes	AGDS120A
200	+ 8 h 45 min	Self-interference test	AGDF100A
210	+ 1 h	MBS heating	AGDF055A
220	+ 1 h	Go to safe mode & off	AGDF060A
([1]) The second procedure is used starting with Passive Checkout n. 2, due to new definitions and variations in GIADA procedures applied from beginning 2006.			

Table 4.6. GIADA plan for P/L checkout phases from 1 to 13 (TBC)

4.2.4 Planet swing-by plans

No particular activity plan is foreseen for GIADA during planet swing-bys but possible checks as in Table 4.6. (TBC).

4.2.5 Asteroids fly-by plans

No particular activity plan is foreseen for GIADA during asteroid fly-bys but possible checks as in Table 4.6. (TBC).

4.2.6 Interference

In-flight interference tests between GIADA and other Rosetta Payload have been performed during Commissioning Part 2 (see Section 4.2.2).

Results of performed tests demonstrate that some effect on GIADA in terms of noise increase due to switch on of other Rosetta P/L may be present. However, no clear correlation could be identified.

Other future in-flight tests should clarify the potential interference effects on GIADA.

4.2.7 Operational Constraints

4.2.7.1 Constraints within the instrument that need to go into the EDFs

Constraints about instrument internal functioning mainly concern applicability of different TC's within operation modes. Details about applicability of TC's vs. GIADA status / operation mode are presented in AD2 (Section 2.8).

All these constraints are reflected in Flight Control Procedures (see Section 0).

A particularly important constraint concerns the switch-off of GIADA, that must be performed always after the cover has been closed. The following Remark then must be considered.

Remark 4.4 Never switch GIADA off with cover open
It is to be understood that switching off GIADA while its protective cover is not in the closed position may result in unit exposure to temperatures which are very close to the non-op limits, therefore this situation shall be avoided whenever possible (e.g. during ground testing).

During flight, it is foreseen to avoid this by using a specific OBCP, Close_Cover_OBCP (refer to **AD6 -** formerly Emergency_Close_Cover_OBCP), triggered by the internal temperature monitoring of GIADA (refer to Section 4.3.4). Should it be impossible to use this OBCP for any reason, the corresponding FCP (GD-FCP-200) shall be used.

4.2.7.2 Constraints due to other instruments that need to go into the EDFs

No constraint on other Rosetta P/L has been identified so far, but the one possibly related to pollution produced by other P/L and Rosetta sub-systems.

Therefore, GIADA should be kept in OFF status and with cover closed whenever pollution with volatile or solid materials is foreseen from other elements on-board Rosetta.

In this respect, effects produced by thruster operation should be kept under control and GIADA should be kept in OFF status and with cover closed when thrusters are expected to be operated, as a general rule.

4.2.7.3 Pointing constraints

4.2.7.3.1 Pointing Constraints to avoid GDS saturation

In principle, the optimal performances of GDS can be reached only ***avoiding direct sun irradiation inside the instrument***. This condition can be obtained if the angle between $+Z_u$ direction and sun direction is > 80 deg. For smaller angles, down to 11 deg, no thermal problems will affect GIADA, according to the performed thermal analysis (**RD7**). On the other hand, solar stray-light effects will affect GDS reading with angle decreasing, so that the subsystem sensitivity will be degraded. Therefore, the requirement concerning the angle between sun direction and $+Z_u$ direction is that it should be > 80 deg for as long as possible, to guarantee optimal performances of GDS.

See sequernces GD_POINTING_STRAY_LIGHT__OBS07A.itl and GD_POINTING_STRAY_LIGHT__OBS10A.itl in ANNEX 6: Commissioning sequences of procedures.

Remark 4.5: GDS Output saturation due to Sun aspect

Indeed, during the Pointing Test, performed on 23-30 Sep. 2004, it has been observed that:

The GDS Left channel is saturated for Sun angle between 30 and 75 deg

The GDS Right channel is saturated for Sun angle below 75 deg

The Sun was in the X-Z plane and the Sun angle is measured from the Z axis in the direction of X axis

The angle between $-Y_u$ direction and sun direction has to be >80 deg in the X_u-Y_u plane, and >65 deg in the Y_u-Z_u plane, to avoid sun radiation entering the GIADA-1 module through the laser exit aperture.

Other requirements about pointing strategy for GIADA optimal scientific achievements are reported in Section 4.4.

4.2.7.3.2 Pointing requirements for Frangibolt activation

As evidenced in the conclusions of RD7, the unlocking of the Frangibolt should occur with TRP temperatures lower than +40°C. In order to achieve this condition, S/C pointing expected during Frangibolt activation shall be analysed and a dedicated S/C pointing scenario could be required (see Section 4.2.2).

4.2.7.4 Power constraints

4.2.7.4.1 MBS Heating in Normal Mode

In order to maintain GIADA within allocated power budget (see Table 3.4), when GIADA is in Normal Mode, the IS and GDS sub-systems must be switched-off by ground TCs before MBS heating. MBS's must be heated one by one.

This constraint is implemented in GD-FCP-055 (Perform MBS Heating).

4.2.7.4.2 Implication of MBS heating power profile at cold temperature on operations

Based on the MBS behaviour during heating observed at cold temperature described in Section 3.2.1.1, the following recommendation is issued.

Remark 4.6: Slow current drop after MBS heating at cold

Before to resume the nominal Normal mode configuration (with all IS and GDS S/S ON and with Laser-ON), it shall be waited until the complete drop of current, i.e. at least 30 s after the MBS heater switching off. This applies only when the GIADA TRP is below of 0 °C.

This precaution has been implemented in the timing of GIADA MBS heating procedure (GD-FCP-055), as a 10 min interval is used within the procedure, instead of the 6 mins default timeout value defined in the CT.

4.2.7.5 Thermal constraints

The operational configuration of GIADA instrument foresees the cover opening and the instrument pointing in the direction of the nucleus. During the operation, the most important issue is the temperature of internal sub-systems (mainly the Impact Sensor) that may fall outside the specified ranges (both non-operative and operative) due to thermal environment conditions. The sun (space) heats (cools) the internal sub-systems depending on the S/C pointing direction. In case of thermal contingencies, the GIADA on-board software autonomously performs some actions.

All the main subsystems within GIADA (ME, GDS, IS and MBS) are equipped with temperature sensors, whose purpose is to guarantee that both the operating and the non-operating temperature limits, defined for each subsystem, are respected. The S/W reads these sensors according to the contents of the Configuration Table (it is possible to disable any subsystem temperature checking), every 40 s or 10s (if the CF is uploaded following the .mpr file in ANNEX 7: GIADA Configuration File).

The ME temperature sensor is, of course, always working when GIADA is powered on, regardless of its operating mode. The ME has a maximum non-operating limit only.

The GDS and MBS temperature sensors are active only when the relevant subsystem is switched on. Both these subsystem have a maximum non-operating limit, while the GDS has a minimum non-operating limit only. Note that even if the temperature reading is performed when GDS is ON, the thermal contingency is performed only when Lasers are switched-On.

The IS plate temperature sensor is instead always active in scientific modes (i.e. Normal and Flux), independently from the IS status. The IS has a minimum non-operating limit, and both maximum operating and non-operating limits.

The management of GIADA thermal contingencies is described in Section 4.3.4.

4.2.7.6 Other constraints

None identified.

4.3 Failure detection and recovery strategy

The information here following summarises the one contained in ANNEX 2: GIADA-2 FS Software User Manual (Section 4) and in **AD2** (Section 2.8), where more details can be found.

4.3.1 Management of Recoverable and Unrecoverable Faults

Two circuits present on the ME of GIADA perform the on-board management of faults: the Watchdog circuit and the Error Detection and Correction (EDAC) unit.

The purpose of the Watchdog is to permit recovery of "endless loop" situations, by means of resetting GIADA. The ME Watchdog circuit, whose time-out limit is 1 s, is refreshed only once in the code, at the beginning of the main loop.

In addition to endless loops, the following errors will trigger the Watchdog:

- INT0, INT1, INT3, INT4 software interrupts;
- Non-Maskable Interrupt (NMI);
- Unrecoverable EDAC faults (see below).

After a watchdog reset, a specific Error Event Report Subtype 3, ID 42309 "Previous Execution Reset By Watchdog" (YGD42309) will be generated, including the available information to identify the reset cause.

The purpose of the EDAC is to detect both recoverable and unrecoverable errors that could happen when the CPU accesses a memory location; errors are trapped on both data and address lines. In case a recoverable fault is detected, the EDAC will proceed to correct it and the S/W will continue its execution flow; the correction action is notified to ground using an Error Event report Subtype 3, ID 42186 "EDAC Event Error" (YGD42186).

If an unrecoverable fault is detected, the S/W cannot continue its execution flow, and the watchdog will reset GIADA as explained before.

The description of possible errors generated by GIADA is reported in ANNEX 2: GIADA-2 FS Software User Manual (Section 4), where tables with instructions for consequent recovery actions are reported.

Table 4.7. summarises the major system failure modes and describes the relevant consequences. Refer to the FMECA document (**RD6**) for detailed description**.**

In all cases of contingencies, the criteria stated in Section 6.4 must be accounted for, as well as the **Remark 4.4**.

System	Failure	Response
Protective Cover opening	Failure to Open Failure to Close	The Motor windings are redounded: open (close) the Cover with the other available I/F
Launch Lock Mechanism (Frangibolt)	Failure to Activate	The Frangibolt heaters are redounded: activate the Frangibolt with the other available I/F
CPU electronics	Failure of Key components	Use the other available I/F
Power Distribution	Failure of DC/DC converter	Use the other available I/F
IS	Temperature falls outside the operative range (hot case only)	IS switched off (autonomously)
IS, GDS Laser, MBS or ME	Temperature falls outside the non-operative range	No autonomous actions are taken, apart from triggering the (Emergency) Close Cover OBCP
IS, GDS, MBS	Critical failure at subsystem switch-on (e.g. excessive in-rush current)	No autonomous actions are taken; the subsystems can be partially or completely disabled by patching the Configuration Table

Table 4.7. Major Failure Modes and Possible Recovery Operations

4.3.2 Requirements for on-board monitoring

No On-board Monitoring Requirements are issued by GIADA to DMS, as all health and housekeeping task are performed autonomously.

However, as described in Section 3.3, some OBCPs (Power_On, Close_Cover, Switch_On_Lasers) are triggered through event monitoring by the S/C.

4.3.3 Requirements for on-ground monitoring

See Section 7.10 and **Remark 7.3**.

4.3.4 Thermal Contingencies

Thermal constraints on GIADA sub-systems are described in Section 4.2.7.5.

Thermal contingencies concerning the non-operating limits are managed as follows:

- First the situation is signalled to ground using a proper Event Report Subtype 3, ID 42211 “Laser Temperature Above Max Temp” (YGD42211), 42212 “Laser Temperature Below Min Temp” (YGD42212), 42230 “MBS Temperature Above Max Temp” (YGD42230), 42240 “IS Plate Temperature Above MAX NON-OP Temp” (YGD42240), 42241 “IS Plate Temperature Below Min Temp” (YGD42241), 42242 “Main Electronic Temperature Above MAX-OP Temp” (YGD42242);
- Then another Event Report Subtype 4, ID 42032 “Start Emergency Cover Close OBCP” (YGD42032) is generated, triggering the Close_Cover_OBCP, whose purpose is: a) to switch off all the subsystems (except for the ME) by commanding the experiment to go in Safe mode; b) to change the operational mode to Cover and to close the GIADA cover; c) to command the experiment into Safe Mode.

Thermal contingencies concerning the maximum operating limit of IS only are managed differently:

- First the situation is signalled to ground using a proper Event Report Subtype 3, ID “42220 IS Plate Temperature Above MAX-OP Temp” (YGD42220);
- Then the IS is switched off autonomously;

- The IS plate temperature sensor is still read; as soon as the monitored temperature goes below the operating limit, minus a hystheresis, the IS is switched on autonomously, thus restoring its full operation.
- If procedures running in parallel would command IS while it is off, they will be efficient according to the selection criteria as in nominal operations. In particular, if the IS is commanded on again by a command issued within a running sequence, the thermal contingency criteria shall be applied again.

Both the switching on and off of the IS are notified to ground by means of Event Reports Subtype 3, respectively IDs "42218 IS switched-on, status resumed by end of thermal contingency" and 42219 "IS switched-off, due to thermal contingency" (YGD42218 and YGD42219).

The operating limits, as well as the IS plate hystheresis, are parameters contained in the Context File (see Section 5.2.1.1); the frequency with which the S/W performs the subsystems checking is instead a S/W variable, located in a specific area in the RAM (refer to RAM map in ANNEX 2: GIADA-2 FS Software User Manual – Appendix B), whose value can be changed by using Service 6. By default, the temperature checking is performed every minute. This automatic procedure can be disabled either by patching the actual Context File (RAM copy), or by uploading at next power-on a new, modified copy, that excludes any autonomous thermal checking.

The IS and Laser temperature readings, together with those monitored on the Frangibolt and the Main Electronics (close to its hottest point), are transmitted every 40s (default) or 10s (after uploading the CF according to ANNEX 7: GIADA Configuration File) in HK packets.

The actual temperature limits in use on GIADA on-board software after uploading the CF are summarised in ANNEX 7: GIADA Configuration File (refer to .mpr file).

4.3.5 Laser-1 light monitor failure

Each Laser source in the GDS driver has an internal light monitor photodiode, which normally is used to monitor the Laser light degradation with time.

During the GIADA FS thermal-vacuum test, an anomaly on the Laser 1 light monitor has been detected, that has been reported in the GIA-GAL-NCR-D027 in **RD11**. The Laser 1 light monitor presents a **not nominal value** when the corresponding Laser temperature is below a defined threshold:

- When the temperature is below –3 °C, the Laser 1 light monitor provides a fixed value of about 0.7 V (Main) and about 0.6 V (Redundant), while the nominal value is from –0.1 V to 0 V (with laser switched-off) or > 0V, but a different value (when laser is switched on).
- When the temperature changes (refer to Figure 4.2.) and overcomes about –3 °C, the Laser 1 monitor drops to the nominal value (about –0.03V, with laser switched-off).
- When the temperature changes (refer to Figure 4.3.) and falls below about –7°C, the Laser 1 monitor rises from the nominal value (about –0.03 V, with laser switched-off) to the unexpected 0.7 V value.

The other three Laser monitors do not present this anomaly along the full thermal cycle.

The reason of the failure can only be explained with a malfunctioning of the photo diode in the Laser device.

Remark 4.7. Problem with Laser 1 monitor below -3 °C

This problem is present whatever the status of the laser is (ON or OFF). The problem is linked to a malfunctioning of the laser monitor photodiode itself. The laser monitor function was implemented to monitor the Laser light degradation with time and does not affect the GDS science operations. In the present condition, the Laser 1 light can be monitored when temperature is above few degrees. This condition is expected to occur during the Operation @ the comet and could be achieved also in other phases with cover closed.

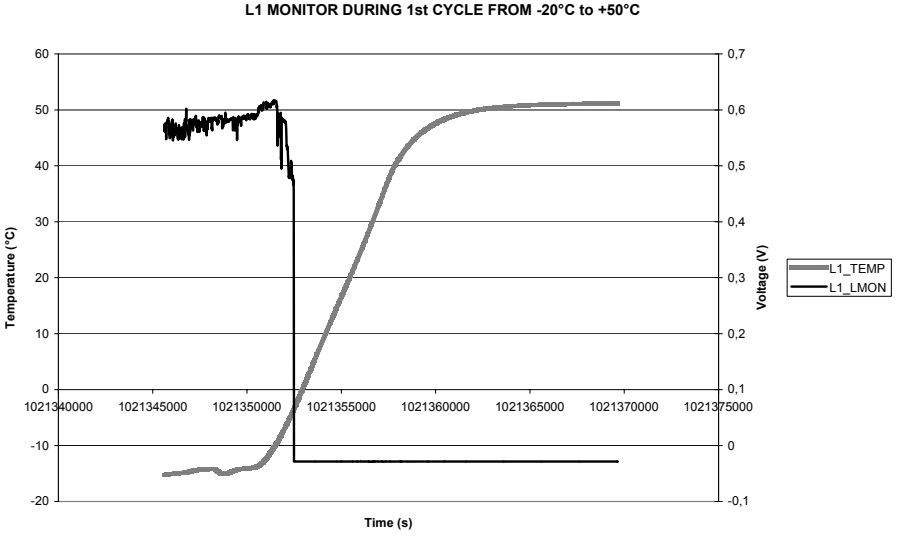


Figure 4.2. Laser-1 light monitor during transition from –20°C to 50°C

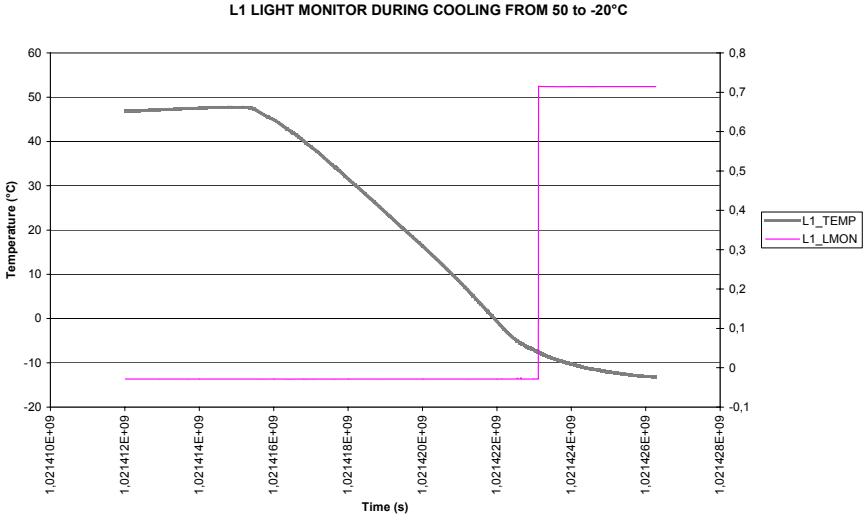


Figure 4.3. Laser-1 light monitor during transition from 50°C to -20°C

4.3.6 GDS Left internal stray-light

During Cleaning and Close-out activities in Kourou before launch, a GDS Left signal (average 0.65 V) slightly above threshold has been observed. The same effect has been observed during in flight commissioning. The intensity looks to increase in time (up to about 0.82 V). As a consequence, the GDS L Threshold has been increased (wrt. pre-flight fixed value) to minimise stray-light signal production. The value set (L threshold at 29 units corresponding to 1.2 V) during the Interference 2 commissioning phase has guaranteed a substantial reduction of stray-light events from about 1 – 10 events s-1 (with threshold at 0.8 V) to 0.01 events s-1. A further increase of the GDS Left threshold is required to eliminate this class of ghost events. This has been tried during PC0 and PC1 tests (L threshold up to at 35 units corresponding to 1.6 V) but the effect could not be checked as the S/C attitude configuration wrt. the Sun produced GDS saturation, so that no GDS scientific events were detected.

In addition, other GDS detections are observed with amplitude high or close to saturation limit (6.9 V). The origin of these events is still not clear and could be due to internal or external electronic noise. Further tests are needed to identify the nature of these events.

Remark 4.8: Monitoring on GDS stray-light level

It is necessary to check at all GIADA switch-on the evolution of the stray-light level, in order to optimise GDS L Threshold setting

4.3.7 MBS frequency variation during flight

Monitoring of MBS frequency at different switch-on during commissioning has shown that 3 MBS do show a progressive increase of frequency probably due to some contamination of the quartz crystal sensors (see Table 4.8). While this effect was not observed between on-ground test values and first switch-on @ commissioning, the effect looks evident at the second switch-on. The effect does stabilise after the Pointing 2 tests. The contamination looks to be due to some stable material, as the frequency has not changed significantly even after MBS exposure to Sun and MBS heating sequence.

MBS nominal sensitivity = 2.00E-10 g Hz^{-1}
MBS sensor surface = 1.00E-05 m^2
(Assumed) deposit density = 1.00E+06 g m^{-3}

	Comm 1 f (Hz)	Point 2 f (Hz)	Delta (Hz)	Delta m (g)	Thickness (m)
MB1	2700	5250	2550	5.10E-07	5.10E-08
MB2	2512	2578	66	1.32E-08	1.32E-09
MB3	2391	4093	1702	3.40E-07	3.40E-08
MB4	2503	2588	85	1.70E-08	1.70E-09
MB5	2620	3671	1051	2.10E-07	2.10E-08

Table 4.8. MBS frequency variation from Commissioning 1 to Pointing 2 tests and estimated total mass deposit.

Remark 4.9: Monitoring of MBS frequency evolution

The MBS frequency evolution with time must be analysed carefully at every GIADA switch-on to alert on any frequency variation produced by further contamination.

4.4 Pointing Requirements

In addition to the pointing constraints reported in Section 4.2.7, in order to optimise the dust collection and to analyse in detail the physical and dynamic properties of grains pertaining to the two classes of "direct" and "reflected" grains (see Section 2.1) a pointing strategy is required. This must be applied during specific campaigns of measurements, compatibly with the overall mission profile development, according to the following requirements.

4.4.1 Close observation phase

During the **close observation phase** it is planned that the S/C - nucleus distance will decrease to less than 2 R_n (nuclear radii), so entering the grain "full acceleration regime". It is expected that the S/C velocity will be comparable to the (very low) grain velocities. In this phase it will be useful to tilt the $+Z_u$ axis by a small angle (less than 20 deg) in the plane identified by the nucleus direction and the S/C velocity in order to constrain the received velocities. This approach will allow us to monitor the dust acceleration. Moreover, the data collected in this phase will be useful also to characterise the surface activity; a key information to select the SSP landing site.

4.4.2 SSP delivery & relay phase

During the **SSP delivery & relay phase** it is planned that the S/C - nucleus distance will range from 4 to 20 R_n. Again, very low dust velocities are expected (full acceleration regime). The requirement of tilting the $+Z_u$ axis by a small angle (less than 20 deg) in the plane identified by the nucleus direction and the S/C velocity is maintained.

4.4.3 Extended monitoring phase

During the **extended monitoring phas**e, the S/C - nucleus distance should vary in the 20 - 200 R_n range and "petal-like" trajectories are foreseen by the present mission plan. In this phase, most of the dust collection by GIADA should occur when the S/C - nucleus distances is > 50 R_n. Most of the grains are expected from the nucleus direction, so a continuous $+Z_u$ pointing in the nucleus direction is required. On the other hand, when the S/C is at < 50 R_n from the nucleus, tilting the $+Z_u$ axis in the plane determined by nucleus direction and S/C velocity would allow us to detect grains with radial velocities « 1 m s^{-1}. Their detection would offer strong constraints to the dust velocity probability function.

The observation requirements during various mission phases are summarised in Table 4.9..

Mission Phase	Pointing requirement
close observation and SSP delivery & relay	Z_u axis tilted by less than 20 deg in the plane identified by the nucleus direction and the S/C velocity
extended monitoring (at > 50 R_n)	Z_u axis in the nucleus direction
extended monitoring (at < 50 R_n)	Z_u axis tilted by less than 20 deg in the plane identified by the nucleus direction and the S/C velocity

Table 4.9. Pointing strategy during different mission phases

5. MODE DESCRIPTIONS

The information given below is an overview, for more details see **AD2** (Section 2.8.2.2) and ANNEX 2: GIADA-2 FS Software User Manual (Section 2.2.3).

5.1 Mode transition table

GIADA has four operative modes, as reported in Table 5.1., where sequences to access the different modes are also listed. Allowed transitions are shown Figure 5.1**Errore. L'origine riferimento non è stata trovata.**.

Mode Name	Active subsystems	Measured quantities	Sequence to access the Mode
Safe Mode	ME	None	GD-SEQ-065
Normal Mode	ME, GDS, 5 MBSs, IS Note: actual number of sensors used depends on the Context File content	Dust flux and fluence Grain Scattering properties Momentum of single grains Velocity of grains Mass of single grains	GD-SEQ-611 GD-FCP-110 also used to go to Normal + Enable Sci TM
Flux Mode	ME, 5 MBSs	Dust flux and fluence	GD-SEQ-616
Cover Mode	ME, Cover or Frangibolt Electronics	N/A	GD-SEQ-035

Table 5.1. GIADA operative modes and transition sequences

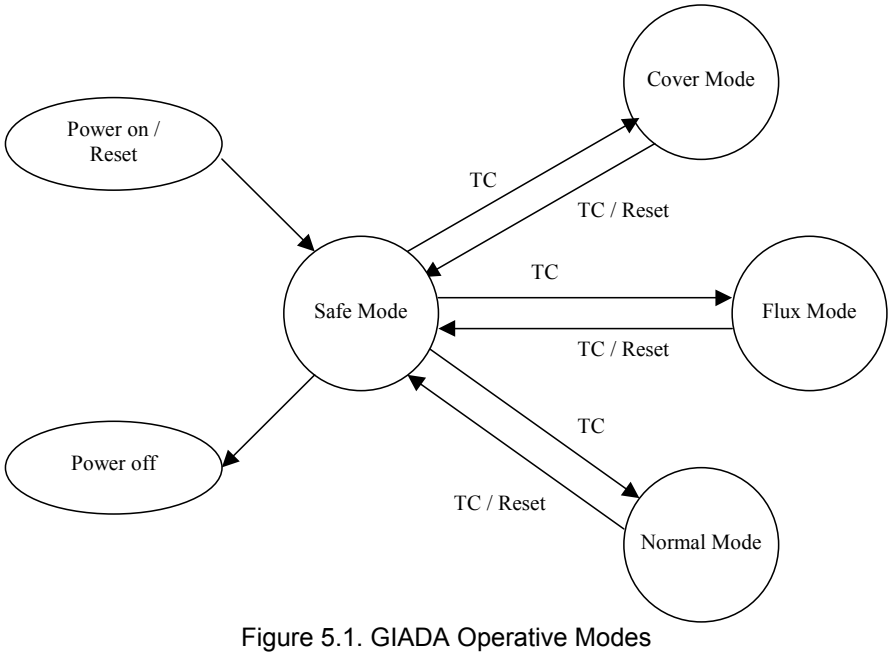


Figure 5.1. GIADA Operative Modes

As shown in Table 5.1. different operational modes correspond to different measured quantities and different active sensors/subsystems.

5.2 Detailed mode description

Figure 5.1**Errore. L'origine riferimento non è stata trovata.** represents the mode transition diagram for GIADA. The transitions between the four operative modes can only be executed by TC, i.e. there is no autonomous mode transition, but in two cases. First, if a change mode is sent before time synchronisation TC at power on, GIADA will change the mode to SAFE autonomously after 60 s or after time synchronisation TC arrival (as described in Section 5.2.1). Second, as described in Section 4.2.7.5, any detected thermal contingency starts an emergency OBCP, whose purpose is to switch off all the subsystems and to close the cover. This is achieved by the following sequence: TC "Go to Safe Mode" (resulting in switching off all the measurement sub-systems), TC "Go to Cover Mode", commands for cover closing and finally "Go to Safe Mode".

Power, data volume and data rate budgets for each mode are reported in Section 3.4.

5.2.1 Safe Mode

This mode is entered, by default, after either power-on or reset. Only the Main Electronics is running; the on board S/W runs from PROM. In this mode no scientific measurements are taken, and the instrument waits for a TC to begin normal operation. The only data that are collected and sent on the OBDH bus are the HK information, unless the relative TC has stopped their delivery. This mode allows time synchronisation, TC execution and memory manipulations (patches and dumps). All the sub-systems are initialised in power-off condition after software boot.

After a power-on/reset, the on-board software is first copied from PROM to RAM, and then a jump to the first valid code address in PROM is performed. The H/W and S/W initialisation activities, including a check of the validity of the NVRAM contents, are performed; the instrument is then ready to receive the commands.

The test of the NVRAM basically verifies the presence and consistency of the Virtual Disk (the memory patches are memorised into NVRAM as files, organised with FAT). If the Virtual Disk is not recognised as present (i.e., some of the CRC's checks are not OK), the NVRAM is then reset and the Virtual Disk is created from scratch. The consistency check of the Virtual Disk is performed in steps. First the software checks the CRC of the main and redundant Virtual Disk FATs. If this first test is successful, then the S/W verifies the CRC of each contained file, extracting it from the FAT. At this point, the software loads from PROM the Context File into NVRAM and RAM. In case of successfully completed NVRAM checks, the patches (if any) are loaded depending on the contents of the Context File "Patches Status" field.

GIADA goes to Safe mode immediately after power-on but, according to the relevant requirements in **AD1**, can only notify its operative mode via TM, either after receiving the time synchronisation TC, or after the timeout of 60 s expires (time synchronisation TC is not received). This information is delivered both inside every HK packet (whose period is 40 s by default or 10 s if the CF is uploaded following .mpr file in ANNEX 7: GIADA Configuration File), and in a Normal Progress Event report (delivered only once for every mode transition). During this period, GIADA is anyway in Safe mode, and thus will accept and execute all the relevant commands, even the ones that imply an operative mode change. In this last case, after either the 'time sync' TC is received, or the 60 seconds timeout has expired, GIADA will autonomously perform a transition to Safe mode. At this time, it will issue the relevant Event Report Type 1, ID 42050 "GIADA in Safe Mode", notifying the mode change. The conclusion is that the normal power-on sequence of GIADA should not include any command, except the Request Connection Test or Accept Context Request TCs before the first GIADA HK packet is transmitted.

Remark 5.1: Event Report TM (5,3) "42310 EDAC Error During S/W Start And Dump" at switch on

An Event Report TM (5,3) - "42310 EDAC Error During S/W Start And Dump" might be received at switch on, in addition to the nominal Event Report TM (5,1) - "42050 GIADA in Safe Mode" and the HK Report TM(3,25), when GIADA is switched on the first time or with KAL off

Remark 5.2: Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" at switch on

An Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" might be received at switch on, in addition to the nominal Event Report TM (5,1) - "42050 GIADA in Safe Mode" and the HK Report TM(3,25), when GIADA is switched on after a VD reset

5.2.1.1 Context File Content, Use and Modification

Details about **Context File** (CF) are reported in ANNEX 2: GIADA-2 FS Software User Manual (Section 3.7). Here we recall some main information.

Regardless of its operational mode, the instrument will run autonomously according to a pre-defined configuration. This functional configuration description and other important parameters are maintained within the Configuration Table, which is a replica, located in GIADA RAM, of the GIADA Context File.

In nominal conditions, GIADA shall receive the Context File from the DMS (using Service 18), as part of the experiment power on OBCP; in case such file is not received, GIADA will use the default copy of the Context File, which is stored in the experiment ROM.

During the GIADA bootstrap, the received Context File (regardless of its provenience - ROM or TC) is copied in both RAM and NVRAM:

1. CF RAM copy (also know as **Configuration Table**). Stored in RAM, address: 0x903A (inclusive)
2. CF NVRAM copy. Stored in NVRAM, address: 0x0008 (inclusive)

The main difference between the Configuration Table in RAM and the Context File stored in NVRAM is that, while the NVRAM Context File content CANNOT be altered by GIADA private services, the Configuration Table is, indeed, altered according to the commands that GIADA receives. These changes are normally temporary, since their foreseen use is mainly for experiment testing and/or troubleshooting and/or specific operations. This is the reason for maintaining in GIADA two distinct copies of the received Context File: the copy held in NVRAM is the one that will be sent to the DMS, via Service 18, as part of the experiment power off OBCP.

There are several ways to modify the Context File copies (see also Figure 5.2):

a) Using the **TC(18,3) Accept Context (ZGD00009)**. This TC has a CF attached, coming from S/C DMS, that is copied in both CF copies (RAM and NVRAM).

The **TC(18,1) Report Context (ZGD00008)** returns the copy of NVRAM that will be stored in the DMS memory.

In the nominal Power ON OBCP, the DMS will send to GIADA the **TC(18,3) Accept Context (ZGD00009)** in order to modify the CF copies and in the nominal Power OFF OBCP the DMS will send to GIADA the **TC(18,1) Report Context (ZGD00008)**.

b) Using the **TC(6,2) Load Memory Absolute Addressing** (also called patches) to modify independently

1. the CF RAM copy: ZGDX0617 **(Patch CT in RAM),** or ZGD00602 **(Load Memory ID 81)**, or ZGDX0601 **(Patch CT in RAM,** version flight 1**)**; the latter allows uploading the version of the CT used for flight after launch

OR

2. the CF NVRAM copy: ZGDX0618 **(Patch CF in NVRAM)** or ZGD00603 **(Load Memory ID 82)**.

The **TC(6,5) GIADA Dump CF (ZGDX0701)** can be used to report the CF copy from RAM, while **TC(6,5) Dump Memory Absolute Addressing (ZGD00004)** can be used to report the CF copies independently.

The option **b)** is the only way to completely modify the CF copies from ground. Only parts of CT in RAM can be modified by setting GIADA specific parameters with several TCs (private services).
There is a tool called "GIADA CF to MPR" that using as input a CF generated by the GIADA EGSE, translates it to the DMS patch format.

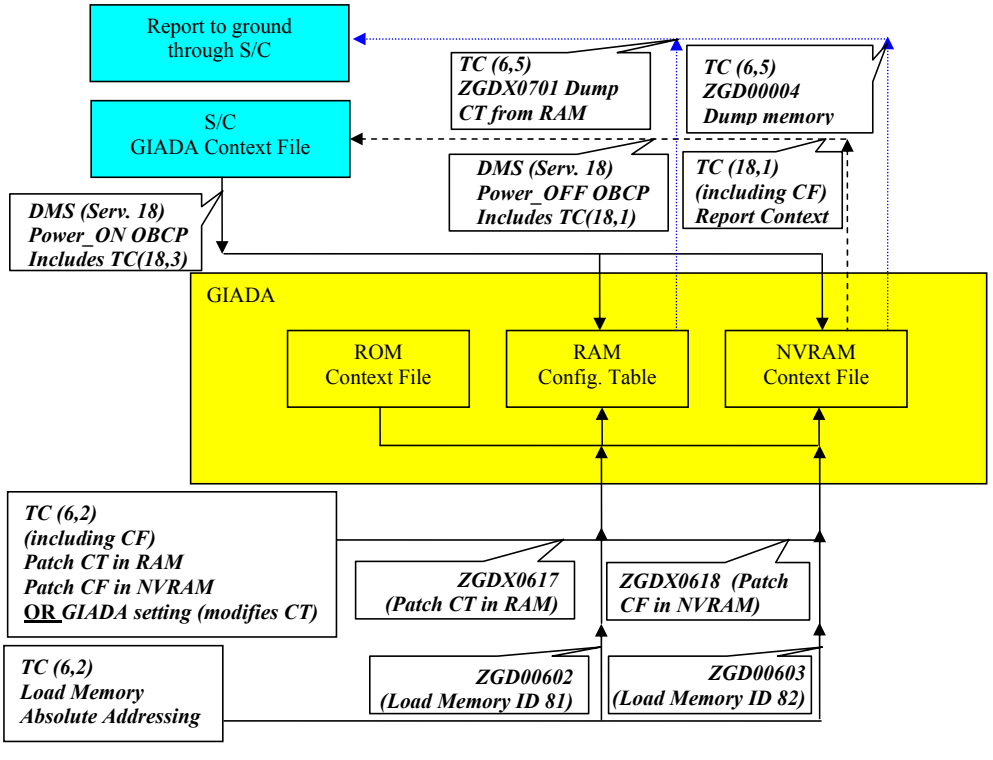


Figure 5.2. Methods for Context File and Configuration Table management

The status of the CF patches is managed as it follows:

When the **TC(6,2)** is received, the patch is always applied.

Only the patches to RAM, by **TC(6,2)** (ZGDX0601, ZGD00602, ZGDX0617), are stored in the Virtual Disk (VD) and the patches status of the CF RAM copy is updated setting to 1 the appropriated bit. The HK patches status is always a copy of the current CF RAM copy patches status. The CF NVRAM copy is not affected by these actions.

The patches to NVRAM, by **TC(6,2)** (ZGD00603, ZGDX0618), do not affect the patches status bits of the CF RAM copy neither the HK bits. They are not stored in the VD.

With option **b.2)** to update the CF NVRAM copy, the HK patches status is not modified (the patch is not stored in the VD and the CF RAM copy has not been updated).

To modify the CF RAM copy using the procedure **b.1)**, the CF RAM copy is overwritten with the new CF patch (and so the HK patch status bits), then the new patch must be added to the patches status of the CF RAM copy (because this patch is really a patch to the RAM). For example, if the current CF RAM copy has 5 patches in its patches status and using the procedure **b.1)** the new CF patch has 2 patches in its patches status, finally the HK status will have 3 patches (2 originally by the CF patch and one more for the CF patch itself).

If the CF copies are updated using the option **a)** and the new CF has a patches status with some bits enabled, then patches associated with these bits are loaded from the VD and applied automatically. This process is not valid if we use the option **b)**. If the relevant patches are not present in the VD an error event report will be generated by GIADA, but in any case the HK bits will reflect the status imposed by the new CF RAM copy.

The patches status bits of the CF are executive only with option **a)**. When we patch something we are the responsible of each bit we write, and the RAM CF copy patches status bits are read and sent in the HK, with no action more. If we patch with option **b)** no action is taken.
The patches status bits of the HK only have the meaning of which patches stored in the VD are applied unless the CF RAM copy is patched or the VD has been reset.

There are several Power ON/OFF possible sequences, with associated Conext File and Configuration Table management.

The one presently used in flight is as described in Remark 5.3.

Remark 5.3: Power ON/OFF and use of Context File in flight

⇒ ***Power ON (GD-SEQ-001 including Power-on OBCP)***

- ***The "Switch to Safe Mode" FCP is used to power-on GIADA (see Section 0).***
- ***At start up the CF in GIADA ROM is copied into NVRAM CF and into CT RAM***
- ***The first step inside the FCP is the execution of the Power-on OBCP (in which the NVRAM Context File and the RAM Configuration Table can be updated from the DMS by means of Service 18)***
- ***Then, the FCP runs a Memory Load Command (Service 6) to change only the Configuration Table in the RAM (status bits = 0 – HK patch status bits = 1).***
- ***Then, the FCP sends the patches to on-board Software ver. 2.3***
- ***The procedure leaves unchanged the NVRAM Context File***

Therefore, the Configuration Table is practically updated by Service 6 (Memory Load service) instead of Service 18.

⇒ ***Power OFF (GD-FCP-060 including GIADA Power-off OBCP – see Section 0)***

- ***At the next power off, a patch (included in Power-off OBCP) is applied to reset the Virtual Disk and to avoid that it becomes full (see Remark 6.2)***
- ***Then the DMS stores into SSMM a copy of the Context File not-aligned with the Configuration Table, for the successive GIADA Power-on OBCP.***

Other possible Power ON/OFF sequences are applicable (considering or not the use of the Service 18 and the powering or not of the the Keep Alive Line), although presently not reflected in any existing Flight Control Procedure. They are discussed in ANNEX 2: GIADA-2 FS Software User Manual (Section 2.2.2) in order to keep trace of various alternatives and record them in case of need.

5.2.1.2 Memory Patching

When a memory load command is received (Service 6), depending upon the Memory ID, the following actions are taken:

♦ID = RAM the received blocks are written both in RAM, at the memory location(s) specified in the Memory Load packet and, if there is still available space in the Virtual Disk, in NVRAM, formatting them according to the Virtual Disk format in order to retrieve them later. The Configuration Table (in RAM) is also updated and at next transition from Safe Mode to another mode, the uploaded memory patches take effect.

♦ID = NVRAM the received blocks are only written in NVRAM at the memory location(s) specified in the Memory Load packet.

5.2.2 Normal Mode

This is the operative mode of GIADA during nominal S/C and instrument operational conditions where every subsystem is running. The onboard S/W runs in RAM. Only after receiving a proper mode transition command ('Go to Normal'), this operative mode is entered. After entering Normal mode, depending on the actual Configuration Table status, the sub-systems are sequentially switched on but the GDS Laser Illuminator, which requires a sequence of two telecommands, issued by a proper OBCP procedure. This OBCP procedure is triggered by GIADA S/W via an On-board Action Anomalous Event report that is sent every time the GDS is switched on.

No science TM packets will be issued from GIADA until the corresponding TC has enabled the science packet generation. At this point GIADA will perform the scientific acquisitions (periodically, in the case of the MBS which are read every 300 s, and event driven, for the IS and GDS subsystems).

Other periodic activities that run in Normal Mode are:

- HK data acquisitions every 40 s or 10s in case the CF is uploaded (refer to ANNEX 2: GIADA-2 FS Software User Manual – Section 3.2);
- Subsystems temperature monitoring every 60 s;
- GDS, IS and MBS self-calibration (generation of specific scientific TM) every hour.

As already explained in Section 4.2.1.1, in order to switch on the GDS Laser Illuminator, the GIADA S/W must receive a sequence of two telecommands in a well-defined time relationship. An 'Arm Laser' command must be issued first, followed by a 'Switch Laser On/Off' one, within 40 s from reception of the previous TC. The control logic in charge of the laser arm and switching operations is mapped in different memory locations, thus minimising the probabilities of unwanted triggering of the GDS Laser Illuminator due to a software failure. If no 'Switch Laser On' TC is received within the gating window open by the 'Arm Laser' TC, the arm logic is reset by the software. Otherwise, the switch on procedure starts. At this point, the current to the lasers is actually enabled. Since the laser diodes are very sensitive to switch on operations performed at low temperatures, the on-board S/W performs this operation first setting the current to a low level (approximately above the threshold current giving laser light; default value is specified in the Context File). After a predefined time of 30 s has elapsed, the current is set to its default value, contained in the Context File. This default value can be changed either patching the actual Context File or by sending a Telecommand 'Set GDS Operation Mode'.

5.2.2.1 IS internal calibration behaviour

The IS calibration stimulus is a voltage pulse of a pre-defined level that is applied to the stimuli piezo. The calibration is periodic or triggered by ground TC. The voltage level and number of stimuli depend on parameters in the Configuration Table (when autonomous) or on TC parameters. The stimuli piezo provides a mechanical stimulus to the IS sensor plate which is detected by the five detection piezoelectric sensors. Two mechanical stimuli occur when the voltage rises to the pre-defined level and when it falls to 0V. Between the two edges, a time delay of about 1 s is foreseen to catch the detections. Two IS detections correspond to one voltage pulse.

The IS calibration (autonomous and by ground TC) is used to observe the behaviour of the IS sensor in time and in different environment conditions (i.e. different steady-state temperatures). Due to difference in rise and fall times (already explained in the GIA-GAL-NCR-D010 in **RD11**), the behaviour of IS is different under the two stimuli. Along the GIADA test campaign, it has been noticed (refer to GIA-GAL-NCR-D019 and GIA-GAL-NCR-D034 in **RD11**) that only when voltage stimulus falls to 0V, the sensor response is close to the results taken during the S/S calibration. The corresponding detection shall be used to monitor the IS sensor behaviour. This means the first detection (in correspondence of the rising edge) should be not neglected.

5.2.3 Flux Mode

During the mapping phase of the comet nucleus, the event rate could not need the operation of the single grain detection (GDS + IS) sub-systems. Only the five microbalance (MBS) sensors and the main electronics could, then, be active. The switching to Flux mode happens by means of proper TC, when GIADA is in Safe mode. The HK acquisition and transmission is also enabled in this mode, as well as the monitoring of the thermistor placed on the IS plate, as explained in Section 4.3.4.

5.2.4 Cover Mode

In this mode, all operations related to the protective cover can be performed. Mainly two operations are foreseen: the Frangibolt actuation (or checking) and the cover opening/closing. The HK acquisition and transmission is also enabled in this mode.

The Frangibolt holds the protective cover in place and it shall be activated before the first cover opening. Two procedures are foreseen, one for Frangibolt checkout and one for Frangibolt actuation. The protective cover can be open or closed in order to expose, or to protect, the internal sub-systems: GDS, MBSs and IS. Transition to this mode can only happen by means of the proper TC.

The Frangibolt actuation is performed via a sequence of two telecommands that shall be received in a well-defined time window. An 'Arm Frangibolt' command is first issued, followed by an 'Activate Frangibolt' TC. The arm and activate control logic electronics are mapped in different memory locations, thus minimising the risk of an unwanted triggering of the Frangibolt activation due to a software failure. If the 'Activate Frangibolt' TC is not received within the gating window open by the 'Arm Frangibolt' TC, the arm logic is reset by software. Otherwise, the procedure starts: first the GIADA S/W activates the heaters placed on the mechanical bracket that supports the Protective cover for a default time (this default value is memorised in the Context File) and then the Frangibolt is activated. The heating of the mechanical bracket is requested to remove possible ice sticking between its surface and the cover (during flight operation) and to improve the environmental conditions (mainly less cold temperature) when the Frangibolt is to be activated. The Frangibolt activation will end either in case its internal temperature reaches a threshold or after a timeout expires; the default values for both these parameters are specified in the Context File.

Remark 5.4: Context File to be used for Frangibolt activation

A different Context File shall be uploaded to GIADA before attempting to activate the Frangibolt, depending on which I/F is powered on at the moment of the intended device activation. Refer to GIA-GAL-NCR-C011 in RD10 for additional details.

As for the Frangibolt, operation of the stepper motor that drives the protective cover is achieved by a sequence of two telecommands that shall be received in a well-defined time relationship. The 'Arm Cover' TC shall be issued first and, after reception of either an 'Open Cover' or 'Close Cover' TC within the gating window, the motor phases will be energised. The arm and open/close control logics are mapped in different memory location. The cover opening foresees three steps: the activation, for a predefined time, of the heaters placed on the mechanical bracket that supports the protective cover; the heating, for a predefined time as well, of the motor body by means of an additional heater element; the actual cover opening. The heating of the mechanical bracket is needed to remove possible ice sticking between it and the cover (in flight operation). The default values of these times are memorised in the Context File.

The closing procedure is slightly different, since the 'Close Cover' TC requires a parameter to indicate if the heating of the mechanical bracket is to be performed or not, before actually closing the cover. By default, the heaters-on time relevant to closing the cover is set to zero, to avoid unneeded delays.

6. OPERATIONAL PROCEDURES

6.1 Ground test Sequences

The GIADA Ground Test Sequences are given in ANNEX 3: GIADA Ground Test Sequences. As a reference, the FS IST test inputs are given in ANNEX 5: List of EGSE Test Scripts.

6.2 On-board Control Procedures

The lsit of GIADA OBCP's is shown in Table 6.1**Errore. L'origine riferimento non è stata trovata.**. More details are given in **AD6** and **AD2** (Section 2.8.4.2).

GIADA ON-BOARD CONTROL PROCEDURES (OBCP) SUMMARY			
OBCP Name	Function	Usage ([1])	Events to be monitored
Power_On_OBCP	Used to switch on GIADA	N	YGD42050
Power_Off_OBCP	Used to switch off GIADA	N	NA
Activate_Frangibolt_OBCP	Used to activate the Frangibolt that keeps GIADA protective cover in the locked position during launch	N([2])	NA
Open_Cover_OBCP	Used to open GIADA protective cover	N	NA
Close_Cover_OBCP	Used to close GIADA protective cover. Can be triggered in case of detected thermal contingencies (formerly Emergency_Close_Cover_OBCP)	N/C	YGD42032
Switch_On_Lasers_OBCP	Used to switch on the lasers in the GDS subsystem; it shall be triggered by YGD42033 event report	N	YGD42033

Table 6.1. GIADA OBCP Summary

([1]) N = Normal; C = Contingency
([2]) Shall be executed only once, at commissioning

Remark 6.1. Frangibolt OBCP deleted from SSMM
TheFrangibolt was successfully activated at the first GIADA switch on, during Commissioning. Therefore the Frangibolt OBCP is not necessary anymore. It has been decided to delete it from the SSMM.

6.2.1 GIADA Power-Off OBCP requirement

At GIADA cold start (i.e., for GIADA @ -30°C), it is possible to receive several Error/Anomaly report - Ground-action TM (5,3) ID 42186 (YGD42186 - EDAC Event error). This Anomaly Report was experienced during GIADA Thermal Vacuum test (refer to GIA-GAL-NCR-D028 in **RD11**) and it happened when GIADA was switched ON with KAL line switched off.

With the KAL off, once GIADA is switched off, the NVRAM devices are not powered. These memories consume very little power (especially at low temperature), so that they may retain some amount of data. During the next power-on, the GIADA On-Board Software checks certain values of Virtual Disk (refer to Section 5.2.1). If they are not correct the memory is initialised, but if they are correct, it is assumed that all the Virtual Disk is not empty. The integrity of the data is not ensured; in this case an EDAC Error can appear each time these words of the NVRAM are read (i.e., @ Switch On, Change to Safe Mode from another mode, Context File upload and Patches upload).

When, for some reason (e.g. memory patches), the relevant words are written, the EDAC Error disappears. However, despite the presence of the 42186 EDAC error, GIADA behaves correctly (i.e. the Context file and the software patches were correctly loaded and executed).

To avoid the reception of these events, a patch to reset the Virtual Disk must be uploaded at GIADA Power Off (refer to ANNEX 2: GIADA-2 FS Software User Manual - Appendix E: 'Patch Reset Vdisk' .mpr file). This patch is in place in the Power-Off OBCP procedure.

Remark 6.2: Patch to reset Virtual Disk at Power Off and to avoid Vdisk to become full

The previous patch is also used to avoid the reception of an Anomaly report - Ground-action TM (5,3) ID 42304 (YGD42304 – Cannot Add More Patches, i.e. Vdisk is full), when GIADA is turned-ON/OFF several times with KAL always ON. At every GIADA power-ON, the uploaded patches are added into Vdisk free space (maximum patches number is 64). If Vdisk is not empty, it may be possible to achieve the end of free space and, thus, to receive the message. However, the patches are loaded in RAM, even if the Vdisk is full.

Remark 6.3: No Cover-close OBCP call when cover already closed recommended

Since the Power-Off OBCP includes the Cover-Close OBCP, it is recommended to build procedures in order to NEVER have the Cover-Close OBCP preceding the Power-Off OBCP; this in order to avoid that the cover is commanded to close, although already in closed position. This precaution is intended to avoid that the cover bounces on the closed position several times.

6.3 Flight Control Procedures

The procedure summary list is reported in the Table 6.2.

Title	Procedure	Sequence	TC(s)	Formal parameter(s) that can be set	Duration up to last TC	Duration up to completion (***)
SWITCH ON/OFF						
Switch ON GIADA Main / Redundant	GD-SEQ-001	AGDS001A	ZDMX0049 + ZSKA8041	VGD0001B + VGD0001A	0 m 20 s	1 m 0 s
Switch to Safe Mode (Main)	GD-FCP-001	Deleted @ 12.2005 - Substituted by GD-SEQ-001				
Switch to Safe Mode (Redundant)	GD-FCP-002	Deleted @ 12.2005 - Substituted by GD-SEQ-001				
Go to Safe Mode and wait for Power OFF	GD-FCP-060	AGDF060A	ZGD19601 + ZGD00004 + ZSKA8042	-	6 m 0 s	8 m 10 s (*) used 30 m 0 s
MODE TRANSITIONS						
Go to Cover Mode	GD-SEQ-035	AGDS035A	ZGD19606	-	0 m 1 s	0 m 10 s
Go to Cover Mode	GD-FCP-030	Deleted @ 12.2005 as no more needed - See GD-SEQ-035				
Go to Normal Mode	GD-SEQ-611	AGDS611A	ZGD19611	-	0 m 0 s	0 m 10 s
Go to Normal Mode + Enable SCI TM	GD-FCP-110	AGDS110A	ZGD19611 + ZGD00010	-	1 m 30 s	1 m 40 s
Go to Safe Mode	GD-SEQ-065	AGDS065A	ZGD19601	-	0 m 0 s	0 m 10 s
Go to Flux Mode	GD-SEQ-616	AGDS616A	ZGD19616	-	0 m 0 s	0 m 10 s
OPS IN SAFE MODE						
Patch CT v.flight 1	GD-SEQ-002	AGDS002A	ZGDX0601 + ZGDX0701	-	2 m 0 s	2 m 10 s used 5 m 0 s
Patch SW v.2.3	GD-SEQ-003	AGDS003A	ZGDX0651 + ZGDX0652 + ZGDX0661 + ZGDX0662 + ZGDX0671 + ZGDX0672 + ZGDX0702 to ZGDX0724	-	3 m 50 s	4 m 0 s used 18 m 0 s

GD Patch CT RAM	GD-SEQ-004	AGDS004A	ZGDX0617 + ZGDX0701	VGDX0001 to VGDX0069 (69 parameters)	0 m 10 s	0 m 20 s
Dump CT RAM	GD-SEQ-005	AGDS005A	ZGDX0701	-	0 m 0 s	0 m 10 s
GD Patch CF NVRAM	GD-SEQ-006	AGDS006A	ZGDX0618 + ZGD00004	VGDX0001 to VGDX0069 (69 parameters)	0 m 10 s	0 m 20 s
Dump CF NVRAM	GD-SEQ-007	AGDS007A	ZGD00004	-	0 m 0 s	0 m 10 s
Enable HK Report	GD-SEQ-201	AGDS201A	ZGD00001	-	0 m 0 s	0 m 10 s
Disabile HK Report	GD-SEQ-202	AGDS202A	ZGD00002	-	0 m 0 s	0 m 10 s
Dump Memory	GD-SEQ-204	AGDS204A	ZGD00004	VGDS0601, VGDS1601, VGDS0602, VGDS0603	0 m 0 s	0 m 10 s
Check Memory	GD-SEQ-205	AGDS205A	ZGD00005	VGDS0601, VGDS1601, VGDS0602, VGDS0603	0 m 0 s	0 m 10 s
Connection Test	GD-SEQ-207	AGDS207A	ZGD00007	-	0 m 0 s	0 m 10 s
Accept Context	GD-SEQ-209	AGDS209A	ZGD00009	-	0 m 0 s	0 m 10 s
Report Context	GD-SEQ-208	AGDS208A	ZGD00008	-	0 m 0 s	0 m 10 s
Reset TM O/P Buffer	GD-SEQ-551	AGDS551A	ZGD25501	-	0 m 0 s	0 m 10 s
Patch Vdisk	GD-SEQ-605	AGDS605A	ZGDX0605 + 725	-	0 m 5 s	0 m 15 s
Patch Reset Event	GD-SEQ-606	AGDS606A	ZGDX0606 + 726	-	0 m 5 s	0 m 15 s
Patch IS Autogain	GD-SEQ-607	AGDS607A	ZGDX0607 + 727	-	0 m 5 s	0 m 15 s
OPS IN COVER MODE						
Perform Cover Opening	GD-FCP-090	AGDF090A	ZSKA8043	-	5 m 0 s	6 m 40 s used 10 m 0 s
Perform Cover Closing	GD-FCP-070	AGDF070A	ZSKA8044	-	5 m 0 s	TBD used 10 m 0 s
Test Heaters	GD-SEQ-231	AGDS231A	ZGD19231	VGDS0005	0 m 0 s	0 m 20 s
Activate Frangibolt	GD-FCP-040	Deleted @ 12.2005 as no more needed				
OPS IN NORMAL MODE						
Perform Normal Mode Self-interference Check	GD-FCP-100	AGDF100A	ZGD19346 + ZGD19426 + ZGD19536 + ZGD19311 + ZGD19401	-	50 m 0 s	51 m 0 s used 60 m 0 s
Calibrate IS, GDS, MBS	GD-FCP-120	AGDS120A	ZGD19346 + ZGD19426 + ZGD19536	-	4m 0s	5 m 0 s used 5 m 0 s

Perform functional test in Normal Mode	GD-FCP-020	Deleted @ 12.2005 as no more needed				
Enable SCI Pkt	GD-SEQ-210	AGDS210A	ZGD00010	-	0 m 0 s	0 m 10 s
Disable SCI Pkt	GD-SEQ-211	AGDS211A	ZGD00011	-	0 m 0 s	0 m 10 s
Wait in Normal Mode for Sun sluing OPs	GD-FCP-080	none	none	To be deleted	N/A	N/A
OPS IN NORMAL MODE on GDS						
Set GDS On/Off	GD-SEQ-311	AGDS311A	ZGD19311	VGDS037A	0 m 0 s	1 m 0 s
Setting GDS (thresholds)	GD-SEQ-038	AGDS038A	ZGD19326	VGDS038A + VGDS038B	0 m 1 s	0 m 20 s
Set GDS mode	GD-SEQ-316	AGDS316A	ZGD19316	VGDS009A, VGDS010A, VGDS011A, VGDS012A, VGDS014A	0 m 0 s	0 m 20 s
Switch Laser on	GD-SEQ-301	AGDS301A	ZGD19301 + 306	-	0 m 2 s	1 m 0 s
Switch Laser off	GD-SEQ-306	AGDS306A	ZGD19306	-	0 m 0 s	0 m 10 s
Calibrate GDS	GD-SEQ-346	AGDS346A	ZGD19346	-	0 m 0 s	1 m 0 s
OPS IN NORMAL MODE on IS						
Switch IS ON/OFF	GD-SEQ-037	AGDS037A	ZGD19401	VGDS037A	0 m 1 s	1 m 0 s
Setting IS Ops Mode, PZT Range, Gain and Thresholds	GD-SEQ-036	AGDS036A	ZGD19411 + ZGD19406	VGDS0031 to VGDS0035 + VGDS0018 to VGDS0029	0 m 30 s	1 m 0 s
Calibrate IS	GD-SEQ-426	AGDS426A	ZGD19426	VGDD0036, VGDD0037	0 m 0 s	1m 0 s
OPS IN NORMAL MODE on MBS / in FLUX MODE						
Set MBS On/Off	GD-SEQ-501	AGDS501A	ZGD19501	VGDS037A	0 m 0 s	0 m 30 s
Set MBS Ops Mode	GD-SEQ-506	AGDS506A	ZGD19506	VGDS0040, VGDS0041, VGDS0042, VGDS0043, VGDS0044	0 m 0 s	0 m 10 s
Set Time Meas (interval between MBS meas.s)	GD-SEQ-521	AGDS521A	ZGD19521	VGDS031A	0 m 0 s	0 m 10 s
Heat MB (all MBs)	GD-FCP-055	AGDF055A	ZGD19311 + ZGD19401 + ZGD00010 + ZGD19521 + ZGD19526	-	55 m 0 s	55 m 10 s
Heat MB (single MB)	GD-SEQ-526	AGDS526A	ZGD19526	VGDS0047	0 m 0 s	(**)
Calibrate MBS	GD-SEQ-536	AGDS536A	ZGD19536	-	0 m 0 s	1 m 0 s
OPS IN ANY MODE						
Emergency Close Cover	GD-CRP-200	AGDC200A	ZGD19601 + ZGD19606 + ZGD19216 + ZGD19226 + ZGD19601	-	2 m 35 s	2 m 45 s

(*) actual duration from flight data TM, but it could depend on instrument setting (e.g. heters-on time) in CT
(**) depends on timeout or max MBS temperature parameters, stored in the CT

(***) For some procedures "used duration" in flight is given, together with the minimal procedure duration required up to completion.

Table 6.2. Procedure summary list

Remark 6.4: FCPs in the ESA approved format

In the present version of the User Manual, we refer directly to the FCPs in the form approved by ESA for automatic execution (see AD8). We recall that all the FCPs have some optional steps. These 'Opt' steps shall be considered in case the TC's are executed step by step (to properly set-up the instrument) in near-real time using the monitor/commanding capabilities of the ROSETTA Mission Operative Centre. However, as baseline, 'Opt' steps are not part of the automatic FCPs execution, so that no time is associated to them.

Remark 6.5: Time margins required at the end of FCPs execution

Note that the time duration of FCPs in the form approved by ESA for automatic execution, as reported in AD8, refers to the time interval between procedure beginning and issue of last Telecommand. This does not account for the time needed to complete the last Telecommand. Therefore, an appropriate time must be left at the end of each sequence/procedure, before starting the next one in a series, in order to avoid incomplete execution – see Table 6.2.

6.4 Contingency Recovery Procedures

The general action to be taken for recovery procedures is to command the unit to Safe Mode, with its protective cover in the closed position. According to **RD7**, in this configuration GIADA will survive in both the foreseen op and non-op temperature ranges. Then the unit may be safely switched off by switching off its currently powered LCL-PSU.

In this respect, the **Remark 4.4** has to be taken into account.

Refer to Section 4.3 for failure detection and recovery strategy.

See AD8 for GD-CRP-200 **Emergency Close Cover**.

6.5 Requirements on the use of the EQM

GIADA EQM is available and could be used to test on ground sequences before implementation on Unit in flight.

Maintanence as appropriate shall be guaranteed by GIADA Team.

It must be noticed, however, that EQM is not fully representative of Flight Unit, so that some differences in operation and limitations in use apply to GIADA EQM.

7. DATA OPERATIONS HANDBOOK

The Rosetta Science Database for GIADA is reported in ANNEX 4: GIADA Database Template.

7.1 Telecommand Functions Definitions

See ANNEX 2: GIADA-2 FS Software User Manual – Section 3.

7.2 Telecommand Parameters Definitions

See ANNEX 2: GIADA-2 FS Software User Manual – Section 3**.**

7.3 Telemetry Packets Definitions

See ANNEX 2: GIADA-2 FS Software User Manual – Section 3**.**

7.4 Telemetry Parameters Definitions

See ANNEX 2: GIADA-2 FS Software User Manual – Section 3**,** unless as defined hereafter.

7.4.1 Warning on science TM (20,3) – MBS heating

Remark 7.1: Unexpected high readings on MBS4 and 5 during heating
During the execution of MBS-4 and 5 heating (on Main or Redundant Interfaces), the first or second frequency measurement in the relevant TM packet report (TM service 20,3) shows a not expected value: the reading is about 700Hz greater than the nominal.

This problem was observed, for the first time, during GIADA Thermal Vacuum test (refer to GIA-GAL-NCR-D029 in **RD11**) and appeared at ambient temperature also.

The anomalous reading could be due to GIADA electronics behaviour and probably does not depends on the unit itself.

Recommendation: the value is easily detected in the telemetry report and can be discarded during data post processing.

7.4.2 Warning on 'Cover Status' parameter in HK TM

According to the disposition of the GIA-GAL-NCR-D016 in **RD11**, the decoding of the Reed switches (named 'Open' and 'Closed') status in the 'Cover Status' parameter of the HK report shall be the following:

a. The '0' status indicates the reed switch is Closed (i.e. it is active)

b. The '1' status indicates the reed switch is Open (i.e. it is NOT active).

7.5 Event Packets Definitions

See ANNEX 2: GIADA-2 FS Software User Manual (Sections 3 and 4), unless as defined hereafter.

7.5.1 Warning on the 'Cover Status' par. in Normal/Progress Report - Event 42007

According to the disposition of the GIA-GAL-NCR-D016 in **RD11**, the following text shall be applied to the decoding of the parameter 'Cover Status' in the Cover Report (Event 42007).

The reed switch bits position are not in accordance with the SW ICD (latest version of 2.8 EID-B Section 2.8.3.1.3.1: RS1 means 'status of reed switch Open' and RS2 means 'status of reed switch Closed', contrarily to what declared in the ICD and reported in the following figure.

Figure 7.1. Wrong description of Reed Switch status.

Moreover:

a. The '0' status indicates the reed switch is Closed (i.e. it is active)
b. The '1' status indicates the reed switch is Open (i.e. it is NOT active).

Remark 7.2: Wrong interpretation of Cover Report by the GIADA EGSE SW
In the analysis of GIADA Cover Reports (CREP) obtained during commissioning in flight, despite the fact that the behaviour of the cover open-close operations is nominal, it has been observed an anomaly in the data produced by the GIADA EGSE SW (GES). In particular, the nominal time to open the cover (with the actual nominal configuration) is 7 seconds. Instead, sometimes it has been observed an anomalous coincidence of "Begin time of operation" and "End time of operation" or a time interval between Begin and End times different from 7 s. A revision of on-ground data has demonstated that this problem was already present in previous tests (although not identified, so far). A careful analysis of TM data has shown that the behaviour of GIADA is nominal and the time data provided by the experiment are as expected. The cause of the anomalous coincidence is identified in a a bug in the conversion from the Hex

time stamp values to the Dec time stamp values operated by the GES. Possibly it is due to the roundoff in the HEX to DEC conversion that can vary between 0 and 16 seconds.
Note that the "Begin time of operations" is a 6 byte parameter starting at byte 21 in the packet, while "End time of operation" is reported in the last 6 bytes of the packet).
The identified problem in the GES shall have to be recovered as soon as possible in future updating of the GIADA EGSE SW.

7.6 Anomaly Reports Definitions

See ANNEX 2: GIADA-2 FS Software User Manual (Sections 3 and 4).

7.7 Context File Definition

See ANNEX 2: GIADA-2 FS Software User Manual – Section 3.7**.**

7.8 Data & Dump Files Definitions

See ANNEX 2: GIADA-2 FS Software User Manual – Section 3.4**.**

7.9 GIADA APID numbers

The list of APIDS for GIADA is reported in Table 7.1.

Type	Number
ACK	1441
HK	1444
EVENT	1447
DUMP	1449
PRIVATE	1452
superAPID	-10

Table 7.1. List of APID numbers for GIADA

7.10 List of HK packets/parameters and events to be monitored on ground with limit values

The list of HK parameters to be monitored by the ground with limit values is reported in Table 7.2, while the List of events to be monitored on ground is reported in Table 7.3.

Remark: refer to **RD5** for the conversion factors to be applied to data from TM packets.

QUANTITY	NAME	LNAME	SOFT ALARM LIMITS [Meas. units/hex value in RSDB parameter]				HARD ALARM LIMITS [Meas. units/hex value in RSDB parameter]			
			Lower		Upper		Lower		Upper	
Frangibolt Temperature (*)	NGDD0020	Frangibolt Temperature	-30 °C	0x04CA	+95 °C (*)	0x0646	-50 °C	0x0482	+120 °C	0x068A
Laser1 Temperature	NGDD0032	Laser1 Temperature	-20 °C	0x0DB8	+50 °C	0x06A4	-30 °C	0x0E18	+60 °C	0x05A0
Laser2 Temperature	NGDD0033	Laser2 Temperature	-20 °C	0x0DB8	+50 °C	0x06A4	-30 °C	0x0E18	+60 °C	0x05A0
Laser3 Temperature	NGDD0034	Laser3 Temperature	-20 °C	0x0DB8	+50 °C	0x06A4	-30 °C	0x0E18	+60 °C	0x05A0
Laser4 Temperature	NGDD0035	Laser4 Temperature	-20 °C	0x0DB8	+50 °C	0x06A4	-30 °C	0x0E18	+60 °C	0x05A0
Laser1 Light Monitor	NGDD0036	Laser1 light monitor	0.05 W	0x0274	0.7 W	0x0D58	-0.1 W	0x0000	0.8 W	0x0F05
Laser2 Light Monitor	NGDD0037	Laser2 light monitor	0.05 W	0x0292	0.7 W	0x0F2C	-0.1 W	0x0000	0.8 W	0x0FFF
Laser3 Light Monitor	NGDD0038	Laser3 light monitor	0.05 W	0x0272	0.7 W	0x0B56	-0.1 W	0x0064	0.8 W	0x0CB4
Laser4 Light Monitor	NGDD0039	Laser4 light monitor	0.05 W	0x02C2	0.7 W	0x0E9F	-0.1 W	0x0000	0.8 W	0x0FFF
IS Plate Temperature	NGDD0057	IS Plate Temperature	-20 °C	0x0DA8	+80 °C	0x0AB8	-30 °C	0x0DF3	+90 °C	0x0A6D
MBS1 (+X) Temperature	NGDD0076	MBS1 Temperature	-30 °C	0x02B0	+80 °C	0x0A61	-40 °C	0x01FD	+90 °C	0x0B15
MBS2 (+Y) Temperature	NGDD0077	MBS2 Temperature	-30 °C	0x02C2	+80 °C	0x0A68	-40 °C	0x0210	+90 °C	0x0B1B
MBS3 (-X) Temperature	NGDD0078	MBS3 Temperature	-30 °C	0x02D5	+80 °C	0x0A81	-40 °C	0x0221	+90 °C	0x0B36
MBS4 (-Y) Temperature	NGDD0079	MBS4 Temperature	-30 °C	0x02BC	+80 °C	0x0A6A	-40 °C	0x020B	+90 °C	0x0B1D
MBS5 (+Z) Temperature	NGDD0080	MBS5 Temperature	-30 °C	0x02A8	+80 °C	0x0A48	-40 °C	0x01F8	+90 °C	0x0AFF
Power Supply Temperature	NGDD0085	PS Temperature	-20 °C	0x073E	+70 °C	0x096A	-40 °C	0x06C2	+85 °C	0x09C7
+5V Power Consumption ([1])	NGDD0086	Current +5V	110 mA	0x019B	150 mA	0x01C6	80 mA	0x017A	180 mA	0x01E7
+15V Power Consumption ([1])	NGDD0087	Current +15V	30 mA	0x0144	60 mA	0x0274	20 mA	0x01BD	70 mA	0x02A2
-15V Power Consumption ([1])	NGDD0088	Current -15V	50 mA	0x02AA	90 mA	0x0359	40 mA	0x027E	100 mA	0x0385
+5V Power Consumption ([2])	NGDD0086	Current +5V	110 mA	0x019B	150 mA	0x01C6	80 mA	0x017A	180 mA	0x01E7
+15V Power Consumption ([2])	NGDD0087	Current +15V	30 mA	0x0144	600 mA	0x0C28	20 mA	0x01BD	700 mA	0x0DF4
-15V Power Consumption ([2])	NGDD0088	Current -15V	50 mA	0x02AA	600 mA	0x0C16	40 mA	0x027E	700 mA	0x0DCC

+5V Power Consumption ([3])	NGDD0086	Current +5V	800 mA	0x0488	1600 mA	0x07EC	100 mA	0x0190	1800 mA	0x08C5
+15V Power Consumption ([3])	NGDD0087	Current +15V	350 mA	0x07AA	550 mA	0x0B42	20 mA	0x01BD	600 mA	0x0C28
-15V Power Consumption ([3])	NGDD0088	Current -15V	250 mA	0x0617	350 mA	0x07CE	50 mA	0x02AA	400 mA	0x08A8
+5V Power Consumption ([4])	NGDD0086	Current +5V	110 mA	0x019B	170 mA	0x01DC	100 mA	0x0190	1500 mA	0x0780
+15V Power Consumption ([4])	NGDD0087	Current +15V	140 mA	0x03E4	200 mA	0x04F8	20 mA	0x01BD	220 mA	0x0554
-15V Power Consumption ([4])	NGDD0088	Current -15V	75 mA	0x0317	135 mA	0x041F	50 mA	0x02AA	155 mA	0x0476

Table 7.2. List of HK parameters to be monitored by the ground with limit values

(*) This limit is applicable only if the Frangibolt has not been actuated yet. It shall be ignored during and after device actuation in commissioning.
([1]) Safe mode ([2]) Cover mode ([3]) Normal mode ([4]) Flux mode

Remark 7.3: Action to be taken upon parameter/event monitoring triggering on ground

Due to mission timeline, information on overcoming of Hard Alarm Limits will, in general, arrive with such a time delay, with respect to execution of complete sequences of instrument procedures, to prevent any possibility to act on the instrument in real time. Based on this condition, whenever overcoming of Hard Alarm Limits values is detected, it is required to abort any new sequence of procedures and to signal as soon as possible the event to GIADA PI Team for a quick evaluation of the counteractions to be undertaken. This precaution must be applied in combination with *Errore. L'origine riferimento non è stata trovata..*

Remark 7.4: Validity of Power Consumption limits vs. OOL

The Soft and Hard Alarm Limits for Power consumption reported in Table 7.2 for parameters NGDD0086, NGDD0087 and/or NGDD0088 refer to the different GIADA operating modes. The Soft Alarm Limits in Normal and Flux Modes refer to nominal conditions, i.e. with all sub-systems switched ON. This means that when GIADA is in Normal Mode, but not with all sub-systems ON (or in Flux with MBS OFF), the Soft Alarm Limits indicated in the Table can be overcome. In order to avoid flood of Out Of Limits (OOL) alarms, it has been decided (July 2006) to refer the Hard Alarm Limits to the extreme instrument status for each mode (e.g., in normal mode, with all subsystems off – lower – or at maximum power consumption - upper). Other configurations not related to real GIADA failure may still give OOL, related to operation in non nominal temperature conditions, although such conditions have never been experienced so far.

Remark 7.5: YGD42223 - "*Hardware Error in IS: No IRQ received*" at IS power ON

The event YGD42223 - "Hardware Error in IS: No IRQ received" (see Table 7.3) is received at the IS power ON, when the science telemetry is enabled. This is a known behaviour, already signalled during on-ground tests. In this case, the event is not related to any real GIADA problem.

NAME	LNAME	C_TMPARAM	
		NAME	LNAME
YGD42001	Heater ON	NGDA0060	Heater ID
YGD42002	Heater OFF	NGDA0060	Heater ID
YGD42007	Cover Report Remark: refer to 7.5.1 for correct interpretation of the 'Cover Status#' parameters.	NGDA0607 NGDA0608 NGDA0609 NGDA0610 NGDA0611 NGDA0612 NGDA0613 NGDA0614 NGDA0615 NGDA0616 NGDA0608	Cover Direction Time Stamp Cover Status 1 Cover Status 2 Cover Status 3 Cover Status 4 Cover Status 5 Cover Status 6 Cover Status 7 Cover Status 8 Time Stamp
YGD42008	Heaters Current Consumption	NGDA0047 NGDA0048	+15V PowerConsum Global -15V PowerConsum Global
YGD42016	MB Heaters ON	-	
YGD42017	MB Heaters OFF	-	
YGD42032	Emergency_Cover_Close_OBCP	-	
YGD42033	Switch_Lasers_ON_OBCP	-	
YGD42185	ADC timeout	-	
YGD42186	EDAC error	NGDA0624 NGDA0625 NGDA0626	Error type - EDAC Status High Error Address Low Error Address
YGD42187	Generic Timer IRQ Nor Arrive	-	
YGD42200	Frangibolt to disarmed state	-	
YGD42201	Cover to disarm state	-	
YGD42210	Laser to disarmed state	-	
YGD42211	Laser Tmp too high	NGDA0062	Laser Temperature
YGD42212	Laser Tmp too low	NGDA0062	Laser Temperature
YGD42213	HwErr in GDS event	-	
YGD42214	HwErr in GDS: IRQ not Rec.	-	
YGD42218	IS On due Thermal Contingency	NGDA0628	IS Temperature
YGD42219	IS Off due Thermal Contingency	NGDA0628	IS Temperature
YGD42220	IS Plate Tmp too high	NGDA0628	IS Temperature
YGD42222	HwErr in IS Event	-	
YGD42223	HwErr in IS: IRQ not Rec.	-	
YGD42230	MBS plate Tmp too high	NGDA0629	MBS Temperature
YGD42232	HwErr in MBS Event	-	
YGD42233	HwErr in MBS: IRQ not Rec.	-	
YGD42240	IS Temp above Max Non Op	NGDA0628	IS Temperature
YGD42241	IS Temp below Min Temp	NGDA0628	IS Temperature
YGD42242	ME Temp above Max Op	NGDA0630	Main-electr Temperature
YGD42260	Scheduler Full	-	
YGD42274	File does not exist	NGDA0627	File ID
YGD42304	Can not add more patches	-	
YGD42309	Previous Execution due by WD	NGDA0621 NGDA0622 NGDA0623	Status register after WD EDAC Status EDAC Address Register
YGD42310	EDAC Error during SW Start	NGDA0622 NGDA0623	EDAC Status EDAC Address Register

Table 7.3. List of events to be monitored on ground

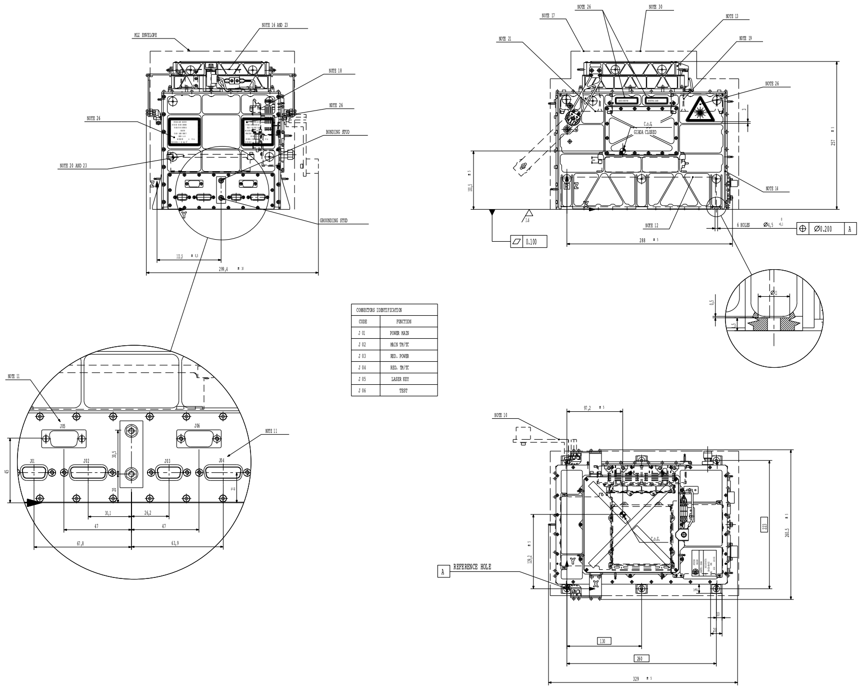
8. ANNEXES

ANNEX 1: PFM and FS Mechanical Assembly Drawings

RO-GIA-DM-003 Issue 2 – Rev. 5
and
MICD (drawing n. 36531C00057A)

Date: 15 - 10 - 1998

Total Annex Pages: 2



CONNECTORS IDENTIFICATION	
CODE	FUNCTION
J 01	POWER MAIN
J 02	MAIN TM/TC
J 03	RED. POWER
J 04	RED. TM/TC
J 05	LASER KEY
J 06	TEST

30 - MLI IS PROVIDED BY 5 WARNING LABELS

29 - LOCATION FOR S/C NON OP. HEATERS (IF ANY)

28 - TRP - LOCATION FOR S/C POWERED THERMISTOR (COULD BE THE THERMISTOR PROVIDED BY S/C TCS)

27 - UNIT HEAT DISSIPATION :
-NORMAL 19.7 W
-MAXIMUM 24.7 W (LONG PEAK POWER 10 min) <

26 - WARNINGS

25 - ITEM OPTICAL PROPERTIES α_{BOL} = 0.93 ε_{BOL} = 0.84

24 - ITEM OPTICAL PROPERTIES α_{BOL} = 0.26 ε_{BOL} = 0.04

23 - ITEM OPTICAL PROPERTIES α_{BOL} = 0.15 ε_{BOL} = 0.15

22 - UNIT HEAT CAPACITY = 6486 J/K ± 5%

21 - GDS Rec. Rgh. HEAT CAPACITY = 175 J/K ± 5%

20 - I.S. HEAT CAPACITY = 430 J/K ± 5%

19 - GDS Rec. Lft. HEAT CAPACITY = 175 J/K ± 5%

18 - LASER BOX HEAT CAPACITY = 564 J/K ± 5%

17 - MLI HEAT CAPACITY = 240 J/K ± 5%

16 - BAFFLE HEAT CAPACITY = 50 J/K ± 5%

15 - MBS HEAT CAPACITY = 173 J/K ± 5%

14 - STRUCTURE HEAT CAPACITY = 1844 J/K ± 5%

13 - MECHANISM HEAT CAPACITY = 173 J/K ± 5%

12 - MAIN ELECTRONIC HEAT CAPACITY = 2492 J/K ± 5%

11 - CONNECTORS IDENTIFICATION

10 - ITEMS SHALL BE REMOVED BEFORE FLIGHT

9 - BONDING AND GROUNDING STUDS FIXING TORQUE IS 1.5 Nm

8 - CONNECTORS SCREW TORQUE IS 0.34 Nm

7 - MOMENTS OF INERTIA :

GIADA OPEN (FUNCTIONAL) :

MOMENT OF INERTIA W.R.T. C.O.G. X AXIS = 0.057 Kgm^2

MOMENT OF INERTIA W.R.T. C.O.G. Y AXIS = 0.087 Kgm^2

MOMENT OF INERTIA W.R.T. C.O.G. Z AXIS = 0.085 Kgm^2

GIADA CLOSED (INTEGRATION/CRUISE) :

MOMENT OF INERTIA W.R.T. C.O.G. X AXIS = 0.062 Kgm^2

MOMENT OF INERTIA W.R.T. C.O.G. Y AXIS = 0.084 Kgm^2

MOMENT OF INERTIA W.R.T. C.O.G. Z AXIS = 0.078 Kgm^2

6 - FIXING I/F SCREWS TORQUE IS 2.3 Nm ± 10%

5 - GROUND STORAGE TEMPERATURE Min. -10 °C Max. 60 °C (DRY N2 PURGING)

4 - THE EXTERNAL I/F SURFACE FINISH IS CHROMATE CONVERSION COATED (ALODINE)

3 - TOTAL CONTACT AREA IS 635 cm^2

2 - THE MATERIAL OF THE MOUNTING PLANE AND WALLS IS ALUMINIUM ALLOY 6082 T6, I/F BOLTS AND WASHERS M4 AS IN EIDA 2.2.7.1

NOTE 1 - MASS 6.050 Kg (WITH INSTRUMENT MLI)

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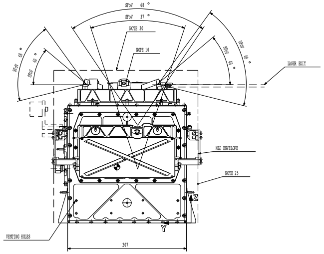
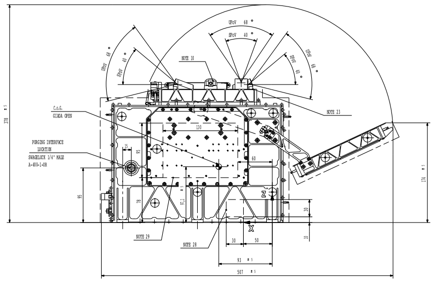
ZONA	DESCRIZIONE MODIFICA	DATA	DIS.	APPR.	D.A.Q.	I.R.
	MODIFICATO SECONDO ODM 757039506959	[illegible]	Baiardi			5
	MODIFICATO SECONDO ODM 725000106882	[illegible]	Baiardi			4
	MODIFICATO SECONDO ODM 757038906828	[illegible]	Baiardi			3
	MODIFICATO SECONDO ODM 757037206734	[illegible]	Baiardi			2
	AGGIORNATO GRAFICAMENTE	[illegible]	Baiardi			1

MATERIALE	TOLLERANZE GENERALI SECONDO ± 2	NOMENCLATURA GIADA CONFIGURATION DRAWING
TRATTAMENTO	SMUSSI RAGGI NON Q.TI	36579C00057A
OFFICINE GALILEO	DIS. Baiardi 15/10/98; CONTR.; APPR.	VISTO D.A.Q.
COD. IDENT. A 3006	RUGOSITA' IN MICROMETRI	TIMBRO MICROFILM
FOGLIO 1 DI 2	A 1	SCALA 1:2,5

12C00057C1





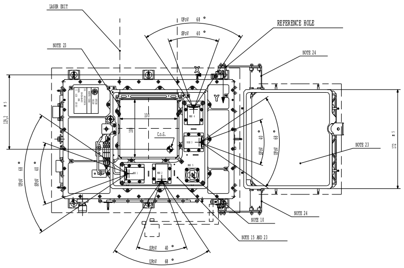
	X	Y	Z
LASER EXIT	80 180	FROM 36	236 240

VERTEX COORDINATES OF SFoV IN URF SYSTEM

	X	Y	Z
MBS 1	164	171.5	240
MBS 2	107	181	240
MBS 3	42	117	240
MBS 4	51.5	60	240
MBS 5	54	174	243
IS	130	93	93.5

VERTEX COORDINATES OF UFoV IN URF SYSTEM

	X	Y	Z
MBS 1	166.5	171.5	240.9
MBS 2	107	183.5	240.9
MBS 3	39.5	117	240.9
MBS 4	51.5	57.5	240.9
MBS 5	54	174	245.6
IS	130	93	169.5



RO-GIA-DM-003 ISSUE 2 REV 5

ZONA	DESCRIZIONE MODIFICA	DATA	DIS.	APPR.	D.A.Q.	I.R.
	MODIFICATO SECONDO ODM 757039506959	[illegible]	Baiardi			5
	MODIFICATO SECONDO ODM 757038906828	[illegible]	Baiardi			3
	MODIFICATO SECONDO ODM 757037206734	[illegible]	Baiardi			2
	AGGIORNATO GRAFICAMENTE	[illegible]	Baiardi			1

MATERIALE

TOLLERANZE GENERALI SECONDO ± 2

NOMENCLATURA: GIADA CONFIGURATION DRAWING

TRATTAMENTO

SMUSSI RAGGI NON Q.TI

36579C00057A

OFFICINE GALILEO

DIS. Baiardi 15/10/98

CONTR.

APPR.

VISTO D.A.Q.

RUGOSITA' IN MICROMETRI

TIMBRO MICROFILM

COD. IDENT. A 3006

FOGLIO 2 DI 2 | A 1 | SCALA 1:2.5

12C00057C2

ANNEX 2: GIADA-2 FS Software User Manual

RO-GIA-IAA-MA-009 Issue 2, Rev. 2
Date: 27 - 05 - 2007

Total Annex Pages: 322

GIADA-2 FS SOFTWARE USER MANUAL

Document No.: RO-GIA-IAA-MA-009
Issue: 2
Revision: 2
Date: 27.05.2007
Pages: 322

	NAME	FUNCTION	SIGNATURE	DATE
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Spain

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Document Change Record

DOCUMENT CHANGE RECORD			
ISSUE	**DATE**	**AFFECTED PAGES**	**CHANGE DESCRIPTION**
1	**03 May 2002**	**All**	**First Release**
1 rev 1	**16 May 2002**	**154 - 159**	**Actualisation of Patches**
1 rev 2	**27 May 2002**	**14-15** **150-152**	**Actualisation of GIADA Switch ON Configurations** **Revision of Patches**
1 rev 3	**06 Jun 2002**	**18, 91** **161-162**	**Correction of RSDB short names of Calibrate_GDS and Set MBS On/Off** **Example of RAM CF Dump**
1 rev 4	**21 Aug. 2002**	**152**	**Vdisk Reset Patch in NVRAM instead of RAM**
2 rev 0	**04 Feb. 2004**	**All**	**General Revision**
2 rev 1	**30 July 2006**	**All**	**General Revision**
2 rev 2	**27 May 2007**	**42**	**Compliance with EID-A**

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1. INTRODUCTION

1.1. Intended readership

It is assumed that the reader has a reasonable degree of knowledge about the GIADA system: operating modes, data concepts, parameters meaning and range and assembly language. GIADA includes some modes / commands / parameters restrictions, but it is possible to perform some actions (sending the wrong commands) that can cause errors in the System. Therefore, it is in the entire responsibility of the user to send the right (in the sense of intended) or wrong (in the sense of unintended) command.

1.2. Applicability statement

This Software User Manual (SUM) applies to the GIADA On board Software, version 2.3 (plus patches), installed on GIADA-2 Subsystem of the GIADA instrument onboard the ROSETTA mission.

This Document assumes that the patches are applied at the normal GIADA switch on through OBCP.

This Document assumes that Polling Sequence Table (PST) used by the Spacecraft SW will be the typical PST cycle of 8s (PST 0 ,see AD3).

1.3. Purpose

This Software User Manual provides the procedures for operating GIADA in normal and anomalous cases. It is intended to be self-contained, so it also provides any information that is considered useful for the operation of the system, such as memory map, etc.

1.4. How to use this document

This document has been organised as follows:

- Section 1 is devoted to the introduction.
- Section 2 includes a general overview of GIADA: operation modes, transitions between modes and available commands.
- Section 3 contains the TC and TM description.
- Section 4 is dedicated to the Recovery Actions.
- Appendices containing the SW ICD document, GIADA memory maps, patches, patcheables functions, Default Context Files and Glossary.

1.5. Related Documents

1.5.1. Applicable Documents

AD1	RO-EST-RS-3001/EID A	ROSETTA Experiment Interface Document Part A
AD2	RO-EST-RS-3009/EID B	ROSETTA – GIADA Experiment Interface Document Part B
AD8	RO-ESC-IF-5004	Rosetta Mission Control System Command Request Interface Document
AD9	RO-EST-RS-3001/EID C	Experiment Interface Document Part C Operational and Data Interfaces: Implementation Guidelines and EID-B templates
AD10	RO-EST-RS-3001/EID A	2.7 - On-Board Data Handling Interface Requirements
AD11	RO-GIA-IAA-TN012	DPU Peripheral Description, Memory and I/O Map

1.5.2. Reference Documents

[RD1] ESA SOFTWARE ENGINEERING STANDARDS.
PSS-05-00
Issue 2, Date February 1991

1.6. Conventions

'System' refers to GIADA.
'Subsystems' refers to GDS, IS and MBS.

1.7. Problem reporting instructions

Please use Section 4 (RECOVERY ACTIONS). If the problem persists then send the EGSE logs and other available information about the problem found to the GIADA TEAM.

2. OVERVIEW

2.1. HW Environment

GIADA-2 is part of the GIADA experiment and consists of two sets of electrical parts working in redundancy. GIADA SW is the same for the two GIADA-2 sets. The switch between them is made by the DMS. Each one includes a 8086 microprocessor, running at 4 MHz. GIADA SW is resident in the 64 Kwords (16 bit + 6 bit of Hamming Code) ROM and is copied into the 64 Kwords (16 bit + 6 bit of Hamming Code) RAM at start-up (Dump Process). SW execution begins in the copy in ROM (Safe Mode) and changes to the copy in RAM (Normal, Flux, Cover Modes).

The interfaces between GIADA and the DMS are defined in [AD1, AD10].

2.2. Software Overview

See Appendix A. Software ICD (RO-EST-RS-3009/EID B – Section 2.8).

2.2.1. GIADA Start Process

The GIADA 'START' process is executed in every GIADA switch on or WatchDog Reset, and comprises the following functions

START:

- Disable Interrupts
- Refresh Watchdog
- Initialise Segment
- Store in NVRAM the EDAC Status and clear EDAC
- Erase and verify RAM
- Copy from NVRAM to RAM the EDAC Status
- Set all IRQ's To empty function
- Call LOADER, if no response then Call DUMPER

LOADER:

- Initialise PIC and enable only the Test port interrupt
- Initialise the Test Port
- Send through Test Port the Magic Words: 0x0050, 0x0049, 0x004E and 0x0047
- Set Timeout to 300ms
- Wait for receive through the Test Port the Words: 0x0050, 0x004F, 0x004E and 0x0047

- If the timeout is reached or words different than those expected are received call DUMPER
- If right words are received
  - Receive the length and the CRC of the program to load from Test Port
  - Receive program Words from Test Port and put in RAM
  - if CRC is OK then execute the program in RAM
    else jump to START

DUMPER:

- Refresh Watchdog
- Disable in the PIC all interrupts
- Mirror the code and data stored in ROM into RAM
- Execute the program in ROM (GIADA SW program).

The main intention of "Loader" is to detect and correct errors during GIADA integration. It's use is meaningless in flight.

The final state of RAM and ROM after the "Dumper Process" is shown in Figure 1. Note that the Interrupt Vector Tables are copied from ROM (containing dummy values) to RAM but are correctly initialised later on.

The Default Context File is copied from ROM to RAM.

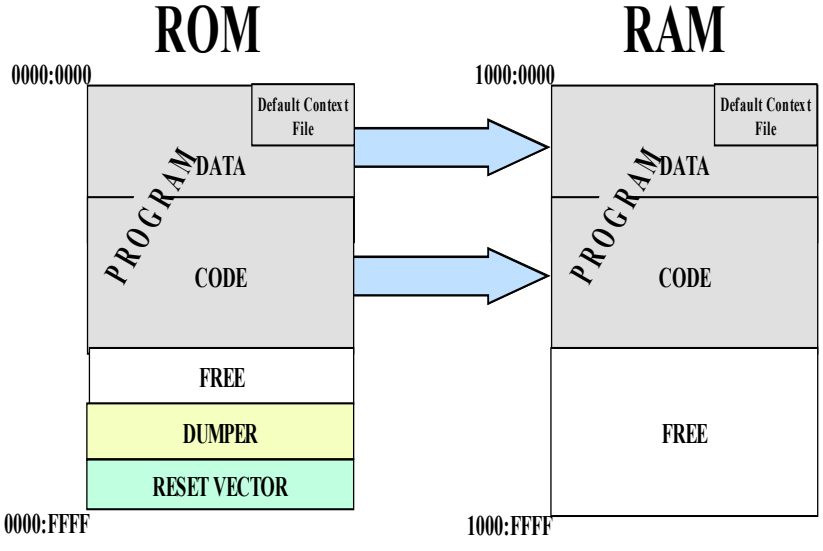

Figure 1. GIADA dumper process

2.2.2. GIADA Switch ON Configurations

In the configuration presently used, the NVRAM and VD capabilities are not used (CF in RAM is updated by patch and VD is reset @ switch off). The used sequence is as it follows:

- ***Power ON***
  - Execution of the Power-on OBCP (in which the NVRAM Context File and the RAM Configuration Table are updated from the DMS by means of Service 18)
    An Event Report TM (5,3) "42310 EDAC Error During S/W Start And Dump" and an Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" might be received, in addition to the nominal Event Report TM (5,1) "42050 GIADA in Safe Mode" and the HK Report TM(3,25)
  - Memory Load Command (Service 6) to change only the Configuration Table in the RAM (status bits = 0 – HK patch status bits = 1).
    The patch to the RAM CF copy should have its patches status reflecting the patches applied.
  - Send the patches to SW 2.3.

  This procedure leaves the NVRAM Context File unchanged and the Configuration Table is updated by Service 6 (Memory Load service).

- ***Next Power OFF***
  - A patch (included in Power-off OBCP) is applied to reset the Virtual Disk and to avoid that it becomes full
  - The DMS stores into SSMM a copy of the Context File not-aligned with the Configuration Table, for the successive GIADA Power-on.

Other possible Power ON/OFF sequences are applicable, considering or not the use of the Service 18 and the powering or not of the Keep Alive Line, although presently not reflected in any existing Flight Control Procedure. They are reported here below in order to keep trace of various alternatives and record them in case of need.

In must be considered that:

- The Power On OBCP includes the TC(18,3) Accept Context (ZGD00009). (The last CF NVRAM copy is given to GIADA by the DMS)
- The Power Off OBCP includes the TC(18,1) Report Context (ZGD00008). (The CF NVRAM copy is stored in the DMS memory)
- The Power Off OBCP includes the VD reset

Note that:

- When GIADA is switched on for the first time or with KAL off, an Event Report TM (5,3) "42310 EDAC Error During S/W Start And Dump" may be received, in addition to the nominal Event Report TM (5,1) - "42050 GIADA in Safe Mode" and the HK Report TM(3,25)

- When GIADA is switched on after a switch off including a VD reset, an Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" may be received, in addition to the nominal Event Report TM (5,1) - "42050 GIADA in Safe Mode" and the HK Report TM(3,25)

2.2.2.1. Switch ON patching NVRAM CF and RAM CT – with KAL off

- ***POWER ON***
  1. Power On OBCP (includes Service 18)
     An Event Report TM (5,3) "42310 EDAC Error During S/W Start And Dump" and an Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" might be received, in addition to the nominal Event Report TM (5,1) "42050 GIADA in Safe Mode" and the HK Report TM(3,25)
  2. Patch NVRAM CF copy and RAM CT (status bits = 0 – HK patch status bits = 1)
  3. Patch SW (HK patch status bits = number of patches +1 CF patch)

- ***POWER OFF***
  1. Power Off OBCP (including patch to Reset VD)

- ***NEXT POWER ON***
  1. Power On OBCP
     An Event Report TM (5,3) "42310 EDAC Error During S/W Start And Dump" and an Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" might be received, in addition to the nominal Event Report TM (5,1) "42050 GIADA in Safe Mode" and the HK Report TM(3,25)
  2. Patch SW (HK patch status bits = number of patches)

- ***POWER OFF***
  1. Power Off OBCP (including patch to Reset VD)

2.2.2.2. Switch ON patching NVRAM CF and RAM CT – with KAL on

- ***POWER ON***
  1. Power On OBCP (includes Service 18)
     An Event Report TM (5,3) "42310 EDAC Error During S/W Start And Dump" and an Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" might be received, in addition to the nominal Event Report TM (5,1) "42050 GIADA in Safe Mode" and the HK Report TM(3,25)
  2. Patch NVRAM CF copy and RAM CT (status bits = 0 – HK patch status bits = 1)
     The patch to the NVRAM CF copy must have its patches status equal to 0. The patch to the CF RAM copy should have its patches status reflecting the patches applied.
  3. Patch SW (HK patch status bits = number of patches +1 CF patch)

- ***POWER OFF***
  1. Power Off OBCP (including patch to Reset VD)

- ***NEXT POWER ON***
  1. Power On OBCP (HK patch status bits = number of SW patches)
     An Event Report TM (5,3) "42309 Previous Execution Reset By Watch Dog" might be received, in addition to the nominal Event Report TM (5,1) "42050 GIADA in Safe Mode" and the HK Report TM(3,25)

- ***POWER OFF***
  1. Power Off OBCP (including patch to Reset VD)

2.2.3. Modes and Transitions

The different GIADA operative modes and the active subsystems are reported in Table 1.

Mode	Active Sub-system	Execution Memory
Safe	ME	ROM
Cover	ME + Cover or Frangibolt	RAM
Flux	ME + MBS	RAM
Normal	ME + any combination of On/Off of GDS, IS and MBS	RAM

Table 1. Operative Modes

The transition between modes is shown in Figure 2.

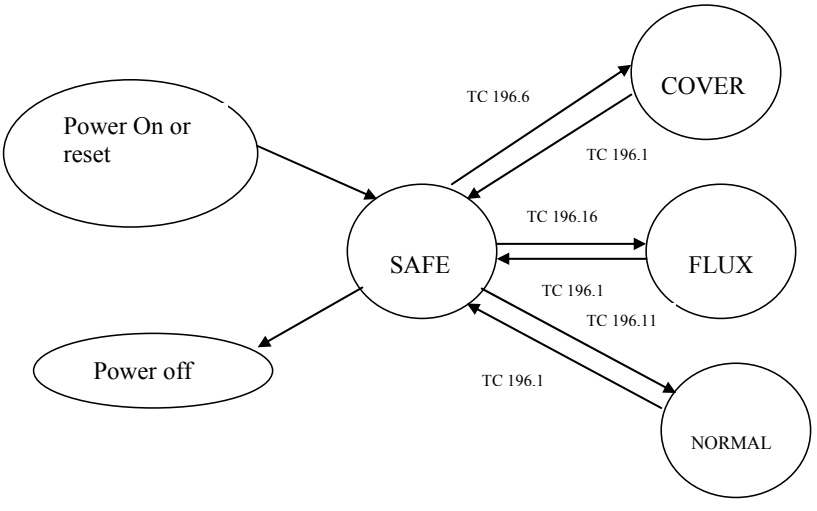

Figure 2. Mode transition diagram

Every transition between modes needs to pass through the Safe Mode. Invalid transitions are rejected by GIADA.

In either Cover, Normal or Flux Modes, the instrument will run autonomously according to a pre-defined configuration. This functional configuration description and other important configuration parameters are maintained within the Configuration Table.

The list of all GIADA's commands and their allowability are defined in Table 2

ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
Housekeeping Reporting –3					
5 *ZGD00001*	Enable Housekeeping Report Generation	+	+	+	+
6 *ZGD00002*	Disable Housekeeping Report Generation	+	+	+	+
Memory Management Service – 6					
2 *ZGD00003*	Load Memory Absolute Addressing	+	-	-	-
5 *ZGD00004*	Dump Memory Absolute Addressing	+	-	-	-
9 *ZGD00005*	Check Memory Absolute Addressing	+	-	-	-
Time Management Service – 9					
1 *ZGD00006*	Accept Time Update	+	+	+	+
Test Service – 17					
1 *ZGD00007*	Perform Connection Test	+	+	+	+
Context Transfer Service – 18					
1 *ZGD00008*	Report Context	+	-	-	-
3 *ZGD00009*	Accept Context	+	-	-	-
Science Data Transfer Service – 20					
1 *ZGD00010*	Enable Science Packet Generation	-	-	+	+
3 *ZGD00011*	Disable Science Packet Generation	-	-	+	+
Private Telecommand Service: Cover - 192					
1 *ZGD19201*	Arm Frangibolt	-	+	-	-
2 *ZGD19202*	Disarm Frangibolt	-	+	-	-
6 *ZGD19206*	Test Frangibolt	-	+	-	-
11 *ZGD19211*	Activate Frangibolt	-	+	-	-
16 *ZGD19216*	Arm Cover	-	+	-	-
17 *ZGD19217*	Disarm Cover	-	+	-	-

ST *RSDB*	Telecommand	Safe	Cover	Normal	Flux
21 *ZGD19221*	Open Cover	-	+	-	-
26 *ZGD19226*	Close Cover	-	+	-	-
31 *ZGD19231*	Test Heater	-	+	-	-
Private Telecommand Service: GDS - 193					
1 *ZGD19301*	Arm Laser	-	-	+	-
2 *ZGD19302*	Disarm Laser	-	-	+	-
6 *ZGD19306*	Switch Laser On/Off	-	-	+	-
11 *ZGD19311*	Set GDS On/Off	-	-	+	-
16 *ZGD19316*	Set GDS Operation Mode	-	-	+	-
26 *ZGD19326*	Set Photodiode Threshold	-	-	+	-
46 *ZGD19346*	Calibrate GDS	-	-	+	-
Private Telecommand Service: IS - 194					
1 *ZGD19401*	Set IS On/Off	-	-	+	-
6 *ZGD19406*	Set IS Operation Mode	-	-	+	-
11 *ZGD19411*	Set PZT Threshold Level	-	-	+	-
26 *ZGD19426*	Calibrate IS	-	-	+	-
Private Telecommand Service: - MBS 195					
1 *ZGD19501*	Set MBS On/Off	-	-	+	+
6 *ZGD19506*	Set MBS Operation Mode	-	-	+	+
21 *ZGD19521*	Set Time Between Measurements	-	-	+	+
26 *ZGD19526*	Heat MBS	-	-	+	+
36 *ZGD19536*	Calibrate MBS	-	-	+	+
Private Telecommand Service: - Mode Transitions 196					
1 *ZGD19601*	Go to Safe Mode	-	+	+	+
6 *ZGD19606*	Go to Cover Mode	+	-	-	-
11 *ZGD19611*	Go to Normal Mode	+	-	-	-
16 *ZGD19616*	Go to Flux Mode	+	-	-	-

ST *RSDB*	Telecommand	Safe	Cover	Normal	Flux
Private Telecommand Service: Co-ordinated Commands – 255					
1 *ZGD25501*	Reset Telemetry Output	+	+	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 2. Telecommand allow ability in GIADA Modes

2.2.3.1. Safe Mode

GIADA is in Safe Mode under one of these circumstances:

- At Switch on (by Reset or Watch Dog)
- When "Go to Safe Mode" TC(196,1) is executed

This mode is executed in ROM, this means that any patch applied before, or accepted and applied in this mode does not take effect. ***The patches only take effect when the code is executed in RAM.***

In this mode all the GIADA subsystems are off (GDS, IS, MBS) and cannot be switched On.

2.2.3.2. Cover Mode

This mode allows working with the Cover (Open and Close), the Frangibolt (test and activation) and testing the paired heaters (Cover-Frangibolt and Cover-Motor).

In this mode all the GIADA subsystems are off (GDS, IS, MBS) and cannot be switched On.

2.2.3.3. Normal Mode

The Normal Mode, where all the sensors are active by default, is the baseline to be used in nominal S/C and instrument operational conditions. In case of contingency, a sub-set of the GIADA sensors can be disabled. In Normal Mode, it will be possible to perform auto-calibrations and to manage contingencies, either autonomously or by OBCPs.

This is the mode in which by default all the subsystems are ON (GDS, IS and MBS).

Remark 1. Enabling Science Generation in Normal Mode
Before to receive the Science Packets generated by the subsystems it is necessary to enable the science generation, by default it is disabled each time GIADA enters in this mode coming from Safe mode.

2.2.3.4. Flux Mode

The Flux Mode is dwesigned to be used during the "mapping" phase of the mission, both for power saving reasons and because the expected event rate does not justify the switching on of the single grain detection (GDS + IS) sub-systems.

This is the mode in which by default MBS is ON and the other subsystems cannot be switched On.

Remark 2. Enabling Science Generation in Flux Mode
Before to receive the Science Packets generated by the MBS it is necessary to enable the science generation, by default it is disabled each time GIADA enters in this mode coming from Safe mode.

3. TELECOMMANDS AND TEMELEMETRIES

While GIADA is working, it will be able to accept after the first HK any of the mandatory Packet Services and some of the optional ones. Table 3 provides a summary of all the Services and Reports supported by GIADA.

ST *RSDB*	Service Requests	ST *RSDB*	Service Reports
Telecommand Verification Service – 1			
		1 *YGDST001*	Acceptance Success Report
		2 *YGDST002/* *YGDST003/* *YGDST004/* *YGDST005/* *YGDST006/* *YGDST007*	Acceptance Failure Report
		7 *YGDST020*	Execution Completion Success Report
		8 *YGDST025*	Execution Completion Failure Report
Housekeeping Reporting –3			
5 *ZGD00001*	Enable Housekeeping Report Generation		
6 *ZGD00002*	Disable Housekeeping Report Generation		
		25 *YGD00001*	Housekeeping Report
Event Reporting – 5			
		1 *YGD42001/* *YGD42002/* *YGD42007/* *YGD42008/* *YGD42016/* *YGD42017/* *YGD42050/* *YGD42051/* *YGD42052/* *YGD42053*	Normal/Progress Report
		2 *YGD42185/* *YGD42186/* *YGD42187/* *YGD42200/* *YGD42201/* *YGD42210/* *YGD42211/* *YGD42212/* *YGD42213/* *YGD42214/* *YGD42218/*	Error/Anomaly Report – Warning

ST *RSDB*	Service Requests	ST *RSDB*	Service Reports
		YGD42219/ *YGD42220/* *YGD42222/* *YGD42223/* *YGD42230/* *YGD42232/* *YGD42233/* *YGD42240/* *YGD42241/* *YGD42242/* *YGD42260/* *YGD42274/* *YGD42304/* *YGD42309/* *YGD42310*	
		3 *Not Used*	Error/Anomaly Report – Ground Action
		4 *YGD42032* *YGD42033*	Error/Anomaly Report – On-board Action
Memory Management Service – 6			
2 *ZGD00003*	Load Memory Absolute Addressing		
5 *ZGD00004*	Dump Memory Absolute Addressing	6 *YGD00601 /* *YGD00602 /* *YGD00603*	Dump Memory Absolute Addressing Report
9 *ZGD00005*	Check Memory Absolute Addressing	10 *YGD00604 /* *YGD00605 /* *YGD00606*	Check Memory Absolute Addressing Report
Time Management Service – 9			
1 *ZGD00006*	Accept Time Update		
Test Service – 17			
1 *ZGD00007*	Perform Connection Test	2 *YGD00012*	Connection Test Report
Context Transfer Service – 18			
1 *ZGD00008*	Report Context	2 *YGD00013*	Context Report
3 *ZGD00009*	Accept Context		
Science Data Transfer Service – 20			
1 *ZGD00010*	Enable Science Packet Generation	3 *YGD00020*	Science Report
2 *ZGD00011*	Disable Science Packet Generation		
Private Telecommand Service: Cover - 192			
1 *ZGD19201*	Arm Frangibolt		
2 *ZGD19202*	Disarm Frangibolt		

ST *RSDB*	Service Requests	ST *RSDB*	Service Reports
6 *ZGD19206*	Test Frangibolt		
11 *ZGD19211*	Activate Frangibolt		
16 *ZGD19216*	Arm Cover		
17 *ZGD19217*	Disarm Cover		
21 *ZGD19221*	Open Cover		
26 *ZGD19226*	Close Cover		
31 *ZGD19231*	Test Heater		
Private Telecommand Service: GDS - 193			
1 *ZGD19301*	Arm Laser		
2 *ZGD19302*	Disarm Laser		
6 *ZGD19306*	Switch Laser On/Off		
11 *ZGD19311*	Set GDS On/Off		
16 *ZGD19316*	Set GDS Operation Mode		
26 *ZGD19326*	Set Photodiode Threshold		
46 *ZGD19346*	Calibrate GDS		
Private Telecommand Service: IS - 194			
1 *ZGD19401*	Set IS On/Off		
6 *ZGD19406*	Set IS Operation Mode		
11 *ZGD19411*	Set PZT Threshold Level		
26 *ZGD19426*	Calibrate IS		
Private Telecommand Service: - MBS 195 (Flux and Normal Modes)			
1 *ZGD19501*	Set MBS On/Off		
6 *ZGD19506*	Set MBS Operation Mode		
21 *ZGD19521*	Set Time Between Measurements		
26 *ZGD19526*	Heat MBS		
36 *ZGD19536*	Calibrate MBS		
Private Telecommand Service: - Mode Transitions 196			

ST *RSDB*	Service Requests	ST *RSDB*	Service Reports
1 *ZGD19601*	Safe Mode		
6 *ZGD19606*	Cover Mode		
11 *ZGD19611*	Normal Mode		
16 *ZGD19616*	Flux Mode		
Private Telecommand Service: Co-ordinated Commands – 255			
1 *ZGD25501*	Reset Telemetry Output		

Table 3. Telecommands and Telemetries

3.1. Service – 1

ST *RSDB*	Service Requests	ST *RSDB*	Service Reports
Telecommand Verification Service – 1			
		1 *YGDST001*	Acceptance Success Report
		2 *YGDST002/ YGDST003/ YGDST004/ YGDST005/ YGDST006/ YGDST007*	Acceptance Failure Report
		7 *YGDST020*	Execution Completion Success Report
		8 *YGDST025*	Execution Completion Failure Report

Table 4. Telecommand Verification Service

The Telecommand Verification Service (Table 4) provides the capability for the explicit verification of a telecommand packet, from acceptance to completion of execution. In this sense, it should be seen as a supporting Service for the telecommand packets (Service Requests) belonging to all other services.

The following stages of telecommand processing are identified:

- Acceptance of the telecommand by GIADA. At this stage of telecommand processing, a required set of checks is applied to the telecommand packet before starting execution. This will include verification of header, checksum, etc. This element of the Telecommand Verification Service is supported for all telecommands.

- Completion of Execution of the telecommand. It is not applicable to all telecommands, but should be used wherever practical (e.g. Open or Close the Cover).

To indicate which type (none, one or both) of acknowledgements is required, the telecommand "acknowledge" field, contained in the data field header of the telecommand (see EID-A section 2.7.2.2 for details) must be set.

GIADA will generate a report packet, indicating either success or failure, for one or both of the above cases as requested in acknowledgement flags of the telecommand packet header. These reports will provide sufficient auxiliary data for the ground to fully understand the report (e.g., to identify the nature and cause of a telecommand failure).

Checks to be performed on incoming TC will be:

- The whole packet has been received within time out period (2 seconds)
- Check sum
- Application ID
- Valid Type and/or Sub-type
- If the Command can be executed in the actual operation mode
- Packet data field consistently
- Check CheckSum flag
- Check ACK

In case the TC requires an "Acceptance Success Report" TC(1,1) the acknowledgement report will be generated within 4 s of receipt of the command.

Remark 3. DMS timeout for receipt of acceptance verification
The DMS timeout for receipt of an acceptance verification report is 20 seconds, and the unit's TM may be buffered for up to 16 seconds, due to polling algorithm. GIADA shall therefore issue the acceptance within 4 seconds).

In case GIADA shall detect a TC Acceptance error or a 2s time-out occurs, GIADA shall perform the following recovery actions:

- Reflect the error in telemetry according to packet service 1
- Suspend TC processing for 16s (+10%, -0%) (except for TM (1,2) failure Code 5)
- Flush TC input buffer
- Await for next TC packet

3.1.1. TC Rating and prioritised TC

Remark 4. Maximum commanding rate
The maximum sustained commanding rate shall not exceed 4 kbit/s, corresponding to about 2 commands (with maximum size) within 1 s.

GIADA manages TC HW FIFO buffer 4Kwords, where the TC's are stored and executed sequentially in the queue of execution except for the prioritised TCs (Accept Time Update and Safe Mode) that are executed ASAP. In the case GIADA has buffered the two prioritised TCs, the TC Safe Mode is executed before.

3.1.2. Acceptance and Execution TC flags

The default values of Acceptance and Execution Flags in all TC's are reported in Table 5.

ST *RSDB*	Service Requests	Acceptance Flag	Execution Flag
Housekeeping Reporting –3			
5 *ZGD0001*	Enable Housekeeping Report Generation	✓	
6 *ZGD0002*	Disable Housekeeping Report Generation	✓	
Memory Management Service – 6			
2 *ZGD0003*	Load Memory Absolute Addressing	✓	✓
5 *ZGD0004*	Dump Memory Absolute Addressing	✓	
9 *ZGD0005*	Check Memory Absolute Addressing	✓	
Time Management Service – 9			
1 *ZGD0006*	Accept Time Update		
Test Service – 17			
1 *ZGD0007*	Perform Connection Test	✓	
Context Transfer Service – 18			
1 *ZGD0008*	Report Context	✓	
3 *ZGD00009*	Accept Context	✓	
Science Data Transfer Service – 20			
1 *ZGD0009*	Enable Science Packet Generation	✓	
2 *ZGD0010*	Disable Science Packet Generation	✓	
Private Telecommand Service: Cover - 192			
1 *ZGD19201*	Arm Frangibolt	✓	✓
2 *ZGD19202*	Disarm Frangibolt	✓	
6 *ZGD19206*	Test Frangibolt	✓	✓
11 *ZGD19211*	Activate Frangibolt	✓	✓
16 *ZGD19216*	Arm Cover	✓	✓
17 *ZGD19217*	Disarm Cover	✓	
21 *ZGD19221*	Open Cover	✓	✓
26 *ZGD19226*	Close Cover	✓	✓

ST *RSDB*	Service Requests	Acceptance Flag	Execution Flag
31 *ZGD19231*	Test Heater	✓	
Private Telecommand Service: GDS - 193			
1 *ZGD19301*	Arm Laser	✓	✓
2 *ZGD19302*	Disarm Laser	✓	
6 *ZGD19306*	Switch Laser On/Off	✓	✓
11 *ZGD19311*	Set GDS On/Off	✓	
16 *ZGD19316*	Set GDS Operation Mode	✓	
26 *ZGD19326*	Set Photodiode Threshold	✓	
46 *ZGD19346*	Calibrate GDS	✓	
Private Telecommand Service: IS - 194			
1 *ZGD19401*	Set IS On/Off	✓	
6 *ZGD19406*	Set IS Operation Mode	✓	
11 *ZGD19411*	Set PZT Threshold Level	✓	
26 *ZGD19426*	Calibrate IS	✓	
Private Telecommand Service: - MBS 195 (Flux and Normal Modes)			
1 *ZGD19501*	Set MBS On/Off	✓	
6 *ZGD19506*	Set MBS Operation Mode	✓	
21 *ZGD19521*	Set Time Between Measurements	✓	
26 *ZGD19526*	Heat MBS	✓	
36 *ZGD19536*	Calibrate MBS	✓	
Private Telecommand Service: - Mode Transitions 196			
1 *ZGD19601*	Safe Mode	✓	
6 *ZGD19606*	Cover Mode	✓	
11 *ZGD19611*	Normal Mode	✓	
16 *ZGD19616*	Flux Mode	✓	
Private Telecommand Service: Co-ordinated Commands – 255			
1 *ZGD25501*	Reset Telemetry Output	✓	

Table 5. Acceptance and Execution TC Flags

By default, the “Accept Time Update” TC(9,1) has no Acceptance flag; this means that the related TM(1,1) will not be delivered.

3.1.3. Acceptance Success Report TM(1,1)

The TM (1,1) is received when the TC sent to GIADA has the ACK bits = '0001' bin (AD1. 2.7.2.2)

When this TM is received the associated TC has been accepted and begun its execution.

3.1.4. Acceptance Failure Report TM(1,2)

The TM (1,2) is received when the TC sent to GIADA has the ACK bits = '0001' bin (AD1. 2.7.2.2)

The possible Failure Codes are reported in Table 6.

Failure Code ***RSDB***	
1 *YGDST002*	Incomplete Packet (Failed to receive whole packet within time out period (2 seconds for OBDH bus))
2 *YGDST003*	Incorrect check sum
3 *YGDST004*	Incorrect application ID
4 *YGDST005*	Invalid command code (Type and/or Sub-type)
5 *YGDST006*	Command can not be executed in the actual operation mode
6 *YGDST007*	Packet data field inconsistent

Table 6 Failure Codes for Acceptance Failure Reports TM (1,2)

The related failure parameters are reported in Table 7.

Failure Code ***RSDB***	*Parameter 1* *8 bits*	*Parameter 2* *8 bits*	*Parameter 3* *16 bits*	*Parameter 4* *16 bits*
1 *YGDST002*	Packet Type from received TC	Packet Sub-Type from received TC	Number of octets in packet header	Number of octets actually received
2 *YGDST003*	Packet Type from received TC	Packet Sub-Type from received TC	Received Checksum (from TC packet)	Expected Checksum (calculated)
3 *YGDST004*	Packet Type from received TC	Packet Sub-Type from received TC	'0000' (hex)	'0000' (hex)
4 *YGDST005*	Packet Type from received TC	Packet Sub-Type from received TC	'A5' (hex). Service unknown 'A0' (hex). Sub-service unknown	'0000' (hex)

Failure Code ***RSDB***	*Parameter 1* *8 bits*	*Parameter 2* *8 bits*	*Parameter 3* *16 bits*	*Parameter 4* *16 bits*
5 *YGDST006*	Packet Type from received TC	Packet Sub-Type from received TC	Actual Mode: 0 = Safe 1 = Cover 2 = Flux 3 = Normal 0xA55A(hex)=TC is not finished yet	'0000' (hex)
6 *YGDST007*	Packet Type from received TC	Packet Sub-Type from received TC	If < '8000' (hex): *Parameter Error Position*, i.e. Word Position (offset zero) of the first field error. If '8000' (hex): *TC does not produce any change (See section 4 for additional information)*	Erroneous word value read or '0000' if the Param3= *TC does not produce any change*

Table 7. Failure Parameters for Acceptance Failure Reports TM (1,2)

Remark 5. TC ignored within 16s from when TM(1,2) is receoved
When one TM(1,2) is received, any TC sent during 16s are ignored by GIADA, except for the TM(1,2) with Failure Code 5 where the TC's are accepted immediately.

Failure Code 5 can be produced in two situations:

- Parameter 3 = 0xA55A
  When a TC is issued to GIADA during execution of another "long" command (e.g. "Open Cover").
- Parameter 3 = 0, 1, 2 or 3
  When a TC, that cannot be accepted in the current operation mode.

If a TC has two or more errors only one error TM(1,2) is generated with the lower Failure Code.

3.1.5. Execution Completion Success Report TM(1,7)

The TM (1,7) is received when the TC sent to GIADA has the ACK bits = '1000' bin (AD1. 2.7.2.2)

When this TM is received the TC associated has been executed successfully and GIADA can execute the next TC.

The timing of the Execution Completion Success Report is command specific; this information is reported in Table 8 (default values).

Type	Subtype	*RSDB*	Telecommand Name	Timeout Value [s]
6	**2**	*ZGD0003*	Load Memory Absolute Addressing	8
192	**1**	*ZGD19201*	Arm Frangibolt	5
	6	*ZGD19206*	Test Frangibolt Device	60
	11	*ZGD19211*	Activate Frangibolt	90
	16	*ZGD19216*	Arm Cover	5
	21	*ZGD19221*	Open Cover	120
	26	*ZGD19226*	Close Cover	120
193	**1**	*ZGD19301*	Arm Laser	5
	6	*ZGD19306*	Switch Laser On/Off	10

Table 8. TC Timeouts to receive the execution TM

3.1.6. Execution Completion Failure Report TM(1,8)

The TM (1,8) is received when the TC sent to GIADA has the ACK bits = '1000' bin (AD1. 2.7.2.2).

The possible Failure Codes are reported in Table 9. The related failure parameters are reported in Table 10.

Failure Code - *RSDB*	
2 *YGDST026*	Cover related error
3 *YGDST027*	GDS related error

Table 9. Failure Codes for Execution Completion Failure Reports TM (1,8)

Failure Code *RSDB*	Parameter 1 8 bits	Parameter 2 8 bits	Parameter 3 16 bits	Parameter 4 16 bits
2 *YGDST026*	Packet Type from received TC	Packet Sub-Type from received TC	Error Subtype (See table below)	Parameter: see table below
3 *YGDST027*	Packet Type from received TC	Packet Sub-Type from received TC	Error Subtype (See table below)	Parameter: see table below

Table 10. Failure Parameters for Execution Completion Failure Reports TM (1,8)

The error subtype applicable to Failure Code 2 (Execution Error in Cover), is reported in Table 11.

Execution Error Subtype	Error Subtype	Parameter
6	The Frangibolt is not armed.	'0000' Hex
11	The Frangibolt temperature is above the safety limit.	FB Temp From 0 to 4095 (12 bits) in ADC units

Execution Error Subtype	Error Subtype	Parameter
16	Timeout: it has been impossible to reach to the testing temperature.	FB Temp From 0 to 4095 (12 bits) in ADC units
21	Timeout: it has been impossible to reach to the activation temperature.	FB Temp From 0 to 4095 (12 bits) in ADC units
41	The motor is not armed.	'0000' Hex
48	Timeout in Cover Movement Operation.	Cover Motor Status Hex

Table 11. Error Subtypes for Cover related Execution Completion Failure Reports TM (1,8)

The error subtype applicable to Failure Code 3 (Execution Error in GDS), is reported in Table 12.

Execution Error Report ID	Error Subtype	Parameter
6	Lasers are not armed	'0000' Hex
7	GDS is Off	'0000' Hex

Table 12. Error Subtypes for GDS related Execution Completion Failure Reports TM (1,8)

3.2. Housekeeping Reporting –3

Housekeeping Reporting –3			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
5 *ZGD00001*	Enable Housekeeping Report Generation		
6 *ZGD00002*	Disable Housekeeping Report Generation		
		25 *YGD00001*	Housekeeping Report

Table 13. Housekeeping Reporting

This Service (Table 13), along with the Event Reporting Service, provides the reporting to the ground of all information of operational value, which is not explicitly provided within the reports of other services.

Housekeeping telemetry shall allow monitoring of the proper operation of the unit, including:

- Unambiguous identification of the conditions required for execution of all possible configuration dependent telecommands (example Lasers switching).

- Status information provided from direct measurements rather than from secondary effects.

Data within a housekeeping telemetry packet are self standing and do not require data from other packets or from telecommand history in order to be interpreted.

A single telemetry parameter is always provided, to unambiguously identify the mode of operation of the instrument.

Only one Structure Identification (SID) is needed.

GIADA supports the 'default' report. This is identified by SID = 1. At power on, or reset, following time synchronisation, GIADA will enable autonomously the generation of the 'default' HK report. The default housekeeping report is generated according to the collection interval that is specified in the Configuration Table: parameter "Time HK Packet".

Enabling/disabling of housekeeping reports is controlled by commands subtypes 5 & 6 (see subtype definitions). By default the HK service is enabled by GIADA.

Remark 6. Meaning of HK fields with subsystems off
If one subsystem is off (GDS, IS, MBS) the related HK fields are set to zero and must be ignored. This is not true for the IS temperature that gives the temperature independently of the IS status (On/Off) and the operational mode.

3.2.1. Modes Allowability of TC in HK Service

Modes allowability of Housekeeping Reporting in shown in Table 14.

ST *RSDB*	Telecommand	Safe	Cover	Normal	Flux
Housekeeping Reporting –3					
5 *ZGD00001*	Enable Housekeeping Report Generation	+	+	+	+
6 *ZGD00002*	Disable Housekeeping Report Generation	+	+	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 14. Modes allowability of Housekeeping Reporting

3.2.2. HK values in GIADA Operative Modes

Every HK value is a snapshot of the GIADA parameters (SW and HW). The HW parameters are calculated every time that the HK is generated (do not use past values) and the SW values are extracted from the related SW variables present status and HW registers.

3.2.3. Enable Housekeeping Report Generation TC(3,5)

On receipt of this TC, GIADA will deliver periodically the HK reports within the rate time specified in the CT parameter "Time HK Packet"

Two possibilities exist to change the HK rate time:

A) (RECOMENDED) Send a CF with the desired time in the parameter "Time HK Packet".
B) By patch, patching the parameter "Time HK Packet" in the RAM CT.

The new HK time rate takes effect under one of this conditions:

A) Wait for one HK generated with the past rate.
B) Disabling/Enabling the HK

Remark 7. Maximum rate for HK
The maximum rate recommended for HK is 5s.

By default the HK service is enabled by GIADA.

3.2.4. Disable Housekeeping Report Generation TC(3,6)

On receipt of this request GIADA will stop the generation of the HK report.

3.2.5. Housekeeping Report TC(3,6)

See Appendix A. Software ICD (RO-EST-RS-3009/EID B – Section 2.8).

3.2.6. Housekeeping Parameter Description and Mode Applicability

Outside the declared Mode Operation Applicability the HK parameters must be ignored, as reported in Table 15.

HK Parameter Name	Function	Safe Mode	Cover Mode	Flux Mode	Normal Mode
Dust Flux	Number of IS events in last minute (counts·dm^{-2}·min^{-1}) Values=EEEE (hex) Not available FFFF(hex) Saturated. > 600 events in last minute It's only available when GIADA is in Normal Mode and the IS is ON. During the first minute after the IS on the Dust Flux=Not Available. Immediately after IS off Dust Flux=Not Available This value is independent of status of the Science TM Enabled/Disabled flag				✓

HK Parameter Name	Function	Safe Mode	Cover Mode	Flux Mode	Normal Mode
Operation Mode	GIADA Operative Mode: Safe, Normal ,Flux, Cover	✓	✓	✓	✓
Event Report TM overflow	Value=1 If number of TM (5,3) > 500 Value=0 In other cases One time this flag is set to 1, this value remains set until next GIADA Switch On or until the patch to reset this value is applied	✓	✓	✓	✓
Science TM overflow	Value=1 If number of IS or GDS events accepted in one second is over the limit specified in the CF parameters "Max GDS Events Per second" and "Max IS Events Per second" respectively. This flag is reset every second. This flag is independent of status of the Science TM Enabled/Disabled flag Value=0 In other cases				✓
Science TM Enabled/Disabled	Value=1 If the Science packets must be delivered Value=0 In other cases			✓	✓
Frangibolt Armed/disarmed	Value=1 If the FB is armed Value=0 In other cases		✓		
Motor Armed/disarmed	Value=1 If the Cover is armed Value=0 In other cases		✓		
"Open" reed-switch	Value=1 If the Open reed-switch is open Value=0 If the Open reed-switch is close	✓	✓	✓	✓
"Closed" reed-switch	Value=1 If the Closed reed-switch is open Value=0 If the Closed reed-switch is close	✓	✓	✓	✓
Cover Heater ON/OFF	Value=1 Cover heater is being heated Value=0 In other cases		✓		
Motor Heater ON/OFF	Value=1 Motor heater is being heated Value=0 In other cases		✓		
Frangibolt Heater ON/OFF	Value=1 FB heater is being heated Value=0 In other cases		✓		
Frangibolt Temp.	FB Temperature Value always available	✓	✓	✓	✓
GDS ON/OFF	Value=1 If the GDS is switched ON Value=0 In other cases				✓
Laser Armed/disarmed	Value=1 If the Laser are armed Value=0 In other cases Ignore if the GDS is off				✓
Laser Power Consumption	Laser Consumption: Off, Low, Medium, High By default in every Laser Switch On the laser Power is set to Low during 30s and after this period is set to the Laser Power configuration established in the CF Ignore if the GDS is off				✓
Laser Operation Mode	Laser Operation Mode: DC Couple 1 only, DC Couple 2 only, AC both couples (3) Ignore if the GDS is off				✓
Receiver Left Enabled/Disabled	Value=1 If the GDS Left Receiver is enabled Value=0 In other cases Ignore if the GDS is off				✓
Receiver Right Enabled/Disabled	Value=1 If the GDS Right Receiver is enabled Value=0 In other cases Ignore if the GDS is off				

HK Parameter Name	Function	Safe Mode	Cover Mode	Flux Mode	Normal Mode
Laser Power Supply on/off	Value=1 If the Laser are switched ON Value=0 In other cases Ignore if the GDS is off				✓
Number of Detections	Laser Pulse Enough Ignore if the GDS is off				✓
Laser1 Temp.	Laser 1 Temperature. Ignore if the GDS is off				✓
Laser2 Temp.	Laser 2 Temperature. Ignore if the GDS is off				✓
Laser3 Temp.	Laser 3 Temperature. Ignore if the GDS is off				✓
Laser4 Temp.	Laser 4 Temperature. Ignore if the GDS is off				✓
Laser1 light	Laser 1 light. Ignore if the GDS is off				✓
Laser2 light	Laser 2 light. Ignore if the GDS is off				✓
Laser3 light	Laser 3 light. Ignore if the GDS is off				✓
Laser4 light	Laser 4 light. Ignore if the GDS is off				✓
Threshold Left	GDS Left threshold . Ignore if the GDS is off				✓
Threshold Right	GDS Right threshold . Ignore if the GDS is off				✓
IS ON/OFF	Value=1 If the IS is switched ON Value=0 In other cases				✓
PZTE Enabled/Disabled	Value=1 If the PZT E is enabled Value=0 In other cases Ignore if the IS is off				✓
PZTD Enabled/Disabled	Value=1 If the PZT D is enabled Value=0 In other cases Ignore if the IS is off				✓
PZTC Enabled/Disabled	Value=1 If the PZT C is enabled Value=0 In other cases Ignore if the IS is off				✓
PZTB Enabled/Disabled	Value=1 If the PZT B is enabled Value=0 In other cases Ignore if the IS is off				✓
PZTA Enabled/Disabled	Value=1 If the PZT A is enabled Value=0 In other cases Ignore if the IS is off				✓
Range	IS Range: Low, High Ignore if the IS is off				✓
Gain PZTE	PZTE Gain: Low, High Ignore if the IS is off				✓
Gain PZTD	PZTD Gain: Low, High Ignore if the IS is off				✓
Gain PZTA	PZTA Gain: Low, High Ignore if the IS is off				✓
IS Plate Temp.	IS Plate Temperature Value always available	✓	✓	✓	✓
Threshold PZTA	PZT A Threshold Ignore if the IS is off				✓
Threshold PZTB	PZT B Threshold Ignore if the IS is off				✓
Threshold PZTC	PZT C Threshold Ignore if the IS is off				✓
Threshold PZTD	PZT D Threshold Ignore if the IS is off				✓
Threshold PZTE	PZT E Threshold Ignore if the IS is off				✓

HK Parameter Name	Function	Safe Mode	Cover Mode	Flux Mode	Normal Mode
MBS ON/OFF	Value=1 If the MBS is switched ON Value=0 In other cases			✓	✓
MB5 Enabled/Disabled	Value=1 If the MB 5 is enabled Value=0 In other cases Ignore if the MBS is off			✓	✓
MB4 Enabled/Disabled	Value=1 If the MB 4 is enabled Value=0 In other cases Ignore if the MBS is off			✓	✓
MB3 Enabled/Disabled	Value=1 If the MB 3 is enabled Value=0 In other cases Ignore if the MBS is off			✓	✓
MB2 Enabled/Disabled	Value=1 If the MB 2 is enabled Value=0 In other cases Ignore if the MBS is off			✓	✓
MB1 Enabled/Disabled	Value=1 If the MB 1 is enabled Value=0 In other cases Ignore if the MBS is off			✓	✓
MB5 Heater ON/OFF	Value=1 If the MB 5 heaters is on Value=0 In other cases Ignore if the MBS is off			✓	✓
MB4 Heater ON/OFF	Value=1 If the MB 4 heaters is on Value=0 In other cases Ignore if the MBS is off			✓	✓
MB3 Heater ON/OFF	Value=1 If the MB 3 heaters is on Value=0 In other cases Ignore if the MBS is off			✓	✓
MB2 Heater ON/OFF	Value=1 If the MB 2 heaters is on Value=0 In other cases Ignore if the MBS is off			✓	✓
MB1 Heater ON/OFF	Value=1 If the MB 1 heaters is on Value=0 In other cases Ignore if the MBS is off			✓	✓
MBS1 Temperature	MBS 1 temperature. Ignore if the MBS is off			✓	✓
MBS2 Temperature	MBS 2 temperature Ignore if the MBS is off			✓	✓
MBS3 Temperature	MBS 3 temperature Ignore if the MBS is off			✓	✓
MBS4 Temperature	MBS 4 temperature Ignore if the MBS is off			✓	✓
MBS5 Temperature	MBS 5 temperature Ignore if the MBS is off			✓	✓
PS Temperature	Power Supply Temperature	✓	✓	✓	✓
+5V Power Consumption	+5V power consumption	✓	✓	✓	✓
+15V Power Consumption	+15V power consumption	✓	✓	✓	✓
-15V Power Consumption	-15V power consumption	✓	✓	✓	✓
Patches Status	Patches Applied (See “Relationship between HK and CF patches status and VD” for more information)	✓	✓	✓	✓

Table 15. HK Parameter description and Mode Applicability.

3.3. Event Reporting – 5

The Event Service (Table 16) provides the capability for the transmission of reports to notify ground or DMS of an event of operational significance.

Event Reporting – 5			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
		1 *YGD42001/* *YGD42002/* *YGD42007/* *YGD42008/* *YGD42016/* *YGD42017/* *YGD42050/* *YGD42051/* *YGD42052/* *YGD42053*	Normal/Progress Report
		2 *YGD42185/* *YGD42186/* *YGD42187/* *YGD42200/* *YGD42201/* *YGD42210/* *YGD42211/* *YGD42212/* *YGD42213/* *YGD42214/* *YGD42218/* *YGD42219/* *YGD42220/* *YGD42222/* *YGD42223/* *YGD42230/* *YGD42232/* *YGD42233/* *YGD42240/* *YGD42241/* *YGD42242/* *YGD42260/* *YGD42274/* *YGD42304/* *YGD42309/* *YGD42310*	Error/Anomaly Report – Warning
		3 *Not Used*	Error/Anomaly Report – Ground Action
		4 *YGD42032* *YGD42033*	Error/Anomaly Report – On-board Action

Table 16. Event Reporting

The Service covers the requirement for event reporting i.e.:

- reporting of failures and/or anomalies detected onboard
- reporting of autonomous onboard actions
- reporting of normal progress of operations/activities, e.g. detection
- reporting of events which are not anomalous: reaching of predefined steps in an operation etc

Four different levels of event report are provided:

- normal/progress reports (used, for example, to notify to ground of an onboard autonomous action, which does not relate to a fault condition);
- error/anomaly report – Warning. An event for which no action needs to (or can) be taken.
- error/anomaly report – Ground Action. An event for which some pre-defined ground recovery action is required.
- error/anomaly report - On-board Action. An event for which some pre-defined on-board recovery action is required.

All events of operational significance, including notification of all autonomous actions and detected anomalies, are reported in a complete and unambiguous manner using event reports packets.

3.3.1. Normal/Progress Report TM(5,1)

The possible TM(5,1) are reported in Table 17.

ID ***RSDB***	**Name**	**Parameters**		
42001 *YGD42001*	Heaters ON	2 octets	Heater ID: 0x0004 = Cover Heater 0x0005 = Cover and Frangibolt Heaters 0x0006 = Cover and Motor Heaters	
42002 *YGD42002*	Heaters OFF	2 octets	Heater ID: 0x0004 = Cover Heater 0x0005 = Cover and Frangibolt Heaters 0x0006 = Cover and Motor Heaters	
42007 *YGD42007*	Cover Report	526 octets	2 octets	Direction
			6 octets	Time Stamp Begin
			512 octets	Each octet holds the Cover Status (see below)
			6 octets	Time Stamp End
42008 *YGD42008*	Heaters Current Consumption	4 octets	2 Octets	+15V Current From 0 to 4095 in ADC units (to be converted on ground to current)

			2 Octets	-15V Current From 0 to 4095 in ADC units (to be converted on ground to current)
42016 *YGD42016*	MB Heaters ON	2 octets	Heater ID (from 1 to 5 included)	
42017 *YGD42017*	MB Heaters OFF	2 octets	Heater ID (from 1 to 5 included)	
42050 *YGD42050*	GIADA in Safe Mode.	2 octets	'0000'hex	
42051 *YGD42051*	GIADA in Cover Mode.	2 octets	'0000'hex	
42052 *YGD42052*	GIADA in Normal Mode.	2 octets	'0000'hex	
42053 *YGD42053*	GIADA in Flux Mode.	2 octets	'0000'hex	

Table 17. Normal/Progress Reports TM(5,1).

The appearance scenarios for TM(5,1) are reported in Table 18.

ID ***RSDB***	**Name**	**Appearance Scenario**
42001 *YGD42001*	Heaters ON	One of the following TC has been executed: Test FB TC(192,6), Activate FB TC(192,11) Open Cover TC(192,21) Close Cover TC(192,26), Test Heater TC(192,31). The parameter of this TM indicates the pair of heaters that were switched on.
42002 *YGD42002*	Heaters OFF	One of the following TC has been executed: Test FB TC(192,6), Activate FB TC(192,11) Open Cover TC(192,21) Close Cover TC(192,26), Test Heater TC(192,31). The parameter of this TM indicates the pair of heaters that were switched off.
42007 *YGD42007*	Cover Report	One of the following TC has been executed: Open Cover TC(192,21) Close Cover TC(192,26).The report holds the log of the movement and it is delivered at the end of the movement.
42008 *YGD42008*	Heaters Current Consumption	The Test Heaters TC (192,31) has been executed
42016 *YGD42016*	MB Heaters ON	The Heat MB TC (195,26) has been executed
42017 *YGD42017*	MB Heaters OFF	The Heat MB TC (195,26) has been executed
42050 *YGD42050*	GIADA in Safe Mode.	The Safe Mode TC(196,1) has been executed
42051 *YGD42051*	GIADA in Cover Mode.	The Cover Mode TC(196,6) has been executed
42052 *YGD42052*	GIADA in Normal Mode.	The Normal Mode TC(196,11) has been executed
42053 *YGD42053*	GIADA in Flux Mode.	The Flux Mode TC(196,16) has been executed

Table 18. Appearance Scenarios for TM(5,1)

3.3.2. Error/Anomaly Report – Warning TM(5,2)

Not used by GIADA.

3.3.3. Error/Anomaly Report – Ground Action TM(5,3)

The possible TM(5,3) are reported in Table 19 (See Section 4 for more information).

ID ***RSDB***	**Name**	**Parameters**		
42185 *YGD42185*	ADC Conversion Timeout	2 octets	‘0000’hex	
42186 *YGD42186*	EDAC Event Error	6 octets	2 Octets	Error Type and EDAC Status
			2 Octets	High Error Address
			2 Octets	Low Error Address
42187 *YGD42187*	Generic Timer IRQ Not Arrived	2 octets	‘0000’hex	
42200 *YGD42200*	Frangibolt to disarmed state	2 octets	‘0000’hex	
42201 *YGD42201*	Motor to disarmed state	2 octets	‘0000’hex	
42210 *YGD42210*	Laser To Disarmed State	2 octets	‘0000’hex	
42211 ***YGD42211***	**Laser Temperature Above Max Temp**	**2 octets**	**From 0 to 4095 in ADC units (to be converted on ground to temperature)**	
42212 ***YGD42212***	**Laser Temperature Below Min Temp**	**2 octets**	**From 0 to 4095 in ADC units (to be converted on ground to temperature)**	
42213 *YGD42213*	Hardware Error In GDS Event Detection Circuitry	2 octets	‘0000’hex	
42214 *YGD42214*	Hardware Error In GDS Event Detection Circuitry No IRQ Received	2 octets	‘0000’hex	
42218 *YGD42218*	IS switched-on, status resumed by end of thermal contingency	2 octets	‘From 0 to 4095 in ADC units (to be converted on ground to IS temperature)	
42219 *YGD42219*	IS switched-off, due to thermal contingency.	2 octets	‘From 0 to 4095 in ADC units (to be converted on ground to IS temperature)	
42220 *YGD42220*	IS Plate Temperature Above MAX-OP Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42222 *YGD42222*	Hardware Error In IS Event Detection Circuitry	2 octets	‘0000’hex	
42223 *YGD42223*	Hardware Error In IS Event Detection Circuitry No IRQ Received	2 octets	‘0000’hex	
42230 ***YGD42230***	**MBS Temperature Above Max Temp**	**2 octets**	**From 0 to 4095 in ADC units (to be converted on ground to temperature)**	
42232 *YGD42232*	Hardware Error In MBS Event Detection Circuitry	2 octets	‘0000’hex	
42233 *YGD42233*	Hardware Error In MBS Event Detection Circuitry No IRQ Received	2 octets	‘0000’hex	
42240 ***YGD42240***	**IS Plate Temperature Above MAX NON-OP Temp**	**2 octets**	**From 0 to 4095 in ADC units (to be converted on ground to temperature)**	

ID *RSDB*	Name	Parameters		
42241 ***YGD42241***	**IS Plate Temperature Below Min Temp**	**2 octets**	**From 0 to 4095 in ADC units (to be converted on ground to temperature)**	
42242 ***YGD42242***	**Main Electronic Temperature Above MAX-OP Temp**	**2 octets**	**From 0 to 4095 in ADC units (to be converted on ground to temperature)**	
42260 *YGD42260*	Scheduler Full	2 octets	'0000'hex	
42274 *YGD42274*	Virtual Disk File Does Not Exist	2 octets	File ID	
42304 *YGD42304*	Cannot Add More Patches	2 octets	'0000'hex	
42309 *YGD42309*	Previous Execution Reset By Watch Dog	6 octets	2 Octets	After Watchdog Register
			2 Octets	EDAC Status
			2 Octets	EDAC Address Register
42310 *YGD42310*	EDAC Error During S/W Start And Dump	4 octets	2 Octets	EDAC Status
			2 Octets	EDAC Address Register

Table 19. Error/Anomaly Warning Reports TM(5,3)

At GIADA_SWITCH_ON a counter is initialized, the counter of TM Events Errors TM(5,3). When this counter reaches 500 there no more TM(5,3) will be issued and this situation is reflected in the Housekeeping parameter Event_TM_Overflow.
For the TM(5,3) that generate an OBCP (evidenced in **bold** in Table 19) a protection is implemented in order to avoid commanding more than one Close_Cover_OBCP.
This means that a single problem could generate the same event up to maximum 500 times, before stopping. This situation implies the following Remark.

Remark 8. Maximum number of TM(5,3) reports
To avoid an avalanche of TM(5,3) reports, the maximum number of TM (5,3) allowed in all the modes is 500. When this limit is reached, the HK flag "Event Report TM overflow" is set. The only way to reset the "Event Report TM overflow" flag is applying the Patch "Reset Event Overflow" (See Appendix E) or switch off and switch on GIADA.

Remark 9. Potential problem with overloading the Critical Event Log
GIADA SW has been designed to trace any error, so that it is not compliant with requirement in EID-A – Section 2.8.3.3.3 Functional requirements for service 5, where it is clearly specified that "a single report shall be generated only once per anomaly/event occurrence". This lack of compliance is in addition to the risk of overrunning the max number of events in the Critical Event Log (CEL) before wraparound (which is 256).
Possible actions are as it follow:

- ***To patch the counter in memory at the start up to have the desired maximum value of the total error events, but not only one for each error type. This would limit the total number of events and could create problems if GIADA is on for a long time (overflow event report TM); we should reset the counter by applying proper patch or switch off/on GIADA. In any case, if there is an avalanche of reports before the patch applying, there is no way to avoid it.***
- ***Alternatively, a "major modification" to the onboard SW is possible to avoid avalanches. However, this will be effective only on operational modes other than the SAFE, so also in this case there is no guarantee that the problem does not occur.***

Since the problem has never occurred so far we decided (in agreement with ESA) to leave the status as is, to monitor the evolution and, in case, to take proper action to implement one of the previous options.

On this aspect ESA has issued the Anomaly Report AR_ROS_SC_134. To better trace the behaviour of GIADA we recall that the Event Errors, TM (5,3), that can produce a flow of TM are those listed in Table 20.

ID ***RSDB***	**Name**	**Possible Event Flow**
42185 *YGD42185*	ADC Conversion Timeout	YES, If yes GIADA will not function at all
42186 *YGD42186*	EDAC Event Error	YES[2]
42187 *YGD42187*	Generic Timer IRQ Not Arrived	NO (3 Times Max)
42200 *YGD42200*	Frangibolt to disarmed state	NO
42201 *YGD42201*	Motor to disarmed state	NO
42210 *YGD42210*	Laser To Disarmed State	NO
42211 *YGD42211*	Laser Temperature Above Max Temp	NO
42212 *YGD42212*	Laser Temperature Below Min Temp	NO
42213 *YGD42213*	Hardware Error In GDS Event Detection Circuitry	YES[1]
42214 *YGD42214*	Hardware Error In GDS Event Detection Circuitry No IRQ Received	YES[1]
42218 *YGD42218*	IS switched-on, status resumed by end of thermal contingency	NO unless thermal fluctuation

ID ***RSDB***	**Name**	**Possible Event Flow**
42219 *YGD42219*	IS switched-off, due to thermal contingency.	NO unless thermal fluctuation
42220 *YGD42220*	IS Plate Temperature Above MAX-OP Temp	NO unless thermal fluctuation
42222 *YGD42222*	Hardware Error In IS Event Detection Circuitry	YES[1]
42223 *YGD42223*	Hardware Error In IS Event Detection Circuitry No IRQ Received	YES[1]
42230 *YGD42230*	MBS Temperature Above Max Temp	NO
42232 *YGD42232*	Hardware Error In MBS Event Detection Circuitry	YES[1]
42233 *YGD42233*	Hardware Error In MBS Event Detection Circuitry No IRQ Received	YES[1]
42240 *YGD42240*	IS Plate Temperature Above MAX NON-OP Temp	NO
42241 *YGD42241*	IS Plate Temperature Below Min Temp	NO
42242 *YGD42242*	Main Electronic Temperature Above MAX-OP Temp	NO
42260 *YGD42260*	Scheduler Full	YES If yes GIADA will not function at all in a little time.
42274 *YGD42274*	Virtual Disk File Does Not Exist	NO
42304 *YGD42304*	Cannot Add More Patches	NO
42309 *YGD42309*	Previous Execution Reset By Watch Dog	NO
42310 *YGD42310*	EDAC Error During S/W Start And Dump	NO

Table 20. Event Errors, TM (5,3), that can produce a flow of TM's.

In all the cases, the maximum number of TM (5,3) allowed in all the modes is 500. Anyhow this number could be patched to have a minimum number of reports. When this limit is reached, the HK flag "Event Report TM overflow" is set. The only way to reset the "Event Report TM overflow" flag is by applying the Patch "Reset Event Overflow" or switch off and switch on GIADA.

1)
More explanations:

42222 (*YGD42222):*
Hardware Error in IS Event Detection Circuitry:
The number of channel enabled is greater than the channels detected plus channels in overflow. Only one error event could be caused by a bit flip inside the FPGA. If a flow of event rises, should be one TM per IS real event. Disabling the affected channel or the entire subsystem will avoid the flow.

42223 (*YGD42223),*
Hardware Error in IS Event Detection Circuitry No IRQ Received:
Some cases have been described in the documentation related mainly with calibration of the subsystem. Another possible origin is a very noisy environment, not detected up to now in the entire test made. And a real error that should advice us the quality of data collected. Switching off the subsystem will avoid the flow of error events.

42213 (*YGD42213):*
Hardware Error in GDS Event Detection Circuitry:
There is a channel with begin of detection but not end of detection neither overflow after enough time. Only one error event could be caused by a bit flip inside the FPGA. If a flow of event rises, should be one TM per GDS real event. Disabling the affected channel or the entire subsystem will avoid the flow.

42214 (*YGD42214),*
Hardware Error in GDS Event Detection Circuitry No IRQ Received:
A possible origin is a very noisy environment, not detected up to now in the entire test made. And a real error that should advice us the quality of data collected. Switching off the subsystem will avoid the flow of error events.

42232 (*YGD42232):*
Hardware Error in MBS Event Detection Circuitry:
The timer that control the measure time arrives to the overflow, this is impossible with the programmable values. Only one error event could be caused by a bit flip inside the FPGA. If a flow of event rises, should be one TM per MBS real read. Disabling the entire subsystem will avoid the flow.

42233 (*YGD42233),*
Hardware Error in MBS Event Detection Circuitry No IRQ Received:
A possible origin is a very noisy environment, not detected up to now in the entire test made. And a real error that should advice us the quality of data collected. Switching off the subsystem will avoid the flow of error events.

2)
42186 (*YGD42186),*
EDAC Event Error:
For this type of error can be four possible scenarios:

ROM: if an EDAC error is produced in the code that runs in ROM, this is only in Safe Mode, a flow of Telemetry Error Event will appear for sure. The only way to minimize the effect is to patch the maximum number of TM(5,3) events counter. It should be remarked that the occupation of the code in ROM is less than the 40% of the capacity of the devices.

Code in RAM: In the modes different from Safe, the code runs from RAM. Here other two possibilities can appear: if the EDAC error is caused by a bit-flip, after a switch off/on will solved the problem. But if it is a permanent damage of the device, a patch that remaps the function affected will avoid the problem.

Data in RAM: If a flow of Event Error appears this means a permanent damage of the device, if a patch that remaps the variable is applicable, this will solve the problem, if not, t he only way to minimize the effect is to patch the maximum number of TM(5,3) events counter.

NVRAM: Up to now, there is no possibility to have a flow of Error Events

3.3.3.1. After Watch_Dog and EDAC registers information

After Watch_Dog Status Register definition is:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
OPT 1	WD_IN	EDAC_ER	INT4	INT3	NMI	INT1	INT0

INT0: Asserted by user in the INT0 (Div by 0) service subprogram.
INT1: Asserted by user in the INT1 (Trace) service subprogram.
NMI: Asserted by user in the NMI service subprogram.
INT3: Asserted by user in the INT3 (SW Interrupt) service subprogram.
INT4: Asserted by user in the INT4 (Overflow) service subprogram.
EDAC_Er: Asserted by user in the EDAC Interrupt service subprogram.
WD_IN: Asserted automatically after the Watch_dog Pulse.
OPT1: Spare

The EDAC Address Register definition is:

A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0

A0=Bit 0…A15=Bit 15
A15-A0: The address of erroneous data (LSB).

The EDAC Status Register definition is:

X	X	X	X	X	X	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0

B0=Bit 0…B15=Bit 15
B3 to B0: A19 to A16. The MSB of the Address bus in an erroneous data.

B7 to B4: Status of Bits B3 to B0 in Control Register.
B9-B8: Error Type.

00: No error.
01: One Bit error has occurred in Data Bus.
10: One Bit error has occurred in Hamming Code bits.
11: Two or more errors have occurred.

3.3.4. Error/Anomaly Report – On-board Action TM(5,4)

The possible TM(5,4) are reported in Table 21.

ID *RSDB*	Name	Parameters	
42032 *YGD42032*	Start Emergency Cover Close OBCP	2 octets	'0000'hex
42033 *YGD42033*	Start Switch Lasers ON OBCP	2 octets	'0000'hex

Table 21. Error/Anomaly On Board Action Reports TM(5,4)

3.4. Memory Management Service – 6

Memory Management Service – 6			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
2 *ZGD00003*	Load Memory Absolute Addressing		
5 *ZGD00004*	Dump Memory Absolute Addressing	6 *YGD00601 /* *YGD00602 /* *YGD00603*	Dump Memory Absolute Addressing Report
9 *ZGD00005*	Check Memory Absolute Addressing	10 *YGD00604 /* *YGD00605 /* *YGD00606*	Check Memory Absolute Addressing Report

Table 22. Memory Management Service

This Service (Table 22) provides the capability for loading, dumping and checking the contents of either a contiguous memory area or of several non-contiguous ('scattered') memory areas of GIADA.

Remark 10. GIADA Memory ID
GIADA requires 3 Memory ID and the word-width is always 16 bits.

GIADA ROM Memory ID = 80 dec (0x50 hex)
GIADA RAM Memory ID = 81 dec (0x51 hex)
GIADA NVRAM Memory ID = 0x82 dec (0x52 hex)

GIADA Word Width = 16 bits

Remark 11. Alignment of data in GIADA Memory
The alignment of data in GIADA memory is in the little-endian format proper of the 80x86 processor family.

It is possible to load, dump or check any RAM or NVRAM memory area. It is possible to dump or check any ROM memory area.

Every Memory Management telecommand packet needed to update any area of memory will be self consistent in that:

- the successful load will not depend on previous packets
- if the packet is rejected or the load fails for this packet, it may be up-linked alone at a later time
- the rejection or failure of a packet shall be clearly and unambiguously indicated by a telecommand verification packet giving the telecommand packet sequence number and reason for failure in a standard way

The CRC Checksum algorithms are defined in [AD9] and are used also for telecommand verification.

All the TC or TM memory references follow the format: XXXX ZZZZ
where XXXX is one of the segment values:

0000 (hex) for RAM
1000 (hex) for NVRAM
F000 (hex) for ROM

where ZZZZ (hex) is the offset inside the segment XXXX from 0000(hex) to FFFF(hex) both inclusives.

Examples:

0000:0400 = 00400 is the address 0400 (hex) in RAM
1000:0400 = 10400 is the address 0400 (hex) in NVRAM
F000:0400 = F0400 is the address 0400 (hex) in ROM

3.4.1. Modes Allowability of TC in Memory Service

The Modes Allowability of TC in Memory Service is reported in Table 23.

ST *RSDB*	Telecommand	Safe	Cover	Normal	Flux
2 *ZGD00003*	Load Memory Absolute Addressing	+	-	-	-
5 *ZGD00004*	Dump Memory Absolute Addressing	+	-	-	-
9 *ZGD00005*	Check Memory Absolute Addressing	+	-	-	-
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 23. Modes Allowability of TC in Memory Service

3.4.2. Load Memory Absolute Addressing TC(6,2)

This command can only be applied in RAM and NVRAM memory.

Each Memory Load in RAM will be verified, applied and stored. The verification consists in checking the correctness of the patch parameters (Memory ID, Start and Address). The application consists in loading in memory the bytes declared in the patch. The store consists in writing the patch into the VD like a file, along with checksum data to verify its validity before read it.

Memory loads in NVRAM are also verified and applied but are not stored in the VD.

On receipt of this TC, GIADA will load one defined area (simple patch) or multiple areas (multi-patch) of memory with the provided data. The multi-patch must be referred to the same memory ID (RAM, NVRAM).

In order to retrieve the patches stored in the VD it is needed to send the Accept Context TC (18,3), enabling the appropriate bit in the patch status (see Section 3.4.2.2.3 - Relationship between HK and CF patches status and VD).

Remark 12. Patch acceptance and application
The patches can be accepted only in Safe Mode, but take effect only when GIADA goes to a different mode: from Safe to Cover, Flux or Normal.

By default this TC requires at the end of the execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.4.2.1. Load Memory by Absolute Addressing Parameters

The Absolute Addressing Parameters for Load Memory are shown in Table 24.

Memory ID	1 octet	RAM:0x51(hex) NVRAM:0x52(hex)	
Number of blocks	1 octet		
Start Address	4 octets		Repeat Number of blocks times
Block Length	2 octets		
Data 0	2 octets		
Data 1	2 octets		
…	2 octets		
Data N	2 octets		

Table 24. Load Memory by Absolute Addressing Parameters

Checks to be done (by the user) to all "Load Memory by Absolute Addressing" TC (6,2) are:

- Memory ID= RAM:0x51(hex) or NVRAM:0x52(hex)
- Number of blocks > 0
  Max Number of blocks = 0x10 (hex) blocks
- Start Address >= 0000:0000 (hex) for RAM
  Start Address >= 1000:0000 (hex) for NVRAM
- Block Length > 0
  Block Length <= 0x72(hex). Only valid when Number of blocks=1
- Start Address + Block Length <= 0000:FFFF (hex) for RAM
  Start Address + Block Length <= 1000:FFFF (hex) for NVRAM
- Data >=0x0000 (hex)
  Data <=0xFFFF (hex)

Please check the "Appendix F. Patcheable Functions Table" in order to not choose invalid addresses to patch.

If there is more than one error inside the TC only the first error will be reported.

3.4.2.2. Virtual Disk (VD)

The objective of the VD is to store the RAM patches (but not NVRAM patches).

When GIADA is switched off, the VD, that resides in NVRAM, is powered by KAL, so its content is not lost and available when GIADA is switched On again. The structure of the VD is shown in Figure 3.

Virtual Disk Map

Offset (hex)	Content	
0100	Number of Files	Redundant FAT
0102	Used Words	
0104	CRC Control Vars	
0106	Begin Word File 0	
0108	Size File 0	
010A	Handle File 0	
010C	CRC File 0	
...		
0306	Begin Word File 64	
0308	Size File 64	
030A	Handle File 64	
030C	CRC File 64	
030E	Redundant FAT CRC	
0310	**Files Buffer Begin**	
...		
4D0E	**Files Buffer End**	FAT
4D10	Begin Word File 0	
4D12	Size File 0	
4D14	Handle File 0	
4D16	CRC File 0	
...		
4F10	Begin Word File 64	
4F12	Size File 64	
4F14	Handle File 64	
4F16	CRC File 64	
4F18	FAT CRC	

Figure 3 Virtual Disk Map

The first 3 words stored are called “Virtual Disk Control Variables” and must be set to 0 to reset the VD (see

Appendix E. Utility Patches - patch 2). For each file a file description is stored containing: address of the first word of the file, file size, unique file handle and the file CRC. The FAT stores the description of 65 files (Master File Index + 64 files) and in case of a FAT error, there is a mirror, called Redundant FAT, that can be copied over the FAT. This process should be done dumping the Redundant FAT "Dump Memory Absolute Addressing" TC(6,5) and overwriting the content of the FAT using "Load Memory Absolute Addressing" TC(6,2).

VD holds maximum 64 patches. Each patch can store 114 Words of raw data (excluded the patch header), so the max area patchable is 64x114 Words=7296 Words. In case of multi patch, take into account that the size patch header is 3 Words and this room decreased the raw patch data.

In any moment, the VD holds the "Master File Index", with file handle 9B5A(hex), that allows to add or retrieve patches. This File is, in any case, the file zero of the VD and has no representation in any of the patches status present (HK or CF).

The patches file handles begin to count from 9B5B(hex) consecutively.

3.4.2.2.1. Virtual Disk Checks

The VD is checked under one of these situations:

- Passing from one Mode (Normal, Flux or Cover) to Safe
- Switching Off and On GIADA
- When a CF is accepted using "Accept Context" TC(18,3)

If after the VD check, it is corrupted, the VD is automatically reset and regenerated. For the first situation also the whole NVRAM is clear (included the copy of CF in NVRAM).

The VD integrity is checked using the CRC's of:

- Virtual Disk Control Variables
- FAT
- Files
- Redundant FAT

The algorithm used for the CRC is the XOR algorithm.

Remark 13. Storage format of Virtual Disk
It is very important to understand that the whole VD is stored in Little-Endian format due the use of 80x86 processor family.

This means, for example, if the user dumps the "Virtual Disk Control Variables" after VD reset, we will see something like this:

01 00 40 00 41 00

This means:
Number of Files=00 01 "Master File Index"
Used Words= 00 40 Size of "Master File Index"
CRC= 00 41 CRC

The SW manages the data in the proper way to produce the expected results.

3.4.2.2.2. Virtual Disk Reset

The complete sequence of VD reset is composed by:

- Apply the patch for VD reset.
- Regenerate the VD changing to Safe Mode. If the system is in Safe Mode, then change to Cover Mode and then to Safe.

If the second step is skipped, the system must be switched OFF and ON in order to avoid undesired System behaviour.

3.4.2.2.3. Relationship between HK and CF patches status and VD

The CF patches status field (sent by Accept Context TC(18,3)) shows the patches that the user wants to be applied, the HK patches status is one copy of this CF patches status. Really the HK patches status is the patches status of the CT in RAM, so when GIADA accepts one CF from the DMS, the CF received is copied in RAM (CT) and NVRAM (copy of CF), and then unanimity exists in the patches status of both segments. But when a patch is successfully applied and stored in the VD, only the RAM CT patches status is updated (and consequently the HK patches status) but not the NVRAM CF patches status.

In any case, the patches status is described by 64 bits, one for each patch. The less significant bit corresponds to the file 1 of the VD FAT and the more significant bit corresponds to the file 64 of the VD FAT. The "Master File Index" has the position 0 in the VD FAT and has no representation in the patch status. If the CF patches status sent to GIADA has the *bit x* set to 1, then GIADA tries to find it into the VD and to apply it.

In the nominal situation, the CF Patches Status refers to an existing patch in the VD. In an automatic process, each bit enabled in the CF patches status, loads a patch from the VD and applies it. After this process, the HK patch status can be viewed like patches successfully applied. Every patch applied and stored into the VD updates the HK patches status.

In not nominal situation, if the CF patch status refers to a not existing patch into the VD, an even report TM(5,3) is raised "42274 Virtual Disk File Does Not Exist". Under these

circumstances, the HK patch status must be ignored and to avoid future information with inconsistent problems (HK patches status can be considered like patches applied but this is not true) it is recommended to switch off and on again GIADA in order to obtain a consistent HK patches status. Remember that the HK patches status is a copy of the CF patches status and this refers to a patch that does not exist.

If the CF is applied using patches and not using the service 18, it is necessary that the patch status field shows the real situation of the patches. For example, if 4 patches exist before uploading the CF by patch, the new patches status must be 5 (previous 4 patches plus the patch for the CF). If the CF ignores the patches applied, it can generate undesired results. For example if 4 patches were applied and the new CF patches status is 0, the next HK patches status will be set to 1 (only the patch for the CF), but in reality 5 patches do exist, applied and stored in the VD, the first 4 plus the patch for CF; therefore, it is necessary an additional patch to update the HK patches status.

3.4.2.2.4. Building RAM Patches

The mission of the patch is to modify the behaviour of a specific function partially or fully. The process to build a patch consists of the following steps:

1. Find the memory address of the function that we want to modify.
2. Find Room for the patch.
3. Generate the operation codes of the patch.
4. Build the “mpr” file

We show the whole patch process with two patch examples.

The first patch (partial modification) modifies the C function “GetDustFlux” to generate FFFF (hex) when the dust flux is saturated (originally must generate EEEE(hex)).

The second patch (full modification) substitutes the whole function with another function that return “ABCD” (hex) in any case.

It is strongly recommended to maintain a low level trace of all the patches. Patches applied, patches present but not applied, date of the last patch application, NCR or SPR, or SMR associated with the patch, memory map of all the patches, patch position into multi-Patch, etc.

3.4.2.2.4.1. Finding the memory address of the function to patch

Look for the name of the function to patch in the Appendix B and annotate the function begin address. If the function runs only in Safe Mode, the function can not be patched and there is nothing to do. If it runs in Safe Mode and in other modes, the patch only takes effect when GIADA is not in SAFE.

All the memory references in Appendix B are in RAM. Disassembly the executable "shell.exe" and take the asm code that begins at function begin address until the end of the function (find the asm sentence "ret"). It is very important to review the document that holds all the patches applied to understand which are the patches that are currently applied to the function in order to give a full understanding of the situation.

For the two patch examples the function is "GetDustFlux".
In the memory map of Appendix B "*0000:3213 _GetDustFlux*" appears. So, the memory address of the function begins in "0000:3213" in RAM. The asm code is:

```
:0000.3213 813E9E8DEEEE          cmp word ptr [8D9E], EEEE
:0000.3219 7505                  jne 3220
:0000.321B B8EEEE                mov ax, EEEE
:0000.321E EB10                  jmp 3230
:0000.3220 813E9E8D5802          cmp word ptr [8D9E], 0258
:0000.3226 7605                  jbe 322D
:0000.3228 B8FFFF                mov ax, FFFF
:0000.322B EB03                  jmp 3230
:0000.322D A19E8D                mov ax, word ptr [8D9E]
:0000.3230 C3                    ret
```

In our first example, the patch modifies the GetDustFlux function to return in any case the value FFFF(hex).

The second example will substitute all the GetDustFlux function by other that returns ABCD(hex).

3.4.2.2.4.2. Find Room for the patch

Decide if there is room in the proper function for the patch or not. To do this it is necessary to understand how the function works in asm, and the type and size of the modification that we want to do. If there is no room for the function in the proper function, then we must try to find the room in the _FREESPACE segment (see Appendix B):

Begin	End	Size	Name
06A2CH	08D39H	0230EH	_FREESPACE

It is very important to maintain a memory map of the patches stored in the _FREESPACE memory to avoid patches overlapping.

In our first example there is room enough in the proper function to apply the patch: 0321B(hex).
In the second example we will use the _FREESPACE and the address used starts in 06A2C(hex).

3.4.2.2.4.3. Operation Codes Generation

In any case (partial and full modification), the patch address must begin in an even address, otherwise an EDAC error will be generated. If the beginning address of the patch is odd we must use the first even address before. It's very important not to modify the original value stored in the even address. All patches must have even size (in bytes) because the min memory item managed is 1Word=2Bytes, otherwise an EDAC error can be generated. This means that if the patch has an odd size we must incorporate the next byte after the patch like part of it, obviously without changing its actual content, or (recommended) increase the size of the function with the asm instruction NOP that has exactly 1 byte of size.

The mechanism to generate the operation codes in patches with partial modification is based on the study of the asm code and the original C code, finding the right position to make the patch and using a 8086 assembler manual to get the operation codes desired. If there is not enough room for applying the patch, we must use a full modification patch.

In our first example:

Original :

```
Address     Op. Codes            ASM
:0000.321B B8EEEE                mov ax, EEEE
```

Desired :

```
Address     Op. Codes            ASM
:0000.321B B8FFFF                mov ax, FFFF
```

The mechanism to generate the operation codes in patches with full modification has two steps:

1. Put an unconditional short jump at the begin of the original function to the new function.
2. Build the patch data with the new function using a 8086 assembler manual to get the operation codes desired.

It is important to remark that this new function must be a function, this means that it must be finished with the asm sentence "ret".

In our second example, the jump is:

Original:

```
Address     Op. Codes            ASM
:0000.3212  C3                   ret
:0000.3213 813E9E8DEEEE          cmp word ptr [8D9E], EEEE
```

Desired (jump to FreeSpace):

```
Address     Op. Codes              ASM
:0000.3212  C3                      ret
:0000.3213 E91638                  jmp 6A2C
```

Since the patch address is odd, we must take into account the first even address before corresponding to another function.

In our second example, the new function is:

Original:

```
:0000.6A2C 00000000000000000000   BYTE 10 DUP(0)
```

Patch Data with the new function:

```
:0000.6A2C B8CDAB                  mov ax, ABCD
:0000.6A2F C3                      ret
```

3.4.2.2.4.4. Build the "mpr" file

Following the "mpr" file format specified in AD8 and taking into account the patch data and memory addresses of the patch, generate the proper file.

For our first example:

```
HEADER_START

CREATION_TIME=2001-06-14T17:41:26Z
USER=RMORALES

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=01
START_ADDRESS=0000321C NUM_WORDS=0001 DATA=FFFF

MP_END
```

For our second example:

```
HEADER_START

CREATION_TIME=2001-6-14T17:51:26Z
USER=RMORALES

HEADER_END

MP_START
```

```
PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=02
START_ADDRESS=00006A2C NUM_WORDS=0002 DATA=B8CD,ABC3
START_ADDRESS=00003212 NUM_WORDS=0002 DATA=C3E9 1638

MP_END
```

The value "PROC_ID=5A" refers to the GIADA Process ID.
The value "MEM_ID=51" refers to the RAM memory in hex.

3.4.2.2.5. Building NVRAM Patches

In the case of the RAM, room is not enough for patches or un-usable, so it is possible to use the free NVRAM memory for managing patches (see Appendix C). The procedure is the same than that showed in "Building RAM patches" (see Section 3.4.2.2.4) except in three points:

1. The unconditional jump must be far and not short, due to segment change.
2. The last sentence of the new function must be an unconditional far jump to the asm "ret" sentence in the old function.
3. It is not possible to make calls to RAM functions inside the new function, as there are different segments.

3.4.2.2.6. Add Patches to Virtual Disk

All the patches that have the "Memory ID = 81(dec)" (RAM) will be stored in the VD automatically. The NVRAM patches are applied but not stored in the VD.

The VD is big enough to store the allowed 64 patches with the max size. The only reason to avoid to store a RAM patch is that the VD has already 64 patches stored (independently of their length), but in any case the patch is applied but not stored. This error condition is signed with the event report TM (5,3) "42304 Cannot Add More Patches". In this situation it is needed a VD reset and to optimize the patch organisation using multi-patch in order to free one of this 64 patches.

The patch is stored in the first free FAT slot with a file handle consecutive with respect to the last file stored. The "Master File Index" has the handle 9B5A (hex) and the handle of the rest of the files starts with 9B5A.

When the patch is successfully stored in the VD, the HK patches status is updated to show it. For more details see "Relationship between HK and CF patches status and VD" (see Section 3.4.2.2.3).

If we want that the new patches will be applied autonomously (Power on OBCP) in every GIADA switch on there are two possibilities:

a) Send to GIADA a CF (Service 18) with the appropriate patch status
b) Modify the NVRAM copy of the CF using patches.

In case a) the patches will be applied immediately, in case b) we must wait for the next switch on.

When a patch is successfully applied and stored in the VD, only the RAM CF patches status is updated (and so the HK patches status) but not the NVRAM CF patches status.

3.4.2.2.7. Retrieve Patches from Virtual Disk

The only way to retrieve the patches stored in the VD is by sending a Accept Context TC (18,3) enabling the appropriate bit in the patch status field (see "Relationship between HK and CF patches status and VD" – Section 3.4.2.2.3). If the patch does not exist in the VD, an Event Error "42274 Virtual Disk File not exist" is generated, and there will be a HK patches status inconsistency.

The less significant bit corresponds to the file 1 of the VD FAT and the more significant bit corresponds to the file 64 of the VD FAT. The "Master File Index" has the position 0 in the VD FAT and has no representation in the patch status. If the CF patches status sent to GIADA had the *bit x* set to 1, then GIADA tries to find and apply the *file x* in the VD.

3.4.2.2.8. Reset Virtual Disk Procedure

This process must be executed under one of the next circumstances:

- VD is full. A patch organisation optimisation is required.
- Want to delete all patches.
- VD corruption.

This process comprises three steps:

1. Set the VD control variables to 0 in order to reset the VD. See Appendix E(patch 2).
2. Send a CF with all patches status bits to 0 in order to have the HK patches status consistent or send a patch to the HK patches status with all 0.
3. Go To Cover and Go To Safe in order to regenerate the "Master File Index"

Steps 2 and 3 can be avoided if GIADA is immediately switched off.

After one VD Reset all the desired patches must be uploaded again Patching with "Load Memory Absolute Addressing" TC (6,2).

The VD reset is a logical reset, this means that the FAT's and files are not erased.

3.4.3. Dump Memory Absolute Addressing TC(6,5)

This command can be applied in ROM, RAM and NVRAM memory.

A Dump Memory Absolute Addressing Report TM(6,6) is expected after sending this TC.

On receipt of these requests GIADA will dump the contents of the defined area (simple dump) (or areas multi-dump) of memory in a TM Memory dump TM packet. The multi-dump must be referred to the same memory ID (ROM, RAM, NVRAM).

3.4.3.1. Dump Memory by Absolute Addressing Parameters

Memory ID	1 octet	ROM:0x50(hex) RAM:0x51(hex) NVRAM:0x52(hex)	
Number of blocks	1 octet		
Start Address	4 octets		Repeat Number of blocks times
Block Length	2 octets		
Notes:			

Table 25. Dump Memory by Absolute Addressing

Checks to be done to all “Dump Memory by Absolute Addressing” TC (6,5) (Table 25):

- Memory ID=ROM:0x51(hex), RAM:0x51(hex) or NVRAM:0x52(hex)
- Number of blocks > 0
  Max Number of blocks = 0x1F0(hex) blocks
- Start Address >= 0000:0000 (hex) for RAM
  Start Address >= 1000:0000 (hex) for NVRAM
  Start Address >= F000:0000 (hex) for ROM
- Block Length > 0
  Block Length <= 0x07FC(hex). Only valid when Number of blocks=1
- Start Address + Block Length <= 0000:FFFF (hex) for RAM
  Start Address + Block Length <= 1000:FFFF (hex) for NVRAM
  Start Address + Block Length <= F000:FFFF (hex) for ROM
- Data >=0x0000 (hex)
  Data <=0xFFFF (hex)
- ∑ Block Length > 2048 – ((Number of blocks * 3)+1)

In principle, it has no sense to dump dynamic variables (like clock) or intermediate buffers, as when the dump report is available the memory contents could be already different.

3.4.4. Dump Memory Absolute Addressing Report TM(6,6)

This TM packet is the response to the "Dump Memory Absolute Addressing" TC (6,5). The TM can be single (single TC dump) or multiple (multi-dump TC).

It is very important to understand that all the data greater than one byte are interpreted in Big Endian format and the codes are always represented by one byte.

ADDRESS	BYTES	ASM
:0000.311A	33C0	xor ax, ax (Code 'xor ':33 and Code 'ax,ax':C0)
:0000.311C	B85802	mov ax, 0258 (Code 'mov ax':B8 and Data:0258)

3.4.5. Dumping Patches in FREE_SPACE Segment

In case of using the _FREESPACE segment to make a patch (hereafter patch A) and the size of this patch is odd, the next byte after the patch can be used (see Operation Codes Generation – Section 3.4.2.2.4.3) to convert the patch size to even. If this byte is unused, its final value depends on the value assigned for a future patch (hereafter patch B) that will require to use this byte. So, the final value of this byte is in principle unknown, if the patch B is not present and a default value must be used for building the "mpr" file for patch A. When the patch B will be available, the last byte of patch A must be updated accordingly. Otherwise, a dump of the last byte of patch A will show the value modified by patch B, instead of the default value stored in patch A in the "mpr file". This discrepancy has no effect in the normal execution, as the last byte of patch A is used only for pad and is correctly modified by patch B.

To avoid this type of effects it is recommended to use the asm sentence NOP to convert the size of the patches from odd to even.

3.4.6. Check Memory Absolute Addressing TC(6,9)

This command can be applied in ROM, RAM and NVRAM memory.

On receipt of this request GIADA will perform a pre defined checksum on the contents of the defined area (simple check) or areas (multi-check) of memory. The multi-check only must be referred to the same memory ID (ROM, RAM, NVRAM).

A Check Memory Absolute Addressing Report TM(6,10) is expected after sending this TC. The multi-check must be referred to the same memory ID (ROM, RAM, NVRAM).

In principle, it has no sense to check dynamic variables (like clock) or intermediate buffers as when the check report was available the memory contents could be different.

3.4.6.1. Memory Check by Absolute Addressing Parameters

Memory ID	1 octet	ROM:0x50(hex) RAM:0x51(hex) NVRAM:0x52(hex)	
Number of blocks	1 octet		
Start Address	4 octets		Repeat Number of blocks times
Block Length	2 octets		
Notes:			

Table 26. Memory Check by Absolute Addressing Parameters

Checks to be done to all "Memory Check by Absolute Addressing" TC (6,9) (Table 26):

- Memory ID=ROM:0x51(hex), RAM:0x51(hex) or NVRAM:0x52(hex)
- Number of blocks > 0
  Max Number of blocks = 0x1F0(hex) blocks
- Start Address >= 0000:0000 (hex) for RAM
  Start Address >= 1000:0000 (hex) for NVRAM
  Start Address >= F000:0000 (hex) for ROM
- Block Length > 0
  Block Length <= 6000(hex). Only valid when Number of blocks=1
- Start Address + Block Length <= 0000:FFFF (hex) for RAM
  Start Address + Block Length <= 1000:FFFF (hex) for NVRAM
  Start Address + Block Length <= F000:FFFF (hex) for ROM
- Data >=0x0000 (hex)
  Data <=0xFFFF (hex)

The algorithm used for computing the CRC is specified in AD9. With large amounts of data, the algorithm is computational heavy.

Remark 14. Check of large Memory areas
Checking an area grater than 6000(hex) generates a Watch-Dog GIADA Reset!. In case of multi-check in the same TC the total Block Length will be not greater than 6000(hex).

3.4.7. Check Memory Absolute Addressing Report TM(6,10)

On receipt of a dump request Check Memory Absolute Addressing TC(6,9), GIADA will calculate the CRC of the contents of the defined area(s) of memory, and report the results as a memory check report. The response TM can be simple (simple TC check) or multiple (multi-check TC)

3.5. Time Management Service – 9

Time Management Service – 9			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD00006*	Accept Time Update		

Table 27. Time Management Service

The Time Management Service (Table 27) provides the capability for the synchronisation of GIADA with the Spacecraft time reference.

The Spacecraft Elapsed Time packet provided by this service will be used to update the instrument time reference on receipt of the following broadcast pulse. The precise means of synchronisation is defined in AD10 section 2.7.

The time synchronisation shall occur at defined regular intervals.

GIADA needs one time synchronisation per hour.

Remark 15. Telemetry time stamping accuracy
GIADA will maintain telemetry time stamping to an accuracy of better than 100 ms. The accuracy of GIADA is 4 ms

The time of all the TM's is stamped when they are created, the time of the scientific events is stamped when they are detected.

3.5.1. Modes Allowability of TC in Time Management Service

Modes allowability of TC in Time Management Service is shown in Table 28.

ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
Time Management Service – 9					
1 *ZGD00006*	Accept Time Update	+	+	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 28. Mode Allowability of Time Management Service

3.5.1. Accept Time Update TC(9,1)

When a TC time packet (service 9) is received by GIADA, the rising edge of the following TSY pulse will be used to set the GIADA real time clock with the on-board time transmitted within the TC packet.

It is recommended that the user does not use this command because it can generate a GIADA time stamp de-synchronization. This TC must be used by the DMS only.

This TC has a prioritised execution with respect to all the other TC's (except Safe Mode TC), this means that when it is fully received, it is executed ASAP.

This TC is always accepted by GIADA, even if other activities (like cover opening, FB actuation etc.) are running, i.e. the error code 5 with parameter 0xA55A "TC is not finished yet" is not applicable. As a consequence, any activity that has not still been completed will be interrupted when this command is received, and completed afterwards.

By default, this TC has no Acceptance or Execution flags; this means that the TM of Service 1: Acceptance Success Report TM(1,1) and Execution Completion Success Report TM(1,2) are not expected.

3.6. Test Service – 17

Test Service – 17			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD00007*	Perform Connection Test	2 *YGD00012*	Connection Test Report

Table 29. Test Service

The Test Service (Table 29) provides the capability to test the connection between DMS and GIADA. Ground or DMS will generate a test request packet, GIADA will respond with pre-defined test information. The Connection Test is a kind of "Ping" for the DMS to be sure that the connection is working.

3.6.1. Modes Allowability of TC in Test Service

ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
Time Management Service – 9					
1 *ZGD00007*	Perform Connection Test	+	+	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 30. Modes allowability of Test Service

The Modes Allowability of Test Service is shown in Table 30.

3.6.2. Perform Connection Test TC(17,1)

When GIADA receives a connection test command, it will respond with a Connection Test Report packet within 4 seconds.

3.6.3. Connection Test Report TM(17,2)

The connection Test Report is issued as a response to a Perform Connection Test TC(17,1).

3.7. Context Transfer Service – 18

Context Transfer Service – 18			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD00008*	Report Context	2 *YGD00013*	Context Report
3 *ZGD00009*	Accept Context		

Table 31. Context Transfer Service

The Context Transfer Service is shown in Table 31.

In any mode, the instrument will run autonomously according to a pre-defined configuration. This functional configuration description and other important configuration parameters are maintained within the Configuration Table, which is a replica, located in GIADA RAM, of the GIADA Context File.

In nominal conditions, GIADA shall receive the Context File from the DMS (using Service 18), as part of the experiment power on OBCP; in case such a file is not received, GIADA will use a copy of the Context File, which is stored in ROM.

During the GIADA bootstrap, the received Context File (regardless of its provenience) is copied to both RAM and NVRAM.

Remark 16. Difference between Context File in NVRAM and Config. Table in RAM
The main difference between the RAM Configuration Table and the NVRAM Context File is that, while the NVRAM Context File contents cannot be altered by GIADA private services, the RAM Configuration Table is, indeed, altered according to the commands that GIADA receives. These changes are normally temporary, since their foreseen use is mainly for experiment testing and/or troubleshooting. This is the reason for maintaining in GIADA two different copies of the received Context File: the copy held in NVRAM is the one that will be sent to the DMS, via Service 18, as part of the experiment power off OBCP.

Remark 17. Permanent updating of Context File
Once it is decided to render the changes in the Context File permanent, this is accomplished by modifying the whole NVRAM Context File sending a new CF (Service 18) or patching the CF copies. At the next experiment power off OBCP, the modified Context File will also be stored in the SSMM, overwriting the already existing copy.

The default CF implemented in GIADA can be reviewed in Appendix G. Default Context File.

The CF can be set to GIADA using Service 18 or uploading directly using patches for the two CF copies in RAM and NVRAM, taking into account to put the HK patches status in a coherent state (see Section 3.4.2.2.3 - Relationship between HK and CF patches status and VD). In case of patches use, take into account that the following actions will not be executed:

1. CF CRC check
2. VD integrity check
3. Patches applied automatically following the CF Patches status

The GIADA SW does not check the validity of all the parameters of the CF. This means that if one parameter has 12bits as maximum value but is set to 16bits before to be sent to GIADA, GIADA will not check it and will use the whole 16bits, and in the following CF request this parameter will be set to 16bits by GIADA SW. So it is very important to take care about the validity of CF parameters before sending them to GIADA.

3.7.1. Modes Allowability of TC in Context Transfer Service

ST *RSDB*	Telecommand	Safe	Cover	Normal	Flux
Context Transfer Service – 18					
1 *ZGD00008*	Report Context	+	-	-	-
3 *ZGD00009*	Accept Context	+	-	-	-
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 32. Modes allowability of Context Transfer Service

The modes allowability of Context Transfer Service is shown in Table 32.

3.7.1.1. Report Context TC(18,1) and Accept Context TC (18,3)

The Report Context asks GIADA to send the NVRAM Context File copy.

The Accept Context sends the Context File information to GIADA and the NVRAM and RAM copies are updated. The DMS shall use the Accept Context at least during the start up procedure, commanded using an OBCP.

Context File parameters are reported in Table 33.

CF Parameter Name	Function	Default Value (hex)	Special Meaning
Cover and Frangibolt Heaters-On Time	Heating time for the pair Cover-Frangibolt heaters.	0x001E	In seconds
Cover and Motor Heaters-On Time	Heating time for the pair Cover-Motor heaters	0x0000	In seconds
FB Safety Temp.	Temperature with any try of "Test Frangibolt" TC (192,6) is rejected if the present FB temperature is above	0x05A1	34,86ºC
FB test Temp.	Max temperature that FB can reach with "Test Frangibolt" TC (192,6)	0x05C0	44,86ºC
FB testing timeout	Max Time for "Test Frangibolt" TC (192,6)	0x0000003C	In seconds
FB working Temp.	Max temperature that FB can reach with "Activate Frangibolt" TC (192,11)	0x0663	100ºC
FB op. timeout	Max Time for "Activate Frangibolt" TC (192,11)	0x00000258	In seconds
Velocity	Steps per second in the motor cover	0x0032	40 Steps/second
Steps to Open	Number of steps to open the Cover	0x00A3	None
Steps to Close	Number of steps to close the Cover	0x00A3	In seconds
Opening timeout	Max Time opening the Cover	0x00000078	In seconds
Closing timeout	Max Time closing the Cover	0x00000078	In seconds
GDS Status	GDS status	0xAF03	GDS ON Medium Laser Power AC Both Couples Left and Right Receivers Enabled 3 detections
GDS Thresholds	GDS thresholds	0x3D72	Left=1,49v Right=2,80v
Laser Max Temp.	Laser Max Temperature that generates the Emergency Close Cover OBCP	0xF5B9	Temp. Check. On. Four Laser Max Temp= 58ºC
Laser Min Temp.	Laser Min Temperature that generates the Emergency Close Cover OBCP	0xFE3F	Temp. Check. On. Four Laser Max Temp= -29.24ºC
Time between Cal.	Time between autonomous GDS Calibration	0x00000E10	In Seconds

CF Parameter Name	Function	Default Value (hex)	Special Meaning
IS Status	IS Status	0x9F17	IS ON PZT Enabled: A,B,C, D,E Range Low Gain E High Gain D Low Gain A High
IS Plate MAX-OP Temperature	IS temperature that switch off the IS	0x1A10	Temp. Check. On. 0x1A10 IS Max OP Temp= 100,05ºC
IS Plate Hysteresis Temperature	IS temperature that switch on the IS after IS switch off due temperature	0x004B	Delta Increment respect to IS Plate Max-OP Temperature = 9,98ºC
IS Thresholds	IS thresholds	0x0005,0x040A,0x0505	0,05v IS A 0,05v IS B 0,10v IS C 0,05v IS D 0,05v IS E
Time between Cal.	Time between autonomous IS Calibration	0x00000E10	In Seconds
Calibration Configuration	IS calibration Configuration	0x1902	Calibration level =1.02v Number of stimuli events=2
MBS Status	MBS status	0x9F00	MBS ON Enabled MB: A,B,C, D,E
MBS Max Temp	MBS Max Temperature that generates the Emergency Close Cover OBCP	0x0AC1	85ºC
MBS Temp. Checking	Enable/Disable the MBS temperature check	0xF800	Temp. Check. On: MB A,B,C,D,E
MB Time interval	Time between MB Readings	0x0000012C	In Seconds
MBS Maximum Temperature during Heating	Max temperature during MB heating	0x0A10	75 ºC
Heating Timeout	Max Time heating one of the five MB	0x00000168	In Seconds
Time between Cal.	Time between autonomous MBS Calibration	0x00000E10	In Seconds
IS Plate MAX NON-OP Temp.	IS max Temperature that generates the Emergency Close Cover OBCP	0x19C5	Temp. Check. On. IS Max Non OP Temp=110,04ºC
IS Plate Min Temp.	IS min Temperature that generates the Emergency Close Cover OBCP	0x1E07	Temp. Check. On. IS Min Non OP Temp= -35,04ºC
ME MAX-OP Temp.	ME max Temperature that generates the Emergency Close Cover OBCP	0x1A25	Temp. Check. On. 100ºC

CF Parameter Name	Function	Default Value (hex)	Special Meaning
Timeout Sci. Packet	Time between science events	0x0000003C	In Seconds
Time HK Packet	Time between HK packets	0x00000028	In Seconds
Arm TCs Timeout	Max Time for Arm FB TC(192,1), Arm Cover TC(192,16) and Arm Laser TC(193,1)	0x00000028	In Seconds
Patches Status	Patches applied. One bit per patch. Bit less significative represents patch 1 Bit more significative represents patch 64	0x0000,0x0000,0x0000, 0x0000	No patches to apply
Max GDS Events per Second	Max GDS event accepted by GIADA in one second	0x0028	None
Max IS Events per Second	Max IS event accepted by GIADA in one second	0x0028	None
CF CRC	CF CRC	0xA062	None

Table 33. CF Parameters

Every time interval in the CF (timeouts, time between actions) must be greater than 1, and the min recommend value is the default.

In order to set the appropriate temperature and thresholds values it is necessary to use the HW calibration curves.

The temperature sensors of IS and Lasers have a transfer function with negative temperature coefficient, this means that for smaller ADC counts, higher temperature is obtained and, conversely, for higher ADC counts lower temperature is obtained. Use this information to set the appropriate temperature limits to GDS and IS.

All the temperature conversions to Celsius degrees are made using the Main chain.

All the MBS temperatures are referred to MBS 1 calibration curves.

Special Relationships between CF Parameters that must be maintained (time always in seconds and temperatures in ADC counts):

- (Cover and Frangibolt Heaters On Time + Cover and Motor Heaters On Time + 10) < Opening timeout
- (Cover and Motor Heaters On Time + 10) < Closing timeout
- MBS Time interval > 10
- Laser Max Temp. < Laser Min Temp.
- IS Plate MAX NON-OP Temp. < IS Plate Min Temp.

Lower thresholds (IS and GDS) means high probability to detect events (IS and GDS).

Remark 18. Maximum number of events managed by GIADA
In a SW analysis GIADA can manage 40 events per second of GDS and 40 events per second of IS. But after a performance measure it has been concluded that GIADA SW can only manage around 20 Events per second of GDS and around 20 Events per second of IS, due to the complexity of event processing.

If there is a higher number of events in the fields "Max GDS Events per Second" or "Max IS Events per Second", a SW reset can be produced. GIADA SW Interrupts Services for GDS and IS have a high priority and will be attended ASAP without refreshing the watchdog.

3.7.2. Context Report TM(18,2)

As a response to subtype 1, GIADA provides its context from NVRAM copy.

3.8. Science Data Transfer Service – 20

Science Data Transfer Service – 20			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD00010*	Enable Science Packet Generation	3 *YGD00020*	Science Report
2 *4ZGD00011*	Disable Science Packet Generation		

Table 34. Science Data Transfer Service

The Science Data Transfer Service (Table 34) is used to control the transfer science data from GIADA to the DMS and/or the SSMM. The data will subsequently be down-linked. The science data are delivered to the DMS only if the science is enabled. If the science is disabled, all the subsystems detect the science events, the science packets are build but not delivered. The HK parameters "Dust Flux" and "Science Report Overflow" are independent of the status (enabled/disabled) of the science.

By default, the science is disabled when GIADA reaches the Normal and the Flux mode and must be enabled explicitly using "Enable Science Packet Generation" TC(20,1).

Science data packets are not processed by the DMS, they are nominally filed on the SSMM, for down-link during ground visibility.

All science packets have the packet category "Private" (Category 3). Science data packets may be delivered with different structure, and at different transmission rates according to the operation Mode or type of information.

For Science reports, the data generated will never exceed the values reported in Table 35.

Mode	Active Sub-system	Average Data Rate [kbit/s]	Peak Data Rate[1] [kbit/s]
Safe	ME	0.1 (*)	0.9 (*)
Cover	ME + Cover or Frangibolt	0.1 (*)	4 (**)
Flux	ME + MBS	0.1 (***)	4
Normal	ME + any combination of GDS, IS and/or MBS	6 (****)	64

(1) Sustained for a maximum period of 1 s

(*) Only HK reports are delivered (tipically with a period of 40 s) in Safe Mode – The HK rate is the same whatever is the operation mode

(**) Due to Cover Status Trace Event Report

(***) Due to MBS reading every 300 s

(****) Corresponding to about 20 GDS + 20 IS events / s

Table 35. GIADA data rate

Remark 19. Maximum data rate from GIADA

It is important to remark that all data rate calculations are based on the experiment foreseen performances (i.e., maximum number of grain events that can be processed in 1 s), and not on the foreseen event rate coming from the comet models, which leads to a much lower rate.

Under the worst conditions (IS and GDS flow of events) in Normal mode, GIADA can only generate about 6 Kbits/s Average Data Rate (about 20 GDS Events and 20 IS Events) and not the declared 12Kbits/s. So, in any case, GIADA will never go out the Science Data Rate limits declared.

In Normal Mode, as the science data generated by a single particle are a few octets, in order to optimise the data package header to application data rate, some events will be added to form a unique Application Data Field with a length of about 550 octets maximum (about 10 unambiguous impacts). The final TM data package will be sent to the DMS if at least one of the following situations is achieved:

- **SIZE**: The accumulated data plus size of the last detected event are greater than the length of 512 octets (last event is included in the next science packet). The final packet will be composed by the accumulated data plus GDS buffered event (if exists) with a size about 550 octets maximum.

- **TIME**: The time elapsed without the reception of any event is greater than a timeout stored in the Context File (parameter “Timeout Sci Packet”).

Remark 20. IS and GDS association of events

When an IS event is detected and the flight-time is not zero and a GDS Event exists buffered, this will produce a GDS+IS Event. All the GDS events are buffered waiting for an IS event until a new GDS event is detected or until the timeout set with the CF parameter “Timeout Sci Packet” is achieved. It can be possible to have two GDS events (one per channel) generated by the same particle with the same event time;

in this case, the GDS Right Channel will be associated with the IS event (if exists) to produce a GDS+IS event.

Moreover, there will be a dynamic limitation in the scientific data rate in order to not exceed the allowed data rates. This limitation is configurable by CF Parameters "Max GDS Events per second" and "Max IS Events per second". By default both values are set to 40. A higher number can produce undesired results and probably a GIADA Reset.

It is important to understand that if the GDS, IS or MBS events are produced very slowly the limit of the size are not easy to reach and the condition to close the Science Packet should be the time. But if the events come in intervals less than the parameter "Timeout Sci Packet" of the CF, the condition to close the science packet will be the size (probably after long time due the small size of the event data).

All the calibration Science Packets and the MB Heating Science Packet are delivered immediately after its generation and are not affected by the size and time Science Data restrictions.

When GIADA goes to Safe Mode, if any Science Packet not closed exists, this packet will be closed and delivered (if the Enable Science is set).

The types of GIADA Science Report are (see [AD2] for more details):

- Normal Mode Science Information (GDS,IS and MBS)
- MB Heating
- GDS Calibration Science information
- IS Calibration Science information
- MBS Calibration Science information

The "Science TM overflow" HK parameter is reset every second, when GIADA is in Normal Mode. So, it is not easy to see this flag set in the HK report.

The following rules must be taken into account in order to understand Science Packets:

- If the Laser is off, then no GDS Science Events are generated.
- If the GDS Left Receiver is disabled, no GDS Science Events are generated from the Left Channel.
- If the GDS Right Receiver is disabled, no GDS Science Events are generated from the Right Channel.
- If the PZT x of the IS is disabled, the amplitude and the time in the science packet of this PZT is set to 0.
- During the IS stimulation in the IS Calibration process, if one IS event will not arrive within the 2s timeout, the amplitude and the time of the 5 PZT of this IS event are set to 0.

- If the MB x is disabled, the frequency and the temperature of this MB in the science packet is set to 0 in both science packets: periodic MBS reading and MB heating.
- When the MB is disabled by SW, is not disabled by HW, this means that the MB event will be produced and managed but filled with zeroes.

3.8.1. Modes Allowability of TC in Science Data Transfer Service

Science Data Transfer Service – 20					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD00010*	Enable Science Packet Generation	-	-	+	+
3 *ZGD00011*	Disable Science Packet Generation	-	-	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 36. Modes allowability for Science Data Transfer Service

This service (Table 36) allows or avoids the generation of the Science Reports. The GIADA behaviour in case of Science Event (GDS, IS, MBS) is the same independently of the status of Science Generation flag (process the IRQ, read HW registers..), but if this flag is "off", the report is not sent. The HK values "Dust Flux" and "Science Report Overflow" flag are updated independently of the status of the "Science Generation" flag. This means that if the science reports flag is "off", it could happen that GIADA reaches the Dust Flux overflow or the Science Report Overflow.

3.8.1. Enable Science Packet Generation

On receipt of this request, GIADA will start the generation of the science reports. This enabling shall be done after entering into Flux or Normal Modes.

3.8.2. Disable Science Packet Generation

On receipt of this request, GIADA will stop the generation of the science reports. GIADA will also disable this functionality autonomously when performing the transitions to Safe Mode.

3.8.3. Science Report

The types of GIADA Science Report are (see [AD2] for more details):

- Normal Mode Science Information (GDS,IS and MBS)
- MB Heating
- GDS Calibration Science information

- IS Calibration Science information
- MBS Calibration Science information

The Normal Mode Science Information sub-data fields are:

- Grain passage detection only by GDS
- Grain impact detection only by IS
- Grain impact detection by GDS and IS
- Readout of MB

Each "new" detection event by the GDS sub-system and/or by one sensor of IS is added. Each reading of any MB is also added.

If one MB is saturated, it can be cleaned by heating the sensor. This procedure is started with a TC from ground. During this procedure, a list of mass (frequency) versus temperature is acquired in order to perform a "micro-gravimetry" experiment.

As result of a calibration (at subsystems initialisation, requested from ground or scheduled), a Science TM Packet will be generated. There are 3 types of Calibrations packets, related to GDS, IS and MBS. The most recent calibration packet received shall be used for deriving physical quantities on the EGSE.

Remark 21. Meaning of SUM and NOISE in GDS and IS calibration packets
Two parameters of the IS and GDS science calibration reports are the SUM and NOISE. The SUM is the sum of 8 means, each mean takes 4 measures. The NOISE is the sum of the squares of 8 means, each mean takes 4 measures.

$$\text{Sum} = \sum_{j=1}^{8} \left(\frac{\sum_{i=1}^{4} x_{ij}}{4} \right)$$

$$\text{Noise} = \sum_{j=1}^{8} \left(\frac{\sum_{i=1}^{4} x_{ij}}{4} \right)^2$$

The Calibration Science Packets delivered after the Subsystem switch On must be ignored as the Subsystem is not stable yet.

The Calibration Science Packets can be explicitly requested using the "Calibrate GDS" TC(193,31), "Calibrate IS" TC(194,26), "Calibrate MBS" TC(195,36). These packets are also generated autonomously, using the CF parameters "GDS Time between Cal", "IS Time between Cal", "MBS Time between Cal". The calibration of the GDS (explicitly or

autonomously) is only allowed when the laser is on TC(193.6). The autonomous generation is not re-scheduled with the switch On/Off of the Science Packet Generation.

In Normal mode, all the subsystems (GDS, IS and MBS) are allowed to be switched on, in Flux only the MBS and in the rest of the modes none is allowed.

In the IS, when an event is detected and the gain of PZT A is 1 (high) and the amplitude of event is saturated (it is greater than 0xEA6(hex) ADC counts, to modify this value see Appendix E for Utility Patches), GIADA sets autonomously the gain of PZT A to 0 (low) and reads again the amplitude, finally it will set the PZT A to gain 1 again. This action is called “PZTA auto-gain”.

3.9. Private Telecommand Service: Cover - 192

Private Telecommand Service: Cover - 192			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD19201*	Arm Frangibolt		
2 *ZGD19202*	Disarm Frangibolt		
6 *ZGD19206*	Test Frangibolt		
11 *ZGD19211*	Activate Frangibolt		
16 *ZGD19216*	Arm Cover		
17 *ZGD19217*	Disarm Cover		
21 *ZGD19221*	Open Cover		
26 *ZGD19226*	Close Cover		
31 *ZGD19231*	Test Heater		

Table 37. Cover Service

The service 192 is devoted to the cover management (Table 37).

All the commands related with cover management can be executed only in Cover Mode. Otherwise, an Acceptance Failure Report (Failure Code = 5) shall be issued.

3.9.1. Modes Allowability of TC in Cover Service

Private Telecommand Service: Cover - 192					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD19201*	Arm Frangibolt	-	+	-	-
2 *ZGD19202*	Disarm Frangibolt	-	+	-	-
6 *ZGD19206*	Test Frangibolt	-	+	-	-
11 *ZGD19211*	Activate Frangibolt	-	+	-	-
16 *ZGD19216*	Arm Cover	-	+	-	-
17 *ZGD19217*	Disarm Cover	-	+	-	-
21 *ZGD19221*	Open Cover	-	+	-	-
26 *ZGD19226*	Close Cover	-	+	-	-
31 *ZGD19231*	Test Heater	-	+	-	-
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 38. Modes Allowability of Cover Service

The modes allowability of Cover Service is shown in Table 38.

3.9.2. Arm Frangibolt TC(192,1)

This TC is used to arm the FB. This TC must be executed before any FB operation (test or activate).

Once the Frangibolt is armed, if after a defined timeout (CF Parameter "Arm TC's Timeout") either a Test Frangibolt or an Activate Frangibolt TC does not arrive, the Frangibolt will return automatically to disarmed state issuing an Error Event Report (Service 5, subtype 3, ID 42200 "Frangibolt to disarmed state").

By default this TC requires at the end of this execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.9.3. Disarm Frangibolt TC(192,2)

This TC is used to disarm the Frangibolt.

The conditions in which the FB is set to disarm state autonomously are:

- At the end of "Test Frangibolt" TC(192,6) by timeout or temperature
- At the end of "Activate Frangibolt" TC(192,11) by timeout or temperature
- Timeout between "Arm Frangibolt" TC(192,1) and "Test Frangibolt" TC(192,6) or "Activate Frangibolt" TC(192,11)
- If "Test Frangibolt" TC(192,6) can not reach the testing temperature
- If after "Test Frangibolt" TC(192,6) issuing the actual FB Temperature is over the Safety temperature.

3.9.4. Test Frangibolt TC(192,6)

This TC is used to test if the FB works properly before activating it. To be operated, it is mandatory that the Frangibolt will be in the Armed state, otherwise the TM(1,8) Failure Code 2, Subtype 6 "The Frangibolt is not armed" is raised.

Once the FB is successfully activated, this TC has no sense to be executed.

The test consists in activating the Frangibolt until either the testing temperature is reached, or a timeout is expired. The FB will finish its testing when one of these conditions comes true:

- CF Parameter "FB testing timeout" operation Time out
- FB reaches the temperature specified in the CF Parameter "FB Test Temp"

In order to avoid undesired activation during testing, the Frangibolt temperature shall be below a safety limit stored in CF parameter "FB Safety Temp". If the FB temperature is over the safety limit, a TM(1,8) Failure Code 2, Subtype 11 "The Frangibolt Temperature is above the safety limit" shall be issued.

If after the aforementioned timeout, stored in the CF Parameter "FB testing timeout", the temperature is below the testing one, a timeout error shall be issued with TM(1,8) Failure Code 2, Subtype 16 "Timeout: it has been impossible to reach the testing temperature".

To Test the FB, GIADA will turn on the Cover and Frangibolt heaters, for a time specified in the Context File (CF Parameter "Cover and Frangibolt Heaters On Time") and then will be switched off. This activity will be signalled by:

- Normal Progress Event Report TM(5.1), IDs 42001 "Heaters on" parameter 5
- Normal Progress Event Report TM(5.1), IDs 42002 "Heaters off" parameter 5

At the end of the operation the FB is disarmed autonomously.

By default this TC requires at the end of execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.9.5. Activate Frangibolt TC(192,11)

Remark 22. Activate Frangibolt TC(192,11) not in use anymore
The Frangibolt activation is a "one-shot" operation. This TC is obsolete since the first GIADA switch-on during Commissioning, when the frangibolt was successfully activated. Any procedure, TC or OBCP may have been deleted since the activation date and is not available. This TC is not to be used anymore during nominal GIADA operations.

This TC is used to break the FB to allow Open and Close cover operations. Once the FB will be successfully activated, this TC has no sense to be executed.

To be operated, it is mandatory that the Frangibolt will be in the Armed state, otherwise the TM(1,8) Failure Code 2, Subtype 6 "The Frangibolt is not armed" is raised.

The activation consists in delivering power to the Frangibolt until one of these conditions comes true:

- CF Parameter "FB Op. timeout" operation Time out
- FB reaches the temperature specified in the CF Parameter "FB Working Temp."

If after the aforementioned timeout, stored in the CF Parameter "FB Op. timeout", the temperature is below the activation one, a timeout error shall be issued with TM(1,8) Failure Code 2, Subtype 21 "Timeout: it has been impossible to reach the activation temperature"

To Activate the FB, GIADA will turn on the Cover and Frangibolt heaters, for a time specified in the Context File (CF Parameter "Cover and Frangibolt Heaters On Time"), and then will be switched off. This activity will be signalled by:

- Normal Progress Event Report TM (5.1), IDs 42001 "Heaters on" parameter 5
- Normal Progress Event Report TM (5.1), IDs 42002 "Heaters off" parameter 5

At the end of the operation the FB is disarmed autonomously.

By default this TC requires at the end of execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.9.6. Arm Cover TC(192,16)

This TC is used to arm the motor before any motor operation (open or close). Once the motor is armed, if after a defined timeout (CF Parameter "Arm TC's Timeout") a cover operation TC (Open or Close) does not arrive, the Motor will return automatically to disarmed state issuing an Error Event Report (Service 5, 3, ID 42201, "Motor to disarmed state").

By default this TC requires at the end of this execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.9.7. Disarm Cover TC(192,17)

This TC is used to disarm the motor and to avoid open or close the cover. The conditions in which the Cover is set to disarm state autonomously are:

- At the end of "Open Cover" TC(192,21)
- At the end of "Close Cover" TC(192,26)
- Timeout between "Arm Cover" TC(192,16) and "Open Cover" TC(192,21) or "Close Cover" TC(192,26)
- If "Open Cover" TC(192,21) or "Close Cover" TC(192,26) generates a timeout.

3.9.8. Open Cover TC(192,21)

This TC is used to Open the cover. To be operated, it is mandatory that the motor will be in the Armed state, otherwise the TM(1,8) Failure Code 2, Subtype 41 "The Motor is not armed" is raised.

Remark 23. Steps in Open Cover TC
This movement has two steps: heat and move

- **Heat**

To open the cover, GIADA first will turn on the ***Cover and Frangibolt heaters***, for a time specified in the Context File (CF Parameter "Cover and Frangibolt Heaters On Time"), then the ***Cover and Motor heaters***, for a time specified in the Context File (CF Parameter "Cover and Motor Heaters On Time"), and finally the ***Cover Heater***, until the end of the movement of the cover, when the heater is switched off. This activity will be signalled by:

  - Normal Progress Event Report TM (5.1), IDs 42001 "Heaters on" parameter 5
  - Normal Progress Event Report TM (5.1), IDs 42002 "Heaters off" parameter 5
  - Normal Progress Event Report TM (5.1), IDs 42001 "Heaters on" parameter 6
  - Normal Progress Event Report TM (5.1), IDs 42002 "Heaters off" parameter 6
  - Normal Progress Event Report TM (5.1), IDs 42001 "Heaters on" parameter 4

- Normal Progress Event Report TM (5.1), IDs 42002 "Heaters off" parameter 4

- **Move**

GIADA will move the motor towards the open position the number of steps specified in the Context File (CF Parameter "Steps to Open") with a specific velocity (CF Parameter "Velocity").

During the motor operation, a log with the Cover Status will be generated and sent after the end of the movement as a Normal Progress Event Report. (5.1, ID 42007 "Cover Report").

The whole movement and heating are controlled by one timeout (CF Parameter "Opening Timeout"). If a timeout occurs a timeout error shall be issued with TM(1,8) Failure Code 2, Subtype 48 "Timeout in Cover Movement Operation".

By default CF, the CF Parameter "Cover and Motor Heaters On Time" is equal to zero so no heating will be produced.

It is possible to Open the Cover twice (or more times) without close it, in case of motor cover problem or cover position unknown.

At the end of the operation the cover is disarmed autonomously.

By default, this TC requires at the end of the execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.9.9. Close Cover TC(192,26)

This TC is used to close the cover. To be operated, it is mandatory that the motor will be in the Armed state, otherwise the TM(1,8) Failure Code 2, Subtype 41 "The Motor is not armed" is raised.

Remark 24. Steps in Close Cover TC
This movement has two steps: heat and move.

- **Heat**

To close the cover, GIADA first will turn on (only in slow close, see Cover Close Parameters) the ***Cover and Motor heaters***, for a time specified in the Context File (CF Parameter "Cover and Motor Heaters On Time"), then will turn on the ***Cover Heater*** (for both slow and quick close) until the end of the movement, then the cover heater is switched off. This activity will be signalled by means of Normal Progress Event Report (5.1, IDs 42001 "Heaters on" and 42002 "Heaters off"):

- Normal Progress Event Report TM (5.1), IDs 42001 "Heaters on" parameter 6 (Only for parameter 0xFFFF: slow close)
- Normal Progress Event Report TM (5.1), IDs 42002 "Heaters off" parameter 6 (Only for parameter 0xFFFF: slow close)
- Normal Progress Event Report TM (5.1), IDs 42001 "Heaters on" parameter 4
- Normal Progress Event Report TM (5.1), IDs 42002 "Heaters off" parameter 4

- **Move**

Then GIADA will move the motor towards the close position the number of steps specified in the Context File (CF Parameter "Steps to Close") with a specific velocity (CF Parameter "Velocity"). During the motor operation, a log with the Cover Status will be generated and sent after the end of the movement as a Normal Progress Event Report. (5.1, ID 42007 "Cover Report").

The whole movement and heating are controlled by one timeout (CF Parameter "Closing Timeout"). If a timeout occurs, a timeout error shall be issued with TM(1,8) Failure Code 2, Subtype 48 "Timeout in Cover Movement Operation".

By default CF, the CF Parameter "Cover and Motor Heaters On Time" is equal to zero so no heating will be produced (only in slow close, see Cover Close Parameters).

It is possible to Close the Cover twice (or more times) without open it, in case of motor cover problem or cover position unknown.

At the end of the operation the cover is disarmed autonomously.

By default this TC requires at the end of execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.9.9.1. Close Cover Parameters

This TC has one parameter to indicate the type of closing as shown in Table 39.

Parameter Value (hexadecimal)	**Action**
FFFF	Slow Close. Heat the Motor and Cover Heaters the time specified in the CF Parameter "Cover and Motor Heaters On Time"
0000	Quick Close. Not heat the Motor and Cover Heaters.
Other value	TC rejected

Table 39. Close Cover Parameters

The slow close is the parameter value used in normal situation, the quick way is used in the DMS OBCP "Emergency Close Cover".

3.9.10. Test Heater TC(192,31)

This TC is used to test the heaters which are installed on the cover edge, on the motor body and behind the Frangibolt actuator.

The testing is performed switching on the selected heater for 5 seconds and then sending a Normal Progress Event Report (5.1, ID 42008, " Heaters current consumption "), to demonstrate that the +/-15V currents have increased their values.

The heaters are always tested in pairs (see parameters).

After sending the TM package, the selected heaters are switched off.

3.9.10.1. Test Heaters Parameters

This TC has one parameter to indicate the type of heating as shown in Table 40.

Parameter Value (hexadecimal)	Action
5	Cover and Frangibolt heaters
6	Motor and Cover heaters
Other value	TC rejected

Table 40. Test Heater Parameters

3.10. Private Telecommand Service: GDS - 193

Private Telecommand Service: GDS - 193			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD19301*	Arm Laser		
2 *ZGD19302*	Disarm Laser		
6 *ZGD19306*	Switch Laser On/Off		
11 *ZGD19311*	Set GDS On/Off		
16 *ZGD19316*	Set GDS Operation Mode		
26 *ZGD19326*	Set Photodiode Threshold		
46 *ZGD19346*	Calibrate GDS		

Table 41. Private Telecommand Service: GDS

The service 193 is devoted to the GDS management (Table 41).

All the commands related with GDS management can be executed only in Normal Mode. Otherwise an Acceptance Failure Report (Failure Code = 5) shall be issued.

The nominal sequence for working with the GDS is as it follows:

- Enable Science (if needed) TC(20,1)
- Set GDS ON (if needed, by default ON) TC(193,11)
- Arm Lasers TC(193,1)
- Switch On Lasers TC(193,6)
- Set GDS Operation Mode (if needed) TC(193,16)
- Set Photodiode Thresholds (if needed) TC(193,26)
- Calibrate GDS (if needed) TC(193,51)
- Set GDS OFF TC(193,11)

3.10.1. Modes Allowability of TC in GDS Service

Private Telecommand Service: GDS - 193					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD19301*	Arm Laser	-	-	+	-
2 *ZGD19302*	Disarm Laser	-	-	+	-
6 *ZGD19306*	Switch Laser On/Off	-	-	+	-
11 *ZGD19311*	Set GDS On/Off	-	-	+	-
16 *ZGD19316*	Set GDS Operation Mode	-	-	+	-
26 *ZGD19326*	Set Photodiode Threshold	-	-	+	-
51 *ZGD19346*	Calibrate GDS	-	-	+	-
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 42. Modes allowability for Private Telecommand Service: GDS

Modes allowability for Private Telecommand Service: GDS is shown in Table 42.

3.10.2. Arm Laser TC(193,1)

This TC is used to arm the lasers before switching them on.

Once the lasers are armed, if after a defined timeout (CF Parameter "Arm TC's Timeout") the "Switch Lasers On/Off" TC(193,6) with parameter 0xFFFF does not arrive, the lasers will return automatically to disarmed state issuing an Error Event Report (5.3 , ID 42210, "Lasers to disarmed state ").

By default this TC requires at the end of execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.10.3. Disarm Laser TC(193,2)

This TC is used to disarm the lasers. When this TC is executed and the lasers are ON, the lasers are switched off autonomously due to safety reasons. The conditions in which the lasers are set to disarm state autonomously are:

- At the end of "GDS OFF/OFF" TC(192,11) with parameter 0x0000
- At the end of "Switch Laser ON/OFF" TC(1923,6) with parameter 0x0000
- Timeout between "Arm Laser" TC(193,1) and "Switch Laser ON/OFF" TC(1923,6) with parameter 0xFFFF

3.10.4. Switch Laser On/Off TC(193,6)

This TC switches the lasers ON or OFF.

To be switched on, it is mandatory that the lasers shall be in the Armed state and the GDS in On state, otherwise the TM(1,8) Failure Code 3, Subtype 6 "Lasers are not armed" or TM(1,8) Failure Code 2, Subtype 7 "GDS is Off" are raised respectively.

The lasers shall always be switched on at low power mode and, after a defined time (30s), the power will be changed to the normal level specified in CF Parameter Status "Default Laser Power".

Remark 25. Ignore GDS calibration after laser switch on
After switch on the lasers, a calibration will be performed, and an appropriate Science Report will be generated. This Report is received only when the Science Report is enabled, but must be ignored because the lasers are not stable. The following calibrations must be taken into account.

If the lasers are switched off, the laser are disarmed autonomously, due to safety reasons.

By default this TC requires at the end of execution one of the following TM:

- TM(1,7) "Execution Completion Success Report"
- TM(1,8) "Execution Completion Failure Report"

3.10.4.1. Switch Laser On/Off Parameters

This TC has one parameter to indicate the type of action: see Table 43.

Parameter Value (hexadecimal)	Action
FFFF	Set Lasers On
0000	Set Lasers OFF
Other value	TC rejected

Table 43. Switch Laser Parameters

3.10.4.2. Set GDS On/Off TC(193,11)

This TC turns the GDS ON or OFF.

After turning GDS on, GIADA will issue an Onboard Action Event Report (5.4, ID 42033, "Start Switch_Lasers_On_OBCP ") to start the relevant OBCP.

The GDS Operation Mode will be set according to the default configuration stored into the Configuration Table. The default mode can be changed from ground using the "Set GDS Operation Mode" TC(193,16).

During GDS operation, GIADA shall check every 40 s that the temperatures of the four lasers are within the operating limits (CF Parameter "Laser Min Temp" and CF Parameter "Laser Max Temp"). If the temperature is out of the limits, GIADA will first issue an Error Report (5.3, either ID 42211 "Laser Temperature Above Max Temp" or ID 42212 "Laser Temperature Below Min Temp"), and then issue an Onboard Action Event Report (5.4, ID 42032 "Start Emergency_Close_Cover_OBCP").

The four max and min temperature check can be enabled/disabled with the appropriate bits of CF Parameter "Laser Min Temp" and CF Parameter "Laser Max Temp".

GIADA will follow the majority vote reported in Table 44 in order to raise the laser temperature warning:

Number of Lasers Enabled	Min number of Lasers Temp. Out of the limit to raise the warning
4	2
3	2
2	1
1	1

Table 44. Majority vote table for laser temperature.

If the GDS is switched off, the lasers are switched off and disarmed autonomously.

3.10.4.3. Set GDS On/Off Parameters

This TC has one parameter to indicate the type of action (see Table 45):

Parameter Value (hexadecimal)	Action
FFFF	Set GDS On
0000	Set GDS Off
Other value	TC rejected

Table 45. Set GDS Parameters

3.10.4.4. Set GDS Operation Mode TC(193,16)

This TC changes the default operation mode of the GDS.

The new operation mode is maintained by GIADA between Modes change until GIADA will be switched Off or a new TC for modification or a new CF will be sent (also for CF uploaded by patch). In the next GIADA switch On the GDS mode used will be the one specified in the CF Parameter "GDS Status" (See Appendix G. Default Context File).

By default, every time that the lasers are switched on (with the operation mode stored in the CF parameter "GDS Status") the laser power is set to low power and after 30s it is established to the power indicated in the CF Parameter "Default Laser Power".

Remark 26. No use of "Set GDS Operation Mode" TC(193,16) during laser switching on
It is recommended not to send a "Set GDS Operation Mode" TC(193,16) in the 30s time window described above.

3.10.4.5. Set GDS Operation Mode Parameters

This TC has one parameter to indicate the GDS operation mode desired as shown in Table 46.

Bit Position	Value/Action
Bit 0 MSB	Not used (always 0)
Bit 1	Not used (always 0)
Bit 2 Bit 3	Default Laser Power 00 = OFF 01 = Low 10 = Medium 11 = High
Bit 4 Bit 5	Laser Operation Mode 01 = DC Couple 1 only 10 = DC Couple 2 only 11 = AC Both Couples

Bit 6	Receiver Left Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 7	Receiver Right Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 8	Not used (always 0)
Bit 9	Not used (always 0)
Bit 10	Not used (always 0)
Bit 11	Not used (always 0)
Bit 12	Not used (always 0)
Bit 13	Not used (always 0)
Bit 14 Bit 15 LSB	Number of Detections From 1 to 3

Table 46. Set GDS Operation Mode Parameters

3.10.4.6. Set Photodiode Threshold TC(193,26)

This TC sets the threshold of both photodiodes channels.

The GDS must be On before sending this TC.

The new operation mode is maintained by GIADA between Modes change until GIADA will be switched Off or a new TC for modification or a new CF will be sent (also for CF uploaded by patch). In the next GIADA switch On, the thresholds used will be the specified in the CF Parameter “GDS thresholds” (See Appendix G. Default Context File).

3.10.4.7. Set GDS Photodiode Threshold Parameters

This TC has one parameter to indicate the GDS operation mode desired as shown in Table 47.

Bit Position	Value/Action
MSB Bit 0..Bit 7	Threshold Left From 0 to 255 (8 bits) in DAC Units
LSB Bit 8..Bit 15	Threshold Right From 0 to 255 (8 bits) in DAC Units

Table 47. Set GDS Photodiode Threshold Parameters

3.10.4.8. Calibrate GDS TC(193,46)

This TC starts the calibration procedure of the GDS electronics.

The Laser shall be On before calibrate it.

The calibration can either be started from ground using the appropriate TC or automatically with a time period stored into the CF Parameter "Time between Cal".

The very first calibration (if science is enabled) after the Lasers are switched on must be ignored because the Lasers are not stable. The following Calibrations must be taken into account.

3.11. Private Telecommand Service: IS - 194

Private Telecommand Service: IS - 194			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD19401*	Set IS On/Off		
6 *ZGD19406*	Set IS Operation Mode		
11 *ZGD19411*	Set PZT Threshold Level		
26 *ZGD19426*	Calibrate IS		

Table 48. Private Telecommand Service: IS

The service 194 is devoted to the IS management (Table 48).

All the commands related with IS management can be executed only in Normal Mode. Otherwise, an Acceptance Failure Report (Failure Code = 5) shall be issued.

The nominal sequence for working with the IS is as follows:

- Enable Science (if needed) TC(20,1)
- Set IS Operation Mode (if needed) TC(194,6)
- Set IS ON (if needed, by default ON) TC(194,1)
- Set PZT Threshold Level (if needed) TC(194,11)
- Calibrate IS (if needed) TC(194,26)
- Set IS OFF TC(194,1)

Nominally, there are IS Resets out of the end of IRQ processing, these Resets occur under one of the following conditions:

- Two consecutively GDS events without IS event and an overflow in flight time is present
- In the IS switch on procedure
- In the IS IRQ reactivation after was deactivated due to the IS reach the maximum of IS events per second

3.11.1. Modes Allowability of TC in IS Service

Private Telecommand Service: IS - 194					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD19401*	Set IS On/Off	-	-	+	-
6 *ZGD19406*	Set IS Operation Mode	-	-	+	-
11 *ZGD19411*	Set PZT Threshold Level	-	-	+	-
26 *ZGD19426*	Calibrate IS	-	-	+	-
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 49. Modes Allowability of Private Telecommand Service: IS

The Modes allowability of Private Telecommand Service: IS is shown in Table 49.

3.11.2. Set IS On/Off TC(194,1)

This TC turns the IS ON or OFF.

The IS Operation Mode will be set according to the default configuration stored into the CF Parameter "IS Status". This mode can be changed from ground using the "Set IS Operation Mode" TC(194,6).

During IS operation, GIADA shall check every 40 s that the temperature of the IS plate is within the non-operating limits (CF Parameters "IS Plate Min Temp" and CF Parameter "IS Plate MAX NON-OP Temp"). If the temperature is out of the non-operating limits, GIADA will first issue an Error Report (5.3, either ID 42240 "IS Plate Temperature Above MAX NON-OP Temp" or ID 42241 "IS Temperature Below Min Temp"), and then issue a Onboard Action Event Report (5.4, ID 42032 "Start Emergency_Close_Cover_OBCP").

This max and min temperature check can be enabled/disabled with the appropriate bits of CF Parameter "IS Plate Min Temp" and CF Parameter "IS Plate MAX NON-OP Temp"

During IS operation, GIADA shall also check every 40 s that the temperature of the IS plate is over the maximum operating limit (CF Parameter "IS Plate Max OP Temperature"); if this condition is true, GIADA will first issue an Error Report (5.3, ID 42220 "IS Plate Temperature Above MAX-OP Temp"), and then switch off the IS autonomously. As a consequence of switching off the IS, another Error Report (5.3, ID 42219 "IS switched-off due to thermal contingency") will be issued. As soon as the IS plate temperature goes again inside the operating limits (taking into account the CF Parameter "IS Plate Hysteresis Temperature"), the IS will be switched on autonomously, and an Error Report (5.3, ID 42218 "IS switched-on, status resumed by end of thermal contingency") will be issued.

This temperature check can be enabled/disabled with the appropriate bits of CF Parameter "IS Plate Temperature Above MAX-OP Temp".

Remark 27. Ignore IS calibration after switch on
After switching on the IS, a calibration will be performed, and an appropriate Science Report will be generated. This Report is received only when the Science Report is enabled but must be ignored because the IS is not stable. The following calibrations must be taken into account.

3.11.2.1. Set IS On/Off Parameters

This TC has one parameter to indicate the type of action as shown in Table 50.

Parameter Value (hexadecimal)	Action
FFFF	Set IS On
0000	Set IS Off
Other value	TC rejected

Table 50. Set IS Parameters

3.11.3. Set IS Operation Mode TC(194,6)

This TC sets the IS operation mode.

The new operation mode is maintained by GIADA between Mode changes until GIADA will be switched Off or until new TC for modification or a new CF will be sent (also for CF uploaded by patch). In the next GIADA switch On, the IS Status used will be the specified in the CF Parameter "IS Status" (See Appendix G. Default Context File).

The correct sequence that sets the IS operation mode is:

1. If the IS is On then Switch Off IS TC(194,1).Parameter 0000(hex)
2. Set the IS Operation Mode TC(194,6).
3. If the IS was On before step 1 then Switch On IS TC(194,1) with parameter FFFF(hex)

Remark 28. No IS operation mode change with IS on
It is recommended not to change IS Operation mode when the IS is On, as some spurious IS events can be generated under these conditions.

3.11.3.1. Set IS Operation Mode Parameters

This TC has one parameter to indicate the IS operation mode desired as shown in Table 51.

Bit Position	Value/Action
Bit 0 MSB	Not used (always 0)
Bit 1	Not used (always 0)
Bit 2	Not used (always 0)
Bit 3	PZTE Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 4	PZTD Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 5	PZTC Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 6	PZTB Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 7	PZTA Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 8	Range 0 = Low 1 = High
Bit 9	Not used (always 0)
Bit 10	Not used (always 0)
Bit 11	Gain PZTE 0 = Low 1 = High
Bit 12	Gain PZTD 0 = Low 1 = High
Bit 13	Not used (always 0)
Bit 14	Not used (always 0)
Bit 15 LSB	Gain PZTA 0 = Low 1 = High

Table 51. Set IS Operation Mode Parameters

3.11.4. Set PZT Threshold Level TC(194,11)

This TC sets the threshold of the five PZTs.

The new thresholds are maintained by GIADA between Modes changes until GIADA will be switched Off or until new TC for modification or a new CF will be sent (also for CF uploaded by patch). In the next GIADA switch On, the IS thresholds used will be the specified in the CF Parameter “IS thresholds” (See Appendix G. Default Context File).

3.11.4.1. Set IS PZT Threshold Level Parameters

This TC has one parameter to indicate the IS PZT Threshold Levels desired as shown in Table 52.

Bit Position	Value/Action
Bit 0 MSB .. Bit 7	Not used (always 0)
Bit 8 .. Bit 15	Threshold PZTA From 0 to 255 (8 bits) in DAC Units
Bit 16 .. Bit 23	Threshold PZTB From 0 to 255 (8 bits) in DAC Units
Bit 24 .. Bit 31	Threshold PZTC From 0 to 255 (8 bits) in DAC Units
Bit 32 .. Bit 39	Threshold PZTD From 0 to 255 (8 bits) in DAC Units
Bit 40 .. Bit 47 LSB	Threshold PZTE From 0 to 255 (8 bits) in DAC Units

Table 52. Set IS PZT Threshold Level Parameters

3.11.5. Calibrate IS TC(194,26)

This TC starts the calibration procedure of the IS electronics.

The calibration can either be started from ground using the appropriate TC or automatically with a time period stored into the CF Parameter “Time between Cal”. The IS must be On before calibrate it.

See Remark 27 about the first calibration.

3.11.5.1. IS Calibration Parameters

This TC has one parameter to indicate the IS calibration desired as shown in Table 53.

Bit Position	Value/Action
MSB Bit 0..Bit 7	Calibration level From 0 to 255 (8 bits) in DAC Units
LSB Bit 8..Bit 15	Number of stimuli Shall be an even (LSB at 0) number, between 2 and 8

Table 53. IS Calibration Parameters

In the IS Calibration Science Packet the number of IS Events must be the same than that expressed in the "Number of Stimuli" parameter. The PZT of calibration will be stimulated with the specified "Calibration level", the "Number of Stimuli"/2 pulses. An IS event is expected in the up and down edges of the pulse of stimulation. If after the IS stimulation for any reason the expected IS event does not arrive within a 2s timeout, the Science Event data of this IS event (time and amplitude of the 5 PZT) are set to 0 and the IS is stimulated again (if necessary).

3.12. Private Telecommand Service: MBS - 195

Private Telecommand Service: MBS – 195			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD19501*	Set MBS On/Off		
6 *ZGD19506*	Set MBS Operation Mode		
21 *ZGD19521*	Set Time Between Measurements		
26 *ZGD19526*	Heat MBS		
36 *ZGD19536*	Calibrate MBS		

Table 54. Private Telecommand Service: MBS

The service 195 is devoted to the MBS management (Table 54).

All the commands related with MBS management can be executed in Flux or in Normal Mode. Otherwise, an Acceptance Failure Report (Failure Code = 5) shall be issued.

The nominal sequence for working with the MBS is as follows:

- Enable Science (if needed) TC(20,1)
- Set MBS ON (if needed, by default ON) TC(195,1)
- Set MBS Operation Mode (if needed) TC(195,6)
- Set Time Between Measurements (if needed) TC(195,21)
- Heat MBS (if needed) TC(195,26)
- Calibrate MBS (if needed) TC(195,36)
- Set MBS OFF TC(195,1)

3.12.1. Modes Allowability of TC in MBS Service

Private Telecommand Service: MBS - 195					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD19501*	Set MBS On/Off	-	-	+	+
6 *ZGD19506*	Set MBS Operation Mode	-	-	+	+
21 *ZGD19521*	Set Time Between Measurements	-	-	+	+
26 *ZGD19526*	Heat MBS	-	-	+	+
36 *ZGD19536*	Calibrate MBS	-	-	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 55. Modes Allowability of Private Telecommand Service: MBS

Modes Allowability of Private Telecommand Service: MBS is shown in Table 55.

3.12.2. Set MBS On/Off TC(195,1)

This TC turns the MBS ON or OFF.

The MBS Operation Mode will be set according to the default configuration stored into the Configuration Table (CF Parameter "MBS Status"). This mode can be changed from ground using the "Set MBS Operation Mode" TC (195,6).

The MBS shall be read periodically (MB reading) and a Science Package shall be issued with the data. The reading period is stored into the CF (CF Parameter "MBS Time Interval") and can be modified using the "Set Time Between Measurements" TC(195,21). This Report is received only when the Science Report is enabled.

After switching on the MBS, a calibration will be performed, and an appropriate Science Report will be generated. This Report is received only when the Science Report is enabled but must be ignored because the MBS is not stable. The following Calibrations must be take into account.

During MBS operation, GIADA shall check every 40 s that the temperature of every MB is below the maximum operating limit (CF Parameter "MBS Max Temp"). If the temperature is out of the limits, GIADA will first issue an Error Report (5.3, ID 42230 "MBS Temperature Above Max Temp"), and then issue a Onboard Action Event Report (5.4, ID 42032 "Start Emergency_Close_Cover_OBCP").

This temperature check can be enabled/disabled with the appropriates bits of CF Parameter "MBS Temp Checking".

When any MB is saturated, it is possible to clean it using "Heat MBS" TC(195,26).

3.12.2.1. Set MBS On/Off Parameters

This TC has one parameter to indicate the type of action as shown in Table 56.

Parameter Value (hexadecimal)	Action
FFFF	Set MBS On
0000	Set MBS Off
Other value	TC rejected

Table 56. Set MBS Parameters

3.12.3. Set MBS Operation Mode TC(195,6)

This TC sets the MBS default operation mode.

The new operation mode is maintained by GIADA between Mode changes until GIADA will be switched Off or until new TC for modification or a new CF will be sent (also for CF uploaded by patch). In the next GIADA switch On, the MBS Status used will be the specified in the CF Parameter "MBS Status" (see Appendix G. Default Context File).

3.12.3.1. Set MBS Operation Mode Parameters

This TC has one parameter to indicate the MBS operation mode desired as shown in Table 57.

Bit Position	Value/Action
Bit 0 MSB	Not used (always 0)
Bit 1	Not used (always 0)
Bit 2	Not used (always 0)
Bit 3	MB5 Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 4	MB4 Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 5	MB3 Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 6	MB2 Enabled/Disabled 0 = Disabled 1 = Enabled
Bit 7	MB1 Enabled/Disabled

	0 = Disabled 1 = Enabled
Bit 8 … Bit 15 LSB	Not used (always 0)

Table 57. Set MBS Operation Mode Parameters

3.12.4. Set Time Between Measurements TC(195,21)

This TC defines the time interval between MB's readings. The integration time for each 5 MB is about 1sec. Min time value recommended is 10s.

The new time value is maintained by GIADA between Mode changes until GIADA will be switched Off or until new TC for modification or a new CF will be sent (also for CF uploaded by patch). In the next GIADA switch On, the time value used will be the specified in the CF Parameter "MB Time Interval" (see Appendix G. Default Context File).

3.12.4.1. Set Time between Measurements Parameters

The Parameters for Set Time between Measurements are shown in Table 58.

Parameter Value (hexadecimal)	**Action**
Min=0x0000000A (hex) Max=0xFFFFFFFF (hex)	A double word that indicates the number of seconds between MB readings.
0	TC Rejected

Table 58. Parameters for Set Time between Measurements

3.12.5. Heat MBS TC(195,26)

This TC starts the heating of the specified MB.

GIADA shall issue a Science Report with the results (only if the Science is enabled).

Remark 29. GDS and IS off in Normal Mode before MBS Heating
If GIADA is in Normal Mode, before executing this TC, the GDS and the IS must be commanded off by the proper TCs. After the heating, the GDS and the IS shall be switched on via TC's, if needed.

The selected MB shall be heated until the maximum heating temperature is reached (CF Parameter "MBS maximum temperature during heating") or a timeout occurs (CF Parameter "Heating Timeout"). In the meanwhile, the data are collected into science packets which are sent to the DMS. As in the packets the temperature is included, it can be checked if there was a timeout. This avoids the use of an error report.

During the MB heating the relevant MB is read every second.

The start and the end of a MB heating is signalled with the following events

- Normal Progress Event Report TM (5.1), IDs 42016 "MB Heaters on" parameter from 1 to 5
- Normal Progress Event Report TM (5.1), IDs 42017 "MB Heaters off" parameter from 1 to 5

Remark 30. Effects of MBS Heating while it is disabled
One MB can be heated although it is disabled in the MB operation mode. In this case, GIADA delivers a Heating Science Packet with frequency and temperature set all to zero, although the MB will be really heated. The periodic reading of one MB disabled produces that the MB related event data of frequency and temperature are set all to zero.

The MB Heating has priority over the periodic MB reading. This means that if the MB is being heated and a MB Reading is scheduled to be executed, this execution is stopped and re-scheduled with a delay stored in the CF parameter "MB time interval". If one MB is being read and a MB heat arrives, the reading is stopped, the related data erased, and the MB heating begin its execution. The next MB reading will occur in the time specified in the CF parameter "MB time interval" since last attempt of reading.

Remark 31. Incorrect data reading at beginning of MBS Heating
It may occur that the first Heating data will be incorrect as a MB Reading event is considered a MB Heating event. These data must be ignored. This situation may occur when the process of the periodic reading of the MB is being executed and at that moment a TC for heating is accepted and executed before the IRQ of the MB reading is received; under these circumstances the red frequency value is wrong.

3.12.5.1. Set Heat MB Parameters

This TC has one word parameter to indicate the MB to heat (Table 59).

Parameter Value (hexadecimal)	Action
1,2,3,4,5	MB to heat
Other value	TC Rejected

Table 59. Parameter for MB Heating

3.12.6. Calibrate MBS TC(195,36)

This command starts the calibration procedure for the MBS.

The calibration can either be started from ground using the appropriate TC or automatically with a time period stored into the CF Parameter "Time between Cal".

The MBS must be On before calibrate it.

Remark 32. Ignore MB calibration data after MBS switch on
The very first calibration (if science is enabled) after the MBS was switched on must be ignored because the MB is not stable. The following calibrations must be taken into account.

3.13. Private Telecommand Service: Mode Transitions – 196

The Private Telecommand Service: Mode Transitions is shown in Table 60.

Private Telecommand Service: Mode Transitions -196			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD19601*	Safe Mode		
6 *ZGD19606*	Cover Mode		
11 *ZGD19611*	Normal Mode		
16 *ZGD19616*	Flux Mode		

Table 60. Private Telecommand Service: Mode Transitions

3.13.1. Modes Allowability of TC in Mode Transitions Service

The Modes Allowability for Private Telecommand Service: Mode Transitions is shown in Table 61.

Private Telecommand Service: MBS - 195					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD19601*	Go to Safe Mode	-	+	+	+
6 *ZGD19606*	Go to Cover Mode	+	-	-	-
11 *ZGD19611*	Go to Normal Mode	+	-	-	-
16 *ZGD19616*	Go to Flux Mode	+	-	-	-
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 61. Modes Allowability for Private Telecommand Service: Mode Transitions

3.13.2. Safe Mode TC(196,1)

This TC changes the operation mode to Safe Mode. This mode runs in ROM.

As result of the change in the operation mode, a Progress Report (5.1, ID 42050, "GIADA in Safe Mode") will be issued.

The actions to be done by GIADA when going to Safe are:

- Generate the Event to indicate the mode change
- Set all the subsystems (GDS,IS,MBS) to OFF state
- End Cover Actions
  - Stop Cover Motor
  - Disarm FB
  - Disarm Cover
  - Kill all cover scheduler tasks
- Disarm Laser
- Disable Parallel Tasks
- Close Science Packet
- Empty the event tail
- Regenerate Virtual Disk if it is corrupted
- Stop the IS Temperature Monitor
- Set the GIADA mode variable to SAFE MODE
- Execute the ROM Code Segment copy

Remark 33. Safe Mode TC(196,1) stops any running activity
This TC is always accepted by GIADA, even if other activities (like cover opening, frangibolt actuation, etc.) are running, i.e. the error code 5 with parameter 0xA55A "TC is not finished yet" is not applicable. As a consequence, any activity that has not still been completed will be interrupted when this command is received, regardless of its completion.

When GIADA goes to Safe Mode, if some Science Packet is not closed, this packet will be closed and delivered (if the Enable Science is set).

3.13.3. Cover Mode TC(196,6)

This TC changes the operation mode to Cover Mode. This mode runs in RAM.

As result of the change in the operation mode, a Progress Report (5.1, ID 42051, "GIADA in Cover Mode") will be issued.

The actions to be done by GIADA when going to Cover Mode are:

- Generate the Event to indicate the mode change

- Stop the IS Temperature Monitor
- Set the GIADA mode variable to COVER MODE
- Execute the RAM Code Segment copy

3.13.4. Normal Mode TC(196,11)

This TC changes the operation mode to Normal Mode. This mode runs in RAM.

As result of the change in the operation mode, a Progress Report (5.1, ID 42052, "GIADA in Normal Mode") will be issued.

The actions to be done by GIADA when going to Normal Mode are:

- Generate the Event to indicate the mode change
- Set all the subsystems (GDS,IS,MBS) to their default CF value (On or OFF)
- Start the IS Temperature Monitor
- Set the GIADA mode variable to NORMAL MODE
- Execute the RAM Code Segment copy

3.13.5. Flux Mode TC(196,16)

This TC changes the operation mode to Flux Mode. This mode runs in RAM.

As result of the change in the operation mode, a Progress Report (5.1, ID 42053, "GIADA in Flux Mode") will be issued.

The actions to be done by GIADA when going to Flux Mode are:

- Generate the Event to indicate the mode change
- Set the MBS to this default CF value (On or OFF)
- Start the IS Temperature Monitor
- Set the GIADA mode variable to FLUX MODE
- Execute the RAM Code Segment copy

3.14. Private Telecommand Service: Co-ordinated Commands – 255

Private Telecommand Service: Co-ordinated Commands is shown in Table 62.

Private Telecommand Service: Co-ordinated Commands – 255			
ST ***RSDB***	**Service Requests**	**ST** ***RSDB***	**Service Reports**
1 *ZGD25501*	Reset Telemetry Output		

Table 62. Private Telecommand Service: Co-ordinated Commands

3.14.1. Modes Allowability of TC in Co-ordinated Commands Service

Modes Allowability of Private Telecommand Service: Co-ordinated Commands is shown in Table 63.

Private Telecommand Service: Co-ordinate COmmands - 255					
ST ***RSDB***	**Telecommand**	**Safe**	**Cover**	**Normal**	**Flux**
1 *ZGD25501*	Reset Telemetry Output	+	+	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 63. Modes Allowability for Private Telecommand Service: Co-ordinated Commands

3.15. Reset Telemetry Output TC(255,1)

If the TM stream from the unit appears corrupted, the DMS may issue this command as part of the TM recovery procedure described in EID-A section 2.7.3.2.

It may happen that the acceptance TM (1,1) related with this TC will be missed, as the TC resets the buffer TM that holds it.

4. RECOVERY ACTIONS

In this section the most probable errors and their recovery actions are considered. If the recovery action does not work, the TC syntax and semantic is correct and the problem persists then switch off GIADA following the Power OFF OBCP and report the error to PI.

4.1. Recovery Actions for Service 1. TC Verification Service

4.1.1. Recovery Actions for Acceptance Failure TM(1,2)

Recovery actions for Acceptance Failure are reported in Table 64.

Failure Code *RSDB*	Failure Name	Probable Reason	Recovery Action
	No TM Response	GIADA TC acceptance suspended due to TC Acceptance error or TC acceptance 2s time-out	Wait 16s, send a "Perform Connection Test" TC (17,1) and wait for "Acceptance Success Report " TM(1,1). If no TM is received then switch off GIADA and report the error
		OBDH error or GIADA HW/SW error	Switch off and on again GIADA, with the normal procedure. If no TM is received from GIADA switch off GIADA and report the error
1 *YGDST002*	Incomplete Packet	HW FIFO error or OBDH error or Giada SW error	Wait 16s and send the next TC. If the problem persists switch off and on again GIADA, with the normal procedure and repeat the TC
2 *YGDST003*	Incorrect check sum	Wrong CRC of the TC sent to GIADA.	Wait 16s, send the next TC and check the CRC of the TC sent
3 *YGDST004*	Incorrect application ID	Wrong APID of the TC sent to GIADA	Wait 16, send the next TC and check the APID of the TC sent
4 *YGDST005*	Invalid Command code	Wrong Type or subtype of the TC sent to GIADA	Wait 16, send the next TC and check the type, subtype of the TC sent
5 *YGDST006*	Command cannot be executed in the present operation mode	Parameter 3=0(Safe), 1(Cover), 2(Flux), 3(Normal). The TC sent is not allowed in the current GIADA operation Mode	See the Table "Telecommand allowability in GIADA modes". Change to the appropriate mode to allow the execution of the desired TC

		Parameter 3=A55A(hex). A TC was sent before finishing the current TC execution	Wait until the current TC finishes before sending another TC
6 *YGDST007*	Packet data field inconsistent	Parameter 3 < 8000 (hex). The TC parameters are incorrect	Review the parameter values of the TC sent to GIADA before sending the next TC
		Parameter 3 = 8000 (hex). One of the following actions has been executed: • With Science enabled, "Enable Science Packet Generation" TC(20,1) was sent • With Science disabled, "Disable Science Packet Generation" TC(20,2) was sent • With HK enabled, "Enable Housekeeping Report Generation" TC(3,5) was sent • With HK disabled, "Disable Housekeeping Report Generation" TC(3,6) was sent • With FB armed, "Arm Frangibolt" TC(192,1) was sent • With FB disarmed, "Disarm Frangibolt" TC(192,2) was sent • With Cover armed, "Arm Cover" TC(192,16) was sent • With Cover disarmed, "Disarm Cover" TC(192,17) was sent • With Laser armed, "Arm Laser" TC(193,1) was sent • With Laser armed, "Disarm Laser" TC(193,2) was sent • With Laser ON, "Switch Laser On/Off" TC(193,6) with parameter 0xFFFF(hex) was sent or with Laser OFF "Switch Laser On/Off" TC(193,6) with parameter 0x0000 (hex) was sent • With GDS ON, "Set GDS On/Off" TC(193,11) with parameter 0xFFFF(hex) was sent or with GDS OFF "Set GDS On/Off" TC(193,11) with parameter 0x0000 (hex) was sent • With GDS OFF, "Set Photodiode Thereshold" TC(193,26) was sent • With Laser OFF, "Calibrate GDS" TC(193,46) was sent • With IS ON, Set IS On/Off" TC(194,1) TC(193,11) with parameter 0xFFFF(hex) was sent or with IS OFF, Set IS On/Off"	Review the present GIADA status and the semantic of the TC sent before sending the next TC

		TC(194,1) with parameter 0x0000 (hex) was sent • With IS OFF, "Calibrate IS" TC(194,26) was sent • With MBS ON, Set MBS On/Off" TC(195,1) with parameter 0xFFFF(hex) was sent or with MBS OFF, Set MBS On/Off" TC(195,1) with parameter 0x0000 (hex) was sent • With MBS OFF or/and GDS ON or/and IS ON, "Heat MBS" TC(195,26) was sent • With MBS OFF, "Calibrate MBS" TC(195,36) was sent • With GIADA in SAFE, "Safe Mode" TC(196,1) was sent • With GIADA in COVER, "Cover Mode" TC(196,6) was sent • With GIADA in NORMAL, "Normal Mode" TC(196,11) was sent • With GIADA in FLUX, "Flux Mode" TC(196,16) was sent	

Table 64. Recovery actions for Acceptance Failure Reports TM (1,2)

4.1.2. Recovery Actions for Cover Execution Completion Failure TM(1,8)

Recovery actions for Cover Execution Completion Failure are reported in Table 65.

RSDB CODE: YGDST026

Failure Code 2 Parameter 4	Failure Name	Probable Reason	Recovery Action
6	The Frangibolt is not armed	FB not armed	Obsolete
11	The Frangibolt temperature is above the safety limit	FB is too hot to be tested. In order to Test the FB, its temperature must be lower than the CF parameter "FB Safety Temp"	Obsolete
		CF parameter "FB Safety Temp" too low	Obsolete
16	Timeout: it has been impossible to reach the testing temperature	CF parameter "FB test Temp" too high	Obsolete
		CF parameter "FB testing timeout" too short	Obsolete
		FB HW error	Obsolete
21	Timeout: it has been impossible to reach the	CF parameter "FB working Temp" too high	Obsolete
		CF parameter "FB op. timeout" too	Obsolete

	activation temperature	short	
		FB HW error	Obsolete
41	The motor is not armed	Cover not armed	Send "Arm Cover" TC(192,16)
48	Timeout in Cover Movement Operation	CF parameter "Opening timeout" too short. See "Report Context TC(18,1) and Accept Context TC (18,3)"	Change the CF parameter "Opening timeout"
		CF parameter "Closing timeout" too short. See "Report Context TC(18,1) and Accept Context TC (18,3)"	Change the CF parameter "Closing timeout"
		HW Error in the Cover Motor	Try to switch off and on again GIADA and repeat the procedure

Table 65. Recovery actions for Cover Execution Completion Report TM (1,8)

4.1.3. Recovery Actions for GDS Execution Completion Failure TM(1,8)

Recovery actions for GDS Execution Completion Failure are reported in Table 66.

RSDB CODE: YGDST027

Failure Code 3 Parameter 4	Failure Name	Probable Reason	Recovery Action
6	Lasers are not armed	Laser not armed	Send "Arm Laser" TC(193,1)
7	GDS is Off	GDS is switched off	Send "Set GDS On/Off" TC(193,11) with parameter FFFF (hex)

Table 66. Recovery actions for GDS Execution Completion Report TM (1,8)

4.1.4. Recovery Actions for HK Report TM(3,25)

Recovery actions for GDS Execution Completion Failure are reported in Table 67.

Failure Description	Probable Reason	Recovery Action
HK not arrive	HK Disabled	Enable the HK with "Enable Housekeeping Report Generation" TC(3,5) and wait the time stored in the GIADA CF parameter "Time HK Packet" plus 20s
HK with corrupted values	SW corruption	Try to switch off and on again GIADA and wait the first HK

Table 67. Recovery actions for Service 3. HK Report

4.2. Recovery Actions for Service 5. Event Reporting

4.2.1. Recovery Actions for Service 5. Event Reporting TM(5,3)

Recovery actions for Service 5. Event Reporting TM(5,3) are reported in Table 68.

ID *RSDB*	Error Name	Probable Reason	Recovery Action
42185 *YGD42185*	ADC Conversion Timeout	ADC HW error. The status of the ADC has not changed from Ready status to Read status after the conversion	Switch off GIADA and report the error
42186 *YGD42186*	EDAC Event Error	Patch applied to an odd address	Modify the patch and apply it to the even address immediately before that previous used. See "Load Memory Absolute Addressing" TC(6,2)
		GIADA is switched ON with KAL OFF and the VDISK has not been reset before the last Switch OFF, could be EDAC Event Errors due to the corruption of the NVRAM.	Execute the procedure to Reset the Virtual Disk
		Memory HW error. At this point the only EDAC Error can be recoverable	Report error.
42187 *YGD42187*	Generic Timer IRQ Not Arrived	Generic Timer HW error	Switch off GIADA and report the error
42200 *YGD42200*	Frangibolt to disarmed state	Time between the execution of "Arm Frangibolt" TC(192,1) and The execution of "Test Frangibolt" TC(192,6) or "Activate Frangibolt" TC(192,11) is greater than the time specified in the CF parameter "Arm TCs Timeout"	Obsolete
42201 *YGD42201*	Motor to disarmed state	Time between the execution of "Arm Cover"TC(192,16) and the execution of "Open Cover" TC(192,21) or "Close Cover" TC(192,26) is greater than the time specified in the CF parameter "Arm TCs Timeout"	Send "Arm Cover" TC(192,16) again and send the "Open Cover " TC(192,21) or "Close Cover" TC(192,26) in a time window shorter than that specified in the CF parameter "Arm TCs Timeout"

42210 *YGD42210*	Laser To Disarmed State	Time between the execution of "Arm Laser" TC(193,1) and the execution of "Switch On/Off "Laser" TC(193,6) with parameter 0xFFFF(hex) is greater than the time specified in the CF parameter "Arm TCs Timeout"	Send "Arm Laser" TC(193,1) again and send the "Switch On/Off Laser " TC(193,6) with parameter 0xFFFF(hex) in a time window shorter than that specified in the CF parameter "Arm TCs Timeout"
42211 *YGD42211*	Laser Temperature Above Max Temp	Laser Temperature too hot	Wait until GIADA is in SAFE due to "Start Emergency Cover Close OBCP" TM(5,4) and after a TBD period of time switch the subsystem On, wait the HK and check its temperature. If it is out of limit this event will appear again
		Wrong CF parameter "Laser Max Temp''	Change the CF parameter "Laser Max Temp''
42212 *YGD42212*	Laser Temperature Below Min Temp	Laser Temperature too cold	Wait until GIADA is in SAFE due to "Start Emergency Cover Close OBCP" TM(5,4) and after a TBD period of time switch the subsystem On, wait the HK and check it's temperature. If it's out of limit this event will appear again
		Wrong CF parameter "Laser Min Temp''	Change the CF parameter "Laser Min Temp''
42213 *YGD42213*	Hardware Error In GDS Event Detection Circuitry	This error is produced when processing the information for a GDS event, if a Detection without Final Flag neither Overflow takes places	Report the error if it appears a great number of times, then Switch off GIADA
42214 *YGD42214*	Hardware Error In GDS Event Detection Circuitry No IRQ Received	This error is produced when in the GDS IRQ. SW checks that the originator of this is the GDS acquisition inside the FPGA through a dedicated bit in the Status Register.	Report the error if it appears a great number of times, then Switch off GIADA
42218 *YGD42218*	IS switched-on, status resumed by end of thermal contingency	IS is switched ON inside security temperature range after it was switched off as it was too hot	Nothing to do. This is normal behaviour. The IS is switched on autonomously
42219 *YGD42219*	IS switched-off, due to thermal contingency.	IS is above the CF parameter "IS Plate MAX-OP Temperature" and is switched off until the IS temperature will be inside the security temperature range	Nothing to do. This is normal behaviour. The IS is switched off autonomously

		Wrong CF parameter "IS Plate MAX-OP Temperature"	Change the CF parameter "IS plate MAX OP temp"
42220 *YGD42220*	IS Plate Temperature Above MAX-OP Temp	IS is above the CF parameter "IS Plate MAX-OP Temperature"	Wait the autonomous IS off
		Wrong CF parameter "IS Plate MAX-OP Temperature''	Change the CF parameter "IS Plate MAX- OP Temperature"
42222 *YGD42222*	Hardware Error In IS Event Detection Circuitry	This error is produced when processing the information for an IS event, the number of Detections plus Overflows plus Disabled channels is less than 5	Report the error if it appears a great number of times, then Switch off GIADA
42223 *YGD42223*	Hardware Error In IS Event Detection Circuitry No IRQ Received	In the IS IRQ, SW checks that the originator of this is the IS acquisition inside the FPGA through a dedicated bit in the Status Registers. If it is not the case, the Error Event is sent. Under the running SW V2.3 plus patches, the reset of the IS is implemented with several pulses (required by the Proximity Electronics), even inside the acquisition IRQ, where the reception of IRQ is disabled in the CPU, so if the signal coming from the IS subsystem remains over the threshold after the reset, it can happen that there will be a detection before the next pulse of reset where the relevant flag is reset, but the IRQ to the CPU takes place when the current IRQ subroutine is finished, and this Error Event is generated. This situation is more probable during the IS Stimulation	It is received at the IS power ON and after the calibration, when the science telemetry is enabled. This is a known behaviour, already signalled during on-ground tests. In this case, the event is not related to any real GIADA problem.
42230 *YGD42230*	MBS Temperature Above Max Temp	MBS Temperature is above the CF parameter "MBS Max Temp"	Wait until GIADA is in SAFE due to "Start Emergency Cover Close OBCP" TM(5,4) and after a TBD period of time switch the subsystem On, wait the HK and check it's temperature. If it's out of limit this event will appear again
		Wrong CF parameter "MBS Max Temp"	Change the CF parameter "MBS Max Temp"

42232 *YGD42232*	Hardware Error In MBS Event Detection Circuitry	If during the integration time of 1 sec to measure the frequency, a timeout of 2 sec takes place, this Error Event is produced	Report the error if it appears a great number of times, then Switch off GIADA
42233 *YGD42233*	Hardware Error In MBS Event Detection Circuitry No IRQ Received	In the MBS IRQ, SW checks that the originator of this is the MBS acquisition inside the FPGA through a dedicated bit in the Status Registers. If it is not the case, the Error Event is sent	Report the error if it appears a great number of times, then Switch off GIADA
42240 *YGD42240*	IS Plate Temperature Above MAX NON-OP Temp	IS is above the CF parameter "IS Plate MAX NON-OP Temp"	Wait until GIADA is in SAFE due to "Start Emergency Cover Close OBCP" TM(5,4) and check with the HK's that it's temperature is in range
		Wrong CF parameter "IS Plate MAX NON-OP Temp.''	Change the CF parameter "IS Plate MAX NON-OP Temp."
42241 *YGD42241*	IS Plate Temperature Below Min Temp	IS is below the CF parameter "IS Plate Min Temp"	Wait until GIADA is in SAFE due to "Start Emergency Cover Close OBCP" TM(5,4) and check with the HK's that it's temperature is in range
		Wrong CF parameter "IS Plate Min Temp.''	Change the CF parameter "IS Plate Min Temp."
42242 *YGD42242*	Main Electronic Temperature Above MAX-OP Temp	ME is above the CF parameter "ME MAX-OP Temp."	Wait until GIADA is in SAFE due to "Start Emergency Cover Close OBCP" TM(5,4) and check with the HK's that it's temperature is in range
		Wrong CF parameter "ME MAX-OP Temp."	Change the CF parameter "ME MAX-OP Temp."
42260 *YGD42260*	Scheduler Full	The Scheduler can not accept more programmed tasks, but this only occurs in a SW corruption.	Switch off GIADA and then switch on GIADA and report the error.
42274 *YGD42274*	Virtual Disk File Does Not Exist	The CF sent refers to a patch that does not exist in the VD	Review the CF patch status and the VD status. Delete the bits in the CF Patches Status that not reference a VD file. See "Load Memory Absolute Addressing" TC(6,2)
42304 *YGD42304*	Cannot Add More Patches	Load Memory TC (6,2) is sent but VD is full.	Reset VD, optimise the patch organisation and upload again the patches. See "Load Memory Absolute Addressing" TC(6,2)

42309 *YGD42309*	Previous Execution Reset By Watch dog	Last GIADA execution was anomaly finished	Report the error. Reinitialize all the sequences from the beginning. Analyse this error with the information present in "Event Reporting" Section. Pay special attention to the last patches sent.
42310 *YGD42310*	EDAC Error During S/W Start And Dump	The very first time that GIADA is switched on	Nothing to do. Normal behaviour.
		KAL line is switched off and GIADA is switched on	Normal behaviour. Execute the procedure to Reset the Virtual Disk

Table 68. Recovery actions for Service 5. Event Reporting TM(5,3)

4.2.2. Recovery Actions for Service 5. Event Reporting TM(5,4)

Recovery actions for Service 5. Event Reporting TM(5,4) are reported in Table 69.

ID	Error Name	Probable Reason	Recovery Action
42032 *YGD42032*	Start Emergency Cover Close OBCP	PSU-CPU Board or GDS or IS or MBS Thermal contingency	Wait for Emergency Close Cover OBCP and follow the recovery action of the specific thermal contingency
42033 *YGD42033*	Start Switch Lasers ON OBCP	GDS is switched on	Nothing to do. Normal behaviour

Table 69. Recovery actions for Service 5. Event Reporting TM(5,4)

4.3. Recovery Actions for Service 6. Memory Management Service

4.3.1. Recovery Actions for Load Memory TC(6,2)

Recovery actions for Load Memory TC(6,2) are reported in Table 70.

Failure Description	Probable Reason	Recovery Action
"Acceptance failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Bad TC parameters	Review the address format, Memory ID, Number of blocks, Start Address and Block Length

Table 70. Recovery actions for Service 6. Load Memory

4.3.2. Recovery Actions for Dump Memory TC(6,5)

Recovery actions for Dump Memory TC(6,5) are reported in Table 71.

Failure Description	Probable Reason	Recovery Action
"Acceptance failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Bad TC parameters	Review the address format, Memory ID, Number of blocks, Start Address, Block Length
Dump Memory Report TM(6,6) of the memory that was patched is wrong	If several patches have been sent, could be happened that one byte of the last word of one patch will be a dummy byte, and if this byte is used by another patch, when a Dump Memory is executed, a difference of this ONE byte can exist	A careful production of patches and dump is recommended. See Section 3.4.5 "Dumping Patches in FREE_SPACE Segment "

Table 71. Recovery actions for Service 6. Dump Memory

4.3.3. Recovery Actions for Check Memory TC(6,6)

Recovery actions for Check Memory TC(6,6) are reported in Table 72.

Failure Description	Probable Reason	Recovery Action
"Acceptance Failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Bad TC parameters	Review the address format, Memory ID, Number of blocks, Start Address, Block Length
GIADA Reset	The Checked Memory Length is greater than 6000(hex). See "Memory Check by Absolute Addressing Parameters"	Modify the TC check and reduce the Checked Memory Length below 6000 (hex)

Table 72. Recovery actions for Service 6. Check Memory

4.4. Recovery Actions for Service 9. Time Management Service

4.4.1. Recovery Actions for Accept Time Update TC(9,1)

Recovery actions for Accept Time Update TC(9,1) are reported in Table 73.

Failure Description	Probable Reason	Recovery Action
TM desynchronised	DMS did not send the time update at Switch On or TC for time update lost	Ask to DMS to send to GIADA the Time Update TC(9,1). Wait 60s since the time update was sent and if past this time the TM are desynchronised then Switch off GIADA and report the error

Table 73. Recovery actions for Service 9. Time Update

4.5. Recovery Actions for Service 20. Context Transfer Service

4.5.1. Recovery Actions for Report Context TC(18,1)

Recovery actions for Report Context TC(18,1) are reported in Table 74.

Failure Description	Probable Reason	Recovery Action
"Acceptance Failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	CF CRC wrong	Review the CRC filed of CF

Table 74. Recovery actions for Service 18. Context Transfer Service

4.6. Recovery Actions for Service 20. Science Data Transfer Service

4.6.1. Recovery Actions for Science Report TM(20,3)

Recovery actions for Science Report TM(20,3) are reported in Table 75.

Failure Description	Probable Reason	Recovery Action
Science not arrive	Science is disabled	Check the HK parameter "Science TM Enabled/Disabled" and if its disabled send "Enable Science" TC(20,1)
	CF Parameter "Timeout Sci. Packet" too long. See "Science Data Transfer Service"	Change the CF Parameter "Timeout Sci. Packet"

Table 75. Recovery actions for Service 20. Science Report

4.7. Recovery Actions for Service 192. Cover Service

4.7.1. Recovery Actions for Close Cover TC(192,26)

Recovery actions for Close Cover TC(192,26) are reported in Table 76.

Failure Description	Probable Reason	Recovery Action
"Acceptance Failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Bad Parameter	Check that the parameter is 0x0000 (hex) or 0xFFFF (hex)

Table 76. Recovery actions for Service 192. Close Cover

4.7.2. Recovery Actions for Test Heater TC(192,31)

Recovery actions for Test Heater TC(192,31) are reported in Table 77.

Failure Description	Probable Reason	Recovery Action
"Acceptance Failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Bad Parameter	Check that the parameter is 5 (hex) or 6(hex)

Table 77. Recovery actions for Service 192. Test Heater

4.8. Recovery Actions for Service 193.GDS Service

4.8.1. Recovery Actions for Switch Laser On/Off TC(193,6)

Recovery actions for Switch Laser On/Off TC(193,6) are reported in Table 78.

Failure Description	Probable Reason	Recovery Action
"Acceptance Failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Parameter=0000 (hex)	The subsystem is already off
	Parameter=FFFF (hex	The subsystem is already on
	Bad Parameter	Check that the parameter is 0x0000 (hex) or 0xFFFF (hex)
	The GDS is off	Send TC(193,11) Set "GDS On/Off" with parameter 0xFFFF (hex), "Arm the Laser" TC(193,1) and try to "Switch Laser On/Off" TC(193,6) again

Table 78. Recovery actions for Service 193. Switch Laser On/Off

4.8.2. Recovery Actions for Set GDS On/Off TC(193,11)

Recovery actions for Set GDS On/Off TC(193,1) are reported in Table 79.

Failure Description	Probable Reason	Recovery Action
"Acceptance Failure Report" TM(1,2) with Parameter 6= 0x8000(hex)	Parameter=0000 (hex)	The subsystem is already off
	Parameter=FFFF (hex	The subsystem is already on
	Bad Parameter	Check that the parameter is 0x0000 (hex) or 0xFFFF (hex)

Table 79. Recovery actions for Service 193. Set GDS ON/Off

4.8.3. Recovery Actions for Set Photodiode Threshold TC(193,26)

Recovery actions for Set Photodiode Threshold TC(193,26) are reported in Table 80.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	The GDS is OFF	Send "Switch GDS On/Off" TC(193,11) with parameter 0xFFFF(hex) before set the new thresholds

Table 80. Recovery actions for Service 193. Set Photodiode Threshold

4.8.4. Recovery Actions for Calibrate GDS TC(193,46)

Recovery actions for Calibrate GDS TC(193,46) are reported in Table 81.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	Laser is OFF	Send "Switch Laser On/Off "TC(193,6) with parameter 0xFFFF(hex) before calibrate
Science Packet not arrive	Science Report Generation is disabled	Check the HK parameter "Science TM Enabled/Disabled" and if its disabled send "Enable the Science Report Generation" TC(20,1)

Table 81. Recovery actions for Service 193. Calibrate GDS

4.9. Recovery Actions for Service 194.IS Service

4.9.1. Recovery Actions for Set IS On/Off TC(194,1)

Recovery actions for Set IS On/Off TC(194,1) are reported in Table 82.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	Parameter=0000 (hex)	The subsystem is already off
	Parameter=FFFF (hex	The subsystem is already on
	Bad Parameter	Check that the parameter is 0x0000 (hex) or 0xFFFF (hex)

Table 82. Recovery actions for Service 194. Set IS ON/Off

4.9.2. Recovery Actions for Calibrate IS TC(194,26)

Recovery actions for Calibrate IS TC(194,26) are reported in Table 83.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	IS is Off	Send "Set IS On/Off" TC(194,1) with parameter 0xFFFF(hex) before calibrate
Science Packet not arrive	Science Report Generation is disabled	Check the HK parameter "Science TM Enabled/Disabled" and if its disabled send "Enable the Science Report Generation" TC(20,1)

Table 83. Recovery actions for Service 194. Calibrate IS

4.10. Recovery Actions for Service 195.MBS Service

4.10.1. Recovery Actions for Set MBS On/Off TC(195,1)

Recovery actions for Set MBS On/Off TC(195,1) are reported in Table 84.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	Parameter=0000 (hex)	The subsystem is already off
	Parameter=FFFF (hex	The subsystem is already on
	Bad Parameter	Check that the parameter is 0x0000 (hex) or 0xFFFF (hex)

Table 84. Recovery actions for Service 195. Set MBS ON/Off

4.10.2. Recovery Actions for Set Time between Measurements TC(195,21)

Recovery actions for Set Time between Measurements TC(195,21) are reported in Table 85.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	The time programmed is zero	Put a time different to zero. See "Set Time between Measurements Parameters"

Table 85. Recovery actions for Service 195. Set Time between Measures

4.10.3. Recovery Actions for Heating MB TC(195,26)

Recovery actions for Heating MB TC(195,26) are reported in Table 86.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	GDS or IS or both are ON	If IS is ON then send "Set IS On/Off" TC(194,1) with parameter 0x0000(hex). If GDS is ON then send "Switch GDS On/Off" TC(193,11) with parameter 0x0000(hex) OFF. When both subsystems are OFF then send the TC again
	Wrong Parameter	Check that the parameter is one of: 1,2,3,4,5
	MBS Off	Send TC(195,1) Set "MBS On/Off" with Parameter FFFF(hex) and try to heat again

Table 86. Recovery actions for Service 195. Heat MB

4.10.4. Recovery Actions for Calibrate MBS TC(195,36)

Recovery actions for Calibrate MBS TC(195,36) are reported in Table 87.

Failure Description	Probable Reason	Recovery Action
TC Rejected TM (1,2) With Parameter 6=0x8000(hex)	MBS is Off	Send "Set MBS On/Off" TC(195,1) with parameter 0xFFFF(hex) before calibrate
Science Packet not arrive	Science Report Generation is disabled	Check the HK parameter "Science TM Enabled/Disabled" and if its disabled send "Enable the Science Report Generation" TC(20,1)

Table 87. Recovery actions for Service 195. Calibrate MBS

4.11. Recovery Actions for Service 255. Co-ordinated Commands Service

4.11.1. Recovery Actions for Reset TM Output TC(255,1)

Recovery actions for Reset TM Output TC(255,1) are reported in Table 88.

Failure Description	Probable Reason	Recovery Action
"Acceptance Success Report" TM(1,1) missed	This TC has erased the buffer that holds it's "Acceptance Success Report" TM(1,1). See "Reset Telemetry Output TC(255,1)"	Normal behaviour

Table 88. Recovery actions for Service 255. Reset TM Output.

Appendix A. Software ICD (RO-EST-RS-3009/EID B – Section 2.8)

RO-EST-RS-3009/EID B – Section 2.8

Experiment Software and Autonomous Functions

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2.8. EXPERIMENT SOFTWARE AND AUTONOMOUS FUNCTIONS

2.8.1. Software Concept and Functional Requirements

2.8.1.1. Software Overview

The software design will follow the usual layered structure, i.e. central kernel consisting of low level routines working out to the outer layer, consisting of experiment control sequences. Software design will comply with ESA "Guide to applying the ESA software engineering standard to small software projects", BSSC(96)2, Issue 1 May 1996. It will be written in C.

The GIADA RAM memory structure will be similar to a UNIX task structure: there will be a TEXT segment where the code will be stored, a DATA segment for the initialised (constant) variables, a BBS for the un-initialised variables and, on the top of the RAM memory, the STACK segment. Both TEXT and DATA segments are copied from ROM to RAM at the initialisation procedure by the "Dumper" in the same addresses but in different segment. The vector Reset in ROM indicates the position to jump (first instruction of Dumper) when GIADA is switched on.. The memory structure is shown in Figure 2.8-1.

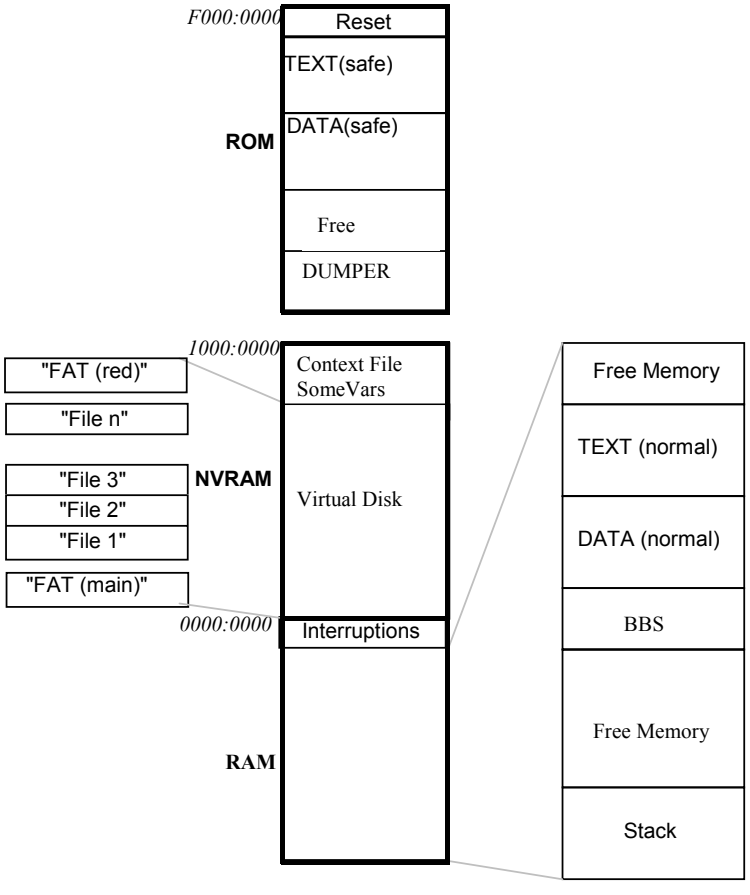

Figure 2.8-1 GIADA Memory Structure.

The software is structured in small modules and are located in the ROM (if GIADA runs in safe mode) or in the RAM (if GIADA is not in safe mode). Modules of ROM can not be patched. Modules of RAM can be patched except some concrete modules. The patches are loaded either from the ground using TCs or from the DMS SSMM and are stored in GIADA into the Virtual Disk, located in NVRAM.

The ROM will contain all the executable code plus a Hamming error correction code (extra 6 bits per 16 bit word).

A NVRAM memory, powered by the Keep Alive Line (KAL), is provided to store information that must be protected from an unwanted power off. The structure in NVRAM is composed by one copy of Context File, some variables and the Virtual Disk. Inside Virtual Disk, there will be two File Allocation Tables (FAT), main on

the bottom and redundant on the top of the NVRAM, and several "slots" for the different patches.
The switch-on procedure will be conducted by the Power-on On-Board Control Procedure (Power_On_OBCP). The operation of the DPU will be such that, after switching on, the program will start execution from the ROM, and GIADA will enter in "Safe Mode". These OBCPs are defined in section 2.8.6.
The main software is "interruptions driven". The existing interruptions are:

TSY	->	Time Synchronisation Pulse
RTClock	->	Real Time Clock interrupt
TC	->	TC FIFO: transition from empty to not empty
TM	->	TM FIFO: transition from not empty to empty
Motor	->	the motor has moved in one step
Event GDS	->	a dust particle has been detected by GDS
Event IS	->	a dust particle has been detected by IS
MBS	->	the integration of one MBS has finished
Periodic IRQ	->	general purpose timer IRQ
Serial	->	character from the serial test port (not used in flight)
EDCU	->	fault in memory
TC time-out	->	time-out in the reception of a TC
INT0	->	division error
INT1	->	single step
NMI	->	NMI
INT3	->	Debug
INT4	->	Overflow

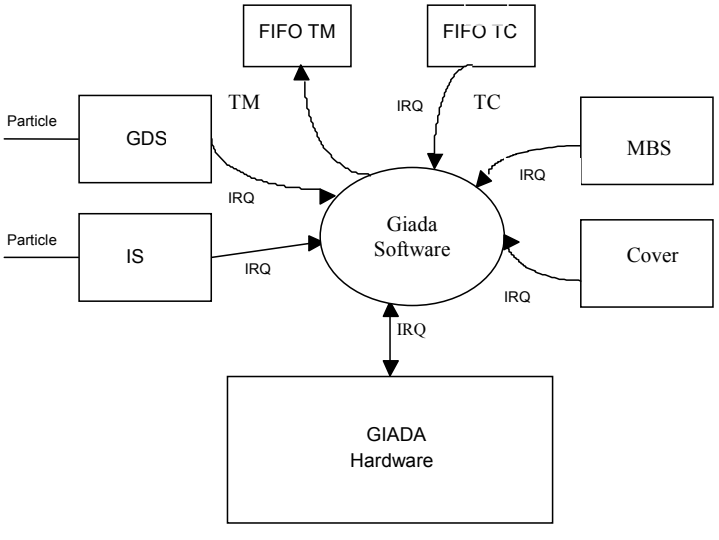

Figure 2.8-2 Main Software Block Diagram

The received TCs will be checked and, if acknowledge (Acceptance and/or Execution) is required by the TC "acknowledge" field, contained in its "Data Field Header", a report will be generated, using the Telecommand Verification Service (Type 1).

As a basis, all the TCs will require the Acceptance Acknowledgement.

In case of a "Failure" report, GIADA will provide sufficient data in the report to fully understand the nature and cause of the fault using the adequate Failure Codes, as well as suspending TC processing for 16 s and then flushing TC input buffer.

The "Acceptance" reports will be generated within 4s of the receipt of the Telecommand.

Some of the commands (for instance "Open Cover" or "Arm Laser"), will use the TC "Execution Complete". The time out will be dependent of the TC action.

2.8.1.2. Autonomy Concept

2.8.1.2.1. Nominal Operations and Experiment Configuration

In either Normal or Flux Modes, the instrument will run autonomously according to a pre-defined configuration. This functional configuration description and other important configuration parameters are maintained within the Configuration Table, which is a replica, located in GIADA RAM, of the GIADA Context File.

In nominal conditions, GIADA shall receive the Context File from the DMS (using Service 18), as part of the experiment power on OBCP; in case such a file is not received, GIADA will use a copy of the Context File, which is stored into the experiment ROM.

During the GIADA bootstrap, the received Context File (regardless of its provenience) is copied to both RAM and NVRAM.

The main difference between the Configuration Table and the Context File stored in NVRAM is that, while the NVRAM Context File contents cannot be altered by GIADA private services, the Configuration Table is, indeed, altered according to the commands that GIADA receives. These changes are normally temporary, since their foreseen use is mainly for experiment testing and/or troubleshooting. This is the reason for maintaining in GIADA two

distinct copies of the received Context File: the copy held in NVRAM is the one that will be sent to the DMS, via Service 18, as part of the experiment power off OBCP.

Once it is decided to render the changes in the Context File permanent, this is accomplished by modifying the whole NVRAM Context File by patching, using Service type 6 (Memory Management). At the next experiment power off OBCP, the modified Context File will also be stored in the SSMM, overwriting the already existing copy.

2.8.1.2.2. Autonomous Management of Contingencies

2.8.1.2.2.1. Recoverable and Unrecoverable Faults

The on-board management of faults is essentially performed by two circuits present on the ME of GIADA: the Watchdog circuit and the Error Detection and Correction (EDAC) unit.

The purpose of the Watchdog is to permit recovery of "endless loop" situations, by means of resetting GIADA. The Watchdog circuit, whose time-out limit is 1 s, is refreshed only once in the code, at the beginning of the main loop.

In addition to endless loops, the following errors will trigger the Watchdog:

- INT0, INT1, INT3, INT4 software interrupts;
- Non-Maskable Interrupt (NMI);
- unrecoverable EDAC fault (see below).

After a watchdog reset, a specific Error Event Report Subtype 3 will be generated, including the available information to identify the reset cause.

The purpose of the EDAC is to detect both recoverable and unrecoverable errors that could happen when the CPU accesses a memory location; errors are trapped on both data and address lines. In case a recoverable fault is detected, the EDAC will proceed to correct it and the S/W will continue its execution flow; the correction action is notified to ground using an Error Event report Subtype 3.
If an unrecoverable fault is detected, the S/W cannot continue its execution flow, and the Watchdog will reset GIADA as explained before.

2.8.1.2.2.2. Thermal Contingencies

All the main subsystems within GIADA (ME, GDS, IS and MBS) are equipped with temperature sensors, whose purpose is to guarantee that both the operating and the non-operating temperature limits, defined for each subsystem, are respected. The S/W reads these sensors according to the contents of the Configuration Table (it is possible to disable any subsystem temperature checking), every 40 s.

The ME temperature sensor is, of course, always working when GIADA is powered on, regardless of its operating mode. The ME only has a maximum non-operating limit.

The GDS and MBS temperature sensors are only active when the relevant subsystem is switched on. Both these subsystem have a maximum non-operating limit, while only the GDS has a minimum non-operating limit.

The IS plate temperature sensor is instead always active in scientific modes (i.e. Normal and Flux), independently from the IS status. The IS has a minimum non-operating limit, and both maximum operating and non-operating limits.

Thermal contingencies concerning the non-operating limits are managed as follows:

- first the situation is signalled to ground using a proper Event Report Subtype 3;
- then another Event Report Subtype 4 is generated, triggering the Emergency_Close_Cover_OBCP, whose purpose is to switch off all the subsystems (except for the ME), close GIADA cover, and command the experiment into Safe Mode.

Thermal contingencies concerning the maximum operating limit (applicable to IS only) are managed differently:

- first the situation is signalled to ground using a proper Event Report Subtype 3;
- then the IS is switched off autonomously;
- the IS plate temperature sensor is still read; as soon as the monitored temperature goes below the operating limit, minus an hystheresis, the IS is switched on autonomously.

Both the switching on and off of the IS are notified to ground by means of Event Report Subtype 3.

All the operating and non-operating limits, as well as the IS plate hystheresis, are parameters contained in the Configuration Table. The frequency with which the S/W performs the subsystems checking is instead a variable in the S/W, located in a TBD specific area in the RAM; its value can be changed by patching it using Service 6.

2.8.1.3. Software Maintenance Approach

2.8.1.3.1. Loading of Experiment Memory

It will be possible to upload a new version of any non-Safe Mode software module in case of discrepancies discovered at any phase of the project. It is anticipated that this may be particularly useful after launch to re-schedule the data collection sequence, to take into account changes in the instrument or evolution of the knowledge about the status of the comet environment.

The loading of the experiment memory will be done using the TC Packet Service Type 6 (Memory Management.

Memory loads in RAM will be treated as patches: each received module will be stored in the RAM and verified. The verification consists in checking the correctness of the patch parameters (Memory ID, Start and Address).
Then, the software patch will be written in the NVRAM into Virtual Disk, along with checksum data to verify its validity before actual application.

It will possible to check any module of memory using the TC Packet Service Type 6 (Memory Management).

2.8.1.3.2. Dumping of Experiment Memory

Any memory area will be accessible for dumping to ground on request, provided that the requested area is not larger than the maximum allowable service report data field size. The dumping will be done using the TC Packet Service Type 6 (Memory Management).

2.8.1.4. Data Delivery Concept

2.8.1.4.1. Housekeeping

Housekeeping telemetry shall allow monitoring of the proper operation of the unit, including:

- Unambiguous identification of the conditions required for execution of all possible configuration dependent telecommands (example Lasers switching)
- Status information provided from direct measurements rather than from secondary effects.

Data within a housekeeping telemetry packet is self standing, and does not require data from other packets, or from telecommand history in order to interpret it.

A single telemetry parameter is always provided, to unambiguously identify the mode of operation of the instrument.

Only one Structure Identification (SID) is needed.

GIADA supports the 'default' report. This is identified by SID = 1. At power on, or reset, following time synchronisation, GIADA will enable the generation of the 'default' HK report. The default housekeeping report is generated once each collection interval.

SID	Definition
1	Default Housekeeping Report

2.8.1.4.2. Events

The Event Service provides the capability for the transmission of reports to notify the ground or DMS of an event of operational significance.

The Service covers the requirement for event reporting i.e.:

- reporting of failures and/or anomalies detected onboard;
- reporting of autonomous onboard actions;
- reporting of normal progress of operations/activities, e.g. detection of events which are not anomalous, reaching of predefined steps in an operation etc.

Four distinct levels of event report are provided:

- normal/progress reports (used, for example, to notify the ground of an onboard autonomous action, which does not relate to a fault condition);
- error/anomaly report – Warning ; For which no action needs to (or can) be taken.
- error/anomaly report – Ground Action. An event for which some pre-defined ground recovery action is required.
- error/anomaly report - On-board Action. An event for which some pre-defined on-board recovery action is required.

All events of operational significance, including notification of all autonomous actions and detected anomalies, are reported in a complete and unambiguous manner using event reports packets.

With the following characteristics:

- Anomaly reports will uniquely identify the anomaly, time of occurrence and relevant data.
- Reports will be generated only once per anomaly/event occurrence, and will be concise.
- The nature/severity of the report packet will be indicated in the packet data field header.
- Data within an event packet will be self standing, and not require data from other packets, or from telecommand history in order to interpret it.

2.8.1.4.3. Science

In Normal Mode, as the science data generated by a single particle are a few octets in order to optimise the data package header to application data rate, some events will be added to form a unique Application Data Field with a length of about 512 octets (about 10 unambiguous impacts). The final data TM data package will be sent to the DMS if at least one of the following events occurs:

- the accumulated data are near the maximum length (512 octets)
- the time elapsed without the reception of an event is greater than a timeout stored in the Context File.

Moreover, there will be a dynamic limitation of the scientific data rate in order to not exceed the allowed data rates, as declared in section 2.8.1.2.2.1.

The science sub-data fields are:

- grain passage detection only by GDS
- grain impact detection by only by IS
- grain impact detection by GDS and IS
- Readout of one MB

Each "new" detection event by the GDS sub-system and/or by one sensor of IS is added. Each reading of any MB is also added.

2.8.1.4.4. Application Process ID

GIADA will need only one Process Identification Number:

GIADA Process ID = 90

2.8.1.5. Timing Requirements

GIADA supports telemetry time stamping with an accuracy of 100 ms.

The Time Management Service provides the capability for the synchronisation of GIADA with the Spacecraft time reference. When a TC time packet (service 9) is received by GIADA, the rising edge of the following TSY pulse will be used to set the GIADA real time clock with the on-board time transmitted within the TC packet. The precise means of synchronisation is defined in section 2.7.

The time synchronisation shall occur at a defined regular interval, which for GIADA is one hour.

2.8.2. Instrument Operating Modes

2.8.2.1. Mode Definitions

The different GIADA operative modes have been defined in section EID-B 1.4 and are here summarised.

Mode	Active Sub-system	Average Data Rate [kbit/s]	Peak Data Rate[1] [kbit/s]
Safe	ME	0.1 (*)	0.9 (*)
Cover	ME + Cover or Frangibolt	0.1 (*)	4 (**)
Flux	ME + MBS	0.1 (***)	4
Normal	ME + any combination of GDS, IS and/or MBS	12	64

Table. 2.8-1 Operation Modes

[1] Sustained for a maximum period of 1 s
(*) Due to HK reports (delivered with a period of 40 s)
(**) Due to Cover Status Trace Event Report
(***) Due to MBS reading every 300 s

It is important to remark that all data rate calculations are based on the experiment foreseen performances (i.e. maximum number of grain events that can be processed in 1 s), and not on the foreseen event rate coming from the comet models, which leads to a much lower rate.

The Safe Mode allows time synchronisation, TC execution, housekeeping telemetry generation and memory manipulations (patches and dumps).

The Cover Mode allows cover open, close and Frangibolt and heaters testing and activation.

The Flux Mode is used during the “mapping” phase of the mission profile both for power saving reasons and because the expected event rate does not justify the switching on of the single grain detection (GDS + IS) sub-systems.

The Normal mode, where all the sensors are active, is the baseline to be used in nominal S/C and instrument operational conditions. In case of contingency, a sub-set of the GIADA sensors can be disabled. In Normal Mode, it will be possible to perform auto-calibrations and to manage contingencies, either autonomously or by OBCPs.

2.8.2.2. Mode Transition Diagrams

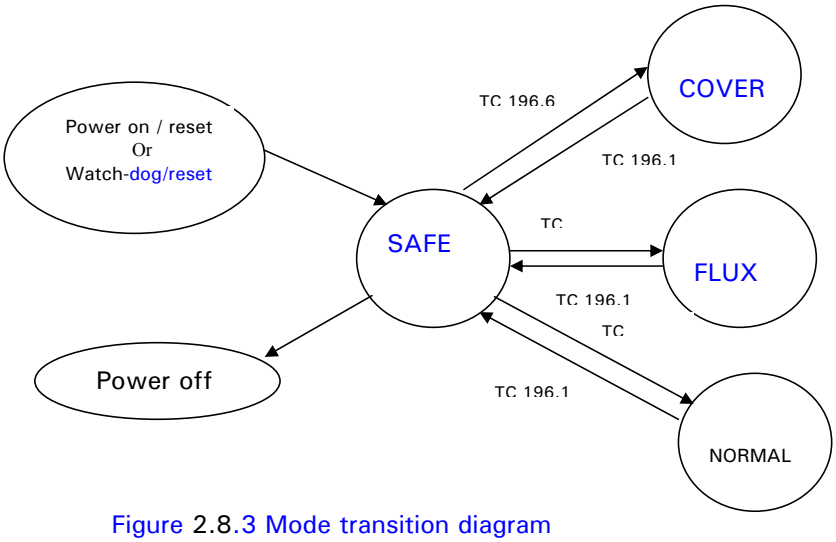

Figure 2.8.3 Mode transition diagram

The transition between modes will be performed using dedicated TCs or by means of OBCPs. Any mode change will be notified to the DMS using the Event Reporting Service (Type 5.1).

In case of GIADA reset induced by the watchdog circuit, an event report (Type 5.3) will be sent after rebooting, to indicate (if possible) the reset cause (e.g. NMI, unrecoverable EDAC error, etc.), as explained in section 2.8.1.2.2.1.

2.8.3. Packet Definitions

2.8.3.1. Packet Service Compliance

While GIADA is working, it will be able to accept any of the mandatory Packet Services and some of the optional ones. The table below provides a summary of all the Services and Reports supported by GIADA.

ST	Service Requests	ST	Service Reports
Telecommand Verification Service - 1			
		1	Acceptance Report Success
		2	Acceptance Failure Report
		7	Execution Completion Success Report:
		8	Execution Completion Failure Report
Housekeeping Reporting -3			
5	Enable Housekeeping Report Generation		
6	Disable Housekeeping Report Generation		
		25	Housekeeping Report
Event Reporting - 5			
		1	Normal/Progress Report
		2	Error/Anomaly Report - Warning
		3	Error/Anomaly Report - Ground Action
		4	Error/Anomaly Report - On-board Action
Memory Management Service - 6			
2	Load Memory Absolute Addressing		
5	Dump Memory Absolute Addressing	6	Dump Memory Absolute Addressing Report
9	Check Memory Absolute Addressing	10	Check Memory Absolute Addressing Report
Time Management Service - 9			
1	Accept Time Update		
Test Service - 17			
1	Perform Connection Test	2	Connection Test Report
Context Transfer Service - 18			
1	Report Context	2	Context Report
Science Data Transfer Service - 20			
1	Enable Science Packet Generation	3	Science Report

2	Disable Science Packet Generation		
Private Telecommand Service: Cover - 192			
1	Arm Frangibolt		
2	Disarm Frangibolt		
6	Test Frangibolt		
11	Activate Frangibolt		
16	Arm Cover		
17	Disarm Cover		
21	Open Cover		
26	Close Cover		
31	Test Heater		
32 25 5	Spare		
Private Telecommand Service: GDS - 193			
1	Arm Laser		
2	Disarm Laser		
6	Switch Laser On/Off		
11	Set GDS On/Off		
16	Set GDS Operation Mode		
26	Set Photodiode Threshold		
46	Calibrate GDS		
47 25 5	Spare		
Private Telecommand Service: IS - 194			
1	Set IS On/Off		
6	Set IS Operation Mode		
11	Set PZT Threshold Level		
26	Calibrate IS		
27 25 5	Spare		
Private Telecommand Service: - MBS 195 (Flux and Normal Modes)			
1	Set MBS On/Off		
6	Set MBS Operation Mode		
21	Set Time Between Measurements		
26	Heat MBS		
36	Calibrate MBS		
37 25 5	Spare		
Private Telecommand Service: - Mode Transitions 196			
1	Safe Mode		

6	Cover Mode		
11	Normal Mode		
16	Flux Mode		
17 25 5	Spare		

Private Telecommand Service: Co-ordinated Commands – 255			
1	Reset Telemetry Output		
2 25 5	Spare		

Table 2.8-2: Service Requests and Reports

2.8.3.1.1. Service 1: Telecommand Verification

The Telecommand Verification Service provides the capability for the explicit verification of a telecommand packet, from acceptance to completion of execution. In this sense, it should be seen as a supporting Service for the telecommand packets (Service Requests) belonging to all other services.

The following stages of telecommand processing are identified:

- Acceptance of the telecommand by GIADA. At this stage of telecommand processing, a required set of checks is applied to the telecommand packet prior to the start of execution. This will include verification of header, checksum etc. This element of the telecommand verification Service is supported for all telecommands.
- Completion of Execution of the telecommand. Not applicable to all telecommands, but should be used wherever practical (e.g. Open or close the Cover).

In case where GIADA detects a TC packet error or a time-out occurs, GIADA shall perform the following recovery action:

- Reflect the error in telemetry according to packet service 1
- Suspend TC processing for 16s (+10%, -0%)
- Flush TC input buffer
- Await for next TC packet

To indicate which type (none, one or both) of acknowledge is required, the source of the telecommand will set zero, one or two bits of the telecommand “acknowledge” field, contained in the data field header of the telecommand (see EID-A section 2.7.2.2 for details).

Acceptance Acknowledgement will be required for all TCs, and Execution Acknowledge will be applied on a case-by-case basis.

GIADA will generate a report packet, indicating either success or failure, for one or both of the above cases as requested in acknowledgement flags of the telecommand packet header. These reports will provide sufficient auxiliary data for the ground to fully understand the report (e.g. to identify the nature and cause of a telecommand failure).

Checks to be performed on incoming TC will be:

- The whole packet has been received within time out period (2 seconds)
- Check sum
- Application ID
- Valid Type and/or Sub-type
- If the Command can be executed in the actual operation mode
- Packet data field consistently

In the case of TC 'Acceptance' verification the acknowledgement report will be generated within 4 s of receipt of the command. (Note: the DMS timeout for receipt of an acceptance verification report is 20 seconds, and the unit's TM may be buffered for up to 16 seconds, due to polling algorithm. GIADA shall therefore issue the acceptance within 4 seconds).

The maximum sustained commanding rate shall not exceed 4 kbit/s (TBC), corresponding to about 2 commands (maximum size) within 1 s

In the case of TC 'Execution' verification, the timing of the acknowledgement is command specific; this information is reported in Table 2.8-3.

Note: GIADA does not test for a contiguous increment of TC source sequence count field (this is used as a TC identifier only).

2.8.3.1.1.1. Subtype 1: Acceptance Success Report.

The Acceptance Success Report has the following format:

Telemetry Packet Information			
Packet Name	Acceptance Success Report	Instrument	GIADA
Packet Function			
Generation Rules			
Header Information			
Process ID	90	Packet Category	1
Service Type	1	Service Subtype	1
Structure ID		Packet length	13
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
TC Packet ID	2 octets	Is a full 16-bit copy of the Packet ID field of the command to which the report is applicable	
TC Sequence Control	2 octets	Is a full 16-bit copy of the Sequence Control field of the command to which the report is applicable.	
Notes:			

2.8.3.1.1.2. Subtype 7: Execution Success Report

The Execution Success Report has the following format:

Telemetry Packet Information			
Packet Name	Execution Success Report	Instrument	GIADA
Packet Function			
Generation Rules			
Header Information			
Process ID	90	Packet Category	1
Service Type	1	Service Subtype	7
Structure ID		Packet length	13
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
TC Packet ID	2 octets	Is a full 16-bit copy of the Packet ID field of the command to which the report is applicable	
TC Sequence Control	2 octets	Is a full 16-bit copy of the Sequence Control field of the command to which the report is applicable	
Notes:			

All the commands that require an execution acknowledge are summarised in the following table, together with the related timeouts.

Type	Subtype	Telecommand Name	Timeout Value [s]
6	2	Load Memory Absolute Addressing	8
192	1	Arm Frangibolt	5
	6	Test Frangibolt Device	60
	11	Activate Frangibolt	90
	16	Arm Cover	5
	21	Open Cover	120
	26	Close Cover	120
193	1	Arm Laser	5
	6	Switch Laser On/Off	10

Table 2.8-3: Telecommand Execution Time-outs

2.8.3.1.1.3. Sub type 2: Acceptance Failure Report

The Acceptance Failure Report has the following format:

Telemetry Packet Information			
Packet Name	Acceptance Failure Report	Instrument	GIADA
Packet Function			
Generation Rules			
Header Information			
Process ID	90	Packet Category	1
Service Type	1	Service Subtype	2
Structure ID		Packet length	21
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
TC Packet ID	2 octets	Is a full 16-bit copy of the Packet ID field of the command to which the report is applicable	
TC Sequence Control	2 octets	Is a full 16-bit copy of the Sequence Control field of the command to which the report is applicable	
Failure Code	2 octets	See table below.	
Parameters	6 octets	See table below.	
Notes:			

The Failure Codes are reported below:

1	Incomplete Packet (Failed to receive whole packet within time out period (2 seconds for OBDH bus))
2	Incorrect check sum
3	Incorrect application ID
4	Invalid command code (Type and/or Sub-type)
5	Command can not be executed in the actual operation mode
6	Packet data field inconsistent

Table 2.8-4: Failure Codes for Acceptance Failure Reports

The Failure Parameters are reported below:

Failure Code	*Parameter 1 8 bits*	*Parameter 2 8 bits*	*Parameter 3 16 bits*	*Parameter 4 16 bits*
1	Packet Type from received TC	Packet Sub-Type from received TC	Number of octets in packet header	Number of octets actually received
2	Packet Type from received TC	Packet Sub-Type from received TC	Received Checksum (from TC packet)	Expected Checksum (calculated)
3	Packet Type from received TC	Packet Sub-Type from received TC	'0000' (hex)	'0000' (hex)
4	Packet Type from received TC	Packet Sub-Type from received TC	'A5' (hex). Service unknown 'A0' (hex). Sub-service unknown	'0000' (hex)
5	Packet Type from received TC	Packet Sub-Type from received TC	Actual Mode: 0 = Safe 1 = Cover 2 = Flux 3 = Normal A55A(hex) = TC is not finished yet	'0000' (hex)
6	Packet Type from received TC	Packet Sub-Type from received TC	If < '8000' (hex): *Parameter Error Position*, i.e. Word Position (offset zero) of the first field error. If '8000' (hex): *TC does not produce any change*	Erroneous word value read or '0000' if the Param3 = *TC does not produce any change*

Table 2.8-5: Acceptance Failure Reports Failure Codes Parameters

Failure Code 5 can be produced in two situations:
- when a TC is issued to GIADA during execution of another "long" command (e.g. "Open Cover");
- when a TC, that cannot be accepted in the current operation mode, is nevertheless issued.

The only exception for the first case are TCs 9.1 Accept Time Update and 196.1 Go to Safe Mode: these commands will be accepted and executed by GIADA even if some other activity is currently running.
It is to be remarked that the "Go to Safe Mode" TC will interrupt any pending or running activity, while this is not true for the other aforementioned command.

The TC incompatibilities table, applicable to Failure Code 5, is reported below:

ST	Telecommand	Safe	Cover	Normal	Flux
	Housekeeping Reporting –3				
5	Enable Housekeeping Report Generation	+	+	+	+
6	Disable Housekeeping Report Generation	+	+	+	+
	Memory Management Service – 6				
2	Load Memory Absolute Addressing	+	-	-	-
5	Dump Memory Absolute Addressing	+	-	-	-
9	Check Memory Absolute Addressing	+	-	-	-
	Time Management Service – 9				
1	Accept Time Update	+	+	+	+
	Test Service – 17				
1	Perform Connection Test	+	+	+	+
	Context Transfer Service – 18				
1	Report Context	+	-	-	-
3	Accept Context	+	-	-	-
	Science Data Transfer Service – 20				
1	Enable Science Packet Generation	-	-	+	+
3	Disable Science Packet Generation	-	-	+	+
	Private Telecommand Service: Cover - 192				
1	Arm Frangibolt	-	+	-	-
2	Disarm Frangibolt	-	+	-	-
6	Test Frangibolt Device	-	+	-	-

11	Activate Frangibolt	-	+	-	-
16	Arm Cover	-	+	-	-
17	Disarm Cover	-	+	-	-
21	Open Cover	-	+	-	-
26	Close Cover	-	+	-	-
31	Test Heater	-	+	-	-
	Private Telecommand Service: GDS - 193				
1	Arm Laser	-	-	+	-
2	Disarm Laser	-	-	+	-
6	Switch Laser On/Off	-	-	+	-
11	Set GDS On/Off	-	-	+	-
16	Set GDS Operation Mode	-	-	+	-
26	Set Photodiode Threshold	-	-	+	-
51	Calibrate GDS	-	-	+	-
	Private Telecommand Service: IS - 194				
1	Set IS On/Off	-	-	+	-
6	Set IS Operation Mode	-	-	+	-
11	Set PZT Threshold Level	-	-	+	-
26	Calibrate IS	-	-	+	-
	Private Telecommand Service: - MBS 195				
1	Set MBS On/Off	-	-	+	+
6	Set MBS Operation Mode	-	-	+	+
21	Set Time Between Measurements	-	-	+	+
26	Heat MBS	-	-	+	+
36	Calibrate MBS	-	-	+	+
	Private Telecommand Service: - Mode Transitions 196				
1	Go to Safe Mode	-	+	+	+
6	Go to Cover Mode	+	-	-	-
11	Go to Normal Mode	+	-	-	-
16	Go to Flux Mode	+	-	-	-
	Private Telecommand Service: Co-ordinated Commands – 255				
1	Reset Telemetry Output	+	+	+	+
Note: "+" means that the TC can be accepted "-" means that the TC can NOT be accepted					

Table 2.8-6: Telecommand Incompatibilities Table

2.8.3.1.1.4. Subtype 8: Execution Completion Failure Report

The Execution Completion Failure Report has the following format:

Telemetry Packet Information			
Packet Name	Execution Completion Failure Report	Instrument	GIADA
Packet Function			
Generation Rules			
Header Information			
Process ID	90	Packet Category	1
Service Type	1	Service Subtype	8
Structure ID		Packet length	21
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
TC Packet ID	2 octets	Is a full 16-bit copy of the Packet ID field of the command to which the report is applicable	
TC Sequence Control	2 octets	Is a full 16-bit copy of the Sequence Control field of the command to which the report is applicable	
Failure Code	2 octets	See table below	
Parameters	6 octets	See table below	
Notes:			

The Failure Codes are reported below:

2	Cover related error
3	GDS related error

Table 2.8-7: Failure Codes for Execution Completion Failure Reports

The Failure Parameters are reported below:

Failure Code	**Parameter 1 8 bits**	**Parameter 2 8 bits**	**Parameter 3 16 bits**	**Parameter 4 16 bits**
2	Packet Type from received TC	Packet Sub-Type from received TC	Error Subtype (See table below)	Parameter: see table below
3	Packet Type from received TC	Packet Sub-Type from received TC	Error Subtype (See table below)	Parameter: see table below

Table 2.8-8: Parameters for Execution Failure Reports Failure Codes

The error subtype applicable to Failure Code 2 (Execution Error in Cover), is reported below:

Execution Error Subtype	Error Subtype	Parameter
6	The Frangibolt is not armed.	'0000' Hex
11	The Frangibolt temperature is above the safety limit.	FB Temp From 0 to 4095 (12 bits) in ADC units
16	Timeout: it has been impossible to reach to the testing temperature.	FB Temp From 0 to 4095 (12 bits) in ADC units
21	Timeout: it has been impossible to reach to the activation temperature.	FB Temp From 0 to 4095 (12 bits) in ADC units
41	The motor is not armed.	'0000' Hex
48	Timeout in Cover Movement Operation.	Cover Motor Status Hex

Table 2.8-9: Error Subtypes for Execution Completion Failure Code 2

The error subtype applicable to Failure Code 3 (Execution Error in GDS), is reported below:

Execution Error Report ID	Error Subtype	Parameter
6	Lasers are not armed	'0000' Hex
7	GDS is Off	'0000' Hex

Table 2.9-10: Error Subtypes for Execution Completion Failure Code 3

2.8.3.1.2. Service 3: Housekeeping Data Reporting

This Service, along with the Event Reporting Service, provides for the reporting to the ground of all information of operational significance, which is not explicitly provided within the reports of other services.

Refer to section 2.8.1.4.1 for general information about housekeeping.

Only one Structure Identification (SID) is needed.

GIADA supports the 'default' report. This is identified by SID = 1. At power on, or reset, following time synchronisation, GIADA will enable the generation of the 'default' HK report. The default housekeeping report is generated once each collection interval.

SID	Definition
1	Default Housekeeping Report

Enabling/disabling of housekeeping reports is controlled by commands subtypes 5 & 6 (see subtype definitions).

2.8.3.1.2.1. Subtype 5: Enable Housekeeping Report Generation

On receipt of this request GIADA will start the generation of the HK report.

Telecommand Packet Information			
Packet Name	Enable HK Report Generation	Instrument	GIADA
Packet Function	Enable Housekeeping Report Generation		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	3	Service Subtype	5
Structure ID		Packet length	7
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Pad Field	1 octet		
SID	1 octet	Always 1	
Notes:			

2.8.3.1.2.2. Subtype 6: Disable Housekeeping Report Generation

On receipt of this request GIADA will stop the generation of the HK report.

Telecommand Packet Information			
Packet Name	Disable HK Report Generation	Instrument	GIADA
Packet Function	Disable Housekeeping Report Generation		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	3	Service Subtype	6
Structure ID		Packet length	7
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Pad Field	1 octet		
SID	1 octet	Always 1	
Notes:			

2.8.3.1.2.3. Subtype 25: Housekeeping Parameter Reporting

The Default HK Report format is as follows:

Telemetry Packet Information			
Packet Name	HK Parameter Reporting	Instrument	GIADA
Packet Function	Default Housekeeping Parameter Reporting		
Generation Rules			
Header Information			
Process ID	90	Packet Category	4
Service Type	3	Service Subtype	25
Structure ID		Packet length	79
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Pad Field	1 octet		
SID	1 octet	Always 1	
Dust Flux	2 octets	From 0 to 600 = Number of IS events in last minute (counts·dm^{-2}·min^{-1}) 'EEEE' (hex) = Dust Flux not available 'FFFF' (hex) = Overflow	
Operation Mode	2 octets	Bit 0 MSB Bit 1 ... Bit 7	Operation Mode '00000000'b = Safe '00000001'b = Cover '00000010'b = Flux '00000011'b = Normal
		Bit 8 .. Bit 11	Not Used: always at 0
		Bit 12	Event Report TM overflow 0 = Non-overflow 1 = Overflow
		Bit 13	Science TM overflow 0 = Non-overflow 1 = Overflow
		Bit 14	Not Used: always at 0
		Bit 15 LSB	Science TM Enabled/Disabled 0 = Disabled 1 = Enabled

Cover			
Cover Status	2 octets	Bit 0 MSB	Not Used: always at 0
		...	
		Bit 5	
		Bit 6	Frangibolt Armed/disarmed 0 = Disarmed 1 = Armed
		Bit 7	Motor Armed/disarmed 0 = Disarmed 1 = Armed
		Bit 8	Not Used: always at 0
		Bit 9	Not Used: always at 0
		Bit 10	"Open" reed-switch 0 = Open 1 = Closed
		Bit 11	"Closed" reed-switch 0 = Open 1 = Closed
		Bit 12	Not Used: always at 0
		Bit 13	Cover Heater ON/OFF 0 = OFF 1 = ON
		Bit 14	Motor Heater ON/OFF 0 = OFF 1 = ON
		Bit 15 LSB	Frangibolt Heater ON/OFF 0 = OFF 1 = ON
Frangibolt Temp.	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	

GDS			
GDS Status	2 octets	Bit 0 MSB	GDS ON/OFF 0 = OFF 1 = ON
		Bit 1	Laser Armed/disarmed 0 = Disarmed 1 = Armed
		Bit 2	Laser Power Consumption 00 = OFF 01 = Low 10 = Medium 11 = High
		Bit 3	
		Bit 4	Laser Operation Mode 01 = DC Couple 1 only 10 = DC Couple 2 only 11 = AC Both Couples
		Bit 5	
		Bit 6	Receiver Left Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 7	Receiver Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 8	Laser Power Supply on/off 0 = Off 1 = On
		.....	Not Used (Always at 0)
		Bit 13	
		Bit 14	Number of Detections From 1 to 3
		Bit 15 LSB	
Laser1 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	

Laser2 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser3 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser4 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser1 Light	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser2 Light	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

Laser3 Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser4 Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
GDS Thresholds	2 octets	Bit 0 MSB	Threshold Left From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 7	
		Bit 8	Threshold Right From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 15 LSB	

IS			
IS Status	2 octets	Bit 0 MSB	IS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)
		Bit 3	PZTE Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 4	PZTD Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 5	PZTC Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 6	PZTB Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 7	PZTA Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 8	Range 0 = Low 1 = High
		Bit 9	Not Used (Always at 0)
		Bit 10	Not Used (Always at 0)
		Bit 11	Gain PZTE 0 = Low 1 = High
		Bit 12	Gain PZTD 0 = Low 1 = High
		Bit 13	Not used: always at 0
		Bit 14	Not used: always at 0
		Bit 15 LSB	Gain PZTA 0 = Low 1 = High
IS Plate Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	

		Bit 15 LSB	
IS Thresholds	6 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 7	
		Bit 8	Threshold PZTA From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 15	
		Bit 16	Threshold PZTB From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 23	
		Bit 24	Threshold PZTC From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 31	
		Bit 32	Threshold PZTD From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 39	
		Bit 40	Threshold PZTE From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 47 LSB	

MBS			
MBS Status	2 octets	Bit 0 MSB	MBS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)
		Bit 3	MB5 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 4	MB4 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 5	MB3 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 6	MB2 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 7	MB1 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 8	Not used (always at 0)
		Bit 9	Not used (always at 0)
		Bit 10	Not used (always at 0)
		Bit 11	MB5 Heater ON/OFF 0 = OFF 1 = ON
		Bit 12	MB4 Heater ON/OFF 0 = OFF 1 = ON
		Bit 13	MB3 Heater ON/OFF 0 = OFF 1 = ON
		Bit 14	MB2 Heater ON/OFF 0 = OFF 1 = ON
		Bit 15 LSB	MB1 Heater ON/OFF 0 = OFF 1 = ON
MBS1 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	
		..	

		Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
MBS2 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MBS3 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MBS4 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MBS5 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	

Power Supply			
PS Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
+5V Power Consumption	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
+15V Power Consumption	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
-15V Power Consumption	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	

On-board Software Status			
Patches Status	8 Octets	Bit 0 MSB	Patch ID = 64 Used/not used 0 = Not used 1 = Used
		Bit 1	Patch ID = 63 Used/not used 0 = Not used 1 = Used
		...	...
		Bit 62	Patch ID = 2 Used/not used 0 = Not used 1 = Used
		Bit 63 LSB	Patch ID = 1 Used/not used 0 = Not used 1 = Used

CRC		
HK Data Field CRC	2 Octets	

Notes:
The following parameters come from S/W variables:

- Dust Flux
- Operation Mode
- Cover Status:
  - Frangibolt Armed/disarmed
  - Motor Armed/disarmed
- GDS Status
- GDS Thresholds
- IS Status
- IS Thresholds
- MBS Status:
  - MBS ON/OFF
  - MB5 Enabled/Disabled

  ...
  - MB1 Enabled/Disabled
- Patches Status

Notes cont'd:

The following parameters come from H/W reading:

- Cover Status:
  - "Open" reed-switch
  - "Closed" reed-switch
  - Cover Heater ON/OFF
  - Motor Heater ON/OFF
  - Frangibolt Heater ON/OFF
- Frangibolt Temp.
- Laser1 Temp.
  …
- Laser5 Temp.
- Laser1 light Monitor
  …
- Laser5 light Monitor
- IS Plate Temp.
- MBS Status:
  - MB5 Heater ON/OFF
    …
  - MB1 Heater ON/OFF
  - MBS1 Temperature
    …
  - MBS5 Temperature
- PS Temperature
- +5V Power Consumption
- +15V Power Consumption
- -15V Power Consumption

2.8.3.1.3. Service 5: Event Reporting

This service provides the capability for the transmission of reports to notify the ground or DMS of an event of operational significance. All events will be stored in SSMM and down-linked.

Refer to section 2.8.1.4.2 for general information about the event reports.

2.8.3.1.3.1. Subtype 1: Normal Progress Event Report

Telemetry Packet Information			
Packet Name	Normal Progress Event Report	Instrument	GIADA
Packet Function	Normal Progress Event Report		
Generation Rules			
Header Information			
Process ID	90	Packet Category	7
Service Type	5	Service Subtype	1
Structure ID		Packet length	For all IDs except 42007 & 42008: 13 For ID 42007: from 21 to 423 For ID 42008: 15
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Event ID	2 octets	See table below	
Parameter List	Variable	See table below	
Notes:			

ID	Name	Parameters		
42001	Heaters ON	2 octets	Heater ID: 0x0005 = Cover and Frangibolt Heaters 0x0006 = Cover and Motor Heaters	
42002	Heaters OFF	2 octets	Heater ID: 0x0005 = Cover and Frangibolt Heaters 0x0006 = Cover and Motor Heaters	
42007	Cover Report	256 words	2 octets	Direction
			6 octets	Time Stamp Begin
			256 octets	Each octet holds the Cover Status (see below)
			6 octets	Time Stamp End
42008	Heaters Current Consumption	4 octets	2 Octets	+15V Current From 0 to 4095 in ADC units (to be converted on ground to current)
			2 Octets	-15V Current From 0 to 4095 in ADC units (to be converted on ground to current)
42016	MB Heaters ON	2 octets	Heater ID (from 1 to 5 included)	
42017	MB Heaters OFF	2 octets	Heater ID (from 1 to 5 included)	
42050	GIADA in Safe Mode.	2 octets	‘0000’hex	
42051	GIADA in Cover Mode.	2 octets	‘0000’hex	
42052	GIADA in Normal Mode.	2 octets	‘0000’hex	
42053	GIADA in Flux Mode.	2 octets	‘0000’hex	

Table 2.8-11: IDs for Normal/progress Event Reports

The cover status word is defined as follows:

C7	C6	C5	C4	C3	C2	C1	C0	RS 1	RS 2	PH 1	PH 0	R3	R2	R1	Ir

- Ir: Status of IRQ line of Stepper Motor Controller (meaning: don't care).
- RS1 Status of Reed Switch "Closed"
- RS2 Status of Reed Switch "Open"
- R1: Clear=1/ No Clear = 0 the Interrupt to CPU. If this bit is cleared, there is not interrupt from the counter (meaning: don't care)
- R2: Open=1/Close=0.
- R3:Start=1/Stop and Clear = 0 the steps.
- PH1-PH0: Status of the phases.
- C7-C0: Number of steps to finish the movement

2.8.3.1.3.2. Subtype 2: Warning Anomalous Event Report

At this moment, it is not foreseen any Warning Event

2.8.3.1.3.3. Subtype 3: Ground Action Anomalous Event Report

Telemetry Packet Information			
Packet Name	Ground Action Anomalous Event Report	Instrument	GIADA
Packet Function	Ground Action Anomalous Event Report		
Generation Rules			
Header Information			
Process ID	90	Packet Category	7
Service Type	5	Service Subtype	3
Structure ID		Packet length	For all IDs except 42186, 42309 & 42310: 13 For IDs 42186 & 42309: 17 For ID 42310: 15
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Event ID	2 octets	See table below	
Parameter list	Variable	See table below	

Notes:
When Event report IDs 42211, 42212, 42240, 42241, 42242 and 42230 are raised by GIADA, an on-board action anomalous event report ID 42032 will also be issued (in Normal and in FLux modes only) automatically, to start the Emergency_Close_Cover_OBCP

When Event report ID 42220 is raised by GIADA (either in Normal or in Flux modes), the IS will be automatically switched off and will be switched on again when the IS temperature will be below MAX-OP temperature minus the relevant hystheresis. Both parameters are contained in the Context File.

ID	Name	Parameters		
42185	ADC Conversion Timeout	2 octets	'0000'hex	
42186	EDAC Event Error	6 octets	2 Octets	Error Type and EDAC Status
			2 Octets	High Error Address
			2 Octets	Low Error Address
42187	Generic Timer IRQ Not Arrived	2 octets	'0000'hex	
42200	Frangibolt to disarmed state	2 octets	'0000'hex	
42201	Motor to disarmed state	2 octets	'0000'hex	
42210	Laser To Disarmed State	2 octets	'0000'hex	
42211	Laser Temperature Above Max Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42212	Laser Temperature Below Min Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42213	Hardware Error In GDS Event Detection Circuitry	2 octets	'0000'hex	
42214	Hardware Error In GDS Event Detection Circuitry No IRQ Received	2 octets	'0000'hex	
42218	IS switched-on, status resumed by end of thermal contingency	2 octets	'From 0 to 4095 in ADC units (to be converted on ground to IS temperature)	
42219	IS switched-off, due to thermal contingency.	2 octets	'From 0 to 4095 in ADC units (to be converted on ground to IS temperature)	
42220	IS Plate Temperature Above MAX-OP Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42222	Hardware Error In IS Event Detection Circuitry	2 octets	'0000'hex	
42223	Hardware Error In IS Event Detection Circuitry No IRQ Received	2 octets	'0000'hex	
42230	MBS Temperature Above Max Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	

42232	Hardware Error In MBS Event Detection Circuitry	2 octets	‘0000’hex	
42233	Hardware Error In MBS Event Detection Circuitry No IRQ Received	2 octets	‘0000’hex	
42240	IS Plate Temperature Above MAX NON-OP Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42241	IS Plate Temperature Below Min Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42242	Main Electronic Temperature Above MAX-OP Temp	2 octets	From 0 to 4095 in ADC units (to be converted on ground to temperature)	
42260	Scheduler Full	2 octets	‘0000’hex	
42274	Virtual Disk File Does Not Exist	2 octets	File ID	
42304	Cannot Add More Patches	2 octets	‘0000’hex	
42309	Previous Execution Reset By Watch Dog	6 octets	2 Octets	After Watchdog Register
			2 Octets	EDAC Status
			2 Octets	EDAC Address Register
42310	EDAC Error During S/W Start And Dump	4 octets	2 Octets	EDAC Status
			2 Octets	EDAC Address Register

Table 2.8-12: IDs for Ground Action Anomalous Event Reports

After Watch_Dog Status Register definition.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
OPT 1	WD_IN	EDAC_ER	INT4	INT3	NMI	INT1	INT0

INT0: Asserted by user in the INT0 (Div by 0) service subprogram.
INT1: Asserted by user in the INT1 (Trace) service subprogram.
NMI: Asserted by user in the NMI service subprogram.
INT3: Asserted by user in the INT3 (SW Interrupt) service subprogram.
INT4: Asserted by user in the INT4 (Overflow) service subprogram.
EDAC_Er: Asserted by user in the EDAC Interrupt service subprogram.
WD_IN: Asserted automatically after the Watch_dog Pulse.
OPT1: Spare

The EDAC Address Register definition

A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0

A0=Bit 0…A15=Bit 15
A15-A0: The address of erroneous data (LSB).

The EDAC Status Register definition

X	X	X	X	X	X	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0

B0=Bit 0…B15=Bit 15

B3 to B0: A19 to A16. The MSB of the Address bus in an erroneous data.
B7 to B4: Status of Bits B3 to B0 in Control Register.
B9-B8: Error Type.

00: No error.
01: One Bit error has occurred in Data Bus.
10: One Bit error has occurred in Hamming Code bits.
11: Two or more errors have occurred.

2.8.3.1.3.4. Subtype 4: On-board Action Anomalous Event Report

Telemetry Packet Information			
Packet Name	On-board Action Anomalous Event Report	Instrument	GIADA
Packet Function	On-board Action Anomalous Event Report		
Generation Rules			
Header Information			
Process ID	90	Packet Category	7
Service Type	5	Service Subtype	4
Structure ID		Packet length	13
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Event ID	2 octets	See table below	
Parameter list	2 octets	See table below	
Notes:			

ID	Name	Parameters	
42032	Start Emergency Cover Close OBCP	2 octets	‘0000’hex
42033	Start Switch Lasers ON OBCP	2 octets	‘0000’hex

Table 2.8-13: IDs for On-board Action Anomalous Event Reports

2.8.3.1.4. Service 6: Memory Management

This Service provides the capability for loading, dumping and checking the contents of either a contiguous memory area or of several non-contiguous ('scattered') memory areas of GIADA.

GIADA requires 3 Memory ID and the word-width is always 16 bits

GIADA ROM Memory ID = 0x80
GIADA RAM Memory ID = 0x81
GIADA NVRAM Memory ID = 0x82

GIADA Word Width = 16 bits

The alignment of data in GIADA memory is in the big-endian format proper of the 80x86 processor family.

It is possible to load, dump or check any RAM or NVRAM memory area from ground. It is possible to dump or check any ROM memory area from ground.

Every Memory Management telecommand packet needed to up date any area of memory will be self consistent in that:

- the successful load will not depend on previous packets
- if the packet is rejected or the load fails for this packet, it may be up-linked alone at a later time.
- the rejection or failure of a packet shall be clearly and unambiguously indicated by a telecommand verification packet giving the telecommand packet sequence number and reason for failure in a standard way.

CRC Checksum algorithms are defined in EID-C part 04, as used for telecommand verification.

2.8.3.1.4.1. Subtype 2: Load Memory by Absolute Addressing

On receipt of this request, GIADA will load the defined area of memory with the provided data.

If the Memory ID is RAM, GIADA will execute this command in two steps:

1. It writes the data at the specified location in RAM;
2. It stores the data as a file in the Virtual Disk in NVRAM, for retrieval after experiment power off.

If there is no more room in the Virtual Disk to store the data as a file, event report ID 42272 "Virtual Disk Full" will be issued, and the second step above will not be executed.

In case it is requested in the TC, GIADA will issue an "Execution Completion Report" (Service 1, subtypes 7 or 8) to verify the correct (or incorrect) downloading of the memory block. The suggested timeout is 8 s (TBC). During this time, GIADA will verify the received data.
In any case, the delay in execution verification does not affect the commanding rate as declared in section 2.8.3.1.1.

Telecommand Packet Information			
Packet Name	Load Memory by Absolute Addressing	Instrument	GIADA
Packet Function	Load Memory by absolute addressing		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	6	Service Subtype	2
Structure ID		Packet length	Variable From 15 to 235
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Memory ID	1 octet	Either 0x81 or 0x82	
Number of blocks	1 octet		
Start Address	4 octets		Repeat Number of blocks times
Block Length	2 octets		
Data 0	2 octets		
Data 1	2 octets		
…	2 octets		
Data N	2 octets		
Notes: the alignment of data in GIADA memory is in the big-endian format proper of the 80x86 processor family. This means that, if the hex value 0xAABB is to be uploaded, the corresponding data in the data block shall be structured as 0xBBAA.			

2.8.3.1.4.2. Subtype 5: Dump memory by Absolute Addressing

On receipt of these requests GIADA will dump the contents of the defined area (or areas) of memory in a TM Memory dump TM packet. The SW shall always ensure that the requested dump report will be smaller than the maximum TM packet size.

Telecommand Packet Information			
Packet Name	Dump Memory by Absolute Addressing	Instrument	GIADA
Packet Function	Dump Memory by absolute addressing		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	6	Service Subtype	5
Structure ID		Packet length	Variable From 13 to 235
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Memory ID	1 octet	Either 0x80, 0x81 or 0x82	
Number of blocks	1 octet		
Start Address	4 octets		Repeat Number of blocks times
Block Length	2 octets		
Notes:			

2.8.3.1.4.3. Subtype 6: Memory Dump by Absolute Addressing

On receipt of a TC dump requests GIADA will dump the contents of the defined area of memory. In this sense the TM packet is a response to a sub-type 5

Telemetry Packet Information			
Packet Name	Memory Dump by Absolute Addressing	Instrument	GIADA
Packet Function	Memory Dump by absolute addressing		
Generation Rules			
Header Information			
Process ID	90	Packet Category	9
Service Type	6	Service Subtype	6
Structure ID		Packet length	Variable From 19 to 4105
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Memory ID	1 octet	Either 0x80, 0x81 or 0x82	
Number of blocks	1 octet		
Start Address	4 octets		Repeat Number of blocks times
Block Length	2 octets		
Data 0	2 octets		
Data 1	2 octets		
…	2 octets		
Data N	2 octets		
Notes: the alignment of data in GIADA memory is in the big-endian format proper of the 80x86 processor family. This means that, if the hex value 0xAABB is dumped, the corresponding data is to be interpreted as 0xBBAA.			

2.8.3.1.4.4. Subtype 9: Memory Check by Absolute Address

On receipt of this request GIADA will perform a pre defined checksum on the contents of the defined area (or areas) of memory. The result of these check(s) being reported in a TM packet of service 6 sub-type 10.

Telecommand Packet Information				
Packet Name	Check Memory	Instrument	GIADA	
Packet Function	Check Memory			
Generation Rules				
Header Information				
Process ID	90	Packet Category	12	
Service Type	6	Service Subtype	9	
Structure ID		Packet length	Variable From 13 to 235	
Data Field Information				
Data Field	*Field Structure*	*Remarks*		
Memory ID	1 octet	Either 0x80, 0x81 or 0x82		
Number of blocks	1 octet			
Start Address	4 octets			Repeat Number of blocks times
Block Length	2 octets			
Notes:				

2.8.3.1.4.5. Subtype 10: Memory Check Report by Absolute Address

On receipt of a dump requests (sub-type 9) GIADA will checksum the contents of the defined area(s) of memory, and report the results as a memory check report.

Telemetry Packet Information				
Packet Name	Memory check report by Absolute Addressing	Instrument	GIADA	
Packet Function	Memory check report by absolute addressing			
Generation Rules				
Header Information				
Process ID	90	Packet Category	7	
Service Type	6	Service Subtype	10	
Structure ID		Packet length	Variable From 19 to 4105	
Data Field Information				
Data Field	*Field Structure*	*Remarks*		
Memory ID	1 octet	Either 0x80, 0x81 or 0x82		
Number of blocks	1 octet			
Start Address	4 octets			Repeat Number of blocks times
Block Length	2 octets			
Checksum	2 octets			

Notes:
Even if the alignment of data in GIADA memory is in the big-endian format, in order to avoid inconsistencies between what has been uploaded and what is to be checked, the CRC will be calculated on the data as if it were in little-endian format.
This means that, if the data 0xABCDEF01 (CRC 0x0442) is uploaded to GIADA, even if it is stored in GIADA memory as 0x01EFCDAB, the CRC will be calculated as if the data were 0xABCDEF01.

2.8.3.1.5. Service 9: Time Synchronisation

The Time Management Service provides the capability for the synchronisation of GIADA with the Spacecraft time reference.

The Spacecraft Elapsed Time packet provided by this service will be used to update the instrument time reference on receipt of the following broadcast pulse. The precise means of synchronisation is defined in section 2.7.

The time synchronisation shall occur at a defined regular interval.

GIADA needs one time synchronisation per hour.

GIADA will maintain telemetry time stamping to an accuracy of better than 100 ms.

2.8.3.1.5.1. Subtype 1: Accept Time Update Request

When a TC time packet (service 9) is received by GIADA, the rising edge of the following TSY pulse will be used to set the GIADA real time clock with the on-board time transmitted within the TC packet. GIADA needs an accuracy of 1 s, but it will support telemetry time stamping with an accuracy of 100 ms.

Telecommand Packet Information			
Packet Name	Accept Time Update Request	Instrument	GIADA
Packet Function	Accept Time Update Request		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	9	Service Subtype	1
Structure ID		Packet length	11
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
SCET	6 octets	CUC Time	
Notes:			

2.8.3.1.6. Service 17: Test

The Test Service provides the capability to test the connection. Ground or DMS will generate a test request packet, GIADA will respond with pre-defined test information. The Connection Test is a kind of "Ping" for the DMS to be sure that the connection is working.

GIADA supports an end-to-end test function in the form of an "are you alive?" test protocol via a standard packet service.

When GIADA receives a connection test command, it will respond with a Connection Test Report packet within 4 seconds.

2.8.3.1.6.1. Subtype 1: Connection Test Request

GIADA shall respond with a sub-type 2 Report.

Telecommand Packet Information			
Packet Name	Connection Test Request	Instrument	GIADA
Packet Function	Connection Test Request		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	17	Service Subtype	1
Structure ID		Packet length	5
Data Field Information: None			
Notes:			

2.8.3.1.6.2. Subtype 2: Connection Test Report

The connection Test Report is issued as a response to a subtype 1 TC.

Telemetry Packet Information			
Packet Name	Connection Test Report	Instrument	GIADA
Packet Function	Connection Test Report		
Generation Rules			
Header Information			
Process ID	90	Packet Category	7
Service Type	17	Service Subtype	2
Structure ID		Packet length	9
Data Field Information: None			
Notes:			

2.8.3.1.7. Service 18: Context Transfer

This service provides the mechanism to allow GIADA to save its current operational information in the SSMM. This information will be returned to the unit after power on.

On receipt of a Context Request, the unit shall furnish the Configuration File within 20 seconds.

The context data will be returned to the unit as a single Accept Context Request command, as dictated by ground command, timeline or DMS.

2.8.3.1.7.1. Subtype 1: Report Context Request

Telecommand Packet Information			
Packet Name	Report Context Request	Instrument	GIADA
Packet Function	Report Context Request		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	18	Service Subtype	1
Structure ID		Packet length	5
Data Field Information: None			
Notes:			

2.8.3.1.7.2. Subtype 2: Context Report

As a response to subtype 1, GIADA provides its context.

Telemetry Packet Information			
Packet Name	Context Report	Instrument	GIADA
Packet Function	Context Report		
Generation Rules			
Header Information			
Process ID	90	Packet Category	11
Service Type	18	Service Subtype	2
Structure ID		Packet length	145
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Cover			
Spare	2 octets	All zeros	
Cover and Frangibolt Heaters-On Time	2 octets	Time (in s.) that the Cover and Frangibolt heaters shall be activated before either opening the cover or activating the Frangibolt. *Default value is 30 s*	
Cover and Motor Heaters-On Time	2 octets	Time (in s.) that the Cover and Motor heaters shall be activated before either opening or closing the cover. *Default value is zero*	
FB Safety Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
FB test Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

FB testing timeout	4 octets	Frangibolt test timeout (in seconds) *Default value is 60 s*	
FB working Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
FB op. timeout	4 octets	Frangibolt operation timeout (in seconds) *Default value is 600 s*	
Velocity	2 octets	Bit 0 MSB .. Bit 7	Not Used (Always at 0)
		Bit 8 ... Bit 15 LSB	Coding of number of steps per second: 20d = 100, 25d = 80, 33d = 60, 40d = 50, 50d = 40, 57d = 35, 66d = 30, 80d = 25, 100d = 20, 134d = 15, 200d = 10. The second number is intended as steps per second *Default value is 50d*
Steps to Open	2 octets	Steps to Open the Cover *Default: 180*	
Steps to Close	2 octets	Steps to Close the Cover *Default: 180*	
Opening timeout	4 octets	Opening timeout (in seconds) *Default value is 120 s*	
Closing timeout	4 octets	Closing timeout (in seconds) *Default value is 120 s*	
GDS Information			
GDS Status	2 octets	Bit 0 MSB	GDS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2 Bit 3	Default Laser Power 00 = OFF 01 = Low 10 = Medium 11 = High *Default value: 10b*

		Bit 4 Bit 5	Laser Operation Mode 01 = DC Couple 1 only 10 = DC Couple 2 only 11 = AC Both Couples *Default value: 11b*
		Bit 6	Receiver Left Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 7	Receiver Right Enable/Disable 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 8 ... Bit 13	Not used (always at 0)
		Bit 14 Bit 15 LSB	# of Detection From 1 to 3 *Default value: 3d*
GDS Thresholds	2 octets	Bit 0 MSB .. Bit 7	Threshold Left From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 8 .. Bit 15 MSB	Threshold Right From 0 to 255 (8 bits) in DAC Units *Default value is 255*
Laser Max Temp.	2 octets	Bit 0 MSB	Laser 4 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 1	Laser 3 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 2	Laser 2 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*

		Bit 3	Laser 1 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser Min Temp.	2 octets	Bit 0 MSB	Laser 4 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 1	Laser 3 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 2	Laser 2 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 3	Laser 1 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Spare	4 octets	All zeros	
Time between Cal.	4 octets	Number of seconds between GDS calibrations	
IS Information			
IS Status	2 octets	Bit 0 MSB	IS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)

		Bit 3	PZTE Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4	PZTD Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 5	PZTC Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 6	PZTB Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 7	PZTA Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 8	Range 0 = Low 1 = High
		Bit 9	Not Used (Always at 0)
		Bit 10	Not Used (Always at 0)
		Bit 11	Gain PZTE 0 = Low 1 = High
		Bit 12	Gain PZTD 0 = Low 1 = High
		Bit 13	Not used (always at 1)
		Bit 14	Not used (always at 1)
		Bit 15 LSB	Gain PZTA 0 = Low 1 = High
IS Plate MAX-OP Temperature	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enable/Disable 0 = Disabled 1 = Enabled *Default value: 1b*

		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Spare	2 octets	All zeros	
IS Plate Hysteresis Temperature	2 octets	Bit 0 MSB Bit 1	Not Used (Always at 0)
		Bit 3 .. Bit 15 LSB	Hysteresis (used to close/open the cover if the temperature is too high) From 0 to 4095 (12 bits) in ADC units
IS Thresholds	6 octets	Bit 0 MSB ..... Bit 7	Not Used (Always at 0)
		Bit 8 .. Bit 15	Threshold PZTA From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 16 .. Bit 23	Threshold PZTB From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 24 .. Bit 31	Threshold PZTC From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 32 .. Bit 39	Threshold PZTD From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 40 .. Bit 47 LSB	Threshold PZTE From 0 to 255 (8 bits) in DAC Units *Default value is 255*
Time between Cal.	4 octets	Time between IS calibrations (seconds)	
Calibration Configuration	2 octets	Bit 0 MSB .. Bit 7	Calibration level From 0 to 255 (8 bits) in DAC Units *Default value is 255*

		Bit 8 ... Bit 12	Not used (always at 0)
		Bit 13 .. Bit 15 LSB	Number of stimuli Even number, from 2 to 8 included
MBS Information			
MBS Status	2 octets	Bit 0 MSB	MBS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)
		Bit 3	MB5 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4	MB4 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 5	MB3 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 6	MB2 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 7	MB1 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 8 .. Bit 15 LSB	Not used (always at 0)
MBS Max Temp	2 octets	Bit 0 MSB .. Bit 3	Not used (always at 0)

		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
MBS Temp. Checking	2 octets	Bit 0 MSB	MBS 5 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 1	MBS 4 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 2	MBS 3 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 3	MBS 2 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4	MBS 1 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 5 ... Bit 15 LSB	Not Used (Always at 0)
MB Time interval	4 octets	Time interval between measures (AM)	
MBS Maximum Temperature during Heating	2 octets	Bit 0 MSB ... Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Heating Timeout	4 octets	Timeout during heating (seconds)	
Time between Cal.	4 octets	Time between MBS calibrations (seconds)	

H/W and S/W Information			
IS Plate MAX NON-OP Temp.	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

IS Plate Min Temp.	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
ME MAX-OP Temp.	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Spare	8 octets	All zeros	
Timeout Sci. Packet	4 octets	Maximum time between Scientific packets (seconds) *Default value: 60 s (TBC)*	
Time HK Packet	4 octets	Time between HK packets (seconds) *Default value is 40 s*	
Arm TCs Timeout	4 octets	Timeout for Arm TCs (seconds) *Default value is 40 s*	
Patches Status	8 octets	Bit 0 MSB	Patch ID = 64 Used/not used 0 = Not used 1 = Used
		Bit 1	Patch ID = 63 Used/not used 0 = Not used 1 = Used
		....	...
		Bit 62	Patch ID = 2 Used/not used 0 = Not used 1 = Used

		Bit 63 LSB	Patch ID = 1 Used/not used 0 = Not used 1 = Used
Max GDS Events Per second	2 octets	1.. 65535 *Default value: 40*	
Max IS Events Per second	2 octets	1.. 65535 *Default value: 40*	
PAD	8 octets	Pad Field. All zeros	
CRC			
CF CRC	2 Octets	CRC of Context File	
Notes: Since the size of the Context File is less than 256 octets, that is the maximum TC Application Data Length, only one Context Segment is needed.			

2.8.3.1.7.3. Subtype 3: Accept Context Request

This TC has the Context File information. The DMS shall provide this information at least during the start procedure, commanded using an OBCP.

Telecommand Packet Information			
Packet Name	Accept Context Request	Instrument	GIADA
Packet Function	Report Context Request		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	18	Service Subtype	3
Structure ID		Packet length	143
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Pad	1 octet		
Segment Number	1 octet	Always 1	
PAD	8 octets	Pad Field. All zeros	
Cover			
Spare	2 octets	All zeros	
Cover and Frangibolt Heaters-On Time	2 octets	Time (in s.) that the Cover and Frangibolt heaters shall be activated before either opening the cover or activating the Frangibolt. *Default value is 30 s*	

Cover and Motor Heaters-On Time	2 octets	Time (in s.) that the Cover and Motor heaters shall be activated before either opening or closing the cover. *Default value is zero*	
FB Safety Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
FB test Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
FB testing timeout	4 octets	Frangibolt test timeout (in seconds) *Default value is 60 s*	
FB working Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
FB op. timeout	4 octets	Frangibolt operation timeout (in seconds) *Default value is 600 s*	
Velocity	2 octets	Bit 0 MSB .. Bit 7	Not Used (Always at 0)

		Bit 8 ... Bit 15 LSB	Coding of number of steps per second: 20d = 100, 25d = 80, 33d = 60, 40d = 50, 50d = 40, 57d = 35, 66d = 30, 80d = 25, 100d = 20, 134d = 15, 200d = 10. The second number is intended as steps per second *Default value is 50d*
Steps to Open	2 octets	Steps to Open the Cover *Default: 180*	
Steps to Close	2 octets	Steps to Close the Cover *Default: 180*	
Opening timeout	4 octets	Opening timeout (in seconds) *Default value is 120 s*	
Closing timeout	4 octets	Closing timeout (in seconds) *Default value is 120 s*	
GDS Information			
GDS Status	2 octets	Bit 0 MSB	GDS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2 Bit 3	Default Laser Power 00 = OFF 01 = Low 10 = Medium 11 = High *Default value: 10b*
		Bit 4 Bit 5	Laser Operation Mode 01 = DC Couple 1 only 10 = DC Couple 2 only 11 = AC Both Couples *Default value: 11b*
		Bit 6	Receiver Left Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 7	Receiver Right Enable/Disable 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 8 ... Bit 13	Not used (always at 0)

		Bit 14 Bit 15 LSB	# of Detection From 1 to 3 *Default value: 3d*
GDS Thresholds	2 octets	Bit 0 MSB .. Bit 7	Threshold Left From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 8 .. Bit 15 MSB	Threshold Right From 0 to 255 (8 bits) in DAC Units *Default value is 255*
Laser Max Temp.	2 octets	Bit 0 MSB	Laser 4 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 1	Laser 3 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 2	Laser 2 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 3	Laser 1 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser Min Temp.	2 octets	Bit 0 MSB	Laser 4 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*

		Bit 1	Laser 3 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 2	Laser 2 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 3	Laser 1 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Spare	4 octets	All zeros	
Time between Cal.	4 octets	Number of seconds between GDS calibrations	
IS Information			
IS Status	2 octets	Bit 0 MSB	IS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)
		Bit 3	PZTE Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4	PZTD Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 5	PZTC Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 6	PZTB Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*

		Bit 7	PZTA Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 8	Range 0 = Low 1 = High
		Bit 9	Not Used (Always at 0)
		Bit 10	Not Used (Always at 0)
		Bit 11	Gain PZTE 0 = Low 1 = High
		Bit 12	Gain PZTD 0 = Low 1 = High
		Bit 13	Not used (always at 1)
		Bit 14	Not used (always at 1)
		Bit 15 LSB	Gain PZTA 0 = Low 1 = High
IS Plate MAX-OP Temperature	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enable/Disable 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Spare	2 octets	All zeros	
IS Plate Hysteresis Temperature	2 octets	Bit 0 MSB Bit 1	Not Used (Always at 0)
		Bit 3 .. Bit 15 LSB	Hysteresis (used to close/open the cover if the temperature is too high) From 0 to 4095 (12 bits) in ADC units
IS Thresholds	6 octets	Bit 0 MSB ..... Bit 7	Not Used (Always at 0)

		Bit 8 .. Bit 15	Threshold PZTA From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 16 .. Bit 23	Threshold PZTB From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 24 .. Bit 31	Threshold PZTC From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 32 .. Bit 39	Threshold PZTD From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 40 .. Bit 47 LSB	Threshold PZTE From 0 to 255 (8 bits) in DAC Units *Default value is 255*
Time between Cal.	4 octets	Time between IS calibrations (seconds)	
Calibration Configuration	2 octets	Bit 0 MSB .. Bit 7	Calibration level From 0 to 255 (8 bits) in DAC Units *Default value is 255*
		Bit 8 ... Bit 12	Not used (always at 0)
		Bit 13 .. Bit 15 LSB	Number of stimuli Even number, from 0 to 8
MBS Information			
MBS Status	2 octets	Bit 0 MSB	MBS ON/OFF 0 = OFF 1 = ON
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)

		Bit 3	MB5 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4	MB4 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 5	MB3 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 6	MB2 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 7	MB1 Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 8 .. Bit 15 LSB	Not used (always at 0)
MBS Max Temp	2 octets	Bit 0 MSB .. Bit 3	Not used (always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
MBS Temp. Checking	2 octets	Bit 0 MSB	MBS 5 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 1	MBS 4 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 2	MBS 3 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*

		Bit 3	MBS 2 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4	MBS 1 Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 5 ... Bit 15 LSB	Not Used (Always at 0)
MB Time interval	4 octets	Time interval between measures (AM)	
MBS Maximum Temperature during Heating	2 octets	Bit 0 MSB ... Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Heating Timeout	4 octets	Timeout during heating (seconds)	
Time between Cal.	4 octets	Time between MBS calibrations (seconds)	
H/W and S/W Information			
IS Plate MAX NON-OP Temp.	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
IS Plate Min Temp.	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)

		Bit 3	Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
ME MAX-OP Temp.	2 octets	Bit 0 MSB .. Bit 2	Not Used (Always at 0)
		Bit 3	Temp. Checking Enabled/Disabled 0 = Disabled 1 = Enabled *Default value: 1b*
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Spare	8 octets	All zeros	
Timeout Sci. Packet	4 octets	Maximum time between Scientific packets (seconds) *Default value: 60 s (TBC)*	
Time HK Packet	4 octets	Time between HK packets (seconds) *Default value is 40 s*	
Arm TCs Timeout	4 octets	Timeout for Arm TCs (seconds) *Default value is 40 s*	
Patches Status	8 octets	Bit 0 MSB	Patch ID = 64 Used/not used 0 = Not used 1 = Used
		Bit 1	Patch ID = 63 Used/not used 0 = Not used 1 = Used
		....	...
		Bit 62	Patch ID = 2 Used/not used 0 = Not used 1 = Used
		Bit 63 LSB	Patch ID = 1 Used/not used 0 = Not used 1 = Used
Max GDS Events Per second	2 octets	1.. 65535 *Default value: 40*	
Max IS Events Per second	2 octets	1.. 65535 *Default value: 40*	

PAD	8 octets	Pad Field. All zeros
CRC		
CF CRC	2 Octets	CRC of Context File

Notes:
Since the size of the Context File is less than 256 octets, that is the maximum TC Application Data Length, only one Context Segment is needed.

2.8.3.1.8. Service 19: Information Distribution

This service provides the mechanism to allow information furnished by one on-board unit to be distributed to one or more other on-board units. GIADA will provide an indication of the Dust Flux, that can be used by other payloads to close their covers in case of an excessive dust flux. This information will be provided in the field "Dust Flux" of the default HK packet.

Dust Flux is the latest available dust flux measurement, expressed as particles (> 20 microns) per square decimetre per minute. This value is an unsigned integer. If the dust flux information can not be provided, it will be indicated by a value of 'EEEE'$_{HEX.}$ Note that the flux value will saturate at approximately 600 counts dm^{-2} min^{-1} this will be indicated by a value of 'FFFF'$_{HEX.}$

2.8.3.1.9. Service 20: Science Data Transfer

This service is used to control the transfer science data from GIADA to the DMS and/or the SSMM. The data will subsequently be down-linked.

Science data packets are not processed by the DMS, they are nominally filed on the SSMM, for down-link during ground visibility.

All science packets have the packet category “Private”. Science data will nominally be sent using packets of subtype 3. Science data packets may be delivered with different structure, and at different transmission rates according to the operation Mode or type of information.

Enabling and disabling the generation of science telemetry reports will be controlled by commands subtypes 1 & 2. At power-on or reset, the generation of all science reports is disabled: the user shall enable its generation after entering in one of the scientific modes (Normal or Flux).

For Science reports, the data generated will never exceed the characteristics described in section 2.8.1.4.3 associated with the defined operation mode (i.e. Packet maximum length, peak data rate, average data rate).

2.8.3.1.9.1. Subtype 1: Enable Science Report Generation

On receipt of this request, GIADA will start the generation of the science reports. This enabling shall be done after entering into Flux or Normal Modes.

Telecommand Packet Information			
Packet Name	Enable Science Report Generation	Instrument	GIADA
Packet Function	Enable Science Report Generation		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	1
Structure ID		Packet length	7
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Pad Field	9 bits	Not used	
PID	7 bits	Always 90d	
Notes:			

2.8.3.1.9.2. Subtype 2: Disable Science Report Generation

On receipt of this request, GIADA will stop the generation of the science reports. GIADA will also disable this functionality autonomously when performing the transitions to Safe Mode.

Telecommand Packet Information			
Packet Name	Disable Science Report Generation	Instrument	GIADA
Packet Function	Disable Science Report Generation		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	2
Structure ID		Packet length	7
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Pad Field	9 bits	Not used	
SID	7 bits	Always 90d	
Notes:			

2.8.3.1.9.3. Subtype 3: Science Reporting

The science sub-data fields are:

- grain passage detection only by GDS
- grain impact detection by only by IS
- grain impact detection by GDS and IS
- Readout of one MB

Each “new” detection event by the GDS sub-system and/or by one sensor of IS is added. Each reading of any MB is also added.

Telemetry Packet Information			
Packet Name	Normal Mode Science	Instrument	GIADA
Packet Function	Normal Mode Science Information		
Generation Rules	Several GDS, IS or MBS events are attached		
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	3
Structure ID		Packet length	Variable from 43 to 511

Data Field Information			
Data Field	*Field Structure*	*Remarks*	
HK Label	2 octets	"HK"(ASCII)	
Laser1 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser2 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser3 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser4 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	

		..	From 0 to 4095 (12 bits) in ADC units
		Bit 15 LSB	
Laser1 Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser2 Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser3 Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Laser4 Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
IS Plate Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	

		.. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
GDS only Label	2 octets	“gr”(ASCII) if GDS right detection “gl”(ASCII) if GDS left detection	

Time of Event	6 octets		
Scattered Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Crossing Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 5	Not Used (Always at 0)
		Bit 6	Crossing Time From 0 to 1023 (10 bits) Least significant bit = 10 μs (both with AC and DC-operated lasers)
		..	
		Bit 15 LSB	
… …			
IS only Label	2 octets	"ii"	
Time of Event	6 octets		
PZTA Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
PZTA Time	2 octets	Bit 0 MSB	Overflow
		..	Not used (always at 0)
		Bit 10	
		Bit 11	Time From 0 to 31 Least significant bit = 3 μs
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	

PZTB Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Not used (always at 1)
		Bit 4	From 0 to 4095 (12 bits) in ADC Units
		..	
		Bit 15 LSB	
PZTB Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	Time From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTC Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Not used (always at 1)
		Bit 4	From 0 to 4095 (12 bits) in ADC Units
		..	
		Bit 15 LSB	
PZTC Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	Time From 0 to 31 Least significant bit =3(μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	

PZTD Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bits) in ADC Units
		..	
		Bit 15 LSB	
PZTD Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	Time From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTE Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bits) in ADC Units
		..	
		Bit 15 LSB	

PZTE Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	Time From 0 to 31 Least significant bit =3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
… …			
GDS+IS Label	2 octets	“gd” if GDS right detection; “gs” if GDS left detection	
Time of GDS Event	6 octets		
Scattered Light	2 octets	Bit 0 MSB	Not Used (Always at 0)
		Bit 1	
		Bit 3	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Crossing Time	2 octets	Bit 0 MSB	Overflow
		..	Not Used (Always at 0)
		Bit 5	
		Bit 6	From 0 to 1023 (10 bits) Least significant bit = 10 μs (either with AC or DC-operated lasers)
		..	
		Bit 15 LSB	
GDS-IS Time of Flight	2 octets	Bit 0 MSB	Overflow
		Bit 1	From 0 to 32767 (15 bits) Least significant bit = 10 (μs)
		..	
		Bit 15 LSB	

PZTA Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bit) in ADC Units
		..	
		Bit 15 LSB	
PZTA Time	2 octets	Bit 0 MSB	Overflow
		..	Not used (always at 0)
		Bit 10	
		Bit 11	Time From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTB Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Not used (always at 1)
		Bit 4	From 0 to 4095 (12 bit) in ADC Units
		..	
		Bit 15 LSB	

PZTB Time	2 octets	Bit 0 MSB	Overflow
		..	Not used (always at 0)
		Bit 10	
		Bit 11	Time From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTC Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Not used (always at 1)
		Bit 4	From 0 to 4095 (12 bit) in ADC Units
		..	
		Bit 15 LSB	
PZTC Time	2 octets	Bit 0 MSB	Overflow
		..	Not used (always at 0)
		Bit 10	
		Bit 11	Time From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	

PZTD Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bit) in ADC Units
		..	
		Bit 15 LSB	
PZTD Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTE Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bit) in ADC Units
		..	
		Bit 15 LSB	

PZTE Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	Time From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
… …			
MB ID	2 octets	Bit 0 MSB	"m" (ASCII)
		..	
		Bit 7	
		Bit 8	Not used (always at 0)
		..	
		Bit 12	
		Bit 13	MB ID From 1 to 5
		Bit 14	
		Bit 15 LSB	
Time of Event	6 octets		
Frequency	4 octets	Bit 0 MSB	Overflow
		Bit 7	Not used (always at 0)
		Bit 8	Frequency 24 bits value, Least significant bit = 1/1.00352 (Hz)
		..	
		Bit 31 MSB	
MB Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
… …			
CRC	2 octets		
Notes:			

If one micro-balance is saturated, it can be cleaned by heating the sensor. This procedure is started from a TC from ground. During this procedure, a list of mass (frequency) versus temperature is acquired in order to perform a "micro-gravimetry" experiment. The resulting science data package is as follows:

Telemetry Packet Information			
Packet Name	MB Heating	Instrument	GIADA
Packet Function	Table of frequency vs. Temperature of one Micro-balance		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	3
Structure ID		Packet length	Variable from 21 to 511
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
MB ID	2 octets	Bit 0 MSB	"h" (ASCII)
		..	
		Bit 7	
		Bit 8	Not used (always at 0)
		..	
		Bit 12	
		Bit 13	MB ID From 1 to 5
		Bit 14	
		Bit 15 LSB	
Time of Heating	6 Octets		
Frequency 0	4 octets	Bit 0 MSB	Overflow
		..	
		Bit 7	Not used (always at 0)
		Bit 8	Frequency
		..	
		Bit 31 MSB	24 bits value, Least significant bit = 1/1.00352 (Hz)

Temperature 0	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Frequency 1	4 octets	Bit 0 MSB	Overflow
		..	
		Bit 7	Not used (always at 0)
		Bit 8	Frequency 24 bits value Least significant bit = 1/1.00352 (Hz)
		..	
		Bit 31 MSB	
Temperature 1	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
… …			
Frequency i	4 octets	Bit 0 MSB	Overflow
		..	
		Bit 7	Not used (always at 0)
		Bit 8	Frequency 24 bits value Least significant bit = 1/1.00352 (Hz)
		..	
		Bit 31 MSB	
Temperature i	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	

… …		

Frequency N	4 octets	Bit 0 MSB	Overflow
		..	
		Bit 7	Not used (always at 0)
		Bit 8	Frequency 24 bits value Least significant bit = 1/1.00352 (Hz)
		..	
		Bit 31 MSB	
Temperature N	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
CRC	2 Octets		
Notes: if the data generated by the heating process does not fit into a single science packet, the data will be split between several packets.			

As result of a calibration (at subsystems initialisation, requested from ground or scheduled), a Science TM Packet will be generated. There are 3 types of Calibrations packets, one related with GDS, other with IS and other with the MBS. The most recent calibration packet received shall be used for deriving physical quantities on the EGSE.
The exact meaning of "sum" and "noise" in the following packets is according to these formulas:

$$\text{Sum} = \Sigma (\text{data}_i)$$
$$\text{Noise} = \Sigma (\text{data}_i^2)$$

Telemetry Packet Information			
Packet Name	GDS Calibration	Instrument	GIADA
Packet Function	GDS Calibration Science information		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	3
Structure ID		Packet length	61
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Label	2 Octets	"CG" (ASCII)	

Time of Calibration	6 Octets		
ADC Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	Temperature From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V0	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V1	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V2	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V3	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

Laser1 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser2 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser3 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser4 Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser1 Light	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

Laser2 Light	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser3 Light	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Laser4 Light	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Sum Left	4 Octets	Sum of N (N = 32) measures 32 bits unsigned integer	
Noise Left	4 Octets	Sum of N (N = 32) squared measures 32 bits unsigned integer	
Sum Right	4 Octets	Sum of N (N = 32) measures 32 bits unsigned integer	
Noise Right	4 Octets	Sum of N (N = 32) squared measures 32 bits unsigned integer	
CRC	2 Octets		

Note:
for the data 'Sum' and 'Noise', the conversion from digital number to Volts is described into APPENDIX C: Mean and Standard deviation calculation for GDS and IS calibration.

Telemetry Packet Information			
Packet Name	IS Calibration	Instrument	GIADA
Packet Function	IS Calibration Science information		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	3
Structure ID		Packet length	Variable From 229 to 511
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Label	2 Octets	"CI" (ASCII)	
Time of Calibration	6 Octets		
ADC Temperature	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V0	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V1	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

Cal. Voltage V2	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Cal. Voltage V3	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
IS Plate Temp.	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
Sum PZTA	4 Octets	Sum of N (N = 32) measures, 32 bits unsigned integer	
Noise PZTA	4 Octets	Sum of N squared measures, 32 bits unsigned integer	
Sum PZTB	4 Octets	Sum of N (N = 32) measures, 32 bits unsigned integer	
Noise PZTB	4 Octets	Sum of N squared measures, 32 bits unsigned integer	
Sum PZTC	4 Octets	Sum of N (N = 32) measures, 32 bits unsigned integer	
Noise PZTC	4 Octets	Sum of N squared measures, 32 bits unsigned integer	
Sum PZTD	4 Octets	Sum of N (N = 32) measures, 32 bits unsigned integer	
Noise PZTD	4 Octets	Sum of N squared measures, 32 bits unsigned integer	
Sum PZTE	4 Octets	Sum of N (N = 32) measures, 32 bits unsigned integer	

Noise PZTE	4 Octets	Sum of N squared measures, 32 bits unsigned integer

Calibration Configuration	2 octets	Bit 0 MSB .. Bit 7	Calibration level From 0 to 255 (8 bits) in DAC Units
		Bit 8 .. Bit 12	Not used (always at zero)
		Bit 13 ... Bit 15 LSB	Number of stimuli Shall be even (LSB at 0)
PZTA Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
PZTA Time	2 octets	Bit 0 MSB	Overflow
		.. Bit 10	Not used (always at 0)
		Bit 11 Bit 12 Bit 13 Bit 14 Bit 15 LSB	From 0 to 31 Least significant bit = 3 (μs)

PZTB Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Not used (always at 1)
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
PZTB Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTC Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Not used (always at 1)
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
PZTC Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	

PZTD Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
PZTD Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
PZTE Amplitude	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Particle detected/non-detected 0 = non-detected 1 = detected
		Bit 2	Range 0 = Low 1 = High
		Bit 3	Gain 0 = Low 1 = High
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	

PZTE Time	2 octets	Bit 0 MSB	Overflow
		..	
		Bit 10	Not used (always at 0)
		Bit 11	From 0 to 31 Least significant bit = 3 (μs)
		Bit 12	
		Bit 13	
		Bit 14	
		Bit 15 LSB	
... ...			
CRC	2 Octets		

Notes:

The data from the artificial "stimuli" are repeated the number of times specified in the "Number of Stimuli" field. This number shall be always even and at least 2; its default value is contained in the "Calibration Configuration" field in the Context File.

For the data 'Sum' and 'Noise', the conversion from digital number to Volt is described into APPENDIX C: Mean and Standard deviation calculation for GDS and IS calibration

Telemetry Packet Information			
Packet Name	MBS Calibration	Instrument	GIADA
Packet Function	MBS Calibration Science information		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	20	Service Subtype	3
Structure ID		Packet length	35
Data Field Information			
Data Field	*Field Structure*	*Remarks*	
Label	2 Octets	"CM" (ASCII)	
Time of Calibration	6 Octets		
ADC Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Cal. Voltage V0	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Cal. Voltage V1	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
Cal. Voltage V2	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	

		..	From 0 to 4095 (12 bits) in ADC units
		Bit 15 LSB	
Cal. Voltage V3	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MB1 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MB2 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MB3 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	From 0 to 4095 (12 bits) in ADC units
		..	
		Bit 15 LSB	
MB4 Temperature	2 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 3	
		Bit 4	

		.. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units

MB5 Temp	2 octets	Bit 0 MSB .. Bit 3	Not Used (Always at 0)
		Bit 4 .. Bit 15 LSB	From 0 to 4095 (12 bits) in ADC units
CRC	2 Octets		
Notes:			

2.8.3.1.10. Service 192: Cover (Private Telecommands)

The service 192 is devoted to the cover management. Different subtypes are defined.

All the commands related with cover management can be executed only in Cover Mode. In other case, an Acceptance Failure Report (Failure Code = 5) shall be issued.

2.8.3.1.10.1. Subtype 1: Arm Frangibolt

This TC is used to arm the Frangibolt before any operation (testing or activation).

Telecommand Packet Information			
Packet Name	Arm Frangibolt	Instrument	GIADA
Packet Function	Arm the Frangibolt		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	1
Structure ID		Packet length	5
Data Field Information (None)			
Notes: • GIADA will issue an Execution Report within 5 s			

Once the Frangibolt is armed, if after a defined timeout (stored in the Context File) either a Test Frangibolt of an Activate Frangibolt TC does not arrive, the Frangibolt will return automatically to disarmed state issuing an Error Event Report (Service 5, subtype 3, ID 42200 “Frangibolt to disarmed state”).

2.8.3.1.10.2. Subtype 2: Disarm Frangibolt

This TC is used to disarm the Frangibolt.

Telecommand Packet Information			
Packet Name	Disarm Frangibolt	Instrument	GIADA
Packet Function	Disarm the Frangibolt		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	2
Structure ID		Packet length	5
Data Field Information (None)			
Notes:			

2.8.3.1.10.3. Subtype 6: Test Frangibolt

This TC is used to test the Frangibolt. The test consists in activate the Frangibolt until either the testing temperature is reached, or a timeout is expired . Both these parameters are stored in the Configuration Table.

Telecommand Packet Information			
Packet Name	Test Frangibolt	Instrument	GIADA
Packet Function	Test the Frangibolt		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	6
Structure ID		Packet length	5
Data Field Information (None)			
Notes: • GIADA will issue an Execution Report within 60 s (time-out parameter contained in Context File)			

To be operated, it is mandatory that the Frangibolt is in Armed state.

In order to avoid undesired activation during testing, the Frangibolt temperature shall be below a safety limit stored in Context File.
If after the aforementioned timeout, stored in the Context File the temperature is below the testing one, a timeout error shall be issued.

The foreseen failure reports 1,8 are:

Execution Error Report ID	Error
2,6	The Frangibolt is not armed
2,11	The Frangibolt temperature is above the safety limit.
2,16	Timeout: it has been impossible to reach to the testing temperature.

Table 2.8-14: Execution Error Report for Test Frangibolt TC

2.8.3.1.10.4. Subtype 11: Activate Frangibolt

This TC is used to activate the Frangibolt.
The activation consists in delivering power to the Frangibolt until either the working temperature is reached, or a timeout is expired . Both these parameters are stored in the Context File.

Telecommand Packet Information			
Packet Name	Activate Frangibolt	Instrument	GIADA
Packet Function	Activate Frangibolt		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	11
Structure ID		Packet length	5
Data Field Information (None)			
Notes: • GIADA will issue an Execution Report within 90 s (time-out parameter contained in Context File)			

To be operated, it is mandatory that the Frangibolt is in Armed state.

If after the aforementioned timeout, stored in the Context File, the temperature is below the activation one, a timeout error shall be issued.
The foreseen failure reports 1.8 are:

Execution Error Report ID	Error
2,6	The Frangibolt is not armed
2,21	Timeout: it has been impossible to reach to the activation temperature.

Table 2.8-15: Execution Error Report for Activate Frangibolt TC

2.8.3.1.10.5. Subtype 16: Arm Cover

This TC is used to arm the motor before any operation (opening or closing).

Telecommand Packet Information			
Packet Name	Arm Cover	Instrument	GIADA
Packet Function	Arm Cover		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	16
Structure ID		Packet length	5
Data Field Information (None)			
Notes: • GIADA will issue an Execution Report within 5 s			

Once the motor is armed, if after a defined timeout (stored in the Context File) a cover operation TC (Open or Close) does not arrive, the Motor will return automatically to disarmed state issuing an Error Event Report (Service 5, 3, ID 42201, "Motor to disarmed state").

2.8.3.1.10.6. Subtype 17: Disarm Cover

This TC is used to disarm the motor.

Telecommand Packet Information			
Packet Name	**disarm Cover**	**Instrument**	**GIADA**
Packet Function	disarm Cover		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	17
Structure ID		Packet length	5
Data Field Information (None)			
Notes:			

2.8.3.1.10.7. Subtype 21: Open Cover

This TC is used to open the cover.

Telecommand Packet Information			
Packet Name	Open Cover	Instrument	GIADA
Packet Function	Open the Cover		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	21
Structure ID		Packet length	5
Data Field Information (None)			
Notes: • GIADA will issue an Execution Report within 120 s (time-out parameter contained in Context File)			

To be operated, it is mandatory that the motor is in Armed state.

To open the cover, GIADA first will turn on the Frangibolt and Cover heaters, for a time specified in the Context File;. This activity will be signalled by means of Normal Progress Event Report (5.1, IDs 42001 “Heaters on” and 42002 “Heaters off”). Then GIADA will move the motor towards the open position the number of steps specified in the Context File. During the motor operation, a log with the Cover Status will be generated and sent after the end of the movement as a Normal Progress Event Report. (5.1, ID 42007 “Cover Report”).

The foreseen failure reports 1,8 are:

Execution Error Report ID	Error
2,41	The motor is not armed
2,48	Time out in Cover Movement Operation

Table 2.8-16: Execution Error Report for Open Cover TC

During the motor activation, the heaters placed on the cover edge and on the motor will be activated the time specified in the Context File.

2.8.3.1.10.8. Subtype 26: Close Cover

This TC is used to close the cover.

Telecommand Packet Information			
Packet Name	Close Cover	Instrument	GIADA
Packet Function	Close the Cover		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	26
Structure ID		Packet length	7
Data Field Information			
Data Field	Field Structure	Remarks	
Action	2 Octets	0000(HEX) = Do not switch on heaters before closing the cover FFFF(HEX) = Switch on heaters before closing the cover	
Notes: • GIADA will issue an Execution Report before 120 s (time-out parameter contained in Context File)			

To be operated, it is mandatory that the motor is in Armed state.

The cover closing operation is similar to the one pertaining to the cover opening, with the exception that it is possible, through the "Action" parameter in the TC data field, to choose if the Motor and Cover heaters are to be switched on or not before actually closing the cover; the actual switching on/off of the heaters will be signalled by means of Normal Progress Event Report (5.1, IDs 42001 "Heaters on" and 42002 "Heaters off").

To close the cover, GIADA will move the motor towards the closed position the number of steps specified in the Context File. During the motor operation, a log with the Cover Status will be generated and sent after the end of the movement as a Normal Progress Event Report. (5.1, ID 42007 "Cover Report").

The foreseen failure reports 1,8 are:

Execution Error Report ID	Error
2,41	The motor is not armed
2,48	A Hardware error occurs in the motor circuitry

Table 2.8-17: Execution Error Report for Close Cover TC

During the motor activation, the heaters placed on the cover edge and on the motor will be activated the time specified in the Context File.

2.8.3.1.10.9. Subtype 31: Test Heater

This TC is used to test the heaters which are installed on the cover edge, on the motor body and behind the Frangibolt actuator.

Telecommand Packet Information			
Packet Name	Test Heater	Instrument	GIADA
Packet Function	Test Heater		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	192	Service Subtype	31
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Heater ID	2 Octets	Bit 0 MSB .. Bit 12	Not used (always at 0)
		Bit 13 ... Bit 15 LSB	Selected Heaters: 5 d = Cover and Frangibolt 6d = Cover and Motor
Notes: • For reasons related to the DC/DC converter, the heaters can only be switched on in couples, no more than one couple at a time. The S/W will check this condition.			

The testing is performed switching on the selected heater for 5 seconds and then sending a Normal Progress Event Report (5.1, ID 42008, " Heaters current consumption "), to demonstrate that the +/-15V currents have increased their values.
After sending the TM package, the selected heater is switched off.

The only valid values for Heater ID are 5 (Cover and Frangibolt heaters on) and 6 (Motor and Cover heaters on).

2.8.3.1.11. Service 193: GDS (Private Telecommands)

The service 193 is devoted to the GDS management.

All the commands related with GDS management can be executed only in Normal Mode. In other case, an Acceptance Failure Report (Failure Code = 5) shall be issued.

Different subtypes are defined:

2.8.3.1.11.1. Subtype 1: Arm Laser

This TC is used to arm the laser before switching them on.

Telecommand Packet Information			
Packet Name	Arm Laser	Instrument	GIADA
Packet Function	Arm Laser		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	1
Structure ID		Packet length	5
Data Field Information (None)			
Notes: • GIADA will issue an Execution Report before 5 s			

Once the lasers are armed, if after a defined timeout (stored in the Context File) the Switch Lasers On TC does not arrive, the lasers will return automatically to disarmed state issuing an Error Event Report (5.3 , ID 42210, “Lasers to disarmed state “).

If this TC is issued while the GDS is off, an Execution Failure Error Report will be generated:

Execution Error Report ID	Error
3,7	GDS is off

2.8.3.1.11.2. Subtype 2: Disarm Laser

This TC is used to disarm the lasers.

Telecommand Packet Information			
Packet Name	Disarm Laser	Instrument	GIADA
Packet Function	Disarm Laser		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	2
Structure ID		Packet length	5
Data Field Information (None)			
Notes:			

2.8.3.1.11.3. Subtype 6: Switch Laser On/Off

This TC switches the lasers ON or OFF.

Telecommand Packet Information			
Packet Name	Switch Laser On/Off	Instrument	GIADA
Packet Function	Switch Laser On/Off		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	6
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Action	2 Octets	0000(HEX) = Off FFFF(HEX) = On	
Notes: • GIADA will issue an Execution Report before 5 s			

To be switched on, it is mandatory that the lasers are in Armed state.

The foreseen failure reports 1,8 are:

Execution Error Report ID	Error
3,6	Lasers are not armed

The lasers shall always be switched on at low power mode and after a defined time (30 s) the power will be changed to the normal level specified in the "GDS Status" word, stored into the Context File.

After switching on the lasers, a calibration will be performed, and an appropriate Science Report will be generated (see section 2.8.3.1.9.3).

2.8.3.1.11.4. Subtype 11: Set GDS ON/OFF

This TC turns the GDS ON or OFF.

Telecommand Packet Information			
Packet Name	Set GDS On/Off	Instrument	GIADA
Packet Function	Set GDS On/Off		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	11
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Action	2 Octets	0000(HEX) = OFF FFFF(HEX) = ON	
Notes:			

After turning GDS on, GIADA will issue an Onboard Action Event Report (5.4, ID 42033, "Start Switch_Lasers_On_OBCP ") to start the relevant OBCP.

The GDS Operation Mode will be set according to the default configuration stored into the Configuration Table. The default mode can be changed from ground using the appropriate TC.

During GDS operation, GIADA shall check every 40 s that the temperature of the lasers is within the operating limits (see section 2.8.1.2.2.2). If the temperature is out of the limits, GIADA will first issue an Error Report (5.3, either ID 42211 "Laser Temperature Above Max Temp" or ID 42212 "Laser Temperature Below Min Temp"), and then issue a Onboard Action Event Report (5.4, ID 42032 "Start Emergency_Close_Cover_OBCP").

2.8.3.1.11.5. Subtype 16: Set GDS Operation Mode

This TC changes the default operation mode of the GDS.

Telecommand Packet Information			
Packet Name	GDS Mode	Instrument	GIADA
Packet Function	Set GDS Operation Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	16
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
GDS Operation Mode	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Not used (always at 0)
		Bit 2 Bit 3	Default Laser Power 00 = OFF 01 = Low 10 = Medium 11 = High
		Bit 4 Bit 5	Laser Operation Mode 01 = DC Couple 1 only 10 = DC Couple 2 only 11 = AC Both Couples
		Bit 6	Receiver Left Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 7	Receiver Right Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 8 Bit 9 Bit 10 Bit 11 Bit 12 Bit 13	Not used (always at 0)
		Bit 14	# of Detection

		Bit 15 LSB	From 1 to 3
Notes:			

The nominal sequence for configuring and start using the GDS is as follows:

- Set GDS ON
- Arm Lasers
- Switch On Lasers
- Set GDS Operation Mode (if needed)
- Set Photodiode Thresholds (if needed)

2.8.3.1.11.6. Subtype 26: Set Photodiode Threshold.

This TC sets the threshold of both photodiodes channels.

Telecommand Packet Information			
Packet Name	Set Photodiode Threshold	Instrument	GIADA
Packet Function	Set Photodiode Threshold		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	26
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
GDS Thresholds	2 octets	Bit 0 MSB .. Bit 7	Threshold Left From 0 to 255 (8 bits) in DAC Units
		Bit 8 Threshold Right From 0 to 255 (8 bits) in DAC Units .. Bit 15 MSB	
Notes: if the thresholds are to be set at a value different from the default one of 255 DAC Units, the relevant TC shall be issued after the GDS operation mode has already been commanded, otherwise the thresholds will be reset to their defaults.			

2.8.3.1.11.7. Subtype 46: Calibrate GDS

This TC starts the calibration procedure of the GDS electronics.

Telecommand Packet Information			
Packet Name	Calibrate GDS	Instrument	GIADA
Packet Function	Calibrate GDS		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	193	Service Subtype	46
Structure ID		Packet length	5
Data Field Information: None			
Notes: • GIADA will generate a Science TM Packet with the calibration data			

2.8.3.1.12. Service 194: IS (Private Telecommands)

The service 194 is devoted to the IS management.

All the commands related with IS management can be executed only in Normal Mode. In other case, an Acceptance Failure Report (Failure Code = 5) shall be issued.

Different subtypes are defined:

2.8.3.1.12.1. Subtype 1: Set IS ON/OFF

This TC turns the IS ON or OFF.

Telecommand Packet Information			
Packet Name	Set IS On/Off	Instrument	GIADA
Packet Function	Set IS On/Off		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	194	Service Subtype	1
Structure ID		Packet length	7
Data Field Information			
Data Filed	Field Structure	Remarks	
Action	2 Octets	0000(HEX) = Off FFFF(HEX) = On	
Notes:			

The IS Operation Mode will be set according to the default configuration stored into the Configuration Table. This mode can be changed from ground using the appropriate TC.

After switching on the IS, a calibration will be performed, and an appropriate Science Report will be generated (see section 2.8.3.1.9.3).
GIADA shall issue a Science Report with the calibration results.

During IS operation, GIADA shall check every 40 s that the temperature of the IS plate is within the non-operating limits. If the temperature is out of the non-operating limits, GIADA will first issue an Error Report (5.3, either ID 42240 "IS Plate Temperature Above MAX NON-OP Temp" or ID 42241 "IS Temperature Below Min Temp"), and then issue a Onboard Action Event Report (5.4, ID 42032 "Start Emergency_Close_Cover_OBCP").

GIADA shall also check every 40 s that the temperature of the IS plate is below the maximum operating limit; if this condition is not true, GIADA will first issue an Error Report (5.3, ID 42220 "IS Plate Temperature Above MAX-OP Temp"), and then switch off the IS autonomously. As a consequence of switching off the IS, another Error Report (5.3, ID 42219 "IS switched-off due to thermal contingency") will be issued.
As soon as the IS plate temperature goes again inside the operating limits (plus/minus an hystheresis), the IS will be switched on autonomously, and an Error Report (5.3, ID 42218 "IS switched-on, status resumed by end of thermal contingency") will be issued.

Refer to section 2.8.1.2.2.2 for more details about management of thermal contingencies.

2.8.3.1.12.2. Subtype 6: Set IS Operation Mode

This TC sets the IS operation mode.

Telecommand Packet Information			
Packet Name	IS Mode	Instrument	GIADA
Packet Function	Set IS Operation Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	194	Service Subtype	6
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
IS Operation Mode	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)
		Bit 3	PZTE Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 4	PZTD Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 5	PZTC Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 6	PZTB Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 7	PZTA Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 8	Range 0 = Low 1 = High
		Bit 9	Not Used (Always at 0)
		Bit 10	Not Used (Always at 0)
		Bit 11	Gain PZTE 0 = Low 1 = High
		Bit 12	Gain PZTD 0 = Low 1 = High
		Bit 13	Not used (always at 1)
		Bit 14	Not used (always at 1)
		Bit 15 LSB	Gain PZTA 0 = Low 1 = High
Notes:			

2.8.3.1.12.3. Subtype 11: Set PZT Threshold Level

This TC sets the threshold of the five PZTs.

Telecommand Packet Information			
Packet Name	Set PZT Threshold Level	Instrument	GIADA
Packet Function	Set PZT Threshold		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	194	Service Subtype	11
Structure ID		Packet length	11
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
IS Thresholds	6 octets	Bit 0 MSB	Not Used (Always at 0)
		..	
		Bit 7	
		Bit 8	Threshold PZTA From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 15	
		Bit 16	Threshold PZTB From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 23	
		Bit 24	Threshold PZTC From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 31	
		Bit 32	Threshold PZTD From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 39	
		Bit 40	Threshold PZTE From 0 to 255 (8 bits) in DAC Units
		..	
		Bit 47 LSB	
Notes:			

2.8.3.1.12.4. Subtype 26: Calibrate IS

This TC starts the calibration procedure of the IS electronics.

Telecommand Packet Information			
Packet Name	Calibrate IS	Instrument	GIADA
Packet Function	Calibrate IS		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	194	Service Subtype	26
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Calibration Configuration	2 octets	Bit 0 MSB .. Bit 7	Calibration level From 0 to 255 (8 bits) in DAC Units
		Bit 8 .. Bit 15 LSB	Number of stimuli Shall be an even (LSB at 0) number, between 2 and 8

Notes:

- GIADA will generate a Science TM Packet with the calibration data
- When an IS calibration is started, regardless if autonomously by IS switch on or by the relevant TC, the GIADA S/W will start a data collecting window of 10 s. If no data are received from the IS PE within this time, GIADA will fill every enabled PZT Amplitude and Time fields in the packet with all zeros

2.8.3.1.13. Service 195 MBS (Private Telecommands)

The service 195 is devoted to the MBS management.

All the commands related with MBS management can be executed only in Flux or in Normal Mode. In other case, an Acceptance Failure Report (Failure Code = 5) shall be issued.

Different subtypes are defined:

2.8.3.1.13.1. Subtype 1: Set MBS ON/OFF

This TC turns the MBS ON or OFF.

Telecommand Packet Information			
Packet Name	Set MBS On/Off	Instrument	GIADA
Packet Function	Set MBS Operation Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	195	Service Subtype	1
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Action	2 Octets	0000(HEX) = OFF FFFF(HEX) = ON	
Notes:			

The MBS Operation Mode will be set according to the default configuration stored into the Configuration Table. This mode can be changed from ground using the appropriate TC.

The MBS shall be read periodically and a Science Package shall be issued with the data. The reading period is stored into the Configuration Table and can be modified using the appropriate TC.

Before beginning the MBS operation, a calibration shall be performed (see section 2.8.3.1.9.3).
GIADA shall issue a Science Report with the calibration results.

The calibration can either be started from ground using the appropriate TC or automatically with a time period stored into the Configuration Table.

During MBS operation, GIADA shall check every 40 s that the temperature of every microbalance is below the maximum operating limit (see section 2.8.1.2.2.2). If the temperature is out of the

limits, GIADA will first issue an Error Report (5.3, ID 42230 "MBS Temperature Above Max Temp"), and then issue a Onboard Action Event Report (5.4, ID 42032 "Start Emergency_Close_Cover_OBCP").

When any MB is saturated, it is possible to clean it by heating. This is commanded using the appropriate TC.

2.8.3.1.13.2. Subtype 6: Set MBS Operation Mode

This TC sets the MBS default operation mode.

Telecommand Packet Information			
Packet Name	Set MBS Operation Mode	Instrument	GIADA
Packet Function	Set MBS Operation Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	195	Service Subtype	6
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
MBS Operation Mode	2 octets	Bit 0 MSB	Not used (always at 0)
		Bit 1	Not used (always at 0)
		Bit 2	Not used (always at 0)
		Bit 3	MB5 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 4	MB4 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 5	MB3 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 6	MB2 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 7	MB1 Enabled/Disabled 0 = Disabled 1 = Enabled
		Bit 8 .. Bit 15 LSB	Not used (always at 0)
Notes:			

2.8.3.1.13.3. Subtype 21: Set Time Interval Between Measures

This TC defines the time interval between MB's readings.

Telecommand Packet Information			
Packet Name	Set Time Meas.	Instrument	GIADA
Packet Function	Time Interval Between Measures		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	195	Service Subtype	21
Structure ID		Packet length	9
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
Time	4 Octets	Number of seconds	
Notes: while it is possible to set the reading interval to a value below 5 seconds, this shall be avoided since it is meaningless (each of the five microbilances needs an integration time of 1 s to be read).			

2.8.3.1.13.4. Subtype 26: Heat MB

This TC starts the heating of the specified MB.

Telecommand Packet Information			
Packet Name	Heat MB	Instrument	GIADA
Packet Function	Heat MB ID		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	195	Service Subtype	26
Structure ID		Packet length	7
Data Field Information			
Data Filed	*Field Structure*	*Remarks*	
MB ID	2 Octets	Bit 0 MSB	Not used (always at 0)
		..	
		Bit 12	
		Bit 13	MB ID = 1..5
		Bit 14	
		Bit 15 LSB	
Notes: • GIADA will generate one or more Science TM Packets, containing the data coming from the selected MB heating.			

GIADA shall issue a Science Report with the results.

The selected MB shall be heated until the maximum heating temperature is reached or a timeout occurs. In the meanwhile, the data are collected into science packets which are sent to the DMS. As in the packets the temperature is included, it can be checked if there was a timeout. This avoids the use of an error report.

The maximum heating temperature is stored in the Configuration Table.

When GIADA is in Normal Mode, before starting the heating, the GDS and the IS shall be commanded off by the proper TCs. After the heating the GDS and the IS shall be switched on or off (via TCs) according to the "Normal Mode" definition stored in the Configuration Table.

GIADA will check that IS and GDS are switched off in the acceptance of the TC and report an Acceptance Failure Report (TM 1,2) if one of them is switched on:

Failure Code	Error
6	Packet data field inconsistent

2.8.3.1.13.5. Calibrate MBS

This command starts the calibration procedure for the MBS.

Telecommand Packet Information			
Packet Name	Calibrate MBS	Instrument	GIADA
Packet Function	Calibrate MBS		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	195	Service Subtype	36
Structure ID		Packet length	5
Data Field Information: None			
Notes: • GIADA will generate a Science TM Packet with the calibration data			

2.8.3.1.14. Service 196 Mode Manager (Private Telecommand)

2.8.3.1.14.1. Subtype 1: Go to Safe Mode

This TC changes the operation mode to Safe Mode.

Telecommand Packet Information			
Packet Name	Go to Safe Mode	Instrument	GIADA
Packet Function	Go to Safe Mode		
Generation Rules			
Header Information			
Process ID	90	**Packet Category**	12
Service Type	196	**Service Subtype**	1
Structure ID		**Packet length**	5
Data Field Information: None			
Notes: This TC is always accepted by GIADA, even if other activities (like cover opening, frangibolt actuation etc.) are running, i.e. the error code 5 with parameter 0xA55A "TC is not finished yet" is not applicable. As a consequence, any activity that has not still been completed will be interrupted when this command is received, regardless of its completion.			

As result of the change in the operation mode, a Progress Report (5.1, ID 42050, “GIADA in Safe Mode”) will be issued.

2.8.3.1.14.2. Subtype 6: Go to Cover Mode

This TC changes the operation mode to Cover Mode.

Telecommand Packet Information			
Packet Name	Go to Cover Mode	Instrument	GIADA
Packet Function	Go to Cover Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	196	Service Subtype	6
Structure ID		Packet length	5
Data Field Information: None			
Notes:			

As result of the change in the operation mode, a Progress Report (5.1, ID 42051, “GIADA in Cover Mode”) will be issued.

2.8.3.1.14.3. Subtype 11: Go to Normal Mode

This TC changes the operation mode to Normal Mode.

Telecommand Packet Information			
Packet Name	Go to Normal Mode	Instrument	GIADA
Packet Function	Go to Normal Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	196	Service Subtype	11
Structure ID		Packet length	5
Data Field Information: None			
Notes:			

As result of the change in the operation mode, a Progress Report (5.1, ID 42052, “GIADA in Normal Mode”) will be issued.

2.8.3.1.14.4. Subtype 16: Go to Flux Mode

This TC changes the operation mode to Flux Mode.

Telecommand Packet Information			
Packet Name	Go to Flux Mode	Instrument	GIADA
Packet Function	Go to Flux Mode		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	196	Service Subtype	16
Structure ID		Packet length	5
Data Field Information: None			
Notes:			

As result of the change in the operation mode, a Progress Report (5.1, ID 42053, “GIADA in Flux Mode”) will be issued.

2.8.3.1.15. Service 255: Co-ordinated Commands

2.8.3.1.15.1. Subtype 1: Reset Telemetry Output Buffer

If the TM stream from the unit appears corrupted, the DMS may issue this command as part of the TM recovery procedure described in EID-A section 2.7.3.2.

Telecommand Packet Information			
Packet Name	Reset Telemetry Output Buffer	Instrument	GIADA
Packet Function	Reset Telemetry Output Buffer		
Generation Rules			
Header Information			
Process ID	90	Packet Category	12
Service Type	255	Service Subtype	1
Structure ID		Packet length	5
Data Field Information: None			
Notes:			

2.8.4. DMS Resource Requirements

2.8.4.1. SSMM Utilisation

See Volume VI.

2.8.4.2. On-Board Control Procedures

Several OBCPs are foreseen in order to control mainly initialisation and shut-down procedures. Also, all those functions related with potentially dangerous operations (open/close the cover and switch the lasers on) shall always controlled by a OBCP.

2.8.4.2.1. Power_On_OBCP(Line)

2.8.4.2.1.1. Objective

This OBCP is devoted to switch GIADA on.

2.8.4.2.1.2. Invocation Parameters

Line: 1 Indicates Main Power Line.
2 Indicates Redundant Power Line.

2.8.4.2.1.3. Preconditions

GIADA shall be OFF
No other GIADA OBCP shall run

2.8.4.2.1.4. Pseudocode Listing

```
Inform To Ground: Power On OBCP Begin
Power On GIADA with Parameter Power line
Wait 20 s
Send TC (9,1) to GIADA: Accept Time Update
Wait 20 s for HK Report (3,25) //HK synchronised
If (Not Received synchronised HK Report)
Then
   //HK desynchronised
   Wait (60-(20+20))s for HK Report (3,25)

   If (Not Received desynchronised HK Report)
   Then
       Send TC(17,1) to GIADA: Request Connection
     Test
      Wait 20 s for Connection Test Response (17, 2)
```

```
            If (Not Received Connection Test Response)
            Then
                Inform To Ground: Parameter Power Line
                fails
               Inform To Ground: Power On OBCP End
              Call OBCP Power Off
            Else
               Inform To Ground: HK Not Received, but
          Connection is alive
          Endif
       Endif
    Endif
    //local OBCP variable to hold do..while loop
    starting time
    Actual_SC_Time:= actual SCET;

    Do
          //local OBCP variable to hold actual S/C time
          Safe_Mode_Timeout := actual SCET;
          If (received TM(5,1)))
          Then
                If (TM (5,1) Param: 42050)
                Then
                      Inform To Ground: GIADA in Safe Mode
                      Send TC(18,3) to GIADA: Accept
                      Context Request
                      Inform To Ground: GIADA Power On
                      Successfully
                      Inform To Ground: Power On OBCP End
                      END OBCP
                Endif
          Endif
                If (TM (5,3) Param: 42310)
                Then
                      Inform to Ground: EDAC Error During
                      S/W Start and Dump
                Endif
                If (TM (5,3) Param: 42309)
                Then
                      Inform To Ground: Previous Execution
                      Reset by Watch Dog
                Endif

    until (Safe_Mode_Timeout >= Actual_SC_Time + 24)
    Inform to Ground: GIADA Power On not Successfully
    Performed
    Call OBCP Power Off
    END OBCP
```

2.8.4.2.1.5. TC/TM Listing

2.8.4.2.1.5.1. TC

Accept Time Update (9,1)
Request Connection Test (17,1)

Accept Context Request (18,3)

2.8.4.2.1.5.2. TM

Normal Progress Event Report (5,1), ID 42050
Anomalous Event Report – Ground Action (5,3), IDs 42309 & 42310
HK Report (3,25)
Connection Test Response (17,2)

2.8.4.2.1.6. Time Constraints

Duration: 120 s (TBC)
Frequency: One per initialisation.

2.8.4.2.2. Power Off OBCP

2.8.4.2.2.1. Objective

This OBCP is devoted to switch GIADA Off.

2.8.4.2.2.2. Invocation Parameters

None

2.8.4.2.2.3. Preconditions

GIADA shall be ON.
GIADA shall be in Safe Mode
No other GIADA OBCP shall run

2.8.4.2.2.4. Pseudocode Listing

```
Inform To Ground: Power Off OBCP begin
Send TC to GIADA: Report Context Request (18,1)
Wait 36 s for Context Report TM (18,2)
If (TM Context Report Timeout)
Then
   Inform To Ground: GIADA Context Report Timeout
Else
   Store Context Report into SSMM
   Inform To Ground: GIADA Power off Successfully
Performed
Endif
Power off GIADA
Inform To Ground: Power Off OBCP End
END OBCP
```

2.8.4.2.2.5. TC/TM

2.8.4.2.2.5.1. TC

Report Context Request (18,1)

2.8.4.2.2.5.2. TM

Context Report (18,2)

2.8.4.2.2.6. Time Constraints

Duration: 70 s (TBC)
Frequency: One for per Power Off.

2.8.4.2.3. Activate_Frangibolt_OBCP

2.8.4.2.3.1. Objective

Activation of the Frangibolt.

2.8.4.2.3.2. Invocation parameters

None.

2.8.4.2.3.3. Preconditions

GIADA shall be in Cover Mode.
No other OBCP shall run.
No more than 5 s shall elapse between the sending of TCs (192,1) and (192,11).

2.8.4.2.3.4. Pseudocode Listing

```
Inform To Ground: Frangibolt Test OBCP Begin
Send TC(192,1) to GIADA: Arm Frangibolt
Wait 30 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
Then
   Inform To Ground: Frangibolt cannot be Armed
   Inform To Ground: Frangibolt Test OBCP End
   END OBCP
Endif


Inform To Ground: Frangibolt Armed

Send TC(192,11) to GIADA: Activate Frangibolt
Wait 240 s for TM(1,7) or TM(1,8): Execution Report

If (received Execution Failure Report (1,8))
Then Inform To Ground: Failed to Activate Frangibolt
Else
   If (received Execution Success Report (1,7))
   Then Inform To Ground: Activation Frangibolt
Successfully
   Endif
Endif
Inform To Ground: Frangibolt Activation OBCP End
END OBCP
```

2.8.4.2.3.5. TC/TM

2.8.4.2.3.5.1. TC

Arm Frangibolt(192,1)
Activate Frangibolt (192,11)

2.8.4.2.3.5.2. TM

Execution Report Success (1,7)
Execution Report Failure (1,8)

2.8.4.2.3.6. Time Constraints

Duration: 300 s (TBC)
Frequency: One per Activate Frangibolt.

2.8.4.2.4. Open Cover OBCP

2.8.4.2.4.1. Objective

This OBCP is devoted to open the cover. Because this is a potentially dangerous action, it will be always controlled by a OBCP and never in autonomous mode.

2.8.4.2.4.2. Invocation Parameters

None.

2.8.4.2.4.3. Preconditions

GIADA shall be in Cover Mode.
No other OBCP shall run.
No more than 5 s shall elapse between the sending of TCs (192,16) and (192,21).

2.8.4.2.4.4. Pseudocode Listing

```
Inform To Ground: Open Cover OBCP begin

Send TC(192,16) to GIADA: Arm Cover

Wait 30 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
Then
   Inform To Ground: Cover cannot be Armed
   Inform To Ground: Open Cover OBCP End
   END OBCP
Endif
```

```
If (received Execution success Report (1,7))
Then Inform To Ground:GIADA Arm Cover Successfully
Endif

Send TC (192,21) to GIADA: Open Cover

Wait 200 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
Then  Inform To Ground: GIADA Cover cannot be open
Else
   If (received Execution Success Report (1,7))
   Then Inform To Ground: GIADA Cover Open
Successfully
   Endif
Endif
Inform To Ground: Open Cover OBCP End
END OBCP
```

2.8.4.2.4.5. TC/TM

2.8.4.2.4.5.1. TC

Arm cover (192,16)
Open Cover (192,21)

2.8.4.2.4.5.2. TM

Execution Report Success (1,7)
Execution Report Failure (1,8)

2.8.4.2.4.6. Time Constraints

Duration: 300 s (TBC)
Frequency: One per each open cover.

2.8.4.2.5. Close_Cover_OBCP

2.8.4.2.5.1. Objective

This OBCP is devoted to open the cover. Because this is a potentially dangerous action, it will be always controlled by a OBCP and never in autonomous mode.

2.8.4.2.5.2. Invocation Parameters

None

2.8.4.2.5.3. Preconditions

GIADA shall be in Cover Mode.
No other OBCP shall run.
No more than 5 s shall elapse between the sending of TCs (192,16) and (192,26).

2.8.4.2.5.4. Pseudocoding Listing

```
Inform To Ground: Close OBCP begin
Send TC(192,16) to GIADA: Arm Cover

Wait 30 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
Then
   Inform To Ground: Cover cannot be Armed
   END OBCP
Else
   If (received Execution success Report (1,7))
   Then Inform To Ground: GIADA Arm Cover
Successfully
   Endif
Endif
Send TC (192,26) with parameter 0xFFFF to GIADA:
Turn on heaters and Close Cover

Wait 120 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
Then  Inform To Ground: GIADA Cover cannot be closed
Else
   If (received Execution Success Report (1,7))
   Then Inform To Ground: GIADA Cover Closed
Successfully
   Endif
Endif
Inform To Ground: Close Cover OBCP End
```

```
END OBCP
```

2.8.4.2.5.5. TC/TM

2.8.4.2.5.5.1. TC

Arm cover (192,16)
Close Cover (192,26)

2.8.4.2.5.5.2. TM

Execution Report Success (1,7)
Execution Report Failure (1,8)

2.8.4.2.5.6. Time Constraints

Duration: 300 s (TBC)
Frequency: One per each close cover

2.8.4.2.6. Switch On Lasers OBCP

2.8.4.2.6.1. Objective

This OBCP is devoted to switch the lasers on. Because this is a potentially dangerous action, it will be always controlled by a OBCP and never in autonomous mode.

2.8.4.2.6.2. Invocation Parameters

None.

2.8.4.2.6.3. Preconditions

GIADA shall be in Normal Mode.
No other GIADA OBCP shall run.
This OBCP shall only be triggered when GIADA generates an On-board Action Event Report (5.4, ID 42033 " Start Switch Lasers ON OBCP").
No more than 5 s shall elapse between the sending of TCs (193,1) and (193,6)

2.8.4.2.6.4. Pseudocoding Listing

```
Inform To Ground: Switch_Lasers_On_OBCP Begin

Send TC(193,1) to GIADA: Arm Laser

Wait 30 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
```

```
Then
   Inform To Ground: Laser cannot be Armed
   Inform To Ground: Switch Laser On OBCP End
   END OBCP
Else
   If (received Execution success Report (1,7))
   Then Inform To Ground: GIADA Laser Armed
Successfully
   Endif
Endif
Send TC (193,6) to GIADA: Switch Laser On

Wait 30 s for TM(1,7) or TM(1,8):Execution Report

If (received Execution Failure Report (1,8))
Then Inform To Ground: Laser can't be Switched On
Else
   If (received Execution Success Report (1,7))
   Then Inform To Ground: Lasers Switched On
   Endif
Endif
Inform To Ground: Switch Laser On OBCP End
END OBCP
```

2.8.4.2.6.5. TC/TM

2.8.4.2.6.5.1. TC

Arm Laser (193,1)
Switch laser ON (193,6)

2.8.4.2.6.5.2. TM

Execution Failure Report (1,8)
Execution Success Report (1,7)

2.8.4.2.6.6. Time Constraints

Duration: 60 s (TBC)
Frequency: One per Switch Laser On

2.8.4.3. On-Board Monitoring Requirements

None. GIADA performs all health and housekeeping task autonomously.

2.8.4.4. Information Distribution Requirements

As described in section 2.8.3.1.2.3, GIADA will offer the Dust Flux information embedded within the HK packets that it generates.

INFORMATION OFFERED	Instrument:	GIADA
Entity	Availability	Remarks
Parameters		
Dust Flux	This parameter is only available when GIADA is in Normal Mode and the IS subsystem is switched on. Frequency of refreshing: the Dust Flux will be recalculated every 40 s	From 0 to 600 = Number of IS events in last minute (counts·dm^{-2}·min^{-1}) 'EEEE' (hex) = Dust Flux not available 'FFFF' (hex) = Overflow

Table 2.8-18: Information Distribution Offered

2.8.4.5. DMS TM Packetisation Requirements

Not applicable.

2.8.5. Summary of all Services Requests and Reports

While GIADA is working, it will be able to accept any of the mandatory Packet Services and some of the optional ones. The table below provides a summary of all the Requests and Reports supported by GIADA.

ST	Service Requests	ST	Service Reports
Telecommand Verification Service – 1			
		1	Acceptance Success Report
		2	Acceptance Failure Report
		7	Execution Completion Success Report
		8	Execution Completion Failure Report
Housekeeping Reporting –3			
5	Enable Housekeeping Report		

	Generation		
6	Disable Housekeeping Report Generation		
		25	Housekeeping Report
Event Reporting – 5			
		1	Normal/Progress Report
		2	Error/Anomaly Report - Warning
		3	Error/Anomaly Report - Ground Action
		4	Error/Anomaly Report – On-board Action
Memory Management Service – 6			
2	Load Memory Absolute Addressing		
5	Dump Memory Absolute Addressing	6	Dump Memory Absolute Addressing Report
9	Check Memory Absolute Addressing	10	Check Memory Absolute Addressing Report
Time Management Service – 9			
1	Accept Time Update		
Test Service – 17			
1	Perform Connection Test	2	Connection Test Report
Context Transfer Service – 18			
1	Report Context	2	Context Report
3	Accept Context		
Information Distribution Service - 19			
Science Data Transfer Service – 20			
1	Enable Science Packet Generation	3	Science Report
2	Disable Science Packet Generation		
Private Telecommand Service: Cover - 192			
1	Arm Frangibolt		
2	Disarm Frangibolt		
6	Test Frangibolt		
11	Activate Frangibolt		
16	Arm Cover		
17	Disarm Cover		
21	Open Cover		
26	Close Cover		

31	Test Heater		
32 25 5	Spare		
Private Telecommand Service: GDS - 193			
1	Arm Laser		
2	Disarm Laser		
6	Switch Laser On/Off		
11	Set GDS On/Off		
16	Set GDS Operation Mode		
26	Set Photodiode Threshold		
46	Calibrate GDS		
47 25 5	Spare		
Private Telecommand Service: IS - 194			
1	Set IS On/Off		
6	Set IS Operation Mode		
11	Set PZT Threshold Level		
26	Calibrate IS		
27 25 5	Spare		
Private Telecommand Service: - MBS 195 (Flux and Normal Modes)			
1	Set MBS On/Off		
6	Set MBS Operation Mode		
21	Set Time Between Measurements		
26	Heat MBS		
36	Calibrate MBS		
37 25 5	Spare		
Private Telecommand Service: - Mode Transitions 196			
1	Safe Mode		
6	Cover Mode		
11	Normal Mode		
16	Flux Mode		
17 25 5	Spare		
Private Telecommand Service: Co-ordinated Commands – 255			
1	Reset Telemetry Output		

Table 2.8-1 Summary of All Services Request and Reports

2.8.6. Description of the OBCPs for contingency operation

Several OBCPs are foreseen in order to have some contingency operations.

2.8.6.1. Emergency_Close_Cover_OBCP

2.8.6.1.1. Objective

If the temperature of any of the GIADA subsystems exceeds the allowed limits, the cover shall be closed as soon as possible to avoid permanent faults. This is done by means of this OBCP.

2.8.6.1.2. Invocation Parameters

None.

2.8.6.1.3. Preconditions

The cover shall be open.
This OBCP should be triggered after GIADA generates an On-board Action Event Report (5.4, ID 42032, " Start Emergency Cover Close OBCP").

2.8.6.1.4. Pseudocoding Listing (TBC)

```
Inform To Ground: Emergency_Close_Cover_OBCP Begin;
Goto_Mode_OBCP(Safe);
Goto_Mode_OBCP(Cover):
Close_Cover_OBCP;
Goto_Mode_OBCP(Safe);
Inform To Ground: Emergency_Close_Cover_OBCP End;
End OBCP
```

2.8.6.1.5. TC/TM

2.8.6.1.5.1. TC

All the ones contained in the descriptions of the called OBCPs

2.8.6.1.5.2. TM

All the ones contained in the descriptions of the called OBCPs

2.8.6.1.6. Time Constraints

Duration: 500 s
Frequency: one for every thermal contingency

APPENDIX A: Bit Numbering Convention

The following convention shall be used to identify each bit in an N-bit field:

Bit 0 MSB		Bit N-1 LSB

The first bit in the field (starting from the left) is defined to be "Bit 0" and will be represented as the left most justified bit in a figure. The next bit is called "Bit 1", and so on, up to "Bit N-1", the bits being represented in this order from left to right in a figure.

All parameters and value in GIADA are of the “Unsigned Integer” type, so Bit 0 is the MSB and Bit N-1 is
the LSB.

Adjacent groups of bits are described in terms of octets and words:

1 octet = 1 byte = 8 bits
1 word = 2 octets = 16 bits

For multiple-byte words, the byte orientation is the same as the bit orientation. The first byte in the word (starting from the left) is defined to be "Byte 0, is the Most Significant Byte and is transmitted first. The next byte is called "Byte 1", and so on, up to "Byte N-1".

Parameters shall have the size of 16, 32 or 48 bits.

Parameters with a length shorter than 16 bits shall be right-adjusted within the occupied 16-bit word, leaving any required padding-bits in the most significant bits of the 16-bit word.

Parameters with a length bigger than 16 bits but shorter than 32 bits shall be right-adjusted within the occupied 32-bit word, leaving any required padding-bits in the most significant bits of the 32-bit word.

Parameters with a length bigger than 32 bits but shorter than 48 bits shall be right-adjusted within the occupied 48-bit word, leaving any required padding-bits in the most significant bits of the 48-bit word.

If more than one parameter is held in a single word the parameters shall be right adjusted.

APPENDIX B: ADC & DAC Unit Definition

In this document, the term 'ADC Unit' is intended as the nominal value (in millivolt) of the analog to digital converter least significant bit.
The nominal value for the ADC Unit is 2.95 mV.
To obtain the voltage actually converted by the ADC, the following formula must be applied:

V = F· Digital_value + Offset [V]

With:
Main channel:

Ref	Voltages	ADC Counts
V3	0 V	286
V2	1.102 V	661
V1	4.416 V	1789
V0	9.914 V	3659

Redundant channel:

Ref	Voltages	ADC Counts
V3	0 V	288
V2	1.105 V	664
V1	4.417 V	1793
V0	9.916 V	3666

One obtains:

F = + 0.0029 [V]
Offset = – 0.8406 [V] main channel
Offset = – 0.8454 [V] redundant channel

In this document, the term 'DAC Unit' is intended as the nominal value (in millivolt) of the digital to analog converter least significant bit.
The nominal value for the DAC Unit is 9.8 mV.

APPENDIX C: Mean and Standard deviation calculation for GDS and IS calibration

From the definition of mean and noise as calculated by the instrument [Sum = Σ ($data_i$); Noise = Σ ($data_i^2$)], the actual value of Mean and Standard Deviation (STD) in ADC units are computed as below:

$$Mean = Sum / N$$
$$STD = [(Noise / N) - Mean^2]^{1/2}$$

where N = 32.

Value of Mean and STD in Volt are computed as below:

$$Mean\_Volt = F \cdot Mean + Offset\ [V]$$
$$STD\_Volt = F \cdot STD\ [V]$$

where:

$$F = + 0.0029\ [V]$$
$$Offset = - 0.8406\ [V]\ \text{main channel}$$
$$Offset = - 0.8454\ [V]\ \text{redundant channel}$$

Appendix B. GIADA RAM Memory Map

The GIADA RAM Memory Map is shown in Figure 4.

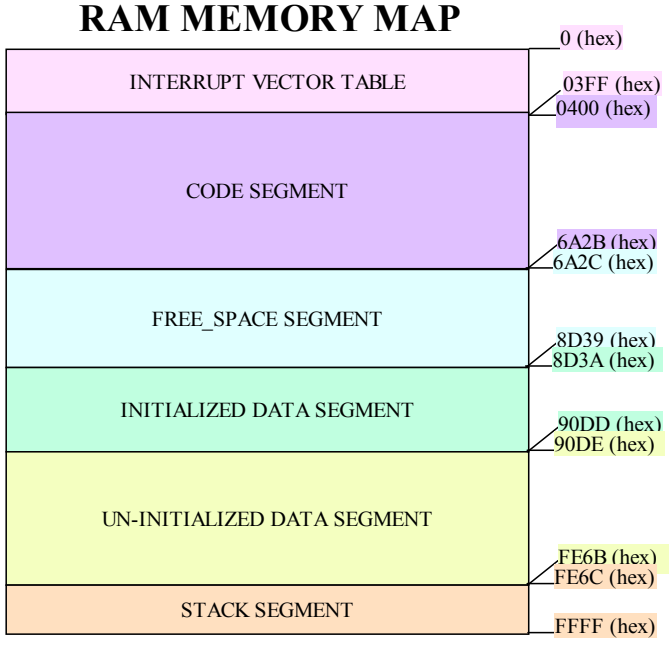

Figure 4. GIADA RAM Memory Map

Below resides a low level map of RAM segment ordered by name and later by address and also a detailed memory map of each module in C (correspondence between source code line number and its start address in RAM).

```
Start  Stop   Length Name               Class

00000H 06A2BH 06A2CH _TEXT              CODE
06A2CH 08D39H 0230EH _FREESPACE         FREESPACE
08D3AH 090DDH 003A4H _DATA              DATA
090DEH 0FE6BH 06D8EH _BSS               BSS
0FE6CH 0FE6CH 00000H _BSSEND            BSSEND

 Address         Publics by Name

0000:0428       DGROUP@
0000:042A       N_SCOPY@
0000:1B92       _AcceptContextFile
0000:111C       _ActivateDesactivateCoverHeater
0000:13E3       _ActivateFrangibolt
0000:1871       _ActivateFrangiboltTimeout
0000:9144       _ActivateFrangiboltTimeoutTaskHandle
0000:075D       _ActivateIRQ
```

```
0000:6724       _ActivateTCProcessing
0000:9112       _ActivateTCProcessingTaskHandle
0000:B69A       _ActualPatchIndex
0000:B698       _ActualPatchIndexWordSize
0000:910C       _ADCErrorReportTaskHandle
0000:609A       _AddFile
0000:90DE       _AdditionalVars
0000:431D       _AddPatch
0000:4B04       _AddSchedulerTask
0000:4A6C       _AddSchedulerTaskArray
0000:4416       _Apply8Patches
0000:447B       _ApplyPatchesParallelTask
0000:394F       _ArmAndHeatHeater
0000:1414       _ArmCover
0000:18CF       _ArmCoverTimeout
0000:9140       _ArmCoverTimeoutTaskHandle
0000:11D5       _ArmFrangibolt
0000:1E9F       _ArmLaser
0000:912E       _AskForLaserOnTaskHandle
0000:B696       _BitMaskForPatch
0000:DE46       _BoardTemperatureOutOfRange
0000:8D44       _BoardTemperaturesAndCurrentsMuxChannels
0000:0DA3       _BuildStatistisc
0000:5CE0       _CalculateAndCheckCRC
0000:228C       _CalibrateGDS
0000:2284       _CalibrateGDSScheduler
0000:30FA       _CalibrateIS
0000:30F1       _CalibrateISScheduler
0000:3CFB       _CalibrateMBS
0000:3CF7       _CalibrateMBScheduler
0000:8D3A       _CalibrationVoltagesMUXChannels
0000:1C94       _CanGenerateEventReport
0000:4694       _ChangeCodeSegment
0000:233D       _ChangeToRealLaserPower
0000:912C       _ChangeToRealLaserPowerTaskHandle
0000:1C4B       _CheckContextServiceParametersError
0000:1A60       _CheckCoverServiceParametersError
0000:9130       _CheckErrorInGDSTemperatureTaskHandle
0000:347E       _CheckErrorInISTemperature
0000:257D       _CheckErrorInLaserTemperature
0000:3EFC       _CheckErrorInMBSTemperature
0000:911A       _CheckErrorInMBSTemperatureTaskHandle
0000:4CE7       _CheckGDSEventsLimits
0000:26E4       _CheckGDSServiceParametersError
0000:2B08       _CheckHKServiceParametersError
0000:4D7D       _CheckISEventsLimits
0000:3615       _CheckISServiceParametersError
0000:3F8D       _CheckMBSServiceParametersError
0000:4241       _CheckMemoryAbsoluteAddressing
0000:44C1       _CheckMemoryServiceParametersError
0000:48ED       _CheckModesServiceParametersError
0000:4F2D       _CheckScienceServiceParametersError
0000:5EC6       _CheckSum
0000:6835       _CheckTC
0000:6668       _CheckTCParameters
0000:05E3       _ClearEDAC
0000:1451       _ClearIRQCoverMotor
0000:0F21       _ClearIRQGenericTimer
0000:077F       _ClearTCTimer
0000:DE32       _Clock
0000:5B1A       _ClockInitialization
0000:5AD9       _ClockIRQ
```

```
0000:176B       _CloseCover
0000:3B68       _CloseHeatReport
0000:3A0F       _CloseReadReport
0000:5A13       _ConectionTestReport
0000:9148       _ContextFileBuffer
0000:5BE6       _CopyBuffers
0000:5C09       _CopyBuffersInterSegment
0000:0B25       _CopyFromOverflowToMirror
0000:67F7       _CopyPacketID
0000:DE16       _CoverArmedStatus
0000:DC00       _CoverHeatersToTest
0000:9136       _CoverHeaterToTestTimeoutTaskHandle
0000:DE18       _CoverMotorDirection
0000:DE1A       _CoverMotorInterruptInEachStep
0000:1468       _CoverMotorIRQ
0000:8DE6       _CRCTable
0000:B694       _currentDataSegmentSweepMemory
0000:D9CC       _CurrentPositiontoWriteMBHeatingBuffer
0000:0E1E       _DACConversion
0000:0C9C       _DAC_ADC_MUXs_Initialization
0000:903A       _defaultContextFile
0000:90C4       _DefaultContextFile
0000:8DBE       _DefaultHK
0000:D792       _defaultHK
0000:2A2A       _DefaultHKReport
0000:943E       _DelayedCompletionACK
0000:0739       _DesactivateIRQ
0000:2811       _DisableHKReport
0000:5618       _DisableParallelTask
0000:4CDE       _DisableScienceEventGeneration
0000:5A2A       _DisableSynchronism
0000:1439       _DisarmCover
0000:1207       _DisarmFrangibolt
0000:1EE9       _DisarmLaser
0000:DE5C       _DumpBuffer
0000:418B       _DumpMemoryAbsoluteAddressing
0000:DE3A       _EDACAddress
0000:063A       _EDACErrorIRQ
0000:9110       _EDACErrorReportTaskHandle
0000:DE3C       _EDACEventReport
0000:06E9       _EDACInitialization
0000:DE38       _EDACStatus
0000:59ED       _EmptyCircularTail
0000:0565       _EmptyFunction
0000:0563       _EmptyIRQ
0000:27DD       _EnableHKReport
0000:5607       _EnableParallelTask
0000:4CD5       _EnableScienceEventGeneration
0000:9134       _EndEnergizationMotorCoverTaskHandle
0000:3003       _EndISStimulation
0000:19BD       _EndMotorCoverEnergization
0000:0B57       _EraseLastBlockSentToSC
0000:DE4A       _EventReportOverflow
0000:C820       _EventsInTailEvent
0000:C822       _eventTail
0000:8DD0       _EventTail
0000:C82C       _EventTailData
0000:4C5D       _ExecuteSchedulerTask
0000:4F80       _ExecuteService
0000:56F1       _ExecuteTC
0000:B45A       _ExecutionFailureParameter3
0000:B458       _ExecutionFailureParameter4
```

```
0000:DE5A       _ExistParallelTask
0000:4A41       _ExistScheduleHandle
0000:6065       _ExistVDiskHandle
0000:5774       _ExtractTC
0000:084D       _FIFOsInitialization
0000:B49E       _FIFOTCBuffer
0000:5C34       _FillBufferWithZeroes
0000:2829       _FillCoverHousekeeping
0000:2892       _FillGDSHousekeeping
0000:28F0       _FillISHousekeeping
0000:2979       _FillMBSHousekeeping
0000:29D0       _FillPowerSupplyHousekeeping
0000:2A0B       _FillSoftwareHousekeeping
0000:D4D0       _FirstFreeSchedulerTask
0000:55E8       _FirstSyncTimeout
0000:D4D2       _FirstTaskActivationTime
0000:DBEC       _FractionSecondOfFirstGDSEvent
0000:DBA0       _FractionSecondOfFirstISEvent
0000:DA0A       _FractionSecondsOfISCalibration
0000:DE14       _FrangiboltArmedStatus
0000:DE28       _FrangiboltTemperatureToReach
0000:DBB4       _GDSCalibrationBuffer
0000:9128       _GDSCalibrationTaskHandle
0000:DBF2       _GDSEventsIRQProcessed
0000:912A       _GDSEventTaskHandle
0000:1D19       _GDSIRQ
0000:D9E8       _GDSISReport
0000:DBFA       _GDSON
0000:0CB2       _GenerateADCErrorReport
0000:0601       _GenerateEDACErrorReport
0000:1CC1       _GenerateEventReport
0000:0FE7       _GenerateHeaderCalibrationReport
0000:23EE       _GenerateHeaderEventScienceReport
0000:3074       _GenerateISStimulus
0000:0F44       _GenericTimerInitialization
0000:0F30       _GenericTimerIRQ
0000:B814       _GenericTimerReachFinalValue
0000:3213       _GetDustFlux
0000:4075       _GetSegmentAddressAndLength
0000:47F2       _GoToCoverMode
0000:489D       _GoToFluxMode
0000:481F       _GoToNormalMode
0000:46AD       _GoToSafeMode
0000:B46E       _GotoSafeTCBuffer
0000:B46C       _GotoSafeTCBuffered
0000:5390       _HardwareInitialization
0000:DE1E       _HeatBeforeCloseCover
0000:DE20       _HeatBeforeOpenCover
0000:DE1C       _HeatBeforeWorkFrangibolt
0000:12DD       _HeatFrangibolt
0000:1237       _HeatFrangiboltParallelTask
0000:1670       _HeatingACHeatersBeforeOpenCover
0000:1299       _HeatingACHeatersBeforeWorkFrangibolt
0000:172E       _HeatingBCHeatersBeforeCloseCover
0000:1638       _HeatingBCHeatersBeforeOpenCover
0000:1895       _HeatingFrangiboltTimeout
0000:9142       _HeatingFrangiboltTimeoutTaskHandle
0000:3C75       _HeatMB
0000:3BE7       _HeatMBParalellTask
0000:91D4       _HKBuffer
0000:9146       _HKTaskHandle
0000:D7D8       _HouseKeepingReportGeneration
```

```
0000:944E       _HWFIFOLatched
0000:90C6       _IndexPosititonOfDoubleWordsInContextFile
0000:14D8       _InitializateCoverMotor
0000:1E8D       _InitializateGDSIRQ
0000:2CED       _InitializateISIRQ
0000:37A2       _InitializateMBSIRQ
0000:55DF       _Initialization
0000:5800       _InitializeCircularTail
0000:449C       _InitializeSegment
0000:5C69       _InPort
0000:5C83       _InPortWord
0000:8D4C       _INTActivationMask
0000:D4CC       _InternalClock
0000:DE30       _InternalClockFractionSeconds
0000:5D98       _InverseWordsOfBuffer
0000:0566       _IRQsInitialization
0000:DA16       _ISCalibrationBuffer
0000:DBAA       _ISCalibrationLevel
0000:9126       _ISCalibrationTaskHandle
0000:DBA6       _ISEventsIRQProcessed
0000:DBAE       _ISImpactSimulationMode
0000:3206       _ISImpactsPerMinTimeout
0000:DB9E       _ISImpactsPerMinute
0000:8D9E       _ISImpactsPerMinuteLastMinute
0000:9120       _ISImpactsPerMinuteTaskHandle
0000:2B76       _ISIRQ
0000:DA10       _ISOffByTemperatureOverLimit
0000:DBB2       _ISON
0000:DBB0       _ISPlateTemperatureOutOfRange
0000:DA12       _ISStimulationonPulseStatus
0000:9124       _ISStimulationTaskHandle
0000:30D8       _ISSTimulationTimeout
0000:3517       _ISTemperatureMonitor
0000:9122       _ISTemperatureMonitorTaskHandle
0000:5F22       _ISVDiskInitializated
0000:4B69       _KillSchedulerTask
0000:DBEA       _LaserArmedStatus
0000:DBE8       _LaserOnStatus
0000:DBF6       _LaserPower
0000:8D64       _LaserTemperatureCheckingMasks
0000:DBF4       _LaserTemperatureOutOfRange
0000:9452       _LastBlockSentToSCSize
0000:DE44       _LastDACValue
0000:D9CE       _LastTestedMBTemperature
0000:B460       _LatestTCNoFinishedPacketID
0000:B45E       _LatestTCNoFinishedPADFiled
0000:B45C       _LatestTCNoFinishedService
0000:40CB       _LoadMemoryAbsoluteAddressing
0000:57D4       _main
0000:1047       _MainElectronicTemperatureCheck
0000:910A       _MainTemperatureTaskHandle
0000:18F3       _MantainCoverMotorEnergized
0000:DE4C       _MAXErrorsEvent
0000:5E52       _MayorityVote
0000:D9E4       _MBEvent
0000:D842       _MBHeatingData
0000:D9E0       _MBHeatingMode
0000:D9CA       _MBIntegrationTimeTimeout
0000:D7DE       _MBSCalibrationBuffer
0000:911E       _MBSCalibrationTaskHandle
0000:8DAA       _MBSEnabledMask
0000:8DB4       _MBSHeaterTemperatureChecking
```

```
0000:D9D4       _MBSHeatingInitialClock
0000:9118       _MBSIntegrationTimeoutTaskHandle
0000:3D66       _MBSIntegrationTimeTimeout
0000:36CC       _MBSIRQ
0000:D9D8       _MBSMaxHeatingTime
0000:D9DC       _MBSMaxTemperatureHeating
0000:D9E6       _MBSON
0000:D7FC       _MBSReadingData
0000:D9D0       _MBSReadingInitialClock
0000:911C       _MBSReadingTaskHandle
0000:D7DA       _MBSStatusForReading
0000:8DA0       _MBSTemperatureMUXChannels
0000:D9E2       _MBSTemperatureOutOfRange
0000:D9DE       _MBToRead
0000:4640       _ModesCommonCode
0000:DC02       _MotorCoverMovementReportBuffer
0000:B498       _NextTCWordPosition
0000:D7DC       _NumberOfMBsReaded
0000:DBAC       _NumberOfSimulatedISImpacts
0000:8DDA       _NumberOfVotesforTrueInMayoringVote
0000:53AF       _NVRAMCheck
0000:DE4E       _OBCPCloseCoverGenerated
0000:1900       _OpenCloseCoverMotorTimeout
0000:9138       _OpenCloseCoverMotorTimeoutTaskHandle
0000:16CA       _OpenCover
0000:1528       _OpenOrCloseCover
0000:14ED       _OpenOrCloseCoverParallelTask
0000:DBFC       _OpenOrCloseTimeout
0000:8DC0       _OperationMode
0000:8DC2       _OperationMode_Index
0000:5C59       _OutPort
0000:902E       _PacketCategoryArray
0000:DE58       _ParallelTask
0000:B69C       _PatchBuffer
0000:B794       _PatchHandlesBuffer
0000:070B       _PICInitialization
0000:DE36       _PICStatus
0000:58FD       _PopFromCircularTail
0000:DE12       _PositionOfNextDataInMotorCoverReport
0000:DBA8       _PositionToWriteNextISCalibrationData
0000:921C       _PositionToWriteNextScienceEvent
0000:DE50       _PowerOnFinish
0000:9116       _PowerOnSyncTimeoutTaskHandle
0000:5625       _ProcessEventTail
0000:2490       _ProcessGDSEvent
0000:3231       _ProcessISEvent
0000:3D7C       _ProcessMBEvent
0000:5820       _PushIntoCircularTail
0000:8D76       _PZTAmplitudeMUXChannels
0000:8D6C       _PZTEnabledMask
0000:8D80       _PZTGainMask
0000:8D94       _PZTPropagationTimeAndStatusRegister
0000:8D8A       _PZTsDACChannels
0000:0CD3       _ReadADCConverter
0000:5D68       _ReadDoubleWord
0000:6226       _ReadFile
0000:2361       _ReadGDSLaserTemperatureAndLight
0000:3A2F       _ReadMBParalellTask
0000:3ABE       _ReadMBS
0000:3D2E       _ReadMBSTemperatures
0000:DBF8       _RealLaserPower
0000:569B       _ReceiveTC
```

```
0000:DBFE       _RemainStepsToCloseOrOpenTheCover
0000:07F3       _ResetFIFOTC
0000:07D4       _ResetFIFOTM
0000:2437       _ResetFlightTime
0000:2B5B       _ResetIS
0000:1D0D       _ResetLaser
0000:36C0       _ResetMBS
0000:10C0       _ResetTMOutput
0000:6816       _RestorePacketID
0000:9456       _SCBlockSizeMirror
0000:944C       _SCBlockSizeOverflow
0000:D4D6       _Scheduler
0000:4964       _SchedulerInitialization
0000:D53A       _SchedulerTasks
0000:9450       _ScienceDataSizeFIFOBufferedActual8sCycle
0000:921E       _ScienceEventBuffer
0000:DE48       _ScienceEventReportOverflow
0000:910E       _ScienceEventTimeoutTaskHandle
0000:921A       _ScienceReportGeneration
0000:4E93       _ScienceReportTimeout
0000:DBEE       _SecondOfFirstGDSEvent
0000:DBA2       _SecondOfFirstISEvent
0000:DA0C       _SecondsOfISCalibration
0000:8DC4       _SecuenceCountAPIDArray
0000:0B01       _SendBlockToSpaceCraft
0000:673F       _SendErrorReportService1
0000:6704       _SendExecutionCompletionSucessReport
0000:640F       _SendReport
0000:1B17       _SendReportContextFile
0000:4E13       _SendScienceReport
0000:0B86       _SendTMsToSpaceCraft
0000:9440       _Service1ReportBuffer
0000:9106       _Service_Index
0000:1F15       _SetGDSOnOff
0000:1FEB       _SetGDSOperationMode
0000:0446       _SetIRQ_0_Handler
0000:047F       _SetIRQ_1_Handler
0000:04B8       _SetIRQ_2_Handler
0000:04F1       _SetIRQ_3_Handler
0000:052A       _SetIRQ_4_Handler
0000:2CFF       _SetISOnOff
0000:2ECD       _SetISOperationMode
0000:2E7B       _SetISRangeAndGain
0000:39C7       _SetMBForFrecuencyReading
0000:37B4       _SetMBSOnOff
0000:38B7       _SetMBSOperationMode
0000:2226       _SetPhotodiodeThreshold
0000:2FAD       _SetPZTThreshold
0000:2F36       _SetPZTThresholdArray
0000:38F7       _SetTimeBetweenMBSMeasures
0000:5C9B       _SetVect
0000:DA14       _SizeOfISCalibrationData
0000:547B       _SoftwareInitialization
0000:4997       _SortSchedulerTasks
0000:B692       _StartAddressSweepBlock
0000:0F5F       _StartGenericTimer
0000:07B5       _StartTCTimer
0000:913C       _StopHeatingBeforeCloseCoverTaskHandle
0000:1920       _StopHeatingBeforeCloseCoverTimeout
0000:913E       _StopHeatingBeforeOpenCoverTaskHandle
0000:190A       _StopHeatingBeforeOpenCoverTimeout
0000:913A       _StopHeatingBeforeWorkFrangiboltTaskHandle
```

```
0000:185B       _StopHeatingBeforeWorkFrangiboltTimeout
0000:079E       _StopTCTimer
0000:5DDC       _SwapWordsOfDoubleWordOfContextFile
0000:208D       _SwitchLaserOnOff
0000:2413       _SwitchOnLaserTimeout
0000:9132       _SwitchOnLaserTimeoutTaskHandle
0000:0FC7       _SwitchRele
0000:5B3E       _SynchronismInitialization
0000:DE2A       _SynchronizationFractionSeconds
0000:DE2C       _SynchronizationSeconds
0000:B484       _SyncTCBuffer
0000:B482       _SYNCTCBuffered
0000:DE56       _TaskAddress
0000:B598       _TCBuffer
0000:8DD4       _TCData
0000:9006       _TCExecutionIncompabilityMatrix
0000:9026       _TCIncompabilityOperationModeMask
0000:092B       _TCIRQ
0000:B49A       _TCLength
0000:B468       _TCPacketID
0000:B466       _TCPADField
0000:B49C       _TCReceived
0000:B464       _TCService
0000:8DD2       _TCTail
0000:B816       _tcTail
0000:B820       _TCTailData
0000:0887       _TCTimeoutGenerateReport
0000:08EE       _TCTimeoutIRQ
0000:9114       _TCTimeoutReportTaskHandle
0000:1363       _TestFrangibolt
0000:180E       _TestHeater
0000:1936       _TestHeaterTimeout
0000:DE26       _TestingFrangibolt
0000:DE52       _TimeofLastTCSyncReceived
0000:DE24       _TimeoutHeatingFrangibolt
0000:DE22       _TimeoutOpeningOrClosingCover
0000:5BAD       _TimeStamp
0000:5A3F       _TimeSynchronizationIRQ
0000:0AA8       _TM8sCycle
0000:9108       _TM8sCycleTaskHandle
0000:9458       _TMFIFOMirror
0000:8DD6       _TMFIFOMirrorData
0000:9454       _TMFIFOMirrorFull
0000:EE6C       _TMFIFOOverflow
0000:8DD8       _TMFIFOOverflowData
0000:0AAF       _TMIRQ
0000:636B       _TryToStoreTM
0000:632D       _TryToStoreTMInOverflowMirror
0000:6000       _UpdateFATsCRCs
0000:6182       _UpdateFile
0000:5CB7       _UpdateInterruptVectorTable
0000:5B53       _UpdateTime
0000:6290       _VDiskManagement
0000:5F02       _VirtualDiskInitialization
0000:5E33       _WordSquare

 Address         Publics by Value

0000:0428       DGROUP@
0000:042A       N_SCOPY@
0000:0446       _SetIRQ_0_Handler
0000:047F       _SetIRQ_1_Handler
```

```
0000:04B8       _SetIRQ_2_Handler
0000:04F1       _SetIRQ_3_Handler
0000:052A       _SetIRQ_4_Handler
0000:0563       _EmptyIRQ
0000:0565       _EmptyFunction
0000:0566       _IRQsInitialization
0000:05E3       _ClearEDAC
0000:0601       _GenerateEDACErrorReport
0000:063A       _EDACErrorIRQ
0000:06E9       _EDACInitialization
0000:070B       _PICInitialization
0000:0739       _DesactivateIRQ
0000:075D       _ActivateIRQ
0000:077F       _ClearTCTimer
0000:079E       _StopTCTimer
0000:07B5       _StartTCTimer
0000:07D4       _ResetFIFOTM
0000:07F3       _ResetFIFOTC
0000:084D       _FIFOsInitialization
0000:0887       _TCTimeoutGenerateReport
0000:08EE       _TCTimeoutIRQ
0000:092B       _TCIRQ
0000:0AA8       _TM8sCycle
0000:0AAF       _TMIRQ
0000:0B01       _SendBlockToSpaceCraft
0000:0B25       _CopyFromOverflowToMirror
0000:0B57       _EraseLastBlockSentToSC
0000:0B86       _SendTMsToSpaceCraft
0000:0C9C       _DAC_ADC_MUXs_Initialization
0000:0CB2       _GenerateADCErrorReport
0000:0CD3       _ReadADCConverter
0000:0DA3       _BuildStatistisc
0000:0E1E       _DACConversion
0000:0F21       _ClearIRQGenericTimer
0000:0F30       _GenericTimerIRQ
0000:0F44       _GenericTimerInitialization
0000:0F5F       _StartGenericTimer
0000:0FC7       _SwitchRele
0000:0FE7       _GenerateHeaderCalibrationReport
0000:1047       _MainElectronicTemperatureCheck
0000:10C0       _ResetTMOutput
0000:111C       _ActivateDesactivateCoverHeater
0000:11D5       _ArmFrangibolt
0000:1207       _DisarmFrangibolt
0000:1237       _HeatFrangiboltParallelTask
0000:1299       _HeatingACHeatersBeforeWorkFrangibolt
0000:12DD       _HeatFrangibolt
0000:1363       _TestFrangibolt
0000:13E3       _ActivateFrangibolt
0000:1414       _ArmCover
0000:1439       _DisarmCover
0000:1451       _ClearIRQCoverMotor
0000:1468       _CoverMotorIRQ
0000:14D8       _InitializateCoverMotor
0000:14ED       _OpenOrCloseCoverParallelTask
0000:1528       _OpenOrCloseCover
0000:1638       _HeatingBCHeatersBeforeOpenCover
0000:1670       _HeatingACHeatersBeforeOpenCover
0000:16CA       _OpenCover
0000:172E       _HeatingBCHeatersBeforeCloseCover
0000:176B       _CloseCover
0000:180E       _TestHeater
```

```
0000:185B       _StopHeatingBeforeWorkFrangiboltTimeout
0000:1871       _ActivateFrangiboltTimeout
0000:1895       _HeatingFrangiboltTimeout
0000:18CF       _ArmCoverTimeout
0000:18F3       _MantainCoverMotorEnergized
0000:1900       _OpenCloseCoverMotorTimeout
0000:190A       _StopHeatingBeforeOpenCoverTimeout
0000:1920       _StopHeatingBeforeCloseCoverTimeout
0000:1936       _TestHeaterTimeout
0000:19BD       _EndMotorCoverEnergization
0000:1A60       _CheckCoverServiceParametersError
0000:1B17       _SendReportContextFile
0000:1B92       _AcceptContextFile
0000:1C4B       _CheckContextServiceParametersError
0000:1C94       _CanGenerateEventReport
0000:1CC1       _GenerateEventReport
0000:1D0D       _ResetLaser
0000:1D19       _GDSIRQ
0000:1E8D       _InitializateGDSIRQ
0000:1E9F       _ArmLaser
0000:1EE9       _DisarmLaser
0000:1F15       _SetGDSOnOff
0000:1FEB       _SetGDSOperationMode
0000:208D       _SwitchLaserOnOff
0000:2226       _SetPhotodiodeThreshold
0000:2284       _CalibrateGDSScheduler
0000:228C       _CalibrateGDS
0000:233D       _ChangeToRealLaserPower
0000:2361       _ReadGDSLaserTemperatureAndLight
0000:23EE       _GenerateHeaderEventScienceReport
0000:2413       _SwitchOnLaserTimeout
0000:2437       _ResetFlightTime
0000:2490       _ProcessGDSEvent
0000:257D       _CheckErrorInLaserTemperature
0000:26E4       _CheckGDSServiceParametersError
0000:27DD       _EnableHKReport
0000:2811       _DisableHKReport
0000:2829       _FillCoverHousekeeping
0000:2892       _FillGDSHousekeeping
0000:28F0       _FillISHousekeeping
0000:2979       _FillMBSHousekeeping
0000:29D0       _FillPowerSupplyHousekeeping
0000:2A0B       _FillSoftwareHousekeeping
0000:2A2A       _DefaultHKReport
0000:2B08       _CheckHKServiceParametersError
0000:2B5B       _ResetIS
0000:2B76       _ISIRQ
0000:2CED       _InitializateISIRQ
0000:2CFF       _SetISOnOff
0000:2E7B       _SetISRangeAndGain
0000:2ECD       _SetISOperationMode
0000:2F36       _SetPZTThresholdArray
0000:2FAD       _SetPZTThreshold
0000:3003       _EndISStimulation
0000:3074       _GenerateISStimulus
0000:30D8       _ISSTimulationTimeout
0000:30F1       _CalibrateISScheduler
0000:30FA       _CalibrateIS
0000:3206       _ISImpactsPerMinTimeout
0000:3213       _GetDustFlux
0000:3231       _ProcessISEvent
0000:347E       _CheckErrorInISTemperature
```

```
0000:3517       _ISTemperatureMonitor
0000:3615       _CheckISServiceParametersError
0000:36C0       _ResetMBS
0000:36CC       _MBSIRQ
0000:37A2       _InitializateMBSIRQ
0000:37B4       _SetMBSOnOff
0000:38B7       _SetMBSOperationMode
0000:38F7       _SetTimeBetweenMBSMeasures
0000:394F       _ArmAndHeatHeater
0000:39C7       _SetMBForFrecuencyReading
0000:3A0F       _CloseReadReport
0000:3A2F       _ReadMBParalellTask
0000:3ABE       _ReadMBS
0000:3B68       _CloseHeatReport
0000:3BE7       _HeatMBParalellTask
0000:3C75       _HeatMB
0000:3CF7       _CalibrateMBScheduler
0000:3CFB       _CalibrateMBS
0000:3D2E       _ReadMBSTemperatures
0000:3D66       _MBSIntegrationTimeTimeout
0000:3D7C       _ProcessMBEvent
0000:3EFC       _CheckErrorInMBSTemperature
0000:3F8D       _CheckMBSServiceParametersError
0000:4075       _GetSegmentAddressAndLength
0000:40CB       _LoadMemoryAbsoluteAddressing
0000:418B       _DumpMemoryAbsoluteAddressing
0000:4241       _CheckMemoryAbsoluteAddressing
0000:431D       _AddPatch
0000:4416       _Apply8Patches
0000:447B       _ApplyPatchesParallelTask
0000:449C       _InitializeSegment
0000:44C1       _CheckMemoryServiceParametersError
0000:4640       _ModesCommonCode
0000:4694       _ChangeCodeSegment
0000:46AD       _GoToSafeMode
0000:47F2       _GoToCoverMode
0000:481F       _GoToNormalMode
0000:489D       _GoToFluxMode
0000:48ED       _CheckModesServiceParametersError
0000:4964       _SchedulerInitialization
0000:4997       _SortSchedulerTasks
0000:4A41       _ExistScheduleHandle
0000:4A6C       _AddSchedulerTaskArray
0000:4B04       _AddSchedulerTask
0000:4B69       _KillSchedulerTask
0000:4C5D       _ExecuteSchedulerTask
0000:4CD5       _EnableScienceEventGeneration
0000:4CDE       _DisableScienceEventGeneration
0000:4CE7       _CheckGDSEventsLimits
0000:4D7D       _CheckISEventsLimits
0000:4E13       _SendScienceReport
0000:4E93       _ScienceReportTimeout
0000:4F2D       _CheckScienceServiceParametersError
0000:4F80       _ExecuteService
0000:5390       _HardwareInitialization
0000:53AF       _NVRAMCheck
0000:547B       _SoftwareInitialization
0000:55DF       _Initialization
0000:55E8       _FirstSyncTimeout
0000:5607       _EnableParallelTask
0000:5618       _DisableParallelTask
0000:5625       _ProcessEventTail
```

```
0000:569B       _ReceiveTC
0000:56F1       _ExecuteTC
0000:5774       _ExtractTC
0000:57D4       _main
0000:5800       _InitializeCircularTail
0000:5820       _PushIntoCircularTail
0000:58FD       _PopFromCircularTail
0000:59ED       _EmptyCircularTail
0000:5A13       _ConectionTestReport
0000:5A2A       _DisableSynchronism
0000:5A3F       _TimeSynchronizationIRQ
0000:5AD9       _ClockIRQ
0000:5B1A       _ClockInitialization
0000:5B3E       _SynchronismInitialization
0000:5B53       _UpdateTime
0000:5BAD       _TimeStamp
0000:5BE6       _CopyBuffers
0000:5C09       _CopyBuffersInterSegment
0000:5C34       _FillBufferWithZeroes
0000:5C59       _OutPort
0000:5C69       _InPort
0000:5C83       _InPortWord
0000:5C9B       _SetVect
0000:5CB7       _UpdateInterruptVectorTable
0000:5CE0       _CalculateAndCheckCRC
0000:5D68       _ReadDoubleWord
0000:5D98       _InverseWordsOfBuffer
0000:5DDC       _SwapWordsOfDoubleWordOfContextFile
0000:5E33       _WordSquare
0000:5E52       _MayorityVote
0000:5EC6       _CheckSum
0000:5F02       _VirtualDiskInitialization
0000:5F22       _ISVDiskInitializated
0000:6000       _UpdateFATsCRCs
0000:6065       _ExistVDiskHandle
0000:609A       _AddFile
0000:6182       _UpdateFile
0000:6226       _ReadFile
0000:6290       _VDiskManagement
0000:632D       _TryToStoreTMInOverflowMirror
0000:636B       _TryToStoreTM
0000:640F       _SendReport
0000:6668       _CheckTCParameters
0000:6704       _SendExecutionCompletionSucessReport
0000:6724       _ActivateTCProcessing
0000:673F       _SendErrorReportService1
0000:67F7       _CopyPacketID
0000:6816       _RestorePacketID
0000:6835       _CheckTC
0000:8D3A       _CalibrationVoltagesMUXChannels
0000:8D44       _BoardTemperaturesAndCurrentsMuxChannels
0000:8D4C       _INTActivationMask
0000:8D64       _LaserTemperatureCheckingMasks
0000:8D6C       _PZTEnabledMask
0000:8D76       _PZTAmplitudeMUXChannels
0000:8D80       _PZTGainMask
0000:8D8A       _PZTsDACChannels
0000:8D94       _PZTPropagationTimeAndStatusRegister
0000:8D9E       _ISImpactsPerMinuteLastMinute
0000:8DA0       _MBSTemperatureMUXChannels
0000:8DAA       _MBSEnabledMask
0000:8DB4       _MBSHeaterTemperatureChecking
```

```
0000:8DBE       _DefaultHK
0000:8DC0       _OperationMode
0000:8DC2       _OperationMode_Index
0000:8DC4       _SecuenceCountAPIDArray
0000:8DD0       _EventTail
0000:8DD2       _TCTail
0000:8DD4       _TCData
0000:8DD6       _TMFIFOMirrorData
0000:8DD8       _TMFIFOOverflowData
0000:8DDA       _NumberOfVotesforTrueInMayoringVote
0000:8DE6       _CRCTable
0000:9006       _TCExecutionIncompabilityMatrix
0000:9026       _TCIncompabilityOperationModeMask
0000:902E       _PacketCategoryArray
0000:903A       _defaultContextFile
0000:90C4       _DefaultContextFile
0000:90C6       _IndexPosititonOfDoubleWordsInContextFile
0000:90DE       _AdditionalVars
0000:9106       _Service_Index
0000:9108       _TM8sCycleTaskHandle
0000:910A       _MainTemperatureTaskHandle
0000:910C       _ADCErrorReportTaskHandle
0000:910E       _ScienceEventTimeoutTaskHandle
0000:9110       _EDACErrorReportTaskHandle
0000:9112       _ActivateTCProcessingTaskHandle
0000:9114       _TCTimeoutReportTaskHandle
0000:9116       _PowerOnSyncTimeoutTaskHandle
0000:9118       _MBSIntegrationTimeoutTaskHandle
0000:911A       _CheckErrorInMBSTemperatureTaskHandle
0000:911C       _MBSReadingTaskHandle
0000:911E       _MBSCalibrationTaskHandle
0000:9120       _ISImpactsPerMinuteTaskHandle
0000:9122       _ISTemperatureMonitorTaskHandle
0000:9124       _ISStimulationTaskHandle
0000:9126       _ISCalibrationTaskHandle
0000:9128       _GDSCalibrationTaskHandle
0000:912A       _GDSEventTaskHandle
0000:912C       _ChangeToRealLaserPowerTaskHandle
0000:912E       _AskForLaserOnTaskHandle
0000:9130       _CheckErrorInGDSTemperatureTaskHandle
0000:9132       _SwitchOnLaserTimeoutTaskHandle
0000:9134       _EndEnergizationMotorCoverTaskHandle
0000:9136       _CoverHeaterToTestTimeoutTaskHandle
0000:9138       _OpenCloseCoverMotorTimeoutTaskHandle
0000:913A       _StopHeatingBeforeWorkFrangiboltTaskHandle
0000:913C       _StopHeatingBeforeCloseCoverTaskHandle
0000:913E       _StopHeatingBeforeOpenCoverTaskHandle
0000:9140       _ArmCoverTimeoutTaskHandle
0000:9142       _HeatingFrangiboltTimeoutTaskHandle
0000:9144       _ActivateFrangiboltTimeoutTaskHandle
0000:9146       _HKTaskHandle
0000:9148       _ContextFileBuffer
0000:91D4       _HKBuffer
0000:921A       _ScienceReportGeneration
0000:921C       _PositionToWriteNextScienceEvent
0000:921E       _ScienceEventBuffer
0000:943E       _DelayedCompletionACK
0000:9440       _Service1ReportBuffer
0000:944C       _SCBlockSizeOverflow
0000:944E       _HWFIFOLatched
0000:9450       _ScienceDataSizeFIFOBufferedActual8sCycle
0000:9452       _LastBlockSentToSCSize
```

```
0000:9454       _TMFIFOMirrorFull
0000:9456       _SCBlockSizeMirror
0000:9458       _TMFIFOMirror
0000:B458       _ExecutionFailureParameter4
0000:B45A       _ExecutionFailureParameter3
0000:B45C       _LatestTCNoFinishedService
0000:B45E       _LatestTCNoFinishedPADFiled
0000:B460       _LatestTCNoFinishedPacketID
0000:B464       _TCService
0000:B466       _TCPADField
0000:B468       _TCPacketID
0000:B46C       _GotoSafeTCBuffered
0000:B46E       _GotoSafeTCBuffer
0000:B482       _SYNCTCBuffered
0000:B484       _SyncTCBuffer
0000:B498       _NextTCWordPosition
0000:B49A       _TCLength
0000:B49C       _TCReceived
0000:B49E       _FIFOTCBuffer
0000:B598       _TCBuffer
0000:B692       _StartAddressSweepBlock
0000:B694       _currentDataSegmentSweepMemory
0000:B696       _BitMaskForPatch
0000:B698       _ActualPatchIndexWordSize
0000:B69A       _ActualPatchIndex
0000:B69C       _PatchBuffer
0000:B794       _PatchHandlesBuffer
0000:B814       _GenericTimerReachFinalValue
0000:B816       _tcTail
0000:B820       _TCTailData
0000:C820       _EventsInTailEvent
0000:C822       _eventTail
0000:C82C       _EventTailData
0000:D4CC       _InternalClock
0000:D4D0       _FirstFreeSchedulerTask
0000:D4D2       _FirstTaskActivationTime
0000:D4D6       _Scheduler
0000:D53A       _SchedulerTasks
0000:D792       _defaultHK
0000:D7D8       _HouseKeepingReportGeneration
0000:D7DA       _MBSStatusForReading
0000:D7DC       _NumberOfMBsReaded
0000:D7DE       _MBSCalibrationBuffer
0000:D7FC       _MBSReadingData
0000:D842       _MBHeatingData
0000:D9CA       _MBIntegrationTimeTimeout
0000:D9CC       _CurrentPositiontoWriteMBHeatingBuffer
0000:D9CE       _LastTestedMBTemperature
0000:D9D0       _MBSReadingInitialClock
0000:D9D4       _MBSHeatingInitialClock
0000:D9D8       _MBSMaxHeatingTime
0000:D9DC       _MBSMaxTemperatureHeating
0000:D9DE       _MBToRead
0000:D9E0       _MBHeatingMode
0000:D9E2       _MBSTemperatureOutOfRange
0000:D9E4       _MBEvent
0000:D9E6       _MBSON
0000:D9E8       _GDSISReport
0000:DA0A       _FractionSecondsOfISCalibration
0000:DA0C       _SecondsOfISCalibration
0000:DA10       _ISOffByTemperatureOverLimit
0000:DA12       _ISStimulationonPulseStatus
```

```
0000:DA14       _SizeOfISCalibrationData
0000:DA16       _ISCalibrationBuffer
0000:DB9E       _ISImpactsPerMinute
0000:DBA0       _FractionSecondOfFirstISEvent
0000:DBA2       _SecondOfFirstISEvent
0000:DBA6       _ISEventsIRQProcessed
0000:DBA8       _PositionToWriteNextISCalibrationData
0000:DBAA       _ISCalibrationLevel
0000:DBAC       _NumberOfSimulatedISImpacts
0000:DBAE       _ISImpactSimulationMode
0000:DBB0       _ISPlateTemperatureOutOfRange
0000:DBB2       _ISON
0000:DBB4       _GDSCalibrationBuffer
0000:DBE8       _LaserOnStatus
0000:DBEA       _LaserArmedStatus
0000:DBEC       _FractionSecondOfFirstGDSEvent
0000:DBEE       _SecondOfFirstGDSEvent
0000:DBF2       _GDSEventsIRQProcessed
0000:DBF4       _LaserTemperatureOutOfRange
0000:DBF6       _LaserPower
0000:DBF8       _RealLaserPower
0000:DBFA       _GDSON
0000:DBFC       _OpenOrCloseTimeout
0000:DBFE       _RemainStepsToCloseOrOpenTheCover
0000:DC00       _CoverHeatersToTest
0000:DC02       _MotorCoverMovementReportBuffer
0000:DE12       _PositionOfNextDataInMotorCoverReport
0000:DE14       _FrangiboltArmedStatus
0000:DE16       _CoverArmedStatus
0000:DE18       _CoverMotorDirection
0000:DE1A       _CoverMotorInterruptInEachStep
0000:DE1C       _HeatBeforeWorkFrangibolt
0000:DE1E       _HeatBeforeCloseCover
0000:DE20       _HeatBeforeOpenCover
0000:DE22       _TimeoutOpeningOrClosingCover
0000:DE24       _TimeoutHeatingFrangibolt
0000:DE26       _TestingFrangibolt
0000:DE28       _FrangiboltTemperatureToReach
0000:DE2A       _SynchronizationFractionSeconds
0000:DE2C       _SynchronizationSeconds
0000:DE30       _InternalClockFractionSeconds
0000:DE32       _Clock
0000:DE36       _PICStatus
0000:DE38       _EDACStatus
0000:DE3A       _EDACAddress
0000:DE3C       _EDACEventReport
0000:DE44       _LastDACValue
0000:DE46       _BoardTemperatureOutOfRange
0000:DE48       _ScienceEventReportOverflow
0000:DE4A       _EventReportOverflow
0000:DE4C       _MAXErrorsEvent
0000:DE4E       _OBCPCloseCoverGenerated
0000:DE50       _PowerOnFinish
0000:DE52       _TimeofLastTCSyncReceived
0000:DE56       _TaskAddress
0000:DE58       _ParallelTask
0000:DE5A       _ExistParallelTask
0000:DE5C       _DumpBuffer
0000:EE6C       _TMFIFOOverflow

Line numbers for c.obj(BOARD.C) segment _TEXT
```

180	0000:0446	182	0000:0456	183	0000:0459	185	0000:045B
187	0000:0475	208	0000:047F	210	0000:048F	211	0000:0492
213	0000:0494	215	0000:04AE	236	0000:04B8	238	0000:04C8
239	0000:04CB	241	0000:04CD	243	0000:04E7	264	0000:04F1
266	0000:0501	267	0000:0504	269	0000:0506	271	0000:0520
292	0000:052A	294	0000:053A	295	0000:053D	297	0000:053F
299	0000:0559	319	0000:0563	321	0000:0563	322	0000:0564
342	0000:0565	344	0000:0565	369	0000:0566	371	0000:056C
374	0000:056C	375	0000:0571	378	0000:058B	379	0000:059B
380	0000:05AC	381	0000:05BD	382	0000:05CE	383	0000:05DF
405	0000:05E3	408	0000:05E3	409	0000:05E4	410	0000:05E5
412	0000:05E6	413	0000:05E9	414	0000:05EA	415	0000:05ED
416	0000:05F0	418	0000:05F2	419	0000:05F5	420	0000:05F8
421	0000:05F9	422	0000:05FC	424	0000:05FD	425	0000:05FE
426	0000:05FF	428	0000:0600	449	0000:0601	451	0000:0601
453	0000:0610	455	0000:061C	456	0000:0639	481	0000:063A
488	0000:064F	489	0000:0652	491	0000:0654	492	0000:065F
493	0000:066A	494	0000:067D	496	0000:0686	498	0000:0691
502	0000:06AB	503	0000:06B1	504	0000:06B7	505	0000:06BD
507	0000:06C3	509	0000:06DA	510	0000:06DD	532	0000:06E9
534	0000:06E9	535	0000:06FA	536	0000:06FD	537	0000:070A
560	0000:070B	562	0000:070B	563	0000:0718	565	0000:0725
566	0000:0732	567	0000:0738	589	0000:0739	591	0000:073C
592	0000:074E	593	0000:075B	615	0000:075D	617	0000:0760
618	0000:0770	619	0000:077D	644	0000:077F	646	0000:077F
647	0000:0780	648	0000:0781	650	0000:0782	651	0000:0785
652	0000:0786	653	0000:0789	654	0000:078B	655	0000:078D
656	0000:0790	657	0000:0793	658	0000:0794	659	0000:0796
660	0000:0799	662	0000:079A	663	0000:079B	664	0000:079C
665	0000:079D	687	0000:079E	689	0000:079E	690	0000:079F
691	0000:07A0	693	0000:07A1	694	0000:07A4	695	0000:07A5
696	0000:07A8	697	0000:07AA	698	0000:07AD	699	0000:07B0
701	0000:07B1	702	0000:07B2	703	0000:07B3	704	0000:07B4
729	0000:07B5	731	0000:07B5	732	0000:07B6	733	0000:07B7
735	0000:07B8	736	0000:07BB	737	0000:07BC	738	0000:07BF
739	0000:07C1	740	0000:07C3	741	0000:07C6	742	0000:07C9
743	0000:07CA	744	0000:07CC	745	0000:07CF	747	0000:07D0
748	0000:07D1	749	0000:07D2	750	0000:07D3	776	0000:07D4
778	0000:07D4	779	0000:07D5	780	0000:07D6	782	0000:07D7
783	0000:07DA	784	0000:07DB	785	0000:07DE	786	0000:07E0
787	0000:07E2	788	0000:07E5	789	0000:07E8	790	0000:07E9
791	0000:07EB	792	0000:07EE	794	0000:07EF	795	0000:07F0
796	0000:07F1	797	0000:07F2	823	0000:07F3	827	0000:07F9
831	0000:07FE	830	0000:0806	834	0000:0813	835	0000:0818
837	0000:0827	838	0000:082D	839	0000:0833	840	0000:0839
842	0000:0846	843	0000:0849	867	0000:084D	869	0000:084D
870	0000:0850	872	0000:0853	873	0000:0864	874	0000:0875
875	0000:0886	897	0000:0887	899	0000:088D	900	0000:0892
902	0000:08A1	903	0000:08A7	904	0000:08AD	906	0000:08C0
907	0000:08D3	908	0000:08EA	929	0000:08EE	931	0000:08FE
932	0000:0901	934	0000:0903	935	0000:0921	980	0000:092B
982	0000:0940	985	0000:0949	986	0000:094C	987	0000:094F
989	0000:0950	990	0000:0953	995	0000:0955	996	0000:0958
997	0000:0959	998	0000:095B	1001	0000:095E	1003	0000:096B
1005	0000:096F	1007	0000:0976	1009	0000:0980	1011	0000:0988
1012	0000:09A6	1013	0000:09AC	1016	0000:09AF	1017	0000:09BB
1019	0000:09BE	1023	0000:09CA	1025	0000:09CD	1027	0000:09E0
1030	0000:09E7	1031	0000:09F1	1032	0000:0A09	1036	0000:0A11
1039	0000:0A18	1040	0000:0A22	1041	0000:0A3A	1045	0000:0A42
1047	0000:0A5F	1050	0000:0A65	1051	0000:0A68	1052	0000:0A6B
1055	0000:0A6C	1056	0000:0A6F	1057	0000:0A70	1058	0000:0A71
1059	0000:0A74	1060	0000:0A77	1063	0000:0A79	1064	0000:0A7C

1065	0000:0A7D	1066	0000:0A80	1067	0000:0A83	1069	0000:0A85
1072	0000:0A95	1073	0000:0A98	1074	0000:0A9B	1075	0000:0A9C
1095	0000:0AA8	1097	0000:0AA8	1098	0000:0AAE	1119	0000:0AAF
1121	0000:0ABF	1122	0000:0ADE	1123	0000:0AEF	1124	0000:0AF7
1145	0000:0B01	1147	0000:0B02	1148	0000:0B03	1150	0000:0B04
1151	0000:0B07	1152	0000:0B0A	1155	0000:0B0D	1156	0000:0B10
1159	0000:0B11	1160	0000:0B13	1161	0000:0B15	1162	0000:0B16
1163	0000:0B17	1164	0000:0B18	1165	0000:0B19	1166	0000:0B1D
1167	0000:0B1F	1171	0000:0B21	1172	0000:0B22	1173	0000:0B23
1197	0000:0B25	1199	0000:0B25	1201	0000:0B2C	1202	0000:0B43
1204	0000:0B4A	1205	0000:0B50	1206	0000:0B56	1230	0000:0B57
1232	0000:0B57	1233	0000:0B5D	1234	0000:0B64	1235	0000:0B6B
1236	0000:0B7F	1237	0000:0B85	1280	0000:0B86	1282	0000:0B8C
1284	0000:0B9F	1286	0000:0BA9	1291	0000:0BB6	1294	0000:0BC1
1295	0000:0BC7	1297	0000:0BCD	1299	0000:0BD0	1300	0000:0BDD
1301	0000:0BE7	1307	0000:0BF0	1308	0000:0BFA	1312	0000:0C03
1313	0000:0C1C	1315	0000:0C35	1322	0000:0C42	1325	0000:0C4F
1326	0000:0C55	1327	0000:0C58	1332	0000:0C5A	1334	0000:0C73
1335	0000:0C76	1338	0000:0C79	1340	0000:0C92	1341	0000:0C98
1363	0000:0C9C	1366	0000:0C9C	1367	0000:0C9F	1368	0000:0CA2
1371	0000:0CA3	1372	0000:0CA6	1373	0000:0CA9	1376	0000:0CAA
1377	0000:0CAD	1378	0000:0CB0	1379	0000:0CB1	1400	0000:0CB2
1402	0000:0CB2	1403	0000:0CC1	1404	0000:0CD2	1444	0000:0CD3
1446	0000:0CDA	1447	0000:0CDF	1450	0000:0CE4	1452	0000:0CEB
1453	0000:0CEC	1454	0000:0CED	1455	0000:0CEE	1456	0000:0CEF
1458	0000:0CF0	1461	0000:0CF2	1462	0000:0CF5	1463	0000:0CF8
1464	0000:0CFB	1467	0000:0CFC	1468	0000:0CFF	1469	0000:0D02
1470	0000:0D04	1471	0000:0D07	1474	0000:0D09	1477	0000:0D0C
1478	0000:0D0F	1480	0000:0D10	1483	0000:0D13	1484	0000:0D16
1485	0000:0D19	1488	0000:0D1A	1489	0000:0D1B	1492	0000:0D1D
1493	0000:0D20	1494	0000:0D23	1495	0000:0D24	1496	0000:0D27
1498	0000:0D28	1499	0000:0D2B	1502	0000:0D2D	1503	0000:0D2E
1504	0000:0D30	1505	0000:0D32	1506	0000:0D33	1507	0000:0D36
1508	0000:0D38	1512	0000:0D3A	1513	0000:0D3D	1514	0000:0D3E
1517	0000:0D40	1518	0000:0D43	1519	0000:0D44	1521	0000:0D46
1522	0000:0D48	1525	0000:0D4B	1526	0000:0D4F	1527	0000:0D51
1530	0000:0D53	1534	0000:0D58	1535	0000:0D5B	1536	0000:0D5E
1539	0000:0D5F	1540	0000:0D62	1541	0000:0D65	1543	0000:0D66
1546	0000:0D83	1547	0000:0D85	1548	0000:0D87	1549	0000:0D89
1550	0000:0D8C	1552	0000:0D8F	1553	0000:0D90	1554	0000:0D91
1555	0000:0D92	1556	0000:0D93	1558	0000:0D94	1560	0000:0D9B
1562	0000:0D9E	1592	0000:0DA3	1594	0000:0DAA	1595	0000:0DBE
1598	0000:0DC3	1600	0000:0DD0	1601	0000:0DDF	1602	0000:0DE6
1606	0000:0DFC	1607	0000:0DFF	1608	0000:0E02	1609	0000:0E04
1610	0000:0E07	1613	0000:0E0A	1614	0000:0E0D	1615	0000:0E10
1616	0000:0E13	1617	0000:0E16	1618	0000:0E19	1662	0000:0E1E
1664	0000:0E24	1665	0000:0E2E	1666	0000:0E33	1669	0000:0E38
1672	0000:0E47	1673	0000:0E4C	1676	0000:0E55	1679	0000:0E62
1680	0000:0E6D	1683	0000:0E7C	1684	0000:0E87	1686	0000:0E93
1688	0000:0E99	1690	0000:0E9E	1694	0000:0EA5	1695	0000:0EA8
1696	0000:0EAB	1699	0000:0EAC	1700	0000:0EAF	1701	0000:0EB1
1702	0000:0EB3	1703	0000:0EB7	1704	0000:0EB8	1705	0000:0EBA
1706	0000:0EBD	1708	0000:0EBE	1709	0000:0EBF	1710	0000:0EC0
1711	0000:0EC4	1712	0000:0EC7	1713	0000:0EC9	1714	0000:0ECC
1715	0000:0ECD	1716	0000:0ECE	1717	0000:0ED1	1719	0000:0ED2
1721	0000:0ED8	1724	0000:0EDE	1725	0000:0EEF	1730	0000:0EF7
1731	0000:0F05	1736	0000:0F17	1737	0000:0F1D	1758	0000:0F21
1760	0000:0F21	1761	0000:0F22	1763	0000:0F23	1764	0000:0F26
1765	0000:0F29	1766	0000:0F2A	1767	0000:0F2C	1769	0000:0F2D
1770	0000:0F2E	1772	0000:0F2F	1795	0000:0F30	1797	0000:0F30
1798	0000:0F31	1800	0000:0F32	1801	0000:0F35	1803	0000:0F37
1804	0000:0F3D	1806	0000:0F40	1807	0000:0F41	1808	0000:0F42

```
  1809 0000:0F43  1834 0000:0F44  1836 0000:0F44  1837 0000:0F55
  1838 0000:0F5B  1839 0000:0F5E  1872 0000:0F5F  1874 0000:0F65
  1876 0000:0F6A  1877 0000:0F76  1879 0000:0F83  1880 0000:0F89
  1885 0000:0F93  1887 0000:0F9B  1888 0000:0FAC  1890 0000:0FAE
  1883 0000:0FB1  1893 0000:0FB8  1894 0000:0FC0  1895 0000:0FC3
  1917 0000:0FC7  1919 0000:0FCA  1920 0000:0FCD  1921 0000:0FD0
  1923 0000:0FD1  1925 0000:0FDE  1926 0000:0FE1  1927 0000:0FE4
  1928 0000:0FE5  1952 0000:0FE7  1956 0000:0FED  1957 0000:0FF5
  1959 0000:1000  1961 0000:1013  1962 0000:1021  1963 0000:1043
  1991 0000:1047  1993 0000:104D  1994 0000:1057  1997 0000:105D
  1999 0000:1063  2000 0000:1068  2002 0000:1078  2004 0000:107D
  2006 0000:1084  2007 0000:1095  2008 0000:10B6  2011 0000:10BC
Line numbers for e.obj(COORSERV.C) segment _TEXT

    58 0000:10C0    61 0000:10C0    63 0000:10D9    66 0000:10DC
    68 0000:10F5    69 0000:10FB    70 0000:1101    71 0000:1107
    72 0000:110D    73 0000:1113    75 0000:1119    76 0000:111B
Line numbers for f.obj(COVER.C) segment _TEXT

   159 0000:111C   161 0000:1122   162 0000:112B   163 0000:1134
   164 0000:113D   166 0000:1142   168 0000:1148   169 0000:114D
   170 0000:115A   171 0000:116D   172 0000:1180   176 0000:118B
   177 0000:119D   178 0000:11AF   180 0000:11C1   181 0000:11D1
   205 0000:11D5   207 0000:11D5   209 0000:11E2   210 0000:11E8
   212 0000:1204   213 0000:1206   237 0000:1207   239 0000:1207
   240 0000:1213   242 0000:121F   243 0000:1225   245 0000:1234
   246 0000:1236   276 0000:1237   278 0000:123D   280 0000:124C
   282 0000:1252   283 0000:1261   284 0000:1264   285 0000:1267
   286 0000:126A   287 0000:126D   290 0000:126F   292 0000:1276
   293 0000:1279   294 0000:127C   295 0000:127F   297 0000:1295
   321 0000:1299   323 0000:1299   325 0000:12A0   328 0000:12AF
   329 0000:12BB   332 0000:12C7   334 0000:12D4   336 0000:12DC
   364 0000:12DD   366 0000:12E0   368 0000:12EF   370 0000:12F6
   371 0000:12FC   372 0000:1302   376 0000:1307   379 0000:1314
   382 0000:132C   384 0000:1348   385 0000:134E   386 0000:1356
   388 0000:135C   390 0000:135F   391 0000:1361   416 0000:1363
   418 0000:1369   419 0000:1378   421 0000:1388   423 0000:1397
   425 0000:139E   426 0000:13A4   427 0000:13AA   430 0000:13AF
   432 0000:13B7   433 0000:13BA   434 0000:13C0   438 0000:13C8
   439 0000:13CE   441 0000:13D4   442 0000:13DF   463 0000:13E3
   465 0000:13E9   467 0000:13F9   468 0000:13FF   470 0000:1405
   471 0000:1410   494 0000:1414   496 0000:1414   497 0000:141A
   498 0000:1436   499 0000:1438   522 0000:1439   524 0000:1439
   525 0000:143F   526 0000:144E   527 0000:1450   552 0000:1451
   554 0000:1451   555 0000:1452   557 0000:1453   558 0000:1456
   560 0000:1457   561 0000:145A   562 0000:145D   563 0000:1460
   565 0000:1461   566 0000:1464   568 0000:1465   569 0000:1466
   570 0000:1467   592 0000:1468   596 0000:147D   597 0000:1480
   599 0000:1482   600 0000:1485   601 0000:1486   602 0000:1488
   603 0000:148A   604 0000:148C   605 0000:1490   606 0000:1493
   607 0000:1494   608 0000:1496   609 0000:1499   611 0000:149C
   613 0000:14A3   614 0000:14A7   616 0000:14B1   617 0000:14B4
   618 0000:14B7   620 0000:14B8   623 0000:14C9   624 0000:14CC
   645 0000:14D8   647 0000:14D8   648 0000:14DB   649 0000:14EC
   674 0000:14ED   676 0000:14ED   678 0000:14F4   679 0000:14FC
   681 0000:14FF   683 0000:1507   684 0000:1527   714 0000:1528
   716 0000:152E   717 0000:153E   720 0000:154A   723 0000:1551
   725 0000:1557   727 0000:155E   728 0000:156E   731 0000:1575
   732 0000:157B   734 0000:1593   735 0000:15A0   736 0000:15A6
   737 0000:15AC   738 0000:15B2   739 0000:15BA   741 0000:15BF
   742 0000:15CB   743 0000:15D8   746 0000:15E8   747 0000:15E9
   748 0000:15EA   749 0000:15ED   750 0000:15EE   751 0000:15F0
```

```
   752 0000:15F2   753 0000:15F4   754 0000:15F8   755 0000:15FB
   756 0000:15FC   757 0000:15FE   758 0000:1601   759 0000:1604
   760 0000:1605   762 0000:1606   763 0000:1610   765 0000:1621
   766 0000:1624   768 0000:162C   769 0000:1634   793 0000:1638
   795 0000:1638   797 0000:163F   799 0000:164E   800 0000:165A
   802 0000:1667   804 0000:166F   831 0000:1670   833 0000:1670
   835 0000:1677   837 0000:1686   838 0000:1692   840 0000:169F
   842 0000:16BB   843 0000:16C1   845 0000:16C9   873 0000:16CA
   875 0000:16CA   877 0000:16D1   878 0000:16D7   879 0000:16DD
   882 0000:16E2   885 0000:16F1   887 0000:16FE   889 0000:171A
   890 0000:1720   891 0000:1723   893 0000:172B   894 0000:172D
   919 0000:172E   921 0000:172E   923 0000:1735   925 0000:1744
   926 0000:1750   927 0000:175D   928 0000:1763   930 0000:176A
   962 0000:176B   964 0000:1771   966 0000:178C   968 0000:1793
   969 0000:1799   970 0000:179F   973 0000:17A4   975 0000:17B3
   977 0000:17B6   979 0000:17BC   980 0000:17C9   985 0000:17D1
   986 0000:17DE   987 0000:17FA   988 0000:1800   991 0000:1808
   992 0000:180A  1015 0000:180E  1017 0000:1814  1019 0000:182F
  1021 0000:1832  1023 0000:183C  1025 0000:1855  1026 0000:1857
  1047 0000:185B  1049 0000:185B  1050 0000:186A  1051 0000:1870
  1073 0000:1871  1075 0000:1871  1077 0000:1880  1079 0000:1883
  1080 0000:1894  1100 0000:1895  1102 0000:1895  1104 0000:18A4
  1105 0000:18B3  1107 0000:18B9  1109 0000:18C8  1110 0000:18CE
  1132 0000:18CF  1134 0000:18CF  1136 0000:18DE  1138 0000:18E1
  1139 0000:18F2  1159 0000:18F3  1161 0000:18F3  1162 0000:18FF
  1184 0000:1900  1186 0000:1900  1187 0000:1906  1188 0000:1909
  1209 0000:190A  1211 0000:190A  1212 0000:1919  1213 0000:191F
  1234 0000:1920  1236 0000:1920  1237 0000:192F  1238 0000:1935
  1260 0000:1936  1264 0000:193C  1267 0000:194B  1269 0000:1950
  1270 0000:1960  1271 0000:1984  1274 0000:19A1  1275 0000:19AD
  1276 0000:19B9  1306 0000:19BD  1308 0000:19BD  1310 0000:19C9
  1311 0000:19D1  1314 0000:19D4  1315 0000:19E0  1317 0000:19EC
  1319 0000:19F4  1320 0000:1A03  1322 0000:1A12  1324 0000:1A2F
  1325 0000:1A32  1326 0000:1A35  1328 0000:1A38  1329 0000:1A5C
  1330 0000:1A5F  1365 0000:1A60  1367 0000:1A66  1368 0000:1A6B
  1370 0000:1A86  1372 0000:1AA5  1375 0000:1AB3  1378 0000:1ABC
  1381 0000:1AC5  1384 0000:1ACE  1388 0000:1ADC  1394 0000:1AED
  1396 0000:1AF8  1397 0000:1AFA
Line numbers for g.obj(CTXTSERV.C) segment _TEXT

    62 0000:1B17    66 0000:1B1D    69 0000:1B36    70 0000:1B43
    71 0000:1B4B    72 0000:1B60    74 0000:1B72    75 0000:1B8C
    76 0000:1B8E   101 0000:1B92   103 0000:1B92   104 0000:1BA2
   106 0000:1BAD   107 0000:1BC9   109 0000:1BDE   111 0000:1BF1
   112 0000:1C00   115 0000:1C15   117 0000:1C2E   118 0000:1C34
   119 0000:1C3A   120 0000:1C40   123 0000:1C48   124 0000:1C4A
   147 0000:1C4B   149 0000:1C51   153 0000:1C58   155 0000:1C70
   158 0000:1C8E   159 0000:1C90
Line numbers for h.obj(EVENSERV.C) segment _TEXT

    53 0000:1C94    55 0000:1C97    57 0000:1C9E    59 0000:1CA6
    60 0000:1CAA    65 0000:1CB2    66 0000:1CB8    69 0000:1CBC
    70 0000:1CBF    98 0000:1CC1   103 0000:1CC7   104 0000:1CCD
   106 0000:1CD3   108 0000:1CDE   109 0000:1CE4   110 0000:1CEA
   111 0000:1D03   112 0000:1D09
Line numbers for i.obj(GDS.C) segment _TEXT

   131 0000:1D0D   133 0000:1D0D   134 0000:1D0E   136 0000:1D0F
   137 0000:1D12   138 0000:1D15   140 0000:1D16   141 0000:1D17
   142 0000:1D18   192 0000:1D19   195 0000:1D2E   198 0000:1D34
   200 0000:1D39   201 0000:1D3E   202 0000:1D43   203 0000:1D48
   204 0000:1D4D   206 0000:1D52   207 0000:1D55   210 0000:1D57
```

211	0000:1D5A	212	0000:1D5D	213	0000:1D60	214	0000:1D63
215	0000:1D66	216	0000:1D69	217	0000:1D6A	218	0000:1D6C
219	0000:1D6E	220	0000:1D71	222	0000:1D74	224	0000:1D7B
225	0000:1D81	228	0000:1D8F	229	0000:1D99	232	0000:1DA9
233	0000:1DAC	234	0000:1DAD	235	0000:1DAF	236	0000:1DB2
237	0000:1DB3	238	0000:1DB5	240	0000:1DB8	245	0000:1DBE
246	0000:1DC1	247	0000:1DC2	248	0000:1DC4	249	0000:1DC6
251	0000:1DC8	252	0000:1DCC	255	0000:1DCE	256	0000:1DD1
257	0000:1DD4	258	0000:1DD7	260	0000:1DD9	261	0000:1DDC
262	0000:1DDF	265	0000:1DE1	266	0000:1DE4	267	0000:1DE7
268	0000:1DE9	271	0000:1DEB	272	0000:1DED	273	0000:1DEF
274	0000:1DF1	280	0000:1DF3	281	0000:1DF6	282	0000:1DF9
283	0000:1DFA	284	0000:1DFC	285	0000:1E00	286	0000:1E03
287	0000:1E06	288	0000:1E08	290	0000:1E0B	291	0000:1E11
293	0000:1E1F	296	0000:1E3C	298	0000:1E48	299	0000:1E4E
300	0000:1E56	304	0000:1E5B	306	0000:1E62	307	0000:1E67
308	0000:1E6C	309	0000:1E71	310	0000:1E76	311	0000:1E7B
313	0000:1E7E	314	0000:1E81	334	0000:1E8D	336	0000:1E8D
337	0000:1E9E	362	0000:1E9F	365	0000:1E9F	367	0000:1EA6
368	0000:1EAC	369	0000:1EB2	372	0000:1EB7	374	0000:1EBD
376	0000:1ECA	378	0000:1EE6	379	0000:1EE8	404	0000:1EE9
406	0000:1EE9	408	0000:1EEF	410	0000:1EFB	412	0000:1F03
414	0000:1F12	415	0000:1F14	454	0000:1F15	456	0000:1F1B
458	0000:1F36	460	0000:1F44	463	0000:1F4A	464	0000:1F52
467	0000:1F5A	470	0000:1F67	473	0000:1F77	475	0000:1F88
477	0000:1F95	478	0000:1F9B	481	0000:1F9D	484	0000:1FA0
486	0000:1FA8	489	0000:1FAF	490	0000:1FBB	495	0000:1FC7
496	0000:1FD3	499	0000:1FDF	502	0000:1FE5	503	0000:1FE7
535	0000:1FEB	541	0000:1FF1	544	0000:1FFF	545	0000:201A
546	0000:2030	549	0000:2033	552	0000:203C	555	0000:204C
556	0000:2059	558	0000:2066	561	0000:2076	563	0000:2087
564	0000:2089	617	0000:208D	619	0000:2093	620	0000:209D
623	0000:20B8	625	0000:20C6	627	0000:20CF	629	0000:20D6
630	0000:20DC	631	0000:20E2	633	0000:20E8	635	0000:20EF
641	0000:20F7	643	0000:2104	646	0000:2113	647	0000:211C
648	0000:2128	650	0000:2134	653	0000:2137	655	0000:213F
658	0000:2146	661	0000:215F	664	0000:2178	666	0000:2194
667	0000:219A	668	0000:21A0	669	0000:21A6	673	0000:21A8
675	0000:21B0	678	0000:21BC	681	0000:21C8	682	0000:21D4
684	0000:21E0	686	0000:21E3	688	0000:21ED	689	0000:21FC
690	0000:220B	692	0000:221A	694	0000:2220	695	0000:2222
724	0000:2226	726	0000:222C	728	0000:2247	730	0000:2253
732	0000:225D	733	0000:226E	735	0000:227E	736	0000:2280
757	0000:2284	759	0000:2284	760	0000:228B	797	0000:228C
799	0000:2292	801	0000:229C	803	0000:22A8	805	0000:22B8
807	0000:22C5	809	0000:22CD	811	0000:22DA	813	0000:22E2
814	0000:22EF	816	0000:22FC	818	0000:2304	820	0000:2310
822	0000:232B	824	0000:2337	825	0000:2339	847	0000:233D
849	0000:233D	851	0000:234C	852	0000:2352	853	0000:2360
875	0000:2361	877	0000:2367	879	0000:2367	881	0000:2377
882	0000:2383	885	0000:23A5	887	0000:23A5	889	0000:23BC
890	0000:23C8	892	0000:23EA	914	0000:23EE	916	0000:23EE
917	0000:23F4	918	0000:23FC	919	0000:240C	920	0000:2412
942	0000:2413	944	0000:2413	946	0000:2422	948	0000:2425
949	0000:2436	972	0000:2437	976	0000:243D	979	0000:244B
980	0000:244E	981	0000:244F	982	0000:2451	983	0000:2454
984	0000:2455	985	0000:2457	988	0000:245A	989	0000:245D
990	0000:245E	992	0000:2461	994	0000:246F	995	0000:2472
997	0000:2479	998	0000:2486	1001	0000:248C	1032	0000:2490
1034	0000:2496	1035	0000:249F	1036	0000:24A4	1038	0000:24AE
1040	0000:24B7	1043	0000:24C1	1046	0000:24CB	1047	0000:24D0
1049	0000:24DC	1050	0000:24E8	1051	0000:24F6	1053	0000:2501

```
  1055 0000:2507  1059 0000:2516  1060 0000:251B  1062 0000:2526
  1064 0000:252F  1065 0000:2545  1068 0000:2568  1069 0000:2579
  1105 0000:257D  1107 0000:2583  1108 0000:258D  1109 0000:2593
  1110 0000:259C  1111 0000:25A5  1112 0000:25AE  1114 0000:25B7
  1115 0000:25BC  1116 0000:25C1  1122 0000:25C1  1123 0000:25C6
  1126 0000:25CB  1128 0000:25E1  1129 0000:25ED  1131 0000:25FD
  1133 0000:2607  1134 0000:2616  1137 0000:2626  1139 0000:2630
  1140 0000:263F  1144 0000:265D  1145 0000:2673  1147 0000:268A
  1149 0000:2696  1151 0000:269D  1152 0000:26A2  1154 0000:26A8
  1156 0000:26AE  1157 0000:26B3  1160 0000:26B9  1161 0000:26C9
  1162 0000:26DA  1164 0000:26E0  1203 0000:26E4  1205 0000:26EA
  1206 0000:2705  1208 0000:270A  1210 0000:272A  1213 0000:273B
  1216 0000:2744  1218 0000:2750  1220 0000:275F  1225 0000:2770
  1227 0000:277C  1229 0000:278B  1234 0000:27A1  1237 0000:27AA
  1241 0000:27B3  1242 0000:27BE  1243 0000:27C0
Line numbers for j.obj(HKSERV.C) segment _TEXT

   103 0000:27DD   105 0000:27DD   108 0000:27E3   110 0000:27F2
   112 0000:280E   113 0000:2810   136 0000:2811   138 0000:2811
   140 0000:2817   142 0000:2826   143 0000:2828   170 0000:2829
   172 0000:282F   173 0000:2841   174 0000:2853   177 0000:2859
   178 0000:285D   180 0000:2867   181 0000:2879   183 0000:288B
   184 0000:288E   214 0000:2892   216 0000:2898   218 0000:28A5
   220 0000:28AC   224 0000:28BA   225 0000:28D1   226 0000:28DC
   227 0000:28E9   228 0000:28EC   258 0000:28F0   260 0000:28F6
   262 0000:2903   264 0000:2913   266 0000:291A   267 0000:2926
   271 0000:2931   272 0000:293C   274 0000:2942   275 0000:2950
   277 0000:2972   278 0000:2975   305 0000:2979   307 0000:297F
   308 0000:2989   310 0000:299B   312 0000:29A2   316 0000:29B0
   317 0000:29BE   318 0000:29C9   319 0000:29CC   345 0000:29D0
   349 0000:29D6   350 0000:29E1   352 0000:2A04   353 0000:2A07
   376 0000:2A0B   378 0000:2A0E   379 0000:2A25   380 0000:2A28
   415 0000:2A2A   417 0000:2A30   419 0000:2A35   420 0000:2A44
   422 0000:2A60   424 0000:2A6A   425 0000:2A70   426 0000:2A76
   428 0000:2A88   429 0000:2A98   430 0000:2AA8   431 0000:2AB8
   432 0000:2AC8   433 0000:2AD8   435 0000:2AE8   436 0000:2B04
   464 0000:2B08   466 0000:2B0E   468 0000:2B29   469 0000:2B34
   470 0000:2B42   472 0000:2B55   473 0000:2B57
Line numbers for k.obj(IS.C) segment _TEXT

   151 0000:2B5B   153 0000:2B5B   154 0000:2B5C   156 0000:2B5D
   157 0000:2B60   158 0000:2B63   160 0000:2B64   164 0000:2B67
   165 0000:2B68   167 0000:2B69   169 0000:2B6A   170 0000:2B6D
   172 0000:2B6F   173 0000:2B72   175 0000:2B73   176 0000:2B74
   177 0000:2B75   213 0000:2B76   216 0000:2B8B   222 0000:2B91
   223 0000:2B94   226 0000:2B96   227 0000:2B99   228 0000:2B9C
   229 0000:2B9F   230 0000:2BA2   231 0000:2BA5   232 0000:2BA8
   233 0000:2BA9   234 0000:2BAB   235 0000:2BAD   236 0000:2BB0
   238 0000:2BB3   240 0000:2BBA   241 0000:2BC0   244 0000:2BCE
   245 0000:2BD8   248 0000:2BDD   249 0000:2BED   251 0000:2C12
   253 0000:2C20   254 0000:2C2B   255 0000:2C3D   259 0000:2C44
   260 0000:2C47   261 0000:2C48   262 0000:2C4A   263 0000:2C4D
   264 0000:2C4E   265 0000:2C50   267 0000:2C53   270 0000:2C59
   271 0000:2C69   273 0000:2C8A   275 0000:2CA7   278 0000:2CB1
   279 0000:2CB5   280 0000:2CB8   281 0000:2CBB   283 0000:2CBD
   284 0000:2CC5   288 0000:2CCB   289 0000:2CDE   290 0000:2CE1
   310 0000:2CED   312 0000:2CED   313 0000:2CFE   367 0000:2CFF
   369 0000:2D05   370 0000:2D20   372 0000:2D2A   374 0000:2D38
   377 0000:2D41   378 0000:2D49   381 0000:2D51   384 0000:2D5E
   386 0000:2D6A   387 0000:2D78   389 0000:2D84   391 0000:2D8C
   393 0000:2D8F   396 0000:2D97   399 0000:2D9D   402 0000:2DB9
   403 0000:2DBF   404 0000:2DC5   406 0000:2DDE   408 0000:2DE4
```

```
   411 0000:2DE7   414 0000:2DEF   417 0000:2DFB   419 0000:2E03
   423 0000:2E0A   424 0000:2E0F   425 0000:2E27   429 0000:2E29
   430 0000:2E35   433 0000:2E41   434 0000:2E50   435 0000:2E5F
   437 0000:2E69   439 0000:2E6F   442 0000:2E75   443 0000:2E77
   465 0000:2E7B   467 0000:2E81   468 0000:2E86   470 0000:2E8B
   471 0000:2E97   472 0000:2EA3   473 0000:2EAE   475 0000:2EB9
   476 0000:2EC9   507 0000:2ECD   511 0000:2ED3   514 0000:2EE1
   515 0000:2EFC   516 0000:2F12   519 0000:2F15   522 0000:2F1C
   524 0000:2F30   525 0000:2F32   548 0000:2F36   550 0000:2F3C
   553 0000:2F41   555 0000:2F51   556 0000:2F59   557 0000:2F6F
   560 0000:2F94   561 0000:2F9C   562 0000:2FA9   586 0000:2FAD
   591 0000:2FB3   593 0000:2FB8   594 0000:2FD6   597 0000:2FEF
   599 0000:2FFD   600 0000:2FFF   626 0000:3003   628 0000:3009
   631 0000:301A   634 0000:3026   636 0000:3033   637 0000:3039
   639 0000:3045   641 0000:3054   642 0000:3070   670 0000:3074
   672 0000:307A   674 0000:308B   676 0000:3092   677 0000:3098
   680 0000:30A5   681 0000:30B1   685 0000:30B5   688 0000:30BB
   689 0000:30C7   691 0000:30D4   714 0000:30D8   716 0000:30D8
   718 0000:30DD   720 0000:30E1   721 0000:30ED   722 0000:30F0
   742 0000:30F1   744 0000:30F1   745 0000:30F9   783 0000:30FA
   788 0000:3100   789 0000:310F   791 0000:312A   793 0000:3134
   795 0000:3141   796 0000:314B   798 0000:3154   799 0000:3161
   801 0000:3171   802 0000:3185   804 0000:31A8   805 0000:31AE
   808 0000:31B7   810 0000:31C3   812 0000:31DC   813 0000:31E2
   816 0000:31E8   817 0000:31F6   818 0000:31F9   819 0000:31FA
   821 0000:31FD   823 0000:3200   824 0000:3202   846 0000:3206
   848 0000:3206   849 0000:320C   850 0000:3212   876 0000:3213
   878 0000:3213   879 0000:3220   880 0000:322D   881 0000:3230
   919 0000:3231   921 0000:3237   922 0000:3246   925 0000:3250
   926 0000:3255   927 0000:3266   929 0000:327E   931 0000:3285
   932 0000:328A   935 0000:328F   936 0000:329D   938 0000:32A2
   940 0000:32AC   941 0000:32BF   943 0000:32C4   945 0000:32D5
   946 0000:32DA   948 0000:32DF   950 0000:32E8   952 0000:32F4
   953 0000:3303   955 0000:3313   956 0000:331D   957 0000:332C
   959 0000:3333   960 0000:3338   965 0000:333D   966 0000:3340
   967 0000:3345   969 0000:334A   970 0000:3362   974 0000:3388
   975 0000:338D   976 0000:3398   978 0000:33A8   980 0000:33AE
   981 0000:33BE   985 0000:33C1   987 0000:33E5   988 0000:33FF
   989 0000:3402   992 0000:3404   994 0000:340D   997 0000:3411
  1000 0000:3417  1002 0000:341D  1003 0000:342B  1005 0000:3430
  1006 0000:3436  1008 0000:343F  1009 0000:3454  1011 0000:3461
  1015 0000:3469  1016 0000:3470  1019 0000:347A  1052 0000:347E
  1054 0000:3484  1055 0000:348E  1056 0000:3494  1058 0000:349D
  1060 0000:34A2  1062 0000:34A8  1064 0000:34AF  1066 0000:34BA
  1067 0000:34CB  1068 0000:34D3  1073 0000:34DB  1075 0000:34E3
  1076 0000:34F4  1077 0000:3505  1078 0000:350D  1081 0000:3513
  1115 0000:3517  1117 0000:351D  1118 0000:3527  1119 0000:352D
  1120 0000:3536  1121 0000:353F  1122 0000:3548  1124 0000:3551
  1125 0000:3556  1128 0000:355B  1130 0000:356B  1131 0000:3580
  1133 0000:3598  1135 0000:35A4  1137 0000:35AB  1139 0000:35B0
  1141 0000:35BB  1142 0000:35CB  1143 0000:35EC  1144 0000:35F2
  1147 0000:35F4  1148 0000:35FC  1149 0000:3611  1179 0000:3615
  1181 0000:361B  1182 0000:3636  1183 0000:363B  1185 0000:3641
  1187 0000:3650  1189 0000:365C  1191 0000:3670  1197 0000:3681
  1198 0000:368D  1199 0000:3698  1200 0000:36A3  1204 0000:36AF
  1205 0000:36BA  1206 0000:36BC
Line numbers for l.obj(MBS.C) segment _TEXT

   141 0000:36C0   143 0000:36C0   144 0000:36C1   146 0000:36C2
   147 0000:36C5   148 0000:36C8   150 0000:36C9   151 0000:36CA
   152 0000:36CB   181 0000:36CC   184 0000:36E1   187 0000:36E7
   188 0000:36EA   191 0000:36EC   192 0000:36EF   193 0000:36F2
```

194	0000:36F5	195	0000:36F8	196	0000:36FB	197	0000:36FE
198	0000:36FF	199	0000:3701	200	0000:3703	203	0000:3706
204	0000:3709	205	0000:370C	206	0000:370F	209	0000:3712
210	0000:3715	211	0000:3716	212	0000:3718	215	0000:371B
216	0000:371E	217	0000:371F	220	0000:3721	221	0000:3724
222	0000:3725	223	0000:3727	225	0000:372A	227	0000:3731
228	0000:3736	229	0000:373B	232	0000:373D	233	0000:3742
236	0000:3747	237	0000:374D	239	0000:3758	241	0000:3770
243	0000:378D	245	0000:3793	246	0000:3796	266	0000:37A2
268	0000:37A2	269	0000:37B3	313	0000:37B4	315	0000:37BA
317	0000:37D5	319	0000:37E3	322	0000:37E9	323	0000:37F1
325	0000:37F9	327	0000:37FC	330	0000:3802	333	0000:381B
336	0000:3837	338	0000:3853	340	0000:3856	341	0000:385C
344	0000:385E	347	0000:3866	348	0000:386E	350	0000:3871
351	0000:3880	352	0000:388F	353	0000:389E	355	0000:38A8
357	0000:38AB	360	0000:38B1	361	0000:38B3	383	0000:38B7
387	0000:38BD	388	0000:38D8	390	0000:38EE	392	0000:38F1
393	0000:38F3	419	0000:38F7	423	0000:38FD	424	0000:390B
426	0000:391B	428	0000:3922	429	0000:3931	432	0000:3949
433	0000:394B	463	0000:394F	465	0000:3955	466	0000:395A
467	0000:395F	470	0000:3964	473	0000:396A	475	0000:3976
476	0000:397B	479	0000:3980	480	0000:398C	483	0000:3998
485	0000:399E	486	0000:39AC	489	0000:39B1	490	0000:39C3
516	0000:39C7	519	0000:39CA	520	0000:39CD	521	0000:39D0
524	0000:39D1	525	0000:39D4	526	0000:39D7	528	0000:39D8
531	0000:39E0	532	0000:39E3	533	0000:39E6	535	0000:39E7
536	0000:39ED	537	0000:3A0D	559	0000:3A0F	561	0000:3A0F
562	0000:3A1E	563	0000:3A2B	564	0000:3A2E	593	0000:3A2F
595	0000:3A35	597	0000:3A3C	598	0000:3A4B	599	0000:3A51
600	0000:3A57	601	0000:3A5B	604	0000:3A62	606	0000:3A6A
607	0000:3A70	609	0000:3A7E	610	0000:3A86	612	0000:3A88
617	0000:3A95	619	0000:3A9F	621	0000:3AA6	622	0000:3AB7
624	0000:3ABA	657	0000:3ABE	660	0000:3AC4	662	0000:3ACE
663	0000:3AD4	664	0000:3AE2	665	0000:3AE8	668	0000:3AEE
669	0000:3AFB	670	0000:3B05	672	0000:3B1D	675	0000:3B27
677	0000:3B2E	678	0000:3B34	680	0000:3B42	681	0000:3B4A
682	0000:3B52	684	0000:3B54	688	0000:3B61	689	0000:3B64
715	0000:3B68	717	0000:3B68	720	0000:3B77	722	0000:3B83
724	0000:3B91	726	0000:3B98	727	0000:3BA1	728	0000:3BA9
729	0000:3BAF	730	0000:3BB5	731	0000:3BBB	734	0000:3BC1
736	0000:3BDD	737	0000:3BE3	738	0000:3BE6	770	0000:3BE7
772	0000:3BED	774	0000:3BF4	776	0000:3BF9	777	0000:3C08
778	0000:3C0E	780	0000:3C14	781	0000:3C22	783	0000:3C44
788	0000:3C56	790	0000:3C5D	791	0000:3C6E	794	0000:3C71
827	0000:3C75	831	0000:3C7B	832	0000:3C81	834	0000:3C9D
836	0000:3CA7	837	0000:3CB5	838	0000:3CBB	840	0000:3CC1
841	0000:3CCB	842	0000:3CD8	843	0000:3CDE	845	0000:3CE4
846	0000:3CE9	848	0000:3CF1	849	0000:3CF3	869	0000:3CF7
871	0000:3CF7	872	0000:3CFA	895	0000:3CFB	897	0000:3CFB
899	0000:3D08	901	0000:3D10	902	0000:3D2B	903	0000:3D2D
923	0000:3D2E	927	0000:3D34	928	0000:3D3F	929	0000:3D62
950	0000:3D66	952	0000:3D66	953	0000:3D75	954	0000:3D7B
993	0000:3D7C	995	0000:3D82	997	0000:3D8F	999	0000:3DA0
1000	0000:3DA5	1001	0000:3DAE	1004	0000:3DB3	1006	0000:3DBA
1007	0000:3DC6	1011	0000:3DE0	1012	0000:3DEC	1015	0000:3E06
1018	0000:3E14	1019	0000:3E1D	1021	0000:3E24	1024	0000:3E35
1025	0000:3E41	1026	0000:3E50	1027	0000:3E52	1029	0000:3E62
1031	0000:3E69	1033	0000:3E70	1034	0000:3E79	1037	0000:3E7E
1039	0000:3E87	1041	0000:3E8E	1042	0000:3EAA	1043	0000:3EB0
1044	0000:3EB9	1047	0000:3EC2	1048	0000:3ECD	1049	0000:3ED3
1052	0000:3ED5	1053	0000:3ED9	1056	0000:3EE9	1057	0000:3EF8
1086	0000:3EFC	1088	0000:3F02	1089	0000:3F0C	1091	0000:3F12

```
  1093 0000:3F17  1095 0000:3F1C  1097 0000:3F28  1098 0000:3F38
  1102 0000:3F52  1104 0000:3F5A  1106 0000:3F61  1107 0000:3F72
  1108 0000:3F83  1111 0000:3F89  1146 0000:3F8D  1148 0000:3F93
  1149 0000:3FAE  1150 0000:3FB9  1152 0000:3FBE  1154 0000:3FDD
  1156 0000:3FE9  1158 0000:3FFD  1163 0000:400E  1166 0000:401D
  1167 0000:402E  1168 0000:403A  1171 0000:404A  1175 0000:4053
  1176 0000:405E  1177 0000:4060
Line numbers for m.obj(MEMSERV.C) segment _TEXT

    77 0000:4075    79 0000:407B    80 0000:4097    81 0000:40AF
    82 0000:40C7   112 0000:40CB   115 0000:40D1   119 0000:40D6
   121 0000:40DC   123 0000:40E8   125 0000:40F6   127 0000:4103
   128 0000:4120   129 0000:4140   132 0000:4154   134 0000:415A
   135 0000:4167   137 0000:4172   139 0000:4185   140 0000:4187
   165 0000:418B   167 0000:4191   171 0000:41A0   173 0000:41A5
   175 0000:41AA   177 0000:41BC   178 0000:41D5   179 0000:41EF
   181 0000:420A   182 0000:420E   185 0000:4222   186 0000:423B
   187 0000:423D   212 0000:4241   214 0000:4247   218 0000:4256
   221 0000:4260   223 0000:4265   225 0000:4281   226 0000:429A
   228 0000:42AE   229 0000:42AF   230 0000:42B2   232 0000:42B4
   234 0000:42C7   236 0000:42C8   237 0000:42DF   238 0000:42E7
   241 0000:42FE   243 0000:4317   244 0000:4319   273 0000:431D
   275 0000:4323   280 0000:4336   283 0000:433B   286 0000:4357
   288 0000:435F   289 0000:4364   290 0000:436E   292 0000:437D
   294 0000:4384   296 0000:438C   297 0000:43A2   300 0000:43A9
   301 0000:43C2   302 0000:43CE   303 0000:43E4   306 0000:43E6
   307 0000:43E9   310 0000:4401   311 0000:4412   334 0000:4416
   337 0000:441C   339 0000:4432   341 0000:4437   342 0000:443F
   343 0000:4466   344 0000:446A   346 0000:4477   368 0000:447B
   370 0000:447B   372 0000:447E   374 0000:448A   376 0000:4491
   377 0000:4497   379 0000:449B   402 0000:449C   404 0000:44A0
   406 0000:44A1   407 0000:44A4   409 0000:44A6   410 0000:44A8
   414 0000:44AA   415 0000:44AC   417 0000:44AE   418 0000:44B1
   419 0000:44B5   420 0000:44B7   423 0000:44B9   424 0000:44BB
   425 0000:44BD   427 0000:44BE   463 0000:44C1   465 0000:44C7
   466 0000:44D2   467 0000:44DD   468 0000:44E2   471 0000:44EC
   473 0000:44F1   476 0000:4500   478 0000:4514   479 0000:451E
   480 0000:4528   481 0000:452A   482 0000:4534   484 0000:453B
   485 0000:4545   492 0000:4552   494 0000:4558   495 0000:455F
   498 0000:4565   500 0000:4575   502 0000:457E   503 0000:4594
   505 0000:45B9   506 0000:45BF   508 0000:45C5   509 0000:45C9
   511 0000:45D3   512 0000:45EA   515 0000:4610   516 0000:4618
   518 0000:463A   519 0000:463C
Line numbers for n.obj(MODES.C) segment _TEXT

   112 0000:4640   114 0000:4643   116 0000:4649   119 0000:465A
   121 0000:4661   122 0000:4667   126 0000:4680   128 0000:4686
   129 0000:468C   130 0000:4692   152 0000:4694   154 0000:4697
   156 0000:4698   158 0000:469B   159 0000:469C   160 0000:469D
   161 0000:469E   162 0000:469F   163 0000:46A0   164 0000:46A1
   165 0000:46A2   167 0000:46A3   169 0000:46AA   170 0000:46AB
   214 0000:46AD   216 0000:46AD   218 0000:46BE   219 0000:46CD
   220 0000:46DC   223 0000:46EB   224 0000:46F7   225 0000:4703
   226 0000:4706   228 0000:4709   229 0000:4718   230 0000:4727
   231 0000:4736   232 0000:4745   233 0000:4754   234 0000:4763
   236 0000:4772   238 0000:477A   241 0000:477D   242 0000:4780
   245 0000:4786   246 0000:4789   249 0000:478F   251 0000:479C
   254 0000:47A2   256 0000:47B5   257 0000:47C4   260 0000:47D9
   262 0000:47E7   264 0000:47EF   265 0000:47F1   290 0000:47F2
   292 0000:47F2   294 0000:4803   296 0000:4815   298 0000:481C
   299 0000:481E   326 0000:481F   328 0000:4825   329 0000:4832
   330 0000:483B   332 0000:4844   334 0000:4855   335 0000:4863
```

```
   336 0000:4871   338 0000:487F   340 0000:4890   342 0000:4897
   343 0000:4899   368 0000:489D   370 0000:48A3   372 0000:48B0
   374 0000:48C1   376 0000:48CF   378 0000:48E0   380 0000:48E7
   381 0000:48E9   407 0000:48ED   409 0000:48F3   411 0000:48F8
   413 0000:4917   414 0000:4925   415 0000:492F   416 0000:4939
   418 0000:4943   420 0000:494E   421 0000:4950
Line numbers for p.obj(SCHEDULE.C) segment _TEXT

    75 0000:4964    79 0000:496A    80 0000:496F    82 0000:4981
    83 0000:4987    84 0000:4993   109 0000:4997   113 0000:499D
   115 0000:49A4   117 0000:49B5   119 0000:49E7   120 0000:49EF
   121 0000:49F9   125 0000:4A24   126 0000:4A3D   149 0000:4A41
   152 0000:4A47   153 0000:4A4C   155 0000:4A66   156 0000:4A68
   192 0000:4A6C   195 0000:4A72   197 0000:4A77   199 0000:4A83
   200 0000:4A8D   202 0000:4A95   203 0000:4A9B   206 0000:4AAB
   209 0000:4AC6   211 0000:4AD4   213 0000:4AEA   214 0000:4AFB
   216 0000:4AFE   217 0000:4B00   251 0000:4B04   257 0000:4B0A
   258 0000:4B1D   259 0000:4B29   261 0000:4B2F   262 0000:4B36
   263 0000:4B45   264 0000:4B5B   266 0000:4B62   268 0000:4B65
   301 0000:4B69   306 0000:4B6F   307 0000:4B82   309 0000:4BA9
   311 0000:4BB2   312 0000:4BB9   315 0000:4BBC   316 0000:4BD2
   318 0000:4BED   319 0000:4C09   321 0000:4C27   323 0000:4C2B
   324 0000:4C4D   325 0000:4C59   348 0000:4C5D   350 0000:4C64
   351 0000:4C7C   353 0000:4C82   355 0000:4C8E   356 0000:4C96
   359 0000:4C98   361 0000:4CA0   362 0000:4CC0   363 0000:4CC3
   364 0000:4CC5   366 0000:4CCD   367 0000:4CD0
Line numbers for q.obj(SCISERV.C) segment _TEXT

    91 0000:4CD5    93 0000:4CD5    94 0000:4CDB    95 0000:4CDD
   117 0000:4CDE   119 0000:4CDE   120 0000:4CE4   121 0000:4CE6
   148 0000:4CE7   155 0000:4CED   157 0000:4CF7   159 0000:4D0C
   161 0000:4D14   163 0000:4D20   164 0000:4D23   165 0000:4D24
   166 0000:4D27   167 0000:4D2B   168 0000:4D2D   170 0000:4D30
   174 0000:4D37   177 0000:4D41   178 0000:4D42   179 0000:4D54
   181 0000:4D61   182 0000:4D69   184 0000:4D6C   185 0000:4D72
   187 0000:4D73   188 0000:4D79   215 0000:4D7D   222 0000:4D83
   224 0000:4D8D   226 0000:4DA2   228 0000:4DAA   230 0000:4DB6
   231 0000:4DB9   232 0000:4DBA   233 0000:4DBD   234 0000:4DC1
   235 0000:4DC3   237 0000:4DC6   241 0000:4DCD   244 0000:4DD7
   245 0000:4DD8   246 0000:4DEA   248 0000:4DF7   249 0000:4DFF
   251 0000:4E02   252 0000:4E08   254 0000:4E09   255 0000:4E0F
   284 0000:4E13   288 0000:4E19   291 0000:4E20   292 0000:4E2A
   294 0000:4E33   295 0000:4E42   297 0000:4E5E   299 0000:4E65
   300 0000:4E68   303 0000:4E6B   305 0000:4E73   306 0000:4E88
   307 0000:4E8F   332 0000:4E93   334 0000:4E99   335 0000:4E9F
   337 0000:4EA4   340 0000:4EB3   342 0000:4EC6   345 0000:4ECC
   346 0000:4ED6   347 0000:4EEC   348 0000:4EF3   351 0000:4EF9
   353 0000:4F00   355 0000:4F23   356 0000:4F29   385 0000:4F2D
   387 0000:4F33   389 0000:4F4E   391 0000:4F59   393 0000:4F67
   395 0000:4F7A   396 0000:4F7C
Line numbers for r.obj(SERVICES.C) segment _TEXT

    71 0000:4F80    73 0000:4F86    75 0000:4FA8    76 0000:4FB0
    77 0000:4FB8    78 0000:4FC0    79 0000:4FC8    80 0000:4FD0
    81 0000:4FD8    82 0000:4FE0    83 0000:4FE8    84 0000:4FF0
    85 0000:4FF8    86 0000:5000    87 0000:5008    88 0000:5010
    91 0000:501C    94 0000:503C    95 0000:504B    98 0000:505A
    99 0000:506C   100 0000:507B   103 0000:508A   106 0000:5099
   109 0000:50A8   110 0000:50B7   113 0000:50C6   114 0000:50D5
   117 0000:50E4   118 0000:50F3   119 0000:5102   120 0000:5111
   121 0000:5120   122 0000:512F   123 0000:513E   124 0000:514D
   125 0000:515C   128 0000:516B   129 0000:517A   130 0000:5189
```

```
   131 0000:519B   132 0000:51AD   133 0000:51BF   134 0000:51D1
   137 0000:51E2   138 0000:51F3   139 0000:5208   140 0000:5217
   143 0000:5228   144 0000:5239   145 0000:5246   146 0000:5253
   147 0000:5260   150 0000:526D   151 0000:527A   152 0000:5287
   153 0000:5294   158 0000:52A1   160 0000:52B0   162 0000:52B3
Line numbers for s.obj(SHELL.C) segment _TEXT

   139 0000:5390   141 0000:5390   142 0000:5393   143 0000:5396
   144 0000:5399   145 0000:539C   146 0000:539F   147 0000:53A2
   148 0000:53A5   149 0000:53A8   150 0000:53AB   151 0000:53AE
   175 0000:53AF   177 0000:53B5   178 0000:53B5   181 0000:53B5
   184 0000:53C7   185 0000:53E0   186 0000:53ED   187 0000:53F5
   188 0000:542C   191 0000:543F   193 0000:544B   194 0000:5453
   195 0000:5462   197 0000:5477   227 0000:547B   232 0000:5481
   234 0000:5485   235 0000:5497   237 0000:54A9   239 0000:54AC
   242 0000:54AF   243 0000:54C1   244 0000:54CE   245 0000:54D6
   248 0000:54F0   251 0000:5506   254 0000:551E   256 0000:5536
   257 0000:5541   259 0000:554C   261 0000:5552   264 0000:5557
   265 0000:555C   266 0000:5562   267 0000:556A   268 0000:5570
   270 0000:5574   273 0000:5591   275 0000:5598   278 0000:55A3
   279 0000:55A8   280 0000:55AE   281 0000:55B4   283 0000:55B8
   287 0000:55D5   288 0000:55D8   289 0000:55DB   310 0000:55DF
   312 0000:55DF   314 0000:55E0   315 0000:55E3   317 0000:55E6
   318 0000:55E7   343 0000:55E8   345 0000:55E8   347 0000:55F7
   348 0000:55FA   349 0000:55FD   350 0000:5600   351 0000:5606
   373 0000:5607   375 0000:560A   376 0000:5610   377 0000:5616
   398 0000:5618   400 0000:5618   401 0000:561E   402 0000:5624
   426 0000:5625   431 0000:562B   433 0000:563D   434 0000:5645
   436 0000:5649   438 0000:564F   440 0000:566B   446 0000:567F
   448 0000:5687   478 0000:569B   482 0000:569B   484 0000:569F
   486 0000:56A9   488 0000:56B0   490 0000:56C8   492 0000:56D3
   494 0000:56DD   496 0000:56E5   497 0000:56E8   498 0000:56EB
   501 0000:56F0   527 0000:56F1   530 0000:56F7   532 0000:5700
   533 0000:5706   535 0000:570F   537 0000:572E   539 0000:573D
   542 0000:575A   543 0000:5760   545 0000:576A   546 0000:5770
   571 0000:5774   573 0000:5774   575 0000:577B   576 0000:578D
   577 0000:5793   579 0000:5795   581 0000:579C   582 0000:57AE
   583 0000:57B4   586 0000:57B6   587 0000:57C8   590 0000:57CF
   591 0000:57D3   617 0000:57D4   619 0000:57DA   621 0000:57DF
   625 0000:57E4   627 0000:57E7   629 0000:57EA   623 0000:57F4
   632 0000:57FA   633 0000:57FC
Line numbers for t.obj(TAIL.C) segment _TEXT

    43 0000:5800    45 0000:5803    46 0000:580B    47 0000:5810
    48 0000:5815    49 0000:581B    50 0000:581E    80 0000:5820
    86 0000:5826    88 0000:582D    89 0000:5836    90 0000:583C
    92 0000:5842    94 0000:584B    95 0000:5852    98 0000:5857
   100 0000:5863   101 0000:586D   102 0000:588D   104 0000:58A6
   105 0000:58C2   108 0000:58D3   109 0000:58E5   111 0000:58EF
   113 0000:58F6   114 0000:58F9   142 0000:58FD   150 0000:5903
   152 0000:590A   153 0000:5913   154 0000:591E   155 0000:5927
   157 0000:592D   159 0000:5935   160 0000:593C   161 0000:5946
   164 0000:5949   166 0000:5955   167 0000:595F   168 0000:597F
   171 0000:5998   174 0000:59B4   175 0000:59C6   176 0000:59D0
   178 0000:59D3   180 0000:59D8   181 0000:59DD   184 0000:59E2
   185 0000:59E9   211 0000:59ED   213 0000:59F0   215 0000:59F7
   216 0000:59FF   217 0000:5A04   219 0000:5A0A   220 0000:5A11
Line numbers for u.obj(TESTSERV.C) segment _TEXT

    39 0000:5A13    41 0000:5A13    42 0000:5A27    43 0000:5A29
Line numbers for v.obj(TIMESERV.C) segment _TEXT
```

```
    72 0000:5A2A    74 0000:5A2A    75 0000:5A36    76 0000:5A3E
   107 0000:5A3F   111 0000:5A54   112 0000:5A57   114 0000:5A59
   116 0000:5A6E   118 0000:5A7C   119 0000:5A7F   120 0000:5A80
   121 0000:5A84   122 0000:5A86   123 0000:5A8B   124 0000:5A90
   128 0000:5A90   129 0000:5A93   131 0000:5A96   132 0000:5A99
   134 0000:5A9C   136 0000:5A9F   138 0000:5AA6   139 0000:5AB5
   141 0000:5ACD   165 0000:5AD9   167 0000:5AD9   168 0000:5ADA
   169 0000:5ADB   170 0000:5ADC   172 0000:5ADD   173 0000:5AE0
   175 0000:5AE2   176 0000:5AE5   177 0000:5AE6   178 0000:5AE9
   179 0000:5AEB   182 0000:5AED   183 0000:5AF2   186 0000:5AF7
   187 0000:5AFB   188 0000:5B00   189 0000:5B02   192 0000:5B04
   193 0000:5B09   194 0000:5B0E   196 0000:5B14   197 0000:5B15
   198 0000:5B16   199 0000:5B17   200 0000:5B18   201 0000:5B19
   223 0000:5B1A   225 0000:5B1A   226 0000:5B26   227 0000:5B2C
   228 0000:5B3D   249 0000:5B3E   251 0000:5B3E   252 0000:5B41
   253 0000:5B52   280 0000:5B53   282 0000:5B53   284 0000:5B61
   286 0000:5B70   288 0000:5B8B   289 0000:5B95   291 0000:5BA2
   293 0000:5BAA   294 0000:5BAC   316 0000:5BAD   318 0000:5BB3
   321 0000:5BB8   322 0000:5BC3   324 0000:5BCE   325 0000:5BD1
   326 0000:5BD3   327 0000:5BD4   328 0000:5BD6   330 0000:5BD9
   331 0000:5BE2
Line numbers for w.obj(UTIL.C) segment _TEXT

    79 0000:5BE6    81 0000:5BEB    82 0000:5BEC    83 0000:5BED
    84 0000:5BEE    85 0000:5BEF    87 0000:5BF0    88 0000:5BF1
    89 0000:5BF3    90 0000:5BF5    91 0000:5BF8    92 0000:5BFB
    94 0000:5BFE    97 0000:5C00    98 0000:5C01    99 0000:5C02
   100 0000:5C03   101 0000:5C04   102 0000:5C05   136 0000:5C09
   138 0000:5C0E   139 0000:5C0F   140 0000:5C10   141 0000:5C11
   142 0000:5C12   143 0000:5C13   145 0000:5C14   146 0000:5C15
   147 0000:5C18   148 0000:5C1A   149 0000:5C1D   150 0000:5C1F
   151 0000:5C22   152 0000:5C25   154 0000:5C28   157 0000:5C2A
   158 0000:5C2B   159 0000:5C2C   160 0000:5C2D   161 0000:5C2E
   162 0000:5C2F   163 0000:5C30   186 0000:5C34   190 0000:5C3B
   192 0000:5C54   217 0000:5C59   219 0000:5C5C   220 0000:5C5D
   222 0000:5C5E   223 0000:5C61   224 0000:5C64   226 0000:5C65
   227 0000:5C66   228 0000:5C67   255 0000:5C69   259 0000:5C6F
   260 0000:5C70   262 0000:5C71   263 0000:5C74   265 0000:5C75
   266 0000:5C77   268 0000:5C7A   269 0000:5C7B   271 0000:5C7C
   272 0000:5C7F   298 0000:5C83   302 0000:5C89   303 0000:5C8A
   305 0000:5C8B   306 0000:5C8E   308 0000:5C8F   310 0000:5C92
   311 0000:5C93   313 0000:5C94   314 0000:5C97   340 0000:5C9B
   342 0000:5C9E   343 0000:5C9F   345 0000:5CA0   346 0000:5CA3
   348 0000:5CA6   349 0000:5CA8   350 0000:5CAA   352 0000:5CAC
   353 0000:5CAD   354 0000:5CAE   355 0000:5CB1   357 0000:5CB3
   358 0000:5CB4   360 0000:5CB5   382 0000:5CB7   386 0000:5CBD
   388 0000:5CC2   389 0000:5CC5   391 0000:5CC8   392 0000:5CCA
   394 0000:5CCC   395 0000:5CCD   396 0000:5CCE   397 0000:5CD1
   399 0000:5CDC   442 0000:5CE0   447 0000:5CE7   448 0000:5CE8
   450 0000:5CE9   451 0000:5CEE   453 0000:5CF3   456 0000:5CF6
   460 0000:5CFB   461 0000:5CFE   462 0000:5D01   463 0000:5D03
   464 0000:5D05   466 0000:5D07   467 0000:5D09   468 0000:5D0B
   469 0000:5D0D   471 0000:5D11   473 0000:5D13   474 0000:5D14
   475 0000:5D17   477 0000:5D19   479 0000:5D1D   481 0000:5D1E
   482 0000:5D21   483 0000:5D24   484 0000:5D26   485 0000:5D28
   486 0000:5D2A   488 0000:5D2C   490 0000:5D2E   491 0000:5D31
   493 0000:5D34   457 0000:5D35   497 0000:5D3F   498 0000:5D42
   502 0000:5D45   503 0000:5D49   504 0000:5D4B   505 0000:5D4E
   506 0000:5D52   507 0000:5D54   508 0000:5D56   509 0000:5D58
   510 0000:5D5A   512 0000:5D5E   513 0000:5D5F   514 0000:5D60
   515 0000:5D63   546 0000:5D68   548 0000:5D6E   550 0000:5D7C
   552 0000:5D7D   553 0000:5D80   555 0000:5D83   556 0000:5D85
```

```
   558 0000:5D87   559 0000:5D8A   561 0000:5D8D   563 0000:5D8E
   564 0000:5D94   589 0000:5D98   594 0000:5D9E   596 0000:5DB1
   597 0000:5DB9   598 0000:5DBC   599 0000:5DBE   600 0000:5DC1
   602 0000:5DD8   627 0000:5DDC   631 0000:5DE2   633 0000:5DE7
   634 0000:5DEF   635 0000:5DFC   636 0000:5E15   638 0000:5E2F
   663 0000:5E33   666 0000:5E39   668 0000:5E3A   669 0000:5E3C
   670 0000:5E3F   671 0000:5E41   672 0000:5E44   674 0000:5E47
   675 0000:5E48   676 0000:5E4E   718 0000:5E52   720 0000:5E58
   722 0000:5E64   724 0000:5E69   726 0000:5E73   728 0000:5E86
   730 0000:5E8C   733 0000:5E9B   736 0000:5EB7   738 0000:5EBF
   739 0000:5EC2
Line numbers for y.obj(VDISK.C) segment _TEXT

    52 0000:5EC6    54 0000:5ECC    56 0000:5ED1    57 0000:5EE4
    59 0000:5EFB    60 0000:5EFE    86 0000:5F02    88 0000:5F08
    90 0000:5F0D    91 0000:5F14    92 0000:5F19    93 0000:5F1E
   121 0000:5F22   123 0000:5F28   126 0000:5F2D   127 0000:5F35
   133 0000:5F3E   135 0000:5F49   136 0000:5F54   137 0000:5F5C
   139 0000:5F62   140 0000:5F74   142 0000:5F86   143 0000:5F92
   145 0000:5F9E   147 0000:5FB4   148 0000:5FC3   149 0000:5FD3
   150 0000:5FDF   152 0000:5FF9   153 0000:5FFC   177 0000:6000
   179 0000:6006   180 0000:600B   182 0000:6019   184 0000:601F
   185 0000:6025   186 0000:602B   190 0000:602D   191 0000:6043
   192 0000:6059   193 0000:6061   217 0000:6065   219 0000:606B
   220 0000:6070   222 0000:6078   224 0000:6083   226 0000:608F
   227 0000:6096   270 0000:609A   272 0000:60A0   273 0000:60A5
   274 0000:60AD   275 0000:60B3   279 0000:60B8   282 0000:60C3
   283 0000:60D3   285 0000:60E9   288 0000:60EF   289 0000:6101
   290 0000:6115   291 0000:6129   293 0000:6147   296 0000:616D
   297 0000:6172   300 0000:6178   302 0000:617B   303 0000:617E
   333 0000:6182   335 0000:6188   342 0000:618D   343 0000:61A1
   346 0000:61C0   347 0000:61D0   350 0000:61E6   351 0000:61F4
   352 0000:620A   353 0000:621D   355 0000:6220   356 0000:6222
   381 0000:6226   383 0000:622C   389 0000:6231   392 0000:6244
   393 0000:6263   395 0000:6273   397 0000:6289   398 0000:628C
   437 0000:6290   439 0000:6296   440 0000:629B   442 0000:62A1
   443 0000:62A2   444 0000:62A3   445 0000:62A6   447 0000:62A8
   449 0000:62BA   450 0000:62BF   451 0000:62D2   452 0000:62E3
   453 0000:62F0   456 0000:62F6   457 0000:62F7   459 0000:62F8
   461 0000:62FF   462 0000:630F   464 0000:6313   465 0000:6316
Line numbers for z.obj(VERFSERV.C) segment _TEXT

   123 0000:632D   125 0000:6333   127 0000:633C   129 0000:6343
   130 0000:634E   131 0000:6355   133 0000:6357   135 0000:635E
   137 0000:6364   138 0000:6367   176 0000:636B   178 0000:6371
   179 0000:637A   181 0000:6380   183 0000:638D   185 0000:6394
   187 0000:639F   189 0000:63A7   190 0000:63AD   193 0000:63B1
   195 0000:63B8   196 0000:63BE   199 0000:63CB   202 0000:63DF
   203 0000:63E5   209 0000:63EE   212 0000:6402   213 0000:6408
   216 0000:640B   252 0000:640F   255 0000:6415   256 0000:6421
   258 0000:642A   259 0000:6435   260 0000:6443   261 0000:644E
   263 0000:645C   264 0000:646E   267 0000:6473   269 0000:647C
   271 0000:6483   272 0000:6489   275 0000:648F   278 0000:64B8
   279 0000:64C8   280 0000:64DA   283 0000:64F8   288 0000:650B
   289 0000:6524   290 0000:653F   293 0000:654D   294 0000:6552
   296 0000:6562   297 0000:656C   299 0000:6582   300 0000:6591
   303 0000:65A1   305 0000:65AA   307 0000:65B0   308 0000:65C9
   309 0000:65F8   312 0000:65FA   313 0000:6613   316 0000:6630
   318 0000:6636   319 0000:6649   321 0000:6664   352 0000:6668
   354 0000:666E   356 0000:6690   357 0000:6699   358 0000:66A1
   359 0000:66A9   360 0000:66B1   361 0000:66B9   362 0000:66C1
   363 0000:66C9   364 0000:66D1   366 0000:66D9   367 0000:66DB
```

```
388 0000:6704   390 0000:6704   391 0000:671D   392 0000:6723
414 0000:6724   416 0000:6724   417 0000:6733   418 0000:6736
419 0000:673E   453 0000:673F   455 0000:6745   457 0000:674A
459 0000:675C   461 0000:6762   462 0000:676A   463 0000:676D
464 0000:6770   467 0000:6790   468 0000:67A6   469 0000:67BA
470 0000:67C0   471 0000:67C6   472 0000:67CC   474 0000:67D2
475 0000:67ED   476 0000:67F3   498 0000:67F7   500 0000:67F7
501 0000:67FD   502 0000:6803   503 0000:6809   504 0000:680F
505 0000:6815   527 0000:6816   529 0000:6816   530 0000:681C
531 0000:6822   532 0000:6828   533 0000:682E   534 0000:6834
567 0000:6835   569 0000:683B   570 0000:6840   571 0000:684A
573 0000:684A   574 0000:6853   575 0000:6860   576 0000:6869
577 0000:687C   579 0000:6881   582 0000:688E   583 0000:6894
584 0000:689A   587 0000:68A0   588 0000:68BE   590 0000:68C4
591 0000:68D3   592 0000:68E5   593 0000:68E5   594 0000:68F9
598 0000:68FE   600 0000:6905   605 0000:6914   606 0000:6923
608 0000:6929   613 0000:6938   614 0000:6945   615 0000:6951
617 0000:6960   622 0000:696D   623 0000:6974   624 0000:697B
626 0000:6982   631 0000:6993   632 0000:699D   634 0000:69A3
635 0000:69A6   636 0000:69AB   637 0000:69AD   640 0000:69B2
643 0000:69BB   646 0000:69C6   647 0000:69CC   648 0000:69D2
649 0000:69D8   652 0000:69E3   654 0000:69E9   657 0000:69F7
658 0000:6A03   660 0000:6A15   664 0000:6A25   665 0000:6A28
```

Appendix C. GIADA NVRAM Memory Map

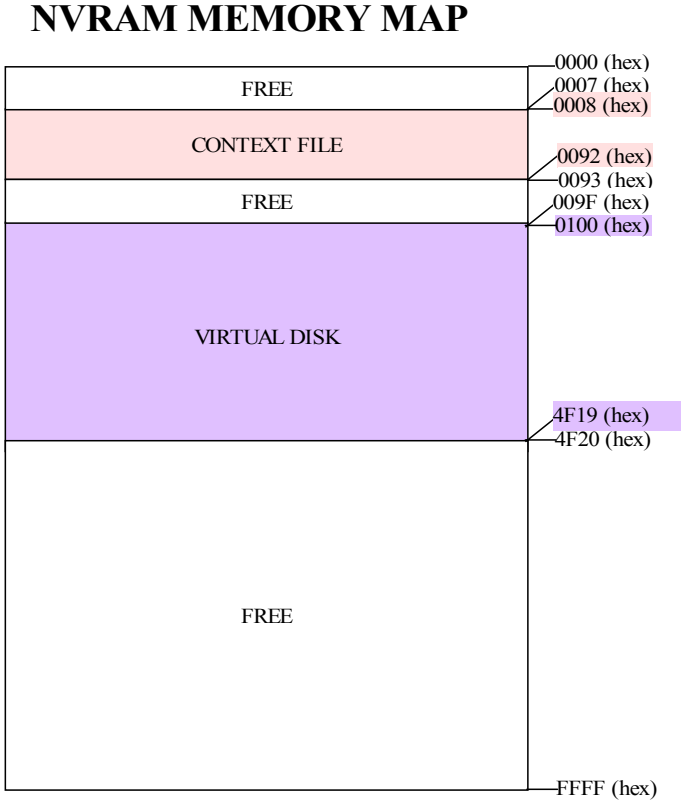

Figure 1 GIADA NVRAM Memory Map

Appendix D. GIADA ROM Memory Map

The GIADA RAM Memory Map is shown in Figure 5.

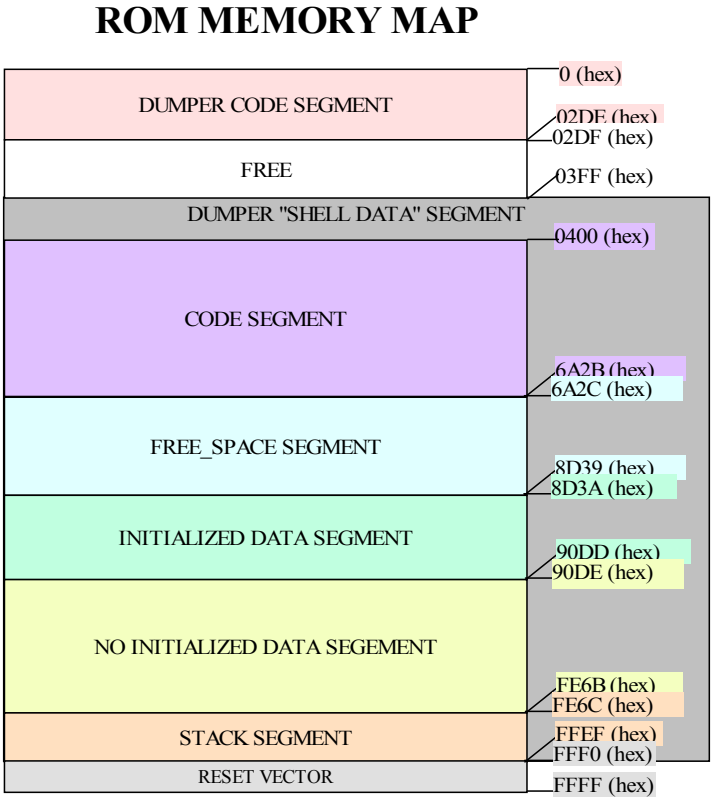

Figure 5. GIADA ROM Memory Map

Below is reported a detailed map of the Dumper. The segments that build the *Dumper "Shell Data" Segment* are the same that are copied in RAM.

```
*******************************************************************************
*                              L O A D      M A P                             *
*******************************************************************************
*    Section Name              Starting Address    Ending Address    Size     *
*******************************************************************************
* c:\proyecto\GIADAQM\obj\dumper.o                                            *
*    _TEXT                          0000                02DE         02DF     *
*    _DATA                          EE00                EE1B         001C     *
*    _DATADUMP                      0400                90E1         8CE2     *
*    _RESET                         FFF0                FFF4         0005     *
*******************************************************************************
             Symbol Name                     Global Value

             ADDRESS_FOR_EDAC_STATUS_WORDS    0000:FF00
             AFTER_WATCHDOG_REGISTER          0000:F000
             BadPing                          F000:016A
             BadPingValue                     0000:7C8E
             BLOCK_LENGTH                     0000:0100
             ByteLoaded                       0000:EE10
             CHANGE_CX                        F000:0239
             CheckSum                         0000:EE14
             CheckSumNotReceived              F000:0065
             CheckSumOK                       F000:01FE
             CheckSumReceived                 0000:EE12
             ClearSerialInterruptValue0       0000:000F
             ClearSerialInterruptValue1       0000:0003
             CodeSegment                      0000:EE1A
             DESTINATION_OFFSET               0000:0400
             Dumper                           F000:0204
             EDACControl                      0000:1000
             EDAC_ADDRESSS_REGISTER           0000:1000
             EDAC_CLEAR_MASK                  0000:00F3
             EDAC_CLEAR_ONE                   0000:000C
             EDAC_CONTROL_REGISTER            0000:1000
             EDAC_CONTROL_STATUS_MASK         0000:00F0
             EDAC_STATUS_REGISTER             0000:1002
             EDAC_Work                        F000:0284
             EmptyIRQ                         F000:0000
             END_ERASE_SEGMENT                F000:02D3
             EraseRAMSegment                  F000:00D0
             EXIT                             F000:023D
             ExitIRQ                          F000:00B2
             ExitIRQWithoutIncrement          F000:00B5
             EXIT_ERASE                       F000:00E8
             Exit_IRQ                         F000:0033
             GoodPing                         F000:0166
             GoodPingValue                    0000:5A6B
             GoOn                             F000:0073
             GoOnLoader                       F000:01CF
             G_Letter                         0000:0047
             HeaderSize                       0000:000A
             InterruptBaseAdress              0000:0020
             Interrupt_Work                   F000:02A4
             I_Letter                         0000:0049
             Jump_Far_Vector                  F000:90DE
             LENGTH_PROGRAM_IN_WORDS          0000:466F
             Loader                           F000:016F
             LoaderRunning                    0000:A0F7
             LoaderSession                    0000:EE00
             LoaderSessionIRQ                 F000:0058
             LoopsWaitingTransmitterBusy      0000:0100
             MaxInterrupt                     0000:0100
```

```
NEXT_BLOCK                      F000:0224
NumBytesOK                      0000:EE0E
NVRAM_DATA_SEGMENT              0000:1000
N_Letter                        0000:004E
OffsetCodeSegment               0000:EE18
Only1ByteLoaded                 F000:007B
OnlyIRQSerialPortEnabled        0000:0001
OtherIRQ                        F000:02B0
O_Letter                        0000:004F
PICIRQRegister                  0000:2002
PICIRQVectorRegister            0000:2000
Ping                            F000:0112
PingOK                          0000:EE04
PingTimeout                     0000:EE02
PingWait                        F000:0145
PongCTE                         0000:EE06
Program                         F000:0400
ProgramSize                     0000:EE16
ProgramStore                    F000:00A7
P_Letter                        0000:0050
RAM_DATA_SEGMENT                0000:0000
RestoreSavedEDACStatus          F000:026A
ROM_DATA_SEGMENT                0000:F000
SendWord                        F000:00EF
SerialIRQ                       F000:0001
SerialPortByteTransmitted       0000:0200
SerialPortControl               0000:4001
SerialPortInitialization0       0000:000C
SerialPortInitialization1       0000:0003
SerialPortInterruptNumber       0000:0020
SerialPortStatus                0000:4000
SerialPortTransmitRegister      0000:4000
SerialPortTransmittedMask       0000:0200
SetBadPing                      F000:0036
SetGoodPing                     F000:0047
SetIRQ                          F000:00C2
START                           F000:02BB
StoreEDACStatus                 F000:024D
StoreHeader                     F000:0098
TransmitterBusy                 0000:0800
TransmitterBusyMask             0000:0800
TwoBytesloaded                  F000:0082
VarsForProgramStore             F000:009D
WaitProgramByte                 F000:01E6
Wait_Busy                       F000:00F7
WatchDog                        0000:9000
WRITE_BLOCK                     F000:0233
Write_Word                      F000:010A
WRITE_WORD                      F000:00D9
```

Appendix E. Utility Patches

List of patches:

- Patch 1 to 2.3 SW version
- Patch 2 to 2.3 SW version
- Patch 3 to 2.3 SW version
- Virtual Disk Reset
- Reset TM(5,3) limit
- Change IS Autogain

The patches: PATCH 1, PATCH 2 and PATCH 3, must be applied in every GIADA switch on procedure for version 2.3 of SW. See *RO-GIA-IAA-SPR-021, RO-GIA-IAA-SPR-022 and RO-GIA-IAA-SPR-023.*

A brief description of mentioned SPR's follows:

RO-GIA-IAA-SPR-021

To avoid that Heat MB events are treated as MB reading events and vice versa, two MB event marks are checked: the label (Reading or Heating) and the time of event (with respect to the Reading or Heating begin time). The time check is not properly implemented and it may happen that one MB heating event is rejected and so it is not incorporated to the science packet.
The same problem appears in the IS calibration as the time filter is not properly implemented and it may happen that some IS calibration events are treated like IS normal events.

RO-GIA-IAA-SPR-022

The thresholds of IS and GDS are established beginning from the last DAC conversion value to the real threshold, step by step. Therefore, spurious events may appear as thresholds may go down, even to zero.

RO-GIA-IAA-SPR-023

In order to ensure the IS acquisition, as the signals coming from PE could remain over the threshold, it is requested to implement the next steps:

- **IS Reset out of Hold with five short IS reset pulses**
- **IS Reset at the end of IS Calibration**
- **At the end of IS IRQ, enlarge IS Reset with Hold up to 300 μsec plus five short IS resets. During this process it is requested to disable the IS_IRQ.**
- **Due to the disabling of the IS_IRQ, it could happen that there will be a IS_IRQ pending but not seen by the DPU so an IS_Reset is needed in this case.**

****

PATCH 1 TO 2.3 SW version

```
HEADER_START

CREATION_TIME=2002-03-10T09:40:46Z
USER=rmorales

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=08

//*****************************************************
//Time Filter. Document related:RO-GIA-IAA-SPR-021

//IS
START_ADDRESS=00006A72
NUM_WORDS=0039
DATA=558B,EC83,EC06,8B5E,048B,4706,B108,D3E8,B400,8B57,06B6,00D3,E203,C289,46FE,C746,FC00,00C7,46F
A,0000,8B5E,048B,5702,8B47,0489,56FC,8946,FA8B,46FC,8B56,FA3B,060E,DA72,0D77,063B,160C,DA76,05B8,0100
,EB1D,8B46,FC8B,56FA,3B06,0EDA,750F,3B16,0CDA,7509,8B46,FE3B,060A,DA73,E033,C08B,E55D,C3B8
START_ADDRESS=00003258 NUM_WORDS=0004 DATA=9090,9050,E813,3859
START_ADDRESS=000031E8 NUM_WORDS=0004 DATA=A134,DE8B,1632,DEA3
START_ADDRESS=000033CE NUM_WORDS=0004 DATA=83FA,0074,30EB,1090

//MBS
START_ADDRESS=00003DD0 NUM_WORDS=0001 DATA=EB34
START_ADDRESS=00003DF6 NUM_WORDS=0001 DATA=EB0E

//*****************************************************

//IS Reset at the end of IS Calibration. Document related:RO-GIA-IAA-SPR-023
START_ADDRESS=00006AE2
NUM_WORDS=0011
DATA=C3B8,0100,5050,B816,DA50,A114,DA40,50B8,0314,50B8,0500,50E8,13F9,83C4,0CE8,59C0,C355
START_ADDRESS=00003054 NUM_WORDS=0004 DATA=E88C,3A8B,E55D,C390

//*****************************************************


MP_END
```

****

PATCH 2 TO 2.3 SW version

```
HEADER_START

CREATION_TIME=2002-03-10T09:40:46Z
USER=rmorales

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
```

NUM_BLOCKS=0B

//***
//DAC stair. Document related:RO-GIA-IAA-SPR-022
START_ADDRESS=00006A2C
NUM_WORDS=0023
DATA=558B,EC83,EC02,8B46,06B1,08D3,E889,46FE,8166,06FF,008B,4604,BA04,00EE,8B56,06D1,E2D1,E281,CA03
,0052,89D0,BA06,00EF,5A52,81E2,FCFF,0B56,FE89,D0BA,0600,EF58,BA06,00EF,8BE5,5DC3

//Reloc calls
START_ADDRESS=00001FB6 NUM_WORDS=0002 DATA=E873,4A59
START_ADDRESS=00001FC2 NUM_WORDS=0002 DATA=E867,4AEB
START_ADDRESS=0000226A NUM_WORDS=0001 DATA=C047
START_ADDRESS=0000227A NUM_WORDS=0001 DATA=B047
START_ADDRESS=00002E18 NUM_WORDS=0001 DATA=123C
START_ADDRESS=00002F6A NUM_WORDS=0002 DATA=E8BF,3A59
START_ADDRESS=00002F82 NUM_WORDS=0002 DATA=E8A7,3A59
START_ADDRESS=00002FA4 NUM_WORDS=0002 DATA=E885,3A59

//***

//Document related:RO-GIA-IAA-SPR-023.IS Blind
START_ADDRESS=00006BB8
NUM_WORDS=001C
DATA=C355,8BEC,83EC,04E8,BBE1,BA12,00ED,2580,0089,46FC,BA02,20ED,2508,0089,46FE,833E,B2DB,0074,0F8
3,7EFC,0074,0983,7EFE,0075,03E8,6FBF,8BE5,5DC3
START_ADDRESS=000056EA NUM_WORDS=0002 DATA=F5E8,CB14

MP_END

****

PATCH 3 TO 2.3 SW version

HEADER_START

CREATION_TIME=2002-04-23T09:40:46Z
USER=rmorales

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=04

//***

//Document related:RO-GIA-IAA-SPR-023.5 IS Reset Pulses
START_ADDRESS=00006B02
NUM_WORDS=0037
DATA=C355,8BEC,83EC,0AC7,46FE,0500,C746,FC00,00C7,46FA,0000,C746,F800,008B,46F8,3B46,FE73,46BA,1600
,B8FF,FFEF,C746,F600,008B,46F6,3B46,FA73,0BFF,46F6,8B46,F63B,46FA,72F5,B800,00EF,C746,F600,008B,46F6,3
B46,FC73,0BFF,46F6,8B46,F63B,46FC,72F5,FF46,F88B,46F8,3B46,FE72,BA8B,E55D,C355
START_ADDRESS=00002B5A NUM_WORDS=0003 DATA=C3E9,A53F,9090

//Document related:RO-GIA-IAA-SPR-023.At the end of IS IRQ, Big IS Reset and 5 IS reset pulses
START_ADDRESS=00006B6E
NUM_WORDS=0026
DATA=C355,8BEC,83EC,028B,1EC4,908B,477E,8946,FEB8,2300,50E8,B39B,5952,50BA,1600,B8FF,FFEF,B816,009
C,9D48,3D00,0075,F8B8,0000,EF58,5AE8,B7BF,A1A6,DB3B,46FE,7D08,B823,0050,E8AA,9B59,908B,E55D,C355

START_ADDRESS=00002CDE NUM_WORDS=0002 DATA=E88E,3E8B

//***

MP_END

****

Remark 34. Last Byte in GIA-IAA-SPR-023

In the previous SW User manual version the last byte of "GIA-IAA-SPR-023.5 IS Reset Pulses" was 0xB8 and the actual value is 0x55(hex). In order to avoid differences in the dump (see Dumping Patches in FREE_SPACE Segment)

****

PATCH RESET VDISK:

HEADER_START

CREATION_TIME=2001-06-14T17:41:26Z
USER=RMORALES
// The following patch reset the VD control variables

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=52
NUM_BLOCKS=01
START_ADDRESS=10000100 NUM_WORDS=0003 DATA=0000,0000,0000

MP_END

****

PATCH RESET TM(5,3) event limit :

```
HEADER_START

CREATION_TIME=2001-06-14T17:45:26Z
USER=RMORALES
//The following patch reset the event report TM(5,3) limit

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=01
START_ADDRESS=0000DE4A NUM_WORDS=0002 DATA=0000,0000

MP_END
```

****

PATCH Modify value of IS Autogain:

```
HEADER_START

CREATION_TIME=2001-06-14T17:45:26Z
USER=RMORALES
//The following patch modify the value of IS Autogain to 0xAABB, it is requested to send this number in
// reverse order (BBAA)

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=01
START_ADDRESS=00002C1C NUM_WORDS=0001 DATA=BBAA

MP_END
```

****

Appendix F. Patcheable Functions Table

The Patchable Functions are reported in Table 89.

Function Name	Safe Mode (Not Patcheable)	Rest Modes (Patcheable)
DGROUP@	✓	✓
N_SCOPY@	✓	✓
SetIRQ_0_Handler	✓	✓
SetIRQ_1_Handler	✓	✓
SetIRQ_2_Handler	✓	✓
SetIRQ_3_Handler	✓	✓
SetIRQ_4_Handler	✓	✓
EmptyIRQ	✓	✓
EmptyFunction	✓	✓
IRQsInitialization	✓	
ClearEDAC	✓	✓
GenerateEDACErrorReport	✓	✓
EDACErrorIRQ	✓	✓
EDACInitialization	✓	
PICInitialization	✓	
DesactivateIRQ	✓	✓
ActivateIRQ	✓	✓
ClearTCTimer	✓	✓
StopTCTimer	✓	✓
StartTCTimer	✓	✓
ResetFIFOTM	✓	✓
ResetFIFOTC	✓	✓
FIFOsInitialization	✓	
TCTimeoutGenerateReport	✓	✓
TCTimeoutIRQ	✓	✓
TCIRQ	✓	✓
TM8sCycle	✓	✓
TMIRQ	✓	✓
SendBlockToSpaceCraft	✓	✓
CopyFromOverflowToMirror	✓	✓
EraseLastBlockSentToSC	✓	✓
SendTMsToSpaceCraft	✓	✓
DAC_ADC_MUXs_Initialization	✓	
GenerateADCErrorReport	✓	✓
ReadADCConverter	✓	✓
BuildStatistisc		✓
DACConversion	✓	✓
ClearIRQGenericTimer	✓	✓
GenericTimerIRQ		✓
GenericTimerInitialization	✓	
StartGenericTimer		✓
SwitchRele		✓

GenerateHeaderCalibrationReport		✓
MainElectronicTemperatureCheck	✓	✓
ResetTMOutput	✓	✓
ActivateDesactivateCoverHeater		✓
ArmFrangibolt		✓
DisarmFrangibolt		✓
HeatFrangiboltParallelTask		✓
HeatingACHeatersBeforeWorkFrangibolt		✓
HeatFrangibolt		✓
TestFrangibolt		✓
ActivateFrangibolt		✓
ArmCover		✓
DisarmCover		✓
ClearIRQCoverMotor		✓
CoverMotorIRQ		✓
InitializateCoverMotor	✓	✓
OpenOrCloseCoverParallelTask		✓
OpenOrCloseCover		✓
HeatingBCHeatersBeforeOpenCover		✓
HeatingACHeatersBeforeOpenCover		✓
OpenCover		✓
HeatingBCHeatersBeforeCloseCover		✓
CloseCover		✓
TestHeater		✓
StopHeatingBeforeWorkFrangiboltTimeout		✓
ActivateFrangiboltTimeout		✓
HeatingFrangiboltTimeout		✓
ArmCoverTimeout		✓
MantainCoverMotorEnergized		✓
OpenCloseCoverMotorTimeout		✓
StopHeatingBeforeOpenCoverTimeout		✓
StopHeatingBeforeCloseCoverTimeout		✓
TestHeaterTimeout		✓
EndMotorCoverEnergization		✓
CheckCoverServiceParametersError		✓
SendReportContextFile	✓	
AcceptContextFile	✓	
CheckContextServiceParametersError	✓	
CanGenerateEventReport	✓	✓
GenerateEventReport	✓	✓
ResetLaser		✓
GDSIRQ		✓
InitializateGDSIRQ	✓	
ArmLaser		✓
DisarmLaser		✓
SetGDSOnOff		✓
SetGDSOperationMode		✓
SwitchLaserOnOff		✓
SetPhotodiodeThreshold		✓
CalibrateGDSScheduler		✓

CalibrateGDS		✓
ChangeToRealLaserPower		✓
ReadGDSLaserTemperatureAndLight		✓
GenerateHeaderEventScienceReport		✓
SwitchOnLaserTimeout		✓
ResetFlightTime		✓
ProcessGDSEvent		✓
CheckErrorInLaserTemperature		✓
CheckGDSServiceParametersError		✓
EnableHKReport	✓	✓
DisableHKReport	✓	✓
FillCoverHousekeeping	✓	✓
FillGDSHousekeeping	✓	✓
FillISHousekeeping	✓	✓
FillMBSHousekeeping	✓	✓
FillPowerSupplyHousekeeping	✓	✓
FillSoftwareHousekeeping	✓	✓
DefaultHKReport	✓	✓
CheckHKServiceParametersError	✓	✓
ResetIS		✓
ISIRQ		✓
InitializateISIRQ	✓	
SetISOnOff		✓
SetISRangeAndGain		✓
SetISOperationMode		✓
SetPZTThresholdArray		✓
SetPZTThreshold		✓
EndISStimulation		✓
GenerateISStimulus		✓
ISSTimulationTimeout		✓
CalibrateISScheduler		✓
CalibrateIS		✓
ISImpactsPerMinTimeout		✓
GetDustFlux		✓
ProcessISEvent		✓
CheckErrorInISTemperature		✓
ISTemperatureMonitor		✓
CheckISServiceParametersError		✓
ResetMBS		✓
MBSIRQ		✓
InitializateMBSIRQ	✓	
SetMBSOnOff		✓
SetMBSOperationMode		✓
SetTimeBetweenMBSMeasures		✓
ArmAndHeatHeater		✓
SetMBForFrecuencyReading		✓
CloseReadReport		✓
ReadMBParalellTask		✓
ReadMBS		✓
CloseHeatReport		✓

HeatMBParalellTask		✓
HeatMB		✓
CalibrateMBScheduler		✓
CalibrateMBS		✓
ReadMBSTemperatures		✓
MBSIntegrationTimeTimeout		✓
ProcessMBEvent		✓
CheckErrorInMBSTemperature		✓
CheckMBSServiceParametersError		✓
GetSegmentAddressAndLength	✓	
LoadMemoryAbsoluteAddressing	✓	
DumpMemoryAbsoluteAddressing	✓	
CheckMemoryAbsoluteAddressing	✓	
AddPatch	✓	
Apply8Patches	✓	
ApplyPatchesParallelTask	✓	
InitializeSegment	✓	
CheckMemoryServiceParametersError	✓	
ModesCommonCode	✓	✓
ChangeCodeSegment	✓	✓
GoToSafeMode	✓	
GoToCoverMode	✓	
GoToNormalMode	✓	
GoToFluxMode	✓	
CheckModesServiceParametersError	✓	✓
SchedulerInitialization	✓	
SortSchedulerTasks	✓	✓
ExistScheduleHandle	✓	✓
AddSchedulerTaskArray	✓	✓
AddSchedulerTask	✓	✓
KillSchedulerTask	✓	✓
ExecuteSchedulerTask	✓	✓
EnableScienceEventGeneration		✓
DisableScienceEventGeneration		✓
CheckGDSEventsLimits		✓
CheckISEventsLimits		✓
SendScienceReport		✓
ScienceReportTimeout		✓
CheckScienceServiceParametersError		✓
ExecuteService	✓	✓
HardwareInitialization	✓	
NVRAMCheck	✓	
SoftwareInitialization	✓	
Initialization	✓	
FirstSyncTimeout	✓	
EnableParallelTask	✓	✓
DisableParallelTask	✓	✓
ProcessEventTail		✓
ReceiveTC	✓	✓
ExecuteTC	✓	✓

ExtractTC	✓	✓
Main	✓	✓
InitializeCircularTail	✓	
PushIntoCircularTail	✓	✓
PopFromCircularTail	✓	✓
EmptyCircularTail	✓	✓
ConectionTestReport	✓	✓
DisableSynchronism	✓	✓
TimeSynchronizationIRQ	✓	✓
ClockIRQ	✓	✓
ClockInitialization	✓	
SynchronismInitialization	✓	
UpdateTime	✓	✓
TimeStamp	✓	✓
CopyBuffers	✓	✓
CopyBuffersInterSegment	✓	✓
FillBufferWithZeroes	✓	✓
OutPort	✓	✓
InPort	✓	✓
InPortWord	✓	✓
SetVect	✓	✓
UpdateInterruptVectorTable	✓	✓
CalculateAndCheckCRC	✓	✓
ReadDoubleWord	✓	✓
InverseWordsOfBuffer	✓	✓
SwapWordsOfDoubleWordOfContextFile	✓	
WordSquare		✓
MayorityVote		✓
CheckSum	✓	
VirtualDiskInitialization	✓	
ISVDiskInitializated	✓	
UpdateFATsCRCs	✓	
ExistVDiskHandle	✓	
AddFile	✓	
UpdateFile	✓	
ReadFile	✓	
VDiskManagement	✓	
TryToStoreTMInOverflowMirror	✓	✓
TryToStoreTM	✓	✓
SendReport	✓	✓
CheckTCParameters	✓	✓
SendExecutionCompletionSucessReport	✓	✓
ActivateTCProcessing	✓	✓
SendErrorReportService1	✓	✓
CopyPacketID	✓	✓
RestorePacketID	✓	✓
CheckTC	✓	✓

Table 89. Patcheable functions

Appendix G. Default Context File

EGSE format.
All values in dec form:

```
[Cover]
CoverFBHeatersOnTime=30
CoverMotorHeatersOnTime=0
LockDeviceSafetyTemperature=1441
LockDeviceTestTemperature=1472
LockDeviceTestTimeout=60
LockDeviceWorkingTemperature=1635
LockDeviceOperationTimeout=600
CoverStepsPerSecond=50
OpenReedSwitchStepsToOpen=163
ClosedReedSwitchStepsToClose=163
OpeningTimeout=120
ClosingTimeout=120
[GDS Information]
GDSStatus=10101111
GDSDetections=3
GDSThresholdLeft=61
GDSThresholdRight=114
GDSMaxTemperatureCheck=1111
GDSLaserMaxTemperature=1465
GDSMinTemperatureCheck=1111
GDSLaserMinTemperature=3647
GDSTimeBetweenCalibrations=3600
[IS Information]
ISStatus=10011111
ISRangeAndGain=00010111
ISMaxTempCheck=0001
ISMaxTemperature=2576
ISHysteresisTemperature=75
ISPZTAThreshold=5
ISPZTBThreshold=4
ISPZTCThreshold=10
ISPZTDThreshold=5
ISPZTEThreshold=5
ISTimeBetweenCalibrations=3600
ISCalibrationLevel=25
ISNumberOfStimulations=2
[MBS Information]
MBSStatus=10011111
MBSMaxWorkingTemperature=2753
MBSTempChecking=11111000
```

```
MBSTimeBetweenMeasures=300
MBSMaxTemperatureDuringHeating=2576
MBSTimeoutHeating=360
MBSTimeBetweenCalibrations=3600
[HW and SW Information]
NonOPMaxTempCheck=0001
NonOPMaxTemperature=2501
NonOPMinTempCheck=0001
NonOPMinTemperature=3591
MEMaxWorkingTempCheck=0001
MEMaxWorkingTemperature=2597
TimeoutBetweenSciencePackets=60
TimeoutBetweenHousekeepingPackets=40
TimeoutForArmTelecommand=40
PatchesStatus=00000000000000000000000000000000000000000000000000000000000000000000
MaxGDSEvents=40
MaxISEvents=40
CRCContextFile=A062
```

Memory Dump of the default Context File from RAM:
Address 0000:903A <hex> Length 45 <hex> :

```
================================================

Thu Jun 06 17:42:40 2002 00 05 44 1A
TM Packet Received from GIADA:
          APID = 90, 9 (DUMP)
          Source Sequence Count: 0
          Packet Length: 155
          SCET Time: 345114.007812 sec.
          Packet Type, Subtype: 6, 6
------------------------------------------------
 0D A9 C0 00 00 9B 00 05 44 1A 02 00 40 06 06 00
 51 01 00 00 90 3A 00 45 00 00 1E 00 00 00 A1 05
 C0 05 3C 00 00 00 63 06 58 02 00 00 32 00 A3 00
 A3 00 78 00 00 00 78 00 00 00 03 AF 72 3D B9 F5
 3F FE 00 00 00 00 10 0E 00 00 17 9F 10 1A 00 00
 4B 00 05 00 0A 04 05 05 10 0E 00 00 02 19 00 9F
 C1 0A 00 F8 2C 01 00 00 10 0A 68 01 00 00 10 0E
 00 00 C5 19 07 1E 25 1A 00 00 00 00 00 00 00 00
 3C 00 00 00 28 00 00 00 28 00 00 00 00 00 00 00
 00 00 00 00 28 00 28 00 00 00 00 00 00 00 00 00
 62 A0
================================================
```

Appendix H. Glossary

Glossary	
ASAP	As Soon As Possible
CF	Context File
CEL	Critical Event Log
DMS	Data Management System
EDAC	Error Detection and Correction
EGSE	Electrical Ground Support Equipment
FB	Frangibolt
GDS	Grain Detection System
GIADA	Grain Impact Analyser and Dust Accumulator
HW	Hardware
HK	Housekeeping
ICD	Interface Control Document
IRQ	Interrupt ReQuest
IS	Impact Sensor
KAL	Keep Alive Line
LOCK DEVICE	Frangibolt
ME	Main Electronic
MBS	Micro Balance Sensor
NCR	Non Conformance Report
NVRAM	No Volatile RAM
OBCP	On-Board Control Procedure
OBDH	On-Board Data Handling
PIC	Peripheral Interrupt Controller
PZT	Piezoelectric Crystal
RAM	Random Access Memory
ROM	Read Only Memory
RSDB	ROSETTA Database
SMP	Software Modification Report
SPR	Software Problem Report
SSMM	Solid State Mass Memory
SW	Software
TBC	To Be Confirmed
TC	Telecommand
TBD	To Be Defined
TM	Telemetry
VD	Virtual Disk

ANNEX 3: GIADA Ground Test Sequences

GIADA EXPERIMENT
INPUTS TO I&T and IST SYSTEM LEVEL TESTS

GIA-GAL-TN-511 Issue 2
Date: 25 – 07 – 2001

Total Annex Pages: 96

GIADA EXPERIMENT

INPUTS TO I&T and IST SYSTEM LEVEL TESTS

	NAME	FUNCTION	SIGNATURE	DATE
PREPARED	L.FARULLI	AIT Engineer		
APPROVED	M.COSI	System Engineer		
APPROVED	P.BRUNO	CADM OFFICE		
APPROVED	G.DIONISIO	PAPM		
AUTHORIZED	G.SIMONCINI	Program Manager		

DOCUMENT CHANGE RECORD

ISSUE	DATE	AFFECTED PAGES	CHANGE DESCRIPTION
1	10/10/2000	All	First Issue of the Document
2	25/07/2001	Only pages marked with the lateral bar	Updated for PFM delivery

LIST OF VALID PAGES

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3	Issue 2	28	Issue 2	53	Issue 2
4	Issue 2	29	Issue 2	54	Issue 2
5	Issue 2	30	Issue 2	55	Issue 2
6	Issue 2	31	Issue 2	56	Issue 2
7	Issue 2	32	Issue 2	57	Issue 2
8	Issue 2	33	Issue 2	58	Issue 2
9	Issue 2	34	Issue 2	59	Issue 2
10	Issue 2	35	Issue 2	60	Issue 2
11	Issue 2	36	Issue 2	61	Issue 2
12	Issue 2	37	Issue 2	62	Issue 2
13	Issue 2	38	Issue 2	63	Issue 2
14	Issue 2	39	Issue 2	64	Issue 2
15	Issue 2	40	Issue 2	65	Issue 2
16	Issue 2	41	Issue 2	66	Issue 2
17	Issue 2	42	Issue 2	67	Issue 2
18	Issue 2	43	Issue 2	68	Issue 2
19	Issue 2	44	Issue 2	69	Issue 2
20	Issue 2	45	Issue 2	70	Issue 2
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22	Issue 2	47	Issue 2	72	Issue 2
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24	Issue 2	49	Issue 2	74	Issue 2
25	Issue 2	50	Issue 2	75	Issue 2

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77	Issue 2	100	Issue 2		
78	Issue 2	101	Issue 2		
79	Issue 2	102	Issue 2		
80	Issue 2	103	Issue 2		
81	Issue 2	104	Issue 2		
82	Issue 2	105	Issue 2		
83	Issue 2	106	Issue 2		
84	Issue 2	107	Issue 2		
85	Issue 2				
86	Issue 2				
87	Issue 2				
88	Issue 2				
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TABLE OF CONTENTS

1. INTRODUCTION

1.1 Scope

The scope of this document is to provide the GIADA experiment inputs to Integration & Test (I&T) and Integrated System Tests (IST), to be performed during the system level AIV programme.

1.2 Documents

1.2.1 Applicable documents

AD1	RO-EST-RS-3001/EID A	ROSETTA Experiment Interface Document Part A
AD2	RO-EST-RS-3009/EID B latest issue	ROSETTA – GIADA Experiment Interface Document Part B
AD3	RO-EST-RS-3001/EID C Part 9, Issue 2	Payload Test Specification Template
AD4	GIA-GAL-TN-507 Issue 2	Technical Note for GIADA Laser Safety Classification

1.2.2 Reference documents

RD1	GIA-GAL-PL-504	GIADA Experiment AIV Plan
RD2	GIA-GAL-PL-506	GIADA Experiment Test Plan
RD3	GIA-GAL-TN-506 Issue 5	Technical Note For The Integration Of GIADA On The Rosetta S/C
RD4	RO-EST-MN-542	ROSETTA PFM PSR MoM
RD5	GIA-GAL-TP-510	GIADA Experiment Bench Test Procedure
RD6	TiNi WI-1019 Revision D	Frangibolt Design, Specification and Operating Guide
RD7	GIA-GAL-ED-503	EIDP GIADA PFM

1.3 Abbreviations and acronyms

EQM	Electrical Qualification Model
EGSE	Electrical Ground Support Equipment
EIDP	End Item Data Package
ESA	European Space Agency
GIADA	Grain Impact Analyser and Dust Accumulator
HK	Housekeeping
H/W	Hardware
ICD	Interface Control Document
I/F	Interface
IST	Integrated System Test
LCL	Latching Current Limiter
MCBT	Mass Counter Balance Tool
MID	Memory ID
NA	Not Applicable
SPT	Specific Performance Test
S/S	Subsystem
TBC	To Be Confirmed
TBD	To Be Defined
TC	Telecommand
TM	Telemetry
URF	Unit Reference Frame
WI	Work Item

2. TEST ITEM

The unit to be tested is identified in accordance to the following table:

UNIT	GIADA
MODEL	PFM
P/N	36531C00057A
S/N	001
CI	A13B see **AD1** sect 2.2.2.2
MANUFACTURER	OG

Figure 1 indicates the plant view of the unit and each foot name (label A to E). The foot labelled with A is the one close to URF hole in the same side of the URF foot. The foot labelled with B is the one far from the URF hole in the same side of the URF foot. Also the Frangibolt that locks GIADA protective cover in place is shown.

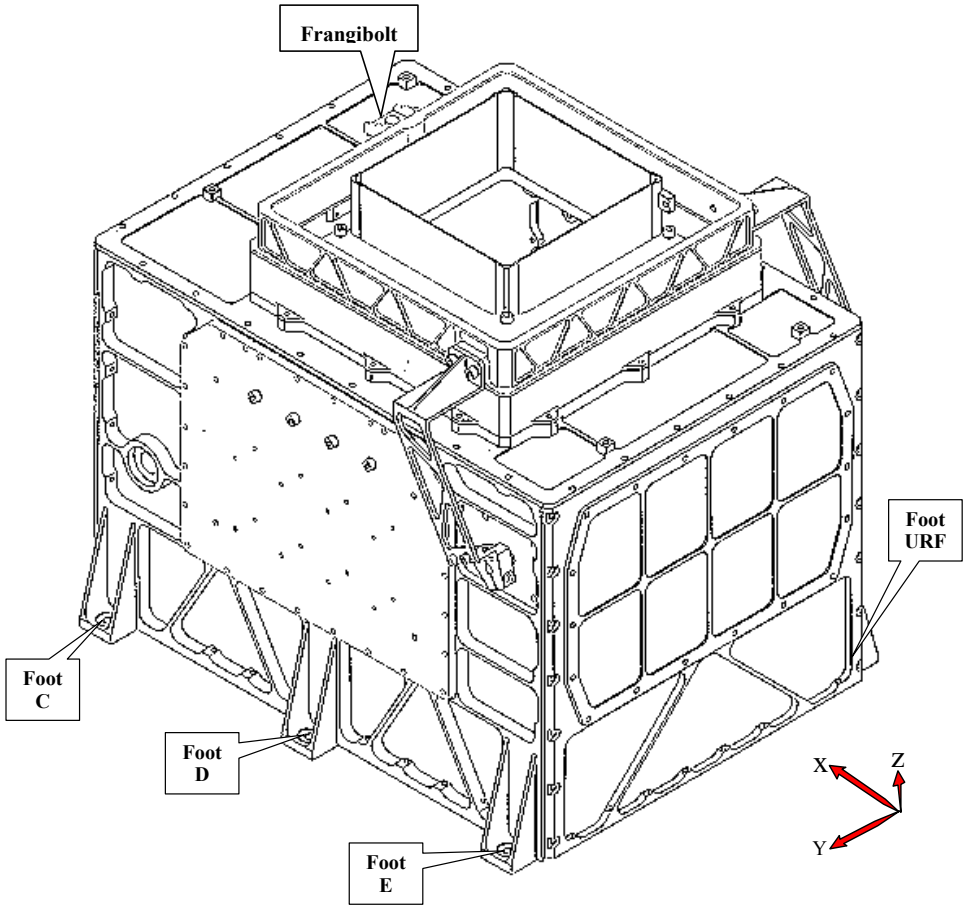

Figure 1: GIADA plant view and feet names

3. GIADA INPUTS TO I&T AND IST

The following sections describe the inputs needed from ALS for Integration & Test (I&T). It is also applicable to Integration System Test (IST).

3.1 Safety related constraints for T4.4.10 Maximum Data Throughput

In order to perform T4.4.10 as defined in AD3, the experiment need to be configured with the cover open and the lasers switched on and set at nominal power. These conditions shall be achieved only during execution of SPT, due to laser safety constraints (refer to AD4 and **RD3**), and thus T4.4.10 inputs are not applicable for GIADA IST.

3.2 General constraints for T4.4.11 Power Consumption

According to AD3, execution of T4.4.11 shall not include activation of mechanisms and/or dangerous experiment configuration. Thus neither cover opening/closing, nor switching on of the lasers inside GIADA are part of the inputs for T4.4.11. These operations will be covered by the inputs for the SPT.

3.3 INPUTS TO IST & I&T

Inputs to IST and I&T are organised as a sequence of tables. Allocation of tests on Main and Redundant I/Fs and their mapping with the requirements present in section 4.4 of AD3 are detailed in Table 1:

Procedure	Integrated System Test Sequence	Input ID
T4.4_020	**Nominal GIADA Switch On & Start-up Verification**	
	F20.1.1 IST Preliminary Operations	
	S10.1.1 Power on Sequence	
T4.4.1	**Connection Test**	E_4.4.1_010
	F10.10.5 Test Service #17	
T4.4.2	**Telemetry and Telecommand Verification**	E_4.4.2_010 E_4.4.2_020 E_4.4.2_030 E_4.4.2_040
	F10.10.7 Science Data Transfer #20	
T4.4.3	**Patch and Dump Test**	E_4.4.3_020 E_4.4.3_030 E_4.4.3_040
	F10.10.3 Memory Management Service (Reduced)	
T4.4.4	**DMS/Payload on board traffic Management**	
	F10.10.2 Housekeeping Service (Reduced)	E_4.4.4_010 E_4.4.4_020
T4.4.5	**Context Saving Test**	
	F10.10.6 Context Transfer Service #18 (Reduced)	
T4.4.6	**Science Data Transfer Verification**	
	T4.4.6 Preliminary Operations	E_4.4.6_010
	F10.20.3 Private TC Service #194 (Set IS on)	E_4.4.6_020 E_4.4.6_030 E_4.4.6_040
	F10.20.4 Private TC Service #195 (Set MBS on)	
	T4.4.6 Post Operations	
T4.4.7	**Private Service Verification**	E_4.4.7_010 E_4.4.7_020 E_4.4.7_030 E_4.4.7_040 E_4.4.7_050
	F10.20.1 Private TC Service #192	
	F10.20.2 Private TC Service #193	

Procedure	Integrated System Test Sequence	Input ID
	F10.20.3 Private TC Service #194	
	F10.20.4 Private TC Service #195	
T4.4.8	**Redundancy Test**	E_4.4.8_010 E_4.4.8_020 E_4.4.8_030 E_4.4.8_040
T4.4.9	**Operative Modes Verification**	E_4.4.9_020
	F10.20.5 Private TC Service #196 (Full)	E_4.4.9_030
T4.4.11	**Power Consumption Test** (To be performed on both Main and Redundant)	E_4.4.11_010 E_4.4.11_020 E_4.4.11_030
T4.4.12	**Functional Performance Test**	E_4.4.12_010
	F10.20.4 Functional-Performance procedure	E_4.4.12_020 E_4.4.12_030
	Nominal GIADA Switch Off (To be performed on both Main and Redundant)	
	S10.1.8 Power off Sequence	
	IST Post Operations	E_4.4.9_010

Table 1: Test sequence for I&T and IST

4. GIADA INTEGRATED SYSTEM TEST INPUTS

4.1 T4.4_020 Nominal GIADA Switch On & Start-up Verification

4.1.1 Not applicable inputs

NA

4.1.2 Inputs provided in procedure F20.1.1 IST Preliminary Operations

NA

4.1.3 Inputs provided in procedure S10.1.1 Power on Sequence

NA

4.1.4 Test Sequence for F20.1.1 IST Preliminary Operations

Project: GIADA	Test Procedure Name: F20.1.1 IST Preliminary Operations Pass/Fail criterium(a): verify correct set-up configuration		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Verify that the Safe Laser key is plugged into the J05 GIADA connector. Alternatively, verify no key is plugged into the J05 GIADA connector	OK	
2	Verify the TC/TM and Power I/Fs are connected according to section 2.6 of GIADA EID-B	Main	
3	Switch on the LCL	ON	

4.1.5 Test Sequence for S10.1.1 Power on Sequence

Project:	Test Procedure Name:	S10.1.1 Power on Sequence		
GIADA	Pass/Fail criterium(a):	verify generation of synchronised TM after receiving TC 9.1 after 20 s from switch on verify generation of default HK reports		
	Input ID:	None		
Test Step			**Nominal values/RSDB inputs**	**Remarks**
1	Power on GIADA Main I/F through the LCL		Main I/F ON	
2	Wait 20 s			
3	Send to GIADA a TC 9.1 "Accept Time Update", within 60 s from step 2		ZGD00006 with: PGDG001 = actual S/C time	
4	Wait 50 s for default HK generation		YGD00001 with: NGDA0003 = 0x0002	'00' = Safe Mode '02' = HK enabled, Science TM disabled
5	Upload Context File		ZGD00009	• Check correctness of ZGD00009 • **Remarks** Content to be clarified by ALS
6	Upload Software Patches		ZGD00003 with Patch21.mpr file	• **Remarks**: the '.mpr' file to be supplied by OG via e-mail

4.2 T4.4.1 Connection Test

4.2.1 Not applicable inputs

None

4.2.2 Inputs provided in procedure F10.10.5 Test Service #17

E_4.4.1_010

4.2.3 Test Sequence for F10.10.5 Test Service #17

Project: GIADA	Test Procedure Name: F10.10.5 Test Service #17 Pass/Fail criterium(a): verify correct functioning of TM link		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA a TC 17.1 "Request Connection Test"	ZGD00007	
2	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from step 2	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Verify that GIADA generates a TM 17.2 as a response to the previous step	YGD00012	E_4.4.1_010

4.3 T4.4.2 Telemetry and Telecommand Verification

4.3.1 Not applicable inputs

E_4.4.2_040

4.3.2 Inputs provided in procedure F10.10.7 Science Data Transfer #20

E_4.4.2_010

E_4.4.2_020

E_4.4.2_030

4.3.3 Test Sequence for F10.10.7 Science Data Transfer #20

Project: GIADA	Test Procedure Name: F10.10.7 Science Data Transfer #20 Pass/Fail criterium(a): verify correct functioning of TM link		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	E_4.4.2_010
2	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.2_020
3	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 42052 (decimal)	E_4.4.2_030
4	Send to GIADA a TC 20.1 "Enable Science Reporting"	ZGD00010	E_4.4.2_010
5	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.2_020
6	In the HK packets, verify that the "Science TM" parameter is set to "Enabled"	YGD00001 with: NGDA0003 = 0x0301	E_4.4.2_020 Optional step, can also be verified on GIADA IWS '0301' = Normal Mode, Science TM enabled
7	Send to GIADA a TC 20.2 "Disable Science Reporting"	ZGD00011	E_4.4.2_010

Project: GIADA	Test Procedure Name: F10.10.7 Science Data Transfer #20 Pass/Fail criterium(a): verify correct functioning of TM link		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
8	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.2_020
9	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	E_4.4.2_010
10	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.2_020
11	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (decimal)	E_4.4.2_030

4.4 T4.4.3 Patch and Dump Test

4.4.1 Not applicable inputs

E_4.4.3_040

4.4.2 Inputs provided in procedure F10.10.3 Memory Management Service (Reduced)

E_4.4.3_020

E_4.4.3_030

4.4.3 Test Sequence for F10.10.3 Memory Management Service (Reduced)

Project: GIADA	**Test Procedure Name:** F10.10.3 Memory Management Service (Reduced) **Pass/Fail criterium(a):** verify patching of GIADA RAM (MID = 81) verify dumping of GIADA RAM (MID = 81)		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA a service 6.2 "Load Memory"	ZGD00003 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8000 PGDG0603 = 0x0006 PGDG0604 = 0x0000 0000 0000 0000 0000 0000	E_4.4.3_030 This is needed to initialise the EDAC = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length (6 words) = Data Block (all words contain zeros)
2	Send to GIADA a service 6.5 "Dump Memory"	ZGD00004 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8000 PGDG0603 = 0x0006	 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length
3	Verify that as a response to the previous step, GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	

Project:	Test Procedure Name:	F10.10.3 Memory Management Service (Reduced)	
GIADA	Pass/Fail criterium(a):	verify patching of GIADA RAM (MID = 81) verify dumping of GIADA RAM (MID = 81)	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
4	Verify that GIADA generates a TM 6.6 "Memory Dump Report"	YGD00005 with: NGDA0601 = 0x5101 NGDA0602 = 0x0000 8000 NGDA0603 = 0x0006 NGDA0604 = 0x0000 0000 0000 0000 0000 0000	E_4.4.3_020 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length = Data Block (must be equal to the previously uploaded one)
5	Send to GIADA a service 6.2 "Load Memory"	ZGD00003 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8000 PGDG0603 = 0x0006 PGDG0604 = 0x0000 ABCD EF01 1456 F89A 0001	E_4.4.3_030 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length = Data Block (CRC validation sequences)
6	Verify that as a response to the previous step, GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
7	Verify that as a response to step 2, GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at step 2 NGDAST02 from TC at step 2	

Project:	Test Procedure Name:	F10.10.3 Memory Management Service (Reduced)
GIADA	Pass/Fail criterium(a):	verify patching of GIADA RAM (MID = 81) verify dumping of GIADA RAM (MID = 81)

Test Step		Nominal values/RSDB inputs	Remarks
8	Send to GIADA a service 6.5 "Dump Memory"	ZGD00004 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8000 PGDG0603 = 0x0006	 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length
9	Verify that as a response to the previous step, GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
10	Verify that GIADA generates a TM 6.6 "Memory Dump Report"	YGD00005 with: NGDA0601 = 0x5101 NGDA0602 = 0x0000 8000 NGDA0603 = 0x0006 NGDA0604 = 0x0000 ABCD EF01 1456 F89A 0001	E_4.4.3_020 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length = Data Block
11	Send to GIADA a service 6.9 "Check Memory"	ZGD00005 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8000 PGDG0603 = 0x0001	Calculates CRC for 0x0000 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length

Project:	Test Procedure Name:	F10.10.3 Memory Management Service (Reduced)	
GIADA	Pass/Fail criterium(a):	verify patching of GIADA RAM (MID = 81) verify dumping of GIADA RAM (MID = 81)	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
12	Verify that as a response to the previous step, GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
13	Verify that as a response to the previous step, GIADA generates a TM 6.10 "Memory Check Report"	YGD00006 with: NGDA0601 = 0x5101 NGDA0602 = 0x0000 8000 NGDA0603 = 0x0001 NGDA0604 = 0x1D0F	E_4.4.3_020 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length = Calculated CRC value
14	Send to GIADA a service 6.9 "Check Memory"	ZGD00005 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8002 PGDG0603 = 0x0002	Calculates CRC for 0xABCDEF01 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length
15	Verify that as a response to the previous step, GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	

Project:	Test Procedure Name:	F10.10.3 Memory Management Service (Reduced)
GIADA	Pass/Fail criterium(a):	verify patching of GIADA RAM (MID = 81) verify dumping of GIADA RAM (MID = 81)

Test Step		Nominal values/RSDB inputs	Remarks
16	Verify that as a response to the previous step, GIADA generates a TM 6.10 "Memory Check Report"	YGD00006 with: NGDA0601 = 0x5101 NGDA0602 = 0x0000 8002 NGDA0603 = 0x0002 NGDA0605 = 0x04A2	E_4.4.3_020 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length = Calculated CRC value
17	Send to GIADA a service 6.9 "Check Memory"	ZGD00005 with: PGDG0601 = 0x5101 PGDG0602 = 0x0000 8006 PGDG0603 = 0x0003	Calculates CRC for 0x1456 F89A 0001 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length
18	Verify that as a response to the previous step, GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
19	Verify that as a response to the previous step, GIADA generates a TM 6.10 "Memory Check Report"	YGD00006 with: NGDA0601 = 0x5101 NGDA0602 = 0x0000 8006 NGDA0603 = 0x0003 NGDA0605 = 0x7FD5	E_4.4.3_020 = Memory Block (Memory ID + Number of blocks) = Memory Start Address = Block Length = Calculated CRC value

4.5 T4.4.4 DMS/Payload on board traffic Management

4.5.1 Not applicable inputs

E_4.4.4_030

4.5.2 Inputs provided in procedure F10.10.2 Housekeeping Service (Reduced)

E_4.4.4_010

E_4.4.4_020

4.5.3 Test Sequence for F10.10.2 Housekeeping Service (Reduced)

Project: GIADA	Test Procedure Name: F10.10.2 Housekeeping Service (Reduced) Pass/Fail criterium(a): verify correct functioning of TM link		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA a TC 3.5 "Enable HK Reporting"	ZGD00001	
2	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Wait 50 s and verify HK packets are delivered from GIADA		
4	Send to GIADA a TC 3.6 "Disable HK Reporting"	ZGD00002	
5	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
6	Wait 30 s and verify no HK packets are delivered from GIADA		

4.6 T4.4.5 Context Saving Test

4.6.1 Not applicable inputs

None

4.6.2 Inputs provided in procedure F10.10.6 Context Transfer Service #18 (Reduced)

TBD

4.6.3 Test Sequence for F10.10.6 Context Transfer Service #18 (Reduced)

Project: GIADA	Test Procedure Name: F10.10.6 Context Transfer Service #18 (Reduced) Pass/Fail criterium(a): verify correct implementation of Context File transfer protocol		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA TC 18.3 "Accept Context File" with datafield as per Annex A	ZGD00009	**Here step is TBC. Waiting for ALS input**
2	Verify that a TM 1.1 "Acceptance acknowledge" is generated from GIADA as a response to the previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Send to GIADA TC 18.1 "Report Context File" with datafield as per Annex A	ZGD00008	**Here step is TBC. Waiting for ALS input**
4	Verify that a TM 1.1 "Acceptance acknowledge" is generated from GIADA as a response to the previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
5	Verify that a TM 18.2 "Context File Report" is generated from GIADA as a response to the 18.1 TC	YGD00013	
6	On the GIADA EGSE S/W, verify the correct contents of downloaded context file	Data field as per Annex A, unless default EPROM CF is used	

4.7 T4.4.6 Science Data Transfer Verification

4.7.1 Not applicable inputs

E_4.4.6_020 (already contained in RSDB)

E_4.4.6_040

E_4.4.6_040 (no HRDC is present on GIADA)

E_4.4.6_050 (no HRDC is present on GIADA)

4.7.2 Inputs provided in procedure T4.4.6 Preliminary Operations

E_4.4.6_010

4.7.3 Inputs provided in procedure F10.20.3 Private TC Service #194 (Set IS on)

E_4.4.6_030

4.7.4 Inputs provided in procedure F10.20.4 Private TC Service #195 (Set MBS on)

E_4.4.6_030

4.7.5 Inputs provided in procedure T4.4.6 Post Operations

None

4.7.6 Test Sequence for T4.4.6 Preliminary Operations

Project: GIADA	Test Procedure Name:	T4.4.6 Preliminary Operations
	Pass/Fail criterium(a):	verify correct execution of the following TCs: 194.1 with "OFF" parameter, 195.1 with "OFF" parameter , 196.1 with "OFF" parameter verify correct execution of the TC 20.1

Test Step		Nominal values/RSDB inputs	Remarks
1	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	E_4.4.6_010
2	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 42052 (decimal)	
4	Send a TC 194.1 with datafield 0x0000 (2 bytes)	ZGD19401 with: PGDG0010 = 0x0000	Set IS off
5	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
6	Wait until next HK packet	50 s	
7	Verify, in the HK reports, the status of the IS S/S	YGD00001 with: NGDD0045= 0	

Project:	Test Procedure Name:	T4.4.6 Preliminary Operations
GIADA	Pass/Fail criterium(a):	verify correct execution of the following TCs: 194.1 with "OFF" parameter, 195.1 with "OFF" parameter , 196.1 with "OFF" parameter verify correct execution of the TC 20.1

Test Step		Nominal values/RSDB inputs	Remarks
8	Send a TC 195.1 with datafield 0x0000 (2 bytes)	ZGD19501 with: PGDG0010 = 0x0000	Set MBS off
9	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
10	Wait until next HK packet	50 s	
11	Verify, in the HK reports, the status of the MBS S/S	YGD00001 with: NGDD0065 = 0	
12	Send a TC 193.1 with datafield 0x0000 (2 bytes)	ZGD19311 with: PGDG0010 = 0x0000	Set GDS OFF
13	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
14	Wait until next HK packet	50 s	
15	In the HK packets, verify that the "GDS Status" parameter indicates " OFF"	YGD00001 with: NGDD0025= 0	
16	Send to GIADA a TC 20.1 "Enable Science Reporting"	ZGD00010	

Project:	Test Procedure Name:	T4.4.6 Preliminary Operations
GIADA	Pass/Fail criterium(a):	verify correct execution of the following TCs: 194.1 with "OFF" parameter, 195.1 with "OFF" parameter , 196.1 with "OFF" parameter verify correct execution of the TC 20.1

Test Step		Nominal values/RSDB inputs	Remarks
17	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	

4.7.7 Test Sequence for F10.20.3 Private TC Service #194 (Set IS on)

Project: GIADA	**Test Procedure Name:** F10.20.3 Private TC Service #194 (Set IS on) **Pass/Fail criterium(a):** verify correct execution of TC 196.1 with "ON" parameter verify delivery of IS related calibration packet		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send a TC 194.1 with datafield 0xFFFF (2 bytes)	ZGD19401 with: PGDG0010 = 0xFFFF	Set IS on
2	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Verify that GIADA generates a 20.3 TM report	YGD00020	E_4.4.6_030 The correct kind of science report can only be verified on the GIADA IWS (info contained within packet data field)
4	Wait until next HK packet	50 s	
5	Verify, in the HK reports, the status of the IS S/S	YGD00001 with: NGDD0045= 1	

4.7.8 Test Sequence for F10.20.4 Private TC Service #195 (Set MBS on)

Project: GIADA	**Test Procedure Name:** F10.20.4 Private TC Service #195 (Set MBS on) **Pass/Fail criterium(a):** verify correct execution of TC 195.1 with "ON" parameter verify delivery of MBS related science packets		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send a TC 195.1 with datafield 0xFFFF (2 bytes)	ZGD19501 with: PGDG0010 = 0xFFFF	Set MBS on
2	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Verify that GIADA generates 20.3 TM reports	YGD00020	E_4.4.6_030 The correct kind of science report can only be verified on the GIADA IWS (info contained within packet data field)
4	Wait until next HK packet	50 s	
5	Verify, in the HK reports, the status of the MBS S/S	YGD00001 with: NGDD0065 = 1	
6	Verify that Science TM reports are delivered from GIADA	Leave experiment in this status for at least 5 minutes	

4.7.9 Test Sequence for T4.4.6 Post Operations

Project: GIADA	Test Procedure Name: T4.4.6 Post Operations Pass/Fail criterium(a): NA		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA a TC 20.1 "Disable Science Reporting"	ZGD00011	
2	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Wait 60 s		
1	Send to GIADA a TC 20.1 "Disable Science Reporting"	ZGD00011	
2	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Wait 60 s		
4	Verify no more scientific packets are delivered by GIADA		
5	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	

Project: GIADA	Test Procedure Name: T4.4.6 Post Operations Pass/Fail criterium(a): NA		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
6	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
7	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	

4.8 T4.4.7 Private Service Verification

4.8.1 Not applicable inputs

E_4.4.7_050 (provided the Safe Key Control is plugged into GIADA – see section 3.1)

4.8.2 Inputs provided in procedure F10.20.1 Private TC Service #192

E_4.4.7_020

E_4.4.7_030

E_4.4.7_040

4.8.3 Inputs provided in procedure F10.20.2 Private TC Service #193

E_4.4.7_020

E_4.4.7_030

E_4.4.7_040

4.8.4 Inputs provided in procedure F10.20.3 Private TC Service #194

E_4.4.7_020

E_4.4.7_030

E_4.4.7_040

4.8.5 Inputs provided in procedure F10.20.4 Private TC Service #195

E_4.4.7_020

E_4.4.7_030

E_4.4.7_040

4.8.6 Test Sequence for F10.20.1 Private TC Service #192

Project: GIADA	Test Procedure Name: F10.20.1 Private TC Service #192 Pass/Fail criterium(a): verify correct execution of TC 192, subtypes 1, 6, 16, 17, 31		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send to GIADA a TC 196.6 "Go to Cover Mode"	ZGD19606	
2	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
3	Verify that GIADA generates a TM 5.1	YGD42051 with: NGDA0059= 42051 (decimal)	
4	Send a TC 192.31 "Test Heaters" with Heater ID =5	ZGD19231 with: PGDG0005 = 0x0005	E_4.4.7_020 Heater Cover & Frangibolt are now powered up
5	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
6	Send a TC 192.31 "Test Heaters" with Heater ID =6	ZGD19231 with: PGDG0005 = 0x0006	E_4.4.7_020 Heater Cover & Motor are now powered up

Project:	Test Procedure Name:	F10.20.1 Private TC Service #192		
GIADA	Pass/Fail criterium(a):	verify correct execution of TC 192, subtypes 1, 6, 16, 17, 31		
	Test Step		Nominal values/RSDB inputs	Remarks
7	Verify that GIADA generates a TM 1.1		YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
8	Send a TC 192.1 "Arm Frangibolt"		ZGD19201	E_4.4.7_020 Frangibolt is now armed
9	Verify that GIADA generates a TM 1.1		YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
10	Verify that GIADA generates a TM 1.7		YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
11	Within 20 s from TC 192.1, send a TC 192.2 "Dis-arm Frangibolt"		ZGD19202	E_4.4.7_020 E_4.4.7_040 Frangibolt is now disarmed
12	Verify that GIADA generates a TM 1.1		YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030

Project: GIADA	Test Procedure Name:	F10.20.1 Private TC Service #192	
	Pass/Fail criterium(a):	verify correct execution of TC 192, subtypes 1, 6, 16, 17, 31	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
13	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
14	Verify that GIADA generates a TM 5.3	YGD42200	E_4.4.7_030 Frangibolt to disarm state
15	Send a TC 192.16 "Arm Cover"	ZGD19216	E_4.4.7_020 Cover is now armed
16	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
17	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
18	Within 20 s from TC 192.16, send a TC 192.17 "Dis-arm Cover"	ZGD19217	E_4.4.7_020 E_4.4.7_040 Cover is now disarmed

Project: GIADA	Test Procedure Name:	F10.20.1 Private TC Service #192	
	Pass/Fail criterium(a):	verify correct execution of TC 192, subtypes 1, 6, 16, 17, 31	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
19	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
20	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
21	Verify that GIADA generates a TM 5.3	YGD42201	E_4.4.7_030 Cover Motor to disarm state
22	Send a TC 192.1 "Arm Frangibolt"	ZGD19201	E_4.4.7_020 Frangibolt is now armed
23	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
24	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030

Project: GIADA	Test Procedure Name:	F10.20.1 Private TC Service #192	
	Pass/Fail criterium(a):	verify correct execution of TC 192, subtypes 1, 6, 16, 17, 31	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
25	Within 20 s from TC 192.1, send a TC 192.6 "Test Frangibolt"	ZGD19206	E_4.4.7_020 E_4.4.7_040 Frangibolt is now heated up for testing
26	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
27	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030 A 1.8 Execution failure report (YGDST025) could also be received, if the test temperature cannot be reached. However, the test can continue without deviations.
28	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	E_4.4.7_020 E_4.4.7_040
29	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
30	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	E_4.4.7_030

4.8.7 Test sequence for F10.20.2 Private TC Service #193

Project:	Test Procedure Name:	F10.20.2 Private TC Service #193	
GIADA	Pass/Fail criterium(a):	verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26 **Warning:** Refer to AD4 and RD3 for laser safety issues.	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Verify that the SAFE Key Control is in place on GIADA J05		
2	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	E_4.4.7_020 E_4.4.7_040
3	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
4	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 42052 (Decimal)	E_4.4.7_030
5	Send a TC 194.1 with datafield 0x0000 (2 bytes)	ZGD19401 with: PGDG0010 = 0x0000	Set IS off
6	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	

Project:	Test Procedure Name:	F10.20.2 Private TC Service #193		
GIADA	Pass/Fail criterium(a):	verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26 **Warning:** Refer to AD4 and RD3 for laser safety issues.		
	Test Step		**Nominal values/RSDB inputs**	**Remarks**
7	Wait until next HK packet		50 s	
8	Verify, in the HK reports, the status of the IS S/S		YGD00001 with: NGDD0045= 0	
9	Send a TC 195.1 with datafield 0x0000 (2 bytes)		ZGD19501 with: PGDG0010 = 0x0000	Set MBS off
10	Verify that GIADA accepts the TC (generation of 1.1 TM report)		YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
11	Wait until next HK packet		50 s	
12	Verify, in the HK reports, the status of the MBS S/S		YGD00001 with: NGDD0065 = 0	
13	Send a TC 193.1 with datafield 0x0000 (2 bytes)		ZGD19311 with: PGDG0010 = 0x0000	Set GDS OFF
14	Verify that GIADA accepts the TC (generation of 1.1 TM report)		YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
15	Wait until next HK packet		50 s	

Project: GIADA	Test Procedure Name: F10.20.2 Private TC Service #193 Pass/Fail criterium(a): verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26 **Warning:** Refer to AD4 and RD3 for laser safety issues.		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
16	In the HK packets, verify that the "GDS Status" parameter indicates " OFF"	YGD00001 with: NGDD0025= 0	
17	Send to GIADA a TC 20.1 "Enable Science Reporting"	ZGD00010	E_4.4.7_020
18	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
19	Send a TC 193.1 with datafield 0xFFFF (2 bytes)	ZGD19311 with: PGDG0010 = 0xFFFF	E_4.4.7_020 E_4.4.7_040 Set GDS ON
20	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
21	Verify that GIADA generates a 5.4 event report	YGD42033	E_4.4.7_030 Start_Laser_ON_OBCP
22	Wait until next HK packet	50 s	
23	In the HK packets, verify that the "GDS Status" parameter indicates " ON"	YGD00001 with: NGDD0025= 1	

Project:	Test Procedure Name:	F10.20.2 Private TC Service #193
GIADA	Pass/Fail criterium(a):	verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26
		Warning: Refer to AD4 and RD3 for laser safety issues.

Test Step		Nominal values/RSDB inputs	Remarks
24	Send a TC 193.1 "Arm Laser"	ZGD19301	E_4.4.7_020 Lasers are now armed
25	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
26	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
27	Within 20 s from TC 193.1, send a TC 193.2 "Dis-arm Laser"	ZGD19302	E_4.4.7_020 E_4.4.7_040 Lasers are now disarmed
28	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
29	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030

Project: GIADA	Test Procedure Name: F10.20.2 Private TC Service #193 Pass/Fail criterium(a): verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26 **Warning:** Refer to AD4 and RD3 for laser safety issues.		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
30	Verify that GIADA generates a TM 5.3	YGD42210	E_4.4.7_030 Laser to disarm state
31	Send a TC 193.16 "Set GDS Operation Mode" with datafield 0x2F03	ZGD19316 with: PGDG0015 = 0x2F03	E_4.4.7_020 0x2F = 0010 1111 (default laser power = medium, AC both couples, Left & Righr Receivers enabled) 0x03 = 0000 0011 (Number of detections = 3)
32	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
33	Wait 50 s		
34	On the GIADA EGSE S/W, verify that the GDS operation mode word in the received HK has changed accordingly		
35	Send a TC 193.26 "Set Photodiode Thresholds" with datafield 0x0505	ZGD19326 with: PGDG0016 = 0x0505	E_4.4.7_020 This sets the detction thresholds to about 0.12 V
36	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030

Project:	Test Procedure Name:	F10.20.2 Private TC Service #193	
GIADA	Pass/Fail criterium(a):	verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26	
		Warning: Refer to AD4 and RD3 for laser safety issues.	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
37	On the GIADA EGSE S/W, verify that the GDS Left and Right Thresholds in the received HK have changed accordingly		
38	Wait 5 minutes		During this period, it is possible that TM 5.3 (YGD42213, YGD42214, YGD42215) are received. If this happens, corrective action is to send a TC ZGD19326 increasing the value of PGDG0016 upto stop the events. Whatever action is taken, it shall be recorded.
39	Send a TC 193.1 "Arm Laser"	ZGD19301	E_4.4.7_020 Lasers are now armed
40	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
41	Verify that GIADA generates a TM 1.7	YGDST020 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
42	Within 20 s from TC 193.1, send a TC 193.6 "Switch Laser On/Off" with datafield 0xFFFF	ZGD19306 with: PGDG0010 = 0xFFFF	E_4.4.7_030 **Lasers are not actually switched on, due to Safe Key presence**

Project:	Test Procedure Name:	F10.20.2 Private TC Service #193		
GIADA	Pass/Fail criterium(a):	verify correct execution of TC 193, subtypes 1, 2, 6, 11, 16, 26 **Warning:** Refer to AD4 and RD3 for laser safety issues.		
Test Step		**Nominal values/RSDB inputs**	**Remarks**	
43	Send a TC 193.26 "Set Photodiode Thresholds" with datafield 0x0505	ZGD19326 with: PGDG0016 = 0x0505	E_4.4.7_020 This sets the detction thresholds to about 0.12 V	
44	Wait 5 minutes for delivery of science packets	YGD00020 (the correct kind of science report can only be verified on the GIADA IWS, as the relevant info is contained within the packets data field)	During this period, it is possible that TM 5.3 (YGD42213, YGD42214, YGD42215) are received. If this happens, corrective action can be to send a TC ZGD19326 increasing the value of PGDG0016 upto stop the events. Whatever action is taken, it shall be recorded.	
45	Send a TC 193.1 with datafield 0x0000	ZGD19311 with: PGDG0010 = 0x0000	E_4.4.7_020 Set GDS OFF	
46	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030	
47	Wait until next HK packet	50 s		
48	In the HK packets, verify that the "GDS Status" parameter indicates " Off"	YGD00001 with: NGDD0025= 0		

4.8.8 Test Sequence for F10.20.3 Private TC Service #194

Project: GIADA	Test Procedure Name: F10.20.3 Private TC Service #194 Pass/Fail criterium(a): verify correct execution of TC 194, subtypes 1, 6, 11, 26		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send a TC 194.1 with datafield 0xFFFF (2 bytes)	ZGD19401 with: PGDG0010 = 0xFFFF	E_4.4.7_020 Set IS ON
2	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
3	Verify that GIADA delivers a science calibration packet for IS	YGD00020	E_4.4.7_030 The correct kind of science report can only be verified on the GIADA IWS, as the relevant info is contained within the packets data field
4	Wait until next HK packet	50 s	
5	In the HK packets, verify that the "IS Status" parameter indicates " ON"	YGD00001 with: NGDD0045= 1	

Project: GIADA	Test Procedure Name: F10.20.3 Private TC Service #194 Pass/Fail criterium(a): verify correct execution of TC 194, subtypes 1, 6, 11, 26		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
6	Send a TC 194.6 "Set IS Operation Mode" with datafield 0x1F0F	ZGD19406 with: PGDG0020 = 0x1F0F	E_4.4.7_020 0x1F = 0001 1111 (All PZTs enabled) 0x18 = 0000 1111 (Range = Low, Gain E = Low, Gain D = High, Gain A = High)
7	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
8	Wait 50 s		
9	On the GIADA EGSE S/W, verify that the IS operation mode word in the received HK has changed accordingly		
10	Send a TC 194.11 "Set PZT Thresholds" with datafield 0x001E1E1E1E1E	ZGD19411 with: PGDG0021 = 0x001E1E1E1E1E	E_4.4.7_020 This sets the detction thresholds of the five PZTs to about 300 mV
11	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
12	On the GIADA EGSE S/W, verify that the IS PZT Thresholds in the received HK have changed accordingly		

Project: GIADA	Test Procedure Name: F10.20.3 Private TC Service #194 Pass/Fail criterium(a): verify correct execution of TC 194, subtypes 1, 6, 11, 26		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
13	Send a TC 194.26 "Calibrate IS" with datafield "6604"	ZGD19426 with: PGDG0022 = 0X6604	E_4.4.7_020 IS is now self-stimulated with 4 impulses, each 1V in amplitude
14	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
15	Verify that GIADA delivers a science calibration packet for IS	YGD00020	E_4.4.7_030 The correct kind of science report can only be verified on the GIADA IWS, as the relevant info is contained within the packets data field
16	Send a TC 194.1 with datafield 0x0000	ZGD19401 with: PGDG0010 = 0x0000	E_4.4.7_020 Set IS OFF
17	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
18	Wait until next HK packet	50 s	
19	In the HK packets, verify that the "IS Status" parameter indicates " Off"	YGD00001 with: NGDD0045= 0	

4.8.9 Test Sequence for F10.20.4 Private TC Service #195

Project: GIADA	Test Procedure Name: F10.20.4 Private TC Service #195 Pass/Fail criterium(a): verify correct execution of TC 195, subtypes 1, 6, 21, 26, 36		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Send a TC 195.1 with datafield 0xFFFF (2 bytes)	ZGD19501 with: PGDG0010 = 0xFFFF	E_4.4.7_020 Set MBS ON
2	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
3	Verify that GIADA delivers a science calibration packet for MBS	YGD00020	E_4.4.7_030 The correct kind of science report can only be verified on the GIADA IWS, as the relevant info is contained within the packets data field
4	Wait until next HK packet	50 s	
5	In the HK packets, verify that the "MBS Status" parameter indicates " ON"	YGD00001 with: NGDD0065= 1	
6	Wait until at least two scientific packets are delivered from GIADA (about 60 s)	YGD00020	E_4.4.7_030
7	On the GIADA EGSE S/W, verify and record the delay time between the received science packets		Check to be performed in the Event Time in the Science Reports.

Project: GIADA	Test Procedure Name: F10.20.4 Private TC Service #195 Pass/Fail criterium(a): verify correct execution of TC 195, subtypes 1, 6, 21, 26, 36		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
8	Send a TC 195.21 "Set Time Interval Between Measurements" with datafield 0x00000019	ZGD19521 with: PGDG0031 = 0x0000 0019	E_4.4.7_020 0x0000 0019 = Time between measurments set to 25s
9	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
10	Wait until at least two scientific packets are delivered from GIADA (about 5 minutes)	YGD00020	E_4.4.7_030
11	On the GIADA EGSE S/W, verify and record the delay time between the time of the events in received science packets	Shall be about 25 s	
12	Send a TC 195.6 "Set MBS Operation Mode" with datafield 0x0000	ZGD19506 with: PGDG0030 = 0x0000	E_4.4.7_020 0x0000 = All MBS are excluded
13	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
14	Wait 50 s		
15	On the GIADA EGSE S/W, verify that the MBS operation mode word in the received HK has changed accordingly		
16	Verify that no more scientific packets are delivered		

Project: GIADA	Test Procedure Name: F10.20.4 Private TC Service #195 Pass/Fail criterium(a): verify correct execution of TC 195, subtypes 1, 6, 21, 26, 36		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
17	Send a TC 195.6 "Set MBS Operation Mode" with datafield 0x1F00	ZGD19506 with: PGDG0030 = 0x1F00	E_4.4.7_020 0x1F00 = All MBS are included
18	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
19	Wait 50 s		
20	On the GIADA EGSE S/W, verify that the MBS operation mode word in the received HK has changed accordingly		
21	Verify that scientific packets are now delivered	YGD00020	E_4.4.7_030
22	Send a TC 195.26 "Heat MB" with datafield "0003"	ZGD19526 with: PGDG0032 = 0x0003	E_4.4.7_020 MB#3 is now heated up
23	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
24	Verify that GIADA delivers a MBS heating science packet	YGD00020	E_4.4.7_030 The correct kind of science report can only be verified on the GIADA IWS, as the relevant info is contained within the packets data field

Project: GIADA	Test Procedure Name: F10.20.4 Private TC Service #195 Pass/Fail criterium(a): verify correct execution of TC 195, subtypes 1, 6, 21, 26, 36		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
25	Wait for confirmation form the IWS Operator the MBS heating is finished		
26	Send a TC 195.36 "Calibarte MBS"	ZGD19536	E_4.4.7_020
27	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
28	Verify that GIADA delivers a MBS calibration science packet	YGD00020	E_4.4.7_030 The correct kind of science report can only be verified on the GIADA IWS, as the relevant info is contained within the packets data field
29	Send a TC 195.1 with datafield 0x0000	ZGD19501 with: PGDG0010 = 0x0000	E_4.4.7_020 Set MBS OFF
30	Verify that GIADA accepts the TC (generation of 1.1 TM report)	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
31	Wait until next HK packet	50 s	
32	In the HK packets, verify that the "MBS Status" parameter indicates " Off"	YGD00001 with: NGDD0065= 0	

Project: GIADA	Test Procedure Name: F10.20.4 Private TC Service #195 Pass/Fail criterium(a): verify correct execution of TC 195, subtypes 1, 6, 21, 26, 36		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
33	Send to GIADA a TC 20.2 "Disable Science Reporting"	ZGD00011	E_4.4.7_020
34	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
35	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	E_4.4.7_020 E_4.4.7_040
36	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	E_4.4.7_030
37	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDD0065= 42050 (Decimal)	E_4.4.7_030
38	Power off GIADA through the LCL		

4.9 T4.4.8 Redundancy Test

4.9.1 Not applicable inputs

E_4.4.8_030 (GIADA is cold redundant)

E_4.4.8_040

4.9.2 Inputs provided in procedure T4.4.8 Redundancy Test

E_4.4.8_010

E_4.4.8_020

4.9.3 Test Sequence for T4.4.8 Redundancy Test

Project: GIADA	Test Procedure Name: T4.4.8 Redundancy Test Pass/Fail criterium(a): verify cold redundancy switching of GIADA		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Power on GIADA Redundant I/F through the LCL	Redundant I/F ON	E_4.4.8_010
2	Wait 20 s		E_4.4.8_010
3	Send to GIADA a TC 9.1 "Accept Time Update", within 60 from step 2	ZGD00006 with: PGDG001 = actual S/C time	E_4.4.8_010
4	Wait 50 s for default HK generation	YGD00001 with: NGDA0003 = 0x0002	E_4.4.8_020 '00' = Safe Mode '02' = HK enabled, Science TM disabled
5	Upload Context File	ZGD00009	• Check correctness of ZGD00009 • **Remarks** Content to be clarified by ALS
6	Upload Software Patches	ZGD00003 with Patch21.mpr file	• **Remarks**: the '.mpr' file to be supplied by OG via e-mail
7	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	E_4.4.8_010

Project: GIADA	Test Procedure Name: T4.4.8 Redundancy Test Pass/Fail criterium(a): verify cold redundancy switching of GIADA		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
8	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
9	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 0x0000	
10	Wait until next HK packet	50 s	
11	Verify, in the HK reports, the operative mode of GIADA	YGD00001 with: NGDA0003 = 0x0301	E_4.4.8_020 Optional step, can also be verified on GIADA IWS '03' = Normal Mode '01' = Science TM disabled
12	Send to GIADA a TC 20.1 "Enable Science Reporting"	ZGD00010	E_4.4.8_010
13	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
14	Wait 5 minutes and verify if the Science TM reports arrives		Arrival of the TM depends on the Default Context File loaded in GIADA, it may be possible no Science TM data arrive
15	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	

Project: GIADA	Test Procedure Name: T4.4.8 Redundancy Test Pass/Fail criterium(a): verify cold redundancy switching of GIADA		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
16	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
17	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 0x0000	
18	Power off GIADA through the LCL		

4.10 T4.4.9 Operative Modes Verification

4.10.1 Not applicable inputs

E_4.4.9_010 (already provided in section 4.1.4)

E_4.4.9_020_010 (no HK parameter is to be checked by the CCS)

4.10.2 Inputs provided in procedure F10.20.5 Private TC Service #196 (Full)

E_4.4.9_020_020

E_4.4.9_020_030

E_4.4.9_030

4.10.3 Test Sequence for F10.20.5 Private TC Service #196 (Full)

Project: GIADA	**Test Procedure Name:** F10.20.5 Private TC Service #196 (Full) **Pass/Fail criterium(a):** verify correctness of transitions between GIADA operative modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Power on GIADA Main I/F through the LCL	Main I/F ON	
2	Wait 20 s		
3	Send to GIADA a TC 9.1 "Accept Time Update", within 60 from step 2	ZGD00006 with: PGDG001 = actual S/C time	
4	Wait 50 s for default HK generation	YGD00001 with: NGDA0003 = 0x0000	'00' = Safe Mode '00' = HK enabled, Science TM disabled
5	Upload Context File	ZGD00009	• Check correctness of ZGD00009 • **Remarks** Content to be clarified by ALS
6	Upload Software Patches	ZGD00003 with Patch21.mpr file	• **Remarks**: the '.mpr' file to be supplied by OG via e-mail
7	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	E_4.4.9_020_020 No scientific data, only HK packets. E_4.4.9_020_030

Project: GIADA	Test Procedure Name:	F10.20.5 Private TC Service #196 (Full)	
	Pass/Fail criterium(a):	verify correctness of transitions between GIADA operative modes	
Test Step		**Nominal values/RSDB inputs**	**Remarks**
8	Verify that GIADA refuses to execute the TC (generation of 1.2 TM report)	YGDST006 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step NGDAST03 = 0x0005 NGDAST04 = 0xC401 NGDAST05 = 0x0000	Failure code 5 TC type and subtype Actual operational mode (Safe)
9	Wait for 16 s (TBC)	16 s	
10	Send to GIADA a TC 196.16 "Go to Flux Mode"	ZGD19616	E_4.4.9_020_020 Scientific data (when enabled) and HK packets. E_4.4.9_020_030
11	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
12	Verify that GIADA generates a TM 5.1	YGD42053 with: NGDA0059 = 42053 (Decimal)	
13	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	

Project: GIADA	Test Procedure Name: F10.20.5 Private TC Service #196 (Full) Pass/Fail criterium(a): verify correctness of transitions between GIADA operative modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
14	Verify that GIADA refuses to execute the TC (generation of 1.2 TM report)	YGDST006 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step NGDAST03 = 0x0005 NGDAST04 = 0xC40B NGDAST015 = 0x0002	 Failure code 5 TC type and subtype Actual operational mode (Flux)
15	Wait 16 s (TBC)		
16	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	
17	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
18	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	
19	Send to GIADA a TC 196.11 “Go to Normal Mode”	ZGD19611	E_4.4.9_020_020 E_4.4.9_020_030

Project: GIADA	Test Procedure Name: F10.20.5 Private TC Service #196 (Full) Pass/Fail criterium(a): verify correctness of transitions between GIADA operative modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
20	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
21	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 42052 (Decimal)	
22	Wait until next HK packet	50 s	
23	Verify, in the HK reports, the operative mode of GIADA	YGD00001 with: NGDA0003 = 0x0300	Optional step, can also be verified on GIADA IWS '03' = Normal Mode '00' = Science TM disabled
24	Send to GIADA a TC 196.6 "Go to Cover Mode"	ZGD19606	E_4.4.9_020_020 E_4.4.9_020_030
25	Verify that GIADA refuses to execute the TC (generation of 1.2 TM report)	YGDST006 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step NGDAST03 = 0x0005 NGDAST04 = 0xC406 NGDAST015 = 0x0003	Failure code 5 TC type and subtype Actual operational mode (Normal)

Project: GIADA	Test Procedure Name: F10.20.5 Private TC Service #196 (Full) Pass/Fail criterium(a): verify correctness of transitions between GIADA operative modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
26	Wait for 16 s (TBC)		
27	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	
28	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
29	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	
30	Wait for 50s to check the HK TM	50 s	
31	Send to GIADA a TC 196.6 "Go to Cover Mode"	ZGD19606	E_4.4.9_020_020 No scientific data, only HK packets. E_4.4.9_020_030
32	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
33	Verify that GIADA generates a TM 5.1	YGD42051 with: NGDA0059= 42051 (Decimal)	
34	Wait 50 s to check the HK TM	50 s	

Project: GIADA	Test Procedure Name: F10.20.5 Private TC Service #196 (Full) Pass/Fail criterium(a): verify correctness of transitions between GIADA operative modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
35	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	
36	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
37	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	

4.11 T4.4.10 Maximum Data Throughput

Refer to the session 4.7 and 4.8. During these tests being the IS and GDS thresholds have been set to a low level, GIADA provides the science TM to a maximum data throughput possible without Laser switched-ON. The real maximum (science) data throufghput will be only experienced during the SPT when the Laser will be switched-ON and the GDS will detect particle by means of stimuli integrated on the top of GIADA.

4.12 T4.4.11 Power Consumption Test

The test procedure is required to run for both the Main and Redundant Interfaces.

4.12.1 Not applicable inputs

None

4.12.2 Inputs provided in procedure T4.4.11 Power Consumption Test

E_4.4.11_010

E_4.4.11_020

E_4.4.11_030

4.12.3 Test Sequence for T4.4.11 Power Consumption Test

Project: GIADA	**Test Procedure Name:** T4.4.11 Power Consumption Test **Pass/Fail criterium(a):** verify nominal power consumption of GIADA in Safe and Normal modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Power on GIADA through the LCL		The procedure can be applied to Main or Redundant depending on the LCL to be switched-ON
2	Wait 20 s		
3	Send to GIADA a TC 9.1 "Accept Time Update", within 60 from step 2	ZGD00006 with: PGDG001 = actual S/C time	
4	Wait 50 s for default HK generation	YGD00001 with: NGDA0003 = 0x0000	'00' = Safe Mode '00' = HK enabled, Science TM disabled
5	Upload Context File	ZGD00009	• Check correctness of ZGD00009 • **Remarks** Content to be clarified by ALS
6	Upload Software Patches	ZGD00003 with Patch21.mpr file	• **Remarks**: the '.mpr' file to be supplied by OG via e-mail
7	Verify that GIADA is in Safe Mode	ZGD19611	E_4.4.11_020
8	Record the power consumption in Safe Mode	V = 28.216 [V] I = 0.142 [A]	E_4.4.11_010 E_4.4.11_030
9	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	E_4.4.11_020

Project: GIADA	Test Procedure Name: T4.4.11 Power Consumption Test Pass/Fail criterium(a): verify nominal power consumption of GIADA in Safe and Normal modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
10	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
11	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 42052 (Decimal)	
12	Record the power consumption in Normal Mode, with all subsystems on but with GDS lasers switched off	V = 28.0 [V] I = 0.440 [A]	E_4.4.11_010 E_4.4.11_030
13	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	
14	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
15	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	
16	Send to GIADA a TC 196.16 "Go to Flux Mode"	ZGD19616	E_4.4.9_020_020 E_4.4.9_020_030

Project: GIADA	Test Procedure Name: T4.4.11 Power Consumption Test Pass/Fail criterium(a): verify nominal power consumption of GIADA in Safe and Normal modes		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
17	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
18	Verify that GIADA generates a TM 5.1	YGD42053 with: NGDA0059 = 42053 (Decimal)	
19	Record the power consumption in Flux Mode	V = 28.0 [V] I = 0.24 [A]	
20	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	
21	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
22	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	
23	Power off GIADA through the LCL		

4.13 T4.4.12 Functional Performance Test

4.13.1 Not applicable inputs

None

4.13.2 Inputs provided in procedure T4.4.11 Power Consumption Test

E_4.4.12_010

E_4.4.12_020

E_4.4.12_030

4.13.3 Test Sequence for F10.20.4 Functional-Performance procedure

Project: GIADA	**Test Procedure Name:** F10.20.4 Functional-Performance procedure **Pass/Fail criterium(a):** verify generation of scientific packets		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
1	Power on GIADA Redundant I/F through the LCL	Redundant I/F ON	E_4.4.8_010
2	Wait 20 s		E_4.4.8_010
3	Send to GIADA a TC 9.1 "Accept Time Update", within 60 from step 2	ZGD00006 with: PGDG001 = actual S/C time	E_4.4.8_010
4	Wait 50 s for default HK generation	YGD00001 with: NGDA0003 = 0x0000	'00' = Safe Mode '00' = HK enabled, Science TM disabled
5	Upload Context File	ZGD00009	• Check correctness of ZGD00009 • **Remarks** Content to be clarified by ALS
6	Upload Software Patches	ZGD00003 with Patch21.mpr file	• **Remarks**: the '.mpr' file to be supplied by OG via e-mail
7	Send to GIADA a TC 196.11 "Go to Normal Mode"	ZGD19611	E_4.4.8_010
8	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	

Project: GIADA	Test Procedure Name: F10.20.4 Functional-Performance procedure Pass/Fail criterium(a): verify generation of scientific packets		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
9	Verify that GIADA generates a TM 5.1	YGD42052 with: NGDA0059= 42052 (Decimal)	
10	Wait until next HK packet	40 s	
11	Verify, in the HK reports, the operative mode of GIADA	YGD00001 with: NGDA0003 = 0x0300	E_4.4.8_020 Optional step, can also be verified on GIADA IWS '03' = Normal Mode '00' = Science TM disabled
12	Send to GIADA a TC 20.1 "Enable Science Reporting"	ZGD00010	E_4.4.8_010
13	Verify that GIADA generates a TM 1.1 "Acceptance acknowledge", within 20 s from previous step	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
14	Wait for an hour (several science packets should be delivered from GIADA)	YGD00020	E_4.4.12_030
15	Send to GIADA a TC 196.1 "Go to Safe Mode"	ZGD19601	
16	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	

Project: GIADA	Test Procedure Name: F10.20.4 Functional-Performance procedure Pass/Fail criterium(a): verify generation of scientific packets		
Test Step		**Nominal values/RSDB inputs**	**Remarks**
17	Verify that GIADA generates a TM 5.1	YGD42050 with: NGDA0059= 42050 (Decimal)	
18	Power off GIADA through the LCL		

4.14 Nominal GIADA Switch Off

This procedure shall be executed for both Main and Redundant I/F.

4.14.1 Not applicable inputs

NA

4.14.2 Inputs provided in procedure S10.1.8 Power off Sequence

NA

4.14.3 Test Sequence for S10.1.8 Power off Sequence

Project: GIADA	**Test Procedure Name:** S10.1.8 Power off Sequence **Pass/Fail criterium(a):** verify correct execution of nominal GIADA switch off sequence		
Test Step		**Nominal value** **Actual value**	**Remarks**
1	Power on GIADA through the LCL		
2	Wait 20 s		
3	Send to GIADA a TC 9.1 "Accept Time Update", within 60 from step 2	ZGD00006 with: PGDG001 = actual S/C time	
4	Wait 50 s for default HK generation	YGD00001 with: NGDA0003 = 0x0000	'00' = Safe Mode '00' = HK enabled, Science TM disabled
5	Upload Context File	ZGD00009	• Check correctness of ZGD00009 • **Remarks** Content to be clarified by ALS
6	Upload Software Patches	ZGD00003 with Patch21.mpr file	• **Remarks**: the '.mpr' file to be supplied by OG via e-mail
7	Wait until next HK packet	50 s	
8	Send a TC 18.1 "Report Context Request" to GIADA	ZGD00008	

Project: GIADA	Test Procedure Name: S10.1.8 Power off Sequence Pass/Fail criterium(a): verify correct execution of nominal GIADA switch off sequence		
Test Step		**Nominal value** **Actual value**	**Remarks**
9	Verify that GIADA generates a TM 1.1	YGDST001 with: NGDAST01 from TC at previous step NGDAST02 from TC at previous step	
10	Verify that GIADA generates a TM 18.2	YGD00013	
11	Power off GIADA through the LCL	OFF	

4.15 IST Post Operations

None

ANNEX A DATAFIELD FOR PFM CONTEXT FILE

Datafield size: 134 octets

Data:
```
00 00 05 9F 05 BD 00 00 00 3C 06 59 00 00 02 58
00 32 00 A3 00 A3 00 00 00 78 00 00 00 78 AF 03
3D 72 F5 D3 FE 23 00 00 00 00 00 00 0E 10 9F 06
19 F8 00 00 00 4B 00 05 04 05 05 05 00 00 0E 10
F7 04 9F 00 0A 7F F8 00 00 00 01 2C 09 CF 00 00
01 68 00 00 0E 10 19 F8 1E 0D 1A 63 00 00 00 00
00 00 00 00 00 00 00 3C 00 00 00 28 00 00 00 28
00 00 00 00 00 00 00 00 00 00 28 00 28 00 00 00 00
00 00 00 00 C5 A6
```

ANNEX B CONTENT OF UPLOADED PFM CONTEXT FILE

The relevant values for all parameters in the above CF are depicted below:

ANNEX C CONTENT OF DEFAULT PFM CONTEXT (PROM)

ANNEX 4: GIADA Database Template

RSDB_GIADA_FS
Date: 15– 09 – 2006

Total Annex Pages: 63

Remark 8.1: Calibration curve for GDS and IS Thresholds

Only one calibration curve is available for all thresholds, i.e. CGDP0002 (with CAL values 0 – 255 digits vs. 0 – 2.5 V). This is used for NGDD0040, NGDD0041, NGDD0058, NGDD0059, NGDD0060, NGDD0061, which refer respectively to GDS Threshold Left, GDS Threshold Right, PZTA Threshold, PZTB Threshold, PZTC Threshold, PZTD Threshold, PZTE Threshold. This means that any decoding of GDS Thr.s based on these values would be WRONG, while it is CORRECT for IS PZT Thr.s. In principle, different CAL curves should be implemented for the different Thresholds.

NAME	TMTC	GCPASS	LNAME	TC_LOW_RANGE	TC_HIGH_RANGE	TC_VAL_TYPE
LGDA0016	TM	N				NULL
LGDA0011	TM	N				NULL
LGDA0017	TM	N				NULL
LGDA0018	TM	N				NULL
LGDA0019	TM	N				NULL
LGDA0020	TM	N				NULL
LGDA0021	TM	N				NULL
LGDA0022	TM	N				NULL
LGDA0023	TM	N				NULL
LGDA0031	TM	N				NULL
LGDA0036	TM	N				NULL
LGDA0037	TM	N				NULL
LGDA0038	TM	N				NULL
LGDA0039	TM	N				NULL
LGDA0040	TM	N				NULL
LGDA0045	TM	N				NULL
LGDA0046	TM	N				NULL
LGDA0047	TM	N				NULL
LGDA0048	TM	N				NULL
LGDD0020	TM	N				NULL
LGDD0032	TM	N				NULL
LGDD0033	TM	N				NULL
LGDD0034	TM	N				NULL
LGDD0035	TM	N				NULL
LGDD0036	TM	N				NULL
LGDD0037	TM	N				NULL
LGDD0038	TM	N				NULL
LGDD0039	TM	N				NULL
LGDD0057	TM	N				NULL
LGDD0076	TM	N				NULL
LGDD0077	TM	N				NULL
LGDD0078	TM	N				NULL
LGDD0079	TM	N				NULL
LGDD0080	TM	N				NULL
LGDD0085	TM	N				NULL
LGDD0086	TM	N				NULL
LGDD0087	TM	N				NULL
LGDD0088	TM	N				NULL

LIMS_NAME	LIMS_TMTC	RANK	CONDITION	DATA_TYPE	SOFT_LOW	SOFT_HIGH	SOFT_DELTA	SOFT_NUMOUT	HARD_LOW	HARD_HIGH	HARD_DELTA	HARD_NUMOUT	HARD_ACTION	VAL_TYPE
LGDA0011	TM	16	TRUE	CAL	-30	95	0	1	-50	120		1		INT
LGDA0016	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDA0017	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDA0018	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDA0019	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDA0020	TM	16	TRUE	CAL	0.05	0.6	0	1	-0.1	0.8		1		REAL
LGDA0021	TM	16	TRUE	CAL	0.05	0.6	0	1	-0.1	0.8		1		REAL
LGDA0022	TM	16	TRUE	CAL	0.05	0.6	0	1	-0.1	0.8		1		REAL
LGDA0023	TM	16	TRUE	CAL	0.05	0.6	0	1	-0.1	0.8		1		REAL
LGDA0031	TM	16	TRUE	CAL	-20	80	0	1	-30	90		1		INT
LGDA0036	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDA0037	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDA0038	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDA0039	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDA0040	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDA0045	TM	16	TRUE	CAL	-20	70	0	1	-40	85		1		INT
LGDA0046	TM	16	TRUE	CAL	350	1600	0	1	300	1800		1		INT
LGDA0047	TM	16	TRUE	CAL	200	350	0	1	150	400		1		INT
LGDA0048	TM	16	TRUE	CAL	350	700	0	1	300	790		1		INT
LGDD0020	TM	16	TRUE	CAL	-30	95	0	1	-50	120		1		INT
LGDD0032	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDD0033	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDD0034	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDD0035	TM	16	TRUE	CAL	-20	50	0	1	-30	60		1		INT
LGDD0036	TM	16	TRUE	CAL	0.05	0.7	0	1	-0.1	0.9		1		REAL
LGDD0037	TM	16	TRUE	CAL	0.05	0.7	0	1	-0.1	0.9		1		REAL
LGDD0038	TM	16	TRUE	CAL	0.05	0.7	0	1	-0.1	0.9		1		REAL
LGDD0039	TM	16	TRUE	CAL	0.05	0.7	0	1	-0.1	0.9		1		REAL
LGDD0057	TM	16	TRUE	CAL	-20	80	0	1	-30	90		1		INT
LGDD0076	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDD0077	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDD0078	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDD0079	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDD0080	TM	16	TRUE	CAL	-30	70	0	1	-40	90		1		INT
LGDD0085	TM	16	TRUE	CAL	-20	70	0	1	-40	85		1		INT
LGDD0086	TM	16	TRUE	CAL	350	1600	0	1	300	1800		1		INT
LGDD0087	TM	16	TRUE	CAL	350	700	0	1	300	790		1		INT
LGDD0088	TM	16	TRUE	CAL	200	350	0	1	150	400		1		INT

CATEGORY	NAME	GCPASS		LNAME	BYTE_PACKED	CALCSIZE	TO_BE_REARRANGED	SCOPE	LINKTODPGR	DPGR_NAME	START_ITEM	NB_ITEMS
PKBM	WGD09001	N	GIADA Header Block 90/1		N	128	N	SPACE	N			
PKBM	WGD09004	N	GIADA Header Block 90/4		N	128	N	SPACE	N			
PKBM	WGD09007	N	GIADA Header Block 90/7		N	128	N	SPACE	N			
PKBM	WGD09009	N	GIADA Header Block 90/9		N	128	N	SPACE	N			
PKBM	WGD09011	N	GIADA Header Block 90/11		N	128	N	SPACE	N			
PKBM	WGD09012	N	GIADA Header Block 90/12		N	128	N	SPACE	N			
PKBC	XGDM0100	N	MLC Block 1, GIADA, N = 12		N	16	N	SPACE	N			
PKBC	XGDM0101	N	MLC Block 1, GIADA, N = 14		N	16	N	SPACE	N			
PKBC	XGDM0200	N	Selection ML, GIADA-A		N	32	N	SPACE	N			
PKBC	XGDM0300	N	Effective ML, GIADA		N	16	N	SPACE	N			
PKBC	XGDM0400	N	Selection ML, GIADA-B		N	32	N	SPACE	N			

PKBL_NAME	PKBL_CATEGORY	PBLE_ORDER	ELTTYPE	ITEMOFFSET	PBLE_SIZE	FIXEDVALUE	REPEAT	CALCSIZE	TMPA_NAME	TCPA_NAME	PKBL_NESTED_NAME	PKBL_NESTED_CATEG	EXCP_CODE	DESCRIPTION	NGRPSIZE
WGD09001	PKBM	0	PARAM	0	16		1	16	NSBAH001						
WGD09001	PKBM	1	PARAM	16	16		1	16	NGDAH111						
WGD09001	PKBM	2	PARAM	32	16		1	16	NGDAH112						
WGD09001	PKBM	3	PARAM	48	48		1	48	NGDAH113						
WGD09001	PKBM	4	PARAM	96	32		1	32	NGDAH114						
WGD09004	PKBM	0	PARAM	0	16		1	16	NSBAH001						
WGD09004	PKBM	1	PARAM	16	16		1	16	NGDAH141						
WGD09004	PKBM	2	PARAM	32	16		1	16	NGDAH142						
WGD09004	PKBM	3	PARAM	48	48		1	48	NGDAH143						
WGD09004	PKBM	4	PARAM	96	32		1	32	NGDAH144						
WGD09007	PKBM	0	PARAM	0	16		1	16	NSBAH001						
WGD09007	PKBM	1	PARAM	16	16		1	16	NGDAH171						
WGD09007	PKBM	2	PARAM	32	16		1	16	NGDAH172						
WGD09007	PKBM	3	PARAM	48	48		1	48	NGDAH173						
WGD09007	PKBM	4	PARAM	96	32		1	32	NGDAH174						
WGD09009	PKBM	0	PARAM	0	16		1	16	NSBAH001						
WGD09009	PKBM	1	PARAM	16	16		1	16	NGDAH191						
WGD09009	PKBM	2	PARAM	32	16		1	16	NGDAH192						
WGD09009	PKBM	3	PARAM	48	48		1	48	NGDAH193						
WGD09009	PKBM	4	PARAM	96	32		1	32	NGDAH194						
WGD09011	PKBM	0	PARAM	0	16		1	16	NSBAH001						
WGD09011	PKBM	1	PARAM	16	16		1	16	NGDAH1B1						
WGD09011	PKBM	2	PARAM	32	16		1	16	NGDAH1B2						
WGD09011	PKBM	3	PARAM	48	48		1	48	NGDAH1B3						
WGD09011	PKBM	4	PARAM	96	32		1	32	NGDAH1B4						
WGD09012	PKBM	0	PARAM	0	16		1	16	NSBAH001						
WGD09012	PKBM	1	PARAM	16	16		1	16	NGDAH1C1						
WGD09012	PKBM	2	PARAM	32	16		1	16	NGDAH1C2						
WGD09012	PKBM	3	PARAM	48	48		1	48	NGDAH1C3						
WGD09012	PKBM	4	PARAM	96	32		1	32	NGDAH1C4						
XGDM0100	PKBC	0	PARAM	0	8		1	8		FGDM0100					
XGDM0100	PKBC	1	PARAM	8	8		1	8		FGDM0101					
XGDM0101	PKBC	0	PARAM	0	8		1	8		FGDM0100					
XGDM0101	PKBC	1	PARAM	8	8		1	8		FGDM0102					
XGDM0200	PKBC	0	PARAM	0	1		1	1		FGDM0200					
XGDM0200	PKBC	1	PARAM	1	1		1	1		FGDM0201					
XGDM0200	PKBC	2	PARAM	2	5		1	5		FGDM0202					
XGDM0200	PKBC	3	PARAM	7	1		1	1		FGDM0203					
XGDM0200	PKBC	4	PARAM	8	5		1	5		FGDM0204					
XGDM0200	PKBC	5	PARAM	13	3		1	3		FGDM0205					
XGDM0200	PKBC	6	PARAM	16	16		1	16		FGDM0206					
XGDM0300	PKBC	0	PARAM	0	1		1	1		FGDM0300					
XGDM0300	PKBC	1	PARAM	1	1		1	1		FGDM0301					
XGDM0300	PKBC	2	PARAM	2	5		1	5		FGDM0302					
XGDM0300	PKBC	3	PARAM	7	1		1	1		FGDM0303					
XGDM0300	PKBC	4	PARAM	8	5		1	5		FGDM0304					
XGDM0300	PKBC	5	PARAM	13	3		1	3		FGDM0305					
XGDM0400	PKBC	0	PARAM	0	1		1	1		FGDM0400					
XGDM0400	PKBC	1	PARAM	1	1		1	1		FGDM0401					
XGDM0400	PKBC	2	PARAM	2	5		1	5		FGDM0402					
XGDM0400	PKBC	3	PARAM	7	1		1	1		FGDM0403					
XGDM0400	PKBC	4	PARAM	8	5		1	5		FGDM0404					
XGDM0400	PKBC	5	PARAM	13	3		1	3		FGDM0405					
XGDM0400	PKBC	6	PARAM	16	16		1	16		FGDM0406					

NAME	CATEGORY	GCPASS		LNAME	RED_NAME	USAGE	SGRP_NAME	PTC	PFC	TCPA_SIZE	CALIB_TYPE	CALC_NAME_1		UNIT_NAME_SELC1	UNIT_NAME_SELC1R	ENGLABEL	DEF_VALUE	IS_MODIFIABLE	LIMS_NAME		TCDP_TCGP_NAME	TCDP_START_BIT		ON_BOARD_SW	OB_CMD_TYPE		BCOU_NAME	CHAD_1N	CHAD_1R	CHAD_2N	CHAD_2R		PROTOCOL		BCOU_NAME_RED	CHAD_1N_RED	CHAD_1R_RED	CHAD_2N_RED	CHAD_2R_RED	PROTOCOL_RED
PGDG9901	OCMD	N	Switch MLC for GIADA			3	SGDGIADA		3	12	16	NONE		UGDGIADA				Y					NONE	MEMORY	RBDRTUPL		1					0D;1D							
PGDG9991	OCMD	N	MLC for GIADA		PGDG9992	3	SGDGIADA		3	12	16	NONE		UGDGIADA		UGDGIADA		Y					NONE	MEMORY	RBDRTUPL		2							RBDRTUPL		2				
PGDG0001	TCGP	N	CUC Time			7	SGDGIADA		9	17	48	NONE		UGDGIADA				Y					NONE																
PGDG0002	TCGP	N	Global PID			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0005	TCGP	N	Heater ID			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0010	TCGP	N	On/Off Action			7	SGDGIADA		3	12	16	DIG	CGDV0014	UGDGIADA			Off	Y					NONE																
PGDG0015	TCGP	N	GDS Ops Mode			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0016	TCGP	N	GDS Threshold			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0020	TCGP	N	IS Ops Mode			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0021	TCGP	N	IS Thresholds			7	SGDGIADA		0	48	48	NONE		UGDGIADA				Y					NONE																
PGDG0022	TCGP	N	Calibration Config			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0030	TCGP	N	MBS Ops Mode			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0031	TCGP	N	Time			7	SGDGIADA		3	14	32	NONE		UGDGIADA				Y					NONE																
PGDG0032	TCGP	N	Global MB ID			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDG0601	TCGP	N	Memory ID			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y					NONE																
PGDG0602	TCGP	N	MemStart			7	SGDGIADA		3	14	32	NONE		UGDGIADA				Y					NONE																
PGDG0603	TCGP	N	MemLength			7	SGDGIADA		3	12	16	NONE		UGDGIADA			1	Y					NONE																
PGDG0604	TCGP	N	MemData			7	SGDGIADA		3	12	16	NONE		UGDGIADA				Y					NONE																
PGDG1601	TCGP	N	Memory blocks			7	SGDGIADA		3	4	8	NONE		UGDGIADA			1	Y					NONE																
PGDGA001	TCGP	N	Global SID			7	SGDGIADA		0	16	16	NONE		UGDGIADA				Y					NONE																
PGDD0001	TCDP	N	PAD-9bits			7	SGDGIADA		3	5	9	NONE		UGDGIADA			0	N	PGDG0002		0	NONE																
PGDD0002	TCDP	N	PID			7	SGDGIADA		3	3	7	NONE		UGDGIADA			90	Y	PGDG0002		9	NONE																
PGDD0004	TCDP	N	Spare			7	SGDGIADA		3	9	13	NONE		UGDGIADA			0	N	PGDG0005		0	NONE																
PGDD0005	TCDP	N	Selected heaters			7	SGDGIADA		2	3	3	DIG	CGDV0015	UGDGIADA				Y	PGDG0005		13	NONE																
PGDD0008	TCDP	N	Spare			7	SGDGIADA		2	2	2	NONE		UGDGIADA			0	N	PGDG0015		0	NONE																
PGDD0009	TCDP	N	Default Laser Power			7	SGDGIADA		2	2	2	DIG	CGDV0011	UGDGIADA				Y	PGDG0015		2	NONE																
PGDD0010	TCDP	N	Laser Ops Mode			7	SGDGIADA		2	2	2	DIG	CGDV0012	UGDGIADA				Y	PGDG0015		4	NONE																
PGDD0011	TCDP	N	Left Receiver en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0015		6	NONE																
PGDD0012	TCDP	N	Right Receiver en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0015		7	NONE																
PGDD0013	TCDP	N	Spare			7	SGDGIADA		2	6	6	NONE		UGDGIADA			0	N	PGDG0015		8	NONE																
PGDD0014	TCDP	N	Nb of Detections			7	SGDGIADA		2	2	2	NONE		UGDGIADA				Y	PGDG0015		14	NONE																
PGDD0015	TCDP	N	Left Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0016		0	NONE																
PGDD0016	TCDP	N	Right Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0016		8	NONE																
PGDD0017	TCDP	N	Spare			7	SGDGIADA		2	3	3	NONE		UGDGIADA			0	N	PGDG0020		0	NONE																
PGDD0018	TCDP	N	PZT5 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0020		3	NONE																
PGDD0019	TCDP	N	PZT4 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0020		4	NONE																
PGDD0020	TCDP	N	PZT3 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0020		5	NONE																
PGDD0021	TCDP	N	PZT2 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0020		6	NONE																
PGDD0022	TCDP	N	PZT1 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0020		7	NONE																
PGDD0023	TCDP	N	Range			7	SGDGIADA		1	0	1	DIG	CGDV0013	UGDGIADA				Y	PGDG0020		8	NONE																
PGDD0024	TCDP	N	Spare			7	SGDGIADA		2	2	2	NONE		UGDGIADA			0	N	PGDG0020		9	NONE																
PGDD0025	TCDP	N	Gain PZT5			7	SGDGIADA		1	0	1	DIG	CGDV0013	UGDGIADA				Y	PGDG0020		11	NONE																
PGDD0026	TCDP	N	Gain PZT4			7	SGDGIADA		1	0	1	DIG	CGDV0013	UGDGIADA				Y	PGDG0020		12	NONE																
PGDD0027	TCDP	N	Gain PZT3			7	SGDGIADA		1	0	1	DIG	CGDV0013	UGDGIADA				Y	PGDG0020		13	NONE																
PGDD0028	TCDP	N	Gain PZT2			7	SGDGIADA		1	0	1	DIG	CGDV0013	UGDGIADA				Y	PGDG0020		14	NONE																
PGDD0029	TCDP	N	Gain PZT1			7	SGDGIADA		1	0	1	DIG	CGDV0013	UGDGIADA				Y	PGDG0020		15	NONE																
PGDD0030	TCDP	N	Spare			7	SGDGIADA		2	8	8	NONE		UGDGIADA			0	N	PGDG0021		0	NONE																
PGDD0031	TCDP	N	PZT1 Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0021		8	NONE																
PGDD0032	TCDP	N	PZT2 Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0021		16	NONE																
PGDD0033	TCDP	N	PZT3 Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0021		24	NONE																
PGDD0034	TCDP	N	PZT4 Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0021		32	NONE																
PGDD0035	TCDP	N	PZT5 Threshold			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0021		40	NONE																
PGDD0036	TCDP	N	Calibration Level			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0022		0	NONE																
PGDD0037	TCDP	N	Nb of Stimuli			7	SGDGIADA		3	4	8	NONE		UGDGIADA				Y	PGDG0022		8	NONE																
PGDD0039	TCDP	N	Spare			7	SGDGIADA		2	3	3	NONE		UGDGIADA			0	N	PGDG0030		0	NONE																
PGDD0040	TCDP	N	MB5 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0030		3	NONE																
PGDD0041	TCDP	N	MB4 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0030		4	NONE																
PGDD0042	TCDP	N	MB3 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0030		5	NONE																
PGDD0043	TCDP	N	MB2 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0030		6	NONE																
PGDD0044	TCDP	N	MB1 en/dis			7	SGDGIADA		1	0	1	DIG	CGDV0004	UGDGIADA				Y	PGDG0030		7	NONE																

PGDD0045	TCDP	N	Spare	7	SGDGIADA	2	8	8	NONE	UGDGIADA	0	N	PGDG0030	8	NONE
PGDD0046	TCDP	N	Spare	7	SGDGIADA	3	9	13	NONE	UGDGIADA	0	N	PGDG0032	0	NONE
PGDD0047	TCDP	N	MB ID	7	SGDGIADA	2	3	3	NONE	UGDGIADA		Y	PGDG0032	13	NONE
PGDDA001	TCDP	N	PAD	7	SGDGIADA	2	8	8	NONE	UGDGIADA	0	N	PGDGA001	0	NONE
PGDDA002	TCDP	N	SID	7	SGDGIADA	2	8	8	NONE	UGDGIADA	1	Y	PGDGA001	8	NONE
FGDM0100	TCGP	N	PAD	7	SDMRTUPSM000	3	4	8	NONE	UDMRTUPSM000	0	N			NONE
FGDM0101	TCGP	N	N = 12	7	SDMRTUPSM000	3	4	8	NONE	UDMRTUPSM000	12	N			NONE
FGDM0102	TCGP	N	N = 14	7	SDMRTUPSM000	3	4	8	NONE	UDMRTUPSM000	14	N			NONE
FGDM0200	TCGP	N	Route	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0201	TCGP	N	PAD	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0202	TCGP	N	Destination	7	SDMRTUPSM000	3	1	5	NONE	UDMRTUPSM000	0	N			NONE
FGDM0203	TCGP	N	Delayed ML	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0204	TCGP	N	Peripheral Address	7	SDMRTUPSM000	3	1	5	NONE	UDMRTUPSM000	11	N			NONE
FGDM0205	TCGP	N	ML Address	7	SDMRTUPSM000	2	3	3	NONE	UDMRTUPSM000	1	N			NONE
FGDM0206	TCGP	N	MLC Data, GIADA-A	7	SGDGIADA	3	12	16	NONE	UGDGIADA	13	N			NONE
FGDM0300	TCGP	N	Route	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0301	TCGP	N	PAD	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0302	TCGP	N	Destination	7	SDMRTUPSM000	3	1	5	NONE	UDMRTUPSM000	0	N			NONE
FGDM0303	TCGP	N	Delayed ML	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0304	TCGP	N	Peripheral Address	7	SDMRTUPSM000	3	1	5	NONE	UDMRTUPSM000	11	N			NONE
FGDM0305	TCGP	N	ML Address, GIADA-Data	7	SDMRTUPSM000	2	3	3	NONE	UDMRTUPSM000	2	N			NONE
FGDM0400	TCGP	N	Route	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0401	TCGP	N	PAD	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0402	TCGP	N	Destination	7	SDMRTUPSM000	3	1	5	NONE	UDMRTUPSM000	0	N			NONE
FGDM0403	TCGP	N	Delayed ML	7	SDMRTUPSM000	2	1	1	NONE	UDMRTUPSM000	0	N			NONE
FGDM0404	TCGP	N	Peripheral Address	7	SDMRTUPSM000	3	1	5	NONE	UDMRTUPSM000	11	N			NONE
FGDM0405	TCGP	N	ML Address	7	SDMRTUPSM000	2	3	3	NONE	UDMRTUPSM000	1	N			NONE
FGDM0406	TCGP	N	MLC Data, GIADA-B	7	SGDGIADA	3	12	16	NONE	UGDGIADA	29	N			NONE
FGDMM001	TCGP	N	MLC Data, GIADA0 Word1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	7596	N			NONE
FGDMM002	TCGP	N	MLC Data, GIADA0 Word2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	49154	N			NONE
FGDMM003	TCGP	N	MLC Data, GIADA0 Word3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	5	N			NONE
FGDMM004	TCGP	N	MLC Data, GIADA0 Word4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	6596	N			NONE
FGDMM005	TCGP	N	MLC Data, GIADA0 Word5	7	SGDGIADA	3	12	16	NONE	UGDGIADA	256	N			NONE
FGDMM006	TCGP	N	MLC Data, GIADA0 Word6	7	SGDGIADA	3	12	16	NONE	UGDGIADA	14841	N			NONE
FGDMM011	TCGP	N	MLC Data, GIADA1 Word1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	7596	N			NONE
FGDMM012	TCGP	N	MLC Data, GIADA1 Word2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	49155	N			NONE
FGDMM013	TCGP	N	MLC Data, GIADA1 Word3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	5	N			NONE
FGDMM014	TCGP	N	MLC Data, GIADA1 Word4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	6596	N			NONE
FGDMM015	TCGP	N	MLC Data, GIADA1 Word5	7	SGDGIADA	3	12	16	NONE	UGDGIADA	1536	N			NONE
FGDMM016	TCGP	N	MLC Data, GIADA1 Word6	7	SGDGIADA	3	12	16	NONE	UGDGIADA	6159	N			NONE
FGDMM021	TCGP	N	MLC Data, GIADA2 Word1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	7596	N			NONE
FGDMM022	TCGP	N	MLC Data, GIADA2 Word2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	49156	N			NONE
FGDMM023	TCGP	N	MLC Data, GIADA2 Word3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	5	N			NONE
FGDMM024	TCGP	N	MLC Data, GIADA2 Word4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	6592	N			NONE
FGDMM025	TCGP	N	MLC Data, GIADA2 Word5	7	SGDGIADA	3	12	16	NONE	UGDGIADA	4096	N			NONE
FGDMM026	TCGP	N	MLC Data, GIADA2 Word6	7	SGDGIADA	3	12	16	NONE	UGDGIADA	29790	N			NONE
FGDMM031	TCGP	N	MLC Data, GIADA3 Word1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	7596	N			NONE
FGDMM032	TCGP	N	MLC Data, GIADA3 Word2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	49157	N			NONE
FGDMM033	TCGP	N	MLC Data, GIADA3 Word3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	7	N			NONE
FGDMM034	TCGP	N	MLC Data, GIADA3 Word4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	6592	N			NONE
FGDMM035	TCGP	N	MLC Data, GIADA3 Word5	7	SGDGIADA	3	12	16	NONE	UGDGIADA	6656	N			NONE
FGDMM036	TCGP	N	MLC Data, GIADA3 Word6	7	SGDGIADA	3	12	16	NONE	UGDGIADA	0	N			NONE
FGDMM037	TCGP	N	MLC Data, GIADA3 Word7	7	SGDGIADA	3	12	16	NONE	UGDGIADA	40141	N			NONE
PGDX0001	TCGP	N	CF spare 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0002	TCGP	N	CF CovFra heat on time	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0003	TCGP	N	CF CovMot heat on time	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0004	TCGP	N	CF FB safety temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0005	TCGP	N	CF FB test temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0006	TCGP	N	CF FB test timeout 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0007	TCGP	N	CF FB test timeout 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0008	TCGP	N	CF FB working temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0009	TCGP	N	CF FB op timeout 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0010	TCGP	N	CF FB op timeout 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0011	TCGP	N	CF velocity	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0012	TCGP	N	CF steps to open	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0013	TCGP	N	CF steps to close	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0014	TCGP	N	CF opening timeout 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE
PGDX0015	TCGP	N	CF opening timeout 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA		Y			NONE

PGDX0016	TCGP	N	CF closing timeout 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0017	TCGP	N	CF closing timeout 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0018	TCGP	N	CF GDS status	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0019	TCGP	N	CF GDS thresholds	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0020	TCGP	N	CF laser max temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0021	TCGP	N	CF laser min temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0022	TCGP	N	CF spare 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0023	TCGP	N	CF spare 3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0024	TCGP	N	CF GDS time bet cal 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0025	TCGP	N	CF GDS time bet cal 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0026	TCGP	N	CF IS status	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0027	TCGP	N	CF IS maxop temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0028	TCGP	N	CF spare 4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0029	TCGP	N	CF IS hyst temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0030	TCGP	N	CF IS thresholds 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0031	TCGP	N	CF IS thresholds 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0032	TCGP	N	CF IS thresholds 3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0033	TCGP	N	CF IS time bet cal 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0034	TCGP	N	CF IS time bet cal 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0035	TCGP	N	CF IS cal config	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0036	TCGP	N	CF MBS status	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0037	TCGP	N	CF MBS max temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0038	TCGP	N	CF MBS temp checking	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0039	TCGP	N	CF MBS time interval 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0040	TCGP	N	CF MBS time interval 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0041	TCGP	N	CF MBS max heat temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0042	TCGP	N	CF heating timeout 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0043	TCGP	N	CF heating timeout 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0044	TCGP	N	CF MBS time bet cal 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0045	TCGP	N	CF MBS time bet cal 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0046	TCGP	N	CF IS maxnonop temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0047	TCGP	N	CF IS min temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0048	TCGP	N	CF ME maxop temp	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0049	TCGP	N	CF spare 5	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0050	TCGP	N	CF spare 6	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0051	TCGP	N	CF spare 7	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0052	TCGP	N	CF spare 8	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0053	TCGP	N	CF timeout sci pkt 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0054	TCGP	N	CF timeout sci pkt 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0055	TCGP	N	CF time HK pkt 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0056	TCGP	N	CF time HK pkt 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0057	TCGP	N	CF arm TC timeout 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0058	TCGP	N	CF arm TC timeout 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0059	TCGP	N	CF patches status 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0060	TCGP	N	CF patches status 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0061	TCGP	N	CF patches status 3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0062	TCGP	N	CF patches status 4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0063	TCGP	N	CF max GDS events sec	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0064	TCGP	N	CF max IS events sec	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0065	TCGP	N	CF PAD 1	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0066	TCGP	N	CF PAD 2	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0067	TCGP	N	CF PAD 3	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0068	TCGP	N	CF PAD 4	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE
PGDX0069	TCGP	N	CF CRC	7	SGDGIADA	3	12	16	NONE	UGDGIADA	Y	NONE

NAME	GCPASS	LNAME	USAGE	PKGE_NAME	PID	PCKCATEG	SCOPE	SUBSCHEDID	CMDCLASS	MINLENGTH	MAXLENGTH	AUTHORISATION	PRECONDITION	COMPRESSION	ACKTYPE	TCPK_CONSTRAINT	TIMEEXP	ACTION	COMP_PCK	RED_PCK		NOTE	TO_BE_REARRANGED	CALCSIZE
ZGDMM900	N	GIADA MLC-A, Go to Safe Mode	4	ETC00202D0ML	1	12	SPACE	14		62	62	N	NONE	BOTH						ZGDMR900	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19601		N	496
ZGDMM901	N	GIADA MLC-A, Go to Cover Mode	4	ETC00202D0ML	1	12	SPACE	14		62	62	N	NONE	BOTH						ZGDMR901	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19606		N	496
ZGDMM902	N	GIADA MLC-A, Arm Cover	4	ETC00202D0ML	1	12	SPACE	14		62	62	N	NONE	BOTH						ZGDMR902	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19216		N	496
ZGDMM903	N	GIADA MLC-A, Close Cover	4	ETC00202D0ML	1	12	SPACE	14		70	70	N	NONE	BOTH						ZGDMR903	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19226		N	560
ZGD00001	N	EnableHKReport	7	ETC00305HKEN	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD00002	N	DisableHKReport	7	ETC00306HKDS	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD00004	N	DumpMemory	7	ETC00605MMDP	90	12	SPACE	14		20	20	N	NONE	BOTH									N	160
ZGD00005	N	Check memory	7	ETC00609MMCK	90	12	SPACE	14		20	20	N	NONE	BOTH									N	160
ZGD00006	N	TimeUpdate	7	ETC00901TSAC	90	12	SPACE	14		18	18	N	NONE	BOTH									N	144
ZGD00007	N	ConnectionTest	7	ETC01701CTST	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD00008	N	ReportContext	7	ETC01801CXRP	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD00009	N	AcceptContext	7	ETC01803CXAC	90	12	SPACE	14		152	152	N	NONE	BOTH									N	96
ZGD00010	N	EnableSciPkt	7	ETC02001SDEN	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD00011	N	DisableSciPkt	7	ETC02002SDDS	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD00601	N	Load Memory ID 80	7	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	176
ZGD00602	N	Load Memory ID 81	7	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	176
ZGD00603	N	Load Memory ID 82	7	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	176
ZGD19201	N	Arm Frangibolt	7	ETC19201	90	12	SPACE	14		12	12	Y	NONE	BOTH									N	96
ZGD19202	N	Dis-arm Frangibolt	7	ETC19202	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19206	N	Test Frangibolt	7	ETC19206	90	12	SPACE	14		12	12	Y	NONE	BOTH									N	96
ZGD19211	N	Activate Frangibolt	7	ETC19211	90	12	SPACE	14		12	12	Y	NONE	BOTH									N	96
ZGD19216	N	Arm Cover	7	ETC19216	90	12	SPACE	14		12	12	Y	NONE	BOTH									N	96
ZGD19217	N	Dis-arm Cover	7	ETC19217	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19221	N	Open Cover	7	ETC19221	90	12	SPACE	14		12	12	Y	NONE	BOTH									N	96
ZGD19226	N	Close Cover	7	ETC19226	90	12	SPACE	14		14	14	Y	NONE	BOTH									N	112
ZGD19231	N	Test Heater	7	ETC19231	90	12	SPACE	14		14	14	Y	NONE	BOTH									N	112
ZGD19301	N	Arm Laser	7	ETC19301	90	12	SPACE	14		12	12	Y	NONE	BOTH									N	96
ZGD19302	N	Dis-arm Laser	7	ETC19302	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19306	N	SwitchLaserOn/Off	7	ETC19306	90	12	SPACE	14		14	14	Y	NONE	BOTH									N	112
ZGD19311	N	Set GDS On/Off	7	ETC19311	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19316	N	GDS Mode	7	ETC19316	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19326	N	Ph. Threshold	7	ETC19326	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19346	N	Cal. GDS	7	ETC19346	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19401	N	Set IS On/Off	7	ETC19401	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19406	N	Set IS Ops Mode	7	ETC19406	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19411	N	PZT Threshold	7	ETC19411	90	12	SPACE	14		18	18	N	NONE	BOTH									N	144
ZGD19426	N	Calibrate IS	7	ETC19426	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19501	N	Set MBS On/Off	7	ETC19501	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19506	N	Set MBS OpsMode	7	ETC19506	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19521	N	Set Time Meas.	7	ETC19521	90	12	SPACE	14		16	16	N	NONE	BOTH									N	128
ZGD19526	N	Heat MB	7	ETC19526	90	12	SPACE	14		14	14	N	NONE	BOTH									N	112
ZGD19536	N	Calibrate MBS	7	ETC19536	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19601	N	Go to Safe Md	7	ETC19601	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19606	N	Go to Cover Md	7	ETC19606	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19611	N	Go to Normal Md	7	ETC19611	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD19616	N	Go to Flux Md	7	ETC19616	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD25501	N	Reset TM O/P Buffer	7	ETC25501	90	12	SPACE	14		12	12	N	NONE	BOTH									N	96
ZGD66666	N	Load S/W V2.1	7	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	720
ZGDX0652	N	Giada SW Patch_1/2 (v2.3)	2	ETC00602MMLD	90	12	SPACE	14		68	68	N	NONE	BOTH									N	544
ZGDX0661	N	Giada SW Patch_2/1 (v2.3)	2	ETC00602MMLD	90	12	SPACE	14		164	164	N	NONE	BOTH									N	1312
ZGDX0662	N	Giada SW Patch_2/2 (v2.3)	2	ETC00602MMLD	90	12	SPACE	14		86	86	N	NONE	BOTH									N	688
ZGDX0671	N	Giada SW Patch_3/1 (v2.3)	2	ETC00602MMLD	90	12	SPACE	14		142	142	N	NONE	BOTH									N	1136
ZGDX0672	N	Giada SW Patch_3/2 (v2.3)	2	ETC00602MMLD	90	12	SPACE	14		106	106	N	NONE	BOTH									N	848
ZGDX0900	N	EQM ONLY Giada SW Patch CF	2	ETC00602MMLD	90	12	SPACE	14		158	158	N	NONE	BOTH									N	1264
ZGDX0651	N	Giada SW Patch_1/1 (v2.3)	2	ETC00602MMLD	90	12	SPACE	14		192	192	N	NONE	BOTH									N	1536
ZGDX0613	N	GIADA20_P009_5	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	672
ZGDX0614	N	GIADA20_P009_6	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	848
ZGDX0615	N	GIADA20_P009_7	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	768
ZGDX0616	N	GIADA20_P009_8	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	832
ZGDX0701	N	Giada dump Context File	7	ETC00605MMDP	90	12	SPACE	14		20	20	N	NONE	BOTH									N	160
ZGDX0601	N	Giada Patch Context File	2	ETC00602MMLD	90	12	SPACE	14		22	158	N	NONE	BOTH									N	1264
ZGDX0608	N	GIADA20_P009_0	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	1728
ZGDX0609	N	GIADA20_P009_1	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	800
ZGDX0610	N	GIADA20_P009_2	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	800
ZGDX0611	N	GIADA20_P009_3	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	800
ZGDX0612	N	GIADA20_P009_4	2	ETC00602MMLD	90	12	SPACE	14		22		N	NONE	BOTH									N	800
ZGDX0602	N	Giada SW Patch_1	2	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	1968
ZGDX0603	N	Giada SW Patch_2	2	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	1888
ZGDX0604	N	Giada SW Patch_3	2	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	1872
ZGDX0605	N	Giada Patch_Vdisk	2	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	208
ZGDX0606	N	Giada Patch Reset Event	2	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	192
ZGDX0607	N	Giada Patch IS Autogain	2	ETC00602MMLD	90	12	SPACE	14		22	248	N	NONE	BOTH									N	176
ZGDX0702	N	Dump GIADA SW Patch_1/1	2	ETC00605MMDP	90	12	SPACE	14		20		N	NONE	BOTH									N	160
ZGDX0703	N	Dump GIADA SW Patch_1/2	2	ETC00605MMDP	90	12	SPACE	14		20		N	NONE	BOTH									N	160

ZGDX0704	N	Dump GIADA SW Patch_1/3	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0705	N	Dump GIADA SW Patch_1/4	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0706	N	Dump GIADA SW Patch_1/5	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0707	N	Dump GIADA SW Patch_1/6	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0708	N	Dump GIADA SW Patch_1/7	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0709	N	Dump GIADA SW Patch_1/8	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0710	N	Dump GIADA SW Patch_2/1	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0711	N	Dump GIADA SW Patch_2/2	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0712	N	Dump GIADA SW Patch_2/3	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0713	N	Dump GIADA SW Patch_2/4	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0714	N	Dump GIADA SW Patch_2/5	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0715	N	Dump GIADA SW Patch_2/6	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0716	N	Dump GIADA SW Patch_2/7	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0717	N	Dump GIADA SW Patch_2/8	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0718	N	Dump GIADA SW Patch_2/9	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0719	N	Dump GIADA SW Patch_2/10	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0720	N	Dump GIADA SW Patch_2/11	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0721	N	Dump GIADA SW Patch_3/1	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0722	N	Dump GIADA SW Patch_3/2	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0723	N	Dump GIADA SW Patch_3/3	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0724	N	Dump GIADA SW Patch_3/4	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0725	N	Dump GIADA Vdisk Patch	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0726	N	Dump GIADA Reset Event Patch	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDX0727	N	Dump GIADA IS Autogain Patch	2 ETC00605MMDP	90	12	SPACE	14	20		N	NONE	BOTH					N	160
ZGDMR900	N	GIADA MLC-B, Go to Safe Mode	4 ETC00202D0ML	1	12	SPACE	14	62	62	N	NONE	BOTH	ZGDMM900	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19601			N	496
ZGDMR901	N	GIADA MLC-B, Go to Cover Mode	4 ETC00202D0ML	1	12	SPACE	14	62	62	N	NONE	BOTH	ZGDMM901	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19606			N	496
ZGDMR902	N	GIADA MLC-B, Arm Cover	4 ETC00202D0ML	1	12	SPACE	14	62	62	N	NONE	BOTH	ZGDMM902	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19216			N	496
ZGDMR903	N	GIADA MLC-B, Close Cover	4 ETC00202D0ML	1	12	SPACE	14	70	70	N	NONE	BOTH	ZGDMM903	Emergency Shut Down Command for Payload to be used by OBCPs immediately after Reconfiguration during Spacecraft initialization. Uploaded TC = ZGD19226			N	560
ZGDX0617	N	Giada Patch Context File in RAM	2 ETC00602MMLD	90	12	SPACE	14	22	158	N	NONE	BOTH					N	1264
ZGDX0618	N	Giada Patch Context File in NVRAM	2 ETC00602MMLD	90	12	SPACE	14	22	158	N	NONE	BOTH					N	1264

TCPK_NAME
EXPRESSION
TIMEOUT

TCPK_NAME	TCPE_ORDER	ELTTYPE	ITEMOFFSET	TCPE_SIZE	FIXEDVALUE	REPEAT	CALCSIZE	PKBL_NAME	PKBL_CATEGORY	TCPA_NAME	TCPK_NAME_INNER	EXCP_CODE	DESCRIPTION	NGRPSIZE
ZGDX0605	5	FIXED	80	16	0	1	16						Data	
ZGDX0605	6	FIXED	96	16	0	1	16						Data	
ZGDX0606	0	FIXED	0	8	81	1	8						Memory ID	
ZGDX0606	1	FIXED	8	8	1	1	8						Number of blocks	
ZGDX0606	2	FIXED	16	32	56906	1	32						Start Address	
ZGDX0606	3	FIXED	48	16	2	1	16						Lenght	
ZGDX0606	4	FIXED	64	16	0	1	16						Data	
ZGDX0606	5	FIXED	80	16	0	1	16						Data	
ZGDX0607	0	FIXED	0	8	81	1	8						Memory ID	
ZGDX0607	1	FIXED	8	8	1	1	8						Number of blocks	
ZGDX0607	2	FIXED	16	32	11292	1	32						Start Address	
ZGDX0607	3	FIXED	48	16	1	1	16						Lenght	
ZGDX0607	4	FIXED	64	16	48042	1	16						Data	
ZGDX0603	87	FIXED	1536	16	116	1	16						Data	
ZGDX0603	88	FIXED	1552	16	3971	1	16						Data	
ZGDX0603	89	FIXED	1568	16	32508	1	16						Data	
ZGDX0603	90	FIXED	1584	16	116	1	16						Data	
ZGDX0603	91	FIXED	1600	16	2435	1	16						Data	
ZGDX0603	92	FIXED	1616	16	32510	1	16						Data	
ZGDX0603	93	FIXED	1632	16	117	1	16						Data	
ZGDX0603	94	FIXED	1648	16	1000	1	16						Data	
ZGDX0603	95	FIXED	1664	16	28607	1	16						Data	
ZGDX0603	96	FIXED	1680	16	35813	1	16						Data	
ZGDX0603	97	FIXED	1696	16	24003	1	16						Data	
ZGDX0603	98	FIXED	1712	32	22250	1	32						Start Address	
ZGDX0603	99	FIXED	1744	16	2	1	16						Lenght	
ZGDX0603	100	FIXED	1760	16	62952	1	16						Data	
ZGDX0603	101	FIXED	1776	16	51988	1	16						Data	
ZGDX0604	0	FIXED	0	8	81	1	8						Memory ID	
ZGDX0604	1	FIXED	8	8	4	1	8						Number of blocks	
ZGDX0604	2	FIXED	16	32	27394	1	32						Start Address	
ZGDX0604	3	FIXED	48	16	55	1	16						Lenght	
ZGDX0604	4	FIXED	64	16	50005	1	16						Data	
ZGDX0604	5	FIXED	80	16	35820	1	16						Data	
ZGDX0604	6	FIXED	96	16	33772	1	16						Data	
ZGDX0900	44	FIXED	704	16	15377	1	16						Data	
ZGDX0900	45	FIXED	720	16	15360	1	16						Data	
ZGDX0900	46	FIXED	736	16	0	1	16						Data	
ZGDX0900	47	FIXED	752	16	4110	1	16						Data	
ZGDX0900	48	FIXED	768	16	0	1	16						Data	
ZGDX0900	49	FIXED	784	16	64281	1	16						Data	
ZGDX0900	50	FIXED	800	16	4126	1	16						Data	
ZGDX0900	51	FIXED	816	16	25370	1	16						Data	
ZGDX0900	52	FIXED	832	16	0	1	16						Data	
ZGDX0900	53	FIXED	848	16	0	1	16						Data	
ZGDX0900	54	FIXED	864	16	0	1	16						Data	
ZGDX0900	55	FIXED	880	16	0	1	16						Data	
ZGDX0900	56	FIXED	896	16	15360	1	16						Data	
ZGDX0900	57	FIXED	912	16	0	1	16						Data	
ZGDX0900	58	FIXED	928	16	2560	1	16						Data	
ZGDX0900	59	FIXED	944	16	0	1	16						Data	
ZGDX0900	60	FIXED	960	16	10240	1	16						Data	
ZGDX0900	61	FIXED	976	16	0	1	16						Data	
ZGDX0900	62	FIXED	992	16	0	1	16						Data	
ZGDX0900	63	FIXED	1008	16	0	1	16						Data	
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ZGDX0900	65	FIXED	1040	16	0	1	16						Data	
ZGDX0900	66	FIXED	1056	16	10240	1	16						Data	
ZGDX0900	67	FIXED	1072	16	10240	1	16						Data	
ZGDX0900	68	FIXED	1088	16	0	1	16						Data	

ZGDX0900	69	FIXED	1104	16	0	1	16	Data
ZGDX0900	70	FIXED	1120	16	0	1	16	Data
ZGDX0900	71	FIXED	1136	16	0	1	16	Data
ZGDX0900	72	FIXED	1152	16	32920	1	16	Data
ZGDX0671	34	FIXED	544	16	63035	1	16	Data
ZGDX0671	35	FIXED	560	16	18170	1	16	Data
ZGDX0671	36	FIXED	576	16	29429	1	16	Data
ZGDX0671	37	FIXED	592	16	47104	1	16	Data
ZGDX0671	38	FIXED	608	16	239	1	16	Data
ZGDX0671	39	FIXED	624	16	51014	1	16	Data
ZGDX0671	40	FIXED	640	16	62976	1	16	Data
ZGDX0671	41	FIXED	656	16	139	1	16	Data
ZGDX0671	42	FIXED	672	16	18166	1	16	Data
ZGDX0671	43	FIXED	688	16	15174	1	16	Data
ZGDX0671	44	FIXED	704	16	64627	1	16	Data
ZGDX0671	45	FIXED	720	16	3071	1	16	Data
ZGDX0671	46	FIXED	736	16	18166	1	16	Data
ZGDX0671	47	FIXED	752	16	35654	1	16	Data
ZGDX0671	48	FIXED	768	16	63035	1	16	Data
ZGDX0671	49	FIXED	784	16	18172	1	16	Data
ZGDX0671	50	FIXED	800	16	29429	1	16	Data
ZGDX0671	51	FIXED	816	16	65350	1	16	Data
ZGDX0671	52	FIXED	832	16	63627	1	16	Data
ZGDX0671	53	FIXED	848	16	18168	1	16	Data
ZGDX0671	54	FIXED	864	16	15174	1	16	Data
ZGDX0671	55	FIXED	880	16	65138	1	16	Data
ZGDX0671	56	FIXED	896	16	47755	1	16	Data
ZGDX0671	57	FIXED	912	16	58717	1	16	Data
ZGDX0671	58	FIXED	928	16	50104	1	16	Data
ZGDX0671	59	FIXED	944	32	11098	1	32	Start Address 2
ZGDX0671	60	FIXED	976	16	3	1	16	Lenght
ZGDX0671	61	FIXED	992	16	50153	1	16	Data
ZGDX0671	62	FIXED	1008	16	42303	1	16	Data
ZGDX0671	63	FIXED	1024	16	37008	1	16	Data
ZGDX0672	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0672	1	FIXED	8	8	2	1	8	Number of blocks
ZGDX0672	2	FIXED	16	32	27502	1	32	Start Address 1
ZGDX0672	3	FIXED	48	16	38	1	16	Lenght
ZGDX0672	4	FIXED	64	16	50005	1	16	Data
ZGDX0672	41	FIXED	656	16	50005	1	16	Data
ZGDX0672	42	FIXED	672	32	11486	1	32	Start Address 2
ZGDX0672	43	FIXED	704	16	2	1	16	Lenght
ZGDX0672	44	FIXED	720	16	59534	1	16	Data
ZGDX0672	45	FIXED	736	16	16011	1	16	Data
ZGDX0900	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0900	1	FIXED	8	8	1	1	8	Number of blocks
ZGDX0900	2	FIXED	16	32	36922	1	32	Start Address 1
ZGDX0900	3	FIXED	48	16	69	1	16	Lenght
ZGDX0900	4	FIXED	64	16	0	1	16	Data
ZGDX0900	5	FIXED	80	16	7680	1	16	Data
ZGDX0900	6	FIXED	96	16	0	1	16	Data
ZGDX0900	7	FIXED	112	16	48133	1	16	Data
ZGDX0900	8	FIXED	128	16	50949	1	16	Data
ZGDX0900	9	FIXED	144	16	15360	1	16	Data
ZGDX0900	10	FIXED	160	16	0	1	16	Data
ZGDX0900	11	FIXED	176	16	24582	1	16	Data
ZGDX0900	12	FIXED	192	16	22530	1	16	Data
ZGDX0900	13	FIXED	208	16	0	1	16	Data
ZGDX0900	14	FIXED	224	16	51200	1	16	Data
ZGDX0900	15	FIXED	240	16	41728	1	16	Data
ZGDX0900	16	FIXED	256	16	41728	1	16	Data
ZGDX0900	17	FIXED	272	16	30720	1	16	Data
ZGDX0900	18	FIXED	288	16	0	1	16	Data
ZGDX0900	19	FIXED	304	16	30720	1	16	Data
ZGDX0900	20	FIXED	320	16	0	1	16	Data
ZGDX0900	21	FIXED	336	16	943	1	16	Data
ZGDX0672	5	FIXED	80	16	35820	1	16	Data
ZGDX0672	6	FIXED	96	16	33772	1	16	Data

ZGDX0672	7	FIXED	112	16	651	1	16	Data	
ZGDX0672	8	FIXED	128	16	7876	1	16	Data	
ZGDX0672	9	FIXED	144	16	37003	1	16	Data	
ZGDX0672	10	FIXED	160	16	18302	1	16	Data	
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ZGDX0672	13	FIXED	208	16	8960	1	16	Data	
ZGDX0672	14	FIXED	224	16	20712	1	16	Data	
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ZGDX0672	16	FIXED	256	16	22866	1	16	Data	
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ZGDX0672	18	FIXED	288	16	5632	1	16	Data	
ZGDX0672	19	FIXED	304	16	47359	1	16	Data	
ZGDX0672	20	FIXED	320	16	65519	1	16	Data	
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ZGDX0672	22	FIXED	352	16	156	1	16	Data	
ZGDX0672	23	FIXED	368	16	40264	1	16	Data	
ZGDX0672	24	FIXED	384	16	15616	1	16	Data	
ZGDX0672	25	FIXED	400	16	117	1	16	Data	
ZGDX0672	26	FIXED	416	16	63672	1	16	Data	
ZGDX0672	27	FIXED	432	16	0	1	16	Data	
ZGDX0672	28	FIXED	448	16	61272	1	16	Data	
ZGDX0672	29	FIXED	464	16	23272	1	16	Data	
ZGDX0672	30	FIXED	480	16	47039	1	16	Data	
ZGDX0672	31	FIXED	496	16	41382	1	16	Data	
ZGDX0672	32	FIXED	512	16	56123	1	16	Data	
ZGDX0672	33	FIXED	528	16	18174	1	16	Data	
ZGDX0672	34	FIXED	544	16	32008	1	16	Data	
ZGDX0672	35	FIXED	560	16	47139	1	16	Data	
ZGDX0672	36	FIXED	576	16	80	1	16	Data	
ZGDX0672	37	FIXED	592	16	59562	1	16	Data	
ZGDX0672	38	FIXED	608	16	39769	1	16	Data	
ZGDX0672	39	FIXED	624	16	37003	1	16	Data	
ZGDX0672	40	FIXED	640	16	58717	1	16	Data	
ZGD00602	3	PARAM	48	16		1	16	PGDG0603	1
ZGD00602	4	PARAM	64	16		1	16	PGDG0604	
ZGD00603	0	PARAM	0	8		1	8	PGDG0601	
ZGD00603	1	PARAM	8	8		1	8	PGDG1601	3
ZGD00603	2	PARAM	16	32		1	32	PGDG0602	
ZGD00603	3	PARAM	48	16		1	16	PGDG0603	1
ZGD00603	4	PARAM	64	16		1	16	PGDG0604	
ZGD19226	0	PARAM	0	16		1	16	PGDG0010	
ZGD19231	0	PARAM	0	16		1	16	PGDG0005	
ZGD19306	0	PARAM	0	16		1	16	PGDG0010	
ZGD19311	0	PARAM	0	16		1	16	PGDG0010	
ZGD19316	0	PARAM	0	16		1	16	PGDG0015	
ZGD19326	0	PARAM	0	16		1	16	PGDG0016	
ZGD19401	0	PARAM	0	16		1	16	PGDG0010	
ZGD19406	0	PARAM	0	16		1	16	PGDG0020	
ZGD19411	0	PARAM	0	48		1	48	PGDG0021	
ZGD19426	0	PARAM	0	16		1	16	PGDG0022	
ZGD19501	0	PARAM	0	16		1	16	PGDG0010	
ZGD19506	0	PARAM	0	16		1	16	PGDG0030	
ZGD19521	0	PARAM	0	32		1	32	PGDG0031	
ZGD19526	0	PARAM	0	16		1	16	PGDG0032	
ZGD66666	0	FIXED	0	8	81	1	8	Mem ID	
ZGD66666	1	FIXED	8	8	6	1	8	N.of Blocks	
ZGD66666	2	FIXED	16	32	3386	1	32	Start Addr. B1	
ZGD66666	3	FIXED	48	16	1	1	16	Lengt of B1	
ZGD66666	4	FIXED	64	16	51130	1	16	Data 1 of B1	
ZGD66666	5	FIXED	80	32	3392	1	32	Start Addr. B2	
ZGD66666	6	FIXED	112	16	1	1	16	Lengt of B2	
ZGD66666	7	FIXED	128	16	49921	1	16	Data 1 of B2	
ZGD66666	8	FIXED	144	32	3460	1	32	Start Addr.of B3	
ZGD66666	9	FIXED	176	16	1	1	16	Length of B3	
ZGD66666	10	FIXED	192	16	37008	1	16	Data1 of B3	
ZGD66666	33	FIXED	608	16	29728	1	16	Data 3 of B6	
ZGD66666	11	FIXED	208	32	12610	1	32	Start Addr. Of B4	

ZGD66666	12	FIXED	240	16	2	1	16		Length of B4	
ZGD66666	13	FIXED	256	16	47359	1	16		Data 1 of B4	
ZGD66666	14	FIXED	272	16	65515	1	16		Data 2 of B4	
ZGD66666	15	FIXED	288	32	13310	1	32		Start Addr. B5	
ZGD66666	16	FIXED	320	16	12	1	16		Length of B5	
ZGD66666	17	FIXED	336	16	9472	1	16		Data 1 of B5	
ZGD66666	18	FIXED	352	16	4233	1	16		Data 2 of B5	
ZGD66666	19	FIXED	368	16	18170	1	16		Data 3 of B5	
ZGD66666	20	FIXED	384	16	35655	1	16		Data 4 of B5	
ZGD66666	21	FIXED	400	16	23689	1	16		Data 5 of B5	
ZGD66666	22	FIXED	416	16	18172	1	16		Data 6 of B5	
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ZGD66666	24	FIXED	448	16	4233	1	16		Data 8 of B5	
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ZGD66666	26	FIXED	480	16	35918	1	16		Data 10 of B5	
ZGD66666	27	FIXED	496	16	61580	1	16		Data 11 of B5	
ZGD66666	28	FIXED	512	16	20206	1	16		Data 12 of B5	
ZGD66666	29	FIXED	528	32	14334	1	32		Start Addr. Of B6	
ZGD66666	30	FIXED	560	16	3	1	16		Length of B6	
ZGD66666	31	FIXED	576	16	15926	1	16		Data 1 of B6	
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ZGD00001	0	PARAM	0	16		1	16	PGDGA001		
ZGD00002	0	PARAM	0	16		1	16	PGDGA001		
ZGD00004	0	PARAM	0	8		1	8	PGDG0601		
ZGD00004	1	PARAM	8	8		1	8	PGDG1601		2
ZGD00004	2	PARAM	16	32		1	32	PGDG0602		
ZGD00004	3	PARAM	48	16		1	16	PGDG0603		
ZGD00005	0	PARAM	0	8		1	8	PGDG0601		
ZGD00005	1	PARAM	8	8		1	8	PGDG1601		2
ZGD00005	2	PARAM	16	32		1	32	PGDG0602		
ZGD00005	3	PARAM	48	16		1	16	PGDG0603		
ZGD00006	0	PARAM	0	48		1	48	PGDG0001		
ZGD00010	0	PARAM	0	16		1	16	PGDG0002		
ZGD00011	0	PARAM	0	16		1	16	PGDG0002		
ZGD00601	0	PARAM	0	8		1	8	PGDG0601		
ZGD00601	1	PARAM	8	8		1	8	PGDG1601		3
ZGD00601	2	PARAM	16	32		1	32	PGDG0602		
ZGD00601	3	PARAM	48	16		1	16	PGDG0603		1
ZGD00601	4	PARAM	64	16		1	16	PGDG0604		
ZGD00602	0	PARAM	0	8		1	8	PGDG0601		
ZGD00602	1	PARAM	8	8		1	8	PGDG1601		3
ZGD00602	2	PARAM	16	32		1	32	PGDG0602		
ZGDX0651	0	FIXED	0	8	81	1	8		Memory ID	
ZGDX0651	1	FIXED	8	8	6	1	8		Number of blocks	
ZGDX0651	2	FIXED	16	32	27250	1	32		Start Address 1	
ZGDX0651	3	FIXED	48	16	57	1	16		Lenght	
ZGDX0651	4	FIXED	64	16	21899	1	16		Data	
ZGDX0651	5	FIXED	80	16	60547	1	16		Data	
ZGDX0651	6	FIXED	96	16	60422	1	16		Data	
ZGDX0651	7	FIXED	112	16	35678	1	16		Data	
ZGDX0651	8	FIXED	128	16	1163	1	16		Data	
ZGDX0651	9	FIXED	144	16	18182	1	16		Data	
ZGDX0651	10	FIXED	160	16	45320	1	16		Data	
ZGDX0651	11	FIXED	176	16	54248	1	16		Data	
ZGDX0651	12	FIXED	192	16	46080	1	16		Data	
ZGDX0651	13	FIXED	208	16	35671	1	16		Data	
ZGDX0651	14	FIXED	224	16	1718	1	16		Data	
ZGDX0651	15	FIXED	240	16	211	1	16		Data	
ZGDX0651	16	FIXED	256	16	57859	1	16		Data	
ZGDX0602	92	FIXED	1568	16	41236	1	16		Data	
ZGDX0602	93	FIXED	1584	16	55872	1	16		Data	
ZGDX0602	94	FIXED	1600	16	20664	1	16		Data	
ZGDX0602	95	FIXED	1616	16	788	1	16		Data	
ZGDX0602	96	FIXED	1632	16	20664	1	16		Data	
ZGDX0602	97	FIXED	1648	16	1280	1	16		Data	
ZGDX0602	98	FIXED	1664	16	20712	1	16		Data	
ZGDX0602	99	FIXED	1680	16	5113	1	16		Data	
ZGDX0602	100	FIXED	1696	16	33732	1	16		Data	

ZGDX0602	101	FIXED	1712	16	3304	1	16	Data
ZGDX0602	102	FIXED	1728	16	22976	1	16	Data
ZGDX0602	103	FIXED	1744	16	50005	1	16	Data
ZGDX0602	104	FIXED	1760	32	12372	1	32	Start Address
ZGDX0602	105	FIXED	1792	16	4	1	16	Lenght
ZGDX0602	106	FIXED	1808	16	59532	1	16	Data
ZGDX0602	107	FIXED	1824	16	14987	1	16	Data
ZGDX0602	108	FIXED	1840	16	58717	1	16	Data
ZGDX0602	109	FIXED	1856	16	50064	1	16	Data
ZGDX0603	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0603	1	FIXED	8	8	11	1	8	Number of blocks
ZGDX0603	2	FIXED	16	32	27180	1	32	Start Address
ZGDX0603	3	FIXED	48	16	35	1	16	Lenght
ZGDX0603	4	FIXED	64	16	21899	1	16	Data
ZGDX0603	5	FIXED	80	16	60547	1	16	Data
ZGDX0603	6	FIXED	96	16	60418	1	16	Data
ZGDX0603	7	FIXED	112	16	35654	1	16	Data
ZGDX0603	8	FIXED	128	16	1713	1	16	Data
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ZGDX0603	10	FIXED	160	16	59529	1	16	Data
ZGDX0603	11	FIXED	176	16	18174	1	16	Data
ZGDX0603	12	FIXED	192	16	33126	1	16	Data
ZGDX0603	13	FIXED	208	16	1791	1	16	Data
ZGDX0603	14	FIXED	224	16	139	1	16	Data
ZGDX0603	15	FIXED	240	16	17924	1	16	Data
ZGDX0603	16	FIXED	256	16	47620	1	16	Data
ZGDX0604	78	FIXED	1280	16	22866	1	16	Data
ZGDX0604	79	FIXED	1296	16	20666	1	16	Data
ZGDX0604	80	FIXED	1312	16	5632	1	16	Data
ZGDX0604	81	FIXED	1328	16	47359	1	16	Data
ZGDX0604	82	FIXED	1344	16	65519	1	16	Data
ZGDX0604	83	FIXED	1360	16	47126	1	16	Data
ZGDX0604	84	FIXED	1376	16	156	1	16	Data
ZGDX0604	85	FIXED	1392	16	40264	1	16	Data
ZGDX0604	86	FIXED	1408	16	15616	1	16	Data
ZGDX0604	87	FIXED	1424	16	117	1	16	Data
ZGDX0604	88	FIXED	1440	16	63672	1	16	Data
ZGDX0604	89	FIXED	1456	16	0	1	16	Data
ZGDX0604	90	FIXED	1472	16	61272	1	16	Data
ZGDX0604	91	FIXED	1488	16	23272	1	16	Data
ZGDX0604	92	FIXED	1504	16	47039	1	16	Data
ZGDX0604	93	FIXED	1520	16	41382	1	16	Data
ZGDX0604	94	FIXED	1536	16	56123	1	16	Data
ZGDX0604	95	FIXED	1552	16	18174	1	16	Data
ZGDX0604	96	FIXED	1568	16	32008	1	16	Data
ZGDX0604	97	FIXED	1584	16	47139	1	16	Data
ZGDX0604	98	FIXED	1600	16	80	1	16	Data
ZGDX0604	99	FIXED	1616	16	59562	1	16	Data
ZGDX0604	100	FIXED	1632	16	39769	1	16	Data
ZGDX0604	101	FIXED	1648	16	37003	1	16	Data
ZGDX0604	102	FIXED	1664	16	58717	1	16	Data
ZGDX0604	103	FIXED	1680	16	50005	1	16	Data
ZGDX0604	104	FIXED	1696	32	11486	1	32	Start Address
ZGDX0604	105	FIXED	1728	16	2	1	16	Lenght
ZGDX0604	106	FIXED	1744	16	59534	1	16	Data
ZGDX0604	107	FIXED	1760	16	16011	1	16	Data
ZGDX0605	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0605	1	FIXED	8	8	1	1	8	Number of blocks
ZGDX0605	2	FIXED	16	32	268435712	1	32	Start Address
ZGDX0605	3	FIXED	48	16	3	1	16	Lenght
ZGDX0605	4	FIXED	64	16	0	1	16	Data
ZGDX0602	58	FIXED	928	16	49291	1	16	Data
ZGDX0602	59	FIXED	944	16	58717	1	16	Data
ZGDX0602	60	FIXED	960	16	50104	1	16	Data
ZGDX0602	61	FIXED	976	32	12888	1	32	Start Address
ZGDX0602	62	FIXED	1008	16	4	1	16	Lenght
ZGDX0602	63	FIXED	1024	16	37008	1	16	Data
ZGDX0602	64	FIXED	1040	16	36944	1	16	Data

ZGDX0602	65 FIXED	1056	16	59411	1	16	Data
ZGDX0602	66 FIXED	1072	16	14425	1	16	Data
ZGDX0602	67 FIXED	1088	32	12776	1	32	Start Address
ZGDX0602	68 FIXED	1120	16	4	1	16	Lenght
ZGDX0602	69 FIXED	1136	16	41268	1	16	Data
ZGDX0602	70 FIXED	1152	16	56971	1	16	Data
ZGDX0602	71 FIXED	1168	16	5682	1	16	Data
ZGDX0602	72 FIXED	1184	16	56995	1	16	Data
ZGDX0602	73 FIXED	1200	32	13262	1	32	Start Address
ZGDX0602	74 FIXED	1232	16	4	1	16	Lenght
ZGDX0602	75 FIXED	1248	16	33786	1	16	Data
ZGDX0602	76 FIXED	1264	16	116	1	16	Data
ZGDX0602	77 FIXED	1280	16	12523	1	16	Data
ZGDX0602	78 FIXED	1296	16	4240	1	16	Data
ZGDX0602	79 FIXED	1312	32	15824	1	32	Start Address
ZGDX0602	80 FIXED	1344	16	1	1	16	Lenght
ZGDX0602	81 FIXED	1360	16	60212	1	16	Data
ZGDX0602	82 FIXED	1376	32	15862	1	32	Start Address
ZGDX0602	83 FIXED	1408	16	1	1	16	Lenght
ZGDX0602	84 FIXED	1424	16	60174	1	16	Data
ZGDX0602	85 FIXED	1440	32	27362	1	32	Start Address
ZGDX0602	86 FIXED	1472	16	17	1	16	Lenght
ZGDX0602	87 FIXED	1488	16	50104	1	16	Data
ZGDX0602	88 FIXED	1504	16	256	1	16	Data
ZGDX0602	89 FIXED	1520	16	20560	1	16	Data
ZGDX0602	90 FIXED	1536	16	47126	1	16	Data
ZGDX0602	91 FIXED	1552	16	55888	1	16	Data
ZGDX0604	43 FIXED	688	16	15174	1	16	Data
ZGDX0604	44 FIXED	704	16	64627	1	16	Data
ZGDX0604	45 FIXED	720	16	3071	1	16	Data
ZGDX0604	46 FIXED	736	16	18166	1	16	Data
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ZGDX0604	51 FIXED	816	16	65350	1	16	Data
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ZGDX0604	54 FIXED	864	16	15174	1	16	Data
ZGDX0604	55 FIXED	880	16	65138	1	16	Data
ZGDX0604	56 FIXED	896	16	47755	1	16	Data
ZGDX0604	57 FIXED	912	16	58717	1	16	Data
ZGDX0604	58 FIXED	928	16	50104	1	16	Data
ZGDX0604	59 FIXED	944	32	11098	1	32	Start Address
ZGDX0604	60 FIXED	976	16	3	1	16	Lenght
ZGDX0604	61 FIXED	992	16	50153	1	16	Data
ZGDX0604	62 FIXED	1008	16	42303	1	16	Data
ZGDX0604	63 FIXED	1024	16	37008	1	16	Data
ZGDX0604	64 FIXED	1040	32	27502	1	32	Start Address
ZGDX0604	65 FIXED	1072	16	38	1	16	Lenght
ZGDX0604	66 FIXED	1088	16	50005	1	16	Data
ZGDX0604	67 FIXED	1104	16	35820	1	16	Data
ZGDX0604	68 FIXED	1120	16	33772	1	16	Data
ZGDX0604	69 FIXED	1136	16	651	1	16	Data
ZGDX0604	70 FIXED	1152	16	7876	1	16	Data
ZGDX0604	71 FIXED	1168	16	37003	1	16	Data
ZGDX0604	72 FIXED	1184	16	18302	1	16	Data
ZGDX0604	73 FIXED	1200	16	35142	1	16	Data
ZGDX0604	74 FIXED	1216	16	65208	1	16	Data
ZGDX0604	75 FIXED	1232	16	8960	1	16	Data
ZGDX0604	76 FIXED	1248	16	20712	1	16	Data
ZGDX0604	77 FIXED	1264	16	45979	1	16	Data
ZGDX0603	52 FIXED	896	16	45127	1	16	Data
ZGDX0603	53 FIXED	912	32	11800	1	32	Start Address
ZGDX0603	54 FIXED	944	16	1	1	16	Lenght
ZGDX0603	55 FIXED	960	16	4668	1	16	Data
ZGDX0603	56 FIXED	976	32	12138	1	32	Start Address
ZGDX0603	57 FIXED	1008	16	2	1	16	Lenght

ZGDX0603	58	FIXED	1024	16	59583	1	16	Data
ZGDX0603	59	FIXED	1040	16	14937	1	16	Data
ZGDX0603	60	FIXED	1056	32	12162	1	32	Start Address
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ZGDX0603	66	FIXED	1184	16	59525	1	16	Data
ZGDX0603	67	FIXED	1200	16	14937	1	16	Data
ZGDX0603	68	FIXED	1216	32	27576	1	32	Start Address
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ZGDX0603	70	FIXED	1264	16	50005	1	16	Data
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ZGDX0603	75	FIXED	1344	16	47634	1	16	Data
ZGDX0603	76	FIXED	1360	16	237	1	16	Data
ZGDX0603	77	FIXED	1376	16	9600	1	16	Data
ZGDX0603	78	FIXED	1392	16	137	1	16	Data
ZGDX0603	79	FIXED	1408	16	18172	1	16	Data
ZGDX0603	80	FIXED	1424	16	47618	1	16	Data
ZGDX0603	81	FIXED	1440	16	8429	1	16	Data
ZGDX0603	82	FIXED	1456	16	9480	1	16	Data
ZGDX0603	83	FIXED	1472	16	137	1	16	Data
ZGDX0603	84	FIXED	1488	16	18174	1	16	Data
ZGDX0603	85	FIXED	1504	16	33598	1	16	Data
ZGDX0603	86	FIXED	1520	16	45787	1	16	Data
ZGDX0604	7	FIXED	112	16	2759	1	16	Data
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ZGDX0604	10	FIXED	160	16	51014	1	16	Data
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ZGDX0604	15	FIXED	240	16	51014	1	16	Data
ZGDX0604	16	FIXED	256	16	63488	1	16	Data
ZGDX0604	17	FIXED	272	16	139	1	16	Data
ZGDX0604	18	FIXED	288	16	18168	1	16	Data
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ZGDX0604	20	FIXED	320	16	65139	1	16	Data
ZGDX0604	21	FIXED	336	16	18106	1	16	Data
ZGDX0604	22	FIXED	352	16	5632	1	16	Data
ZGDX0604	23	FIXED	368	16	47359	1	16	Data
ZGDX0604	24	FIXED	384	16	65519	1	16	Data
ZGDX0604	25	FIXED	400	16	51014	1	16	Data
ZGDX0604	26	FIXED	416	16	62976	1	16	Data
ZGDX0604	27	FIXED	432	16	139	1	16	Data
ZGDX0604	28	FIXED	448	16	18166	1	16	Data
ZGDX0604	29	FIXED	464	16	15174	1	16	Data
ZGDX0604	30	FIXED	480	16	64115	1	16	Data
ZGDX0604	31	FIXED	496	16	3071	1	16	Data
ZGDX0604	32	FIXED	512	16	18166	1	16	Data
ZGDX0604	33	FIXED	528	16	35654	1	16	Data
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ZGDX0604	35	FIXED	560	16	18170	1	16	Data
ZGDX0604	36	FIXED	576	16	29429	1	16	Data
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ZGDX0604	38	FIXED	608	16	239	1	16	Data
ZGDX0604	39	FIXED	624	16	51014	1	16	Data
ZGDX0604	40	FIXED	640	16	62976	1	16	Data
ZGDX0604	41	FIXED	656	16	139	1	16	Data
ZGDX0604	42	FIXED	672	16	18166	1	16	Data
ZGDX0603	17	FIXED	272	16	238	1	16	Data
ZGDX0603	18	FIXED	288	16	35670	1	16	Data
ZGDX0603	19	FIXED	304	16	1745	1	16	Data

ZGDX0603	20	FIXED	320	16	58065	1	16	Data
ZGDX0603	21	FIXED	336	16	57985	1	16	Data
ZGDX0603	22	FIXED	352	16	51715	1	16	Data
ZGDX0603	23	FIXED	368	16	82	1	16	Data
ZGDX0603	24	FIXED	384	16	35280	1	16	Data
ZGDX0603	25	FIXED	400	16	47622	1	16	Data
ZGDX0603	26	FIXED	416	16	239	1	16	Data
ZGDX0603	27	FIXED	432	16	23122	1	16	Data
ZGDX0603	28	FIXED	448	16	33250	1	16	Data
ZGDX0603	29	FIXED	464	16	64767	1	16	Data
ZGDX0603	30	FIXED	480	16	2902	1	16	Data
ZGDX0603	31	FIXED	496	16	65161	1	16	Data
ZGDX0603	32	FIXED	512	16	53434	1	16	Data
ZGDX0603	33	FIXED	528	16	1536	1	16	Data
ZGDX0603	34	FIXED	544	16	61272	1	16	Data
ZGDX0603	35	FIXED	560	16	47622	1	16	Data
ZGDX0603	36	FIXED	576	16	239	1	16	Data
ZGDX0603	37	FIXED	592	16	35813	1	16	Data
ZGDX0603	38	FIXED	608	16	24003	1	16	Data
ZGDX0603	39	FIXED	624	32	8118	1	32	Start Address
ZGDX0603	40	FIXED	656	16	2	1	16	Lenght
ZGDX0603	41	FIXED	672	16	59507	1	16	Data
ZGDX0603	42	FIXED	688	16	19033	1	16	Data
ZGDX0603	43	FIXED	704	32	8130	1	32	Start Address
ZGDX0603	44	FIXED	736	16	2	1	16	Lenght
ZGDX0603	45	FIXED	752	16	59495	1	16	Data
ZGDX0603	46	FIXED	768	16	19179	1	16	Data
ZGDX0603	47	FIXED	784	32	8810	1	32	Start Address
ZGDX0603	48	FIXED	816	16	1	1	16	Lenght
ZGDX0603	49	FIXED	832	16	49223	1	16	Data
ZGDX0603	50	FIXED	848	32	8826	1	32	Start Address
ZGDX0603	51	FIXED	880	16	1	1	16	Lenght
ZGDX0900	22	FIXED	352	16	2570	1	16	Data
ZGDX0900	23	FIXED	368	16	52469	1	16	Data
ZGDX0900	24	FIXED	384	16	58622	1	16	Data
ZGDX0900	25	FIXED	400	16	0	1	16	Data
ZGDX0900	26	FIXED	416	16	0	1	16	Data
ZGDX0900	27	FIXED	432	16	4110	1	16	Data
ZGDX0900	28	FIXED	448	16	0	1	16	Data
ZGDX0900	29	FIXED	464	16	8095	1	16	Data
ZGDX0900	30	FIXED	480	16	64281	1	16	Data
ZGDX0900	31	FIXED	496	16	0	1	16	Data
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ZGDX0900	33	FIXED	528	16	3840	1	16	Data
ZGDX0900	34	FIXED	544	16	3855	1	16	Data
ZGDX0900	35	FIXED	560	16	3855	1	16	Data
ZGDX0900	36	FIXED	576	16	4110	1	16	Data
ZGDX0900	37	FIXED	592	16	0	1	16	Data
ZGDX0900	38	FIXED	608	16	1271	1	16	Data
ZGDX0900	39	FIXED	624	16	159	1	16	Data
ZGDX0900	40	FIXED	640	16	40722	1	16	Data
ZGDX0900	41	FIXED	656	16	248	1	16	Data
ZGDX0900	42	FIXED	672	16	11265	1	16	Data
ZGDX0900	43	FIXED	688	16	0	1	16	Data
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ZGDX0602	2	FIXED	16	32	27250	1	32	Start Address
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ZGDX0602	4	FIXED	64	16	21899	1	16	Data
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ZGDX0602	6	FIXED	96	16	60422	1	16	Data
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ZGDX0602	9	FIXED	144	16	18182	1	16	Data
ZGDX0602	10	FIXED	160	16	45320	1	16	Data
ZGDX0602	11	FIXED	176	16	54248	1	16	Data
ZGDX0602	12	FIXED	192	16	46080	1	16	Data
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ZGDX0602	14	FIXED	224	16	1718	1	16	Data
ZGDX0602	15	FIXED	240	16	211	1	16	Data
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ZGDX0602	17	FIXED	272	16	49801	1	16	Data
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ZGDX0602	22	FIXED	352	16	18170	1	16	Data
ZGDX0602	23	FIXED	368	16	0	1	16	Data
ZGDX0602	24	FIXED	384	16	35678	1	16	Data
ZGDX0602	25	FIXED	400	16	1163	1	16	Data
ZGDX0602	26	FIXED	416	16	22274	1	16	Data
ZGDX0602	27	FIXED	432	16	35655	1	16	Data
ZGDX0602	28	FIXED	448	16	1161	1	16	Data
ZGDX0602	29	FIXED	464	16	22268	1	16	Data
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ZGDX0602	38	FIXED	608	16	1595	1	16	Data
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ZGDX0602	52	FIXED	832	16	29961	1	16	Data
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ZGDX0602	54	FIXED	864	16	65083	1	16	Data
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ZGDX0602	56	FIXED	896	16	55923	1	16	Data
ZGDX0602	57	FIXED	912	16	57395	1	16	Data
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ZGDX0610	14	FIXED	224	16	18166	1	16	Data
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ZGDX0610	18	FIXED	288	16	35606	1	16	Data
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ZGDX0610	20	FIXED	320	16	41786	1	16	Data
ZGDX0610	21	FIXED	336	16	56457	1	16	Data
ZGDX0610	22	FIXED	352	16	5688	1	16	Data
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ZGDX0610	37	FIXED	592	16	3584	1	16	Data
ZGDX0610	38	FIXED	608	16	60809	1	16	Data
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ZGDX0610	40	FIXED	640	16	4096	1	16	Data
ZGDX0610	41	FIXED	656	16	60808	1	16	Data
ZGDX0610	42	FIXED	672	16	52361	1	16	Data
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ZGDX0611	7	FIXED	112	16	35670	1	16	Data
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ZGDX0611	11	FIXED	176	16	35012	1	16	Data
ZGDX0611	12	FIXED	192	16	33662	1	16	Data
ZGDX0611	13	FIXED	208	16	60416	1	16	Data
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ZGDX0611	15	FIXED	240	16	65350	1	16	Data
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ZGDX0611	18	FIXED	288	16	33017	1	16	Data
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ZGDX0611	21	FIXED	336	16	58640	1	16	Data
ZGDX0611	22	FIXED	352	16	33021	1	16	Data
ZGDX0611	23	FIXED	368	16	117	1	16	Data
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ZGDX0611	25	FIXED	400	16	18156	1	16	Data
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ZGDX0611	28	FIXED	448	16	2795	1	16	Data
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ZGDX0611	30	FIXED	480	16	16444	1	16	Data
ZGDX0611	31	FIXED	496	16	116	1	16	Data
ZGDX0611	32	FIXED	512	16	27371	1	16	Data
ZGDX0611	33	FIXED	528	16	56203	1	16	Data
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ZGDX0611	35	FIXED	560	16	35670	1	16	Data
ZGDX0611	36	FIXED	576	16	61164	1	16	Data
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ZGDX0611	39	FIXED	624	16	65283	1	16	Data
ZGDX0611	40	FIXED	640	16	9472	1	16	Data
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ZGDX0611	42	FIXED	672	16	20216	1	16	Data
ZGDX0611	43	FIXED	688	16	2504	1	16	Data
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ZGDX0612	4	FIXED	64	16	35140	1	16	Data
ZGDX0612	5	FIXED	80	16	2699	1	16	Data
ZGDX0612	6	FIXED	96	16	18162	1	16	Data
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ZGDX0612	9	FIXED	144	16	49232	1	16	Data
ZGDX0612	10	FIXED	160	16	65398	1	16	Data
ZGDX0612	11	FIXED	176	16	61672	1	16	Data
ZGDX0612	12	FIXED	192	16	50338	1	16	Data
ZGDX0612	13	FIXED	208	16	22873	1	16	Data

ZGDX0612	14	FIXED	224	16	35142	1	16	Data
ZGDX0612	15	FIXED	240	16	58931	1	16	Data
ZGDX0612	16	FIXED	256	16	49232	1	16	Data
ZGDX0612	17	FIXED	272	16	47111	1	16	Data
ZGDX0612	18	FIXED	288	16	80	1	16	Data
ZGDX0612	19	FIXED	304	16	36166	1	16	Data
ZGDX0612	20	FIXED	320	16	56912	1	16	Data
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ZGDX0612	23	FIXED	368	16	59550	1	16	Data
ZGDX0612	24	FIXED	384	16	60547	1	16	Data
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ZGDX0614	42	FIXED	672	32	7638	1	32	Start Address
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ZGDX0616	41	FIXED	656	32	19806	1	32	Start Address
ZGDX0616	42	FIXED	688	16	2	1	16	Lenght
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ZGDX0615	0	FIXED	0	8	81	1	8	Memory ID
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ZGDX0608	34	FIXED	624	32	4030	1	32	Start Address
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ZGDX0608	46	FIXED	864	32	9746	1	32	Start Address
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ZGDX0608	48	FIXED	912	16	41978	1	16	Data
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ZGDX0608	63	FIXED	1216	16	0	1	16	Data
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ZGDX0608	76	FIXED	1472	16	0	1	16	Data
ZGDX0608	77	FIXED	1488	32	25480	1	32	Start Address
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ZGDX0609	42	FIXED	672	16	17410	1	16	Data
ZGDX0609	43	FIXED	688	16	47616	1	16	Data
ZGDX0610	0	FIXED	0	8	81	1	8	Memory ID
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ZGDX0610	8	FIXED	128	16	1673	1	16	Data
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ZGDX0608	0	FIXED	0	8	81	1	8	Memory ID
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ZGDX0608	8	FIXED	144	32	3460	1	32	Start Address
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ZGDX0608	11	FIXED	208	32	12610	1	32	Start Address
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ZGDX0608	13	FIXED	256	16	47359	1	16	Data
ZGDX0608	14	FIXED	272	16	65515	1	16	Data
ZGDX0608	15	FIXED	288	32	13310	1	32	Start Address
ZGDX0608	16	FIXED	320	16	12	1	16	Lenght
ZGDX0608	17	FIXED	336	16	9472	1	16	Data
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ZGDX0608	20	FIXED	384	16	35655	1	16	Data
ZGDX0608	21	FIXED	400	16	23689	1	16	Data
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ZGDX0608	27	FIXED	496	16	61580	1	16	Data
ZGDX0608	28	FIXED	512	16	20206	1	16	Data
ZGDX0608	29	FIXED	528	32	14334	1	32	Start Address
ZGDX0608	30	FIXED	560	16	3	1	16	Lenght
ZGDX0608	31	FIXED	576	16	15926	1	16	Data
ZGDX0608	32	FIXED	592	16	55808	1	16	Data
ZGDX0608	33	FIXED	608	16	29728	1	16	Data
ZGDX0662	35	FIXED	576	16	51988	1	16	Data
ZGDX0671	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0671	1	FIXED	8	8	2	1	8	Number of blocks
ZGDX0671	2	FIXED	16	32	27394	1	32	Start Address 1

ZGDX0671	3	FIXED	48	16	55	1	16	Lenght
ZGDX0671	4	FIXED	64	16	50005	1	16	Data
ZGDX0671	5	FIXED	80	16	35820	1	16	Data
ZGDX0671	6	FIXED	96	16	33772	1	16	Data
ZGDX0671	7	FIXED	112	16	2759	1	16	Data
ZGDX0671	8	FIXED	128	16	18174	1	16	Data
ZGDX0671	9	FIXED	144	16	1280	1	16	Data
ZGDX0671	10	FIXED	160	16	51014	1	16	Data
ZGDX0671	11	FIXED	176	16	64512	1	16	Data
ZGDX0671	12	FIXED	192	16	199	1	16	Data
ZGDX0671	13	FIXED	208	16	18170	1	16	Data
ZGDX0671	14	FIXED	224	16	0	1	16	Data
ZGDX0671	15	FIXED	240	16	51014	1	16	Data
ZGDX0671	16	FIXED	256	16	63488	1	16	Data
ZGDX0671	17	FIXED	272	16	139	1	16	Data
ZGDX0671	18	FIXED	288	16	18168	1	16	Data
ZGDX0671	19	FIXED	304	16	15174	1	16	Data
ZGDX0671	20	FIXED	320	16	65139	1	16	Data
ZGDX0671	21	FIXED	336	16	18106	1	16	Data
ZGDX0671	22	FIXED	352	16	5632	1	16	Data
ZGDX0671	23	FIXED	368	16	47359	1	16	Data
ZGDX0671	24	FIXED	384	16	65519	1	16	Data
ZGDX0671	25	FIXED	400	16	51014	1	16	Data
ZGDX0671	26	FIXED	416	16	62976	1	16	Data
ZGDX0671	27	FIXED	432	16	139	1	16	Data
ZGDX0671	28	FIXED	448	16	18166	1	16	Data
ZGDX0671	29	FIXED	464	16	15174	1	16	Data
ZGDX0671	30	FIXED	480	16	64115	1	16	Data
ZGDX0671	31	FIXED	496	16	3071	1	16	Data
ZGDX0671	32	FIXED	512	16	18166	1	16	Data
ZGDX0671	33	FIXED	528	16	35654	1	16	Data
ZGDX0662	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0662	1	FIXED	8	8	2	1	8	Number of blocks
ZGDX0662	2	FIXED	16	32	27576	1	32	Start Address 1
ZGDX0662	3	FIXED	48	16	28	1	16	Lenght
ZGDX0662	4	FIXED	64	16	50005	1	16	Data
ZGDX0662	5	FIXED	80	16	35820	1	16	Data
ZGDX0662	6	FIXED	96	16	33772	1	16	Data
ZGDX0662	7	FIXED	112	16	1256	1	16	Data
ZGDX0662	8	FIXED	128	16	48097	1	16	Data
ZGDX0662	9	FIXED	144	16	47634	1	16	Data
ZGDX0662	10	FIXED	160	16	237	1	16	Data
ZGDX0662	11	FIXED	176	16	9600	1	16	Data
ZGDX0662	12	FIXED	192	16	137	1	16	Data
ZGDX0662	13	FIXED	208	16	18172	1	16	Data
ZGDX0662	14	FIXED	224	16	47618	1	16	Data
ZGDX0662	15	FIXED	240	16	8429	1	16	Data
ZGDX0662	16	FIXED	256	16	9480	1	16	Data
ZGDX0662	17	FIXED	272	16	137	1	16	Data
ZGDX0662	18	FIXED	288	16	18174	1	16	Data
ZGDX0662	19	FIXED	304	16	33598	1	16	Data
ZGDX0662	20	FIXED	320	16	45787	1	16	Data
ZGDX0662	21	FIXED	336	16	116	1	16	Data
ZGDX0662	22	FIXED	352	16	3971	1	16	Data
ZGDX0662	23	FIXED	368	16	32508	1	16	Data
ZGDX0662	24	FIXED	384	16	116	1	16	Data
ZGDX0662	25	FIXED	400	16	2435	1	16	Data
ZGDX0662	26	FIXED	416	16	32510	1	16	Data
ZGDX0662	27	FIXED	432	16	117	1	16	Data
ZGDX0662	28	FIXED	448	16	1000	1	16	Data
ZGDX0662	29	FIXED	464	16	28607	1	16	Data
ZGDX0662	30	FIXED	480	16	35813	1	16	Data
ZGDX0662	31	FIXED	496	16	24003	1	16	Data
ZGDX0662	32	FIXED	512	32	22250	1	32	Start Address 2
ZGDX0662	33	FIXED	544	16	2	1	16	Lenght
ZGDX0662	34	FIXED	560	16	62952	1	16	Data
ZGDX0661	34	FIXED	544	16	61272	1	16	Data
ZGDX0661	35	FIXED	560	16	47622	1	16	Data

ZGDX0661	36	FIXED	576	16	239	1	16	Data
ZGDX0661	37	FIXED	592	16	35813	1	16	Data
ZGDX0661	38	FIXED	608	16	24003	1	16	Data
ZGDX0661	39	FIXED	624	32	8118	1	32	Start Address 2
ZGDX0661	40	FIXED	656	16	2	1	16	Lenght
ZGDX0661	41	FIXED	672	16	59507	1	16	Data
ZGDX0661	42	FIXED	688	16	19033	1	16	Data
ZGDX0661	43	FIXED	704	32	8130	1	32	Start Address 3
ZGDX0661	44	FIXED	736	16	2	1	16	Lenght
ZGDX0661	45	FIXED	752	16	59495	1	16	Data
ZGDX0661	46	FIXED	768	16	19179	1	16	Data
ZGDX0661	47	FIXED	784	32	8810	1	32	Start Address 4
ZGDX0661	48	FIXED	816	16	1	1	16	Lenght
ZGDX0661	49	FIXED	832	16	49223	1	16	Data
ZGDX0661	50	FIXED	848	32	8826	1	32	Start Address 5
ZGDX0661	51	FIXED	880	16	1	1	16	Lenght
ZGDX0661	52	FIXED	896	16	45127	1	16	Data
ZGDX0661	53	FIXED	912	32	11800	1	32	Start Address 6
ZGDX0661	54	FIXED	944	16	1	1	16	Lenght
ZGDX0661	55	FIXED	960	16	4668	1	16	Data
ZGDX0661	56	FIXED	976	32	12138	1	32	Start Address 7
ZGDX0661	57	FIXED	1008	16	2	1	16	Lenght
ZGDX0661	58	FIXED	1024	16	59583	1	16	Data
ZGDX0661	59	FIXED	1040	16	14937	1	16	Data
ZGDX0661	60	FIXED	1056	32	12162	1	32	Start Address 8
ZGDX0661	61	FIXED	1088	16	2	1	16	Lenght
ZGDX0661	62	FIXED	1104	16	59559	1	16	Data
ZGDX0661	63	FIXED	1120	16	14937	1	16	Data
ZGDX0661	64	FIXED	1136	32	12196	1	32	Start Address 9
ZGDX0661	65	FIXED	1168	16	2	1	16	Lenght
ZGDX0661	66	FIXED	1184	16	59525	1	16	Data
ZGDX0661	67	FIXED	1200	16	14937	1	16	Data
ZGDX0652	26	FIXED	432	16	50064	1	16	Data
ZGDX0661	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0661	1	FIXED	8	8	9	1	8	Number of blocks
ZGDX0661	2	FIXED	16	32	27180	1	32	Start Address 1
ZGDX0661	3	FIXED	48	16	35	1	16	Lenght
ZGDX0661	4	FIXED	64	16	21899	1	16	Data
ZGDX0661	5	FIXED	80	16	60547	1	16	Data
ZGDX0661	6	FIXED	96	16	60418	1	16	Data
ZGDX0661	7	FIXED	112	16	35654	1	16	Data
ZGDX0661	8	FIXED	128	16	1713	1	16	Data
ZGDX0661	9	FIXED	144	16	2259	1	16	Data
ZGDX0661	10	FIXED	160	16	59529	1	16	Data
ZGDX0661	11	FIXED	176	16	18174	1	16	Data
ZGDX0661	12	FIXED	192	16	33126	1	16	Data
ZGDX0661	13	FIXED	208	16	1791	1	16	Data
ZGDX0661	14	FIXED	224	16	139	1	16	Data
ZGDX0661	15	FIXED	240	16	17924	1	16	Data
ZGDX0661	16	FIXED	256	16	47620	1	16	Data
ZGDX0661	17	FIXED	272	16	238	1	16	Data
ZGDX0661	18	FIXED	288	16	35670	1	16	Data
ZGDX0661	19	FIXED	304	16	1745	1	16	Data
ZGDX0661	20	FIXED	320	16	58065	1	16	Data
ZGDX0661	21	FIXED	336	16	57985	1	16	Data
ZGDX0661	22	FIXED	352	16	51715	1	16	Data
ZGDX0661	23	FIXED	368	16	82	1	16	Data
ZGDX0661	24	FIXED	384	16	35280	1	16	Data
ZGDX0661	25	FIXED	400	16	47622	1	16	Data
ZGDX0661	26	FIXED	416	16	239	1	16	Data
ZGDX0661	27	FIXED	432	16	23122	1	16	Data
ZGDX0661	28	FIXED	448	16	33250	1	16	Data
ZGDX0661	29	FIXED	464	16	64767	1	16	Data
ZGDX0661	30	FIXED	480	16	2902	1	16	Data
ZGDX0661	31	FIXED	496	16	65161	1	16	Data
ZGDX0661	32	FIXED	512	16	53434	1	16	Data
ZGDX0661	33	FIXED	528	16	1536	1	16	Data
ZGDX0651	76	FIXED	1264	16	116	1	16	Data

ZGDX0651	77	FIXED	1280	16	12523	1	16	Data
ZGDX0651	78	FIXED	1296	16	4240	1	16	Data
ZGDX0651	79	FIXED	1312	32	15824	1	32	Start Address 5
ZGDX0651	80	FIXED	1344	16	1	1	16	Lenght
ZGDX0651	81	FIXED	1360	16	60212	1	16	Data
ZGDX0651	82	FIXED	1376	32	15862	1	32	Start Address 6
ZGDX0651	83	FIXED	1408	16	1	1	16	Lenght
ZGDX0651	84	FIXED	1424	16	60174	1	16	Data
ZGDX0652	0	FIXED	0	8	81	1	8	Memory ID
ZGDX0652	1	FIXED	8	8	2	1	8	Number of blocks
ZGDX0652	2	FIXED	16	32	27362	1	32	Start Address 1
ZGDX0652	3	FIXED	48	16	17	1	16	Lenght
ZGDX0652	4	FIXED	64	16	50104	1	16	Data
ZGDX0652	5	FIXED	80	16	256	1	16	Data
ZGDX0652	6	FIXED	96	16	20560	1	16	Data
ZGDX0652	7	FIXED	112	16	47126	1	16	Data
ZGDX0652	8	FIXED	128	16	55888	1	16	Data
ZGDX0652	9	FIXED	144	16	41236	1	16	Data
ZGDX0652	10	FIXED	160	16	55872	1	16	Data
ZGDX0652	11	FIXED	176	16	20664	1	16	Data
ZGDX0652	12	FIXED	192	16	788	1	16	Data
ZGDX0652	13	FIXED	208	16	20664	1	16	Data
ZGDX0652	14	FIXED	224	16	1280	1	16	Data
ZGDX0652	15	FIXED	240	16	20712	1	16	Data
ZGDX0652	16	FIXED	256	16	5113	1	16	Data
ZGDX0652	17	FIXED	272	16	33732	1	16	Data
ZGDX0652	18	FIXED	288	16	3304	1	16	Data
ZGDX0652	19	FIXED	304	16	22976	1	16	Data
ZGDX0652	20	FIXED	320	16	50005	1	16	Data
ZGDX0652	21	FIXED	336	32	12372	1	32	Start Address 2
ZGDX0652	22	FIXED	368	16	4	1	16	Lenght
ZGDX0652	23	FIXED	384	16	59532	1	16	Data
ZGDX0652	24	FIXED	400	16	14987	1	16	Data
ZGDX0652	25	FIXED	416	16	58717	1	16	Data
ZGDX0651	41	FIXED	656	16	1464	1	16	Data
ZGDX0651	42	FIXED	672	16	256	1	16	Data
ZGDX0651	43	FIXED	688	16	60189	1	16	Data
ZGDX0651	44	FIXED	704	16	35654	1	16	Data
ZGDX0651	45	FIXED	720	16	64651	1	16	Data
ZGDX0651	46	FIXED	736	16	22266	1	16	Data
ZGDX0651	47	FIXED	752	16	15110	1	16	Data
ZGDX0651	48	FIXED	768	16	3802	1	16	Data
ZGDX0651	49	FIXED	784	16	29967	1	16	Data
ZGDX0651	50	FIXED	800	16	15126	1	16	Data
ZGDX0651	51	FIXED	816	16	3290	1	16	Data
ZGDX0651	52	FIXED	832	16	29961	1	16	Data
ZGDX0651	53	FIXED	848	16	35654	1	16	Data
ZGDX0651	54	FIXED	864	16	65083	1	16	Data
ZGDX0651	55	FIXED	880	16	1546	1	16	Data
ZGDX0651	56	FIXED	896	16	55923	1	16	Data
ZGDX0651	57	FIXED	912	16	57395	1	16	Data
ZGDX0651	58	FIXED	928	16	49291	1	16	Data
ZGDX0651	59	FIXED	944	16	58717	1	16	Data
ZGDX0651	60	FIXED	960	16	50104	1	16	Data
ZGDX0651	61	FIXED	976	32	12888	1	32	Start Address 2
ZGDX0651	62	FIXED	1008	16	4	1	16	Lenght
ZGDX0651	63	FIXED	1024	16	37008	1	16	Data
ZGDX0651	64	FIXED	1040	16	36944	1	16	Data
ZGDX0651	65	FIXED	1056	16	59411	1	16	Data
ZGDX0651	66	FIXED	1072	16	14425	1	16	Data
ZGDX0651	67	FIXED	1088	32	12776	1	32	Start Address 3
ZGDX0651	68	FIXED	1120	16	4	1	16	Lenght
ZGDX0651	69	FIXED	1136	16	41268	1	16	Data
ZGDX0651	70	FIXED	1152	16	56971	1	16	Data
ZGDX0651	71	FIXED	1168	16	5682	1	16	Data
ZGDX0651	72	FIXED	1184	16	56995	1	16	Data
ZGDX0651	73	FIXED	1200	32	13262	1	32	Start Address 4
ZGDX0651	74	FIXED	1232	16	4	1	16	Lenght

ZGDX0651	75 FIXED	1248	16	33786	1	16	Data
ZGDX0651	17 FIXED	272	16	49801	1	16	Data
ZGDX0651	18 FIXED	288	16	18174	1	16	Data
ZGDX0651	19 FIXED	304	16	51014	1	16	Data
ZGDX0651	20 FIXED	320	16	64512	1	16	Data
ZGDX0651	21 FIXED	336	16	199	1	16	Data
ZGDX0651	22 FIXED	352	16	18170	1	16	Data
ZGDX0651	23 FIXED	368	16	0	1	16	Data
ZGDX0651	24 FIXED	384	16	35678	1	16	Data
ZGDX0651	25 FIXED	400	16	1163	1	16	Data
ZGDX0651	26 FIXED	416	16	22274	1	16	Data
ZGDX0651	27 FIXED	432	16	35655	1	16	Data
ZGDX0651	28 FIXED	448	16	1161	1	16	Data
ZGDX0651	29 FIXED	464	16	22268	1	16	Data
ZGDX0651	30 FIXED	480	16	35142	1	16	Data
ZGDX0651	31 FIXED	496	16	64139	1	16	Data
ZGDX0651	32 FIXED	512	16	18172	1	16	Data
ZGDX0651	33 FIXED	528	16	35670	1	16	Data
ZGDX0651	34 FIXED	544	16	64059	1	16	Data
ZGDX0651	35 FIXED	560	16	1550	1	16	Data
ZGDX0651	36 FIXED	576	16	55922	1	16	Data
ZGDX0651	37 FIXED	592	16	3447	1	16	Data
ZGDX0651	38 FIXED	608	16	1595	1	16	Data
ZGDX0651	39 FIXED	624	16	5644	1	16	Data
ZGDX0651	40 FIXED	640	16	55926	1	16	Data
ZGDX0702	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0702	1 FIXED	8	8	1	1	8	N
ZGDX0702	2 FIXED	16	32	27250	1	32	StartAddress
ZGDX0702	3 FIXED	48	16	57	1	16	Length
ZGDX0703	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0703	1 FIXED	8	8	1	1	8	N
ZGDX0703	2 FIXED	16	32	12888	1	32	StartAddress
ZGDX0703	3 FIXED	48	16	4	1	16	Length
ZGDX0704	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0704	1 FIXED	8	8	1	1	8	N
ZGDX0704	2 FIXED	16	32	12776	1	32	StartAddress
ZGDX0704	3 FIXED	48	16	4	1	16	Length
ZGDX0705	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0705	1 FIXED	8	8	1	1	8	N
ZGDX0705	2 FIXED	16	32	13262	1	32	StartAddress
ZGDX0705	3 FIXED	48	16	4	1	16	Length
ZGDX0706	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0706	1 FIXED	8	8	1	1	8	N
ZGDX0706	2 FIXED	16	32	15824	1	32	StartAddress
ZGDX0706	3 FIXED	48	16	1	1	16	Length
ZGDX0707	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0707	1 FIXED	8	8	1	1	8	N
ZGDX0707	2 FIXED	16	32	15862	1	32	StartAddress
ZGDX0707	3 FIXED	48	16	1	1	16	Length
ZGDX0708	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0708	1 FIXED	8	8	1	1	8	N
ZGDX0708	2 FIXED	16	32	27362	1	32	StartAddress
ZGDX0708	3 FIXED	48	16	17	1	16	Length
ZGDX0709	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0709	1 FIXED	8	8	1	1	8	N
ZGDX0709	2 FIXED	16	32	12372	1	32	StartAddress
ZGDX0709	3 FIXED	48	16	4	1	16	Length
ZGDX0710	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0710	1 FIXED	8	8	1	1	8	N
ZGDX0710	2 FIXED	16	32	27180	1	32	StartAddress
ZGDX0710	3 FIXED	48	16	35	1	16	Length
ZGDX0711	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0711	1 FIXED	8	8	1	1	8	N
ZGDX0711	2 FIXED	16	32	8118	1	32	StartAddress
ZGDX0711	3 FIXED	48	16	2	1	16	Length
ZGDX0712	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0712	1 FIXED	8	8	1	1	8	N
ZGDX0712	2 FIXED	16	32	8130	1	32	StartAddress

ZGDX0712	3 FIXED	48	16	2	1	16	Length
ZGDX0713	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0713	1 FIXED	8	8	1	1	8	N
ZGDX0713	2 FIXED	16	32	8810	1	32	StartAddress
ZGDX0713	3 FIXED	48	16	1	1	16	Length
ZGDX0714	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0714	1 FIXED	8	8	1	1	8	N
ZGDX0714	2 FIXED	16	32	8826	1	32	StartAddress
ZGDX0714	3 FIXED	48	16	1	1	16	Length
ZGDX0715	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0715	1 FIXED	8	8	1	1	8	N
ZGDX0715	2 FIXED	16	32	11800	1	32	StartAddress
ZGDX0715	3 FIXED	48	16	1	1	16	Length
ZGDX0716	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0716	1 FIXED	8	8	1	1	8	N
ZGDX0716	2 FIXED	16	32	12138	1	32	StartAddress
ZGDX0716	3 FIXED	48	16	2	1	16	Length
ZGDX0717	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0717	1 FIXED	8	8	1	1	8	N
ZGDX0717	2 FIXED	16	32	12162	1	32	StartAddress
ZGDX0717	3 FIXED	48	16	2	1	16	Length
ZGDX0718	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0718	1 FIXED	8	8	1	1	8	N
ZGDX0718	2 FIXED	16	32	12196	1	32	StartAddress
ZGDX0718	3 FIXED	48	16	2	1	16	Length
ZGDX0719	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0719	1 FIXED	8	8	1	1	8	N
ZGDX0719	2 FIXED	16	32	27576	1	32	StartAddress
ZGDX0719	3 FIXED	48	16	28	1	16	Length
ZGDX0720	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0720	1 FIXED	8	8	1	1	8	N
ZGDX0720	2 FIXED	16	32	22250	1	32	StartAddress
ZGDX0720	3 FIXED	48	16	2	1	16	Length
ZGDX0721	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0721	1 FIXED	8	8	1	1	8	N
ZGDX0721	2 FIXED	16	32	27394	1	32	StartAddress
ZGDX0721	3 FIXED	48	16	55	1	16	Length
ZGDX0722	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0722	1 FIXED	8	8	1	1	8	N
ZGDX0722	2 FIXED	16	32	11098	1	32	StartAddress
ZGDX0722	3 FIXED	48	16	3	1	16	Length
ZGDX0723	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0723	1 FIXED	8	8	1	1	8	N
ZGDX0723	2 FIXED	16	32	27502	1	32	StartAddress
ZGDX0723	3 FIXED	48	16	38	1	16	Length
ZGDX0724	0 FIXED	0	8	81	1	8	Mem_ID
ZGDX0724	1 FIXED	8	8	1	1	8	N
ZGDX0724	2 FIXED	16	32	11486	1	32	StartAddress
ZGDX0724	3 FIXED	48	16	2	1	16	Length
ZGDX0725	0 FIXED	0	8	82	1	8	Mem_ID
ZGDX0725	1 FIXED	8	8	1	1	8	N
ZGDX0725	2 FIXED	16	32	268435712	1	32	StartAddress
ZGDX0725	3 FIXED	48	16	3	1	16	Length
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ZGDX0726	1 FIXED	8	8	1	1	8	N
ZGDX0726	2 FIXED	16	32	56906	1	32	StartAddress
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ZGDX0727	1 FIXED	8	8	1	1	8	N
ZGDX0727	2 FIXED	16	32	11292	1	32	StartAddress
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ZGDX0701	1 FIXED	8	8	1	1	8	N
ZGDX0701	2 FIXED	16	32	36922	1	32	Start address
ZGDX0701	3 FIXED	48	16	69	1	16	N words
ZGDX0601	0 FIXED	0	8	81	1	8	Memory ID
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ZGDX0601	2 FIXED	16	32	36922	1	32	Start Address

ZGDX0601	3	FIXED	48	16	69	1	16	Lenght
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ZGDX0601	10	FIXED	160	16	0	1	16	Data
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ZGDX0601	19	FIXED	304	16	30720	1	16	Data
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ZGDX0601	47	FIXED	752	16	4110	1	16	Data
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ZGDX0601	55	FIXED	880	16	0	1	16	Data
ZGDX0601	56	FIXED	896	16	15360	1	16	Data
ZGDX0601	57	FIXED	912	16	0	1	16	Data
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ZGDX0601	59	FIXED	944	16	0	1	16	Data
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ZGDX0601	62	FIXED	992	16	0	1	16	Data
ZGDX0601	63	FIXED	1008	16	0	1	16	Data
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ZGDX0601	65	FIXED	1040	16	0	1	16	Data
ZGDX0601	66	FIXED	1056	16	10240	1	16	Data
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ZGDX0601	68	FIXED	1088	16	0	1	16	Data
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ZGDMM900	2	BLOCK	48	16		1	16 XGDM0300 PKBC		
ZGDMM900	3	PARAM	64	16		1	16	FGDMM001	
ZGDMM900	4	BLOCK	80	32		1	32 XGDM0200 PKBC		
ZGDMM900	5	BLOCK	112	16		1	16 XGDM0300 PKBC		
ZGDMM900	6	PARAM	128	16		1	16	FGDMM002	
ZGDMM900	7	BLOCK	144	32		1	32 XGDM0200 PKBC		
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ZGDMM900	9	PARAM	192	16		1	16	FGDMM003	
ZGDMM900	10	BLOCK	208	32		1	32 XGDM0200 PKBC		
ZGDMM900	11	BLOCK	240	16		1	16 XGDM0300 PKBC		
ZGDMM900	12	PARAM	256	16		1	16	FGDMM004	
ZGDMM900	13	BLOCK	272	32		1	32 XGDM0200 PKBC		
ZGDMM900	14	BLOCK	304	16		1	16 XGDM0300 PKBC		
ZGDMM900	15	PARAM	320	16		1	16	FGDMM005	
ZGDMM900	16	BLOCK	336	32		1	32 XGDM0200 PKBC		
ZGDMM900	17	BLOCK	368	16		1	16 XGDM0300 PKBC		
ZGDMM900	18	PARAM	384	16		1	16	FGDMM006	
ZGDMM901	0	BLOCK	0	16		1	16 XGDM0100 PKBC		
ZGDMM901	1	BLOCK	16	32		1	32 XGDM0200 PKBC		
ZGDMM901	2	BLOCK	48	16		1	16 XGDM0300 PKBC		
ZGDMM901	3	PARAM	64	16		1	16	FGDMM011	
ZGDMM901	4	BLOCK	80	32		1	32 XGDM0200 PKBC		
ZGDMM901	5	BLOCK	112	16		1	16 XGDM0300 PKBC		
ZGDMM901	6	PARAM	128	16		1	16	FGDMM012	
ZGDMM901	7	BLOCK	144	32		1	32 XGDM0200 PKBC		
ZGDMM901	8	BLOCK	176	16		1	16 XGDM0300 PKBC		
ZGDMM901	9	PARAM	192	16		1	16	FGDMM013	
ZGDMM901	10	BLOCK	208	32		1	32 XGDM0200 PKBC		
ZGDMM901	11	BLOCK	240	16		1	16 XGDM0300 PKBC		
ZGDMM901	12	PARAM	256	16		1	16	FGDMM014	
ZGDMM901	13	BLOCK	272	32		1	32 XGDM0200 PKBC		
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ZGDMM901	15	PARAM	320	16		1	16	FGDMM015	
ZGDMM901	16	BLOCK	336	32		1	32 XGDM0200 PKBC		
ZGDMM901	17	BLOCK	368	16		1	16 XGDM0300 PKBC		
ZGDMM901	18	PARAM	384	16		1	16	FGDMM016	
ZGDMM902	0	BLOCK	0	16		1	16 XGDM0100 PKBC		
ZGDMM902	1	BLOCK	16	32		1	32 XGDM0200 PKBC		
ZGDMM902	2	BLOCK	48	16		1	16 XGDM0300 PKBC		
ZGDMM902	3	PARAM	64	16		1	16	FGDMM021	
ZGDMM902	4	BLOCK	80	32		1	32 XGDM0200 PKBC		
ZGDMM902	5	BLOCK	112	16		1	16 XGDM0300 PKBC		
ZGDMM902	6	PARAM	128	16		1	16	FGDMM022	
ZGDMM902	7	BLOCK	144	32		1	32 XGDM0200 PKBC		
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ZGDMM902	9	PARAM	192	16		1	16	FGDMM023	
ZGDMM902	10	BLOCK	208	32		1	32 XGDM0200 PKBC		
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ZGDMM902	12	PARAM	256	16		1	16	FGDMM024	
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ZGDMM902	15	PARAM	320	16		1	16	FGDMM025	
ZGDMM902	16	BLOCK	336	32		1	32 XGDM0200 PKBC		
ZGDMM902	17	BLOCK	368	16		1	16 XGDM0300 PKBC		
ZGDMM902	18	PARAM	384	16		1	16	FGDMM026	
ZGDMM903	0	BLOCK	0	16		1	16 XGDM0101 PKBC		
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ZGDMM903	2	BLOCK	48	16		1	16 XGDM0300 PKBC		
ZGDMM903	3	PARAM	64	16		1	16	FGDMM031	
ZGDMM903	4	BLOCK	80	32		1	32 XGDM0200 PKBC		
ZGDMM903	5	BLOCK	112	16		1	16 XGDM0300 PKBC		
ZGDMM903	6	PARAM	128	16		1	16	FGDMM032	
ZGDMM903	7	BLOCK	144	32		1	32 XGDM0200 PKBC		
ZGDMM903	8	BLOCK	176	16		1	16 XGDM0300 PKBC		

ZGDMM903	9	PARAM	192	16	1	16			FGDMM033
ZGDMM903	10	BLOCK	208	32	1	32	XGDM0200	PKBC	
ZGDMM903	11	BLOCK	240	16	1	16	XGDM0300	PKBC	
ZGDMM903	12	PARAM	256	16	1	16			FGDMM034
ZGDMM903	13	BLOCK	272	32	1	32	XGDM0200	PKBC	
ZGDMM903	14	BLOCK	304	16	1	16	XGDM0300	PKBC	
ZGDMM903	15	PARAM	320	16	1	16			FGDMM035
ZGDMM903	16	BLOCK	336	32	1	32	XGDM0200	PKBC	
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ZGDMM903	18	PARAM	384	16	1	16			FGDMM036
ZGDMM903	19	BLOCK	400	32	1	32	XGDM0200	PKBC	
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ZGDMM903	21	PARAM	448	16	1	16			FGDMM037
ZGDMR900	0	BLOCK	0	16	1	16	XGDM0100	PKBC	
ZGDMR900	1	BLOCK	16	32	1	32	XGDM0400	PKBC	
ZGDMR900	2	BLOCK	48	16	1	16	XGDM0300	PKBC	
ZGDMR900	3	PARAM	64	16	1	16			FGDMM001
ZGDMR900	4	BLOCK	80	32	1	32	XGDM0400	PKBC	
ZGDMR900	5	BLOCK	112	16	1	16	XGDM0300	PKBC	
ZGDMR900	6	PARAM	128	16	1	16			FGDMM002
ZGDMR900	7	BLOCK	144	32	1	32	XGDM0400	PKBC	
ZGDMR900	8	BLOCK	176	16	1	16	XGDM0300	PKBC	
ZGDMR900	9	PARAM	192	16	1	16			FGDMM003
ZGDMR900	10	BLOCK	208	32	1	32	XGDM0400	PKBC	
ZGDMR900	11	BLOCK	240	16	1	16	XGDM0300	PKBC	
ZGDMR900	12	PARAM	256	16	1	16			FGDMM004
ZGDMR900	13	BLOCK	272	32	1	32	XGDM0400	PKBC	
ZGDMR900	14	BLOCK	304	16	1	16	XGDM0300	PKBC	
ZGDMR900	15	PARAM	320	16	1	16			FGDMM005
ZGDMR900	16	BLOCK	336	32	1	32	XGDM0400	PKBC	
ZGDMR900	17	BLOCK	368	16	1	16	XGDM0300	PKBC	
ZGDMR900	18	PARAM	384	16	1	16			FGDMM006
ZGDMR901	0	BLOCK	0	16	1	16	XGDM0100	PKBC	
ZGDMR901	1	BLOCK	16	32	1	32	XGDM0400	PKBC	
ZGDMR901	2	BLOCK	48	16	1	16	XGDM0300	PKBC	
ZGDMR901	3	PARAM	64	16	1	16			FGDMM011
ZGDMR901	4	BLOCK	80	32	1	32	XGDM0400	PKBC	
ZGDMR901	5	BLOCK	112	16	1	16	XGDM0300	PKBC	
ZGDMR901	6	PARAM	128	16	1	16			FGDMM012
ZGDMR901	7	BLOCK	144	32	1	32	XGDM0400	PKBC	
ZGDMR901	8	BLOCK	176	16	1	16	XGDM0300	PKBC	
ZGDMR901	9	PARAM	192	16	1	16			FGDMM013
ZGDMR901	10	BLOCK	208	32	1	32	XGDM0400	PKBC	
ZGDMR901	11	BLOCK	240	16	1	16	XGDM0300	PKBC	
ZGDMR901	12	PARAM	256	16	1	16			FGDMM014
ZGDMR901	13	BLOCK	272	32	1	32	XGDM0400	PKBC	
ZGDMR901	14	BLOCK	304	16	1	16	XGDM0300	PKBC	
ZGDMR901	15	PARAM	320	16	1	16			FGDMM015
ZGDMR901	16	BLOCK	336	32	1	32	XGDM0400	PKBC	
ZGDMR901	17	BLOCK	368	16	1	16	XGDM0300	PKBC	
ZGDMR901	18	PARAM	384	16	1	16			FGDMM016
ZGDMR902	0	BLOCK	0	16	1	16	XGDM0100	PKBC	
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ZGDMR902	2	BLOCK	48	16	1	16	XGDM0300	PKBC	
ZGDMR902	3	PARAM	64	16	1	16			FGDMM021
ZGDMR902	4	BLOCK	80	32	1	32	XGDM0400	PKBC	
ZGDMR902	5	BLOCK	112	16	1	16	XGDM0300	PKBC	
ZGDMR902	6	PARAM	128	16	1	16			FGDMM022
ZGDMR902	7	BLOCK	144	32	1	32	XGDM0400	PKBC	
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ZGDMR902	11	BLOCK	240	16	1	16	XGDM0300	PKBC	
ZGDMR902	12	PARAM	256	16	1	16			FGDMM024
ZGDMR902	13	BLOCK	272	32	1	32	XGDM0400	PKBC	
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ZGDMR902	15	PARAM	320	16	1	16			FGDMM025
ZGDMR902	16	BLOCK	336	32	1	32	XGDM0400	PKBC	

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ZGDMR902	18	PARAM	384	16		1	16			FGDMM026	
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ZGDMR903	15	PARAM	320	16		1	16			FGDMM035	
ZGDMR903	16	BLOCK	336	32		1	32	XGDM0400	PKBC		
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ZGDMR903	18	PARAM	384	16		1	16			FGDMM036	
ZGDMR903	19	BLOCK	400	32		1	32	XGDM0400	PKBC		
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ZGDX0617	24	PARAM	384	16		1	16			PGDX0021	
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ZGDX0617	31	PARAM	496	16		1	16			PGDX0028	
ZGDX0617	32	PARAM	512	16		1	16			PGDX0029	
ZGDX0617	33	PARAM	528	16		1	16			PGDX0030	
ZGDX0617	34	PARAM	544	16		1	16			PGDX0031	
ZGDX0617	35	PARAM	560	16		1	16			PGDX0032	
ZGDX0617	36	PARAM	576	16		1	16			PGDX0033	
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ZGDX0617	41	PARAM	656	16		1	16			PGDX0038	
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ZGDX0617	47	PARAM	752	16		1	16	PGDX0044	
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ZGDX0617	51	PARAM	816	16		1	16	PGDX0048	
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ZGDX0617	59	PARAM	944	16		1	16	PGDX0056	
ZGDX0617	60	PARAM	960	16		1	16	PGDX0057	
ZGDX0617	61	PARAM	976	16		1	16	PGDX0058	
ZGDX0617	62	PARAM	992	16		1	16	PGDX0059	
ZGDX0617	63	PARAM	1008	16		1	16	PGDX0060	
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ZGDX0617	65	PARAM	1040	16		1	16	PGDX0062	
ZGDX0617	66	PARAM	1056	16		1	16	PGDX0063	
ZGDX0617	67	PARAM	1072	16		1	16	PGDX0064	
ZGDX0617	68	PARAM	1088	16		1	16	PGDX0065	
ZGDX0617	69	PARAM	1104	16		1	16	PGDX0066	
ZGDX0617	70	PARAM	1120	16		1	16	PGDX0067	
ZGDX0617	71	PARAM	1136	16		1	16	PGDX0068	
ZGDX0617	72	PARAM	1152	16		1	16	PGDX0069	
ZGDX0618	0	FIXED	0	8	82	1	8		Memory ID
ZGDX0618	1	FIXED	8	8	1	1	8		Number of blocks
ZGDX0618	2	FIXED	16	32	8	1	32		Start Address
ZGDX0618	3	FIXED	48	16	69	1	16		Length
ZGDX0618	4	PARAM	64	16		1	16	PGDX0001	
ZGDX0618	5	PARAM	80	16		1	16	PGDX0002	
ZGDX0618	6	PARAM	96	16		1	16	PGDX0003	
ZGDX0618	7	PARAM	112	16		1	16	PGDX0004	
ZGDX0618	8	PARAM	128	16		1	16	PGDX0005	
ZGDX0618	9	PARAM	144	16		1	16	PGDX0006	
ZGDX0618	10	PARAM	160	16		1	16	PGDX0007	
ZGDX0618	11	PARAM	176	16		1	16	PGDX0008	
ZGDX0618	12	PARAM	192	16		1	16	PGDX0009	
ZGDX0618	13	PARAM	208	16		1	16	PGDX0010	
ZGDX0618	14	PARAM	224	16		1	16	PGDX0011	
ZGDX0618	15	PARAM	240	16		1	16	PGDX0012	
ZGDX0618	16	PARAM	256	16		1	16	PGDX0013	
ZGDX0618	17	PARAM	272	16		1	16	PGDX0014	
ZGDX0618	18	PARAM	288	16		1	16	PGDX0015	
ZGDX0618	19	PARAM	304	16		1	16	PGDX0016	
ZGDX0618	20	PARAM	320	16		1	16	PGDX0017	
ZGDX0618	21	PARAM	336	16		1	16	PGDX0018	
ZGDX0618	22	PARAM	352	16		1	16	PGDX0019	
ZGDX0618	23	PARAM	368	16		1	16	PGDX0020	
ZGDX0618	24	PARAM	384	16		1	16	PGDX0021	
ZGDX0618	25	PARAM	400	16		1	16	PGDX0022	
ZGDX0618	26	PARAM	416	16		1	16	PGDX0023	
ZGDX0618	27	PARAM	432	16		1	16	PGDX0024	
ZGDX0618	28	PARAM	448	16		1	16	PGDX0025	
ZGDX0618	29	PARAM	464	16		1	16	PGDX0026	
ZGDX0618	30	PARAM	480	16		1	16	PGDX0027	
ZGDX0618	31	PARAM	496	16		1	16	PGDX0028	
ZGDX0618	32	PARAM	512	16		1	16	PGDX0029	
ZGDX0618	33	PARAM	528	16		1	16	PGDX0030	
ZGDX0618	34	PARAM	544	16		1	16	PGDX0031	
ZGDX0618	35	PARAM	560	16		1	16	PGDX0032	
ZGDX0618	36	PARAM	576	16		1	16	PGDX0033	
ZGDX0618	37	PARAM	592	16		1	16	PGDX0034	
ZGDX0618	38	PARAM	608	16		1	16	PGDX0035	

ZGDX0618	39 PARAM	624	16	1	16	PGDX0036
ZGDX0618	40 PARAM	640	16	1	16	PGDX0037
ZGDX0618	41 PARAM	656	16	1	16	PGDX0038
ZGDX0618	42 PARAM	672	16	1	16	PGDX0039
ZGDX0618	43 PARAM	688	16	1	16	PGDX0040
ZGDX0618	44 PARAM	704	16	1	16	PGDX0041
ZGDX0618	45 PARAM	720	16	1	16	PGDX0042
ZGDX0618	46 PARAM	736	16	1	16	PGDX0043
ZGDX0618	47 PARAM	752	16	1	16	PGDX0044
ZGDX0618	48 PARAM	768	16	1	16	PGDX0045
ZGDX0618	49 PARAM	784	16	1	16	PGDX0046
ZGDX0618	50 PARAM	800	16	1	16	PGDX0047
ZGDX0618	51 PARAM	816	16	1	16	PGDX0048
ZGDX0618	52 PARAM	832	16	1	16	PGDX0049
ZGDX0618	53 PARAM	848	16	1	16	PGDX0050
ZGDX0618	54 PARAM	864	16	1	16	PGDX0051
ZGDX0618	55 PARAM	880	16	1	16	PGDX0052
ZGDX0618	56 PARAM	896	16	1	16	PGDX0053
ZGDX0618	57 PARAM	912	16	1	16	PGDX0054
ZGDX0618	58 PARAM	928	16	1	16	PGDX0055
ZGDX0618	59 PARAM	944	16	1	16	PGDX0056
ZGDX0618	60 PARAM	960	16	1	16	PGDX0057
ZGDX0618	61 PARAM	976	16	1	16	PGDX0058
ZGDX0618	62 PARAM	992	16	1	16	PGDX0059
ZGDX0618	63 PARAM	1008	16	1	16	PGDX0060
ZGDX0618	64 PARAM	1024	16	1	16	PGDX0061
ZGDX0618	65 PARAM	1040	16	1	16	PGDX0062
ZGDX0618	66 PARAM	1056	16	1	16	PGDX0063
ZGDX0618	67 PARAM	1072	16	1	16	PGDX0064
ZGDX0618	68 PARAM	1088	16	1	16	PGDX0065
ZGDX0618	69 PARAM	1104	16	1	16	PGDX0066
ZGDX0618	70 PARAM	1120	16	1	16	PGDX0067
ZGDX0618	71 PARAM	1136	16	1	16	PGDX0068
ZGDX0618	72 PARAM	1152	16	1	16	PGDX0069

NAME	CATEGORY	G/PASS	LNAME	RED_NAME	USED_NAME	NOMIN_USED	USAGE	SGRP_NAME	PTC	PFC	TMPA_SIZE	ADA_TYPE	ADA_NAME	ADA_NAME_RED	VALIDITY	CALIB_TYPE	CALC_NAME_1	CALC_NAME_2	UNIT_NAME_SELC1	UNIT_NAME_SELC1R	UNIT_NAME_SELC2	ENGLABEL	IS_COCO	IS_COUNTER	COUNT_STEP	COUNT_LOW	COUNT_HIGH	LIMS_NAME	TMDP_TMGP_NAME	START_BIT	EXPRESSION	SOURCE	OBL_MEAS_TYPE	BCOU_NAME	CHAD_1N	CHAD_1R	CHAD_2N	CHAD_2R	PROTOCOL	BCOU_NAME_RED	CHAD_1N_RED	CHAD_1R_RED	CHAD_2N_RED	CHAD_2R_RED	PROTOCOL_RED	ACQ_FREQUENCY	ACQ_PHASE	TIME_OFFSET	TIME_INTERVAL
NGDASDTA	TMGA	N	GIADA SDT SAMP	NGDASDTB			7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA	UGDGIADA			N	N																								0	0
NGDA0051	TMGS	N	Patches Status word2				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0001	TMGS	N	Global SID				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0002	TMGS	N	Dust Flux				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0003	TMGS	N	Operation Mode				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0010	TMGS	N	Cover Status				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0011	TMGS	N	Frangibolt Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0010:RV=1			ANA	CGDP0003		UGDGIADA			degC	N	N																							0	0
NGDA0015	TMGS	N	GDS Stat				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0016	TMGS	N	Laser1 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0025:RV=1			ANA	CGDP0004		UGDGIADA			degC	N	N																							0	0
NGDA0017	TMGS	N	Laser2 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0025:RV=1			ANA	CGDP0004		UGDGIADA			degC	N	N																							0	0
NGDA0018	TMGS	N	Laser3 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0025:RV=1			ANA	CGDP0004		UGDGIADA			degC	N	N																							0	0
NGDA0019	TMGS	N	Laser4 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0025:RV=1			ANA	CGDP0004		UGDGIADA			degC	N	N																							0	0
NGDA0020	TMGS	N	Laser1 light monitor Gbl				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0027:RV<>0			ANA	CGDP0005		UGDGIADA			W	N	N																							0	0
NGDA0022	TMGS	N	Laser3 light monitor Gbl				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0027:RV<>0			ANA	CGDP0007		UGDGIADA			W	N	N																							0	0
NGDA0023	TMGS	N	Laser4 light monitor Gbl				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0027:RV<>0			ANA	CGDP0008		UGDGIADA			W	N	N																							0	0
NGDA0024	TMGS	N	GDS Thresholds				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0030	TMGS	N	IS Stat				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0031	TMGS	N	IS Plate Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NPWDA09:3:SPV="ON" OR ROS.TM.NPWDA213:SPV="ON"			ANA	CGDP0009		UGDGIADA			degC	N	N																							0	0
NGDA0032	TMGS	N	IS Thresholds				7	SGDGIADA	0	48	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0035	TMGS	N	MBS Stat				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0036	TMGS	N	MBS1 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0065:RV=1			ANA	CGDP0010		UGDGIADA			degC	N	N																							0	0
NGDA0037	TMGS	N	MBS2 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0065:RV=1			ANA	CGDP0011		UGDGIADA			degC	N	N																							0	0
NGDA0038	TMGS	N	MBS3 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0065:RV=1			ANA	CGDP0012		UGDGIADA			degC	N	N																							0	0
NGDA0039	TMGS	N	MBS4 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0065:RV=1			ANA	CGDP0013		UGDGIADA			degC	N	N																							0	0
NGDA0040	TMGS	N	MBS5 Tmp Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NGDD0065:RV=1			ANA	CGDP0014		UGDGIADA			degC	N	N																							0	0
NGDA0046	TMGS	N	+5V PowerConsum Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NPWDA09:3:SPV="ON" OR ROS.TM.NPWDA213:SPV="ON"			ANA	CGDP0016		UGDGIADA			mA	N	N																							0	0
NGDA0047	TMGS	N	+15V PowerConsum Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NPWDA09:3:SPV="ON" OR ROS.TM.NPWDA213:SPV="ON"			ANA	CGDP0017		UGDGIADA			mA	N	N																							0	0
NGDA0048	TMGS	N	-15V PowerConsum Global				7	SGDGIADA	3	12	16	T_WORD		ROS.TM.NPWDA09:3:SPV="ON" OR ROS.TM.NPWDA213:SPV="ON"			ANA	CGDP0018		UGDGIADA			mA	N	N																							0	0
NGDA0050	TMGS	N	Patches Status word1				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0054	TMGS	N	HK Data Field CRC				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0059	TMGS	N	EID				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0060	TMGS	N	Heater ID				7	SGDGIADA	3	12	16	T_WORD			DIG	CGDV0015			UGDGIADA				N	N																								0	0
NGDA0061	TMGS	N	Number of Steps				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0062	TMGS	N	Laser Temperature				7	SGDGIADA	3	12	16	T_WORD			ANA	CGDP0004			UGDGIADA			degC	N	N																							0	0
NGDA0063	TMGS	N	Current				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0601	TMGS	N	MemoryID				7	SGDGIADA	3	4	8	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0602	TMGS	N	Memory Address				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0603	TMGS	N	Memory Length				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0604	TMGS	N	Memory Data				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0605	TMGS	N	Memory Check				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0606	TMGS	N	Patches Status 2				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0607	TMGS	N	Cover Direction				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0608	TMGS	N	Time Stamp				7	SGDGIADA	0	48	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0609	TMGS	N	Cover Status 1				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0610	TMGS	N	Cover Status 2				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0611	TMGS	N	Cover Status 3				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0612	TMGS	N	Cover Status 4				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0613	TMGS	N	Cover Status 5				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0614	TMGS	N	Cover Status 6				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0615	TMGS	N	Cover Status 7				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0616	TMGS	N	Cover Status 8				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDA0620	TMGS	N	MB Heater ID				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0621	TMGS	N	Status register after WD				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0622	TMGS	N	EDAC Status				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0623	TMGS	N	EDAC Address Register				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0624	TMGS	N	Error type - EDAC Status				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0625	TMGS	N	High Error Address				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0626	TMGS	N	Low Error Address				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0627	TMGS	N	File ID				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDA0628	TMGS	N	IS Temperature				7	SGDGIADA	3	12	16	T_WORD			ANA	CGDP0009			UGDGIADA			degC	N	N																									
NGDA0629	TMGS	N	MBS Temperature				7	SGDGIADA	3	12	16	T_WORD			ANA	CGDP0010			UGDGIADA			degC	N	N																									
NGDA0630	TMGS	N	Main-electr Temperature				7	SGDGIADA	3	12	16	T_WORD			ANA	CGDP0015			UGDGIADA			degC	N	N																									
NGDA1601	TMGS	N	Memory Blocks				7	SGDGIADA	3	4	8	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH111	TMGS	N	GD90/1 PcktSequence Count				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH112	TMGS	N	GD90/1 Packet length				7	SGDGIADA	2	16	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH113	TMGS	N	GD90/1 DataFieldHdrTime				7	SGDGIADA	9	17	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH114	TMGS	N	GD90/1 DataFieldHdr PUS				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH141	TMGS	N	GD90/4 PcktSequence Count				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH142	TMGS	N	GD90/4 Packet length				7	SGDGIADA	2	16	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH143	TMGS	N	GD90/4 DataFieldHdrTime				7	SGDGIADA	9	17	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH144	TMGS	N	GD90/4 DataFieldHdr PUS				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH171	TMGS	N	GD90/7 PcktSequence Count				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH172	TMGS	N	GD90/7 Packet length				7	SGDGIADA	2	16	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH173	TMGS	N	GD90/7 DataFieldHdrTime				7	SGDGIADA	9	17	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH174	TMGS	N	GD90/7 DataFieldHdr PUS				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH191	TMGS	N	GD90/9 PcktSequence Count				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH192	TMGS	N	GD90/9 Packet length				7	SGDGIADA	2	16	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH193	TMGS	N	GD90/9 DataFieldHdrTime				7	SGDGIADA	9	17	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH194	TMGS	N	GD90/9 DataFieldHdr PUS				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH1B1	TMGS	N	GD90/11 PcktSequenceCount				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH1B2	TMGS	N	GD90/11 Packet length				7	SGDGIADA	2	16	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH1B3	TMGS	N	GD90/11 DataFieldHdrTime				7	SGDGIADA	9	17	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH1B4	TMGS	N	GD90/11 DataFieldHdr PUS				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH1C1	TMGS	N	GD90/12 PcktSequenceCount				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH1C2	TMGS	N	GD90/12 Packet length				7	SGDGIADA	2	16	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAH1C3	TMGS	N	GD90/12 DataFieldHdrTime				7	SGDGIADA	9	17	48	T_48_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAH1C4	TMGS	N	GD90/12 DataFieldHdr PUS				7	SGDGIADA	3	14	32	T_32_BIT			NONE				UGDGIADA				N	N																								0	0
NGDAST01	TMGS	N	Global PID				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST02	TMGS	N	Sequence Control				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST03	TMGS	N	FailureCode				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST04	TMGS	N	Packet Service Info				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST10	TMGS	N	Length in TC header				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST11	TMGS	N	Nb of received bytes				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST12	TMGS	N	ReceivedChecksum				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST13	TMGS	N	ComputedChecksum				7	SGDGIADA	3	12	16	T_WORD			NONE				UGDGIADA				N	N																								0	0
NGDAST14	TMGS	N	FC4_Par3				7	SGDGIADA	3	12	16	T_WORD			DIG	CGDV0001			UGDGIADA				N	N																								0	0

NGDAST15	TMGS	N	FC5_Par3	7	SGDGIADA	3	12	16	T_WORD		DIG	CGDV0002	UGDGIADA		N	N							NONE	0	0
NGDAST20	TMGS	N	InconsistentPar	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N							NONE	0	0
NGDAST30	TMGS	N	Exec FC2 subtype	7	SGDGIADA	3	12	16	T_WORD		DIG	CGDVST01	UGDGIADA		N	N							NONE	0	0
NGDAST31	TMGS	N	Exec FC2 Par	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N							NONE	0	0
NGDAST35	TMGS	N	Exec FC3 subtype	7	SGDGIADA	3	12	16	T_WORD		DIG	CGDVST02	UGDGIADA		N	N							NONE	0	0
NGDAST36	TMGS	N	Exec FC3 Par	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N							NONE	0	0
NGDAST40	TMGS	N	Exec FC4 subtype	7	SGDGIADA	3	12	16	T_WORD		DIG	CGDVST03	UGDGIADA		N	N							NONE	0	0
NGDAST41	TMGS	N	Exec FC4 Par	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N							NONE	0	0
NGDD0001	TMDP	N	SID	7	SGDGIADA	3	4	8	T_BYTE		NONE		UGDGIADA		N	N					NGDA0001	8	NONE	0	0
NGDD0002	TMDP	N	Operation Mode	7	SGDGIADA	2	8	8	T_BYTE		DIG	CGDV0005	UGDGIADA		N	N					NGDA0003	0	NONE	0	0
NGDD0003	TMDP	N	Event Report Overflow	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0003	12	NONE	0	0
NGDD0004	TMDP	N	SciTM En/Dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0003	15	NONE	0	0
NGDD0005	TMDP	N	SciTM Overflow	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0003	13	NONE	0	0
NGDD0010	TMDP	N	Frangibolt Armed	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0010	UGDGIADA		N	N					NGDA0010	6	NONE	0	0
NGDD0011	TMDP	N	Motor Stat	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0010	UGDGIADA		N	N					NGDA0010	7	NONE	0	0
NGDD0014	TMDP	N	Open reed switch	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0006	UGDGIADA		N	N					NGDA0010	10	NONE	0	0
NGDD0015	TMDP	N	Closed reed switch	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0006	UGDGIADA		N	N					NGDA0010	11	NONE	0	0
NGDD0017	TMDP	N	Cover Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0010	13	NONE	0	0
NGDD0018	TMDP	N	Motor Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0010	14	NONE	0	0
NGDD0019	TMDP	N	Frang Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0010	15	NONE	0	0
NGDD0020	TMDP	N	Temperature Frangibolt	7	SGDGIADA	3	8	12	T_12_BIT		ANA	CGDP0003	UGDGIADA	degC	N	N				LGDD0020	NGDA0011	4	NONE		
NGDD0025	TMDP	N	GDS on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0015	0	NONE	0	0
NGDD0026	TMDP	N	Laser armed	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0010	UGDGIADA		N	N					NGDA0015	1	NONE	0	0
NGDD0027	TMDP	N	Laser Power	7	SGDGIADA	2	2	2	T_2_BIT		DIG	CGDV0011	UGDGIADA		N	N					NGDA0015	2	NONE	0	0
NGDD0028	TMDP	N	Laser OpsMode	7	SGDGIADA	2	2	2	T_2_BIT		DIG	CGDV0012	UGDGIADA		N	N					NGDA0015	4	NONE	0	0
NGDD0029	TMDP	N	LeftReceiver En/Dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0015	6	NONE	0	0
NGDD0030	TMDP	N	RightReceiver En/Dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0015	7	NONE	0	0
NGDD0031	TMDP	N	Nb of Detections	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N					NGDA0015	14	NONE	0	0
NGDD0032	TMDP	N	Temperature Laser 1	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0025:RV=1	ANA	CGDP0004	UGDGIADA	degC	N	N				LGDD0032	NGDA0016	4	NONE	0	0
NGDD0033	TMDP	N	Temperature Laser 2	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0025:RV=1	ANA	CGDP0004	UGDGIADA	degC	N	N				LGDD0033	NGDA0017	4	NONE	0	0
NGDD0034	TMDP	N	Temperature Laser 3	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0025:RV=1	ANA	CGDP0004	UGDGIADA	degC	N	N				LGDD0034	NGDA0018	4	NONE	0	0
NGDD0035	TMDP	N	Temperature Laser 4	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0025:RV=1	ANA	CGDP0004	UGDGIADA	degC	N	N				LGDD0035	NGDA0019	4	NONE		
NGDD0036	TMDP	N	Light Monitoring Laser 1	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0090:RV=1	ANA	CGDP0005	UGDGIADA	Watt	N	N				LGDD0036	NGDA0020	4	NONE	0	0
NGDD0037	TMDP	N	Light Monitoring Laser 2	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0090:RV=1	ANA	CGDP0006	UGDGIADA	Watt	N	N				LGDD0037	NGDA0021	4	NONE	0	0
NGDD0038	TMDP	N	Light Monitoring Laser 3	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0090:RV=1	ANA	CGDP0007	UGDGIADA	Watt	N	N				LGDD0038	NGDA0022	4	NONE	0	0
NGDD0039	TMDP	N	Light Monitoring Laser 4	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0090:RV=1	ANA	CGDP0008	UGDGIADA	Watt	N	N				LGDD0039	NGDA0023	4	NONE	0	0
NGDD0040	TMDP	N	Threshold Left	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0024	0	NONE	0	0
NGDD0041	TMDP	N	Threshold Right	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0024	8	NONE	0	0
NGDD0045	TMDP	N	IS on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0030	0	NONE	0	0
NGDD0046	TMDP	N	PZTE en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0030	3	NONE	0	0
NGDD0047	TMDP	N	PZTD en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0030	4	NONE	0	0
NGDD0048	TMDP	N	PZTC en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0030	5	NONE	0	0
NGDD0049	TMDP	N	PZTB en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0030	6	NONE	0	0
NGDD0050	TMDP	N	PZTA en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0030	7	NONE	0	0
NGDD0051	TMDP	N	Range	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0013	UGDGIADA		N	N					NGDA0030	8	NONE	0	0
NGDD0052	TMDP	N	Gain PZTE	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0013	UGDGIADA		N	N					NGDA0030	11	NONE	0	0
NGDD0053	TMDP	N	Gain PZTD	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0013	UGDGIADA		N	N					NGDA0030	12	NONE	0	0
NGDD0056	TMDP	N	Gain PZTA	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0013	UGDGIADA		N	N					NGDA0030	15	NONE	0	0
NGDD0057	TMDP	N	Temperature IS Plate	7	SGDGIADA	3	8	12	T_12_BIT		ANA	CGDP0009	UGDGIADA	degC	N	N				LGDD0057	NGDA0031	4	NONE	0	0
NGDD0058	TMDP	N	PZTA Threshold	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0032	8	NONE	0	0
NGDD0059	TMDP	N	PZTB Threshold	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0032	16	NONE	0	0
NGDD0060	TMDP	N	PZTC Threshold	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0032	24	NONE	0	0
NGDD0061	TMDP	N	PZTD Threshold	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0032	32	NONE	0	0
NGDD0062	TMDP	N	PZTE Threshold	7	SGDGIADA	3	4	8	T_BYTE		ANA	CGDP0002	UGDGIADA	V	N	N					NGDA0032	40	NONE	0	0
NGDD0065	TMDP	N	MBS on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0035	0	NONE	0	0
NGDD0066	TMDP	N	MB5 en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0035	3	NONE	0	0
NGDD0067	TMDP	N	MB4 en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0035	4	NONE	0	0
NGDD0068	TMDP	N	MB3 en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0035	5	NONE	0	0
NGDD0069	TMDP	N	MB2 en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0035	6	NONE	0	0
NGDD0070	TMDP	N	MB1 en/dis	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0004	UGDGIADA		N	N					NGDA0035	7	NONE	0	0
NGDD0071	TMDP	N	MB5 Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0035	11	NONE	0	0
NGDD0072	TMDP	N	MB4 Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0035	12	NONE	0	0
NGDD0073	TMDP	N	MB3 Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0035	13	NONE	0	0
NGDD0074	TMDP	N	MB2 Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0035	14	NONE	0	0
NGDD0075	TMDP	N	MB1 Heater on/off	7	SGDGIADA	1	0	1	T_1_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0035	15	NONE	0	0
NGDD0076	TMDP	N	Temperature MBS1	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0065:RV=1	ANA	CGDP0010	UGDGIADA	degC	N	N				LGDD0076	NGDA0036	4	NONE	0	0
NGDD0077	TMDP	N	Temperature MBS2	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0065:RV=1	ANA	CGDP0011	UGDGIADA	degC	N	N				LGDD0077	NGDA0037	4	NONE	0	0
NGDD0078	TMDP	N	Temperature MBS3	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0065:RV=1	ANA	CGDP0012	UGDGIADA	degC	N	N				LGDD0078	NGDA0038	4	NONE		
NGDD0079	TMDP	N	Temperature MBS4	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0065:RV=1	ANA	CGDP0013	UGDGIADA	degC	N	N				LGDD0079	NGDA0039	4	NONE	0	0
NGDD0080	TMDP	N	Temperature MBS5	7	SGDGIADA	3	8	12	T_12_BIT	ROS.TM.NGDD0065:RV=1	ANA	CGDP0014	UGDGIADA	degC	N	N				LGDD0080	NGDA0040	4	NONE	0	0
NGDD0085	TMDP	N	Temperature PS	7	SGDGIADA	3	8	12	T_12_BIT		ANA	CGDP0015	UGDGIADA	degC	N	N				LGDD0085	NGDA0045	4	NONE	0	0
NGDD0086	TMDP	N	Current +5V	7	SGDGIADA	3	8	12	T_12_BIT		ANA	CGDP0016	UGDGIADA	mA	N	N				LGDD0086	NGDA0046	4	NONE	0	0
NGDD0087	TMDP	N	Current +15V	7	SGDGIADA	3	8	12	T_12_BIT		ANA	CGDP0017	UGDGIADA	mA	N	N				LGDD0087	NGDA0047	4	NONE	0	0
NGDD0088	TMDP	N	Current -15V	7	SGDGIADA	3	8	12	T_12_BIT		ANA	CGDP0018	UGDGIADA	mA	N	N				LGDD0088	NGDA0048	4	NONE		
NGDD0090	TMDP	N	Lsr Pwr Sup On/Off	7	SGDGIADA	2	2	2	T_2_BIT		DIG	CGDV0003	UGDGIADA		N	N					NGDA0015	8	NONE	0	0
NGDD0100	TMDP	N	Time Stamp MS part	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N					NGDA0608	0	NONE	0	0
NGDD0101	TMDP	N	Time Stamp LS part	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N					NGDA0608	32	NONE	0	0
NGDDH110	TMDP	N	Data field header pad	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH114	24	NONE	0	0
NGDDH111	TMDP	N	Segmentation Flag	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N					NGDAH111	0	NONE	0	0
NGDDH112	TMDP	N	GD90/1 SourceSeqCount	7	SGDGIADA	3	10	14	T_14_BIT		NONE		UGDGIADA		N	Y	1	0	16383		NGDAH111	2	NONE	0	0
NGDDH113	TMDP	N	GIADA 90/1 Coarse time	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N					NGDAH113	0	NONE	0	0
NGDDH114	TMDP	N	GIADA 90/1Fine time	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N					NGDAH113	32	NONE	0	0
NGDDH115	TMDP	N	PUS version number	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N					NGDAH114	0	NONE	0	0
NGDDH116	TMDP	N	Checksum flag	7	SGDGIADA	2	1	1	T_1_BIT		NONE		UGDGIADA		N	N					NGDAH114	3	NONE	0	0
NGDDH117	TMDP	N	Data field header spare	7	SGDGIADA	2	4	4	T_4_BIT		NONE		UGDGIADA		N	N					NGDAH114	4	NONE	0	0
NGDDH118	TMDP	N	GIADA 90/1 Packet Type	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH114	8	NONE	0	0
NGDDH119	TMDP	N	GD90/1 Packet Subtype	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH114	16	NONE	0	0
NGDDH140	TMDP	N	Data field header pad	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH144	24	NONE	0	0
NGDDH141	TMDP	N	Segmentation Flag	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N					NGDAH141	0	NONE	0	0
NGDDH142	TMDP	N	GD90/4 SourceSeqCount	7	SGDGIADA	3	10	14	T_14_BIT		NONE		UGDGIADA		N	Y	1	0	16383		NGDAH141	2	NONE	0	0
NGDDH143	TMDP	N	GIADA 90/4 Coarse time	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N					NGDAH143	0	NONE	0	0
NGDDH144	TMDP	N	GIADA 90/4Fine time	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N					NGDAH143	32	NONE	0	0
NGDDH145	TMDP	N	PUS version number	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N					NGDAH144	0	NONE	0	0
NGDDH146	TMDP	N	Checksum flag	7	SGDGIADA	2	1	1	T_1_BIT		NONE		UGDGIADA		N	N					NGDAH144	3	NONE	0	0
NGDDH147	TMDP	N	Data field header spare	7	SGDGIADA	2	4	4	T_4_BIT		NONE		UGDGIADA		N	N					NGDAH144	4	NONE	0	0
NGDDH148	TMDP	N	GIADA 90/4 Packet Type	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH144	8	NONE	0	0
NGDDH149	TMDP	N	GD90/4 Packet Subtype	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH144	16	NONE	0	0
NGDDH170	TMDP	N	Data field header pad	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N					NGDAH174	24	NONE	0	0
NGDDH171	TMDP	N	Segmentation Flag	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N					NGDAH171	0	NONE	0	0
NGDDH172	TMDP	N	GD90/7 SourceSeqCount	7	SGDGIADA	3	10	14	T_14_BIT		NONE		UGDGIADA		N	Y	1	0	16383		NGDAH171	2	NONE	0	0
NGDDH173	TMDP	N	GIADA 90/7 Coarse time	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N					NGDAH173	0	NONE	0	0
NGDDH174	TMDP	N	GIADA 90/7Fine time	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N					NGDAH173	32	NONE	0	0
NGDDH175	TMDP	N	PUS version number	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N					NGDAH174	0	NONE	0	0
NGDDH176	TMDP	N	Checksum flag	7	SGDGIADA	2	1	1	T_1_BIT		NONE		UGDGIADA		N	N					NGDAH174	3	NONE	0	0

NGDDH177	TMDP	N	Data field header spare	7	SGDGIADA	2	4	4	T_4_BIT		NONE		UGDGIADA		N	N				NGDAH174	4	NONE							0	0
NGDDH178	TMDP	N	GIADA 90/7 Packet Type	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH174	8	NONE							0	0
NGDDH179	TMDP	N	GD 90/7 Packet Subtype	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH174	16	NONE							0	0
NGDDH190	TMDP	N	Data field header pad	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH194	24	NONE							0	0
NGDDH191	TMDP	N	Segmentation Flag	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N				NGDAH191	0	NONE							0	0
NGDDH192	TMDP	N	GD90/9 SourceSeqCount	7	SGDGIADA	3	10	14	T_14_BIT		NONE		UGDGIADA		N	Y	1	0	16383	NGDAH191	2	NONE							0	0
NGDDH193	TMDP	N	GIADA 90/9 Coarse time	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N				NGDAH193	0	NONE							0	0
NGDDH194	TMDP	N	GIADA 90/9Fine time	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N				NGDAH193	32	NONE							0	0
NGDDH195	TMDP	N	PUS version number	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N				NGDAH194	0	NONE							0	0
NGDDH196	TMDP	N	Checksum flag	7	SGDGIADA	2	1	1	T_1_BIT		NONE		UGDGIADA		N	N				NGDAH194	3	NONE							0	0
NGDDH197	TMDP	N	Data field header spare	7	SGDGIADA	2	4	4	T_4_BIT		NONE		UGDGIADA		N	N				NGDAH194	4	NONE							0	0
NGDDH198	TMDP	N	GIADA 90/9 Packet Type	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH194	8	NONE							0	0
NGDDH199	TMDP	N	GD 90/9 Packet Subtype	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH194	16	NONE							0	0
NGDDH1B0	TMDP	N	Data field header pad	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH1B4	24	NONE							0	0
NGDDH1B1	TMDP	N	Segmentation Flag	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N				NGDAH1B1	0	NONE							0	0
NGDDH1B2	TMDP	N	GD90/11 SourceSeqCount	7	SGDGIADA	3	10	14	T_14_BIT		NONE		UGDGIADA		N	Y	1	0	16383	NGDAH1B1	2	NONE							0	0
NGDDH1B3	TMDP	N	GIADA 90/11 Coarse time	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N				NGDAH1B3	0	NONE							0	0
NGDDH1B4	TMDP	N	GIADA 90/11Fine time	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N				NGDAH1B3	32	NONE							0	0
NGDDH1B5	TMDP	N	PUS version number	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N				NGDAH1B4	0	NONE							0	0
NGDDH1B6	TMDP	N	Checksum flag	7	SGDGIADA	2	1	1	T_1_BIT		NONE		UGDGIADA		N	N				NGDAH1B4	3	NONE							0	0
NGDDH1B7	TMDP	N	Data field header spare	7	SGDGIADA	2	4	4	T_4_BIT		NONE		UGDGIADA		N	N				NGDAH1B4	4	NONE							0	0
NGDDH1B8	TMDP	N	GIADA 90/11 Packet Type	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH1B4	8	NONE							0	0
NGDDH1B9	TMDP	N	GD90/11 Packet Subtype	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH1B4	16	NONE							0	0
NGDDH1C0	TMDP	N	Data field header pad	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH1C4	24	NONE							0	0
NGDDH1C1	TMDP	N	Segmentation Flag	7	SGDGIADA	2	2	2	T_2_BIT		NONE		UGDGIADA		N	N				NGDAH1C1	0	NONE							0	0
NGDDH1C2	TMDP	N	GD90/12 SourceSeqCount	7	SGDGIADA	3	10	14	T_14_BIT		NONE		UGDGIADA		N	Y	1	0	16383	NGDAH1C1	2	NONE							0	0
NGDDH1C3	TMDP	N	GIADA 90/12 Coarse time	7	SGDGIADA	3	14	32	T_32_BIT		NONE		UGDGIADA		N	N				NGDAH1C3	0	NONE							0	0
NGDDH1C4	TMDP	N	GIADA 90/12Fine time	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N				NGDAH1C3	32	NONE							0	0
NGDDH1C5	TMDP	N	PUS version number	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N				NGDAH1C4	0	NONE							0	0
NGDDH1C6	TMDP	N	Checksum flag	7	SGDGIADA	2	1	1	T_1_BIT		NONE		UGDGIADA		N	N				NGDAH1C4	3	NONE							0	0
NGDDH1C7	TMDP	N	Data field header spare	7	SGDGIADA	2	4	4	T_4_BIT		NONE		UGDGIADA		N	N				NGDAH1C4	4	NONE							0	0
NGDDH1C8	TMDP	N	GIADA 90/12 Packet Type	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH1C4	8	NONE							0	0
NGDDH1C9	TMDP	N	GD90/12 Packet Subtype	7	SGDGIADA	2	8	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAH1C4	16	NONE							0	0
NGDDST01	TMDP	N	PID	7	SGDGIADA	3	3	7	T_7_BIT		NONE		UGDGIADA		N	N				NGDAST01	5	NONE							0	0
NGDDST02	TMDP	N	PktCategory	7	SGDGIADA	3	0	4	T_4_BIT		NONE		UGDGIADA		N	N				NGDAST01	12	NONE							0	0
NGDDST03	TMDP	N	Source	7	SGDGIADA	2	3	3	T_3_BIT		NONE		UGDGIADA		N	N				NGDAST02	2	NONE							0	0
NGDDST04	TMDP	N	Counter	7	SGDGIADA	3	7	11	T_11_BIT		NONE		UGDGIADA		N	N				NGDAST02	5	NONE							0	0
NGDDST05	TMDP	N	TC Type	7	SGDGIADA	3	4	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAST04	0	NONE							0	0
NGDDST06	TMDP	N	TC Sub-type	7	SGDGIADA	3	4	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAST04	8	NONE							0	0
NGDDST10	TMDP	N	Position	7	SGDGIADA	3	4	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAST20	0	NONE							0	0
NGDDST11	TMDP	N	Value	7	SGDGIADA	3	4	8	T_BYTE		NONE		UGDGIADA		N	N				NGDAST20	8	NONE							0	0
NGDASDTB	TMGA	N	Red GIADA SDT SAMP	7	SGDGIADA	3	12	16	T_WORD		NONE		UGDGIADA		N	N						DMS	SERIAL	RBDRTUPL	237	GenericSDT	1	1	0	0
NGDA0021	TMGS	N	Laser2 light monitor Gbl	7	SGDGIADA	3	12	16	T_WORD	ROS.TM.NGDD0027:RV<>0	ANA	CGDP0006	UGDGIADA	W	N	N						NONE							0	0
NGDA0045	TMGS	N	PS Tmp Global	7	SGDGIADA	3	12	16	T_WORD	ROS.TM.NPWDA093:SPV="ON" OR ROS.TM.NPWDA213:SPV="ON"	ANA	CGDP0015	UGDGIADA	degC	N	N						NONE							0	0

NAME	GCPASS	LNAME	USAGE	PKGE_NAME	PID	PCKCATEG	SCOPE	INIT_STATE	OBSW_GENER	OBSW_DECOD	MINLENGTH	MAXLENGTH	FREQGEN	PHASEGEN	SDFVALUE	STARTDATA	COMPRESSION		NOTE	TO_BE_REARRANGED	CALCSIZE
YGD00001	N	HK Report-SID1	7	ETM00325HKPK	90	4	SPACE	AUTH	DMS	NONE	86	86	1	1	1	ALL	NONE			N	688
YGD00012	N	ConnectTestRp	7	ETM01702CTST	90	7	SPACE	AUTH	OTHER	NONE	16	16	1	1		ALL	NONE			N	128
YGD00013	N	Context Report	7	ETM01802CXRP	90	11	SPACE	AUTH	OTHER	NONE	154	154	1	1		ALL	NONE			N	128
YGD00020	N	Science packets (5 different)	7	ETM02003SDRP	90	12	SPACE	AUTH	OTHER	NONE	46	1040	1	1		ALL	NONE			N	128
YGD00601	N	Memory Dump MID 80	7	ETM00606MMDP	90	9	SPACE	AUTH	OTHER	NONE	26	4112	1	1	80	ALL	NONE			N	208
YGD00602	N	Memory Dump MID 81	7	ETM00606MMDP	90	9	SPACE	AUTH	OTHER	NONE	26	4112	1	1	81	ALL	NONE			N	208
YGD00603	N	Memory Dump MID 82	7	ETM00606MMDP	90	9	SPACE	AUTH	OTHER	NONE	26	4112	1	1	82	ALL	NONE			N	208
YGD00604	N	Memory Check MID 80	7	ETM00610MMCK	90	7	SPACE	AUTH	OTHER	NONE	26	26	1	1	80	ALL	NONE			N	208
YGD00605	N	Memory Check MID 81	7	ETM00610MMCK	90	7	SPACE	AUTH	OTHER	NONE	26	26	1	1	81	ALL	NONE			N	208
YGD00606	N	Memory Check MID 82	7	ETM00610MMCK	90	7	SPACE	AUTH	OTHER	NONE	26	26	1	1	82	ALL	NONE			N	208
YGD42001	N	Cover Heaters ON	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	20	50	1	1	42001	ALL	NONE			N	160
YGD42002	N	Cover Heaters OFF	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42002	ALL	NONE			N	160
YGD42007	N	Cover Report	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	526	526	1	1	42007	ALL	NONE			N	512
YGD42008	N	Heaters Current Consumption	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	22	22	1	1	42008	ALL	NONE			N	176
YGD42016	N	MB Heaters ON	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42016	ALL	NONE			N	160
YGD42017	N	MB Heaters OFF	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42017	ALL	NONE			N	160
YGD42032	N	Emergency_Cover_Close_OBCP	7	ETM00504EVEO	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42032	ALL	NONE			N	144
YGD42033	N	Switch_Lasers_ON_OBCP	7	ETM00504EVEO	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42033	ALL	NONE			N	144
YGD42050	N	GD in SafeMd	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42050	ALL	NONE			N	144
YGD42051	N	GD in CoverMd	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42051	ALL	NONE			N	144
YGD42052	N	GD in NormalMd	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42052	ALL	NONE			N	144
YGD42053	N	GD in FluxMd	7	ETM00501EVNM	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42053	ALL	NONE			N	144
YGD42185	N	ADC timeout	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42185	ALL	NONE			N	144
YGD42186	N	EDAC error	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	24	1	1	42186	ALL	NONE			N	192
YGD42187	N	Generic Timer IRQ Nor Arrive	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42187	ALL	NONE			N	144
YGD42200	N	Frangibolt to disarmed state	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42200	ALL	NONE			N	144
YGD42201	N	Cover to disarm state	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42201	ALL	NONE			N	144
YGD42210	N	Laser to disarmed state	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42210	ALL	NONE			N	144
YGD42211	N	Laser Tmp too high	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42211	ALL	NONE			N	160
YGD42212	N	Laser Tmp too low	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42212	ALL	NONE			N	160
YGD42213	N	HwErr in GDS event	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42213	ALL	NONE			N	144
YGD42214	N	HwErr in GDS: IRQ not Rec.	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42214	ALL	NONE			N	144
YGD42218	N	IS On due Thermal Contingency	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42218	ALL	NONE			N	160
YGD42219	N	IS Off due Thermal Contingency	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42219	ALL	NONE			N	160
YGD42220	N	IS Plate Tmp too high	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42220	ALL	NONE			N	160
YGD42222	N	HwErr in IS Event	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42222	ALL	NONE			N	144
YGD42223	N	HwErr in IS: IRQ not Rec.	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42223	ALL	NONE			N	144
YGD42230	N	MBS plate Tmp too high	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42230	ALL	NONE			N	160
YGD42232	N	HwErr in MBS Event	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42232	ALL	NONE			N	144
YGD42233	N	HwErr in MBS: IRQ not Rec.	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42233	ALL	NONE			N	144
YGD42240	N	IS Temp above Max Non Op	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42240	ALL	NONE			N	160
YGD42241	N	IS Temp below Min Temp	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42241	ALL	NONE			N	160
YGD42242	N	ME Temp above Max Op	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42242	ALL	NONE			N	160
YGD42260	N	Sheduler Full	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42260	ALL	NONE			N	144
YGD42274	N	File does not exist	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	20	20	1	1	42274	ALL	NONE			N	160
YGD42304	N	Can not add more patches	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	18	18	1	1	42304	ALL	NONE			N	144
YGD42309	N	Previous Execution due by WD	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	24	24	1	1	42309	ALL	NONE			N	192
YGD42310	N	EDAC Error during SW Start	7	ETM00503EVEG	90	7	SPACE	AUTH	OTHER	NONE	22	22	1	1	42310	ALL	NONE			N	176
YGDST001	N	AcceptSuccess	7	ETM00101TCAS	90	1	SPACE	AUTH	OTHER	NONE	20	20	1	1		ALL	NONE			N	160
YGDST002	N	IncompletePacket	7	ETM00102TCAF	90	1	SPACE	AUTH	OTHER	NONE	28	28	1	1	1	ALL	NONE	Acceptance Failure Report: Failure Code 1. Incomplete Packet within time-out		N	224
YGDST003	N	IncorrectChecksum	7	ETM00102TCAF	90	1	SPACE	AUTH	OTHER	NONE	28	28	1	1	2	ALL	NONE	Acceptance Failure Report: Failure Code 2. Incorrect Checksum		N	224
YGDST004	N	Incorrect APID	7	ETM00102TCAF	90	1	SPACE	AUTH	OTHER	NONE	24	24	1	1	3	ALL	NONE	Acceptance Failure Report: Failure Code 3. Incorrect APID		N	192
YGDST005	N	InvalidCmdCode	7	ETM00102TCAF	90	1	SPACE	AUTH	OTHER	NONE	26	26	1	1	4	ALL	NONE	Acceptance Failure Report: Failure Code 4. Invalid Command Code.		N	208
YGDST006	N	Invalid Mode for the TC Execution	7	ETM00102TCAF	90	1	SPACE	AUTH	OTHER	NONE	26	26	1	1	5	ALL	NONE	Acceptance Failure Report: Failure Code 5. Command can not be executed at this time		N	208
YGDST007	N	DataFieldInconsistent	7	ETM00102TCAF	90	1	SPACE	AUTH	OTHER	NONE	26	26	1	1	6	ALL	NONE	Acceptance Failure Report: Failure Code 6. Data Field Inconsistent		N	208
YGDST020	N	ExecutionSuccess	7	ETM00107TCES	90	1	SPACE	AUTH	OTHER	NONE	20	20	1	1		ALL	NONE			N	160
YGDST025	N	Execution Error	7	ETM00108TCEF	90	1	SPACE	AUTH	OTHER	NONE	24	24	1	1	1	ALL	NONE	Execution Failure Report: Failure Code 1. Execution Error		N	192
YGDST026	N	Cover related error	7	ETM00108TCEF	90	1	SPACE	AUTH	OTHER	NONE	28	28	1	1	2	ALL	NONE	Execution Failure Report: Failure Code 2. Cover related error		N	224
YGDST027	N	GDS related error	7	ETM00108TCEF	90	1	SPACE	AUTH	OTHER	NONE	28	28	1	1	3	ALL	NONE	Execution Failure Report: Failure Code 3. GDS related error		N	224

TMPK_NAME	TMPE_ORDER	ELTTYPE	ITEMOFFSET	TMPE_SIZE	FIXEDVALUE	REPEAT	CALCSIZE	PKBL_NAME	PKBL_CATEGORY	TMPA_NAME	EXCP_CODE	NGRPSIZE
YGD42001	0	BLOCK	0	128		1	128	WGD09007	PKBM			
YGD42001	1	PARAM	128	16		1	16			NGDA0059		
YGD42001	2	PARAM	144	16		1	16			NGDA0060		
YGD00001	0	BLOCK	0	128		1	128	WGD09004	PKBM			
YGD00001	1	PARAM	128	16		1	16			NGDA0001		
YGD00001	2	PARAM	144	16		1	16			NGDA0002		
YGD00001	3	PARAM	160	16		1	16			NGDA0003		
YGD00001	4	PARAM	176	16		1	16			NGDA0010		
YGD00001	5	PARAM	192	16		1	16			NGDA0011		
YGD00001	6	PARAM	208	16		1	16			NGDA0015		
YGD00001	7	PARAM	224	16		1	16			NGDA0016		
YGD00001	8	PARAM	240	16		1	16			NGDA0017		
YGD00001	9	PARAM	256	16		1	16			NGDA0018		
YGD00001	10	PARAM	272	16		1	16			NGDA0019		
YGD00001	11	PARAM	288	16		1	16			NGDA0020		
YGD00001	12	PARAM	304	16		1	16			NGDA0021		
YGD00001	13	PARAM	320	16		1	16			NGDA0022		
YGD00001	14	PARAM	336	16		1	16			NGDA0023		
YGD00001	15	PARAM	352	16		1	16			NGDA0024		
YGD00001	16	PARAM	368	16		1	16			NGDA0030		
YGD00001	17	PARAM	384	16		1	16			NGDA0031		
YGD00001	18	PARAM	400	48		1	48			NGDA0032		
YGD00001	19	PARAM	448	16		1	16			NGDA0035		
YGD00001	20	PARAM	464	16		1	16			NGDA0036		
YGD00001	21	PARAM	480	16		1	16			NGDA0037		
YGD00001	22	PARAM	496	16		1	16			NGDA0038		
YGD00001	23	PARAM	512	16		1	16			NGDA0039		
YGD00001	24	PARAM	528	16		1	16			NGDA0040		
YGD00001	25	PARAM	544	16		1	16			NGDA0045		
YGD00001	26	PARAM	560	16		1	16			NGDA0046		
YGD00001	27	PARAM	576	16		1	16			NGDA0047		
YGD00001	28	PARAM	592	16		1	16			NGDA0048		
YGD00001	29	PARAM	608	32		1	32			NGDA0050		
YGD00001	31	PARAM	672	16		1	16			NGDA0054		
YGD00012	0	BLOCK	0	128		1	128	WGD09007	PKBM			
YGD00013	0	BLOCK	0	128		1	128	WGD09011	PKBM			
YGD00020	0	BLOCK	0	128		1	128	WGD09012	PKBM			
YGD00601	0	BLOCK	0	128		1	128	WGD09009	PKBM			
YGD00601	1	PARAM	128	8		1	8			NGDA0601		
YGD00601	2	PARAM	136	8		1	8			NGDA1601		3
YGD00601	3	PARAM	144	32		1	32			NGDA0602		
YGD00601	4	PARAM	176	16		1	16			NGDA0603		1
YGD00601	5	PARAM	192	16		1	16			NGDA0604		
YGD00602	0	BLOCK	0	128		1	128	WGD09009	PKBM			
YGD00602	1	PARAM	128	8		1	8			NGDA0601		
YGD00602	2	PARAM	136	8		1	8			NGDA1601		3
YGD00602	3	PARAM	144	32		1	32			NGDA0602		
YGD00602	4	PARAM	176	16		1	16			NGDA0603		1
YGD00602	5	PARAM	192	16		1	16			NGDA0604		

YGD00603	0	BLOCK	0	128	1	128	WGD09009	PKBM		
YGD00603	1	PARAM	128	8	1	8			NGDA0601	
YGD00603	2	PARAM	136	8	1	8			NGDA1601	3
YGD00603	3	PARAM	144	32	1	32			NGDA0602	
YGD00603	4	PARAM	176	16	1	16			NGDA0603	1
YGD00603	5	PARAM	192	16	1	16			NGDA0604	
YGD00604	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD00604	1	PARAM	128	8	1	8			NGDA0601	
YGD00604	2	PARAM	136	8	1	8			NGDA1601	3
YGD00604	3	PARAM	144	32	1	32			NGDA0602	
YGD00604	4	PARAM	176	16	1	16			NGDA0603	
YGD00604	5	PARAM	192	16	1	16			NGDA0605	
YGD00605	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD00605	1	PARAM	128	8	1	8			NGDA0601	
YGD00605	2	PARAM	136	8	1	8			NGDA1601	3
YGD00605	3	PARAM	144	32	1	32			NGDA0602	
YGD00605	4	PARAM	176	16	1	16			NGDA0603	
YGD00605	5	PARAM	192	16	1	16			NGDA0605	
YGD00606	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD00606	1	PARAM	128	8	1	8			NGDA0601	
YGD00606	2	PARAM	136	8	1	8			NGDA1601	3
YGD00606	3	PARAM	144	32	1	32			NGDA0602	
YGD00606	4	PARAM	176	16	1	16			NGDA0603	
YGD00606	5	PARAM	192	16	1	16			NGDA0605	
YGD42002	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42002	1	PARAM	128	16	1	16			NGDA0059	
YGD42002	2	PARAM	144	16	1	16			NGDA0060	
YGD42007	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42007	1	PARAM	128	16	1	16			NGDA0059	
YGD42007	2	PARAM	144	16	1	16			NGDA0607	
YGD42007	3	PARAM	160	48	1	48			NGDA0608	
YGD42007	4	PARAM	208	32	1	32			NGDA0609	
YGD42007	5	PARAM	240	32	1	32			NGDA0610	
YGD42007	6	PARAM	272	32	1	32			NGDA0611	
YGD42007	7	PARAM	304	32	1	32			NGDA0612	
YGD42007	8	PARAM	336	32	1	32			NGDA0613	
YGD42007	9	PARAM	368	32	1	32			NGDA0614	
YGD42007	10	PARAM	400	32	1	32			NGDA0615	
YGD42007	11	PARAM	432	32	1	32			NGDA0616	
YGD42007	12	PARAM	464	48	1	48			NGDA0608	
YGD42008	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42008	1	PARAM	128	16	1	16			NGDA0059	
YGD42008	2	PARAM	144	16	1	16			NGDA0047	
YGD42008	3	PARAM	160	16	1	16			NGDA0048	
YGD42016	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42016	1	PARAM	128	16	1	16			NGDA0059	
YGD42016	2	PARAM	144	16	1	16			NGDA0620	
YGD42017	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42017	1	PARAM	128	16	1	16			NGDA0059	
YGD42017	2	PARAM	144	16	1	16			NGDA0620	
YGD42032	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42032	1	PARAM	128	16	1	16			NGDA0059	
YGD42033	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42033	1	PARAM	128	16	1	16			NGDA0059	
YGD42050	0	BLOCK	0	128	1	128	WGD09007	PKBM		
YGD42050	1	PARAM	128	16	1	16			NGDA0059	

YGD42051	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42051	1	PARAM	128	16	1	16			NGDA0059
YGD42052	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42052	1	PARAM	128	16	1	16			NGDA0059
YGD42053	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42053	1	PARAM	128	16	1	16			NGDA0059
YGD42185	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42185	1	PARAM	128	16	1	16			NGDA0059
YGD42186	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42186	1	PARAM	128	16	1	16			NGDA0059
YGD42186	2	PARAM	144	16	1	16			NGDA0624
YGD42186	3	PARAM	160	16	1	16			NGDA0625
YGD42186	4	PARAM	176	16	1	16			NGDA0626
YGD42187	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42187	1	PARAM	128	16	1	16			NGDA0059
YGD42200	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42200	1	PARAM	128	16	1	16			NGDA0059
YGD42201	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42201	1	PARAM	128	16	1	16			NGDA0059
YGD42210	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42210	1	PARAM	128	16	1	16			NGDA0059
YGD42211	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42211	1	PARAM	128	16	1	16			NGDA0059
YGD42211	2	PARAM	144	16	1	16			NGDA0062
YGD42212	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42212	1	PARAM	128	16	1	16			NGDA0059
YGD42212	2	PARAM	144	16	1	16			NGDA0062
YGD42213	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42213	1	PARAM	128	16	1	16			NGDA0059
YGD42214	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42214	1	PARAM	128	16	1	16			NGDA0059
YGD42218	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42218	1	PARAM	128	16	1	16			NGDA0059
YGD42218	2	PARAM	144	16	1	16			NGDA0628
YGD42219	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42219	1	PARAM	128	16	1	16			NGDA0059
YGD42219	2	PARAM	144	16	1	16			NGDA0628
YGD42220	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42220	1	PARAM	128	16	1	16			NGDA0059
YGD42220	2	PARAM	144	16	1	16			NGDA0628
YGD42222	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42222	1	PARAM	128	16	1	16			NGDA0059
YGD42223	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42223	1	PARAM	128	16	1	16			NGDA0059
YGD42230	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42230	1	PARAM	128	16	1	16			NGDA0059
YGD42230	2	PARAM	144	16	1	16			NGDA0629
YGD42232	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42232	1	PARAM	128	16	1	16			NGDA0059
YGD42233	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42233	1	PARAM	128	16	1	16			NGDA0059
YGD42240	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42240	1	PARAM	128	16	1	16			NGDA0059
YGD42240	2	PARAM	144	16	1	16			NGDA0628
YGD42241	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42241	1	PARAM	128	16	1	16			NGDA0059

YGD42241	2	PARAM	144	16	1	16			NGDA0628
YGD42242	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42242	1	PARAM	128	16	1	16			NGDA0059
YGD42242	2	PARAM	144	16	1	16			NGDA0630
YGD42260	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42260	1	PARAM	128	16	1	16			NGDA0059
YGD42274	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42274	1	PARAM	128	16	1	16			NGDA0059
YGD42274	2	PARAM	144	16	1	16			NGDA0627
YGD42304	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42304	1	PARAM	128	16	1	16			NGDA0059
YGD42309	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42309	1	PARAM	128	16	1	16			NGDA0059
YGD42309	2	PARAM	144	16	1	16			NGDA0621
YGD42309	3	PARAM	160	16	1	16			NGDA0622
YGD42309	4	PARAM	176	16	1	16			NGDA0623
YGD42310	0	BLOCK	0	128	1	128	WGD09007	PKBM	
YGD42310	1	PARAM	128	16	1	16			NGDA0059
YGD42310	2	PARAM	144	16	1	16			NGDA0622
YGD42310	3	PARAM	160	16	1	16			NGDA0623
YGDST001	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST001	1	PARAM	128	16	1	16			NGDAST01
YGDST001	2	PARAM	144	16	1	16			NGDAST02
YGDST002	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST002	1	PARAM	128	16	1	16			NGDAST01
YGDST002	2	PARAM	144	16	1	16			NGDAST02
YGDST002	3	PARAM	160	16	1	16			NGDAST03
YGDST002	4	PARAM	176	16	1	16			NGDAST04
YGDST002	5	PARAM	192	16	1	16			NGDAST10
YGDST002	6	PARAM	208	16	1	16			NGDAST11
YGDST003	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST003	1	PARAM	128	16	1	16			NGDAST01
YGDST003	2	PARAM	144	16	1	16			NGDAST02
YGDST003	3	PARAM	160	16	1	16			NGDAST03
YGDST003	4	PARAM	176	16	1	16			NGDAST04
YGDST003	5	PARAM	192	16	1	16			NGDAST12
YGDST003	6	PARAM	208	16	1	16			NGDAST13
YGDST004	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST004	1	PARAM	128	16	1	16			NGDAST01
YGDST004	2	PARAM	144	16	1	16			NGDAST02
YGDST004	3	PARAM	160	16	1	16			NGDAST03
YGDST004	4	PARAM	176	16	1	16			NGDAST04
YGDST005	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST005	1	PARAM	128	16	1	16			NGDAST01
YGDST005	2	PARAM	144	16	1	16			NGDAST02
YGDST005	3	PARAM	160	16	1	16			NGDAST03
YGDST005	4	PARAM	176	16	1	16			NGDAST04
YGDST005	5	PARAM	192	16	1	16			NGDAST14
YGDST006	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST006	1	PARAM	128	16	1	16			NGDAST01
YGDST006	2	PARAM	144	16	1	16			NGDAST02
YGDST006	3	PARAM	160	16	1	16			NGDAST03
YGDST006	4	PARAM	176	16	1	16			NGDAST04
YGDST006	5	PARAM	192	16	1	16			NGDAST15
YGDST007	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST007	1	PARAM	128	16	1	16			NGDAST01

YGDST007	2	PARAM	144	16	1	16			NGDAST02
YGDST007	3	PARAM	160	16	1	16			NGDAST03
YGDST007	4	PARAM	176	16	1	16			NGDAST04
YGDST007	5	PARAM	192	16	1	16			NGDAST20
YGDST020	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST020	1	PARAM	128	16	1	16			NGDAST01
YGDST020	2	PARAM	144	16	1	16			NGDAST02
YGDST025	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST025	1	PARAM	128	16	1	16			NGDAST01
YGDST025	2	PARAM	144	16	1	16			NGDAST02
YGDST025	3	PARAM	160	16	1	16			NGDAST03
YGDST025	4	PARAM	176	16	1	16			NGDAST04
YGDST026	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST026	1	PARAM	128	16	1	16			NGDAST01
YGDST026	2	PARAM	144	16	1	16			NGDAST02
YGDST026	3	PARAM	160	16	1	16			NGDAST03
YGDST026	4	PARAM	176	16	1	16			NGDAST04
YGDST026	5	PARAM	192	16	1	16			NGDAST30
YGDST026	6	PARAM	208	16	1	16			NGDAST31
YGDST027	0	BLOCK	0	128	1	128	WGD09001	PKBM	
YGDST027	1	PARAM	128	16	1	16			NGDAST01
YGDST027	2	PARAM	144	16	1	16			NGDAST02
YGDST027	3	PARAM	160	16	1	16			NGDAST03
YGDST027	4	PARAM	176	16	1	16			NGDAST04
YGDST027	5	PARAM	192	16	1	16			NGDAST35
YGDST027	6	PARAM	208	16	1	16			NGDAST36
YGD00001	30	PARAM	640	32	1	32			NGDA0051

NAME	GCPASS		LNAME	MIMIC	BACKGCOLOR	FOREGCOLOR	UPDATERATE
DGDA0100	N	GIADA PID 90 Packet Info		N	BLACK	GREEN	1
DGDA0001	N	GIADA Status		N	BLACK	GREEN	2
DGDA0002	N	GIADA Cover/Fgbolt Status		N	BLACK	GREEN	2
DGDA0003	N	GIADA MBS Status		N	BLACK	GREEN	2
DGDA0004	N	GIADA GDS Status		N	BLACK	GREEN	2
DGDA0005	N	GIADA IS Status		N	BLACK	GREEN	2

ALND_NAME	TMPA_NAME	DISPROW	DISPCOLUMN	DEPENDENCY	COMMUTATION	DISPFORMAT
DGDA0003	NGDD0074	9	0	INDEP	1	CAL
DGDA0003	NGDD0077	10	0	INDEP	1	CAL
DGDA0003	NGDD0068	12	0	INDEP	1	CAL
DGDA0003	NGDD0073	13	0	INDEP	1	CAL
DGDA0003	NGDD0078	14	0	INDEP	1	CAL
DGDA0003	NGDD0067	16	0	INDEP	1	CAL
DGDA0003	NGDD0072	17	0	INDEP	1	CAL
DGDA0003	NGDD0079	18	0	INDEP	1	CAL
DGDA0003	NGDD0066	20	0	INDEP	1	CAL
DGDA0003	NGDD0071	21	0	INDEP	1	CAL
DGDA0003	NGDD0080	22	0	INDEP	1	CAL
DGDA0004	NGDD0002	1	0	INDEP	1	CAL
DGDA0004	NGDD0025	2	0	INDEP	1	CAL
DGDA0004	NGDD0026	4	0	INDEP	1	CAL
DGDA0004	NGDD0027	5	0	INDEP	1	CAL
DGDA0004	NGDD0028	6	0	INDEP	1	CAL
DGDA0004	NGDD0029	7	0	INDEP	1	CAL
DGDA0004	NGDD0030	8	0	INDEP	1	CAL
DGDA0004	NGDD0031	9	0	INDEP	1	CAL
DGDA0001	NPWDA093	1	0	INDEP	1	CAL
DGDA0001	NPWDA213	2	0	INDEP	1	CAL
DGDA0001	NPWDA380	4	0	INDEP	1	CAL
DGDA0001	NPWDA700	5	0	INDEP	1	CAL
DGDA0001	NGDD0002	7	0	INDEP	1	CAL
DGDA0001	NGDD0085	8	0	INDEP	1	CAL
DGDA0001	NGDD0086	9	0	INDEP	1	CAL
DGDA0001	NGDD0087	10	0	INDEP	1	CAL
DGDA0001	NGDD0088	11	0	INDEP	1	CAL
DGDA0001	NGDD0003	12	0	INDEP	1	CAL
DGDA0001	NGDD0004	13	0	INDEP	1	CAL
DGDA0001	NGDD0005	14	0	INDEP	1	CAL
DGDA0001	NGDA0002	15	0	INDEP	1	CAL
DGDA0100	NGDA0059	19	0	INDEP	1	DEC
DGDA0100	NGDAH112	1	0	INDEP	1	DEC
DGDA0100	NGDAH113	2	0	INDEP	1	DEC
DGDA0100	NGDAH142	8	0	INDEP	1	DEC
DGDA0100	NGDAH143	9	0	INDEP	1	DEC
DGDA0100	NGDAH172	15	0	INDEP	1	DEC
DGDA0100	NGDAH173	16	0	INDEP	1	DEC
DGDA0100	NGDAH192	22	0	INDEP	1	DEC
DGDA0100	NGDAH193	23	0	INDEP	1	DEC
DGDA0100	NGDAH1C2	28	0	INDEP	1	DEC
DGDA0100	NGDAH1C3	29	0	INDEP	1	DEC
DGDA0100	NGDAST03	5	0	INDEP	1	DEC
DGDA0100	NGDD0001	12	0	INDEP	1	DEC
DGDA0100	NGDDH112	0	0	INDEP	1	DEC
DGDA0100	NGDDH118	3	0	INDEP	1	DEC
DGDA0100	NGDDH119	4	0	INDEP	1	DEC
DGDA0100	NGDDH142	7	0	INDEP	1	DEC
DGDA0100	NGDDH148	10	0	INDEP	1	DEC
DGDA0100	NGDDH149	11	0	INDEP	1	DEC
DGDA0100	NGDDH172	14	0	INDEP	1	DEC
DGDA0100	NGDDH178	17	0	INDEP	1	DEC

DGDA0100	NGDDH179	18	0	INDEP	1	DEC
DGDA0100	NGDDH192	21	0	INDEP	1	DEC
DGDA0100	NGDDH198	24	0	INDEP	1	DEC
DGDA0100	NGDDH199	25	0	INDEP	1	DEC
DGDA0100	NGDDH1C2	27	0	INDEP	1	DEC
DGDA0100	NGDDH1C8	30	0	INDEP	1	DEC
DGDA0100	NGDDH1C9	31	0	INDEP	1	DEC
DGDA0001	NGDD0010	18	0	INDEP	1	CAL
DGDA0001	NGDD0011	19	0	INDEP	1	CAL
DGDA0001	NGDD0045	20	0	INDEP	1	CAL
DGDA0001	NGDD0025	21	0	INDEP	1	CAL
DGDA0001	NGDD0026	22	0	INDEP	1	CAL
DGDA0001	NGDD0065	23	0	INDEP	1	CAL
DGDA0002	NGDD0002	1	0	INDEP	1	CAL
DGDA0002	NGDD0010	3	0	INDEP	1	CAL
DGDA0002	NGDD0011	4	0	INDEP	1	CAL
DGDA0002	NGDD0014	5	0	INDEP	1	CAL
DGDA0002	NGDD0015	6	0	INDEP	1	CAL
DGDA0002	NGDD0017	7	0	INDEP	1	CAL
DGDA0002	NGDD0018	8	0	INDEP	1	CAL
DGDA0002	NGDD0019	9	0	INDEP	1	CAL
DGDA0002	NGDD0020	10	0	INDEP	1	CAL
DGDA0003	NGDD0002	1	0	INDEP	1	CAL
DGDA0003	NGDD0065	2	0	INDEP	1	CAL
DGDA0003	NGDD0070	4	0	INDEP	1	CAL
DGDA0003	NGDD0075	5	0	INDEP	1	CAL
DGDA0003	NGDD0076	6	0	INDEP	1	CAL
DGDA0003	NGDD0069	8	0	INDEP	1	CAL
DGDA0001	NGDA0050	16	0	INDEP	1	CAL
DGDA0004	NGDD0032	11	0	INDEP	1	CAL
DGDA0004	NGDD0033	12	0	INDEP	1	CAL
DGDA0004	NGDD0034	13	0	INDEP	1	CAL
DGDA0004	NGDD0035	14	0	INDEP	1	CAL
DGDA0004	NGDD0036	15	0	INDEP	1	CAL
DGDA0004	NGDD0037	16	0	INDEP	1	CAL
DGDA0004	NGDD0038	17	0	INDEP	1	CAL
DGDA0004	NGDD0039	18	0	INDEP	1	CAL
DGDA0004	NGDD0040	20	0	INDEP	1	CAL
DGDA0004	NGDD0041	21	0	INDEP	1	CAL
DGDA0005	NGDD0002	1	0	INDEP	1	CAL
DGDA0005	NGDD0045	2	0	INDEP	1	CAL
DGDA0005	NGDD0051	4	0	INDEP	1	CAL
DGDA0005	NGDD0050	6	0	INDEP	1	CAL
DGDA0005	NGDD0049	7	0	INDEP	1	CAL
DGDA0005	NGDD0048	8	0	INDEP	1	CAL
DGDA0005	NGDD0047	9	0	INDEP	1	CAL
DGDA0005	NGDD0046	10	0	INDEP	1	CAL
DGDA0005	NGDD0056	12	0	INDEP	1	CAL
DGDA0005	NGDD0053	13	0	INDEP	1	CAL
DGDA0005	NGDD0052	14	0	INDEP	1	CAL
DGDA0005	NGDD0057	16	0	INDEP	1	CAL
DGDA0005	NGDD0058	18	0	INDEP	1	CAL
DGDA0005	NGDD0059	19	0	INDEP	1	CAL
DGDA0005	NGDD0060	20	0	INDEP	1	CAL
DGDA0005	NGDD0061	21	0	INDEP	1	CAL
DGDA0005	NGDD0062	22	0	INDEP	1	CAL
DGDA0005	NGDA0030	23	0	INDEP	1	CAL
DGDA0001	NGDA0051	17	0	INDEP	1	CAL

DGDG0100	NAME
N	GCPASS
GIADA TRP 12h	LNAME
TIME	PLOTTYPE
0	DURATIONDAY
12	DURATIONHOR
0	DURATIONMIN
12	XTICS
9	YTICS
6	XGRIDS
9	YGRIDS
RED	AXISCOLOR
2	UPDATERATE
Y	AUTOSCROLL
N	AUTOPRINT
	TMPA_NAME
F	DISPLAYTYPE

DGDG0100	GRAD_NAME
NTSA0193	TMPA_NAME
YELLOW	PLOTCOLOR
S1	PLOTSYMBOL
0	LINETYPE
CAL	CALIBRATED
1	PLOTAREA
-30	YMINVALUE
60	YMAXVALUE

NAME	GCPASS		LNAME	CALTYPE	REVERSIBLE	PTIT_NAME	ADA_NAME
CGDP0001	N	Voltage		CPOI	Y	IGDGIADA	
CGDP0002	N	Threshold		CPOI	Y	IGDGIADA	
CGDV0001	N	FC4_Par3 Cal		SVAL	Y	IGDGIADA	
CGDV0002	N	FC5_Par3 Cal		SVAL	Y	IGDGIADA	
CGDV0003	N	ON/OFF		SVAL	Y	IGDGIADA	
CGDV0004	N	Enabled/Disabled		SVAL	Y	IGDGIADA	
CGDV0005	N	Operation Mode		SVAL	Y	IGDGIADA	
CGDV0006	N	Open/Closed		SVAL	Y	IGDGIADA	
CGDV0007	N	Cover Open Cal		SVAL	Y	IGDGIADA	
CGDV0008	N	Cover Closed Cal		SVAL	Y	IGDGIADA	
CGDV0009	N	Activated/Deactivated		SVAL	Y	IGDGIADA	
CGDV0010	N	Armed/Disarmed		SVAL	Y	IGDGIADA	
CGDV0011	N	Laser Power		SVAL	Y	IGDGIADA	
CGDV0012	N	Laser Ops Mode		SVAL	Y	IGDGIADA	
CGDV0013	N	Low/High		SVAL	Y	IGDGIADA	
CGDV0014	N	On/Off on 16 bits		SVAL	Y	IGDGIADA	
CGDV0015	N	Selected heaters		SVAL	Y	IGDGIADA	
CGDVST01	N	Execerror FC2_Par3 Cal		SVAL	Y	IGDGIADA	
CGDVST02	N	Execerror FC3_Par3 Cal		SVAL	Y	IGDGIADA	
CGDVST03	N	Execerror FC4_Par3 Cal		SVAL	Y	IGDGIADA	
CGDP0003	N	FB Temperature		CPOI	Y	IGDGIADA	
CGDP0004	N	Laser 1,2,3,4 Temperatures		CPOI	Y	IGDGIADA	
CGDP0005	N	Laser 1 Light Mon.		CPOI	Y	IGDGIADA	
CGDP0006	N	Laser 2Light Mon.		CPOI	Y	IGDGIADA	
CGDP0007	N	Laser 3 Light Mon.		CPOI	Y	IGDGIADA	
CGDP0008	N	Laser 4 Light Mon.		CPOI	Y	IGDGIADA	
CGDP0009	N	IS Plate Temperature		CPOI	Y	IGDGIADA	
CGDP0010	N	MBS1 Temperature		CPOI	Y	IGDGIADA	
CGDP0011	N	MBS2 Temperature		CPOI	Y	IGDGIADA	
CGDP0012	N	MBS3 Temperature		CPOI	Y	IGDGIADA	
CGDP0013	N	MBS4 Temperature		CPOI	Y	IGDGIADA	
CGDP0014	N	MBS5 Temperature		CPOI	Y	IGDGIADA	
CGDP0015	N	PS Temperature		CPOI	Y	IGDGIADA	
CGDP0016	N	+5V Power Consum		CPOI	Y	IGDGIADA	
CGDP0017	N	+15V Power Consum		CPOI	Y	IGDGIADA	
CGDP0018	N	-15V Power Consum		CPOI	Y	IGDGIADA	

CALC_NAME	MODL_MODEL	GCPASS		LNAME	COEFF0	COEFF1	DEFAULTTEXT	CALC_CALTYPE
CGDP0001	MPFSGIADA	N	Voltage					CPOI
CGDP0002	MPFSGIADA	N	Threshold					CPOI
CGDV0013	MPFSGIADA	N	Low/High				Invalid	SVAL
CGDVST03	MPFSGIADA	N	Execerror FC4_Par3 Cal				Invalid	SVAL
CGDP0003	MPFSGIADA	N	FB Temperature					CPOI
CGDP0004	MPFSGIADA	N	Laser 1,2,3,4 Tmp					CPOI
CGDP0005	MPFSGIADA	N	Laser 1 Light Mon.					CPOI
CGDP0006	MPFSGIADA	N	Laser 2 Light Mon.					CPOI
CGDP0007	MPFSGIADA	N	Laser 3 Light Mon.					CPOI
CGDP0008	MPFSGIADA	N	Laser 4 Light Mon.					CPOI
CGDP0009	MPFSGIADA	N	IS Plate Temperature					CPOI
CGDP0010	MPFSGIADA	N	MBS1 Temperature					CPOI
CGDP0011	MPFSGIADA	N	MBS2 Temperature					CPOI
CGDP0012	MPFSGIADA	N	MBS3 Temperature					CPOI
CGDP0013	MPFSGIADA	N	MBS4 Temperature					CPOI
CGDP0014	MPFSGIADA	N	MBS5 Temperature					CPOI
CGDP0015	MPFSGIADA	N	PS Temperature					CPOI
CGDP0016	MPFSGIADA	N	+5V Power Consum					CPOI
CGDP0017	MPFSGIADA	N	+15V Power Consum					CPOI
CGDP0018	MPFSGIADA	N	-15V Power Consum					CPOI
CGDV0001	MPFSGIADA	N	FC4_Par3 Cal				Invalid	SVAL
CGDV0002	MPFSGIADA	N	FC5_Par3 Cal				Invalid	SVAL
CGDV0003	MPFSGIADA	N	ON/OFF				Invalid	SVAL
CGDV0004	MPFSGIADA	N	Enabled/Disabled				Invalid	SVAL
CGDV0005	MPFSGIADA	N	Operation Mode				Invalid	SVAL
CGDV0006	MPFSGIADA	N	Open/Closed				Invalid	SVAL
CGDV0007	MPFSGIADA	N	Cover Open Cal				Invalid	SVAL
CGDV0008	MPFSGIADA	N	Cover Closed Cal				Invalid	SVAL
CGDV0009	MPFSGIADA	N	Activated/Deactivated				Invalid	SVAL
CGDV0010	MPFSGIADA	N	Armed/Disarmed				Invalid	SVAL
CGDV0011	MPFSGIADA	N	Laser Power				Invalid	SVAL
CGDV0012	MPFSGIADA	N	Laser Ops Mode				Invalid	SVAL
CGDV0014	MPFSGIADA	N	On/Off on 16 bits				Invalid	SVAL
CGDVST01	MPFSGIADA	N	Execerror FC2_Par3 Cal				Invalid	SVAL
CGDVST02	MPFSGIADA	N	Execerror FC3_Par3 Cal				Invalid	SVAL
CGDV0015	MPFSGIADA	N	Selected heaters				Invalid	SVAL

CALV_CALC_NAME	CALV_MODL_MODEL	XVALUE	XVALUE_HIGH	YVALUE	YDIGTEXT	CALC_CALTYPE
CGDP0001	MPFSGIADA	0		-1		CPOI
CGDP0001	MPFSGIADA	4095		11		CPOI
CGDP0002	MPFSGIADA	0		0		CPOI
CGDP0002	MPFSGIADA	255		2.5		CPOI
CGDP0003	MPFSGIADA	0		-229.02		CPOI
CGDP0003	MPFSGIADA	1100		-64.3907		CPOI
CGDP0003	MPFSGIADA	1125		-57.76040625		CPOI
CGDP0003	MPFSGIADA	1150		-51.001725		CPOI
CGDP0003	MPFSGIADA	1175		-44.11465625		CPOI
CGDP0003	MPFSGIADA	1200		-37.0992		CPOI
CGDP0003	MPFSGIADA	1225		-29.95535625		CPOI
CGDP0003	MPFSGIADA	1250		-22.683125		CPOI
CGDP0003	MPFSGIADA	1275		-15.28250625		CPOI
CGDP0009	MPFSGIADA	2720		83.223		CPOI
CGDP0009	MPFSGIADA	2780		75.2415		CPOI
CGDP0009	MPFSGIADA	2840		67.26		CPOI
CGDP0009	MPFSGIADA	2900		59.2785		CPOI
CGDP0009	MPFSGIADA	2960		51.297		CPOI
CGDP0009	MPFSGIADA	3020		43.3155		CPOI
CGDP0009	MPFSGIADA	3080		35.334		CPOI
CGDP0009	MPFSGIADA	3140		27.3525		CPOI
CGDP0009	MPFSGIADA	3200		19.371		CPOI
CGDP0009	MPFSGIADA	3260		11.3895		CPOI
CGDP0009	MPFSGIADA	3320		3.408		CPOI
CGDP0009	MPFSGIADA	3380		-4.5735		CPOI
CGDP0009	MPFSGIADA	3440		-12.555		CPOI
CGDP0009	MPFSGIADA	3500		-20.5365		CPOI
CGDP0009	MPFSGIADA	3560		-28.518		CPOI
CGDP0009	MPFSGIADA	3620		-36.4995		CPOI
CGDP0009	MPFSGIADA	3680		-44.481		CPOI
CGDP0009	MPFSGIADA	3740		-52.4625		CPOI
CGDP0009	MPFSGIADA	3800		-60.444		CPOI
CGDP0009	MPFSGIADA	4095		-99.686375		CPOI
CGDP0010	MPFSGIADA	0		-68.449		CPOI
CGDP0010	MPFSGIADA	100		-62.859		CPOI
CGDP0010	MPFSGIADA	200		-57.269		CPOI
CGDP0010	MPFSGIADA	300		-51.679		CPOI
CGDP0010	MPFSGIADA	400		-46.089		CPOI
CGDP0010	MPFSGIADA	500		-40.499		CPOI
CGDP0010	MPFSGIADA	600		-34.909		CPOI
CGDP0010	MPFSGIADA	700		-29.319		CPOI
CGDP0010	MPFSGIADA	800		-23.729		CPOI
CGDP0010	MPFSGIADA	900		-18.139		CPOI
CGDP0010	MPFSGIADA	1000		-12.549		CPOI
CGDP0010	MPFSGIADA	1100		-6.959		CPOI
CGDP0010	MPFSGIADA	1200		-1.369		CPOI
CGDP0003	MPFSGIADA	1300		-7.7535		CPOI
CGDP0003	MPFSGIADA	1325		-0.09610625		CPOI

CGDP0003	MPFSGIADA	1350	7.689675	CPOI
CGDP0003	MPFSGIADA	1375	15.60384375	CPOI
CGDP0003	MPFSGIADA	1400	23.6464	CPOI
CGDP0003	MPFSGIADA	1425	31.81734375	CPOI
CGDP0003	MPFSGIADA	1450	40.116675	CPOI
CGDP0003	MPFSGIADA	1475	48.54439375	CPOI
CGDP0003	MPFSGIADA	1500	57.1005	CPOI
CGDP0003	MPFSGIADA	1525	65.78499375	CPOI
CGDP0003	MPFSGIADA	1550	74.597875	CPOI
CGDP0003	MPFSGIADA	1575	83.53914375	CPOI
CGDP0003	MPFSGIADA	1600	92.6088	CPOI
CGDP0003	MPFSGIADA	1625	101.8068438	CPOI
CGDP0003	MPFSGIADA	1650	111.133275	CPOI
CGDP0003	MPFSGIADA	1675	120.5880938	CPOI
CGDP0003	MPFSGIADA	1700	130.1713	CPOI
CGDP0003	MPFSGIADA	1725	139.8828938	CPOI
CGDP0003	MPFSGIADA	1750	149.722875	CPOI
CGDP0003	MPFSGIADA	1775	159.6912438	CPOI
CGDP0003	MPFSGIADA	1800	169.788	CPOI
CGDP0003	MPFSGIADA	1825	180.0131438	CPOI
CGDP0003	MPFSGIADA	4095	1643.539348	CPOI
CGDP0004	MPFSGIADA	0	230.5	CPOI
CGDP0004	MPFSGIADA	900	84.13861987	CPOI
CGDP0004	MPFSGIADA	1000	78.217	CPOI
CGDP0004	MPFSGIADA	1100	73.10374593	CPOI
CGDP0004	MPFSGIADA	1200	68.59975936	CPOI
CGDP0004	MPFSGIADA	1300	64.54381519	CPOI
CGDP0004	MPFSGIADA	1400	60.80860512	CPOI
CGDP0004	MPFSGIADA	1500	57.29678125	CPOI
CGDP0004	MPFSGIADA	1600	53.93699968	CPOI
CGDP0004	MPFSGIADA	1700	50.67996411	CPOI
CGDP0004	MPFSGIADA	1800	47.49446944	CPOI
CGDP0004	MPFSGIADA	1900	44.36344537	CPOI
CGDP0004	MPFSGIADA	2000	41.28	CPOI
CGDP0004	MPFSGIADA	2100	38.24346343	CPOI
CGDP0004	MPFSGIADA	2200	35.25543136	CPOI
CGDP0004	MPFSGIADA	2300	32.31580869	CPOI
CGDP0004	MPFSGIADA	2400	29.41885312	CPOI
CGDP0004	MPFSGIADA	2500	26.54921875	CPOI
CGDP0004	MPFSGIADA	2600	23.67799968	CPOI
CGDP0004	MPFSGIADA	2700	20.75877361	CPOI
CGDP0004	MPFSGIADA	2800	17.72364544	CPOI
CGDP0004	MPFSGIADA	2900	14.47929087	CPOI
CGDP0004	MPFSGIADA	3000	10.903	CPOI
CGDP0004	MPFSGIADA	3100	6.83872093	CPOI
CGDP0004	MPFSGIADA	3200	2.09310336	CPOI
CGDP0004	MPFSGIADA	3300	-3.56845781	CPOI
CGDP0004	MPFSGIADA	3400	-10.42577888	CPOI
CGDP0004	MPFSGIADA	3500	-18.80784375	CPOI
CGDP0004	MPFSGIADA	3600	-29.09676032	CPOI
CGDP0004	MPFSGIADA	3700	-41.73171689	CPOI
CGDP0004	MPFSGIADA	3800	-57.21293856	CPOI
CGDP0004	MPFSGIADA	4095	-125.2258692	CPOI
CGDP0005	MPFSGIADA	0	-0.096298	CPOI
CGDP0005	MPFSGIADA	1000	0.136802	CPOI
CGDP0005	MPFSGIADA	1100	0.160112	CPOI

CGDP0005	MPFSGIADA	1200	0.183422	CPOI
CGDP0005	MPFSGIADA	1300	0.206732	CPOI
CGDP0005	MPFSGIADA	1400	0.230042	CPOI
CGDP0005	MPFSGIADA	1500	0.253352	CPOI
CGDP0005	MPFSGIADA	1600	0.276662	CPOI
CGDP0005	MPFSGIADA	1700	0.299972	CPOI
CGDP0005	MPFSGIADA	1800	0.323282	CPOI
CGDP0005	MPFSGIADA	1900	0.346592	CPOI
CGDP0005	MPFSGIADA	2000	0.369902	CPOI
CGDP0005	MPFSGIADA	2100	0.393212	CPOI
CGDP0005	MPFSGIADA	2200	0.416522	CPOI
CGDP0005	MPFSGIADA	2300	0.439832	CPOI
CGDP0005	MPFSGIADA	2400	0.463142	CPOI
CGDP0005	MPFSGIADA	2500	0.486452	CPOI
CGDP0005	MPFSGIADA	2600	0.509762	CPOI
CGDP0005	MPFSGIADA	2700	0.533072	CPOI
CGDP0005	MPFSGIADA	2800	0.556382	CPOI
CGDP0005	MPFSGIADA	2900	0.579692	CPOI
CGDP0005	MPFSGIADA	3000	0.603002	CPOI
CGDP0005	MPFSGIADA	3100	0.626312	CPOI
CGDP0005	MPFSGIADA	3200	0.649622	CPOI
CGDP0005	MPFSGIADA	3300	0.672932	CPOI
CGDP0005	MPFSGIADA	3400	0.696242	CPOI
CGDP0005	MPFSGIADA	3500	0.719552	CPOI
CGDP0005	MPFSGIADA	3600	0.742862	CPOI
CGDP0005	MPFSGIADA	3700	0.766172	CPOI
CGDP0005	MPFSGIADA	3800	0.789482	CPOI
CGDP0005	MPFSGIADA	3900	0.812792	CPOI
CGDP0005	MPFSGIADA	4095	0.8582465	CPOI
CGDP0006	MPFSGIADA	0	-0.08266	CPOI
CGDP0006	MPFSGIADA	900	0.098681	CPOI
CGDP0006	MPFSGIADA	1000	0.11883	CPOI
CGDP0006	MPFSGIADA	1100	0.138979	CPOI
CGDP0006	MPFSGIADA	1200	0.159128	CPOI
CGDP0006	MPFSGIADA	1300	0.179277	CPOI
CGDP0006	MPFSGIADA	1400	0.199426	CPOI
CGDP0006	MPFSGIADA	1500	0.219575	CPOI
CGDP0006	MPFSGIADA	1600	0.239724	CPOI
CGDP0006	MPFSGIADA	1700	0.259873	CPOI
CGDP0006	MPFSGIADA	1800	0.280022	CPOI
CGDP0006	MPFSGIADA	1900	0.300171	CPOI
CGDP0006	MPFSGIADA	2000	0.32032	CPOI
CGDP0006	MPFSGIADA	2100	0.340469	CPOI
CGDP0006	MPFSGIADA	2200	0.360618	CPOI
CGDP0006	MPFSGIADA	2300	0.380767	CPOI
CGDP0006	MPFSGIADA	2400	0.400916	CPOI
CGDP0006	MPFSGIADA	2500	0.421065	CPOI
CGDP0006	MPFSGIADA	2600	0.441214	CPOI
CGDP0006	MPFSGIADA	2700	0.461363	CPOI
CGDP0006	MPFSGIADA	2800	0.481512	CPOI
CGDP0006	MPFSGIADA	2900	0.501661	CPOI
CGDP0006	MPFSGIADA	3000	0.52181	CPOI
CGDP0006	MPFSGIADA	3100	0.541959	CPOI
CGDP0006	MPFSGIADA	3200	0.562108	CPOI
CGDP0006	MPFSGIADA	3300	0.582257	CPOI
CGDP0006	MPFSGIADA	3400	0.602406	CPOI

CGDP0006	MPFSGIADA	3500	0.622555	CPOI
CGDP0006	MPFSGIADA	3600	0.642704	CPOI
CGDP0006	MPFSGIADA	3700	0.662853	CPOI
CGDP0006	MPFSGIADA	3800	0.683002	CPOI
CGDP0006	MPFSGIADA	4095	0.74244155	CPOI
CGDP0007	MPFSGIADA	0	-0.12859	CPOI
CGDP0007	MPFSGIADA	900	0.128432	CPOI
CGDP0007	MPFSGIADA	1000	0.15699	CPOI
CGDP0007	MPFSGIADA	1100	0.185548	CPOI
CGDP0007	MPFSGIADA	1200	0.214106	CPOI
CGDP0007	MPFSGIADA	1300	0.242664	CPOI
CGDP0007	MPFSGIADA	1400	0.271222	CPOI
CGDP0007	MPFSGIADA	1500	0.29978	CPOI
CGDP0007	MPFSGIADA	1600	0.328338	CPOI
CGDP0007	MPFSGIADA	1700	0.356896	CPOI
CGDP0007	MPFSGIADA	1800	0.385454	CPOI
CGDP0007	MPFSGIADA	1900	0.414012	CPOI
CGDP0007	MPFSGIADA	2000	0.44257	CPOI
CGDP0007	MPFSGIADA	2100	0.471128	CPOI
CGDP0007	MPFSGIADA	2200	0.499686	CPOI
CGDP0007	MPFSGIADA	2300	0.528244	CPOI
CGDP0007	MPFSGIADA	2400	0.556802	CPOI
CGDP0007	MPFSGIADA	2500	0.58536	CPOI
CGDP0007	MPFSGIADA	2600	0.613918	CPOI
CGDP0007	MPFSGIADA	2700	0.642476	CPOI
CGDP0007	MPFSGIADA	2800	0.671034	CPOI
CGDP0007	MPFSGIADA	2900	0.699592	CPOI
CGDP0007	MPFSGIADA	3000	0.72815	CPOI
CGDP0007	MPFSGIADA	3100	0.756708	CPOI
CGDP0007	MPFSGIADA	3200	0.785266	CPOI
CGDP0007	MPFSGIADA	3300	0.813824	CPOI
CGDP0007	MPFSGIADA	3400	0.842382	CPOI
CGDP0007	MPFSGIADA	3500	0.87094	CPOI
CGDP0007	MPFSGIADA	3600	0.899498	CPOI
CGDP0007	MPFSGIADA	3700	0.928056	CPOI
CGDP0007	MPFSGIADA	3800	0.956614	CPOI
CGDP0007	MPFSGIADA	4095	1.0408601	CPOI
CGDP0008	MPFSGIADA	0	-0.10104	CPOI
CGDP0008	MPFSGIADA	1000	0.11299	CPOI
CGDP0008	MPFSGIADA	1100	0.134393	CPOI
CGDP0008	MPFSGIADA	1200	0.155796	CPOI
CGDP0008	MPFSGIADA	1300	0.177199	CPOI
CGDP0008	MPFSGIADA	1400	0.198602	CPOI
CGDP0008	MPFSGIADA	1500	0.220005	CPOI
CGDP0008	MPFSGIADA	1600	0.241408	CPOI
CGDP0008	MPFSGIADA	1700	0.262811	CPOI
CGDP0008	MPFSGIADA	1800	0.284214	CPOI
CGDP0008	MPFSGIADA	1900	0.305617	CPOI
CGDP0008	MPFSGIADA	2000	0.32702	CPOI
CGDP0008	MPFSGIADA	2100	0.348423	CPOI
CGDP0008	MPFSGIADA	2200	0.369826	CPOI
CGDP0008	MPFSGIADA	2300	0.391229	CPOI
CGDP0008	MPFSGIADA	2400	0.412632	CPOI
CGDP0008	MPFSGIADA	2500	0.434035	CPOI
CGDP0008	MPFSGIADA	2600	0.455438	CPOI
CGDP0008	MPFSGIADA	2700	0.476841	CPOI

CGDP0008	MPFSGIADA	2800	0.498244	CPOI
CGDP0008	MPFSGIADA	2900	0.519647	CPOI
CGDP0008	MPFSGIADA	3000	0.54105	CPOI
CGDP0008	MPFSGIADA	3100	0.562453	CPOI
CGDP0008	MPFSGIADA	3200	0.583856	CPOI
CGDP0008	MPFSGIADA	3300	0.605259	CPOI
CGDP0008	MPFSGIADA	3400	0.626662	CPOI
CGDP0008	MPFSGIADA	3500	0.648065	CPOI
CGDP0008	MPFSGIADA	3600	0.669468	CPOI
CGDP0008	MPFSGIADA	3700	0.690871	CPOI
CGDP0008	MPFSGIADA	3800	0.712274	CPOI
CGDP0008	MPFSGIADA	3900	0.733677	CPOI
CGDP0008	MPFSGIADA	4095	0.77541285	CPOI
CGDP0009	MPFSGIADA	0	445.051	CPOI
CGDP0009	MPFSGIADA	2060	171.0195	CPOI
CGDP0009	MPFSGIADA	2120	163.038	CPOI
CGDP0009	MPFSGIADA	2180	155.0565	CPOI
CGDP0009	MPFSGIADA	2240	147.075	CPOI
CGDP0009	MPFSGIADA	2300	139.0935	CPOI
CGDP0009	MPFSGIADA	2360	131.112	CPOI
CGDP0009	MPFSGIADA	2420	123.1305	CPOI
CGDP0009	MPFSGIADA	2480	115.149	CPOI
CGDP0009	MPFSGIADA	2540	107.1675	CPOI
CGDP0009	MPFSGIADA	2600	99.186	CPOI
CGDP0009	MPFSGIADA	2660	91.2045	CPOI
CGDP0010	MPFSGIADA	1300	4.221	CPOI
CGDP0010	MPFSGIADA	1400	9.811	CPOI
CGDP0010	MPFSGIADA	1500	15.401	CPOI
CGDP0010	MPFSGIADA	1600	20.991	CPOI
CGDP0010	MPFSGIADA	1700	26.581	CPOI
CGDP0010	MPFSGIADA	1800	32.171	CPOI
CGDP0010	MPFSGIADA	1900	37.761	CPOI
CGDP0010	MPFSGIADA	2000	43.351	CPOI
CGDP0010	MPFSGIADA	2100	48.941	CPOI
CGDP0010	MPFSGIADA	2200	54.531	CPOI
CGDP0010	MPFSGIADA	2300	60.121	CPOI
CGDP0010	MPFSGIADA	2400	65.711	CPOI
CGDP0010	MPFSGIADA	2500	71.301	CPOI
CGDP0010	MPFSGIADA	2600	76.891	CPOI
CGDP0010	MPFSGIADA	2700	82.481	CPOI
CGDP0010	MPFSGIADA	2800	88.071	CPOI
CGDP0010	MPFSGIADA	2900	93.661	CPOI
CGDP0010	MPFSGIADA	3000	99.251	CPOI
CGDP0010	MPFSGIADA	4095	160.4615	CPOI
CGDP0011	MPFSGIADA	0	-69.711	CPOI
CGDP0011	MPFSGIADA	100	-64.0933	CPOI
CGDP0011	MPFSGIADA	200	-58.4756	CPOI
CGDP0011	MPFSGIADA	300	-52.8579	CPOI
CGDP0011	MPFSGIADA	400	-47.2402	CPOI
CGDP0011	MPFSGIADA	500	-41.6225	CPOI
CGDP0011	MPFSGIADA	600	-36.0048	CPOI
CGDP0011	MPFSGIADA	700	-30.3871	CPOI
CGDP0011	MPFSGIADA	800	-24.7694	CPOI
CGDP0011	MPFSGIADA	900	-19.1517	CPOI
CGDP0011	MPFSGIADA	1000	-13.534	CPOI
CGDP0011	MPFSGIADA	1100	-7.9163	CPOI

CGDP0011	MPFSGIADA	1200	-2.2986	CPOI
CGDP0011	MPFSGIADA	1300	3.3191	CPOI
CGDP0011	MPFSGIADA	1400	8.9368	CPOI
CGDP0011	MPFSGIADA	1500	14.5545	CPOI
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CGDP0011	MPFSGIADA	1800	31.4076	CPOI
CGDP0011	MPFSGIADA	1900	37.0253	CPOI
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CGDP0011	MPFSGIADA	2100	48.2607	CPOI
CGDP0011	MPFSGIADA	2200	53.8784	CPOI
CGDP0011	MPFSGIADA	2300	59.4961	CPOI
CGDP0011	MPFSGIADA	2400	65.1138	CPOI
CGDP0011	MPFSGIADA	2500	70.7315	CPOI
CGDP0011	MPFSGIADA	2600	76.3492	CPOI
CGDP0011	MPFSGIADA	2700	81.9669	CPOI
CGDP0011	MPFSGIADA	2800	87.5846	CPOI
CGDP0011	MPFSGIADA	2900	93.2023	CPOI
CGDP0011	MPFSGIADA	3000	98.82	CPOI
CGDP0011	MPFSGIADA	4095	160.333815	CPOI
CGDP0012	MPFSGIADA	0	-70.65	CPOI
CGDP0012	MPFSGIADA	100	-65.0496	CPOI
CGDP0012	MPFSGIADA	200	-59.4492	CPOI
CGDP0012	MPFSGIADA	300	-53.8488	CPOI
CGDP0012	MPFSGIADA	400	-48.2484	CPOI
CGDP0012	MPFSGIADA	500	-42.648	CPOI
CGDP0012	MPFSGIADA	600	-37.0476	CPOI
CGDP0012	MPFSGIADA	700	-31.4472	CPOI
CGDP0012	MPFSGIADA	800	-25.8468	CPOI
CGDP0012	MPFSGIADA	900	-20.2464	CPOI
CGDP0012	MPFSGIADA	1000	-14.646	CPOI
CGDP0012	MPFSGIADA	1100	-9.0456	CPOI
CGDP0012	MPFSGIADA	1200	-3.4452	CPOI
CGDP0012	MPFSGIADA	1300	2.1552	CPOI
CGDP0012	MPFSGIADA	1400	7.7556	CPOI
CGDP0012	MPFSGIADA	1500	13.356	CPOI
CGDP0012	MPFSGIADA	1600	18.9564	CPOI
CGDP0012	MPFSGIADA	1700	24.5568	CPOI
CGDP0012	MPFSGIADA	1800	30.1572	CPOI
CGDP0012	MPFSGIADA	1900	35.7576	CPOI
CGDP0012	MPFSGIADA	2000	41.358	CPOI
CGDP0012	MPFSGIADA	2100	46.9584	CPOI
CGDP0012	MPFSGIADA	2200	52.5588	CPOI
CGDP0012	MPFSGIADA	2300	58.1592	CPOI
CGDP0012	MPFSGIADA	2400	63.7596	CPOI
CGDP0012	MPFSGIADA	2500	69.36	CPOI
CGDP0012	MPFSGIADA	2600	74.9604	CPOI
CGDP0012	MPFSGIADA	2700	80.5608	CPOI
CGDP0012	MPFSGIADA	2800	86.1612	CPOI
CGDP0012	MPFSGIADA	2900	91.7616	CPOI
CGDP0012	MPFSGIADA	3000	97.362	CPOI
CGDP0012	MPFSGIADA	4095	158.68638	CPOI
CGDP0013	MPFSGIADA	0	-69.239	CPOI
CGDP0013	MPFSGIADA	100	-63.6413	CPOI
CGDP0013	MPFSGIADA	200	-58.0436	CPOI
CGDP0013	MPFSGIADA	300	-52.4459	CPOI

CGDP0013	MPFSGIADA	400	-46.8482	CPOI
CGDP0013	MPFSGIADA	500	-41.2505	CPOI
CGDP0013	MPFSGIADA	600	-35.6528	CPOI
CGDP0013	MPFSGIADA	700	-30.0551	CPOI
CGDP0013	MPFSGIADA	800	-24.4574	CPOI
CGDP0013	MPFSGIADA	900	-18.8597	CPOI
CGDP0013	MPFSGIADA	1000	-13.262	CPOI
CGDP0013	MPFSGIADA	1100	-7.6643	CPOI
CGDP0013	MPFSGIADA	1200	-2.0666	CPOI
CGDP0013	MPFSGIADA	1300	3.5311	CPOI
CGDP0013	MPFSGIADA	1400	9.1288	CPOI
CGDP0013	MPFSGIADA	1500	14.7265	CPOI
CGDP0013	MPFSGIADA	1600	20.3242	CPOI
CGDP0013	MPFSGIADA	1700	25.9219	CPOI
CGDP0013	MPFSGIADA	1800	31.5196	CPOI
CGDP0013	MPFSGIADA	1900	37.1173	CPOI
CGDP0013	MPFSGIADA	2000	42.715	CPOI
CGDP0013	MPFSGIADA	2100	48.3127	CPOI
CGDP0013	MPFSGIADA	2200	53.9104	CPOI
CGDP0013	MPFSGIADA	2300	59.5081	CPOI
CGDP0013	MPFSGIADA	2400	65.1058	CPOI
CGDP0013	MPFSGIADA	2500	70.7035	CPOI
CGDP0013	MPFSGIADA	2600	76.3012	CPOI
CGDP0013	MPFSGIADA	2700	81.8989	CPOI
CGDP0013	MPFSGIADA	2800	87.4966	CPOI
CGDP0013	MPFSGIADA	2900	93.0943	CPOI
CGDP0013	MPFSGIADA	3000	98.692	CPOI
CGDP0013	MPFSGIADA	4095	159.986815	CPOI
CGDP0014	MPFSGIADA	0	-68.348	CPOI
CGDP0014	MPFSGIADA	100	-62.719	CPOI
CGDP0014	MPFSGIADA	200	-57.09	CPOI
CGDP0014	MPFSGIADA	300	-51.461	CPOI
CGDP0014	MPFSGIADA	400	-45.832	CPOI
CGDP0014	MPFSGIADA	500	-40.203	CPOI
CGDP0014	MPFSGIADA	600	-34.574	CPOI
CGDP0014	MPFSGIADA	700	-28.945	CPOI
CGDP0014	MPFSGIADA	800	-23.316	CPOI
CGDP0014	MPFSGIADA	900	-17.687	CPOI
CGDP0014	MPFSGIADA	1000	-12.058	CPOI
CGDP0014	MPFSGIADA	1100	-6.429	CPOI
CGDP0014	MPFSGIADA	1200	-0.8	CPOI
CGDP0014	MPFSGIADA	1300	4.829	CPOI
CGDP0014	MPFSGIADA	1400	10.458	CPOI
CGDP0014	MPFSGIADA	1500	16.087	CPOI
CGDP0014	MPFSGIADA	1600	21.716	CPOI
CGDP0014	MPFSGIADA	1700	27.345	CPOI
CGDP0014	MPFSGIADA	1800	32.974	CPOI
CGDP0014	MPFSGIADA	1900	38.603	CPOI
CGDP0014	MPFSGIADA	2000	44.232	CPOI
CGDP0014	MPFSGIADA	2100	49.861	CPOI
CGDP0014	MPFSGIADA	2200	55.49	CPOI
CGDP0014	MPFSGIADA	2300	61.119	CPOI
CGDP0014	MPFSGIADA	2400	66.748	CPOI
CGDP0014	MPFSGIADA	2500	72.377	CPOI
CGDP0014	MPFSGIADA	2600	78.006	CPOI
CGDP0014	MPFSGIADA	2700	83.635	CPOI

CGDP0014	MPFSGIADA	2800	89.264	CPOI
CGDP0014	MPFSGIADA	2900	94.893	CPOI
CGDP0014	MPFSGIADA	3000	100.522	CPOI
CGDP0014	MPFSGIADA	4095	162.15955	CPOI
CGDP0015	MPFSGIADA	0	-319.59	CPOI
CGDP0015	MPFSGIADA	1260	-115.9362	CPOI
CGDP0015	MPFSGIADA	1320	-106.2384	CPOI
CGDP0015	MPFSGIADA	1380	-96.5406	CPOI
CGDP0015	MPFSGIADA	1440	-86.8428	CPOI
CGDP0015	MPFSGIADA	1500	-77.145	CPOI
CGDP0015	MPFSGIADA	1560	-67.4472	CPOI
CGDP0015	MPFSGIADA	1620	-57.7494	CPOI
CGDP0015	MPFSGIADA	1680	-48.0516	CPOI
CGDP0015	MPFSGIADA	1740	-38.3538	CPOI
CGDP0015	MPFSGIADA	1800	-28.656	CPOI
CGDP0015	MPFSGIADA	1860	-18.9582	CPOI
CGDP0015	MPFSGIADA	1920	-9.2604	CPOI
CGDP0015	MPFSGIADA	1980	0.4374	CPOI
CGDP0015	MPFSGIADA	2040	10.1352	CPOI
CGDP0015	MPFSGIADA	2100	19.833	CPOI
CGDP0015	MPFSGIADA	2160	29.5308	CPOI
CGDP0015	MPFSGIADA	2220	39.2286	CPOI
CGDP0015	MPFSGIADA	2280	48.9264	CPOI
CGDP0015	MPFSGIADA	2340	58.6242	CPOI
CGDP0015	MPFSGIADA	2400	68.322	CPOI
CGDP0015	MPFSGIADA	2460	78.0198	CPOI
CGDP0015	MPFSGIADA	2520	87.7176	CPOI
CGDP0015	MPFSGIADA	2580	97.4154	CPOI
CGDP0015	MPFSGIADA	2640	107.1132	CPOI
CGDP0015	MPFSGIADA	2700	116.811	CPOI
CGDP0015	MPFSGIADA	2760	126.5088	CPOI
CGDP0015	MPFSGIADA	2820	136.2066	CPOI
CGDP0015	MPFSGIADA	2880	145.9044	CPOI
CGDP0015	MPFSGIADA	2940	155.6022	CPOI
CGDP0015	MPFSGIADA	3000	165.3	CPOI
CGDP0015	MPFSGIADA	4095	342.28485	CPOI
CGDP0016	MPFSGIADA	0	-268.6	CPOI
CGDP0016	MPFSGIADA	290	-1.4172	CPOI
CGDP0016	MPFSGIADA	365	67.6818	CPOI
CGDP0016	MPFSGIADA	440	136.7808	CPOI
CGDP0016	MPFSGIADA	515	205.8798	CPOI
CGDP0016	MPFSGIADA	590	274.9788	CPOI
CGDP0016	MPFSGIADA	665	344.0778	CPOI
CGDP0016	MPFSGIADA	740	413.1768	CPOI
CGDP0016	MPFSGIADA	815	482.2758	CPOI
CGDP0016	MPFSGIADA	890	551.3748	CPOI
CGDP0016	MPFSGIADA	965	620.4738	CPOI
CGDP0016	MPFSGIADA	1040	689.5728	CPOI
CGDP0016	MPFSGIADA	1115	758.6718	CPOI
CGDP0016	MPFSGIADA	1190	827.7708	CPOI
CGDP0016	MPFSGIADA	1265	896.8698	CPOI
CGDP0016	MPFSGIADA	1340	965.9688	CPOI
CGDP0016	MPFSGIADA	1415	1035.0678	CPOI
CGDP0016	MPFSGIADA	1490	1104.1668	CPOI
CGDP0016	MPFSGIADA	1565	1173.2658	CPOI
CGDP0016	MPFSGIADA	1640	1242.3648	CPOI

CGDP0016	MPFSGIADA	1715	1311.4638	CPOI
CGDP0016	MPFSGIADA	1790	1380.5628	CPOI
CGDP0016	MPFSGIADA	1865	1449.6618	CPOI
CGDP0016	MPFSGIADA	1940	1518.7608	CPOI
CGDP0016	MPFSGIADA	2015	1587.8598	CPOI
CGDP0016	MPFSGIADA	2090	1656.9588	CPOI
CGDP0016	MPFSGIADA	2165	1726.0578	CPOI
CGDP0016	MPFSGIADA	2240	1795.1568	CPOI
CGDP0016	MPFSGIADA	2315	1864.2558	CPOI
CGDP0016	MPFSGIADA	2390	1933.3548	CPOI
CGDP0016	MPFSGIADA	2465	2002.4538	CPOI
CGDP0016	MPFSGIADA	4095	3504.2054	CPOI
CGDP0017	MPFSGIADA	0	-76.17	CPOI
CGDP0017	MPFSGIADA	500	32.335	CPOI
CGDP0017	MPFSGIADA	620	58.3762	CPOI
CGDP0017	MPFSGIADA	740	84.4174	CPOI
CGDP0017	MPFSGIADA	860	110.4586	CPOI
CGDP0017	MPFSGIADA	980	136.4998	CPOI
CGDP0017	MPFSGIADA	1100	162.541	CPOI
CGDP0017	MPFSGIADA	1220	188.5822	CPOI
CGDP0017	MPFSGIADA	1340	214.6234	CPOI
CGDP0017	MPFSGIADA	1460	240.6646	CPOI
CGDP0017	MPFSGIADA	1580	266.7058	CPOI
CGDP0017	MPFSGIADA	1700	292.747	CPOI
CGDP0017	MPFSGIADA	1820	318.7882	CPOI
CGDP0017	MPFSGIADA	1940	344.8294	CPOI
CGDP0017	MPFSGIADA	2060	370.8706	CPOI
CGDP0017	MPFSGIADA	2180	396.9118	CPOI
CGDP0017	MPFSGIADA	2300	422.953	CPOI
CGDP0017	MPFSGIADA	2420	448.9942	CPOI
CGDP0017	MPFSGIADA	2540	475.0354	CPOI
CGDP0017	MPFSGIADA	2660	501.0766	CPOI
CGDP0017	MPFSGIADA	2780	527.1178	CPOI
CGDP0017	MPFSGIADA	2900	553.159	CPOI
CGDP0017	MPFSGIADA	3020	579.2002	CPOI
CGDP0017	MPFSGIADA	3140	605.2414	CPOI
CGDP0017	MPFSGIADA	3260	631.2826	CPOI
CGDP0017	MPFSGIADA	3380	657.3238	CPOI
CGDP0017	MPFSGIADA	3500	683.365	CPOI
CGDP0017	MPFSGIADA	3620	709.4062	CPOI
CGDP0017	MPFSGIADA	3740	735.4474	CPOI
CGDP0017	MPFSGIADA	3860	761.4886	CPOI
CGDP0017	MPFSGIADA	3980	787.5298	CPOI
CGDP0017	MPFSGIADA	4095	812.48595	CPOI
CGDP0018	MPFSGIADA	0	-43.43	CPOI
CGDP0018	MPFSGIADA	200	2.166	CPOI
CGDP0018	MPFSGIADA	320	29.5236	CPOI
CGDP0018	MPFSGIADA	440	56.8812	CPOI
CGDP0018	MPFSGIADA	560	84.2388	CPOI
CGDP0018	MPFSGIADA	680	111.5964	CPOI
CGDP0018	MPFSGIADA	800	138.954	CPOI
CGDP0018	MPFSGIADA	920	166.3116	CPOI
CGDP0018	MPFSGIADA	1040	193.6692	CPOI
CGDP0018	MPFSGIADA	1160	221.0268	CPOI
CGDP0018	MPFSGIADA	1280	248.3844	CPOI
CGDP0018	MPFSGIADA	1400	275.742	CPOI

CGDP0018	MPFSGIADA	1520		303.0996		CPOI
CGDP0018	MPFSGIADA	1640		330.4572		CPOI
CGDP0018	MPFSGIADA	1760		357.8148		CPOI
CGDP0018	MPFSGIADA	1880		385.1724		CPOI
CGDP0018	MPFSGIADA	2000		412.53		CPOI
CGDP0018	MPFSGIADA	2120		439.8876		CPOI
CGDP0018	MPFSGIADA	2240		467.2452		CPOI
CGDP0018	MPFSGIADA	2360		494.6028		CPOI
CGDP0018	MPFSGIADA	2480		521.9604		CPOI
CGDP0018	MPFSGIADA	2600		549.318		CPOI
CGDP0018	MPFSGIADA	2720		576.6756		CPOI
CGDP0018	MPFSGIADA	2840		604.0332		CPOI
CGDP0018	MPFSGIADA	2960		631.3908		CPOI
CGDP0018	MPFSGIADA	3080		658.7484		CPOI
CGDP0018	MPFSGIADA	3200		686.106		CPOI
CGDP0018	MPFSGIADA	3320		713.4636		CPOI
CGDP0018	MPFSGIADA	3440		740.8212		CPOI
CGDP0018	MPFSGIADA	3560		768.1788		CPOI
CGDP0018	MPFSGIADA	3680		795.5364		CPOI
CGDP0018	MPFSGIADA	4095		890.1481		CPOI
CGDV0001	MPFSGIADA	160	160		SbServUnknwn	SVAL
CGDV0001	MPFSGIADA	165	165		ServUnknwn	SVAL
CGDV0002	MPFSGIADA	0	0		Safe	SVAL
CGDV0002	MPFSGIADA	1	1		Cover	SVAL
CGDV0002	MPFSGIADA	2	2		Flux	SVAL
CGDV0002	MPFSGIADA	3	3		Normal	SVAL
CGDV0003	MPFSGIADA	0	0		OFF	SVAL
CGDV0003	MPFSGIADA	1	1		ON	SVAL
CGDV0004	MPFSGIADA	0	0		Disabled	SVAL
CGDV0004	MPFSGIADA	1	1		Enabled	SVAL
CGDV0005	MPFSGIADA	0	0		Safe	SVAL
CGDV0005	MPFSGIADA	1	1		Cover	SVAL
CGDV0005	MPFSGIADA	2	2		Flux	SVAL
CGDV0005	MPFSGIADA	3	3		Normal	SVAL
CGDV0006	MPFSGIADA	0	0		Closed	SVAL
CGDV0006	MPFSGIADA	1	1		Open	SVAL
CGDV0007	MPFSGIADA	0	0		No open	SVAL
CGDV0007	MPFSGIADA	1	1		Open	SVAL
CGDV0008	MPFSGIADA	0	0		No Closed	SVAL
CGDV0008	MPFSGIADA	1	1		Closed	SVAL
CGDV0009	MPFSGIADA	0	0		De-activated	SVAL
CGDV0009	MPFSGIADA	1	1		Activated	SVAL
CGDV0010	MPFSGIADA	0	0		Disarmed	SVAL
CGDV0010	MPFSGIADA	1	1		Armed	SVAL
CGDV0011	MPFSGIADA	0	0		OFF	SVAL
CGDV0011	MPFSGIADA	1	1		Low	SVAL
CGDV0011	MPFSGIADA	2	2		Medium	SVAL
CGDV0011	MPFSGIADA	3	3		High	SVAL
CGDV0012	MPFSGIADA	1	1		DC_Cpl1_only	SVAL
CGDV0012	MPFSGIADA	2	2		DC_Cpl2_only	SVAL
CGDV0012	MPFSGIADA	3	3		AC_BothCpls	SVAL
CGDV0013	MPFSGIADA	0	0		Low	SVAL
CGDV0013	MPFSGIADA	1	1		High	SVAL
CGDV0014	MPFSGIADA	0	0		Off	SVAL
CGDV0014	MPFSGIADA	65535	65535		On	SVAL
CGDVST01	MPFSGIADA	1	1		HWerrFB_Arm	SVAL

CGDVST01	MPFSGIADA	6	6	FrbtNotArmd	SVAL
CGDVST01	MPFSGIADA	11	11	FrbtTmpAbvLm	SVAL
CGDVST01	MPFSGIADA	16	16	TestgTmpT/O	SVAL
CGDVST01	MPFSGIADA	21	21	ActivnTmpT/O	SVAL
CGDVST01	MPFSGIADA	26	26	HWerrFrgblt	SVAL
CGDVST01	MPFSGIADA	31	31	FrgbltNtRlsd	SVAL
CGDVST01	MPFSGIADA	32	32	FrgbltRlsd	SVAL
CGDVST01	MPFSGIADA	36	36	HWerrMtrArm	SVAL
CGDVST01	MPFSGIADA	41	41	MotorNotArmd	SVAL
CGDVST01	MPFSGIADA	48	48	HWerrMotor	SVAL
CGDVST02	MPFSGIADA	1	1	HWerrLsrArm	SVAL
CGDVST02	MPFSGIADA	6	6	LaserNotArmd	SVAL
CGDVST02	MPFSGIADA	7	7	GDSoff	SVAL
CGDVST02	MPFSGIADA	11	11	TmpTooLow	SVAL
CGDVST02	MPFSGIADA	16	16	TmpTooHigh	SVAL
CGDVST02	MPFSGIADA	21	21	HWerrLsrDrvr	SVAL
CGDVST03	MPFSGIADA	1	1	HWerrMBSArm	SVAL
CGDVST03	MPFSGIADA	6	6	HWerrMBDHtr	SVAL
CGDV0015	MPFSGIADA	5	5	Cvr-frangblt	SVAL
CGDV0015	MPFSGIADA	6	6	Cover-motor	SVAL
CGDV0015	MPFSGIADA	4	4	Motor	SVAL
CGDV0012	MPFSGIADA	0	0	Laser_OFF	SVAL

ANNEX 5: List of EGSE Test Scripts

The procedures have been updated because of different model and new CCS architecture. They have been validated during the Integrated System test on FS model (July 2002).

PGDST_MAIN.e (GIADA IST Test Master Control Sequence)

```
*****************************************************************************
**  ALENIA SPAZIO TORINO -- VIAT ROSETTA TEAM
*****************************************************************************
**
**    Object Name    : PGDST_MAIN
**
**    Config. No.    :
**
**    Origin         : Alenia Spazio VIAT
**
**    Author         : P.Huber
**
**    Purpose        : GIADA IST
**
**
**    Description    : Test Master Controlsequence
**
**    S/S name       : GIADA
**
**    Model        : EQM/PFM
**
**    Applic. Dox    : TBW
**
**---------------------------------------------------------------------------
**    Date        Author           Comments
**---------------------------------------------------------------------------
**    xx/11/2000  C.Prato          first draft
**
```

```
**                P.Huber           modules derived,first CCS version issued
**
**    20/09/2001  L. Malvasio       PFM - IST - All subroutines are affected by changes
**
**    15/07/2002  L. Malvasio       - FS  - IST - PGDGE_PWR-ON/OFF substitution
**                              with CGDGE_PWR-ON/OFF(FM/EQM/FS);
**                              - Uncommented the CALL to Context File Test;
**                                    - All subroutines are affected by changes
**                                          due to the new architecture (T_STEP/DO_DISP/..)
**
**    17/07/2002  E.Cusinato  Cleaned for GIADA IST
*******************************************************************************

GLOBAL

VAR
      ---------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ---------------------------------------
      STRING      $GenProc
      STRING  $Model          -- S/C Model [EQM, PFM]


END GLOBAL

SEQUENCE PGDST_MAIN

Proto
        ------------------------------------------
      -- User Defined In & Out Vars Here
        ------------------------------------------
      INT     $INrestart  := 0       -- Restart at step x, 0 results to start from begin
      String  $INstep := "PGD"         -- step number default
        ------------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
```

```
        ----------------------------------------
        STRING  $M_LogFileNam := ""
        INT     $StepStart := 1
      STRING      $Dispmode := "LOGDISPLAY"
End Proto

CONST
      -------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
```

```
      INT $SecondCMDDes  := 2
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------

VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND           $TCommand(100)
      REFPARAM          $ParametersToRead(100)
      INT               $RefValues(100)
      REAL              $Limits(2)(100)
      INT               $TimeDelay(2)(100)
      STRING            $Configure(4)(100)
      STRING            $TS_Name
      INT               $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT               $PrevScoeConf(18)
      STRING            $I_GenProc := "NULL"
      INT               $NumOfCall := 0
      STRING            $OutMessages(100)
      STRING            $LogFileName
      STRING      $EXE_Test_Manager
      STRING            $StepDes
        STRING           $ParameterType(100)

      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING            $Question
      STRING            $ShouldIDoIt   := "NO"
      STRING            $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING            $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING            $Choice
      INT               $I                      -- loop counter
      STRING            $LCL_branch := "A"      -- LCL branch uesed for test
```

```
      BOOL              $KAL_check  := FALSE     -- if KAL wil be checked or not
      BOOL              $Ask_bool   := FALSE     -- query var.
      INT               $Ask_int    := 99        -- query var.
      INT               $I_abort    := 999       -- abort var.
      INT               $ierr(21) := {0,0,0,0,0, 0,0,0,0,0, 0,0,0,0,0, 0,0,0,0,0, 0}  -- error var.
      INT               $err_cnt := 0
      INT         $restart

MAIN

  WINDOW

  **----------------------------
  ** TS LogBook Initialization
  **----------------------------
  $TS_Name  := "PGDST_MAIN" -- Base for the Logbook Name
  @OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$DispMode)

  **-------------------
  ** SCOE connections
  **-------------------
  $ConfigScoe($TMTCSC) :=  $USED
  @CONN_SCOE1($LogFilename,$ConfigScoe,$DispMode)

  **---------------------------------------
  ** Initialize the communication variables
  **---------------------------------------
  @SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

   $restart := $StepStart

   **-------------------------------------------------------------------------------------
   ** Step 0: log definitions
   **-------------------------------------------------------------------------------------


   SWITCH $restart
      case  0,3,   5,6,7,8,9,10,11,   13,14,15,16,17
```

```
   default
      ** wrong input
      DO

         $OutMessages(0):=  "   "
         $OutMessages(1):=  "Given Start-step input incorrect - valid inputs are:"
         $OutMessages(2):=  "    0       - to start from begin with SCOE connection etc."
         $OutMessages(3):=  "    or"
         $OutMessages(4):=  "    3, 5 to 6, 8 to 18 - possible restart steps "
         @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

         @ASK_NOCHK_I("Give restart input - see above :", *$Ask_int, *$LogFilename)
         EXIT IF ( ($Ask_int = 0) or ($Ask_int = 3)     or \
                   (5 <= $Ask_int) and ($Ask_int <= 11) or \
                   (13<= $Ask_int) and ($Ask_int <= 17) )
      END DO
      $restart := $Ask_int
end SWITCH

SWITCH $StepStart
   case  3
      goto restart_3
   case  5
      goto restart_5
   case  6
      goto restart_6
   case  7
      goto restart_7
   case  8
      goto restart_8
   case  9
      goto restart_9
   case  10
      goto restart_10
   case  11
      goto restart_11
   case  13
```

```
         goto restart_13
      case  14
         goto restart_14
      case  15
         goto restart_15
      case  16
         goto restart_16
      case  17
         goto restart_17
      case  18
         goto restart_18
      default

   end SWITCH

   **-------------------------------------------------------------------------------
   ** CHECK SAFE Key Control (Laser) in place
   **-------------------------------------------------------------------------------
   $StepDes := "CHECK SAFE Key Control (Laser) in place"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,0)

    $YesNoQuestion := "Is the SAFE Key Control in place? YES/<NO>"
    @ASKYESNO(*$ShouldIDoIt, $YesNoQuestion, $LogFileName)

   IF ($ShouldIDoIt = "NO")
      $OutMessages(0)  := "Put the SAFE KEY IN PLACE!!!  Put the SAFE KEY IN PLACE!!! Put the SAFE KEY IN PLACE!!!"
      @DO_DISP1($LogFileName,*$OutMessages,"LOGDISPLAY","BOX","++++-|-|","C")
   END IF

##ConfigurationCheck

   **-------------------------------------------------------------------------------
   ** Connect SCOEs, perform configuration checks
   **-------------------------------------------------------------------------------
   $StepDes := "Connect SCOEs, perform configuration checks"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,1)

    $YesNoQuestion := "IS SCOE CORRECTLY CONFIGURED? YES/<NO>"
```

```
    @ASKYESNO(*$ShouldIDoIt, $YesNoQuestion, $LogFileName)

    IF (($ShouldIDoIt = "NO") OR ($ShouldIDoIt = "no") OR ($ShouldIDoIt = ""))
      $Question := "DO YOU WANT TO ABORT THE SEQUENCE EXECUTION? YES/<NO>"
      @ASKYESNO(*$ShouldIDoIt, $Question, $LogFileName)

      IF (($ShouldIDoIt = "YES") OR ($ShouldIDoIt = "yes"))
          $EXE_Test_Manager := "ABORT"
          GOTO L_ABORT
      END IF
      GOTO ConfigurationCheck
    END IF

   **-------------------------------------------------------------------------------
   ** Power ON Exp. and basic TM Verification
   **-------------------------------------------------------------------------------
   $StepDes := "Power ON GIADA LCL A & basic TM Verification"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,2)

   ** use CF to switch LCL A
   $LCL_branch := "NOM_A"
   $KAL_check   := FALSE
   CALL CGDGE_PWRON ,$LCL_branch,$KAL_check,$LogFileName,-1


##restart_3

   **-------------------------------------------------------------------------------
   ** Step 3: GIADA CONNECTION TEST
   **-------------------------------------------------------------------------------

   ** Note: PGDST_CT.e (EQM version) contains functionalities already tested in others routines;
   **       the only useful functionality (CONNECTION TEST, done with CSYGE_017.e) is left here
   **       and no others routines are consequently called

   $StepDes := "GIADA CONNECTION TEST AND BASIC TM/TC VERIFICATION"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,3)
```

```
   CALL CSYGE_017 ,"GIADA",$LogFileName,-1

   **-------------------------------------------------------------------------------
   ** Step 4: GIADA TM/TC VERIFICATION
   **-------------------------------------------------------------------------------
   $StepDes := "GIADA TM/TC VERIFICATION"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,4)

   $OutMessages(0) := "TM/TC VERIFICATION:"
   $OutMessages(1) := "Actually nothing special is checked here, because"
   $OutMessages(2) := "TM/TC verification is done throughout the whole IST sequence."
   $OutMessages(3) := "No additional testing done"
   @DO_DISP1($LogFileName,*$OutMessages,"LOGDISPLAY","BOX","++++-|-|","C")

##restart_5

   **-------------------------------------------------------------------------------
   ** Step 5: SCIENCE DATA TRANSFER VERIFICATION
   **-------------------------------------------------------------------------------
   $StepDes := "SCIENCE DATA TRANSFER VERIFICATION"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,5)

   CALL PGDST_SCIE, $LogFileName, -1

   **-------------------------------------------------------------------------------

##restart_6

   **-------------------------------------------------------------------------------
   ** Step 6: ON-BOARD TRAFFIC MANAGEMENT
   **-------------------------------------------------------------------------------
   $StepDes := "ON-BOARD TRAFFIC MANAGEMENT"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,6)

   CALL PGDST_DMS, $LogFileName,-1


##restart_7
```

```
   **-------------------------------------------------------------------------------
   ** Step 7: CONTEXT SAVING TEXT
   **-------------------------------------------------------------------------------
   --Remark: (18.07.02)
   --since problems with SSMM with the new DMS S/W it's decided to test Context
   --at the end of IST, moving this step to step 18

   --$StepDes := "Context Saving Text Testing"
   --@TEST_STEP($TS_Name,$LogFilename,$StepDes,7)

   --CALL PGDST_CONTEX, $LogFileName, -1

   ** GIADA mode to be clarifed


##restart_8

--   **-------------------------------------------------------------------------------
--   ** Step 8: PATCH AND DUMP testing
--   **-------------------------------------------------------------------------------
--   $StepDes := "PATCH AND DUMP testing"
--   @TEST_STEP($TS_Name,$LogFilename,$StepDes,8)
--
--   **CALL PGDST_PTCDMP,  $LogFileName, *$EXE_Test_Manager, $mstep+".0"
--
--   ** GIADA mode to be clarifed

##restart_9

   **-------------------------------------------------------------------------------
   ** Step 9: PRIVATE SERVICE VERIFICATION
   **-------------------------------------------------------------------------------
   $StepDes := "PRIVATE SERVICE VERIFICATION"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,9)

   @ASK_NOCHK_B("Really start Private Service Verif.? - (T (for True), F (for False))",\
                *$Ask_bool,*$LogFilename)
```

```
   IF ($Ask_bool)
      CALL PGDST_PRIV, $LogFileName, -1
   END IF

##restart_10

   **-------------------------------------------------------------------------------------
   ** Step 10: Prepare GIADA for Redundancy Test
   **-------------------------------------------------------------------------------------
   $StepDes := "Prepare GIADA for Redundancy Test"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,10)

   CALL CGDGE_PWROFF, "NOM", $LogFileName

   ** use CF to switch LCL B
   $LCL_branch := "RED_B"
   $KAL_check   := FALSE
   CALL CGDGE_PWRON, $LCL_branch, $KAL_check, $LogFileName


##restart_11

   **-------------------------------------------------------------------------------------
   ** Step 11: REDUNDANCY TEST
   **-------------------------------------------------------------------------------------
   $StepDes := "REDUNDANCY TEST"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,11)

   CALL PGDST_RT , $LogFileName, -1

   **-------------------------------------------------------------------------------------
   ** Step 12: Prepaire GIADA for rest of IST
   **-------------------------------------------------------------------------------------
   $StepDes := "Prepare GIADA for rest of IST"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,12)

   CALL CGDGE_PWROFF, "NOM", $LogFileName,-1
```

```
   ** use CF to switch LCL A
   $LCL_branch := "NOM_A"
   $KAL_check   := FALSE
   CALL CGDGE_PWRON, $LCL_branch, $KAL_check, $LogFileName,-1


##restart_13

   **-------------------------------------------------------------------------------
   ** Step 13: OPERATIVE MODE VERIFICATION
   **-------------------------------------------------------------------------------
   $StepDes := "OPERATIVE MODE VERIFICATION"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,13)

   CALL PGDST_OMV, $LogFileName,-1


##restart_14

   **-------------------------------------------------------------------------------
   ** Step 14: MAXIMUM DATA TROUGHPUT TEST
   **-------------------------------------------------------------------------------
   $StepDes := "MAXIMUM DATA TROUGHPUT TEST"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,14)

   $OutMessages(0) := "MAXIMUM DATA TROUGHPUT TEST:     N/A for IST ...                "
   @DO_DISP1($LogFileName,*$OutMessages,"LOGDISPLAY","BOX","++++-|-|","C")



##restart_15

   **-------------------------------------------------------------------------------
   ** Step 15: POWER CONSUMPTION TEST
   **-------------------------------------------------------------------------------
   $StepDes := "POWER CONSUMPTION TEST"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,15)
```

```
   CALL PGDST_PCT, $LogFileName, -1

##restart_16

   **-------------------------------------------------------------------------------
   ** Step 16: Prepaire GIADA for Functional Performance test
   **-------------------------------------------------------------------------------
   $StepDes := "Prepare GIADA for Functional Performance Test"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,16)

   CALL CGDGE_PWROFF, "NOM", $LogFileName


   ** use CF to switch LCL B
   $LCL_branch := "RED_B"
   $KAL_check   := FALSE

   CALL CGDGE_PWRON, $LCL_branch, $KAL_check, $LogFileName


##restart_17

   **-------------------------------------------------------------------------------
   ** Step 17: FUNCTIONAL PERFORMANCE TEST  on LCL B
   **-------------------------------------------------------------------------------
   $StepDes := "FUNCTIONAL PERFORMANCE TEST"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,$StepStart)

   CALL PGDST_FPT, $LogFileName, -1

##restart_18

   **-------------------------------------------------------------------------------
   ** Step 18: CONTEXT SAVING TEXT
   **-------------------------------------------------------------------------------
   $StepDes := "Context Saving Text Testing"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,7)
```

```
   CALL PGDST_CONTEX, $LogFileName, -1

   ** GIADA mode to be clarifed


   **-------------------------------------------------------------------------------
   ** Step 19: NOMINAL GIADA SWITCH OFF
   **-------------------------------------------------------------------------------
   $StepDes := "NOMINAL GIADA SWITCH OFF"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes,$StepStart)

   CALL CGDGE_PWROFF, "NOM", $LogFileName

##L_Abort

  **-----------------
  ** Close LogBook
  **-----------------
  @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

  RETURN "OK"

END SEQUENCE
```

PGDGE_PWRON.e (GIADA Power ON Sequence)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDGE_PWRON.e
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : GIADA Power ON Sequence
**
**  Description   : Power ON Sequence
**
**
**  S/S name      : ROSETTA
**
**  External CF's :
**
**  Inp. Arguments: see proto
**
**  Return Values : see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          P.Huber      draft
**          xx/02/2001          P.Huber      add NOMRED calling
```

```
**  1.2     08/06/2001          P.Huber      change SCET cmd para.
**  1.3     18/06/2001          P.Huber      Change SECT cmd para., use Subr.
**
**  1.4     20/09/2001          L.Malvasio   PFM topics
**  1.5     11/01/2002          A.Moore      Updated to new format
**  1.6     11/01/2002          A.Moore      changed array dimensions for Patch/dump (1000,1500 to 300) using the new
**                                 routines: CSYRU_TC_6_2 and CSYRU_TC_6_5
**  1.7     07/02/2002          A.Moore      Save configuration to Global
**  1.8     22/04/2002          G.Mucera     Skip dump check.
**  7.1     07/06/2002          G.Nicolini   Global variable Payload()() included
**  8.0     10/07/2002          L.Malvasio   Patches changed according to the Flight Spare Model
**                                 relevant to Context file: just 20% changes
**                                 relevant to S/W patches: completely different
**  8.1     19/07/2002          L.Malvasio   Patches for are put in comment according to NCR #...(18.07.02)
*****************************************************************************************************************
GLOBAL
VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc
      STRING  $Model          -- S/C Model [EQM, PFM]
      ------------------------------------
      STRING  $GIADA_status
        BOOL    $GIADANomPower

      INT   $STS

      STRING      $PAYLOAD(25)(25)
      INT     $GD  -- Giada

END GLOBAL

SEQUENCE CGDGE_PWRON

PROTO
```

```
      ----------------------------------------
    -- User Defined In & Out Vars Here
      ----------------------------------------
      STRING    $IN_LCL_branch  := "A"   -- selected LCL branch & used nominal DMS I/F
                        -- possible: NOM_A ... nom I/F via LCL A
                        --           RED_B ... red I/F via LCL B
                        --           A     ... keep DMS unchanged, only LCL A on
                        --           B     ... keep DMS unchanged, only LCL B on
      BOOL      $KAL            := FALSE           -- KAL status check or not
      ----------------------------------------
    -- In & Out Vars Used By The Architecture
      -- !!! Do Not Remove Or Modify !!!
      ----------------------------------------
      STRING    $M_LogFileNam   := ""
    INT       $StepStart      := 1
      ----------------------------------------
      -- In & Out Vars Used to skip the question
      -- for dump check
      -- !!! Do Not Remove Or Modify !!!
      ----------------------------------------
      BOOL      $DumpCheck      := FALSE

END PROTO


 CONST
      -------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
```

```
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------


VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND           $TCommand(100)
      REFPARAM          $ParametersToRead(100)
      INT               $RefValues(100)
      REAL              $Limits(2)(100)
      INT               $TimeDelay(2)(100)
      STRING            $Configure(4)(100)
      STRING            $TS_Name
      INT               $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
```

```
      INT               $PrevScoeConf(18)
      STRING            $I_GenProc := "NULL"
      STRING            $DispMode
      STRING            $OutMessages(100)
      STRING            $LogFileName
      STRING      $EXE_Test_Manager
      STRING            $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      INT       $I   -- loop counter
      STRING    $Ask_res   := "xx"
      BOOL      $Ask_bool  := FALSE
      BOOL      $Flag_checks  := FALSE
      STRING    $LCL_branch
      STRING    $LCL := "A"
      STRING    $Answer

      -- for temp use only
      INT $Load(300)    -- 20
      INT $Dump(300)
      INT $MEM_ID
      INT $PID
      INT $Start_Address
      INT $DumpLength
      INT $LoadLength
      INT $WLEN
      INT $SeqCounter
      -- end of for temp use only


MAIN
   **---------------------------
   ** TS LogBook Initialization
   **---------------------------
   $DispMode := "LOGDISPLAY"
   $TS_Name  := "CGDGE_PWRON" -- Base for the Logbook Name
   @OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$DispMode)
```

```
**-------------------
** SCOE connections
**-------------------
$ConfigScoe($TMTCSC) :=  $USED
@CONN_SCOE1($LogFilename,$ConfigScoe,$DispMode)

**----------------------------------------
** Initialize the communication variables
**----------------------------------------
@SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)
$LCL_branch := $IN_LCL_branch

**--- LCL branch input check ---
SWITCH $LCL_branch
   CASE "A","B"
   CASE "NOM_A","RED_B"
   DEFAULT
      DO
         $OutMessages(0):=  "   "
         $OutMessages(1):=  "LCL branch input incorrect - valid inputs are:"
         $OutMessages(2):=  "  NOM_A ... nom I/F via LCL A  "
         $OutMessages(3):=  "  RED_B ... red I/F via LCL A  "
         $OutMessages(4):=  "  N     ... nom I/F via LCL A  "
         $OutMessages(5):=  "  R     ... red I/F via LCL A  "
         $OutMessages(6):=  "  A     ... keep DMS unchanged, only LCL A on "
         $OutMessages(7):=  "  B     ... keep DMS unchanged, only LCL B on "
         $OutMessages(8):=  "      "
         @DO_DISP1($LogFileName, *$OutMessages, $DispMode)

         @ASK_NOCHK_S("Give LCL branch input - see CFlog :",*$Ask_res,*$LogFilename)
         EXIT IF (($Ask_res ="A")     or ($Ask_res ="B")     or \
                  ($Ask_res ="NOM_A") or ($Ask_res ="RED_B") or \
                  ($Ask_res ="N") or ($Ask_res ="R"))
      END DO
   $LCL_branch := $Ask_res
END SWITCH
```

```
**-----------------------------------------------------------
** Power ON for GIADA will:
**    0. LCL status check and KAL line status check (if requested)
**    1. Send stop time update Cmd
**    2. Power ON GIADA and verify ON status
**    3. Send time update Cmd
**    4. Verify TM
**        5. Check of power-ON conditions
**    6. UPLOAD CONTEXT FILE
**    7. UPLOAD SOFTWARE PATCHES

**-----------------------------------------------------------
**--- 0. LCL status and KAL line status check ---
**-----------------------------------------------------------
$StepDes := "LCL status and KAL line status check"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

$OutMessages(0)  :=  "   "
$OutMessages(1)  :=  "** Checking whether GIADA LCLs are OFF (both main and redundant) and"
$OutMessages(2)  :=  "**                         KALs are ON  (main or red.)."
$OutMessages(3)  :=  "   "
@DO_DISP1($LogFileName, *$OutMessages, $DispMode)

$Configure($Message)($OfDispMode)    := $DispMode
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TM"

$ParametersToRead(0) := &NPWDA093  -- LCL A Status
$RefValues(0) := 0   --  Must be OFF
$TimeDelay($ToReadTLM)(0) := -1
$ParametersToRead(1) := &NPWDA213  -- LCL B Status
$RefValues(1) := 0   -- Must be OFF
$TimeDelay($ToReadTLM)(1) := -1
IF ($KAL)
   $ParametersToRead(2) := &NPWDA320  -- KAL A Voltage
   $TimeDelay($ToReadTLM)(2) := -1
   $ParametersToRead(3) := &NPWDA640  -- KAL B Voltage
```

```
   $TimeDelay($ToReadTLM)(3) := -1

   SWITCH $LCL_branch
    CASE "A","a"
         $Limits(0)(2) := 15.0              -- Must be ON
         $Limits(1)(2) := 20.0              -- > of 15.0 V
    CASE "B","b"
         $Limits(0)(3) := -1.0              -- Must be OFF
         $Limits(1)(3) := 2.0               -- < of 2.0 V
    DEFAULT
   END SWITCH

   $ParametersToRead(4) := &NSGC9999
ELSE
   $ParametersToRead(2) := &NSGC9999
END IF

@EXE_STEP1($LogFileName,$TCommand, $ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,\
          *$Configure,*$EXE_Test_Manager,$TS_Name)

IF ($EXE_Test_Manager = "ABORT") GOTO L_ABORT
   **-------------------------------------------------------
   **--- 1. Send stop time update Cmd ---
   **-------------------------------------------------------
   $StepDes := "Send stop time update Cmd"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes)

   @CSYRU_SCET("STOP", "GIADA", , $LogFileName, *$EXE_Test_Manager)


   **-------------------------------------------------------
   **--- 2. Power ON GIADA and verify ON status ---
   **-------------------------------------------------------
   $StepDes := "Power ON GIADA and verify ON status"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes)

   **--- do DMS specific PL-IF selection ---
   SWITCH $LCL_branch
```

```
 CASE "A"
      $GIADANomPower := TRUE
      $StepDes := "No PL-IF configuration done"
      @TEST_STEP($TS_Name,$LogFilename,$StepDes)

 CASE "B"
      $GIADANomPower := FALSE
      $StepDes := "No PL-IF configuration done"
      @TEST_STEP($TS_Name,$LogFilename,$StepDes)

 CASE "NOM_A", "N"
      $GIADANomPower := TRUE
      $StepDes := "Select Nominal PL-IF"
      @TEST_STEP($TS_Name,$LogFilename,$StepDes)

      CALL CSYGE_NOMRED, "GIADA", "NOM", "ENABLE", $LogFileName, $EXE_Test_Manager
      IF ($EXE_Test_Manager = "ABORT")  GOTO L_ABORT

 CASE "RED_B", "R"
      $GIADANomPower := FALSE
      $StepDes := "Select Red. PL-IF"
      @TEST_STEP($TS_Name,$LogFilename,$StepDes)

      CALL CSYGE_NOMRED, "GIADA", "RED", "ENABLE", $LogFileName, $EXE_Test_Manager
      IF ($EXE_Test_Manager = "ABORT")  GOTO L_ABORT
 DEFAULT
END SWITCH

SWITCH $LCL_branch
 CASE "A", "NOM_A"
      $LCL := "A"
 CASE "B", "RED_B"
      $LCL := "B"
 DEFAULT
END SWITCH

$Configure($Message)($OfCheckTitle)  := "Sending of LCL-ON Cmd & verify"
$Configure($Message)($OfDispMode)    := $DispMode
```

```
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 40
$TimeDelay($AfterCMD)(0) := 20
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$RefValues(0) := 1   --"ON"
$ParametersToRead(1) := &NSGC9999

SWITCH $LCL
 CASE "A"
      $TCommand(0) := {ROS.TC.ZPWMA073SWON , SCOE := "TMTCSC", ACKBITS:="BOTH"}   -- LCL GIADA A ON
      $ParametersToRead(0) := &NPWDA093
 CASE "B"
      $TCommand(0) := {ROS.TC.ZPWMA330SWON , SCOE := "TMTCSC", ACKBITS:="BOTH"}   -- LCL GIADA B ON
      $ParametersToRead(0) := &NPWDA213
 DEFAULT
END SWITCH

@EXE_STEP1($LogFileName,$TCommand, $ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,\
           *$Configure,*$EXE_Test_Manager,$TS_Name)

$PAYLOAD($GD)($STS) := "CONFIGURING"

DISPLAY "waiting 20 sec.s for boot-up ..."
$OutMessages(0)  :=  " Sleeping for 20 seconds...."
@DO_DISP1($LogFileName, *$OutMessages,,, "-----|-|", "C")
DISPLAY " Sleeping for 20 seconds...."
$answer := sshell("sleep 20")


**-----------------------------------------------------
**--- 3 Send time update Cmd ---
**-----------------------------------------------------
$StepDes := "Send time update Cmd"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

@CSYRU_SCET("START", "GIADA", , $LogFileName, *$EXE_Test_Manager)

$OutMessages(0)  :=  " Sleeping for 50 seconds...."
```

```
@DO_DISP1($LogFileName, *$OutMessages,,, "-----|-|", "C")
DISPLAY " Sleeping for 50 seconds...."
$answer := sshell("sleep 50")


**-------------------------------------------------------
**--- 4. Verify TM ---
**-------------------------------------------------------
**--- time update packet receiving
@CSYRU_PKTPRT ("YGD00001", FALSE, 59000, $LogFileName)  -- receive and print packet to CFlog


**-------------------------------------------------------
**--- 5. Check of power-ON conditions ---
**-------------------------------------------------------
$Configure($Message)($OfCheckTitle)  := "Check of power-ON conditions"
$Configure($Message)($OfDispMode)    := $DispMode
$Configure($Message)($OfExeStepMode) := "TM"
$TimeDelay($ToReadTLM)(0) := 30
$ParametersToRead(0) := &NGDA0003
$RefValues(0) := 0
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName,$TCommand, $ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,\
      *$Configure,*$EXE_Test_Manager,$TS_Name)

**  REMARK: --->  See step 1.8 in the header
IF ($DumpCheck)

  $OutMessages(0):=  "*********************************************"
  $OutMessages(1):=  "Do you want to check all Dumped Memory areas? "
  $OutMessages(2):=  "or"
  $OutMessages(3):=  "you prefer to skip? "
  $OutMessages(4):=  ""
  $OutMessages(5):=  "*********************************************"
  @DO_DISP1($LogFileName, *$OutMessages, $DispMode)

  @ASK_NOCHK_B("TRUE to check mem. areas, FALSE to SKIP :",*$Flag_checks,*$LogFilename)
```

```
      END IF
      ******************************************

      **--------------------------------------------------
      **---  6. UPLOAD CONTEXT FILE ----
      **--------------------------------------------------

      $Configure($Message)($OfDispMode)    := $DispMode
      $Configure($Message)($OfCheckTitle)  := "ACCEPT CONTEXT FILE"
      $Configure($Message)($OfExeStepMode) := "TC"
      $TimeDelay($ToReadTLM)(0) := 40

**  REMARK: --->  See Ro-ALS-NCR-8069
*************************************************************************************************
** 19/09/2001  Due to the RO-ALS-NCR-8069 related to wrong Giada command interpretation, the context file **
** upload will be done using service 6, as following step 6.1                                    **
*************************************************************************************************

**   $TCommand(0) := {ROS.TC.ZAC03003 , SCOE := "TMTCSC", ACKBITS:="BOTH", xxxxxxx}  --ACCEPT CONTEXT FILE
**   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

**   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
**              *$TimeDelay, *$Configure, *$EXE_Test_Manager)

      **-------------------------------------------------------------------------
      **---  6.1 UPLOAD CONTEXT FILE (Using service 6 - connected to the NCR8069)----
      **-------------------------------------------------------------------------
      ** this step will be used just because of the problems related to the Rejection of 18,3 service from GIADA
      $StepDes := "UPLOAD CONTEXT FILE"
      @TEST_STEP($TS_Name,$LogFilename,$StepDes)


      ** Default Context File for GIADA PFM:
      $PID      := 0x5A
      $MEM_ID   := 0x51    -- 81dec

      ** Two spare bytes
```

```
$Load(0)  := 0x00
$Load(1)  := 0x00

** Cvr/Frng Heaters on Time
$Load(2)  := 0x1E
$Load(3)  := 0x00

** Cvr/Frng Heaters on Time
$Load(4)  := 0x00
$Load(5)  := 0x00

** Frng Safety Temp
$Load(6)  := 0xA1       -- Changed for FS (11.07.02)
$Load(7)  := 0x05

** Frng Testing Temp
$Load(8)  := 0xA1       -- Changed for FS (11.07.02)
$Load(9)  := 0x05

** Frng Testing Timeout
$Load(10) := 0x1E       -- Changed for FS (11.07.02)
$Load(11) := 0x00
$Load(12) := 0x00
$Load(13) := 0x00

** Frng Working Temp
$Load(14) := 0x64       -- Changed for FS (11.07.02)
$Load(15) := 0x06

** Frng Working Timeout
$Load(16) := 0x58
$Load(17) := 0x02
$Load(18) := 0x00
$Load(19) := 0x00

** Velocity
$Load(20) := 0x32
$Load(21) := 0x00
```

```
** Steps to Open
$Load(22) := 0xAB       -- Changed for FS (11.07.02)
$Load(23) := 0x00

** Steps to close
$Load(24) := 0xAB       -- Changed for FS (11.07.02)
$Load(25) := 0x00

** Opening timeout
$Load(26) := 0x78
$Load(27) := 0x00
$Load(28) := 0x00
$Load(29) := 0x00

** Closing Timeout
$Load(30) := 0x78
$Load(31) := 0x00
$Load(32) := 0x00
$Load(33) := 0x00

** GDS Status
$Load(34) := 0x03
$Load(35) := 0xAF

** GDS Thresholds
$Load(36) := 0x14       -- Changed for FS (11.07.02)
$Load(37) := 0x16

** Laser max temperature
$Load(38) := 0xAF       -- Changed for FS (11.07.02)
$Load(39) := 0xF5

** Laser min temperature
$Load(40) := 0xDD       -- Changed for FS (11.07.02)
$Load(41) := 0xFD       -- Changed for FS (11.07.02)

** Four spare bytes
```

```
$Load(42) := 0x00
$Load(43) := 0x00
$Load(44) := 0x00
$Load(45) := 0x00

** Time between calibration
$Load(46) := 0x10
$Load(47) := 0x0E
$Load(48) := 0x00
$Load(49) := 0x00

** IS Status
$Load(50) := 0x0F       -- Changed for FS (11.07.02)
$Load(51) := 0x9F

** IS Plate max op temperature
$Load(52) := 0xB8       -- Changed for FS (11.07.02)
$Load(53) := 0x1A

** Two spare bytes
$Load(54) := 0x00
$Load(55) := 0x00

** IS plate hyst. temperature
$Load(56) := 0x35       -- Changed for FS (11.07.02)
$Load(57) := 0x00

** IS thresholds
$Load(58) := 0x05
$Load(59) := 0x00
$Load(60) := 0x05       -- Changed for FS (11.07.02)
$Load(61) := 0x05       -- Changed for FS (11.07.02)
$Load(62) := 0x05
$Load(63) := 0x05

** Time between IS calibration
$Load(64) := 0x10
$Load(65) := 0x0E
```

```
$Load(66) := 0x00
$Load(67) := 0x00

** IS Calib. configuration
$Load(68) := 0x04
$Load(69) := 0xF8       -- Changed for FS (11.07.02)

** MBS Status
$Load(70) := 0x00
$Load(71) := 0x9F

** MBS Max Temp
$Load(72) := 0x4B       -- Changed for FS (11.07.02)
$Load(73) := 0x0A

** MBS Temp. Checking
$Load(74) := 0x00
$Load(75) := 0xF8

** MBS Time Interval
$Load(76) := 0x2C
$Load(77) := 0x01
$Load(78) := 0x00
$Load(79) := 0x00

** MBS MAx Temp in Heating
$Load(80) := 0xF3       -- Changed for FS (11.07.02)
$Load(81) := 0x09

** MBS Heating timeout
$Load(82) := 0x68
$Load(83) := 0x01
$Load(84) := 0x00
$Load(85) := 0x00

** MBS Calib. Time
$Load(86) := 0x10
$Load(87) := 0x0E
```

```
$Load(88) := 0x00
$Load(89) := 0x00

** IS Plate max NON-OP Temp
$Load(90) := 0x6D       -- Changed for FS (11.07.02)
$Load(91) := 0x1A       -- Changed for FS (11.07.02)

** IS Plate Min Temp.
$Load(92) := 0xCE       -- Changed for FS (11.07.02)
$Load(93) := 0x1D       -- Changed for FS (11.07.02)

** ME Max Temp
$Load(94) := 0xC7       -- Changed for FS (11.07.02)
$Load(95) := 0x19       -- Changed for FS (11.07.02)

** Eight Spare Bytes
$Load(96) := 0x00
$Load(97) := 0x00
$Load(98) := 0x00
$Load(99) := 0x00
$Load(100) := 0x00
$Load(101) := 0x00
$Load(102) := 0x00
$Load(103) := 0x00

** Timeout Science TM
$Load(104) := 0x3C
$Load(105) := 0x00
$Load(106) := 0x00
$Load(107) := 0x00

** Timeout HK TM
$Load(108) := 0x0A
$Load(109) := 0x00
$Load(110) := 0x00
$Load(111) := 0x00

** ARm TCs Timeout
```

```
$Load(112) := 0x28
$Load(113) := 0x00
$Load(114) := 0x00
$Load(115) := 0x00

** Patches Status
$Load(116) := 0x00
$Load(117) := 0x00
$Load(118) := 0x00
$Load(119) := 0x00
$Load(120) := 0x00
$Load(121) := 0x00
$Load(122) := 0x00
$Load(123) := 0x00

** Max GDS Events/s
$Load(124) := 0x28
$Load(125) := 0x00

** MAx IS Events/s
$Load(126) := 0x28
$Load(127) := 0x00

** Eight Pad Bytes
$Load(128) := 0x00
$Load(129) := 0x00
$Load(130) := 0x00
$Load(131) := 0x00
$Load(132) := 0x00
$Load(133) := 0x00
$Load(134) := 0x00
$Load(135) := 0x00

** Context File CRC word
$Load(136) := 0xDF           -- Changed for FS (11.07.02)
$Load(137) := 0xC6           -- Changed for FS (11.07.02)

$SeqCounter := 0xC000
```

```
$WLEN := 2 -- number of bites in one word, in/out para
$DumpLength := 0x47
$Start_Address := 0x00009038   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 0x45   -- 68 words + 1 word of CRC
$Start_Address := 0x0000903A  -- start address of CF in GIADA RAM
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 0x47
$Start_Address := 0x00009038   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Context File ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

**-------------------------------------------------------
**---  7. UPLOAD SOFTWARE PATCHES  ----
**-------------------------------------------------------

$OutMessages(0)  :=  "                                                                "
$OutMessages(1)  :=  "****************************************************************"
$OutMessages(2)  :=  "***      Giada S/W 2.0 will now be patched to ver. 2.3       ***"
$OutMessages(3)  :=  "***                Changed for FS model                     ***"
$OutMessages(4)  :=  "***          refer to doc. RO-GIA-IAA-SPR-021,022,023       ***"
$OutMessages(5)  :=  "****************************************************************"
$OutMessages(6)  :=  "                                                                "
@DO_DISP1($LogFileName, *$OutMessages, $DispMode)


$StepDes := "UPLOAD SOFTWARE PATCHES"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Activate RV on YGD00602 ",*$Ask_bool,*$LogFilename)  ** may be this is changed from YGD00005 !!!!
END IF
```

```
      $StepDes := "Uploading of Patch"
      @TEST_STEP($TS_Name,$LogFilename,$StepDes)

--      @ASK_NOCHK_B("Ready to execute GIADA S/W Patch Uploading? (True to cont, False to abort)", \
--      *$Ask_bool,*$LogFilename)

      ** IS TIME Filter (Block 1):
      $PID      := 0x5A
      $MEM_ID   := 0x51    -- 81dec

      $Load(0)  := 0x55
      $Load(1)  := 0x8B
      $Load(2)  := 0xEC
      $Load(3)  := 0x83
      $Load(4)  := 0xEC
      $Load(5)  := 0x06
      $Load(6)  := 0x8B
      $Load(7)  := 0x5E
      $Load(8)  := 0x04
      $Load(9)  := 0x8B
      $Load(10) := 0x47
      $Load(11) := 0x06
      $Load(12) := 0xB1
      $Load(13) := 0x08
      $Load(14) := 0xD3
      $Load(15) := 0xE8
      $Load(16) := 0xB4
      $Load(17) := 0x00
      $Load(18) := 0x8B
      $Load(19) := 0x57
      $Load(20) := 0x06
      $Load(21) := 0xB6
      $Load(22) := 0x00
      $Load(23) := 0xD3
      $Load(24) := 0xE2
      $Load(25) := 0x03
      $Load(26) := 0xC2
```

```
$Load(27) := 0x89
$Load(28) := 0x46
$Load(29) := 0xFE
$Load(30) := 0xC7
$Load(31) := 0x46
$Load(32) := 0xFC
$Load(33) := 0x00
$Load(34) := 0x00
$Load(35) := 0xC7
$Load(36) := 0x46
$Load(37) := 0xFA
$Load(38) := 0x00
$Load(39) := 0x00
$Load(40) := 0x8B
$Load(41) := 0x5E
$Load(42) := 0x04
$Load(43) := 0x8B
$Load(44) := 0x57
$Load(45) := 0x02
$Load(46) := 0x8B
$Load(47) := 0x47
$Load(48) := 0x04
$Load(49) := 0x89
$Load(50) := 0x56
$Load(51) := 0xFC
$Load(52) := 0x89
$Load(53) := 0x46
$Load(54) := 0xFA
$Load(55) := 0x8B
$Load(56) := 0x46
$Load(57) := 0xFC
$Load(58) := 0x8B
$Load(59) := 0x56
$Load(60) := 0xFA
$Load(61) := 0x3B
$Load(62) := 0x06
$Load(63) := 0x0E
$Load(64) := 0xDA
```

```
$Load(65) := 0x72
$Load(66) := 0x0D
$Load(67) := 0x77
$Load(68) := 0x06
$Load(69) := 0x3B
$Load(70) := 0x16
$Load(71) := 0x0C
$Load(72) := 0xDA
$Load(73) := 0x76
$Load(74) := 0x05
$Load(75) := 0xB8
$Load(76) := 0x01
$Load(77) := 0x00
$Load(78) := 0xEB
$Load(79) := 0x1D
$Load(80) := 0x8B
$Load(81) := 0x46
$Load(82) := 0xFC
$Load(83) := 0x8B
$Load(84) := 0x56
$Load(85) := 0xFA
$Load(86) := 0x3B
$Load(87) := 0x06
$Load(88) := 0x0E
$Load(89) := 0xDA
$Load(90) := 0x75
$Load(91) := 0x0F
$Load(92) := 0x3B
$Load(93) := 0x16
$Load(94) := 0x0C
$Load(95) := 0xDA
$Load(96) := 0x75
$Load(97) := 0x09
$Load(98) := 0x8B
$Load(99) := 0x46
$Load(100) := 0xFE
$Load(101) := 0x3B
$Load(102) := 0x06
```

```
$Load(103) := 0x0A
$Load(104) := 0xDA
$Load(105) := 0x73
$Load(106) := 0xE0
$Load(107) := 0x33
$Load(108) := 0xC0
$Load(109) := 0x8B
$Load(110) := 0xE5
$Load(111) := 0x5D
$Load(112) := 0xC3
$Load(113) := 0xB8

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 59   -- one word
$Start_Address := 0x00006A70   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 57   -- one word
$Start_Address := 0x00006A72
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 59   -- one word
$Start_Address := 0x00006A70   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS TIME Filter (Block 1) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** IS TIME Filter (Block 2):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0)  := 0x90
$Load(1)  := 0x90
$Load(2)  := 0x90
```

```
$Load(3)  := 0x50
$Load(4)  := 0xE8
$Load(5)  := 0x13
$Load(6)  := 0x38
$Load(7)  := 0x59

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 6   -- one word
$Start_Address := 0x00003256   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 4   -- one word
$Start_Address := 0x00003258
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 6   -- one word
$Start_Address := 0x00003256   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS TIME Filter (Block 2) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF


** IS TIME Filter (Block 3):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0)  := 0xA1
$Load(1)  := 0x34
$Load(2)  := 0xDE
$Load(3)  := 0x8B
$Load(4)  := 0x16
$Load(5)  := 0x32
$Load(6)  := 0xDE
$Load(7)  := 0xA3
```

```
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 6   -- one word
$Start_Address := 0x000031E6   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 4   -- one word
$Start_Address := 0x000031E8
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 6   -- one word
$Start_Address := 0x000031E6   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS TIME Filter (Block 3) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)

END IF

** IS TIME Filter (Block 4):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0)  := 0x83
$Load(1)  := 0xFA
$Load(2)  := 0x00
$Load(3)  := 0x74
$Load(4)  := 0x30
$Load(5)  := 0xEB
$Load(6)  := 0x10
$Load(7)  := 0x90

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 6   -- 4 word
$Start_Address := 0x000033CC   -- start at 1 word less, until plus one word
```

```
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 4   -- 2 word
$Start_Address := 0x000033CE
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 6   -- 4 word
$Start_Address := 0x000033CC   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS TIME Filter (Block 4) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** MBS time Filter (Block 1)

$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xEB
$Load(1) := 0x34
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 3   -- 3 word
$Start_Address := 0x00003DCE   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 1   -- 1 word
$Start_Address := 0x00003DD0
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 3   -- 3 word
$Start_Address := 0x00003DCE   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on MBS time Filter (Block 1) ok? (True to cont, False to abort)",\
```

```
                *$Ask_bool,*$LogFilename)
END IF

** MBS time Filter (Block 2)

$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xEB
$Load(1) := 0x0E
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 3   -- 3 word
$Start_Address := 0x00003DF4   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 1   -- 1 word
$Start_Address := 0x00003DF6
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 3   -- 3 word
$Start_Address := 0x00003DF4   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on MBS time Filter (Block 2) ok? (True to cont, False to abort)",\
                *$Ask_bool,*$LogFilename)
END IF

**--- IS reset at the end of IS calibration (block 1):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0)  := 0xC3
$Load(1)  := 0xB8
$Load(2)  := 0x01
$Load(3)  := 0x00
$Load(4)  := 0x50
```

```
$Load(5)  := 0x50
$Load(6)  := 0xB8
$Load(7)  := 0x16
$Load(8)  := 0xDA
$Load(9)  := 0x50
$Load(10) := 0xA1
$Load(11) := 0x14
$Load(12) := 0xDA
$Load(13) := 0x40
$Load(14) := 0x50
$Load(15) := 0xB8
$Load(16) := 0x03
$Load(17) := 0x14
$Load(18) := 0x50
$Load(19) := 0xB8
$Load(20) := 0x05
$Load(21) := 0x00
$Load(22) := 0x50
$Load(23) := 0xE8
$Load(24) := 0x13
$Load(25) := 0xF9
$Load(26) := 0x83
$Load(27) := 0xC4
$Load(28) := 0x0C
$Load(29) := 0xE8
$Load(30) := 0x59
$Load(31) := 0xC0
$Load(32) := 0xC3
$Load(33) := 0x55
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 19
$Start_Address := 0x00006AE0   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 17
$Start_Address := 0x00006AE2
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)
```

```
$DumpLength := 19
$Start_Address := 0x00006AE0   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS reset at the end of IS calibration (block 1) OK? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)

END IF

**--- IS reset at the end of IS calibration (block 2):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0)  := 0xE8
$Load(1)  := 0x8C
$Load(2)  := 0x3A
$Load(3)  := 0x8B
$Load(4)  := 0xE5
$Load(5)  := 0x5D
$Load(6)  := 0xC3
$Load(7)  := 0x90
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 6
$Start_Address := 0x00003052   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 4
$Start_Address := 0x00003054
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 6
$Start_Address := 0x00003052   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
```

```
@ASK_NOCHK_B("Dump on IS reset at the end of IS calibration (block 2) OK? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)

END IF

** DAC stair:
$PID      := 0x5A
$MEM_ID   := 0x51    -- 81dec

$Load(0)  := 0x55
$Load(1)  := 0x8B
$Load(2)  := 0xEC
$Load(3)  := 0x83
$Load(4)  := 0xEC
$Load(5)  := 0x02
$Load(6)  := 0x8B
$Load(7)  := 0x46
$Load(8)  := 0x06
$Load(9)  := 0xB1
$Load(10) := 0x08
$Load(11) := 0xD3
$Load(12) := 0xE8
$Load(13) := 0x89
$Load(14) := 0x46
$Load(15) := 0xFE
$Load(16) := 0x81
$Load(17) := 0x66
$Load(18) := 0x06
$Load(19) := 0xFF
$Load(20) := 0x00
$Load(21) := 0x8B
$Load(22) := 0x46
$Load(23) := 0x04
$Load(24) := 0xBA
$Load(25) := 0x04
$Load(26) := 0x00
$Load(27) := 0xEE
$Load(28) := 0x8B
```

```
$Load(29) := 0x56
$Load(30) := 0x06
$Load(31) := 0xD1
$Load(32) := 0xE2
$Load(33) := 0xD1
$Load(34) := 0xE2
$Load(35) := 0x81
$Load(36) := 0xCA
$Load(37) := 0x03
$Load(38) := 0x00
$Load(39) := 0x52
$Load(40) := 0x89
$Load(41) := 0xD0
$Load(42) := 0xBA
$Load(43) := 0x06
$Load(44) := 0x00
$Load(45) := 0xEF
$Load(46) := 0x5A
$Load(47) := 0x52
$Load(48) := 0x81
$Load(49) := 0xE2
$Load(50) := 0xFC
$Load(51) := 0xFF
$Load(52) := 0x0B
$Load(53) := 0x56
$Load(54) := 0xFE
$Load(55) := 0x89
$Load(56) := 0xD0
$Load(57) := 0xBA
$Load(58) := 0x06
$Load(59) := 0x00
$Load(60) := 0xEF
$Load(61) := 0x58
$Load(62) := 0xBA
$Load(63) := 0x06
$Load(64) := 0x00
$Load(65) := 0xEF
$Load(66) := 0x8B
```

```
$Load(67) := 0xE5
$Load(68) := 0x5D
$Load(69) := 0xC3

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 37   -- one word
$Start_Address := 0x00006A2A   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 35   -- one word
$Start_Address := 0x00006A2C
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 37   -- one word
$Start_Address := 0x00006A2A   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on DAC stair ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** Relocation calls (Block 1):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xE8
$Load(1) := 0x73
$Load(2) := 0x4A
$Load(3) := 0x59
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 4   -- 5 word
$Start_Address := 0x00001FB4   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 2   -- 3 word
```

```
$Start_Address := 0x00001FB6
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 4   -- 5 word
$Start_Address := 0x00001FB4   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 1) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** Relocation calls (Block 2):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xE8
$Load(1) := 0x67
$Load(2) := 0x4A
$Load(3) := 0xEB
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 4   -- 5 word
$Start_Address := 0x00001FC0   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 2   -- 3 word
$Start_Address := 0x00001FC2
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 4   -- 5 word
$Start_Address := 0x00001FC0   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 2) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF
```

```
** Relocation calls (Block 3):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xC0
$Load(1) := 0x47
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 3   -- 5 word
$Start_Address := 0x00002268   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 1   -- 3 word
$Start_Address := 0x0000226A
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 3   -- 5 word
$Start_Address := 0x00002268   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 3) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** Relocation calls (Block 4):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xB0
$Load(1) := 0x47
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 3   -- 5 word
$Start_Address := 0x00002278   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)
```

```
$LoadLength := 1   -- 3 word
$Start_Address := 0x0000227A
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 3   -- 5 word
$Start_Address := 0x00002278   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 4) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** Relocation calls (Block 5):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0x12
$Load(1) := 0x3C
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 3   -- 5 word
$Start_Address := 0x00002E16   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 1   -- 3 word
$Start_Address := 0x00002E18
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 3   -- 5 word
$Start_Address := 0x00002E16   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 5) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF
```

```
** Relocation calls (Block 6):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xE8
$Load(1) := 0xBF
$Load(2) := 0x3A
$Load(3) := 0x59
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 4   -- 5 word
$Start_Address := 0x00002F68   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 2   -- 3 word
$Start_Address := 0x00002F6A
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 4   -- 5 word
$Start_Address := 0x00002F68   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 6) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** Relocation calls (Block 7):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xE8
$Load(1) := 0xA7
$Load(2) := 0x3A
$Load(3) := 0x59
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 4   -- 5 word
```

```
$Start_Address := 0x00002F80   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 2   -- 3 word
$Start_Address := 0x00002F82
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 4   -- 5 word
$Start_Address := 0x00002F80   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 7) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** Relocation calls (Block 8):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xE8
$Load(1) := 0x85
$Load(2) := 0x3A
$Load(3) := 0x59
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 4   -- 5 word
$Start_Address := 0x00002FA2   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 2   -- 3 word
$Start_Address := 0x00002FA4
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 4   -- 5 word
$Start_Address := 0x00002FA2   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)
```

```
IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on Relocation calls (Block 8) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

--19.07.2002 commentata la patch (blocco 1 e 2)
--19.07.2002 rimossi i commenti

** IS Blind (Block 1):
$PID      := 0x5A
$MEM_ID   := 0x51    -- 81dec

$Load(0)  := 0xC3
$Load(1)  := 0x55
$Load(2)  := 0x8B
$Load(3)  := 0xEC
$Load(4)  := 0x83
$Load(5)  := 0xEC
$Load(6)  := 0x04
$Load(7)  := 0xE8
$Load(8)  := 0xBB
$Load(9)  := 0xE1
$Load(10) := 0xBA
$Load(11) := 0x12
$Load(12) := 0x00
$Load(13) := 0xED
$Load(14) := 0x25
$Load(15) := 0x80
$Load(16) := 0x00
$Load(17) := 0x89
$Load(18) := 0x46
$Load(19) := 0xFC
$Load(20) := 0xBA
$Load(21) := 0x02
$Load(22) := 0x20
$Load(23) := 0xED
$Load(24) := 0x25
$Load(25) := 0x08
```

```
$Load(26) := 0x00
$Load(27) := 0x89
$Load(28) := 0x46
$Load(29) := 0xFE
$Load(30) := 0x83
$Load(31) := 0x3E
$Load(32) := 0xB2
$Load(33) := 0xDB
$Load(34) := 0x00
$Load(35) := 0x74
$Load(36) := 0x0F
$Load(37) := 0x83
$Load(38) := 0x7E
$Load(39) := 0xFC
$Load(40) := 0x00
$Load(41) := 0x74
$Load(42) := 0x09
$Load(43) := 0x83
$Load(44) := 0x7E
$Load(45) := 0xFE
$Load(46) := 0x00
$Load(47) := 0x75
$Load(48) := 0x03
$Load(49) := 0xE8
$Load(50) := 0x6F
$Load(51) := 0xBF
$Load(52) := 0x8B
$Load(53) := 0xE5
$Load(54) := 0x5D
$Load(55) := 0xC3

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 30   -- one word
$Start_Address := 0x00006BB6   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 28   -- one word
```

```
$Start_Address := 0x00006BB8
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 30   -- one word
$Start_Address := 0x00006BB6   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
   @ASK_NOCHK_B("Dump on IS Blind (Block 1) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** IS Blind (Block 2):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xF5
$Load(1) := 0xE8
$Load(2) := 0xCB
$Load(3) := 0x14
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 4   -- 5 word
$Start_Address := 0x000056E8   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 2   -- 3 word
$Start_Address := 0x000056EA
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 4   -- 5 word
$Start_Address := 0x000056E8   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS Blind (Block 2) ok? (True to cont, False to abort)",\
                *$Ask_bool,*$LogFilename)
END IF
```

```
--19.07.2002 commentata la patch (blocco 1 e 2)

** IS Reset Pulses (Block 1):
$PID      := 0x5A
$MEM_ID   := 0x51    -- 81dec

$Load(0)  := 0xC3
$Load(1)  := 0x55
$Load(2)  := 0x8B
$Load(3)  := 0xEC
$Load(4)  := 0x83
$Load(5)  := 0xEC
$Load(6)  := 0x0A
$Load(7)  := 0xC7
$Load(8)  := 0x46
$Load(9)  := 0xFE
$Load(10) := 0x05
$Load(11) := 0x00
$Load(12) := 0xC7
$Load(13) := 0x46
$Load(14) := 0xFC
$Load(15) := 0x00
$Load(16) := 0x00
$Load(17) := 0xC7
$Load(18) := 0x46
$Load(19) := 0xFA
$Load(20) := 0x00
$Load(21) := 0x00
$Load(22) := 0xC7
$Load(23) := 0x46
$Load(24) := 0xF8
$Load(25) := 0x00
$Load(26) := 0x00
$Load(27) := 0x8B
$Load(28) := 0x46
$Load(29) := 0xF8
$Load(30) := 0x3B
```

```
$Load(31) := 0x46
$Load(32) := 0xFE
$Load(33) := 0x73
$Load(34) := 0x46
$Load(35) := 0xBA
$Load(36) := 0x16
$Load(37) := 0x00
$Load(38) := 0xB8
$Load(39) := 0xFF
$Load(40) := 0xFF
$Load(41) := 0xEF
$Load(42) := 0xC7
$Load(43) := 0x46
$Load(44) := 0xF6
$Load(45) := 0x00
$Load(46) := 0x00
$Load(47) := 0x8B
$Load(48) := 0x46
$Load(49) := 0xF6
$Load(50) := 0x3B
$Load(51) := 0x46
$Load(52) := 0xFA
$Load(53) := 0x73
$Load(54) := 0x0B
$Load(55) := 0xFF
$Load(56) := 0x46
$Load(57) := 0xF6
$Load(58) := 0x8B
$Load(59) := 0x46
$Load(60) := 0xF6
$Load(61) := 0x3B
$Load(62) := 0x46
$Load(63) := 0xFA
$Load(64) := 0x72
$Load(65) := 0xF5
$Load(66) := 0xB8
$Load(67) := 0x00
$Load(68) := 0x00
```

```
$Load(69) := 0xEF
$Load(70) := 0xC7
$Load(71) := 0x46
$Load(72) := 0xF6
$Load(73) := 0x00
$Load(74) := 0x00
$Load(75) := 0x8B
$Load(76) := 0x46
$Load(77) := 0xF6
$Load(78) := 0x3B
$Load(79) := 0x46
$Load(80) := 0xFC
$Load(81) := 0x73
$Load(82) := 0x0B
$Load(83) := 0xFF
$Load(84) := 0x46
$Load(85) := 0xF6
$Load(86) := 0x8B
$Load(87) := 0x46
$Load(88) := 0xF6
$Load(89) := 0x3B
$Load(90) := 0x46
$Load(91) := 0xFC
$Load(92) := 0x72
$Load(93) := 0xF5
$Load(94) := 0xFF
$Load(95) := 0x46
$Load(96) := 0xF8
$Load(97) := 0x8B
$Load(98) := 0x46
$Load(99) := 0xF8
$Load(100) := 0x3B
$Load(101) := 0x46
$Load(102) := 0xFE
$Load(103) := 0x72
$Load(104) := 0xBA
$Load(105) := 0x8B
$Load(106) := 0xE5
```

```
$Load(107) := 0x5D
$Load(108) := 0xC3
$Load(109) := 0xB8

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 57   -- one word
$Start_Address := 0x00006B00   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 55   -- one word
$Start_Address := 0x00006B02
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 57   -- one word
$Start_Address := 0x00006B00   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS Reset Pulses (Block 1) ok? (True to cont, False to abort)",\
               *$Ask_bool,*$LogFilename)
END IF

** IS Reset Pulses (Block 2):
$PID     := 0x5A
$MEM_ID  := 0x51    -- 81dec

$Load(0) := 0xC3
$Load(1) := 0xE9
$Load(2) := 0xA5
$Load(3) := 0x3F
$Load(4) := 0x90
$Load(5) := 0x90
$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 5
$Start_Address := 0x00002B58   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)
```

```
$LoadLength := 3
$Start_Address := 0x00002B5A
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 5
$Start_Address := 0x00002B58   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on IS Reset Pulses (Block 2) ok? (True to cont, False to abort)",\
              *$Ask_bool,*$LogFilename)
END IF

--19.07.2002 commentata la patch (blocco 1 e 2)

** 5 IS Reset Pulses (Block 1):
$PID      := 0x5A
$MEM_ID   := 0x51    -- 81dec

$Load(0)  := 0xC3
$Load(1)  := 0x55
$Load(2)  := 0x8B
$Load(3)  := 0xEC
$Load(4)  := 0x83
$Load(5)  := 0xEC
$Load(6)  := 0x02
$Load(7)  := 0x8B
$Load(8)  := 0x1E
$Load(9)  := 0xC4
$Load(10) := 0x90
$Load(11) := 0x8B
$Load(12) := 0x47
$Load(13) := 0x7E
$Load(14) := 0x89
$Load(15) := 0x46
$Load(16) := 0xFE
$Load(17) := 0xB8
```

```
$Load(18) := 0x23
$Load(19) := 0x00
$Load(20) := 0x50
$Load(21) := 0xE8
$Load(22) := 0xB3
$Load(23) := 0x9B
$Load(24) := 0x59
$Load(25) := 0x52
$Load(26) := 0x50
$Load(27) := 0xBA
$Load(28) := 0x16
$Load(29) := 0x00
$Load(30) := 0xB8
$Load(31) := 0xFF
$Load(32) := 0xFF
$Load(33) := 0xEF
$Load(34) := 0xB8
$Load(35) := 0x16
$Load(36) := 0x00
$Load(37) := 0x9C
$Load(38) := 0x9D
$Load(39) := 0x48
$Load(40) := 0x3D
$Load(41) := 0x00
$Load(42) := 0x00
$Load(43) := 0x75
$Load(44) := 0xF8
$Load(45) := 0xB8
$Load(46) := 0x00
$Load(47) := 0x00
$Load(48) := 0xEF
$Load(49) := 0x58
$Load(50) := 0x5A
$Load(51) := 0xE8
$Load(52) := 0xB7
$Load(53) := 0xBF
$Load(54) := 0xA1
$Load(55) := 0xA6
```

```
$Load(56) := 0xDB
$Load(57) := 0x3B
$Load(58) := 0x46
$Load(59) := 0xFE
$Load(60) := 0x7D
$Load(61) := 0x08
$Load(62) := 0xB8
$Load(63) := 0x23
$Load(64) := 0x00
$Load(65) := 0x50
$Load(66) := 0xE8
$Load(67) := 0xAA
$Load(68) := 0x9B
$Load(69) := 0x59
$Load(70) := 0x90
$Load(71) := 0x8B
$Load(72) := 0xE5
$Load(73) := 0x5D
$Load(74) := 0xC3
$Load(75) := 0x55

$WLEN := 2 -- number of bites in one word, in/out para

$DumpLength := 40   -- one word
$Start_Address := 0x00006B6C   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

$LoadLength := 38   -- one word
$Start_Address := 0x00006B6E
@CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

$DumpLength := 40   -- one word
$Start_Address := 0x00006B6C   -- start at 1 word less, until plus one word
@CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

IF ($Flag_checks = TRUE)
@ASK_NOCHK_B("Dump on 5 IS Reset Pulses (Block 1) ok? (True to cont, False to abort)",\
                *$Ask_bool,*$LogFilename)
```

```
      END IF

      ** 5 IS Reset Pulses (Block 2):
      $PID      := 0x5A
      $MEM_ID   := 0x51    -- 81dec

      $Load(0) := 0xE8
      $Load(1) := 0x8E
      $Load(2) := 0x3E
      $Load(3) := 0x8B
      $WLEN := 2 -- number of bites in one word, in/out para

      $DumpLength := 4   -- 3 word
      $Start_Address := 0x00002CDC   -- start at 1 word less, until plus one word
      @CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

      $LoadLength := 2   -- 1 word
      $Start_Address := 0x00002CDE
      @CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

      $DumpLength := 4   -- 3 word
      $Start_Address := 0x00002CDC   -- start at 1 word less, until plus one word
      @CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

      IF ($Flag_checks = TRUE)
      @ASK_NOCHK_B("Dump on 5 IS Reset Pulses (Block 2) ok? (True to cont, False to abort)",\
                     *$Ask_bool,*$LogFilename)
      END IF


$PAYLOAD($GD)($STS) := "STANDBY"

##L_ABORT    ---  END operation caused by User
   **-----------------
   ** Close LogBook
   **-----------------
   @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)
```

```
   $GIADA_status := "ON_ended"            -- set flag for parallel calling

   IF ($EXE_Test_Manager = "ABORT")
      Return "ABORT"
   ELSE
      Return "OK"         -- in CONTINUE case, even if errors had occured !!!!!!
   END IF
END SEQUENCE
```

PGDST_CONTEX.e (Context Saving Text testing)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_CONTEX
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : Context Saving Text testing
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
```

```
**                                          first CCS version issued
**  1.2     20/09/2001          L.Malvasio   PFM topics
**  3.0     10/07/2002          R.R          PFM as inputs 07/2002
*******************************************************************************

GLOBAL

VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc := "NULL"
      STRING  $Model          -- S/C Model [EQM, PFM]

END GLOBAL

SEQUENCE PGDST_CONTEX

PROTO
        ----------------------------------------
      -- User Defined In & Outfirst if applicable
        ----------------------------------------

      ----------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------

      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                             -- TS is called from another one.
                             -- If used stand alone it MUST NOT
                                      -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                             -- If not specified
                             -- step numbering will start
```

```
                          -- from 1

        STRING  $Dispmode := "LOGDISPLAY"

               -- NOTE !!!
               -- $Dispmode should normally be set to "LOGDISPLAY"

               -- "DISPLAY"
               -- the messages will be displayed on the TS Window only

               -- "LOG"
               -- the messages will be written on As Run File
               -- and written in the User defined log file
               -- (LogFileName generated from TS_Name By OPEN_LGB1)
               -- which is stored in the CFM_USER_FILES directory

               -- "LOGDISPLAY"
               -- the messages will be displayed on the TS Window
               -- and written in the OC As Run logfile

               -- "ALSLOGDISP"
               -- the messages will be displayed on the TS Window
               -- and written in the User defined log file which

               -- "LOGBOOK"
               -- the messages will be displayed on OC LogBook

               -- "DISP"
               -- the messages will be displayed on OC Lng Command Window

               -- "LCD"
               -- the messages will be displayed on TS Yellow Display

END PROTO

CONST
      ------------------------------------
      -- Constants Used By The Architecture
```

```
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      INT $CMDCHK    := 3
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------
        INT $ANALOG_VALUE := 9999
VAR
      -------------------------------------
      -- Variables Used By The Architecture
```

```
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND     $TCommand(100)
      REFPARAM    $ParametersToRead(100)
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      INT         $NumOfCall := 0
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $Question
      STRING      $ShouldIDoIt   := "NO"
      STRING      $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING      $Choice
        STRING      $TmpString  -- used to print packets
        INT         $TmpInt
        INT       $I                          -- counter
        BOOL      $Ask_bool  := FALSE         -- query var.
        STRING      $TMPacket
MAIN

  WINDOW   -- init the user i/f window of the sequence


  **---------------------------
  ** TS LogBook Initialization
  ** MANDATORY !!!
```

```
**----------------------------
$TS_Name  := "PGDST_CONTEX" -- Base for the Logbook Name, must be TS Name

@OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$Dispmode)

**-------------------
** SCOE connections
**-------------------
$ConfigScoe($TMTCSC) :=  $USED
@CONN_SCOE1($LogFilename,$ConfigScoe,$Dispmode)

**---------------------------------------
** Initialize the communication variables
** MANDATORY !!!
**---------------------------------------
@SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

-------------------------
-- USER CODE STARTS HERE
-------------------------

** presettings for all actions:
  $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
 $Configure($Message)($OfCheckTitle)  := " "

 $OutMessages(0) := "*********************************************************************"
 $OutMessages(1) := "*  CONTEXT FILE MAY BE NOT SUPPORTED BY SYSTEM "
 $OutMessages(2) := "*       AND / OR MAY BE SKIPPED."
 $OutMessages(3) := "*  "
 $OutMessages(4) := "*  CF will HALT !!! "
 $OutMessages(5) := "*  "
 $OutMessages(6) := "*  ASK Test Conductor for continuation"
 $OutMessages(7) := "*  (no actions coded after CONT.)"
 $OutMessages(8) := "*********************************************************************"
 @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

 HALT   -- !!!!!!!!!!!!!!!!!!!!!
```

```
   **-------------------------------------------------------
   **--- 1. ACCEPT CONTEXT FILE ----
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " ACCEPT CONTEXT FILE"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 40


**  REMARK: --->  See Ro-ALS-NCR-8069
*****************************************************************************************************
** 19/09/2001  Due to the RO-ALS-NCR-8069 related to wrong Giada command interpretation, the context file **
** upload will be done using service 6, as following step 6.1                                          **
*****************************************************************************************************
-- The previous comment is no more applicable for the Giada FS that is going to solve this particular
problem..(18.07.02)

  if ($EXE_Test_Manager = "ABORT") goto L_ABORT

    --No more Applicable (18.07.02)** this TC should be the General TC ZAC... (18,4) with the Giada PID

   --$TCommand(0) := {ROS.TC.ZAC03003, SCOE := "TMTCSC", ACKBITS:="BOTH", xxxxxxx}     --  ACCEPT CONTEXT FILE
   --$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   --
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   $Configure($Message)($OfDispMode)    := $Dispmode
   $Configure($Message)($OfCheckTitle)  := "ACCEPT CONTEXT FILE"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 50
   $Configure($CMDCHK)(0) := "ACC"
   $TimeDelay($AfterCMD)(0) := 20
   $TCommand(0) := {ROS.TC.ZGD00009 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   -- ACCEPT CONTEXT FILE
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
```

```
 @EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)


  @ASK_CHK_B("Ready to send REPORT CONTEXT TC ? - true to cont",*$EXE_Test_Manager,*$LogFileName)
  if ($EXE_Test_Manager = "ABORT") goto L_ABORT

 **-----------------------------------------------------
 **--- 2. REPORT CONTEXT FILE ----
 **-----------------------------------------------------
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

 @RAWDATDISP($LogFileName,"ROS.TM.YGD00013","SET",,30000)
 $Configure($Message)($OfDispMode)    := $Dispmode
 $Configure($Message)($OfCheckTitle)  := "ACCEPT CONTEXT FILE"
 $Configure($Message)($OfExeStepMode) := "TC"
 $TimeDelay($ToReadTLM)(0) := 50
 $Configure($CMDCHK)(0) := "ACC"
 $TimeDelay($AfterCMD)(0) := 20
 $TCommand(0) := {ROS.TC.ZGD00008 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   -- REPORT CONTEXT FILE
 $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

 @EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)

  $StepDes := "REPORT CONTEXT FILE"
  @TEST_STEP($TS_Name,$LogFilename,$StepDes,500)

  @ASK_CHK_B("Aktivat Raw TM Packet viewer for YGD00013 - true to cont",*$EXE_Test_Manager,*$LogFileName)
  if ($EXE_Test_Manager = "ABORT") goto L_ABORT

 --$TMPacket := GETNEXTOCDS ("ROS.TM.YGD00013", TYPE:=-1, TIMEOUT:=10000, OUT:="BYTE")
 @RAWDATDISP($LogFileName,"ROS.TM.YGD00013","GET",,30000)

 $OutMessages(0) :=  "*  Context File report!!!     *"
 @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)
```

```
  **-----------------------------------------------------
  **--- 3. PL status check ----
  **-----------------------------------------------------
  @TEST_STEP($TS_Name,$LogFilename,"PL status check",500)


  @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
             *$EXE_Test_Manager,*$LogFileName)
  if ($EXE_Test_Manager = "ABORT") goto L_ABORT



  ** short error reporting
  ##L_ABORT    ---  END operation caused by User

  -------------------------
 -- USER CODE STOPS HERE
 -------------------------

 **-----------------
 ** SCOEs disconnect
 **-----------------
 --@DISCONN_SCO1($LogFileName,$ConfigScoe,$TS_Name)

 **-----------------
 ** Close LogBook
 **-----------------
 @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

 RETURN "OK"

END SEQUENCE
```

PGDST_DMS.e (ON BOARD TRAFFIC MANAGEMENT)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_DMS
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : ON BOARD TRAFFIC MANAGEMENT
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
```

```
**                                          first CCS version issued
**  2.0     20/09/2001          L. Malvasio  PFM topics
**  3.0     10/07/2002          R.R          PFM as inputs 07/2002
*****************************************************************************
GLOBAL
VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc := "NULL"
      STRING  $Model          -- S/C Model [EQM, PFM]

END GLOBAL

SEQUENCE PGDST_DMS

PROTO
        ----------------------------------------
      -- User Defined In & Outfirst if applicable
        ----------------------------------------

      ----------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------

      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                             -- TS is called from another one.
                             -- If used stand alone it MUST NOT
                                     -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                             -- If not specified
                             -- step numbering will start
                             -- from 1
```

```
        STRING  $Dispmode := "LOGDISPLAY"

                -- NOTE !!!
                -- $Dispmode should normally be set to "LOGDISPLAY"

                -- "DISPLAY"
                -- the messages will be displayed on the TS Window only

                -- "LOG"
                -- the messages will be written on As Run File
                -- and written in the User defined log file
                -- (LogFileName generated from TS_Name By OPEN_LGB1)
                -- which is stored in the CFM_USER_FILES directory

                -- "LOGDISPLAY"
                -- the messages will be displayed on the TS Window
                -- and written in the OC As Run logfile

                -- "ALSLOGDISP"
                -- the messages will be displayed on the TS Window
                -- and written in the User defined log file which

                -- "LOGBOOK"
                -- the messages will be displayed on OC LogBook

                -- "DISP"
                -- the messages will be displayed on OC Lng Command Window

                -- "LCD"
                -- the messages will be displayed on TS Yellow Display

END PROTO

CONST
      ------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      ------------------------------------
```

```
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      INT $CMDCHK    := 3
      ------------------------------------
      -- User Defined Constants Here
      ------------------------------------
        INT $ANALOG_VALUE := 9999
VAR
      ------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      ------------------------------------
```

```
      COMMAND     $TCommand(100)
      REFPARAM    $ParametersToRead(100)
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      INT         $NumOfCall := 0
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $Question
        STRING      $ShouldIDoIt   := "NO"
      STRING      $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING      $Choice
        STRING      $TmpString  -- used to print packets
        INT         $TmpInt

      INT       $I                          -- counter
      BOOL      $Ask_bool  := FALSE         -- query var.

      STRING    $step

MAIN

  WINDOW   -- init the user i/f window of the sequence


  **---------------------------
  ** TS LogBook Initialization
```

```
  ** MANDATORY !!!
  **---------------------------
  $TS_Name  := "PGDST_DMS" -- Base for the Logbook Name, must be TS Name

  @OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$Dispmode)

  **-------------------
  ** SCOE connections
  **-------------------
  $ConfigScoe($TMTCSC) :=  $USED
  @CONN_SCOE1($LogFilename,$ConfigScoe,$Dispmode)

  **---------------------------------------
  ** Initialize the communication variables
  ** MANDATORY !!!
  **---------------------------------------
  @SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

  -------------------------
  -- USER CODE STARTS HERE
  -------------------------

   **-----------------------------------------------------
   **--- 1. DISABLE HK REPORTING ----
   **-----------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " Disable HK Reporting"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 50
   $TCommand(0) := {ROS.TC.ZGD00002 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDDA002 :OBV:= 1}
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}      -- DISABLE HK REPORTING


@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)
```

```
   $OutMessages(0) :=
"*************************************************************************************************************"
   $OutMessages(1) :=  "** WAIT 40 SEC AND VERIFY NO HK PACKETS DELIVERED
**"
   $OutMessages(2) :=
"*************************************************************************************************************"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   ** check with operator
   @ASK_CHK_B ("Verify no HK reporting. (True when ready, False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **-------------------------------------------------------
   **--- 2. ENABLE HK REPORTING ----
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)     := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)   := " Enable HK Reporting"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 50
   $TCommand(0) := {ROS.TC.ZGD00001 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDDA002 :OBV:= 1}
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}      --ENABLE HK REPORTIN

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   $OutMessages(0) := "waiting for 40 sec.s ..."
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   WAITFORSYS 40

   **-------------------------------------------------------
   **--- 3. Configure to Safe Mode   ----
   **-------------------------------------------------------
   $OutMessages(0) := "Configure to Safe Mode"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)
```

```
   call PGDGE_MCHG,  "SAFE", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif

   **-----------------------------------------------------
   **--- 4. PL status check ----
   **-----------------------------------------------------

    $StepDes := "PL status check"
    @TEST_STEP($TS_Name,$LogFilename,$StepDes,500)

   @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   ** short error reporting
   ##L_ABORT    ---  END operation caused by User

   -------------------------
  -- USER CODE STOPS HERE
  -------------------------

  **-----------------
  ** SCOEs disconnect
  **-----------------
  --@DISCONN_SCO1($LogFileName,$ConfigScoe,$TS_Name)

  **-----------------
  ** Close LogBook
  **-----------------
  @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

  RETURN "OK"

END SEQUENCE
```

PGDST_PTCDMP.e (Patch and Dump Testing)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_PTCDMP
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : Patch and Dump Testing
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
**                                           first CCS version issued
```

```
*******************************************************************************

SEQUENCE PGDST_PTCDMP
Proto
   STRING     $IN_LogFileName := "PGDST_PTCDMP"    -- def. W-logfilename
   STRING    *$INOUT_EXE_Test                     -- error/abort flag
   STRING     $INstep         := "PGD"           -- step number
End Proto


CONST
   INT $ANALOG_VALUE := 9999

   INT $OfCheckTitle  := 0
   INT $OfExeStepMode := 1
   INT $OfDispMode    := 2
   INT $AfterCMD      := 0
   INT $ToReadTLM     := 1
   INT $Message       := 0
   INT $FirstCMDDes   := 1
   INT $SecondCMDDes  := 2

Var
   STRING      $DispMode := "LOGDISPLAY"
   STRING      $OutMessages(100)

   STRING      $Question
   STRING      $ShouldIDoIt   := "NO"
   STRING      $UserChoice    := "Y"
   STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
   STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
   STRING      $Choice

   STRING      $Configure(4)(100)
   COMMAND     $TCommand(100)
   REFPARAM    $ParametersToRead(100)
   INT         $RefValues(100)
   REAL        $Limits(2)(100)
```

```
   INT         $TimeDelay(2)(100)

   STRING      $TMPacket(200)
   STRING      $TmpString  -- used to print packets
   INT         $TmpInt

   INT       $I                            -- counter
   BOOL      $Ask_bool  := FALSE           -- query var.
   STRING    $LogFileName := "PGDIST_PDT"
   STRING    $EXE_Test_Manager  := "OK"
   STRING    $step

   STRING    $Check := ""
   STRING    $Data(300)

MAIN
   $step := $INstep
   $LogFileName := $IN_LogFileName
   $EXE_Test_Manager  := $INOUT_EXE_Test

   ** Initialize the communication variables
   @SET_INI_VAL(*$RefValues, *$Limits, *$TimeDelay, *$Configure)

   open a, $LogFileName

   **-----------------------------------------------------------------
   **--- query to start specific main step: PATCH AND DUMP Testing
   **-----------------------------------------------------------------
   @PLMOD_SQUERY ("IST","GIADA", "PATCH AND DUMP Testing",\
                  *$LogFileName,*$EXE_Test_Manager,$step+".0")
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **--- start of temp. block-------------------------------------------------------------
   $OutMessages()  := FILL ("MESSAGES STRING END")
   $OutMessages(0) := " "
   $OutMessages(1) := " Note to the Operator:  "
   $OutMessages(2) := " ====================  "
```

```
$OutMessages(3) := " The following 2 getnext-cmd.s on 1449.6.6 and 1447.6.10 are necessary"
$OutMessages(4) := "  to enable these cmd.s for use lateron in the PDT. "
$OutMessages(5) := " "
$OutMessages(6) := " BUT the following both getnext-cmds will result in expected "
$OutMessages(7) := " time-out errors for Pkt 1449.6.6 and 1447.6.10."
$OutMessages(8) := "*****************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)
@ASK_NOCHK_B("Got the CF-message ? - T & F to cont. PDT CF",*$Ask_bool,*$LogFilename)

$Data() := GETNEXTOCDS("ROS.TM.1449.6.6", -1, 59000, "BYTE")
$Data() := GETNEXTOCDS("ROS.TM.1447.6.10", -1, 59000, "BYTE")

**-------------------------------------------------------------------------------------
** in SUBR.  MEM_TL_SERV.e following getnext are used for GIADA:
** nominal using DB Pkt-name: $Data() := GETNEXTOCDS("ROS.TM.YGD00005", -1, 59000, "BYTE")
** now using:                 $Data() := GETNEXTOCDS("ROS.TM.1449.6.6", -1, 59000, "BYTE")
** and
** nominal using DB Pkt-name: $Data() := GETNEXTOCDS("ROS.TM.YGD00006", -1, 59000, "BYTE")
** now using:                 $Data() := GETNEXTOCDS("ROS.TM.1447.6.10", -1, 59000, "BYTE")
**---end of temp. block ----------------------------------------------------------------


**-----------------------------------------------------
**--- 1. Recieve HK packet ----
**-----------------------------------------------------
@T_STEP (*$step, "1", "Recieve HK packet", *$LogFileName)

$TMPacket := GETNEXTOCDS ("ROS.TM.YGD00001", TYPE:=-1, TIMEOUT:=30000, OUT:= "BYTE")
$OutMessages()  := FILL ("MESSAGES STRING END")
$OutMessages(0) := " "
$OutMessages(1) := " TM packet YGD00001 received.  "
$OutMessages(2) := " "
$OutMessages(3) := "*****************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)


**-----------------------------------------------------
**--- 2. Send the LOAD & DUMP MEMORY commands (zero's) ----
```

```
   **-------------------------------------------------------
   @T_STEP (*$step, "2", "Sending of Load & Dump Memory commands (zero's)", *$LogFileName)

@ASK_NOCHK_B("Aktivat Raw TM Packet viewer for YGD00005 and YGD00006 - true to cont",*$Ask_bool,*$LogFilename)

   DO
      @LDCC_DATA("ZGD_62_65_1.txt",*$Check,*$LogFileName,*$EXE_Test_Manager)

      @ASK_NOCHK_B("Load/dummy memory OK? - T to cont CF, F repeat loading",*$Ask_bool,*$LogFilename)
      exit IF ($Ask_bool)
   ENDDO
@ASK_NOCHK_B("Print both PKT's from viewer ? - (T or F to cont)",*$Ask_bool,*$LogFilename)



   **-------------------------------------------------------
   **--- 3. Recieve HK packet ----
   **-------------------------------------------------------
   @T_STEP (*$step, "3", "Receive HK packet", *$LogFileName)

   $TMPacket := GETNEXTOCDS ("ROS.TM.YGD00001", TYPE:=-1, TIMEOUT:=30000, OUT:= "BYTE")
   $OutMessages()  := FILL ("MESSAGES STRING END")
   $OutMessages(0) := " "
   $OutMessages(1) := " TM packet YGD00001 received.  "
   $OutMessages(2) := " "
   $OutMessages(3) := "*****************************************************************"
   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)


   **-------------------------------------------------------
   **--- 5. Send the LOAD & DUMP MEMORY command (data)----
   **-------------------------------------------------------
   @T_STEP (*$step, "5", "Sending of Load & Dump Memory command (data)", *$LogFileName)

@ASK_NOCHK_B("Aktivat Raw TM Packet viewer for YGD00005 and YGD00006 - true to cont",*$Ask_bool,*$LogFilename)

   DO
      @LDCC_DATA("ZGD_62_65_2.txt",*$Check,*$LogFileName,*$EXE_Test_Manager)
```

```
      @ASK_NOCHK_B("Load/dummy memory OK? - T to cont CF, F repeat loading",*$Ask_bool,*$LogFilename)
      exit IF ($Ask_bool)
   ENDDO
@ASK_NOCHK_B("Print both PKT's from viewer ? - (T or F to cont)",*$Ask_bool,*$LogFilename)


   **-----------------------------------------------------
   **--- 6. PL status check ----
   **-----------------------------------------------------
   @T_STEP (*$step, "6", "PL status check", *$LogFileName)

   @ASK_CHK_B ("PL in status to CONTINUE IST ? (True to cont., False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   ** short error reporting
   ##L_ABORT    ---  END operation caused by User

   close $LogFileName
   $INOUT_EXE_Test := $EXE_Test_Manager

   **IF ($EXE_Test_Manager <> "OK")
   **   Return "NOK"
   **ELSE
   **   Return "OK"
   **ENDIF

   RETURN
END SEQUENCE
```

PGDST_SCIE.e (SCIENCE DATA TRANSFER VERIFICATION)

```
*******************************************************************************
**  ALENIA SPAZIO TORINO -- VIAT ROSETTA TEAM
*******************************************************************************
**
**    Object Name : PGDST_SCIE.e
**
**    Object Type : Test Sequence
**
**    Date        : DD/MM/YYYY
**
**    Config. No. : TBD
**
**    Origin            : Alenia Spazio VIAT
**
**    Author            :
**
**    Purpose           : SCIENCE DATA TRANSFER VERIFICATION
**
**    Description :
**
**    S/S name    :
**
**    Model       :
**
**    Applic. Dox :
**
**-----------------------------------------------------------------------------
**    Date        Author           Comments
**-----------------------------------------------------------------------------
**    xx/11/2000  C.Prato          first draft
**                P.Huber          modules derived,
**                              first CCS version issued
**
**    20/09/2001  L.Malvasio  PFM topics
```

```
**-------------------------------------------------------------------------
*************************************************************************

GLOBAL

VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc := "NULL"
      STRING  $Model          -- S/C Model [EQM, PFM]

END GLOBAL

SEQUENCE PGDST_SCIE

PROTO
        ----------------------------------------
      -- User Defined In & Outfirst if applicable
        ----------------------------------------

      ----------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------

      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                            -- TS is called from another one.
                            -- If used stand alone it MUST NOT
                                    -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                            -- If not specified
                            -- step numbering will start
                            -- from 1
```

```
        STRING  $DispMode := "LOGDISPLAY"

                -- NOTE !!!
                -- $Dispmode should normally be set to "LOGDISPLAY"

                -- "DISPLAY"
                -- the messages will be displayed on the TS Window only

                -- "LOG"
                -- the messages will be written on As Run File
                -- and written in the User defined log file
                -- (LogFileName generated from TS_Name By OPEN_LGB1)
                -- which is stored in the CFM_USER_FILES directory

                -- "LOGDISPLAY"
                -- the messages will be displayed on the TS Window
                -- and written in the OC As Run logfile

                -- "ALSLOGDISP"
                -- the messages will be displayed on the TS Window
                -- and written in the User defined log file which

                -- "LOGBOOK"
                -- the messages will be displayed on OC LogBook

                -- "DISP"
                -- the messages will be displayed on OC Lng Command Window

                -- "LCD"
                -- the messages will be displayed on TS Yellow Display

END PROTO

CONST
      ------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      ------------------------------------
```

```
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      INT $CMDCHK    := 3
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------

VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
```

```
      COMMAND     $TCommand(100)
      REFPARAM    $ParametersToRead(100)
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      INT         $NumOfCall := 0
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $Question
      STRING      $ShouldIDoIt   := "NO"
      STRING      $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING      $Choice
      STRING      $TMPacket(200)
      STRING      $TmpString               -- used to print packets
      INT         $TmpInt
      INT         $I                           -- counter
      BOOL        $Ask_bool  := FALSE          -- query var.


MAIN

  WINDOW   -- init the user i/f window of the sequence

  **----------------------------
  ** TS LogBook Initialization
  ** MANDATORY !!!
  **----------------------------
```

```
$TS_Name  := "PGDST_SCIE" -- Base for the Logbook Name, must be TS Name
@OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$DispMode)

**-------------------
** SCOE connections
**-------------------
$ConfigScoe($TMTCSC) :=  $USED
@CONN_SCOE1($LogFilename,$ConfigScoe,$DispMode)

**---------------------------------------
** Initialize the communication variables
** MANDATORY !!!
**---------------------------------------
@SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

-------------------------
-- USER CODE STARTS HERE
-------------------------

**-----------------------------------------------------
**--- 1. Configure Normal mode  ----
**-----------------------------------------------------
$StepDes := "Configure to NORMAL MODE"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

CALL PGDGE_MCHG ,"NORMAL",$LogFileName, -1

**-----------------------------------------------------
**--- 2. SET IS OFF ----
**-----------------------------------------------------
$Configure($Message)($OfDispMode)    := $Dispmode
$Configure($Message)($OfCheckTitle)  := "SET IS OFF"
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 50
$Configure($CMDCHK)(0) := "ACC"
$TimeDelay($AfterCMD)(0) := 20
$TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "Off"}   --SET IS OFF
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
```

```
$ParametersToRead(0) := &NGDD0045
$RefValues(0) := 0
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)


**-------------------------------------------------------
**--- 3. SET MBS OFF ----
**-------------------------------------------------------
$Configure($Message)($OfDispMode)    := $Dispmode
$Configure($Message)($OfCheckTitle)  := "SET MBS OFF"
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 50
$Configure($CMDCHK)(0) := "ACC"
$TimeDelay($AfterCMD)(0) := 20
$TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "Off"}   --SET MBS OFF
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$ParametersToRead(0) := &NGDD0065
$RefValues(0) := 0                      ** "OFF"
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)

**-------------------------------------------------------
**--- 4. ENABLE SCIENCE REPORTING ----
**-------------------------------------------------------
$StepDes := "ENABLE SCIENCE REPORTING"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

CALL PGDGE_MCHG,  "ENA_SCI", $LogFileName, -1
if ($Rstat = "ABORT")
   $EXE_Test_Manager := "ABORT"
   goto L_ABORT
endif
```

```
**-------------------------------------------------------
**--- 5. SET IS ON ----
**-------------------------------------------------------
$Configure($Message)($OfDispMode)    := $Dispmode
$Configure($Message)($OfCheckTitle)  := "SET IS ON, get Science Packets"
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 40
$Configure($CMDCHK)(0) := "ACC"
$TimeDelay($AfterCMD)(0) := 20
$TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "On"}
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}       -- SET IS ON
$ParametersToRead(0) := &NGDD0045
$RefValues(0) := 1   -- CHECK if IS is set to "ON"
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)

@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 6. SET MBS ON ----
**-------------------------------------------------------
$Configure($Message)($OfDispMode)    := $Dispmode
$Configure($Message)($OfCheckTitle)  := "SET MBS ON and verify"
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 40
$Configure($CMDCHK)(0) := "ACC"
$TimeDelay($AfterCMD)(0) := 20
$TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "On"}   -- SET MBS ON
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$ParametersToRead(0) := &NGDD0065
$RefValues(0) := 1   -- CHECK if MBS is set to "ON"
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
           *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)
```

```
@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 7. Experiment Operation for 5 Minutes ----
**-------------------------------------------------------
$StepDes := "Experiment Operation for 5 Minutes"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

@COUNT_DOWN(300)

@ASK_NOCHK_B("Give restart input - see above : Y to terminate, N to abort", *$Ask_bool, *$LogFilename)

IF(not $Ask_bool)
   $EXE_Test_Manager := "ABORT"
   GOTO L_ABORT
END IF

**-------------------------------------------------------
**--- 8. DISABLE SCIENCE REPORTING ----
**-------------------------------------------------------
$StepDes := "DISABLE SCIENCE REPORTING"
@TEST_STEP($TS_Name,$LogFilename,$StepDes)

CALL PGDGE_MCHG,  "DIS_SCI", $LogFileName, -1
if ($Rstat = "ABORT")
   $EXE_Test_Manager := "ABORT"
   goto L_ABORT
endif

$OutMessages(0) := ""
$OutMessages(1) := "**  WAIT 1 MINUTE AND VERIFY NO SCIENTIFIC PACKETS PRESENT   **"
$OutMessages(2) := ""
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@COUNT_DOWN(60)
```

```
  @ASK_CHK_B ("Verify no scientific packets present (True to cont., False to abort",\
              *$EXE_Test_Manager,*$LogFileName)
  if ($EXE_Test_Manager = "ABORT") goto L_ABORT

--   **-------------------------------------------------------
--   **--- 8. PL status check ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "8", "PL status check", *$LogFileName)
--
--   @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
--               *$EXE_Test_Manager,*$LogFileName)
--   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

##L_ABORT    ---  END operation caused by User
 -------------------------
 -- USER CODE STOPS HERE
 -------------------------

  **-----------------
  ** SCOEs disconnect
  **-----------------
  --@DISCONN_SCO1($LogFileName,$ConfigScoe,$TS_Name)

  **-----------------
  ** Close LogBook
  ** MANDATORY !!!
  **-----------------
  @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

  RETURN "OK"

END SEQUENCE
```

PGDST_PRIV.e (PRIVATE SERVICE VERIFICATION)

```
*******************************************************************************
**  LNG product   : ELISA source
*******************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_PRIV
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber/L.Malvasio
**
**  Purpose       : PRIVATE SERVICE VERIFICATION
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**-----------------------------------------------------------------------------
**  Version     Date            Author       Comment
**-----------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
```

```
**                                          first CCS version issued
**  1.1     20/09/2001          L. Malvasio  issue for PFM
*******************************************************************************

SEQUENCE PGDST_PRIV
Proto
   STRING     $IN_LogFileName := "PGDST_PRIV"    -- def. W-logfilename
   STRING    *$INOUT_EXE_Test                    -- error/abort flag
   STRING     $INstep         := "PGD"           -- step number default
End Proto


CONST
   INT $ANALOG_VALUE := 9999

   INT $OfCheckTitle  := 0
   INT $OfExeStepMode := 1
   INT $OfDispMode    := 2
   INT $AfterCMD      := 0
   INT $ToReadTLM     := 1
   INT $Message       := 0
   INT $FirstCMDDes   := 1
   INT $SecondCMDDes  := 2

Var
   STRING      $DispMode := "LOGDISPLAY"
   STRING      $OutMessages(100)

   STRING      $Question
   STRING      $ShouldIDoIt   := "NO"
   STRING      $UserChoice    := "Y"
   STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
   STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
   STRING      $Choice

   STRING      $Configure(4)(100)
   COMMAND     $TCommand(100)
   REFPARAM    $ParametersToRead(100)
```

```
   INT         $RefValues(100)
   REAL        $Limits(2)(100)
   INT         $TimeDelay(2)(100)

   STRING      $TMPacket(200)
   STRING      $TmpString  -- used to print packets
   INT         $TmpInt

   INT       $I                            -- counter
   BOOL      $Ask_bool  := FALSE           -- query var.
   STRING    $LogFileName := "PGDIST_PSV"
   STRING    $EXE_Test_Manager  := "OK"
   STRING    $step

   INT         $I_abort := 999                      -- abort var.

MAIN
   $step := $INstep
   $LogFileName := $IN_LogFileName
   $EXE_Test_Manager  := $INOUT_EXE_Test

   ** Initialize the communication variables
   @SET_INI_VAL(*$RefValues, *$Limits, *$TimeDelay, *$Configure)

   open a, $LogFileName

   ** presettings for all actions:
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "


   **-------------------------------------------------------------
   **--- query to start specific main step: PRIVATE SERVICE VERIFICATION
   **-------------------------------------------------------------
   @PLMOD_SQUERY ("IST","GIADA", "PRIVATE SERVICE VERIFICATION",\
                  *$LogFileName,*$EXE_Test_Manager,$step+".0")
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT
```

```
 $OutMessages() := FILL ("MESSAGES STRING END")
 $OutMessages(0) :=  "*********************************************************************"
 $OutMessages(1) :=  "** RECORD SERIAL N. (001 W/ MLI INTEGRATED, 002 W/O MLI INTEGRATED **"
 $OutMessages(2) :=  "************************************************************ ********"
 @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

 @ASK_CHK_B ("Serial no. recorded? (True to cont., False to abort",\
             *$EXE_Test_Manager,*$LogFileName)
 if ($EXE_Test_Manager = "ABORT") goto L_ABORT


 **-----------------------------------------------------
 **--- 1. Configure to Cover Mode ----
 **-----------------------------------------------------
 @T_STEP (*$step, "1", "Configure to Cover Mode", *$LogFileName)

 call PGDGE_MCHG,  "COVER", $LogFileName, $step+".0"
 if ($Rstat = "ABORT")
    $EXE_Test_Manager := "ABORT"
    goto L_ABORT
 endif

**-----------------------------------------------------
 **--- 2. HEATHER Cover&Frangibolt ON ----
 **-----------------------------------------------------
 @T_STEP (*$step, "2", "HEATHER Cover&Frangibolt ON", *$LogFileName)

 $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
 $Configure($Message)($OfCheckTitle)  := " "
 $Configure($Message)($OfExeStepMode) := "TC"
 $TimeDelay($ToReadTLM)(0) := 30
 $TCommand(0) := {ROS.TC.ZGD19231 , SCOE := "TMTCSC", ACKBITS:="BOTH", \
                  PGDD0005 :SPV:= "Cvr-frangblt"  }
 $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

 @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
           *$TimeDelay, *$Configure, *$EXE_Test_Manager)
```

```
WAITFORSYS 20
if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 3. HEATHER Cover&Motor ON ----
**-------------------------------------------------------
@T_STEP (*$step, "3", "HEATHER Cover&Motor ON", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 30
$TCommand(0) := {ROS.TC.ZGD19231 , SCOE := "TMTCSC", ACKBITS:="BOTH", \
                 PGDD0005:SPV:= "Cover-motor"}
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT
WAITFORSYS 20


**-------------------------------------------------------
**--- 4. ARM FRANGIBOLT ----
**-------------------------------------------------------
@T_STEP (*$step, "4", "ARM FRANGIBOLT", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 5
$TCommand(0) := {ROS.TC.ZGD19201 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --ARM FRANGIBOLT
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
```

```
            *$TimeDelay, *$Configure, *$EXE_Test_Manager)

    if ($EXE_Test_Manager = "ABORT") goto L_ABORT


    **-------------------------------------------------------
    **--- 5. DISARM FRANGIBOLT ----
    **-------------------------------------------------------
    @T_STEP (*$step, "5", "DISARM FRANGIBOLT", *$LogFileName)

    $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
    $Configure($Message)($OfCheckTitle)  := " "
    $Configure($Message)($OfExeStepMode) := "TC"
    $TimeDelay($ToReadTLM)(0) := 5

    $TCommand(0) := {ROS.TC.ZGD19202 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --DISARM FRANGIBOLT
    $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

    @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
            *$TimeDelay, *$Configure, *$EXE_Test_Manager)

    if ($EXE_Test_Manager = "ABORT") goto L_ABORT


--    **-------------------------------------------------------
--    **--- 6. Get TM packet to verify Frangibolt disarmed ----
--    **-------------------------------------------------------
--    @T_STEP (*$step, "6", "Get TM packet to verify Frangibolt disarmed", *$LogFileName)
--
--    @R_PKTPRT ("YGD42200", FALSE, *$LogFileName)  -- receive and print packet to CFlog

--    display "waiting for 30s ..."

--    WAITFORSYS 30

--    @ASK_NOCHK_B("Packet YGD42200 ok ? - true to cont",*$Ask_bool,*$LogFilename)
```

```
   **-------------------------------------------------------
   **--- 7. ARM COVER ----
   **-------------------------------------------------------
   @T_STEP (*$step, "7", "ARM COVER", *$LogFileName)

-- @ASK_NOCHK_B("Aktivat Raw TM Packet viewer for YGD42201 - true to cont",*$Ask_bool,*$LogFilename)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 5
   $TCommand(0) := {ROS.TC.ZGD19216 , SCOE := "TMTCSC", ACKBITS:="BOTH"}  --ARM COVER
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **-------------------------------------------------------
   **--- 8. DISARM COVER ----
   **-------------------------------------------------------
   @T_STEP (*$step, "8", "DISARM COVER", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 5
   $TCommand(0) := {ROS.TC.ZGD19217 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --DISARM COVER
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


--   **-------------------------------------------------------
```

```
--   **--- 9. Get TM packet to verify Cover disarmed ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "9", "Get TM packet to verify Cover disarmed", *$LogFileName)

--   @R_PKTPRT ("YGD42201", FALSE, *$LogFileName)  -- receive and print packet to CFlog

--   @ASK_NOCHK_B("Packet YGD42201 ok ? - true to cont",*$Ask_bool,*$LogFilename)


##step10_ARM_ACT_FR     -- NEEDED IN CASE OF FRANGIBOLT ACTUAT. FAILURE

--   **-------------------------------------------------------
--   **--- 10. ARM FRANGIBOLT ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "10", "ARM FRANGIBOLT", *$LogFileName)

--   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--   $Configure($Message)($OfCheckTitle)  := " "
--   $Configure($Message)($OfExeStepMode) := "TC"
--   $TimeDelay($ToReadTLM)(0) := 5
--   $TCommand(0) := {ROS.TC.ZGD19201 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --ARM FRANGIBOLT
--   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

--   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
--             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

--   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


--   **-------------------------------------------------------
--   **--- 11. ACTIVATE FRANGIBOLT ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "11", "ACTIVATE FRANGIBOLT", *$LogFileName)

--   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--   $Configure($Message)($OfCheckTitle)  := " "
--   $Configure($Message)($OfExeStepMode) := "TC"
--   $TimeDelay($ToReadTLM)(0) := 5
```

```
--   $TCommand(0) := {ROS.TC.ZGD19211 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   ---- FRANGIBOLT HEATED FOR TESTING PURPOSE
--   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

--   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
--             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

--   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


--   **-------------------------------------------------------
--   **--- 12. Verify FRANGIBOLT IS RELEASED ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "12", "Verify FRANGIBOLT is released", *$LogFileName)

--   $OutMessages() := FILL ("MESSAGES STRING END")
--   $OutMessages(0) :=  "*****************************************************"
--   $OutMessages(1) :=  "** VERIFY FRANGIBOLT IS ACTUALLY RELEASED             **"
--   $OutMessages(2) :=  "*****************************************************"
--   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

--   @ASK_NOCHK_B("Frangibolt released?  - T to cont.IST, F to repeat activation",\
--                *$Ask_bool,*$LogFilename)
--   if (not $Ask_bool)
--      **repeat ACTIVATE FRANGIBOLT step
--      $OutMessages()  := FILL ("MESSAGES STRING END")
--      $OutMessages(0) := "**"
--      $OutMessages(1) := "** Repeat FRANGIBOLT activation (step 10, 11 and 12) requested."
--      $OutMessages(2) := "*************************************************************************"
--      @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)
--      goto step10_ARM_ACT_FR
--   else
--      $OutMessages()  := FILL ("MESSAGES STRING END")
--      $OutMessages(0) := "**"
--      $OutMessages(1) := "** FRANGIBOLT activation successful - continue IST."
--      $OutMessages(2) := "*************************************************************************"
--      @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)
--   endif
```

```
--**   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **-------------------------------------------------------
   **--- 13 - 22. Steps deleted  ----
   **-------------------------------------------------------

--   **-------------------------------------------------------
--   **--- 23. Check if Failure report YGDST025 received  ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "23", "Check if Failure reort YGDST025 received", *$LogFileName)

--   $OutMessages() := FILL ("MESSAGES STRING END")
--   $OutMessages(0) :=  "*************************************************************************"
--   $OutMessages(1) :=  "** FAILURE REPORT YGDST025 MAY BE RECEIVED IF TEMPERATURE NOT REACHED **"
--   $OutMessages(2) :=  "** THE TEST CAN HOWEVER PROCEED WITHOUT DEVIATION                      **"
--   $OutMessages(3) :=  "*************************************************************************"
--   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

--   @ASK_CHK_B ("Proceed with test? (True to cont., False to abort IST",\
--               *$EXE_Test_Manager,*$LogFileName)
--   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 24. Configure to SAFE MODE ----
   **-------------------------------------------------------
   @T_STEP (*$step, "24", "Configure to SAFE MODE", *$LogFileName)

   call PGDGE_MCHG,  "SAFE", $LogFileName, $step+".0"
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


   **-------------------------------------------------------
   **--- 25. Configure to NORMAL MODE ----
   **-------------------------------------------------------
```

```
@T_STEP (*$step, "25", "Configure to NORMAL MODE", *$LogFileName)

call PGDGE_MCHG,  "NORMAL", $LogFileName, $step+".0"
if ($Rstat = "ABORT")
   $EXE_Test_Manager := "ABORT"
   goto L_ABORT
endif

**-------------------------------------------------------
**--- 26. SET IS OFF ----
**-------------------------------------------------------
@T_STEP (*$step, "26", "SET IS OFF", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 50
$TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "Off"}   --SET IS OFF
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$ParametersToRead(0) := &NGDD0045
$RefValues(0) := 0
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT

@ASK_NOCHK_B("IS status ok ? - true to cont",*$Ask_bool,*$LogFilename)

**-------------------------------------------------------
**--- 27. SET MBS OFF ----
**-------------------------------------------------------
@T_STEP (*$step, "27", "SET MBS OFF", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC+TM"
```

```
$TimeDelay($ToReadTLM)(0) := 50
$TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "Off"}   --SET MBS OFF
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$ParametersToRead(0) := &NGDD0065
$RefValues(0) := 0                        ** "OFF"
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 28. SET GDS OFF ----
**-------------------------------------------------------
@T_STEP (*$step, "28", "SET GDS OFF", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 50
$TCommand(0) := {ROS.TC.ZGD19311 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "Off"}   -- SET GDS OFF
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$ParametersToRead(0) := &NGDD0025
$RefValues(0) := 0                      ** "OFF"
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 29. ENABLE SCIENCE REPORTING ----
**-------------------------------------------------------
@T_STEP (*$step, "29", "ENABLE SCIENCE REPORTING", *$LogFileName)

call PGDGE_MCHG,  "ENA_SCI", $LogFileName, $step+".0"
```

```
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


   **-------------------------------------------------------
   **--- 30. SET GDS ON ----
   **-------------------------------------------------------
   @T_STEP (*$step, "30", "SET GDS ON", *$LogFileName)


   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 50
   $ParametersToRead(0) := &NGDD0025
   $RefValues(0) := 1                          ** "ON"
   $TCommand(0) := {ROS.TC.ZGD19311 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="On"}   --SET GDS ON
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,*$TimeDelay, *$Configure,
*$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 31. Receiving Event packet YGD42033 ----
   **-------------------------------------------------------
   @T_STEP (*$step, "31", "Receiving Event packet YGD42033", *$LogFileName)


   $OutMessages()  := FILL ("MESSAGES STRING END")
   $OutMessages(0) :=  "*  Event packet!!!                                                                    *"
   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

   @ASK_NOCHK_B("Packet YGD42033 ok ? - true to cont",*$Ask_bool,*$LogFilename)
```

```
--   **-------------------------------------------------------
--   **--- 32. Verify NGDD0025 Parameter ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "32", "Verify NGDD0025 Parameter", *$LogFileName)

--   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--   $Configure($Message)($OfCheckTitle)  := " "
--   $Configure($Message)($OfExeStepMode) := "TM"
--   $TimeDelay($ToReadTLM)(0) := 30
--   $ParametersToRead(0) := &NGDD0025
--   $RefValues(0) := 1  -- not 1 but "ON" (cal. curve...)
--   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

--   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
--             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

--   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


--@ASK_NOCHK_B("Aktivat Raw TM Packet viewer for YGD42210 - true to cont",*$Ask_bool,*$LogFilename)

   **-------------------------------------------------------
   **--- 33. ARM LASER ----
   **-------------------------------------------------------
   @T_STEP (*$step, "33", "ARM LASER", *$LogFileName)

      ** There's no status indicator in TM for LASER ARM/DISARM STATE !
   $Dispmode       := "LOGDISPLAY"
   $OutMessages()  := FILL ("MESSAGES STRING END")
   $OutMessages(0)  :=  "*********************************************************************************************"
   $OutMessages(1)  :=  "**                                                                                         **"
   $OutMessages(2) :=   "** Be ready to check acceptance and execution of next TC (ZGD19301)!
**"
   $OutMessages(3)  :=  "**                                                                                         **"
   $OutMessages(4)  :=  "*********************************************************************************************"
   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)
```

```
$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 5
$TCommand(0) := {ROS.TC.ZGD19301 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --ARM LASER
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits, \
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 34. DISARM LASER ----
**-------------------------------------------------------
@T_STEP (*$step, "34", "DISARM LASER", *$LogFileName)

$Dispmode       := "LOGDISPLAY"
$OutMessages()  := FILL ("MESSAGES STRING END")
$OutMessages(0)  :=  "*********************************************************************************************"
$OutMessages(1)  :=  "**                                                                                         **"
$OutMessages(2) :=   "** Be ready to check acceptance and execution of next TC (ZGD19302)!                        **"
$OutMessages(3)  :=  "** and Laser ARM/DISARM STATE on EGSE                                                      **"
$OutMessages(4)  :=  "*********************************************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 5

$TCommand(0) := {ROS.TC.ZGD19302 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --DISARM LASER
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits, \
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)
```

```
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

--   **-------------------------------------------------------
--   **--- 35. Receiving Event packet YGD42210 ----
--   **-------------------------------------------------------
--   @T_STEP (*$step, "35", "Receiving Event packet YGD42210", *$LogFileName)

--   @R_PKTPRT ("YGD42210", FALSE, *$LogFileName)  -- receive and print packet to CFlog

--   $OutMessages()  := FILL ("MESSAGES STRING END")
--   $OutMessages(0) :=  "*  Event packet!!!  -   Laser disarmed                                                    *"
--   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

--**   WAITFORSYS 10

--  @ASK_NOCHK_B("Packet YGD42210 ok ? - true to cont, False to abort IST",*$Ask_bool,*$LogFilename)

   **-------------------------------------------------------
   **--- 36. SET GDS OPERATION MODE & verify at EGSE ----
   **-------------------------------------------------------
   @T_STEP (*$step, "36", "SET GDS OPERATION MODE & verify at EGSE", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 40
   $TCommand(0) := {ROS.TC.ZGD19316 , SCOE := "TMTCSC", ACKBITS:="BOTH",  \
                    PGDD0009:= "Medium",  PGDD0010:= "AC_BothCpls", \
                    PGDD0011:= "Enabled", PGDD0012:= "Enabled", PGDD0014:OBV:= 3 }
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}     --SET GDS OPERATION MODE

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)


   $OutMessages() := FILL ("MESSAGES STRING END")
   $OutMessages(0) :=  "************************************************************"
```

```
$OutMessages(1) :=  "** WAIT 40 SEC AND VERIFY ON GIADA EGSE                    **"
$OutMessages(2) :=  "** THAT THE HK HAS CHANGED ACCORDINGLY.                    **"
$OutMessages(3) :=  "**                                                         **"
$OutMessages(4) :=  "*************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@ASK_CHK_B ("GIADA HK OK? (True to cont., False to abort IST)",\
            *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 37. SET PHOTODIODE THRESHOLDS  & verify at EGSE----
**-------------------------------------------------------
@T_STEP (*$step, "37", "SET PHOTODIODE THRESHOLDS & verify at EGSE", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 40

$TCommand(0) := {ROS.TC.ZGD19326 , SCOE := "TMTCSC", ACKBITS:="BOTH", \
PGDD0015:OBV:= 0x0005, PGDD0016:OBV:= 0x0005}                          -- SET PHOTODIODE THRESHOLDS
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "*********************************************************************************"
$OutMessages(1) :=  "**  VERIFY ON GIADA EGSE THAT LEFT AND RIGHT THRESHOLDS                          **"
$OutMessages(2) :=  "**  HAVE CHANGED ACCORDINGLY, THEN WAIT 5 MIN                                   **"
$OutMessages(3) :=  "**                                                                              **"
$OutMessages(4) :=  "**                             ----------------------------                     **"
$OutMessages(5) :=  "**                              WARNING * WARNING * WARNING:                    **"
$OutMessages(6) :=  "**                             ----------------------------                     **"
$OutMessages(7) :=  "**  IF DURING THIS PERIOD   YGD42213, YGD42214 and/or YGD42215   MAY BE RECEIVED,**"
$OutMessages(8) :=  "**                                                                              **"
```

```
$OutMessages(9) :=  "**  THEN:     SEND ZGD19326                                                          **"
$OutMessages(10) :=  "**  with PGDG0016 (and PGDG0015) more than 0x0005 (~0.12 V)                          **"
$OutMessages(11):=  "**                                                                                  **"
$OutMessages(12):=  "**  IF THE PACKETS WILL NOT STOP: 1) send ZGD19311 with PGDG0010 = 0                 **"
$OutMessages(13):=  "**                                2) (or) PGDGIADA SHALL BE POWERED OFF !!!         **"
$OutMessages(14):=  "**                                                                                  **"
$OutMessages(15):=  "**************************************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@ASK_CHK_B ("Proceed with test? (True to cont., False to abort IST)",\
            *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 38. ARM LASER ----
**-------------------------------------------------------
@T_STEP (*$step, "38", "ARM LASER", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 5

$TCommand(0) := {ROS.TC.ZGD19301 , SCOE := "TMTCSC", ACKBITS:="BOTH"}              -- ARM LASER
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 39. SWITCH LASER ON and deliver Science packets for 5 min----
**-------------------------------------------------------
@T_STEP (*$step, "39", "SWITCH LASER ON and deliver Science packets for 5 min", *$LogFileName)
```

```
   ** There's no status indicator in TM for LASER ARM/DISARM STATE !
$Dispmode       := "LOGDISPLAY"
$OutMessages()  := FILL ("MESSAGES STRING END")
$OutMessages(0)  :=  "*********************************************************************************************"
$OutMessages(1)  :=  "**                                                                                         **"
$OutMessages(2) :=   "** Be ready to check acceptance and execution of next TC (ZGD19306)!                       **"
$OutMessages(3)  :=  "**                                                                                         **"
$OutMessages(4)  :=  "*********************************************************************************************"

@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)
$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 5
$TCommand(0) := {ROS.TC.ZGD19306 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "On"}   --SWITCH LASER ON
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 40. SET PHOTODIODE THRESHOLDS  (one time more) & verify at EGSE----
**-------------------------------------------------------
@T_STEP (*$step, "40", "SET PHOTODIODE THRESHOLDS & verify at EGSE", *$LogFileName)


$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 30

$TCommand(0) := {ROS.TC.ZGD19326 , SCOE := "TMTCSC", ACKBITS:="BOTH", \
PGDD0015:OBV:= 0x0005, PGDD0016:OBV:= 0x0005}                          -- SET PHOTODIODE THRESHOLDS
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
```

```
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "*********************************************************************************"
$OutMessages(1) :=  "**  VERIFY ON GIADA EGSE THAT LEFT AND RIGHT THRESHOLDS                          **"
$OutMessages(2) :=  "**  HAVE CHANGED ACCORDINGLY, THEN WAIT 5 MIN                                   **"
$OutMessages(3) :=  "**                                                                              **"
$OutMessages(4) :=  "**                           ---------------------------                        **"
$OutMessages(5) :=  "**                            WARNING * WARNING * WARNING:                      **"
$OutMessages(6) :=  "**                           ---------------------------                        **"
$OutMessages(7) :=  "**  IF DURING THIS PERIOD   YGD42213, YGD42214 and/or YGD42215   MAY BE RECEIVED,**"
$OutMessages(8) :=  "**                                                                              **"
$OutMessages(9) :=  "**  THEN:     SEND ZGD19326                                                     **"
$OutMessages(10) :=  "**  with PGDG0016 (and PGDG0015) more than 0x0005 (~0.12 V)                     **"
$OutMessages(11):=  "**                                                                              **"
$OutMessages(12):=  "**  IF THE PACKETS WILL NOT STOP: 1) send ZGD19311 with PGDG0010 = 0             **"
$OutMessages(13):=  "**                               2) (or) PGDGIADA SHALL BE POWERED OFF !!!      **"
$OutMessages(14):=  "**                                                                              **"
$OutMessages(15):=  "*********************************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@ASK_CHK_B ("Proceed with test? (True to cont., False to abort IST",\
            *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 41. SET GDS OFF ----
**-------------------------------------------------------
@T_STEP (*$step, "41", "SET GDS OFF", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC+TM"
$TimeDelay($ToReadTLM)(0) := 50
$TCommand(0) := {ROS.TC.ZGD19311 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "Off"}   -- SET GDS OFF
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
$ParametersToRead(0) := &NGDD0025
```

```
   $RefValues(0) := 0
   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 42. SET IS ON ----
   **-------------------------------------------------------
   @T_STEP (*$step, "42", "SET IS ON", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 30

   $TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "On"}   -- SET IS ON
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 43. Receive Science calibration packet & verify NGDA0045 ----
   **-------------------------------------------------------
   @T_STEP (*$step, "43", "Receive Science calibration packet & verify NGDA0045", *$LogFileName)


@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)


   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
```

```
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TM"
$TimeDelay($ToReadTLM)(0) := 50
$ParametersToRead(0) := &NGDD0045
$RefValues(0) := 1                    **  "ON"
$ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)


if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 44. SET IS OPERATION MODE & verify at GIADA EGSE ----
**-------------------------------------------------------
@T_STEP (*$step, "44", "SET IS OPERATION MODE & verify at GIADA EGSE", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 50


$TCommand(0) := {ROS.TC.ZGD19406 , SCOE := "TMTCSC", ACKBITS:="BOTH",  \
                 PGDD0018:= "Enabled", PGDD0019:= "Enabled", PGDD0020:= "Enabled", PGDD0021:= "Enabled", \
                 PGDD0022:= "Enabled", PGDD0023:= "Low",     PGDD0025:= "High",    PGDD0026:= "High",    \
            PGDD0027:= "Low",     PGDD0028:= "Low",     PGDD0029:= "High", }       --SET IS OPERATION MODE
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}


@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "************************************************************"
$OutMessages(1) :=  "** WAIT 50 SEC AND                                          **"
```

```
$OutMessages(2) :=  "** VERIFY ON GIADA EGSE THAT IS MODE HAS CHANGED ACCORDINGLY  **"
$OutMessages(3) :=  "**                                                            **"
$OutMessages(4) :=  "****************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

WAITFORSYS 50

@ASK_CHK_B ("GIADA HK OK? (True to cont., False to abort IST)",\
           *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 45. SET PZT THRESHOLDS & verify at GIADA EGSE ----
**-------------------------------------------------------
@T_STEP (*$step, "45", "SET PZT THRESHOLDS & verify at GIADA EGSE", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 50
$TCommand(0) := {ROS.TC.ZGD19411 , SCOE := "TMTCSC", ACKBITS:="BOTH",  \
                 PGDD0031:OBV:=0x00,   PGDD0032:OBV:=0x1E,  PGDD0033:OBV:=0x1E, \
                 PGDD0034:OBV:=0x1E,   PGDD0035:OBV:=0x1E}
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}    --SET PZT THRESHOLDS

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "****************************************************************"
$OutMessages(1) :=  "** ON GIADA EGSE VERIFY THAT IS PZT THRESHOLDS ARE CORRECT    **"
$OutMessages(2) :=  "**                                                            **"
$OutMessages(3) :=  "****************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@ASK_CHK_B ("IS PZT thresholds (30 mV = 0x1E)OK? (True to cont., False to abort IST)",\
           *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT
```

```
   **-------------------------------------------------------
   **--- 46. CALIBRATE IS  & receive Calibration packet YGD00020 ----
   **-------------------------------------------------------
   @T_STEP (*$step, "46", "CALIBRATE IS & receive Calibration packet YGD00020", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 50
   $TCommand(0) := {ROS.TC.ZGD19426 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDD0036:OBV:=0x66, \
   PGDD0037:OBV:=0x02}                                                                    --  CALIBRATE IS
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 47. SET IS OFF ----
   **-------------------------------------------------------
   @T_STEP (*$step, "47", "SET IS OFF", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 50
   $TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "Off"}   --SET IS OFF
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
   $ParametersToRead(0) := &NGDD0045
   $RefValues(0) := 0
   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter
```

```
@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 48. SET MBS ON & receive Calibration packet YGD00020 ----
**-------------------------------------------------------
@T_STEP (*$step, "48", "SET MBS ON & receive Calibration packet YGD00020", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 50
$TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "On"}   --SET MBS ON
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT

WAITFORSYS 50  ** waiting next H/K packet YGD0001

**-------------------------------------------------------
**--- 49. Check NGDD0065 & verify ar GIADA EGSE ----
**-------------------------------------------------------
@T_STEP (*$step, "49", "Check NGDD0065 & verify ar GIADA EGSE", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TM"
$TimeDelay($ToReadTLM)(0) := 50
$ParametersToRead(0) := &NGDD0065
$RefValues(0) := 1
```

```
   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   $OutMessages() := FILL ("MESSAGES STRING END")
   $OutMessages(0) :=  "*****************************************************************"
   $OutMessages(1) :=  "** ON GIADA EGSE VERIFY AND RECORD THE DELAY WITHIN           **"
   $OutMessages(2) :=  "** THE RECEIVED SCIENCE PACKETS                              **"
   $OutMessages(3) :=  "*****************************************************************"
   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

   WAITFORSYS 600 ** waiting next two YGD00020 packets

   @ASK_CHK_B ("Science PKT delay recorded at GIADA EGSE?  (True to cont., False to abort IST",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 50. SET TIME INTERVALS BETWEEN MEASUREMENTS & verify ar GIADA EGSE ----
   **-------------------------------------------------------
   @T_STEP (*$step, "50", "SET TIME INTERVALS BETWEEN MEASUREMENTS & verify ar GIADA EGSE", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 30

   $TCommand(0) := {ROS.TC.ZGD19521 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0031:OBV:=0x00000019}   -- SET TIME
INTERVALS BETWEEN MEASUREMENTS
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   $OutMessages() := FILL ("MESSAGES STRING END")
   $OutMessages(0) :=  "*****************************************************************"
```

```
$OutMessages(1) :=  "** ON GIADA EGSE VERIFY AND RECORD THE DELAY WITHIN           **"
$OutMessages(2) :=  "** THE RECEIVED SCIENCE PACKETS  -  SHOULD BE 25 SEC          **"
$OutMessages(3) :=  "*************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

WAITFORSYS 120 ** waiting next two YGD00020 packets

@ASK_CHK_B ("Science PKT delay recorded at GIADA EGSE?  (True to cont., False to abort IST",\
          *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-----------------------------------------------------
**--- 51. SET MBS OPERATION MODE & verify at GIADA EGSE ----
**-----------------------------------------------------
@T_STEP (*$step, "51", "SET MBS OPERATION MODE & verify at GIADA EGSE", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 50

$TCommand(0) := {ROS.TC.ZGD19506 , SCOE := "TMTCSC", ACKBITS:="BOTH", \
                 PGDD0040:SPV:="Disabled", PGDD0041:SPV:="Disabled", \
                 PGDD0042:SPV:="Disabled", PGDD0043:SPV:="Disabled", \
                 PGDD0044:SPV:="Disabled" }              --SET MBS OPERATION MODE
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "*************************************************************"
$OutMessages(1) :=  "** WAIT 120 SEC and,                                         **"
$OutMessages(1) :=  "** ON GIADA EGSE VERIFY THE HK HAS CHANGED ACCORDINGLY,      **"
$OutMessages(2) :=  "** VERIFY NO MORE SCIENTIFIC PACKETS ARE DELIVERED           **"
$OutMessages(3) :=  "*************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)
```

```
WAITFORSYS 120 ** waiting next two YGD00020 packets

@ASK_CHK_B ("TM verification at GIADA EGSE OK?  (details see CFlog, True to cont., "+\
            "False to abort IST",*$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

**-------------------------------------------------------
**--- 52. SET MBS OPERATION MODE & verify at GIADA EGSE ----
**-------------------------------------------------------
@T_STEP (*$step, "52", "SET MBS OPERATION MODE & verify at GIADA EGSE", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 50

$TCommand(0) := {ROS.TC.ZGD19506 , SCOE := "TMTCSC", ACKBITS:="BOTH", \
                 PGDD0040:SPV:="Enabled", PGDD0041:SPV:="Enabled", \
                 PGDD0042:SPV:="Enabled", PGDD0043:SPV:="Enabled", \
                 PGDD0044:SPV:="Enabled" }               --SET MBS OPERATION MODE
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)

$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "*****************************************************************"
$OutMessages(1) :=  "** WAIT 120 SEC and,                                            **"
$OutMessages(1) :=  "** ON GIADA EGSE VERIFY THE HK HAS CHANGED ACCORDINGLY,       **"
$OutMessages(2) :=  "** VERIFY THAT SCIENTIFIC PACKETS ARE DELIVERED               **"
$OutMessages(3) :=  "*****************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@ASK_CHK_B ("TM verification at GIADA EGSE OK?  (details see CFlog, True to cont., "+\
            "False to abort IST",*$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT
```

```
WAITFORSYS 120 ** waiting next two YGD00020 packets

@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT


**-------------------------------------------------------
**--- 53. HEAT MB & receive Calib.packet ----
**-------------------------------------------------------
@T_STEP (*$step, "53", "HEAT MB & receive Calib.packet", *$LogFileName)

$Configure($Message)($OfDispMode)    := "LOGDISPLAY"
$Configure($Message)($OfCheckTitle)  := " "
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 60
$TCommand(0) := {ROS.TC.ZGD19526 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDD0047:OBV:=3} --HEAT MB #3
$TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
          *$TimeDelay, *$Configure, *$EXE_Test_Manager)


@ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)

if ($EXE_Test_Manager = "ABORT") goto L_ABORT


$OutMessages() := FILL ("MESSAGES STRING END")
$OutMessages(0) :=  "*************************************************************"
$OutMessages(1) :=  "** Wait confirmation that MBS Heat is finished               **"
$OutMessages(1) :=  "** from  IWS operator                                        **"
$OutMessages(2) :=  "**                                                           **"
$OutMessages(3) :=  "*************************************************************"
@DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

@ASK_CHK_B ("MBS Heat finished?  (True to cont, False to abort IST)",*$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT
```

```
   **-------------------------------------------------------
   **--- 54. CALIBRATE MBS & receive Calib.packet ----
   **-------------------------------------------------------
   @T_STEP (*$step, "54", "CALIBRATE MBS & receive Calib.packet", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 30
   $TCommand(0) := {ROS.TC.ZGD19536 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --CALIBRATE MBS
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,*$TimeDelay, *$Configure,
*$EXE_Test_Manager)

   @ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT


   **-------------------------------------------------------
   **--- 55. SET MBS OFF ----
   **-------------------------------------------------------
   @T_STEP (*$step, "55", "SET MBS OFF", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 50
   $TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010 := "Off"}   --SET MBS OFF
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
   $ParametersToRead(0) := &NGDD0065
   $RefValues(0) := 0
   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)
```

```
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

 WAITFORSYS 50 ** waiting net H/K packet

**-----------------------------------------------------------
**--- 56. DISABLE SCIENCE REPORTING ----
**-----------------------------------------------------------
@T_STEP (*$step, "56", "DISABLE SCIENCE REPORTING", *$LogFileName)

call PGDGE_MCHG,  "DIS_SCI", $LogFileName, $step+".0"
if ($Rstat = "ABORT")
   $EXE_Test_Manager := "ABORT"
   goto L_ABORT
endif


**-----------------------------------------------------------
**--- 57. Configure to SAFE MODE ----
**-----------------------------------------------------------
@T_STEP (*$step, "57", "Configure to SAFE MODE", *$LogFileName)

call PGDGE_MCHG,  "SAFE", $LogFileName, $step+".0"
if ($Rstat = "ABORT")
   $EXE_Test_Manager := "ABORT"
   goto L_ABORT
endif

**-----------------------------------------------------------
**--- 58. PL status check ----
**-----------------------------------------------------------
@T_STEP (*$step, "58", "PL status check", *$LogFileName)

@ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
            *$EXE_Test_Manager,*$LogFileName)
if ($EXE_Test_Manager = "ABORT") goto L_ABORT

** short error reporting
```

```
##L_ABORT    ---  END operation caused by User

   close $LogFileName
   $INOUT_EXE_Test := $EXE_Test_Manager

   IF ($EXE_Test_Manager = "ABORT")
      Return "ABORT"
   ELSE
      Return "OK"
   ENDIF

   RETURN

END SEQUENCE
```

PGDST_OMV.e (OPERATIVE MODE VERIFICATION)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_OMV
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : OPERATIVE MODE VERIFICATION
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
```

```
**                                          first CCS version issued
**  1.1     20/09/2001          L. Malvasio  issue for PFM
**  3.0     10/07/2002          R.R          PFM as inputs 07/2002

*******************************************************************************
GLOBAL
VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc := "NULL"
      STRING  $Model          -- S/C Model [EQM, PFM]

END GLOBAL

SEQUENCE PGDST_OMV

PROTO
        ------------------------------------------
      -- User Defined In & Outfirst if applicable
        ------------------------------------------

      ------------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ------------------------------------------

      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                                   -- TS is called from another one.
                                   -- If used stand alone it MUST NOT
                                           -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                                   -- If not specified
                                   -- step numbering will start
                                   -- from 1
```

```
        STRING  $Dispmode := "LOGDISPLAY"

                -- NOTE !!!
                -- $Dispmode should normally be set to "LOGDISPLAY"

                -- "DISPLAY"
                -- the messages will be displayed on the TS Window only

                -- "LOG"
                -- the messages will be written on As Run File
                -- and written in the User defined log file
                -- (LogFileName generated from TS_Name By OPEN_LGB1)
                -- which is stored in the CFM_USER_FILES directory

                -- "LOGDISPLAY"
                -- the messages will be displayed on the TS Window
                -- and written in the OC As Run logfile

                -- "ALSLOGDISP"
                -- the messages will be displayed on the TS Window
                -- and written in the User defined log file which

                -- "LOGBOOK"
                -- the messages will be displayed on OC LogBook

                -- "DISP"
                -- the messages will be displayed on OC Lng Command Window

                -- "LCD"
                -- the messages will be displayed on TS Yellow Display

END PROTO

CONST
      ---------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
```

```
      -------------------------------------
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      INT $CMDCHK    := 3
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------
        INT $ANALOG_VALUE := 9999
VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
```

```
      -------------------------------------
      COMMAND     $TCommand(100)
      REFPARAM    $ParametersToRead(100)
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      INT         $NumOfCall := 0
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $Question
        STRING      $ShouldIDoIt   := "NO"
      STRING      $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING      $Choice
        STRING      $TmpString  -- used to print packets
        INT         $TmpInt

      INT       $I                          -- counter
      BOOL      $Ask_bool  := FALSE         -- query var.

      STRING    $step

MAIN

  WINDOW   -- init the user i/f window of the sequence


  **---------------------------
```

```
  ** TS LogBook Initialization
  ** MANDATORY !!!
  **----------------------------
  $TS_Name  := "PGDST_DMS" -- Base for the Logbook Name, must be TS Name

  @OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$Dispmode)

  **-------------------
  ** SCOE connections
  **-------------------
  $ConfigScoe($TMTCSC) :=  $USED
  @CONN_SCOE1($LogFilename,$ConfigScoe,$Dispmode)

  **---------------------------------------
  ** Initialize the communication variables
  ** MANDATORY !!!
  **---------------------------------------
  @SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

  -------------------------
  -- USER CODE STARTS HERE
  -------------------------

   **-----------------------------------------------------------
   **--- 1. Verify that GIADA is powered via LCL A ----
   **-----------------------------------------------------------
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " Verify that GIADA is powered via LCL A"
   $Configure($Message)($OfExeStepMode) := "TM"
   $TimeDelay($ToReadTLM)(0) := 20
   $ParametersToRead(0) := &NPWDA093    -- LCL A should be ON, LCL B OFF
   $RefValues(0) := 1
   $ParametersToRead(1) := &NPWDA213
   $RefValues(1) := 0
   $ParametersToRead(2) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)
```

```
   **-------------------------------------------------------
   **--- 2. Configure to SAFE MODE - check error reporting ---
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Configure to SAFE MODE - check error reporting "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 30
   $TCommand(0) := {ROS.TC.ZGD19601 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   -- again to SAFE MODE
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   $ParametersToRead(0) := &NGDAST03
   $RefValues(0):= 5
   $ParametersToRead(1) := &NGDAST04
   $RefValues(1) := 0xC401
   $ParametersToRead(2) := &NGDAST15
   $RefValues(2) := 0
   $ParametersToRead(3) := &NSGC9999

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   **-------------------------------------------------------
   **--- 3. Configure to FLUX MODE ----
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Configure to FLUX MODE "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 30
   $TCommand(0) := {ROS.TC.ZGD19616 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --FLUX MODE
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
   $ParametersToRead(0) := &NGDA0059
   $RefValues(0) := 42053
   $ParametersToRead(1) := &NSGC0999 -- This is the termination Parameter
```

```
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)


   **-----------------------------------------------------------
   **--- 4. Configure to NORMAL MODDE - check error reporting----
   **-----------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Configure to NORMAL MODE - check error reporting "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 30
   $TCommand(0) := {ROS.TC.ZGD19611 , SCOE := "TMTCSC", ACKBITS:="BOTH"}  -- again to NORMAL MODE
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

   $ParametersToRead(0) := &NGDAST03
   $RefValues(0) := 5
   $ParametersToRead(1) := &NGDAST04
   $RefValues(1) := 0xC40B
   $ParametersToRead(2) := &NGDAST15
   $RefValues(2) := 2
   $ParametersToRead(3) := &NSGC9999

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)


   **-----------------------------------------------------------
   **--- 5. Configure to SAFE MODE ----
   **-----------------------------------------------------------

   $OutMessages(0) :=  "Configure to SAFE MODE"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

**exp. shows NGDA0003 = 514 - is that OK, MCHG expects =2 ????
**
** what to be done to configure from NOMINAL/FLUX to SAFE ????
```

```
   call PGDGE_MCHG,  "SAFE", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


   **-------------------------------------------------------
   **--- 6. Configure to NORMAL MODE ----
   **-------------------------------------------------------
   $OutMessages(0) :=  "Configure to NORMAL MODE"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   call PGDGE_MCHG,  "NORMAL", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


   **-------------------------------------------------------
   **--- 7. Check TM  ----
   **-------------------------------------------------------
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Check TM (para NGDA0003) "
   $Configure($Message)($OfExeStepMode) := "TM"
   $TimeDelay($ToReadTLM)(0) := 30
   $ParametersToRead(0) := &NGDA0003
   $RefValues(0) := 768
   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   **-------------------------------------------------------
   **--- 8. Configur to COVER MODE  ----
```

```
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Configur to COVER MODE "
   $Configure($Message)($OfExeStepMode) := "TC+TM"
   $TimeDelay($ToReadTLM)(0) := 30

   $TCommand(0) := {ROS.TC.ZGD19606 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --COVER MODE
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
   $ParametersToRead(0) := &NGDA0059

   $RefValues(0) := 42033
   $ParametersToRead(1) := &NSGC9999 -- This is the termination Parameter

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   **-------------------------------------------------------
   **--- 9. Configur to SAFE MODE  ----
   **-------------------------------------------------------
   $OutMessages(0) :=  "Configure to SAFE MODE"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   call PGDGE_MCHG,  "SAFE", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


   **-------------------------------------------------------
   **--- 10. PL status check ----
   **-------------------------------------------------------
   @TEST_STEP($TS_Name,$LogFilename, "PL status check" )

   @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT
```

```
 ** short error reporting
 ##L_ABORT    ---  END operation caused by User

 -------------------------
-- USER CODE STOPS HERE
-------------------------

**-----------------
** SCOEs disconnect
**-----------------
--@DISCONN_SCO1($LogFileName,$ConfigScoe,$TS_Name)

**-----------------
** Close LogBook
**-----------------
@CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

RETURN "OK"
```

END SEQUENCE

PGDGE_MCHG.e (Configures / switches GIADA in differnt modes)

```
**************************************************************************
**  LNG product   : ELISA source
**************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDGE_MCHG
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : Configures / switches GIADA in differnt modes:
**                    - Nominal mode
**                    - SAFE mode,
**                    - FLUX mode,
**                    - ENABLE SCIENCE REPORTING
**                    - DISABLE SCIENCE REPORTING
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : none
**
**  Inp. Arguments: see proto
**
**  Return Values : see proto
**
**
**------------------------------------------------------------------------
```

```
**  Version     Date            Author       Comment
**-------------------------------------------------------------------------
**  1.0     05/11/2001          A.Moore      New Version for AFT/SFT etc.
*************************************************************************

GLOBAL

VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc
      STRING  $Model          -- S/C Model [EQM, PFM]
      ------------------------------------

END GLOBAL

SEQUENCE PGDGE_MCHG

PROTO
        ----------------------------------------
      -- User Defined In & Out Vars Here
        ----------------------------------------
        STRING  $IN_Mode  := "XX"    -- requested mode
        ----------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------
        STRING  $M_LogFileNam := ""
      INT     $StepStart := 1
      STRING  $DispMode := "LOGDISPLAY"

END PROTO


CONST
```

```
-------------------------------------
-- Constants Used By The Architecture
--  !!! Do Not Remove Or Modify !!!
-------------------------------------
INT $TMTCSC   := 0
INT $QLDSC    := 1
INT $IBOBSC   := 2
INT $DMSSC    := 3
INT $PWPYSC   := 4
INT $TTECSC   := 5
INT $MIRO     := 6
INT $OSIRIS   := 7
INT $ROSINA   := 8
INT $RPC      := 9
INT $SSP      := 10
INT $VIRTIS   := 11
INT $SISIML   := 12
INT $MIDAS    := 13
INT $ALICE    := 14
INT $CONSERT  := 15
INT $COSIMA   := 16
INT $GIADA    := 17
INT $NOT_USED := 0
INT $USED     := 3
INT $OfCheckTitle  := 0
INT $OfExeStepMode := 1
INT $OfDispMode    := 2
INT $AfterCMD      := 0
INT $ToReadTLM     := 1
INT $Message       := 0
INT $FirstCMDDes   := 1
INT $SecondCMDDes  := 2
-------------------------------------
-- User Defined Constants Here
-------------------------------------
  INT $ANALOG_VALUE  := 9999
```

```
VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND           $TCommand(100)
      REFPARAM          $ParametersToRead(100)
      INT               $RefValues(100)
      REAL              $Limits(2)(100)
      INT               $TimeDelay(2)(100)
      STRING            $Configure(4)(100)
      STRING            $TS_Name
      INT               $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT               $PrevScoeConf(18)
      STRING            $I_GenProc := "NULL"
      STRING            $OutMessages(100)
      STRING            $LogFileName
      STRING      $EXE_Test_Manager
      STRING            $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING          $Mode_txt    := "SAFE mode"
      STRING          $Mode        := "SAFE"
      INT             $Mode_before := 0    -- mode before commanding

      INT             $TC_cnt   := 1       -- counter for sent cmd.s
      INT             $Para_cnt := 1       -- counter for sent parameters
      STRING          $Ask_res  := "xx"    -- query var.
      BOOL            $Ask_bool := FALSE   -- query var.

MAIN
   $Mode        := $IN_Mode

  **----------------------------
  ** TS LogBook Initialization
  **----------------------------
  $TS_Name  := "PGDGE_MCHG" -- Base for the Logbook Name
```

```
@OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$DispMode)

**-------------------
** SCOE connections
**-------------------
$ConfigScoe($TMTCSC) :=  $USED
@CONN_SCOE1($LogFilename,$ConfigScoe,$DispMode)

**----------------------------------------
** Initialize the communication variables
**----------------------------------------
@SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

 **--- Mode input check ---
 SWITCH $Mode
    CASE "SAFE","NORMAL", "FLUX", "ENA_SCI","DIS_SCI", "COVER"
    DEFAULT
       DO
          $OutMessages(0):=  "   "
          $OutMessages(1):=  "GIADA mode input incorrect - valid inputs are:"
          $OutMessages(2):=  "           SAFE      or"
          $OutMessages(3):=  "           NORMAL    or"
          $OutMessages(3):=  "           FLUX      or"
          $OutMessages(4):=  "           ENA_SCI   or   DIS_SCI"
          @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

          @ASK_NOCHK_S("Give Mode input - see above :", *$Ask_res, *$LogFilename)
          EXIT IF (($Ask_res = "NORMAL")  or ($Ask_res = "SAFE")  or \
                 ($Ask_res = "FLUX") or \
                   ($Ask_res = "ENA_SCI") or ($Ask_res = "DIS_SCI") )
       END DO
       $Mode := $Ask_res
 END SWITCH


 **--- Mode definitions ------------------------------------------------------------------------
 $TC_cnt   := 1   -- counter for sent cmd.s
 $Para_cnt := 1   -- counter for sent parameters
```

```
**-------------------------------------------------------------------------------------------
**--- SEPTEMBER THE 7TH, 2001: ADDED THE CASE STATEMENTS FOR COVER MODE
**--- CASE "NORMAL" MODIFIED IN ORDER TO INCLUDE CHECKS ON THE ACTUAL OPERATION MODE, JUST AS
**--- FOR FLUX MODE
**-------------------------------------------------------------------------------------------


SWITCH $Mode

   Case "NORMAL"
    if ($Mode_before <> 0)
         $OutMessages(0)  :=  "                                                                                "
         $OutMessages(1)  :=  "changing between modes needs the SAFE Mode in between!...                       "
       $OutMessages(2)  :=  "actual Mode is not Safe!!!                                                      "
       $OutMessages(3)  :=  "                                                                                "
         @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

         @ASK_NOCHK_B("Want to put to SAFE?  (True to cont, False to abort)",*$Ask_bool,*$LogFilename)

         $Mode_txt    := "Disable SCI & put to SAFE mode"
         $TCommand(0) := {ROS.TC.ZGD19601 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
         $TimeDelay($AfterCMD)(0) := 4

         ** and then set to Normal
         $Mode_txt    := "NORMAL mode"
         $TCommand(1) := {ROS.TC.ZGD19611 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
         $TimeDelay($ToReadTLM)(1) := 50

         $ParametersToRead(1) := &NGDD0002
         $RefValues(1) := 3                -- checking if Normal Mode

       $TC_cnt   := 2   -- counter for sent cmd.s
    else

         $Mode_txt    := "NORMAL mode"
         $TCommand(0) := {ROS.TC.ZGD19611 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
```

```
            $TimeDelay($ToReadTLM)(0) := 50

            $ParametersToRead(0) := &NGDD0002
            $RefValues(0) := 3                -- checking if Normal Mode

        endif

       Case "FLUX"

          $Mode_before := ROS.TM.NGDD0002:RV   --  mode indicator

        if ($Mode_before <> 0)

**              $Mode_before := ROS.TM.NGDA0003:RV   --  mode indicator
**              if (($Mode_before <> 4099) and ($Mode_before <> 2819))

            $OutMessages(0)  :=  "                                                                                "
            $OutMessages(1)  :=  "changing between modes needs the SAFE Mode in between!...                       "
          $OutMessages(2)  :=  "actual Mode is not Safe!!!                                                      "
          $OutMessages(3)  :=  "                                                                                "
            @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

            @ASK_NOCHK_B("Want to put to SAFE?  (True to cont, False to abort)",*$Ask_bool,*$LogFilename)

            $Mode_txt    := "Disable SCI & put to SAFE mode"
            $TCommand(0) := {ROS.TC.ZGD19601 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
            $TimeDelay($AfterCMD)(0) := 4

            ** and then set to Flux
            $Mode_txt    := "FLUX mode"
            $TCommand(1) := {ROS.TC.ZGD19616 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
            $TimeDelay($ToReadTLM)(1) := 50

            $ParametersToRead(1) := &NGDD0002
            $RefValues(1) := 2                -- checking if Flux Mode

          $TC_cnt   := 2   -- counter for sent cmd.s
```

```
 else

      $Mode_txt    := "FLUX mode"
      $TCommand(0) := {ROS.TC.ZGD19616 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
      $TimeDelay($ToReadTLM)(0) := 50

      $ParametersToRead(0) := &NGDD0002
      $RefValues(0) := 2                -- checking if Flux Mode

 endif


Case "COVER"

   $Mode_before := ROS.TM.NGDD0002:RV   --  mode indicator

 if ($Mode_before <> 0)
      $OutMessages(0)  :=  "                                                                                "
      $OutMessages(1)  :=  "changing between modes needs the SAFE Mode in between!...                       "
    $OutMessages(2)  :=  "actual Mode is not Safe!!!                                                      "
    $OutMessages(3)  :=  "                                                                                "
      @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

      @ASK_NOCHK_B("Want to put to SAFE?  (True to cont, False to abort)",*$Ask_bool,*$LogFilename)

      $Mode_txt    := "Put to SAFE mode"
      $TCommand(0) := {ROS.TC.ZGD19601 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
      $TimeDelay($AfterCMD)(0) := 4
      ** and then set to Cover
      $Mode_txt    := "COVER mode"
      $TCommand(1) := {ROS.TC.ZGD19606 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
      $TimeDelay($ToReadTLM)(1) := 50

      $ParametersToRead(1) := &NGDD0002
      $RefValues(1) := 1                -- checking if Cover Mode

    $TC_cnt   := 2   -- counter for sent cmd.s
```

```
      else

           $Mode_txt    := "COVER mode"
           $TCommand(0) := {ROS.TC.ZGD19606 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
           $TimeDelay($ToReadTLM)(0) := 50

           $ParametersToRead(0) := &NGDD0002
           $RefValues(0) := 1                -- checking if Cover Mode

      endif

     Case "SAFE"

        $Mode_before := ROS.TM.NGDD0002:RV   --  mode indicator

      if ($Mode_before = 0)

           $OutMessages(0)  :=  "                                                                                "
           $OutMessages(1)  :=  "Giada is already in SAFE Mode !!!                                               "
         $OutMessages(2)  :=  "                                                                                "
           $OutMessages(3)  :=  "                                                                                "
           @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

**            @ASK_NOCHK_B("Want to put to SAFE?  (True to cont, False to abort)",*$Ask_bool,*$LogFilename)

**           $TCommand(0) := {ROS.TC.ZGD19601 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
**           $TimeDelay($AfterCMD)(0) := 2

**       WAITFORSYS -50     ** time wait for mode change
           goto bypass
      else
           $Mode_txt    := "SAFE mode"
           $TCommand(0) := {ROS.TC.ZGD19601 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
           $TimeDelay($ToReadTLM)(0) := 50

      endif
        $ParametersToRead(0) := &NGDD0002
        $RefValues(0) := 0                -- checking if Safe Mode
```

```
Case "ENA_SCI"

   ** check if in NORMAl or FLUX mode, if not error message and abort
   $Mode_before := ROS.TM.NGDA0003:RV   --  mode indicator
   if (($Mode_before <> 0x0200) and ($Mode_before <> 0x0300))
      $OutMessages(0):=  "  "
      $OutMessages(1):=  "GIADA not in NORMAL or FLUX mode - MCHG-CF will be aborted with NOK."
      $OutMessages(2):=  "(Ask Test Conductor to correct configuration and re-run MCHG-CF as adviced.)"
      $OutMessages(3):=  "  "
      @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

 ******     $EXE_Test_Manager := "NOK"
 *******      goto L_ABORT
   endif

   $Mode_txt   := "Enable Science reporting"
   $TCommand(0) := {ROS.TC.ZGD00010 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
   $TimeDelay($ToReadTLM)(0) := 50

 $ParametersToRead(0) := &NGDD0004
   $RefValues(0) := 1                          **  "Enabled"

Case "DIS_SCI"

   ** check if in NORMAl or FLUX mode, if not error message and abort
   $Mode_before := ROS.TM.NGDA0003:RV   --  mode indicator
   if (($Mode_before <> 0x0201) and ($Mode_before <> 0x0301))
      $OutMessages(0):=  "  "
      $OutMessages(1):=  "GIADA not in NORMAL or FLUX mode - MCHG-CF will be aborted with NOK."
      $OutMessages(2):=  "(Ask Test Conductor to correct configuration and re-run MCHG-CF as adviced.)"
      $OutMessages(3):=  "  "
      @DO_DISP1($LogFileName,*$OutMessages,$DispMode)

 *****     $EXE_Test_Manager := "NOK"
 *****     goto L_ABORT
   endif
```

```
        $Mode_txt   := "Disable Science reporting"
        $TCommand(0) := {ROS.TC.ZGD00011 , SCOE := "TMTCSC", ACKBITS:="BOTH"}
        $TimeDelay($ToReadTLM)(0) := 50

      $ParametersToRead(0) := &NGDD0004
        $RefValues(0) := 0                              ** "Disabled"

     Default
  END SWITCH

  **---TC / para. termination
  $TCommand($TC_cnt) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
  $ParametersToRead($Para_cnt) := &NSGC9999

  **--- other pre-definitions for subr. EXE_STEP
  $Configure($Message)($OfDispMode)    := $Dispmode
  $Configure($Message)($OfCheckTitle)  := "Configure to "+$Mode_txt+" and verify status"
  $Configure($Message)($OfExeStepMode) := "TC+TM"

  **--- end of Mode definitions ---------------------------------------------------------------
  **-------------------------------------------------------
  **--- 1. Sending of configuration cmd.s and verification --
  **-------------------------------------------------------
  @EXE_STEP1($LogFileName,$TCommand, $ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,\
            *$Configure,*$EXE_Test_Manager,$TS_Name)

  ##bypass
  ##L_ABORT    ---  END operation caused by User

  **-----------------
  ** Close LogBook
  **-----------------
  @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

  RETURN "OK"

END SEQUENCE
```

PGDST_PCT.e (POWER CONSUMPTION TEST)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_PCT
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : POWER CONSUMPTION TEST
**
**
**  Description   :
**
**  S/S name        : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato        first draft
**                              P.Huber      modules derived,
**                                           first CCS version issued
```

```
**  1.1     20/09/2001          L. Malvasio  issue for PFM
**  3.0     10/07/2002          R.R          PFM as inputs 07/2002

*******************************************************************************
GLOBAL
VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc := "NULL"
      STRING  $Model          -- S/C Model [EQM, PFM]

END GLOBAL

SEQUENCE PGDST_PCT
PROTO
        ----------------------------------------
      -- User Defined In & Outfirst if applicable
        ----------------------------------------

      ----------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------

      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                           -- TS is called from another one.
                           -- If used stand alone it MUST NOT
                                   -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                           -- If not specified
                           -- step numbering will start
                           -- from 1

        STRING  $Dispmode := "LOGDISPLAY"
```

```
                -- NOTE !!!
                -- $Dispmode should normally be set to "LOGDISPLAY"

                -- "DISPLAY"
                -- the messages will be displayed on the TS Window only

                -- "LOG"
                -- the messages will be written on As Run File
                -- and written in the User defined log file
                -- (LogFileName generated from TS_Name By OPEN_LGB1)
                -- which is stored in the CFM_USER_FILES directory

                -- "LOGDISPLAY"
                -- the messages will be displayed on the TS Window
                -- and written in the OC As Run logfile

                -- "ALSLOGDISP"
                -- the messages will be displayed on the TS Window
                -- and written in the User defined log file which

                -- "LOGBOOK"
                -- the messages will be displayed on OC LogBook

                -- "DISP"
                -- the messages will be displayed on OC Lng Command Window

                -- "LCD"
                -- the messages will be displayed on TS Yellow Display

END PROTO

CONST
      ------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      ------------------------------------
      INT $TMTCSC   := 0
```

```
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      INT $CMDCHK    := 3
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------
        INT $ANALOG_VALUE := 9999
VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND     $TCommand(100)
```

```
      REFPARAM    $ParametersToRead(100)
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      INT         $NumOfCall := 0
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $Question
        STRING      $ShouldIDoIt   := "NO"
      STRING      $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING      $Choice
        STRING      $TmpString  -- used to print packets
        INT         $TmpInt

      INT       $I                          -- counter
      BOOL      $Ask_bool  := FALSE         -- query var.

      STRING    $step

MAIN

  WINDOW   -- init the user i/f window of the sequence


  **----------------------------
  ** TS LogBook Initialization
  ** MANDATORY !!!
```

```
**----------------------------
$TS_Name  := "PGDST_PCT" -- Base for the Logbook Name, must be TS Name

@OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$Dispmode)

**-------------------
** SCOE connections
**-------------------
$ConfigScoe($TMTCSC) :=  $USED
@CONN_SCOE1($LogFilename,$ConfigScoe,$Dispmode)

**---------------------------------------
** Initialize the communication variables
** MANDATORY !!!
**---------------------------------------
@SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

-------------------------
-- USER CODE STARTS HERE
-------------------------

 **-----------------------------------------------------
 **--- 1. RECORD POWER CONSUMPTION IN SAFE MODE ----
 **-----------------------------------------------------

 $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
 $Configure($Message)($OfCheckTitle)  := " RECORD POWER CONSUMPTION IN SAFE MODE"
 $Configure($Message)($OfExeStepMode) := "TM"
 $TimeDelay($ToReadTLM)(0) := 0

 $ParametersToRead(0) := &NPWDA380    -- LCL A current
 $RefValues(0) := 9999
 $Limits(0)(0) := 0.14 - 0.02
 $Limits(1)(0) := 0.14 + 0.02
 $ParametersToRead(1) := &NPWDA700    -- LCL B current
 $RefValues(1) := 9999
 $Limits(0)(1) := 0.0 - 0.025
 $Limits(1)(1) := 0.0 + 0.025
```

```
   $ParametersToRead(2) := &NSGC9999


@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)


   @ASK_NOCHK_B("Currents ok?",*$Ask_bool,*$LogFilename)


   **-------------------------------------------------------
   **--- 2. Configure to NORMAL MODE ----
   **-------------------------------------------------------
    $OutMessages(2) :=  "Configure to NORMAL MODE"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   call PGDGE_MCHG,  "NORMAL", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


   **-------------------------------------------------------
   **--- 3. Switch MBS ON ----
   **-------------------------------------------------------

--   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--   $Configure($Message)($OfCheckTitle)  := " Switch MBS O"
--   $Configure($Message)($OfExeStepMode) := "TC"
--   $TimeDelay($ToReadTLM)(0) := 30
--   $TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="On"}   --MBS ON
--   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
--
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)
```

```
WAITFORSYS  10          --required time for current transitory reason

   **-------------------------------------------------------
   **--- 4. Record Power Consumption in Normal MODE & MBS, IS, GDS ON ----
   **-------------------------------------------------------
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Record Power Consumption in Normal MODE & MBS, IS, GDS ON "
   $Configure($Message)($OfExeStepMode) := "TM"
   $TimeDelay($ToReadTLM)(0) := 0

   $ParametersToRead(0) := &NPWDA380    -- LCL A current
   $RefValues(0) := 9999
   $Limits(0)(0) := 0.48 - 0.02
   $Limits(1)(0) := 0.48 + 0.02
   $ParametersToRead(1) := &NPWDA700    -- LCL B current
   $RefValues(1) := 9999
   $Limits(0)(1) := 0.0 - 0.025        --TBC !!
   $Limits(1)(1) := 0.0 + 0.025        --TBC !!
   $ParametersToRead(2) := &NSGC9999

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   @ASK_NOCHK_B("Currents ok?",*$Ask_bool,*$LogFilename)

   **-------------------------------------------------------
   **--- 3. Switch MBS OFF ----
   **-------------------------------------------------------
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Switch MBS OFF "
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 50
   $TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="Off"}   --MBS OFF
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)
```

```
WAITFORSYS  10          --required time for current transitory reason

   **-------------------------------------------------------
   **--- 4. Record Power Consumption in Normal MODE, MBS OFF --
   **-------------------------------------------------------
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " Record Power Consumption in Normal MODE, MBS OFF"
   $Configure($Message)($OfExeStepMode) := "TM"
   $TimeDelay($ToReadTLM)(0) := 0

   $ParametersToRead(0) := &NPWDA380    -- LCL A current
   $RefValues(0) := 9999
   $Limits(0)(0) := 0.39 - 0.02
   $Limits(1)(0) := 0.39 + 0.02
   $ParametersToRead(1) := &NPWDA700    -- LCL B current
   $RefValues(1) := 9999
   $Limits(0)(1) := 0.0 - 0.025       --TBC !!
   $Limits(1)(1) := 0.0 + 0.025       --TBC !!
   $ParametersToRead(2) := &NSGC9999

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   @ASK_NOCHK_B("Currents ok?",*$Ask_bool,*$LogFilename)



   **-------------------------------------------------------
   **--- 5. Switch IS OFF ----
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " Switch IS OFF"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 50

   $TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="Off"}   -- IS OFF
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
```

```
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

WAITFORSYS  10          --required time for current transitory reason

   **-------------------------------------------------------------
   **--- 6. Record Power Consumption in Normal MODE, MBS & IS OFF ---
   **-------------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " Record Power Consumption in Normal MODE, MBS & IS OFF"
   $Configure($Message)($OfExeStepMode) := "TM"
   $TimeDelay($ToReadTLM)(0) := 0

   $ParametersToRead(0) := &NPWDA380    -- LCL A current
   $RefValues(0) := 9999
   $Limits(0)(0) := 0.250 - 0.02
   $Limits(1)(0) := 0.250 + 0.02
   $ParametersToRead(1) := &NPWDA700    -- LCL B current
   $RefValues(1) := 9999
   $Limits(0)(1) := 0.0 - 0.025        --TBC !!
   $Limits(1)(1) := 0.0 + 0.025        --TBC !!
   $ParametersToRead(2) := &NSGC9999

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   @ASK_NOCHK_B("Currents ok?",*$Ask_bool,*$LogFilename)


   **-------------------------------------------------------
   **--- 7. Switch GDS ON ----
   **-------------------------------------------------------

--   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--   $Configure($Message)($OfCheckTitle)  := "Switch GDS ON "
--   $Configure($Message)($OfExeStepMode) := "TC"
```

```
--   $TimeDelay($ToReadTLM)(0) := 30

--   $TCommand(0) := {ROS.TC.ZGD19311 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="On"}    --GDS ON
--   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

 --
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   **-----------------------------------------------------
   **--- 8. Configure back to SAFE MODE  ----
   **-----------------------------------------------------
   $OutMessages(0) :=  "Configure back to SAFE MODE"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   call PGDGE_MCHG,  "SAFE", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif

   **-----------------------------------------------------
   **--- 9. PL status check ----
   **-----------------------------------------------------

   @TEST_STEP($TS_Name,$LogFilename,"PL status check")

   @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

  ** short error reporting
   ##L_ABORT    ---  END operation caused by User

  -------------------------
  -- USER CODE STOPS HERE
  -------------------------
```

```
  **-----------------
  ** SCOEs disconnect
  **-----------------
  --@DISCONN_SCO1($LogFileName,$ConfigScoe,$TS_Name)

  **-----------------
  ** Close LogBook
  **-----------------
  @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

  RETURN "OK"
END SEQUENCE
```

PGDST_RT.e (GIADA REDUNDANCY TEST)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_RT
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : GIADA REDUNDANCY TEST
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
```

```
**                                          first CCS version issued
**  1.1     20/09/2001          L. Malvasio  issue for PFM
*******************************************************************************

SEQUENCE PGDST_RT
Proto
   STRING     $IN_LogFileName := "PGDST_RT"    -- def. W-logfilename
   STRING    *$INOUT_EXE_Test                   -- error/abort flag
   STRING     $INstep         := "PGD"          -- step number default
End Proto

CONST
   INT $ANALOG_VALUE := 9999

   INT $OfCheckTitle  := 0
   INT $OfExeStepMode := 1
   INT $OfDispMode    := 2
   INT $AfterCMD      := 0
   INT $ToReadTLM     := 1
   INT $Message       := 0
   INT $FirstCMDDes   := 1
   INT $SecondCMDDes  := 2

Var
   STRING      $DispMode := "LOGDISPLAY"
   STRING      $OutMessages(100)

   STRING      $Question
   STRING      $ShouldIDoIt   := "NO"
   STRING      $UserChoice    := "Y"
   STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
   STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
   STRING      $Choice

   STRING      $Configure(4)(100)
   COMMAND     $TCommand(100)
   REFPARAM    $ParametersToRead(100)
   INT         $RefValues(100)
```

```
   REAL        $Limits(2)(100)
   INT         $TimeDelay(2)(100)

   STRING      $TMPacket(200)
   STRING      $TmpString  -- used to print packets
   INT         $TmpInt

   INT       $I                            -- counter
   BOOL      $Ask_bool  := FALSE           -- query var.
   STRING    $LogFileName := "PGDIST_RT"
   STRING    $EXE_Test_Manager  := "OK"
   STRING    $step

MAIN
   $step := $INstep
   $LogFileName := $IN_LogFileName
   $EXE_Test_Manager  := $INOUT_EXE_Test

   ** Initialize the communication variables
   @SET_INI_VAL(*$RefValues, *$Limits, *$TimeDelay, *$Configure)

   open a, $LogFileName

   **-------------------------------------------------------------------
   **--- query to start specific main step: REDUNDANCY TEST
   **-------------------------------------------------------------------
   @PLMOD_SQUERY ("IST","GIADA", "REDUNDANCY TEST",\
                  *$LogFileName,*$EXE_Test_Manager,$step+".0")
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **---------------------------------------------------------
   **--- 1. Verify that GIADA is powered via LCL B ----
   **---------------------------------------------------------
   @T_STEP (*$step, "1", "Verify that GIADA is powered via LCL B", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TM"
```

```
   $TimeDelay($ToReadTLM)(0) := 20
   $ParametersToRead(0) := &NPWDA093    -- LCL A OFF
   $RefValues(0) := 0
   $ParametersToRead(1) := &NPWDA213    -- LCL B should be ON
   $RefValues(1) := 1
   $ParametersToRead(2) := &NSGC9999 -- This is the termination Parameter

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits, \
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **-------------------------------------------------------
   **--- 2. Configure to NORMAL MODE ----
   **-------------------------------------------------------
   @T_STEP (*$step, "2", "Configure to NORMAL MODE", *$LogFileName)

   call PGDGE_MCHG,  "NORMAL", $LogFileName, $step+".0"
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif
   **-------------------------------------------------------

--   @T_STEP (*$step, "6", "Get YGD42052 TM packet", *$LogFileName)

--   @R_PKTPRT ("YGD42052", FALSE, *$LogFileName)  -- receive and print packet to CFlog

   **-------------------------------------------------------

   **-------------------------------------------------------
   **--- 3. Giada Operative mode - Check NGDA0003 parameter ----
   **-------------------------------------------------------
   @T_STEP (*$step, "3", "Check NGDA0003 parameter", *$LogFileName)

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " "
   $Configure($Message)($OfExeStepMode) := "TM"
```

```
   $TimeDelay($ToReadTLM)(0) := 50
   $ParametersToRead(0) := &NGDD0002
   $RefValues(0) := 3               -- checking if Normal Mode
   $ParametersToRead(1) := &NGDD0003
   $RefValues(1) := 0              -- checking if Science TM is disabled
   $ParametersToRead(2) := &NSGC9999       -- This is the termination Parameter

   @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits, \
             *$TimeDelay, *$Configure, *$EXE_Test_Manager)

   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **-------------------------------------------------------
   **--- 4. ENABLE SCIENCE REPORTING ----
   **-------------------------------------------------------
   @T_STEP (*$step, "4", "ENABLE SCIENCE REPORTING", *$LogFileName)

   call PGDGE_MCHG,  "ENA_SCI", $LogFileName, $step+".0"
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif


--      **-------------------------------------------------------
--      **--- 5. GDS ON ----
--      **-------------------------------------------------------
--      @T_STEP (*$step, "5", "GDS ON", *$LogFileName)
--
--      $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--      $Configure($Message)($OfCheckTitle)  := " "
--      $Configure($Message)($OfExeStepMode) := "TC"
--      $TimeDelay($ToReadTLM)(0) := 30
--      $TCommand(0) := {ROS.TC.ZGD19311 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "On"}   --GDS ON
--      $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

--      @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits, \
--              *$TimeDelay, *$Configure, *$EXE_Test_Manager)
```

```
--      if ($EXE_Test_Manager = "ABORT") goto L_ABORT
--      WAITFOR 20
--
--      **-------------------------------------------------------
--      **--- 6. IS ON and receive calib.packet ----
--      **-------------------------------------------------------
--      @T_STEP (*$step, "6", "IS ON and receive calib.packe", *$LogFileName)

--      @ASK_NOCHK_B("Aktivat Raw TM Packet viewer for YGD00020 - true to cont",*$Ask_bool,*$LogFilename)
--
--      $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--      $Configure($Message)($OfCheckTitle)  := " "
--      $Configure($Message)($OfExeStepMode) := "TC"
--      $TimeDelay($ToReadTLM)(0) := 1
--      $TCommand(0) := {ROS.TC.ZGD19401 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "On"}   --IS ON
--      $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
--
--      @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits, \
--              *$TimeDelay, *$Configure, *$EXE_Test_Manager)

--      @R_PKTPRT ("YGD00020", FALSE, *$LogFileName)  -- receive and print packet to CFlog
--
--       @ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)
--
--      if ($EXE_Test_Manager = "ABORT") goto L_ABORT
--      WAITFOR 20

--      **-------------------------------------------------------
--      **--- 7. MBS ON and receive calib.packet ----
--      **-------------------------------------------------------
--      @T_STEP (*$step, "7", "MBS ON  and receive calib.packet", *$LogFileName)
--
--       @ASK_NOCHK_B("Aktivat Raw TM Packet viewer for YGD00020 - true to cont",*$Ask_bool,*$LogFilename)
--
--      $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--      $Configure($Message)($OfCheckTitle)  := " "
--      $Configure($Message)($OfExeStepMode) := "TC"
```

```
--      $TimeDelay($ToReadTLM)(0) := 1
--      $TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:= "On"}   --MBS ON
--      $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
--
--      @EXE_STEP(*$LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
--              *$TimeDelay, *$Configure, *$EXE_Test_Manager)
--
--      @R_PKTPRT ("YGD00020",FALSE,  *$LogFileName)  -- receive and print packet to CFlog
--
--      @ASK_NOCHK_B("Packet YGD00020 ok ? - true to cont",*$Ask_bool,*$LogFilename)
--
--      if ($EXE_Test_Manager = "ABORT") goto L_ABORT
--      WAITFOR 20
--
--
--      ** TBC,   before configure to safe mode, science must be disabled ??
--      **-------------------------------------------------------
--      **--- 8. DISABLE SCIENCE REPORTING ----
--      **-------------------------------------------------------
--      @T_STEP (*$step, "8", "DISABLE SCIENCE REPORTING", *$LogFileName)
--
--      call PGDGE_MCHG,  "DIS_SCI", $LogFileName,  $step+".0"
--      if ($Rstat = "ABORT")
--         $EXE_Test_Manager := "ABORT"
--         goto L_ABORT
--      endif

   $OutMessages() := FILL ("MESSAGES STRING END")
   $OutMessages(0) := "*************************************************************************"
   $OutMessages(1) := "*                                                                       *"
   $OutMessages(2) := "*  WAIT SCIENCE TM Reports for at least 5 minutes:                      *"
   $OutMessages(3) := "*                                                                       *"
   $OutMessages(4) := "*************************************************************************"
   @DO_DISP(*$LogFileName, *$OutMessages, $DispMode)

   @ASK_CHK_B ("Science TM OK? (True to cont., False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT
```

```
   **-----------------------------------------------------
   **--- 9. Configure to SAFE MODE ----
   **-----------------------------------------------------
   @T_STEP (*$step, "9", "Configure to SAFE MODE", *$LogFileName)

   call PGDGE_MCHG,  "SAFE", $LogFileName,  $step+".0"
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif

   **-----------------------------------------------------
   **--- 10. PL status check ----
   **-----------------------------------------------------
   @T_STEP (*$step, "10", "PL status check", *$LogFileName)

   @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
               *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   ** short error reporting
##L_ABORT    ---  END operation caused by User

   close $LogFileName
   $INOUT_EXE_Test := $EXE_Test_Manager

   IF ($EXE_Test_Manager = "ABORT")
      Return "ABORT"
   ELSE
      Return "OK"
   ENDIF

   RETURN

END SEQUENCE
```

PGDGE_FPT.e (GIADA Power OFF Sequence)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : PGDST_FPT
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber
**
**  Purpose       : FUNCTIONAL PERFORMANCE TEST
**
**
**  Description   :
**
**  S/S name      : ROSETTA
**
**  External CF's : see below
**
**  Inp. Arguments:  see proto
**
**  Return Values :  see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date            Author       Comment
**---------------------------------------------------------------------------
**  1.0     xx/11/2000          C.Prato      first draft
**                              P.Huber      modules derived,
**                                           first CCS version issued
```

```
**  3.0     10/07/2002          R.R          PFM as inputs 07/2002
*******************************************************************************
GLOBAL
VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc := "NULL"
      STRING  $Model          -- S/C Model [EQM, PFM]

END GLOBAL

SEQUENCE PGDST_FPT

PROTO
        ----------------------------------------
      -- User Defined In & Outfirst if applicable
        ----------------------------------------

      ----------------------------------------
      -- In & Out Vars Used By The Architecture
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------

      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                             -- TS is called from another one.
                             -- If used stand alone it MUST NOT
                                      -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                             -- If not specified
                             -- step numbering will start
                             -- from 1

        STRING  $Dispmode := "LOGDISPLAY"
```

```
                -- NOTE !!!
                -- $Dispmode should normally be set to "LOGDISPLAY"

                -- "DISPLAY"
                -- the messages will be displayed on the TS Window only

                -- "LOG"
                -- the messages will be written on As Run File
                -- and written in the User defined log file
                -- (LogFileName generated from TS_Name By OPEN_LGB1)
                -- which is stored in the CFM_USER_FILES directory

                -- "LOGDISPLAY"
                -- the messages will be displayed on the TS Window
                -- and written in the OC As Run logfile

                -- "ALSLOGDISP"
                -- the messages will be displayed on the TS Window
                -- and written in the User defined log file which

                -- "LOGBOOK"
                -- the messages will be displayed on OC LogBook

                -- "DISP"
                -- the messages will be displayed on OC Lng Command Window

                -- "LCD"
                -- the messages will be displayed on TS Yellow Display

END PROTO

CONST
      ------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      ------------------------------------
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
```

```
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      INT $CMDCHK    := 3
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------
        INT $ANALOG_VALUE := 9999
VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND     $TCommand(100)
      REFPARAM    $ParametersToRead(100)
```

```
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      INT         $NumOfCall := 0
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $Question
        STRING      $ShouldIDoIt   := "NO"
      STRING      $UserChoice    := "Y"
      STRING      $USerMessage   := "Optional Check / SetUp Performed? (Y/N)"
      STRING      $YesNoQuestion := "DO YOU WANT TO PROCEED AND EXECUTE THIS TEST? (YES/NO)"
      STRING      $Choice
        STRING      $TmpString  -- used to print packets
        INT         $TmpInt

      INT       $I                          -- counter
      BOOL      $Ask_bool  := FALSE         -- query var.

      STRING    $step

MAIN

  WINDOW   -- init the user i/f window of the sequence


  **----------------------------
  ** TS LogBook Initialization
  ** MANDATORY !!!
  **----------------------------
```

```
$TS_Name  := "PGDST_FTP" -- Base for the Logbook Name, must be TS Name

@OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$Dispmode)

**------------------
** SCOE connections
**------------------
$ConfigScoe($TMTCSC) :=  $USED
@CONN_SCOE1($LogFilename,$ConfigScoe,$Dispmode)

**---------------------------------------
** Initialize the communication variables
** MANDATORY !!!
**---------------------------------------
@SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)

-------------------------
-- USER CODE STARTS HERE
-------------------------

 **-----------------------------------------------------
 **--- 1. Configure to NORMAL MODE ----
 **-----------------------------------------------------
 $OutMessages(0) := "Configure to NORMAL MODE"
 @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

 call PGDGE_MCHG,  "NORMAL", $LogFileName
 if ($Rstat = "ABORT")
    $EXE_Test_Manager := "ABORT"
    goto L_ABORT
 endif

 **-----------------------------------------------------
 **--- 2. ENABLE SCIENCE REPORTING ----
 **-----------------------------------------------------

 $OutMessages(0) := "ENABLE SCIENCE REPORTING."
 @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)
```

```
   call PGDGE_MCHG,  "ENA_SCI", $LogFileName
   if ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      goto L_ABORT
   endif

--   Note: 16/10/01 This step has been deleted due to the MBS starting status setted
--         in the Context File
--   **-------------------------------------------------------
--   **--- 3. Switch MBS ON ----
--   **-------------------------------------------------------

--   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
--   $Configure($Message)($OfCheckTitle)  := "Switch MBS ON "
--   $Configure($Message)($OfExeStepMode) := "TC"
--   $TimeDelay($ToReadTLM)(0) := 30
--   $TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="On"}   --MBS ON
--   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
--
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

--
--   WAITFORSYS 20
--

   **-------------------------------------------------------
   **--- 4. SET TIME INTERVAL ----
   **-------------------------------------------------------
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " SET TIME INTERVAL"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 30
   $TCommand(0) := {ROS.TC.ZGD19521 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0031:OBV:=25}   --SET TIME INTERVAL
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
```

```
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   **-------------------------------------------------------
   **--- 5. Waiting for Science Packets ----
   **-------------------------------------------------------
   @TEST_STEP($TS_Name,$LogFilename,"Waiting for Science Packets")

   $OutMessages(0) :=  "*********************************************************************************"
   $OutMessages(1) :=  "** WAIT FOR HALF AN HOUR FOR SEVERAL SCIENCE PACKETS TO BE DELIVERED           **"
   $OutMessages(2) :=  "** VERIFY ON GIADA EGSE TIME DELAY WITHIN SCIENCE PACKETS (SHOULD BE 25 SEC)   **"
   $OutMessages(3) :=  "*********************************************************************************"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

   @ASK_CHK_B ("Science PKT delays & time stamp recorded? (True to cont., False to abort IST",\
              *$EXE_Test_Manager,*$LogFileName)
   if ($EXE_Test_Manager = "ABORT") goto L_ABORT

   **-------------------------------------------------------
   **--- 6. Switch MBS OFF ----
   **-------------------------------------------------------

   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := " Switch MBS OFF"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TimeDelay($ToReadTLM)(0) := 30
   $TCommand(0) := {ROS.TC.ZGD19501 , SCOE := "TMTCSC", ACKBITS:="BOTH", PGDG0010:="Off"}   --MBS OFF
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,$TS
_Name)

   **-------------------------------------------------------
   **--- 7. DISABLE SCIENCE REPORTING ----
   **-------------------------------------------------------
   $OutMessages(0) := "DISABLE SCIENCE REPORTING"
   @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)
```

```
 call PGDGE_MCHG,  "DIS_SCI", $LogFileName
 if ($Rstat = "ABORT")
    $EXE_Test_Manager := "ABORT"
    goto L_ABORT
 endif

 **-------------------------------------------------------
 **--- 8. Configure to SAFE MODDE ----
 **-------------------------------------------------------
 $OutMessages(0) := "Configure to SAFE MODE"
 @DO_DISP1($LogFileName, *$OutMessages, $Dispmode)

 call PGDGE_MCHG,  "SAFE", $LogFileName
 if ($Rstat = "ABORT")
    $EXE_Test_Manager := "ABORT"
    goto L_ABORT
 endif

 **-------------------------------------------------------
 **--- 9. PL status check ----
 **-------------------------------------------------------
 @TEST_STEP($TS_Name,$LogFilename,"PL status check")

 @ASK_CHK_B ("PL in status to CONTINUE IST? (True to cont., False to abort",\
             *$EXE_Test_Manager,*$LogFileName)
 if ($EXE_Test_Manager = "ABORT") goto L_ABORT

 ** short error reporting
 ##L_ABORT    ---  END operation caused by User

 -------------------------
-- USER CODE STOPS HERE
-------------------------

**-----------------
** SCOEs disconnect
**-----------------
```

```
  --@DISCONN_SCO1($LogFileName,$ConfigScoe,$TS_Name)

  **-----------------
  ** Close LogBook
  **-----------------
  @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

  RETURN "OK"
END SEQUENCE
```

PGDGE_PWROFF.e (GIADA Power OFF Sequence)

```
*****************************************************************************
**  LNG product   : ELISA source
*****************************************************************************
**  Warning : the title of the following fields must not be modified
**
**  Object        : Control File
**
**  Object Name   : CGDGE_PWROFF.e
**
**  Config. No.   :
**
**  Origin        : <1 char. maximum to identify the origin>
**
**  Author        : P.Huber / A.Moore
**
**  Purpose       : GIADA Power OFF Sequence
**
**  Description   : Power OFF Sequence
**
**
** S/S name       : ROSETTA
**
**  External CF's :
**
**  Inp. Arguments: see proto
**
**  Return Values : see proto
**
**
**---------------------------------------------------------------------------
**  Version     Date       Author       Comment
**---------------------------------------------------------------------------
**  1.0     22/10/2001     A.Moore      Initial Version for AFT/SFT
**  2.0     28/01/2002     A.Moore      Include Cover Close
```

```
**  3.0     08/02/2002     A.Moore      Update Fast Switch OFF, SCET & Polling
**  4.0     22/04/2002     G.Mucera     Check of the cover status removed
**  5.1     07/06/2002     L.Malvasio   Global variable Payload included
**  6.1     11/07/2002     L.Malvasio   changes according to the FS:
**                            1) remove comments to Context report
**                            2) patch added to reset virtual disk
*****************************************************************************
GLOBAL
VAR
      ------------------------------------
      -- Global Used By The TS
      -- They Must Be Declared In The
      -- Current Global Area
      ------------------------------------
      STRING      $GenProc
      STRING  $Model          -- S/C Model [EQM, PFM]
      ------------------------------------
      STRING  $GIADA_status
        BOOL    $GIADANomPower

      INT   $STS

      STRING      $PAYLOAD(25)(25)
      INT     $GD  -- Giada

END GLOBAL

SEQUENCE CGDGE_PWROFF

PROTO
        ----------------------------------------
      -- User Defined In & Outfirst if applicable
        ----------------------------------------
        STRING  $IN_off_speed := "NOM"            -- power off speed:
                                 -- NOM = with config. prior LCL off,
                                 -- FAST= w/o config. prior LCL off;
      ----------------------------------------
      -- In & Out Vars Used By The Architecture
```

```
        -- !!! Do Not Remove Or Modify !!!
        ----------------------------------------
      STRING  $M_LogFileNam := ""  -- Name of Master Logfilename if
                                   -- TS is called from another one.
                                   -- If used stand alone it must not
                                            -- be specified.

        INT     $StepStart    := 1   -- This is the first step number.
                                   -- If not specified
                                   -- step numbering will start
                                   -- from 1
END PROTO

CONST
      -------------------------------------
      -- Constants Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      INT $TMTCSC   := 0
      INT $QLDSC    := 1
      INT $IBOBSC   := 2
      INT $DMSSC    := 3
      INT $PWPYSC   := 4
      INT $TTECSC   := 5
      INT $MIRO     := 6
      INT $OSIRIS   := 7
      INT $ROSINA   := 8
      INT $RPC      := 9
      INT $SSP      := 10
      INT $VIRTIS   := 11
      INT $SISIML   := 12
      INT $MIDAS    := 13
      INT $ALICE    := 14
      INT $CONSERT  := 15
      INT $COSIMA   := 16
      INT $GIADA    := 17
      INT $NOT_USED := 0
      INT $USED     := 3
```

```
      INT $OfCheckTitle  := 0
      INT $OfExeStepMode := 1
      INT $OfDispMode    := 2
      INT $AfterCMD      := 0
      INT $ToReadTLM     := 1
      INT $Message       := 0
      INT $FirstCMDDes   := 1
      INT $SecondCMDDes  := 2
      -------------------------------------
      -- User Defined Constants Here
      -------------------------------------

VAR
      -------------------------------------
      -- Variables Used By The Architecture
      --  !!! Do Not Remove Or Modify !!!
      -------------------------------------
      COMMAND     $TCommand(100)
      REFPARAM    $ParametersToRead(100)
      INT         $RefValues(100)
      REAL        $Limits(2)(100)
      INT         $TimeDelay(2)(100)
      STRING      $Configure(4)(100)
      STRING      $TS_Name
      INT         $ConfigScoe(18) := {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0}
      INT         $PrevScoeConf(18)
      STRING      $EXE_Test_Manager := ""
      STRING      $LogFileName
      STRING      $DispMode
      STRING      $OutMessages(100)
        STRING        $StepDes
      -------------------------------------
      -- User Defined Variables Here
      -------------------------------------
      STRING      $TMPacket(1000)
      STRING      $TmpString  -- used to print packets
      INT         $TmpInt
      INT         $I                          -- loop counter
```

```
      BOOL        $Ask_bool := FALSE             -- ask var.
      STRING      $Step
      BOOL        $MCF_flag := FALSE
      STRING      $Off_speed                     -- power off speed
        REAL        $TestValue := 0.020            -- 20 mA
        REAL        $TestResolution := 0.005       -- 0.5 mA
        INT         $unit_mode(5):= {-1,-1,-1,-1,-1}      -- indiviual unit status
      INT         $Load(300)
      INT         $Dump(300)
      INT       $PID
      INT       $MEM_ID
      INT       $WLEN
        INT         $DumpLength
      INT         $LoadLength
        INT         $Start_Address
      INT         $SEQCOUNTER := 0xC000
      BOOL        $Flag_checks

MAIN

  **----------------------------
  ** TS LogBook Initialization
  **----------------------------
  $DispMode := "LOGDISPLAY"
  $TS_Name  := "CGDGE_PWROFF" -- Base for the Logbook Name
  @OPEN_LGB1(*$LogFileName,$M_LogFileNam,$TS_Name,$StepStart,$DispMode)

  **-------------------
  ** SCOE connections
  **-------------------
  $ConfigScoe($TMTCSC) :=  $USED
  @CONN_SCOE1($LogFilename,$ConfigScoe,$DispMode)

  **---------------------------------------
  ** Initialize the communication variables
  **---------------------------------------
  @SET_INI_VAL1(*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$OutMessages)
```

```
SWITCH  $IN_off_speed
   CASE "F", "f", "FAST", "fast", "Fast", "fAST"
      $Off_speed := "FAST"
   DEFAULT
      $Off_speed := "NOM"
END SWITCH


**--- Power OFF of GIADA will: ---
**    1. Configure to SAFE MODE - not for FAST
**    2. Further TM Checks      - not for FAST
**    3. REPORT CONTEXT REQUEST - not for FAST
**    4. Switch BOTH LCLs OFF


**-------------------------------------------------------
**--- 1. Configure GIADA to SAFE MODE
**-------------------------------------------------------

IF ($Off_speed = "FAST")
   $StepDes :=  "Fast GIADA Switch OFF without configuration to safe mode"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes)
ELSE
   ** default to nominal speed switch off, with config. to SAFE mode
   $StepDes :=  "Fast GIADA Switch OFF with configuration to safe mode"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes)

   CALL PGDGE_MCHG,  "SAFE", $LogFileName

   IF ($Rstat = "ABORT")
      $EXE_Test_Manager := "ABORT"
      GOTO L_ABORT
   END IF
END IF


IF ($Off_speed = "NOM")
```

```
--      **-------------------------------------------------------
--      **--- 2. Close Cover
--      **-------------------------------------------------------
--      $Configure($Message)($OfCheckTitle)  := "Go to COVER Mode"
--      $Configure($Message)($OfExeStepMode) := "TC+TM"
--      $Configure($Message)($OfDispMode)    := $DispMode

--      $TCommand(0) := {ROS.TC.ZGD19606, SCOE := "TMTCSC"}
--      $TimeDelay($AfterCMD)(0) := 20
--      $TCommand(1) := {ROS.TC.ZSG00999TMTC, SCOE := "TMTCSC"}

--      $TimeDelay($ToReadTLM)(0) := 50
--      $ParametersToRead(0) := &NGDD0002    -- "Cover" Mode
--      $RefValues(0) := 1
--      $ParametersToRead(1) := &NGDA0010    -- Cover Status check
--      $RefValues(1) := 0x0020
--      $ParametersToRead(2) := &NSGC9999

--
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,
$TS_Name)


--      $Configure($Message)($OfCheckTitle)  := "Arm & Close GIADA Cover"
--      $Configure($Message)($OfExeStepMode) := "TC"
--      $Configure($Message)($OfDispMode)    := $DispMode

--      $TCommand(0) := {ROS.TC.ZGD19216, SCOE := "TMTCSC"}
--      $TimeDelay($AfterCMD)(0) := 2
--      $TCommand(1) := {ROS.TC.ZGD19226, SCOE := "TMTCSC"}
--      $TCommand(2) := {ROS.TC.ZSG00999TMTC, SCOE := "TMTCSC"}

--
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,
$TS_Name)
```

```
--      $OutMessages(0) := "Manually verify receipt of the following Events during cover close:"
--      $OutMessages(1) := "    "
--      $OutMessages(2) := "    YGD42001 - NGDA0060 = 0x0006"
--      $OutMessages(3) := "    YGD42002 - NGDA0060 = 0x0006"
--      $OutMessages(4) := "    YGD42001 - NGDA0060 = 0x0004"
--      $OutMessages(5) := "    YGD42002 - NGDA0060 = 0x0004"
--      $OutMessages(6) := "    "
--      $OutMessages(7) := "WAIT 3 Minutes for GIADA Cover Close to complete..."
--      @DO_DISP1($LogFileName, *$OutMessages, $DispMode)
--      @COUNT_DOWN(180)


--      $Configure($Message)($OfCheckTitle)  := "Final Cover Status Check"
--      $Configure($Message)($OfExeStepMode) := "TM"
--      $Configure($Message)($OfDispMode)    := $DispMode

--      $TimeDelay($ToReadTLM)(0) := 50
--      $ParametersToRead(0) := &NGDA0010
--      $RefValues(0) := 0x0000

--      $ParametersToRead(1) := &NSGC9999

--
@EXE_STEP1($LogFileName,$TCommand,$ParametersToRead,*$RefValues,*$Limits,*$TimeDelay,*$Configure,*$EXE_Test_Manager,
$TS_Name)


--      **-----------------------------------------------------
--      **--- 3. Configure GIADA to SAFE MODE
--      **-----------------------------------------------------
--      CALL PGDGE_MCHG, "SAFE", $LogFileName


      **-----------------------------------------------------
      **--- 4. Further TM checks
      **-----------------------------------------------------

      IF ($Off_speed = "FAST")
```

```
    $OutMessages(0):=  " "
    $OutMessages(1):=  "no TM checks done"
    $OutMessages(2):=  " "
    @DO_DISP1($LogFileName, *$OutMessages, $DispMode)
   ELSE
    $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
    $Configure($Message)($OfCheckTitle)  := "Further TM checks"
    $Configure($Message)($OfExeStepMode) := "TM"
    $ParametersToRead(0) := &NGDD0065           -- MBS off
    $RefValues(0) := 0
    $ParametersToRead(1) := &NGDD0045           -- IS off
    $RefValues(1) := 0
    $ParametersToRead(2) := &NGDD0025           -- GDS off
    $RefValues(2) := 0
    $ParametersToRead(3) := &NSGC9999
    @EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
                *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)

    IF ($EXE_Test_Manager = "ABORT") GOTO L_ABORT
   END IF
END IF  -- Normal SwitchOFF


**-----------------------------------------------------------
**--- 5. REPORT CONTEXT REQUEST & receive report ----------
**-----------------------------------------------------------
IF ($Off_speed = "FAST")
   $StepDes :=  "Report Context Request sent"
   @TEST_STEP($TS_Name,$LogFilename,$StepDes)
ELSE
   $Configure($Message)($OfDispMode)    := "LOGDISPLAY"
   $Configure($Message)($OfCheckTitle)  := "Report Context Request & receive report"
   $Configure($Message)($OfExeStepMode) := "TC"
   $TCommand(0) := {ROS.TC.ZGD00008 , SCOE := "TMTCSC", ACKBITS:="BOTH"}   --REPORT CONTEXT REQUEST
   $TCommand(1) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}
   @EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
              *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)
```

```
   @CSYRU_PKTPRT("YGD00013", FALSE,120,$LogFileName)  -- receive and print packet to CFlog

END IF

**-----------------------------------------------------
**--- 5.1. Patch to reset virtual disk ----------
**-----------------------------------------------------

   ** reset virtual disk:
   $PID     := 0x5A
   $MEM_ID  := 0x52    -- 82dec (NV RAM)

   $Load(0)  := 0x00
   $Load(1)  := 0x00
   $Load(2)  := 0x00
   $Load(3)  := 0x00
   $Load(4)  := 0x00
   $Load(5)  := 0x00

   $WLEN := 2 -- number of bites in one word, in/out para

   $DumpLength := 5   -- one word
   $Start_Address := 0x100000FE   -- start at 1 word less, until plus one word
   @CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

   $LoadLength := 3   -- one word
   $Start_Address := 0x10000100
   @CSYRU_TC_6_2 (*$Logfilename,$MEM_ID,$PID,$Start_Address,$LoadLength,*$Load,*$SeqCounter,TRUE,TRUE,*$WLEN)

   $DumpLength := 5   -- one word
   $Start_Address := 0x100000FE   -- start at 1 word less, until plus one word
   @CSYRU_TC_6_5 ($Logfilename,$MEM_ID,$PID,$Start_Address,$DumpLength,*$SeqCounter,TRUE,TRUE,*$Dump,*$WLEN)

   IF ($Flag_checks = TRUE)
   @ASK_NOCHK_B("Dump on reset virtual disk ok? (True to cont, False to abort)",\
                  *$Ask_bool,*$LogFilename)
   END IF
```

```
**-------------------------------------------------------
**--- 6. Switch BOTH LCLs OFF ----------
**-------------------------------------------------------

$Configure($Message)($OfDispMode)    := $DispMode
$Configure($Message)($OfCheckTitle)  := "Switch BOTH GIADA LCLs OFF"
$Configure($Message)($OfExeStepMode) := "TC"
$TimeDelay($ToReadTLM)(0) := 30

** LCL off cmd.s
$TCommand(0) := {ROS.TC.ZPWMA074SWOF , SCOE := "TMTCSC", ACKBITS:="BOTH"} --LCL GIADA A OFF
$TimeDelay($AfterCMD)(0) := 5
$TCommand(1) := {ROS.TC.ZPWMA331SWOF , SCOE := "TMTCSC", ACKBITS:="BOTH"} --LCL GIADA B OFF
$TCommand(2) := {ROS.TC.ZSG00999TMTC , SCOE := "TMTCSC"}

@EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
           *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)


IF ($Off_speed = "NOM")
   $Configure($Message)($OfDispMode)    := $DispMode
   $Configure($Message)($OfCheckTitle)  := "Verify GIADA LCLs OFF"
   $Configure($Message)($OfExeStepMode) := "TM"
   $TimeDelay($ToReadTLM)(0) := 30

   ** LCL parameters
   $ParametersToRead(0) := &NPWDA093       -- LCL 32A Status
   $RefValues(0) := 0                      -- Must be OFF
   $ParametersToRead(1) := &NPWDA213       -- LCL 32B Status
   $RefValues(1) := 0                      -- Must be OFF
   $ParametersToRead(2) := &NSGC9999       -- This is the termination Parameter
   @EXE_STEP1($LogFileName, $TCommand, $ParametersToRead,*$RefValues,*$Limits,\
         *$TimeDelay, *$Configure, *$EXE_Test_Manager,$TS_Name)

END IF
```

```
   **-----------------------------------------------------
   **--- 7. Stop SCET Updates & Disable Polling
   **-----------------------------------------------------
   IF ($Off_speed = "NOM")
      @CSYRU_SCET("STOP", "GIADA", , $LogFileName, *$EXE_Test_Manager)

      IF($GIADANomPower)
         CALL CSYGE_NOMRED, "GIADA", "NOMINAL", "DISABLE", $LogFileName, $EXE_Test_Manager
      ELSE
         CALL CSYGE_NOMRED, "GIADA", "REDUNDANT", "DISABLE", $LogFileName, $EXE_Test_Manager
      END IF
   END IF


##L_ABORT    ---  END operation caused by User
   **-----------------
   ** Close LogBook
   **-----------------
   @CLOSE_LGB1($LogFileName,$TS_Name,$Dispmode)

   $GIADA_status := "OFF_ended"            -- set flag for parallel calling

   IF ($EXE_Test_Manager = "ABORT")
      Return "ABORT"
   ELSE
      Return "OK"
   END IF

END SEQUENCE
```

ANNEX 6: Commissioning sequences of procedures

In this Section the FOPs in ITL format for the different Commissioning tests are reported. The tests performed are summarised in Table 8.1.

Test	days	Main Report	From	To
Commissioning CVP-0	2g	GIA-GAL-RP-517	03/04/04	04/04/04
Interference 1A-B	3g	GIA-GAL-RP-518, 519, RO-GIA-OACUPA-TN-120	20/09/04	22/09/04
Pointing 1	1g	GIA-GAL-RP-520	23/09/04	23/09/04
Pointing 2	1g	GIA-GAL-RP-520	30/09/04	30/09/04
Interference 2	3g	GIA-GAL-RP-521, 522	12/10/04	14/10/04
Passive Checkout 0	1g	RO-GIA-OACUPA-TN-146, RO-GIA-OACUPA-RP-078	28/03/05	28/03/05
Passive Checkout 1	1g	RO-GIA-OACUPA-TN-148, RO-GIA-OACUPA-RP-077	02/10/05	02/10/05
Passive Checkout 2	2g	RO-GIA-OACUPA-RP-098	05/03/06	06/03/06

Table 8.1. Tests performed on GIADA during Commissioning.

COMMISSIONING CVP-0

Refer to Table 4.2 for timeline.

For safety reasons, this part of the Commissioning has been run by sending manually the single commands to Rosetta from ground one by one and monitoring the results.

GD_INTERFER_COMP_EVF_OPS01A.itl

```
#=============================================================================================#
# Filename:       GD_INTERFER_COMP_EVF_OPS01A.itl
# Type:           Input Timeline file
#
# Description:    This is a description of the interference scenario, in which the experiments
#                 check for external influence from other experiments or subsystems.
#                 Interferences with the AOCMS subsystems will be moved to the pointing scenario
#
#                 This version of the timeline has all its operations scheduled relative to
#                 experiments events, which allows easy re-scheduling while at the same time
#                 clearer iteration with PI teams (as all PI inputs can remain in ONE file,
#                 rather then mixed in with other experiments)
#
# Author:         GIADA team
#
# Verified by:    RSOC
#
#
# Date:           6 July 2004
#
# (c) ESA/Estec
#
#---------------------------------------------------------------------------------------------#
#
# CVS version information:
# $Log: GD_INTERFER_COMP_EVF_OPS01A.itl,v $
# Revision 1.5  2004/08/06 09:56:46  rhoofs
# Time updated to new data for Interference Scenario: 20 September 2004
#
# Revision 1.4  2004/07/30 13:48:03  rhoofs
# - removed certain cover operations
# - added power off/on
# - updated count numbers for events
# - updated power-on sequence with 2 additional sequences (001B and C)
```

```
#
# Revision 1.3  2004/07/12 17:14:21  rhoofs
# updated execution time of interference scenario
#
# Revision 1.2  2004/07/12 13:23:42  rhoofs
# Interference Event driven scheduling for iterated Interference scenario.
# Experiment operations reduced in order to reduce thermal load on spacecraft.
# Also data-rate production reduced to operations which are really necessary for interference.
#
# Revision 1.1  2004/07/08 12:50:58  rhoofs
# Interference planning files for easy re-scheduling and re-iteration
#
#
#=============================================================================================#
# GIADA Interference Operations Overview
# ----------------------------------------
# Emissive mode: Normal Mode + Cover operations
# normal science operation with lasers on
# Susceptible mode: Normal Mode + Cover opening
# Normal science operation with frequent calibrations to detect possible induced noise
# Timed Operations: No
# Requests to other experiments: None
# Requests from other experiments: None
# Special Operations: Power on sequence up to emissive or susceptible configuration takes
# almost 40 minutes
# GIADA sequences for Interference scenario:
#---------------------------------------------------------------------------------------#
# <TC sequence> ( \                 #<TC sequence description>
#          <TC seq parameter>)
#---------------------------------------------------------------------------------------#
# AGDF001A ( \                      # GIADA on Main IF
#          VGDF0001 = "Yes")
# AGDF001B                          # "Patch Context File ( v13"
# AGDF001C                          # "Load SW Patches (nom v13"
# AGDS035A                          # Goto Cover
# AGDF090A                          # Open Cover
# AGDF070A                          # Close Cover
```

```
# AGDF065A                    # Goto Safe
# AGDS110A                    # Goto Normal and enable Sci TM
# AGDS120A ( \                # Calibrate IS, GDS, MBS
#         VGDS0010 = 0xF8 \
#         VGDS0011 = 0x04 )
#
#=============================================================================================#

# RSOC general note:
# The following Operations for GIADA are scheduled in the following way
# To configure GIADA to emissive: Open Covers - emissive - Close Covers
# To configure GIADA to susceptible: Open Covers - susceptible - Close Covers

Version: 00001

# The Interference Scenario will be performed on 18 and 19 September 2004

Ref_date: 20-September-2004

Start_time:       000_00:00:00
End_time:         003_00:00:00

Init_Mode:     GIADA     Off

#---------------------------------------------------------------------------------------#
# INTERFERENCE PART 1A
#---------------------------------------------------------------------------------------#

#---------------------------------------------------------------------------------------#
Description: 1 "Switch on all experiments"
#---------------------------------------------------------------------------------------#

#---------------------------------------------------------------------------------------#
Description: 1.4 "Switch on GIADA"
#---------------------------------------------------------------------------------------#

# Giada switch-on will take about 20 minutes
```

```
# mostly because of patching. LCL is already switch-on early in power-on process

GD_PWRON (COUNT = 1)  00:00:00              GIADA   OFF     AGDF001A ( \
                            VGD0001A = "Yes" [ENG])   # GIADA on Main IF

GD_PWRON (COUNT = 1)  00:02:00              GIADA   Safe    AGDF001B

GD_PWRON (COUNT = 1)  00:06:00              GIADA   Safe    AGDF001C

#-------------------------------------------------------------------------------#
Description: "Switch GIADA to emissive mode"
#-------------------------------------------------------------------------------#

GD_EMISS (COUNT = 1)        00:00:00        GIADA       Safe        AGDS035A    # Goto Cover

Description: "Cover operations with possible vibrations"

GD_EMISS (COUNT = 1)        00:01:00        GIADA       Cover       AGDF090A    # Open Cover

GD_EMISS (COUNT = 1)        00:11:00        GIADA       Cover       AGDS065A    # Goto Safe

Description: " normal science operation with lasers on "

GD_EMISS (COUNT = 1)        00:12:00        GIADA       Safe        AGDS110A    # Goto Normal and enable Sci TM

# GIADA has to remain in this configuration as needed

# RSOC note - TC sequences to configure Giada back:

# Description: " Close cover and GIADA in safe mode "

GD_EMISS (COUNT = 1)        00:45:00  GIADA     Normal      AGDS065A    # Goto Safe

GD_EMISS (COUNT = 1)        00:46:00  GIADA     Safe        AGDS035A    # Goto Cover

GD_EMISS (COUNT = 1)        00:47:00  GIADA     Cover       AGDF070A    # Close Cover
```

```
GD_EMISS (COUNT = 1)          01:00:00    GIADA          Cover              AGDS065A       # Goto Safe

#-------------------------------------------------------------------------------------#
Description: "Switch off GIADA to reduce HK data-volume for scenario"
#-------------------------------------------------------------------------------------#

GD_PWROFF (COUNT = 1)         00:01:00          GIADA            SAFE               AGDF060A       # Safe Mode and OFF via OBCP

#-------------------------------------------------------------------------------------#
Description: "Switch on MIRO for parallel emissive operations"
#-------------------------------------------------------------------------------------#

GD_PWRON (COUNT = 2)   00:00:00                GIADA    OFF       AGDF001A ( \
                                VGD0001A = "Yes" [ENG])    # GIADA on Main IF

GD_PWRON (COUNT = 2)   00:02:00                GIADA    Safe      AGDF001B

GD_PWRON (COUNT = 2)   00:06:00                GIADA    Safe      AGDF001C

#-------------------------------------------------------------------------------------#
Description: 2 "Switch all experiments to emissive mode"
#-------------------------------------------------------------------------------------#

#-------------------------------------------------------------------------------------#
Description: 2.4 "Switch GIADA to emissive mode"
#-------------------------------------------------------------------------------------#

GD_EMISS (COUNT = 2)          00:00:00          GIADA            Safe               AGDS035A       # Goto Cover

Description: "Cover operations with possible vibrations"

GD_EMISS (COUNT = 2)          00:01:00          GIADA            Cover              AGDF090A       # Open Cover

GD_EMISS (COUNT = 2)          00:11:00          GIADA            Cover              AGDS065A       # Goto Safe

Description: " normal science operation with lasers on "
```

GD_EMISS (COUNT = 2)	00:12:00	GIADA	Safe	AGDS110A	# Goto Normal and enable Sci TM

GIADA has to remain in this configuration as needed

RSOC note - TC sequences to configure Giada back:

Description: " Close cover and GIADA in safe mode "

GD_EMISS (COUNT = 2)	00:40:00	GIADA	Normal	AGDS065A	# Goto Safe

COVER OPERATION TAKEN OUT

# GD_EMISS (COUNT = 2)	00:41:00	GIADA	Safe	AGDS035A	# Goto Cover
#					
# GD_EMISS (COUNT = 2)	00:42:00	GIADA	Cover	AGDF070A	# Close Cover
#					
# GD_EMISS (COUNT = 2)	00:55:00	GIADA	Cover	AGDS065A	# Goto Safe

#----------#
Description: 3 "Switch all experiments to susceptible mode"
#----------#
#----------#
Description: 3.4 "Switch GIADA to susceptible mode"
#----------#

Description: " normal science operation with frequent calibrations to detect possible "
Description: " induced noise "

COVER OPERATION TAKEN OUT

# GD_SUSC (COUNT = 1)	00:00:00	GIADA	Safe	AGDS035A	# Goto Cove
#					
# Description: "Cover operations with possible vibrations"					
#					
# GD_SUSC (COUNT = 1)	00:01:00	GIADA	Cover	AGDF090A	# Open Cove
#					

```
# GD_SUSC (COUNT = 1)        00:11:00        GIADA        Cover          AGDS065A      # Goto Safe

GD_SUSC (COUNT = 1) 00:16:00        GIADA          Safe           AGDS110A      # Goto Normal and enable Sci TM

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 6 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"

# 2,5 hours of susceptible operations should be scheduled = 150 min/6 = 25 calibrations

GD_SUSC (COUNT = 1) 00:30:00        GIADA          NORMAL              AGDS120A ( \
                                                   VGDS0010 = 0xF8 \
                                                   VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                   REPEAT = 25 \
                                                   SEPARATION = 00:06:00 )


Description: "Leave all experiments in a susceptible mode for at least ONE hour"

# GAIDA will stay in susceptible for the experiment specific operations which follow directly afterwards


GD_SUSC (COUNT = 1) 03:00:00        GIADA          Normal         AGDS065A      # Goto Safe

GD_SUSC (COUNT = 1) 03:01:00        GIADA          Safe           AGDS035A      # Goto Cover

GD_SUSC (COUNT = 1) 03:02:00        GIADA          Cover          AGDF070A      # Close Cover

GD_SUSC (COUNT = 1) 03:15:00        GIADA          Cover          AGDS065A      # Goto Safe

#-------------------------------------------------------------------------------#
Description:  "GIADA switch off after Interference part 1A"
#-------------------------------------------------------------------------------#

GD_PWROFF (COUNT = 2)       00:01:00        GIADA          SAFE           AGDF060A      # Safe Mode and OFF via OBCP

#-------------------------------------------------------------------------------#
# INTERFERENCE PART 1B
```

```
#-------------------------------------------------------------------------------#

#-------------------------------------------------------------------------------#
Description:  "GIADA switch on for Interference part 1B"
#-------------------------------------------------------------------------------#

GD_PWRON (COUNT = 3)   00:00:00              GIADA    OFF      AGDF001A ( \
                                VGD0001A = "Yes" [ENG])   # GIADA on Main IF

GD_PWRON (COUNT = 3)   00:02:00              GIADA    Safe     AGDF001B

GD_PWRON (COUNT = 3)   00:06:00              GIADA    Safe     AGDF001C

#-------------------------------------------------------------------------------#
Description: 4 "Switch all experiments one by one to an emissive mode and back to an"
Description:   "susceptible mode"
#-------------------------------------------------------------------------------#

GD_SUSC (COUNT = 2) 00:00:00          GIADA          Safe             AGDS035A      # Goto Cove

Description: "Cover operations with possible vibrations"

GD_SUSC (COUNT = 2) 00:01:00          GIADA          Cover            AGDF090A      # Open Cove

GD_SUSC (COUNT = 2) 00:11:00          GIADA          Cover            AGDS065A      # Goto Safe

GD_SUSC (COUNT = 2) 00:16:00          GIADA          Safe             AGDS110A      # Goto Normal and enable Sci TM

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 6 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"

# 5 hours of susceptible operations should be scheduled = 300 min/6 = 50 calibrations

GD_SUSC (COUNT = 2) 00:30:00          GIADA          NORMAL                 AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                REPEAT = 50 \
```

SEPARATION = 00:06:00)

GD_SUSC (COUNT = 2) 05:30:00 GIADA Normal AGDS065A # Goto Safe

COVER OPERATION TAKEN OUT

GD_SUSC (COUNT = 2) 05:31:00 GIADA Safe AGDS035A # Goto Cover
#
GD_SUSC (COUNT = 2) 05:32:00 GIADA Cover AGDF070A # Close Cover
#
GD_SUSC (COUNT = 2) 05:45:00 GIADA Cover AGDS065A # Goto Safe

#----------#
Description: 4.4 "Perform GIADA emissive operations"
#----------#

#----------#
Description: 4.4.3 "Switch GIADA to emissive mode"
#----------#

COVER OPERATION TAKEN OUT

GD_EMISS (COUNT = 3) 00:00:00 GIADA Safe AGDS035A # Goto Cover
#
Description: "Cover operations with possible vibrations"
#
GD_EMISS (COUNT = 3) 00:01:00 GIADA Cover AGDF090A # Open Cover
#
GD_EMISS (COUNT = 3) 00:11:00 GIADA Cover AGDS065A # Goto Safe

Description: " normal science operation with lasers on "

GD_EMISS (COUNT = 3) 00:12:00 GIADA Safe AGDS110A # Goto Normal and enable Sci TM

GIADA has to remain in this configuration as needed

RSOC note - TC sequences to configure Giada back:

```
# Description: " Close cover and GIADA in safe mode "

GD_EMISS (COUNT = 3)          00:40:00          GIADA          Normal          AGDS065A       # Goto Safe

# COVER OPERATION TAKEN OUT

# GD_EMISS (COUNT = 3)        00:41:00          GIADA          Safe            AGDS035A       # Goto Cover
#
# GD_EMISS (COUNT = 3)        00:42:00          GIADA          Cover           AGDF070A       # Close Cover
#
# GD_EMISS (COUNT = 3)        00:55:00          GIADA          Cover           AGDS065A       # Goto Safe

#-------------------------------------------------------------------------------------------#
Description: 4.4.6 "Switch  GIADA back to susceptible mode"
#-------------------------------------------------------------------------------------------#

# COVER OPERATION TAKEN OUT

# GD_SUSC (COUNT = 3)         00:00:00          GIADA          Safe            AGDS035A       # Goto Cove
#
# Description: "Cover operations with possible vibrations"
#
# GD_SUSC (COUNT = 3)         00:01:00          GIADA          Cover           AGDF090A       # Open Cove
#
# GD_SUSC (COUNT = 3)         00:11:00          GIADA          Cover           AGDS065A       # Goto Safe

GD_SUSC (COUNT = 3) 00:16:00          GIADA          Safe            AGDS110A       # Goto Normal and enable Sci TM

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 6 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"

# 12 minutes of susceptible operations should be scheduled = 12 min/6 = 2 calibrations

GD_SUSC (COUNT = 3) 00:30:00          GIADA          NORMAL          AGDS120A ( \
                                                     VGDS0010 = 0xF8 \
                                                     VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
```

REPEAT = 2 \
SEPARATION = 00:06:00)

GD_SUSC (COUNT = 3) 00:45:00	GIADA	Normal	AGDS065A	# Goto Safe
GD_SUSC (COUNT = 3) 00:46:00	GIADA	Safe	AGDS035A	# Goto Cover
GD_SUSC (COUNT = 3) 00:47:00	GIADA	Cover	AGDF070A	# Close Cover
GD_SUSC (COUNT = 3) 01:00:00	GIADA	Cover	AGDS065A	# Goto Safe

#----------#
Description: 5 "Switch off all experiments"
#----------#

#----------#
Description: 5.4 "Switch off GIADA"
#----------#

GD_PWROFF (COUNT = 3)	00:01:00	GIADA	SAFE	AGDF060A	# Safe Mode and OFF via OBCP

GD_POINTING_STRAY_LIGHT__OBS07A.itl

```
# $Log: GD_POINTING_STRAY_LIGHT__OBS07A.itl,v $
# Revision 1.3  2004/09/14 15:18:33  dfrew
# moved initial modes to top-level itl
#
# Revision 1.2  2004/08/12 13:33:31  vdhiri
# Correction to timing. Consideration to OFF/ON times. Addition of Earliest/Latest Times to be able to use overall EVF.
#
# Revision 1.1  2004/08/09 08:32:31  vdhiri
# Current OIOR (ITL) for the Pointing Scenario
#
# Revision 1.5  2004/06/23 12:17:29  dfrew
# Updated pointing events
# made consistent with latest EDFs
#
#=============================================================================================#
# Filename:       GD_POINTING_GIADA___obs7_OPS.itl
# Type:           Input Timeline file
#
# Description:  This file is used to prepare the Pointing scenario for GIADA during.
#           the straylight test from 180 to 90 degrees (observation 7).
#
#
# Author:         RSOC
#                 name:  David Frew
#                 email: dfrew@rssd.esa.int
#
#           EXPERIMENTER TEAM
#           name:  Pasquale Palumbo
#           email: giada@cosmic.na.astro.it
#
#           First version created by GIADA team.
#
# Date:           02 Dec 2002
#
```

```
# (c) ESA/Estec
#
#-------------------------------------------------------------------------------#

Version: 00002

Ref_date: 22-Sep-2004

Start_time: 000_00:00:00
End_time:   002_00:00:00

#Init_Mode:     GIADA     Off

Description: "GIADA Off and Closed, but the Frangibolt has been already activated"

#===============================================================================================#
# Description: "1. | Do initial setup"
#===============================================================================================#

POINTING_START(COUNT=007001) -00:40:00    GIADA     OFF    AGDF001A # GIADA On

POINTING_START(COUNT=007001) -00:39:00    GIADA     SAFE   AGDF001B # GIADA On

POINTING_START(COUNT=007001) -00:35:00    GIADA     SAFE   AGDF001C # GIADA On

POINTING_START(COUNT=007001) -00:16:00    GIADA     SAFE   AGDS035A # Go to Cover Mode

POINTING_START(COUNT=007001) -00:14:00    GIADA     COVER  AGDF090A # Open cover

POINTING_START(COUNT=007001) -00:04:00    GIADA     COVER  AGDS065A # Go to Safe mode

POINTING_START(COUNT=007001) -00:03:00    GIADA     SAFE   AGDS036A ( \ # Set PZT Threshold, IS Ops Mode  Set IS Ch A,B,C,D,E Thresholds to 50, 50, 50, 50,
100 mV,  Set IS Range, Gain E, D, A to Low, High, High, High
                                                  VGDS0031 = 0x05 \ # PZT1_Threshold
                                                  VGDS0032 = 0x05 \ # PZT2_Threshold
                                                  VGDS0033 = 0x05 \ # PZT3_Threshold
                                                  VGDS0034 = 0x05 \ # PZT4_Threshold
```

```
                                VGDS0035 = 0x0A \ # PZT5_Threshold
                                VGDS0018 = "Enabled" [ENG]\ # PZT5_en_dis
                                VGDS0019 = "Enabled" [ENG]\ # PZT4_en_dis
                                VGDS0020 = "Enabled" [ENG]\ # PZT3_en_dis
                                VGDS0021 = "Enabled" [ENG]\ # PZT2_en_dis
                                VGDS0022 = "Enabled" [ENG]\ # PZT1_en_dis
                                VGDS0023 = "Low" [ENG]\ # Range
                                VGDS0025 = "High" [ENG]\ # Gain_PZT5
                                VGDS0026 = "High" [ENG]\ # Gain_PZT4
                                VGDS0027 = "High" [ENG]\ # Gain_PZT3
                                VGDS0028 = "High" [ENG]\ # Gain_PZT2
                                VGDS0029 = "High" [ENG]) # Gain_PZT1

POINTING_START(COUNT=007001) -00:02:00    GIADA      SAFE   AGDS110A # Go to Normal mode


#============================================================================================#
# Description: "2.0 | Straylight test from 180 to 90 deg in 5 deg steps"
#============================================================================================#

#--------------------------------------------------------------------------------------------#
# Description: "2.1 | 6 repetitions on giada calibration at each position"
#--------------------------------------------------------------------------------------------#

POINTING_START(MAX_NR=6 EARLIEST = 001_07:00:00 LATEST = 001_10:25:00)   GIADA    NORMAL     AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \
                                                                    REPEAT = 6 \
                                                SEPARATION = 00:05:00)  # Calibrate IS, GDS, MBS

#============================================================================================#
# Description: "3. | Shut down everything"
#============================================================================================#

# POINTING_END(COUNT=007006)  00:30:00    GIADA    NORMAL          AGDS065A # Go to Safe Mode

# POINTING_END(COUNT=007006)  00:31:00    GIADA    SAFE    AGDS035A # Go to Cover mode
```

POINTING_END(COUNT=007006) 00:32:00 GIADA COVER AGDF070A # Close cover

POINTING_END(COUNT=007006) 00:42:00 GIADA COVER AGDF060A # go to safe mode & off

---------- End of GIADA Pointing Scenario Observation 7 ----------

GD_POINTING_STRAY_LIGHT__OBS10A.itl

```
# $Log: GD_POINTING_STRAY_LIGHT__OBS10A.itl,v $
# Revision 1.5  2004/09/24 12:29:56  dfrew
# scheduled shutdown from pointing_start 010006 as discussed with GIADA team
#
# Revision 1.4  2004/09/24 10:53:18  dfrew
# updated in agreement with GIADA
#
# Revision 1.3  2004/09/23 13:31:47  dfrew
# consistent ITLs for set 10
#
# Revision 1.2  2004/08/12 13:33:32  vdhiri
# Correction to timing. Consideration to OFF/ON times. Addition of Earliest/Latest Times to be able to use overall EVF.
#
# Revision 1.1  2004/08/09 08:32:32  vdhiri
# Current OIOR (ITL) for the Pointing Scenario
#
# Revision 1.5  2004/06/23 12:17:29  dfrew
# Updated pointing events
# made consistent with latest EDFs
#
#=============================================================================================#
# Filename:       GD_POINTING_GIADA__OBS10_OPS.itl
# Type:           Input Timeline file
#
# Description:  This file is used to prepare the Pointing scenario for GIADA during.
#           the straylight test from 45 to 20 degrees (observation 10).
#
#
# Author:         RSOC
#                 name:  David Frew
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#
#           EXPERIMENTER TEAM
#           name:  Pasquale Palumbo
```

```
#             email: giada@cosmic.na.astro.it
#
#             First version created by GIADA team.
#
# Date:               02 Dec 2002
#
# (c) ESA/Estec
#
#-------------------------------------------------------------------------------------------#

Version: 00002

Ref_date: 29-Sep-2004

Start_time: 000_00:00:00
End_time:   002_00:00:00

#Init_Mode:  GIADA     Off

Description: "GIADA Off and Closed, but the Frangibolt has been already activated"

#=============================================================================================#
# Description: "1. | Do initial setup"
#=============================================================================================#

POINTING_START(COUNT=010001) -00:40:00    GIADA     OFF    AGDF001A # GIADA On

POINTING_START(COUNT=010001) -00:39:00    GIADA     SAFE   AGDF001B # GIADA On

POINTING_START(COUNT=010001) -00:35:00    GIADA     SAFE   AGDF001C # GIADA On

POINTING_START(COUNT=010001) -00:16:00    GIADA     SAFE   AGDS035A # Go to Cover Mode

POINTING_START(COUNT=010001) -00:14:00    GIADA     COVER  AGDF090A # Open cover

POINTING_START(COUNT=010001) -00:04:00    GIADA     COVER  AGDS065A # Go to Safe mode
```

```
#POINTING_START(COUNT=010001) -00:03:00    GIADA      SAFE   AGDS036A ( \ # Set PZT Threshold, IS Ops Mode  Set IS Ch A,B,C,D,E Thresholds to 50, 50, 50, 50,
100 mV,  Set IS Range, Gain E, D, A to Low, High, High, High
#                                                  VGDS0031 = 0x05 \ # PZT1_Threshold
#                                                  VGDS0032 = 0x05 \ # PZT2_Threshold
#                                                  VGDS0033 = 0x05 \ # PZT3_Threshold
#                                                  VGDS0034 = 0x05 \ # PZT4_Threshold
#                                                  VGDS0035 = 0x0A \ # PZT5_Threshold
#                                                  VGDS0018 = "Enabled" [ENG]\ # PZT5_en_dis
#                                                  VGDS0019 = "Enabled" [ENG]\ # PZT4_en_dis
#                                                  VGDS0020 = "Enabled" [ENG]\ # PZT3_en_dis
#                                                  VGDS0021 = "Enabled" [ENG]\ # PZT2_en_dis
#                                                  VGDS0022 = "Enabled" [ENG]\ # PZT1_en_dis
#                                                  VGDS0023 = "Low" [ENG]\ # Range
#                                                  VGDS0025 = "High" [ENG]\ # Gain_PZT5
#                                                  VGDS0026 = "High" [ENG]\ # Gain_PZT4
#                                                  VGDS0027 = "High" [ENG]\ # Gain_PZT3
#                                                  VGDS0028 = "High" [ENG]\ # Gain_PZT2
#                                                  VGDS0029 = "High" [ENG]) # Gain_PZT1

POINTING_START(COUNT=010001) -00:02:00    GIADA      SAFE   AGDS110A # Go to Normal mode

#=============================================================================================================#
# Description: "2.0 | Straylight test from 140 to 90 deg in 5 deg steps"
#=============================================================================================================#

#-------------------------------------------------------------------------------------------#
# Description: "2.1 | 6 repetitions on giada calibration at each position"
#-------------------------------------------------------------------------------------------#

POINTING_START(MAX_NR=06 EARLIEST = 001_05:00:00 LATEST = 001_07:55:00)  GIADA    NORMAL      AGDS120A ( \ # "GIADA Calibration v04"
                                                        VGDS0010 = 0xF8 \
                                                        VGDS0011 = 0x04 \
                                                                                REPEAT = 6 \
                                                        SEPARATION = 00:05:00)  # Calibrate IS, GDS, MBS

#=============================================================================================================#
# Description: "3. | Shut down everything"
```

#==#

POINTING_START(COUNT=010006) 00:40:00 GIADA NORMAL AGDS065A # Go to Safe Mode

#POINTING_END(COUNT=010006) 00:31:00 GIADA SAFE AGDS035A # Go to Cover mode

#POINTING_END(COUNT=010006) 00:32:00 GIADA COVER AGDF070A # Close cover

POINTING_START(COUNT=010006) 00:52:00 GIADA SAFE AGDF060A # go to safe mode & off

---------- End of GIADA Pointing Scenario Observation 10 ----------

GD_INTERFER_PART2____OPS01A.itl

```
#=============================================================================================#
# Filename:       GD_INTERFER_PART2____OPS01A.itl
# Type:           Input Timeline file
#
# Description:    This is a description of the interference scenario Part 2, in which the experiments
#                 check for external influence from other experiments or subsystems.
#
#                 This version of the timeline has all its operations scheduled relative to
#                 experiments events, which allows easy re-scheduling while at the same time
#                 clearer iteration with PI teams (as all PI inputs can remain in ONE file,
#                 rather then mixed in with other experiments)
#
# Author:         GIADA team
#
# Verified by:    RSOC
#
#
# Date:           4 October 2004
#
# (c) ESA/Estec
#
#---------------------------------------------------------------------------------------------#
#
# CVS version information:
# $Log: GD_INTERFER_PART2____OPS01A.itl,v $
# Revision 1.5  2004/10/06 08:48:47  rhoofs
# Updated timing again in order to avoid sequence overlap
#
# Revision 1.4  2004/10/05 15:26:35  rhoofs
# Updated timing in order to avoid sequence overlap
#
# Revision 1.3  2004/10/04 16:29:47  rhoofs
# Updated file from GIADA with errors corrected
```

```
#
# Revision 1.1  2004/10/04 14:06:15  rhoofs
# Initial Interference Part 2 files
#
#
#==========================================================================================#

# NOTE: procedures for the Interference Part2
# To allow safe IS setting, a new TC shall be included in the tml (ZGD19401).
# This TC is not included in a dedicated sequence so far; so it should be included ?by hand? in the timeline.


# INTERFERENCE  Part 2a

Version: 00001

# The Interference Scenario will be performed on 12, 13 and 14 October 2004

Ref_date: 12-October-2004

Start_time:     000_00:00:00
End_time:       003_00:00:00

Init_Mode:   GIADA    Off

# NOTE: timing is absolute, starting from 17:00:00; as a reference, about  10 hours are considering for the
# first phase (GIADA on with Main Interface) and about 2:45 hours for the second phase (Red. interface)


#-----------------------------------------------------------------------------------------#
Description: "Switch on GIADA"
#-----------------------------------------------------------------------------------------#

GD_PWRON (COUNT = 1)   00:00:00          GIADA        OFF           AGDF001A ( \
                                                 VGD0001A = "Yes" [ENG])    # GIADA on Main IF

GD_PWRON (COUNT = 1)   00:02:00          GIADA        Safe          AGDF001B
```

```
GD_PWRON (COUNT = 1)   00:06:00              GIADA          Safe              AGDF001C

#-------------------------------------------------------------------------------------#
Description: "Switch GIADA to susceptible mode"
#-------------------------------------------------------------------------------------#

GD_SUSC (COUNT = 1) 00:00:00          GIADA          Safe          AGDS035A      # Goto Cover

Description: "Cover operations with possible vibrations"

GD_SUSC (COUNT = 1) 00:01:00          GIADA          Cover         AGDF090A      # Open Cover

GD_SUSC (COUNT = 1) 00:11:00          GIADA          Cover         AGDS065A      # Goto Safe

Description: " normal science operation with lasers on "

GD_SUSC (COUNT = 1) 00:12:00          GIADA          Safe          AGDS110A      # Goto Normal and enable Sci TM

GD_SUSC (COUNT = 1) 00:14:00          GIADA          Normal        AGDS038A( \
                                                                     VGDS038A = 29 \
                                                                     VGDS038B = 20 )       # Set GDS L and R Thr. ? dec values

GD_SUSC (COUNT = 1) 00:14:30          GIADA          Normal        AGDS037A(\
                                                                     VGDS037A = Off [ENG])                 # Set IS On/Off

GD_SUSC (COUNT = 1) 00:15:00          GIADA          Normal        AGDS036A ( \
                                                                     VGDS0031 = 0x5 \
                                                                     VGDS0032 = 0x5 \
                                                                     VGDS0033 = 0x5 \
                                                                     VGDS0034 = 0x5 \
                                                                     VGDS0035 = 0xa \
                                                                     VGDS0018 = Enabled [ENG] \
                                                                     VGDS0019 = Enabled [ENG] \
                                                                     VGDS0020 = Enabled [ENG] \
                                                                     VGDS0021 = Enabled [ENG] \
                                                                     VGDS0022 = Enabled [ENG] \
```

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                                                VGDS0023 = Low [ENG] \
                                                VGDS0025 = High [ENG] \
                                                VGDS0026 = High [ENG] \
                                                VGDS0027 = High [ENG] \
                                                VGDS0028 = High [ENG] \
                                                VGDS0029 = High [ENG])      # Set IS status and thresholds

GD_SUSC (COUNT = 1) 00:15:30    GIADA    Normal    AGDS037A(\
                                                VGDS037A = On [ENG])        # Set IS On/Off

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 5 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"
# 12 hours 15 minutes of susceptible operations should be scheduled = 735 min/5 = 147 calibrations

GD_SUSC (COUNT = 1) 00:16:00    GIADA    Normal    AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                REPEAT = 147 \
                                                SEPARATION = 00:05:00 )

# Description: "Goto Safe at the end of sensitivity phase, 5 min after last calibration sequence "

#-------------------------------------------------------------------------------#
Description: "Switch off GIADA"
#-------------------------------------------------------------------------------#

GD_PWROFF (COUNT = 1)    00:00:00    GIADA    Normal    AGDS065A    # Goto Safe

GD_PWROFF (COUNT = 1)    00:01:00    GIADA    SAFE      AGDF060A    # Safe Mode and OFF via OBCP


#-------------------------------------------------------------------------------#
Description: "Switch on GIADA using Redundant Interface"
#-------------------------------------------------------------------------------#

Description: "Switch GIADA to the Redundant Interface"
Description: "all other experiments should stay in stable configuration "
```

```
GD_PWRON (COUNT = 2)        00:00:00        GIADA        OFF            AGDF002A ( \
                                                                        VGD0001A = "Yes" [ENG])    # GIADA on Redundant IF

GD_PWRON (COUNT = 2)        00:02:00        GIADA        Safe           AGDF002B

GD_PWRON (COUNT = 2)        00:06:00        GIADA        Safe           AGDF002C

#-------------------------------------------------------------------------------#
Description: "Switch GIADA to susceptible mode"
#-------------------------------------------------------------------------------#

GD_SUSC (COUNT = 2) 00:00:00        GIADA        Safe           AGDS035A       # Goto Cover

Description: "Cover operations with possible vibrations"

GD_SUSC (COUNT = 2)         00:01:00        GIADA        Cover          AGDF090A       # Open Cover

GD_SUSC (COUNT = 2)         00:11:00        GIADA        Cover          AGDS065A       # Goto Safe
# RSOC Comment: Normally only 00:01:00 is used in this sequence of TC sequences

GD_SUSC (COUNT = 2)         00:12:00        GIADA        Safe           AGDS110A       # Goto Normal and enable Sci TM

GD_SUSC (COUNT = 2)         00:14:00        GIADA        Normal         AGDS038A( \
                                                                        VGDS038A = 29 \
                                                                        VGDS038B = 20 )        # Set GDS L and R Thr. ? dec values

GD_SUSC (COUNT = 2)         00:14:30        GIADA        Normal         AGDS037A(\
                                                                        VGDS037A = Off [ENG])                  # Set IS On/Off

GD_SUSC (COUNT = 2)         00:15:00        GIADA        Normal         AGDS036A ( \
                                                                        VGDS0031 = 0x5 \
                                                                        VGDS0032 = 0x5 \
                                                                        VGDS0033 = 0x5 \
                                                                        VGDS0034 = 0x5 \
                                                                        VGDS0035 = 0xa \
                                                                        VGDS0018 = Enabled [ENG] \
```

```
                                                VGDS0019 = Enabled [ENG] \
                                                VGDS0020 = Enabled [ENG] \
                                                VGDS0021 = Enabled [ENG] \
                                                VGDS0022 = Enabled [ENG] \
                                                VGDS0023 = Low [ENG] \
                                                VGDS0025 = High [ENG] \
                                                VGDS0026 = High [ENG] \
                                                VGDS0027 = High [ENG] \
                                                VGDS0028 = High [ENG] \
                                                VGDS0029 = High [ENG])      # Set IS status and thresholds

GD_SUSC (COUNT = 2)     00:15:30    GIADA    Normal      AGDS037A( \
                                                VGDS037A = On [ENG])            # Set IS On/Off

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 5 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"
# 1 hour and 30 minutes of susceptible operations should be scheduled = 100 min/5 = 18

GD_SUSC (COUNT = 2)     00:16:00    GIADA    Normal      AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                REPEAT = 18 \
                                                SEPARATION = 00:05:00 )

#-----------------------------------------------------------------------------------#
Description: "Switch off GIADA"
#-----------------------------------------------------------------------------------#

# Description: " Goto Safe at the end of sensitivity phase, 5 min after last calibration sequence "

GD_PWROFF (COUNT = 2)   00:00:00    GIADA    Normal      AGDS065A    # Goto Safe

Description: " last sequence can be executed 1 minute after the Goto Safe "

GD_PWROFF (COUNT = 2)   00:01:00    GIADA    SAFE        AGDF060A    # Safe Mode and OFF via OBCP
```

```
#-------------------------------------------------------------------------------#
# INTERFERENCE  Part 2b
#-------------------------------------------------------------------------------#

#-------------------------------------------------------------------------------#
Description: "Switch on GIADA"
#-------------------------------------------------------------------------------#


GD_PWRON (COUNT = 3)        00:00:00        GIADA        OFF          AGDF001A ( \
                                                                      VGD0001A = "Yes" [ENG])    # GIADA on Main IF

GD_PWRON (COUNT = 3)        00:02:00        GIADA        Safe         AGDF001B

GD_PWRON (COUNT = 3)        00:06:00        GIADA        Safe         AGDF001C

#-------------------------------------------------------------------------------#
Description: "Switch GIADA to emissive mode"
#-------------------------------------------------------------------------------#

GD_EMISS (COUNT = 1)        00:00:00        GIADA        Safe         AGDS035A       # Goto Cover

Description: "Cover operations with possible vibrations"

GD_EMISS (COUNT = 1)        00:01:00        GIADA        Cover        AGDF090A       # Open Cover

GD_EMISS (COUNT = 1)        00:11:00        GIADA        Cover        AGDS065A       # Goto Safe

GD_EMISS (COUNT = 1)        00:12:00        GIADA        Safe         AGDS110A       # Goto Normal and enable Sci TM

GD_EMISS (COUNT = 1)        00:14:00        GIADA        Normal       AGDS038A( \
                                                                      VGDS038A = 29 \
                                                                      VGDS038B = 20 )        # Set GDS L and R Thr. ? dec values

GD_EMISS (COUNT = 1)        00:14:30        GIADA        Normal       AGDS037A(\
                                                                      VGDS037A = Off [ENG])                 # Set IS On/Off
```

```
GD_EMISS (COUNT = 1)        00:15:00        GIADA        Normal          AGDS036A ( \
                                                                         VGDS0031 = 0x5 \
                                                                         VGDS0032 = 0x5 \
                                                                         VGDS0033 = 0x5 \
                                                                         VGDS0034 = 0x5 \
                                                                         VGDS0035 = 0xa \
                                                                         VGDS0018 = Enabled [ENG] \
                                                                         VGDS0019 = Enabled [ENG] \
                                                                         VGDS0020 = Enabled [ENG] \
                                                                         VGDS0021 = Enabled [ENG] \
                                                                         VGDS0022 = Enabled [ENG] \
                                                                         VGDS0023 = Low [ENG] \
                                                                         VGDS0025 = High [ENG] \
                                                                         VGDS0026 = High [ENG] \
                                                                         VGDS0027 = High [ENG] \
                                                                         VGDS0028 = High [ENG] \
                                                                         VGDS0029 = High [ENG])      # Set IS status and thresholds

GD_EMISS (COUNT = 1)        00:15:30        GIADA        Normal          AGDS037A(\
                                                                         VGDS037A = On [ENG])                # Set IS On/Off

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 5 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"
# 35 minutes of susceptible operations should be scheduled = 35 min/5 = 7 calibrations

GD_EMISS (COUNT = 1)        00:16:00        GIADA        Normal          AGDS120A ( \
                                                                         VGDS0010 = 0xF8 \
                                                                         VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                                         REPEAT = 7 \
                                                                         SEPARATION = 00:05:00 )

#-------------------------------------------------------------------------------------#
Description: "Switch off GIADA"
#-------------------------------------------------------------------------------------#

# Description: " Goto Safe at the end of sensitivity phase, 5 min after last calibration sequence "
```

```
GD_PWROFF (COUNT = 3)      00:00:00      GIADA      Normal      AGDS065A      # Goto Safe

GD_PWROFF (COUNT = 3)      00:01:00      GIADA      SAFE        AGDF060A      # Safe Mode and OFF via OBCP


#-------------------------------------------------------------------------------#
# INTERFERENCE  Part 2c
#-------------------------------------------------------------------------------#

#-------------------------------------------------------------------------------#
Description: "Switch on GIADA"
#-------------------------------------------------------------------------------#

GD_PWRON (COUNT = 4)       00:00:00      GIADA      OFF         AGDF001A ( \
                                                                 VGD0001A = "Yes" [ENG])    # GIADA on Main IF

GD_PWRON (COUNT = 4)       00:02:00      GIADA      Safe        AGDF001B

GD_PWRON (COUNT = 4)       00:06:00      GIADA      Safe        AGDF001C

#-------------------------------------------------------------------------------#
Description: "Perform GIADA specific operations"
#-------------------------------------------------------------------------------#

GD_SUSC (COUNT = 3) 00:00:00      GIADA      Safe        AGDS035A      # Goto Cover

Description: "Cover operations with possible vibrations"

GD_SUSC (COUNT = 3) 00:01:00      GIADA      Cover       AGDF090A      # Open Cover

GD_SUSC (COUNT = 3) 00:11:00      GIADA      Cover       AGDS065A      # Goto Safe

GD_SUSC (COUNT = 3) 00:12:00      GIADA      Safe        AGDS110A      # Goto Normal and enable Sci TM

GD_SUSC (COUNT = 3) 00:14:00      GIADA      Normal      AGDS038A( \
                                                          VGDS038A = 29 \
                                                          VGDS038B = 20 )      # Set GDS L and R Thr. ? dec values
```

```
GD_SUSC (COUNT = 3) 00:14:30    GIADA    Normal    AGDS037A(\
                                                     VGDS037A = Off [ENG])          # Set IS On/Off

GD_SUSC (COUNT = 3) 00:15:00    GIADA    Normal    AGDS036A ( \
                                                     VGDS0031 = 0x5 \
                                                     VGDS0032 = 0x5 \
                                                     VGDS0033 = 0x5 \
                                                     VGDS0034 = 0x5 \
                                                     VGDS0035 = 0xa \
                                                     VGDS0018 = Enabled [ENG] \
                                                     VGDS0019 = Enabled [ENG] \
                                                     VGDS0020 = Enabled [ENG] \
                                                     VGDS0021 = Enabled [ENG] \
                                                     VGDS0022 = Enabled [ENG] \
                                                     VGDS0023 = Low [ENG] \
                                                     VGDS0025 = High [ENG] \
                                                     VGDS0026 = High [ENG] \
                                                     VGDS0027 = High [ENG] \
                                                     VGDS0028 = High [ENG] \
                                                     VGDS0029 = High [ENG])     # Set IS status and thresholds

GD_SUSC (COUNT = 3) 00:15:30    GIADA    Normal    AGDS037A(\
                                                     VGDS037A = On [ENG])           # Set IS On/Off

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 5 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"
# 45 minutes of susceptible operations should be scheduled = 45 min/5 = 9 calibrations

GD_SUSC (COUNT = 3) 00:16:00    GIADA    Normal    AGDS120A ( \
                                                     VGDS0010 = 0xF8 \
                                                     VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                     REPEAT = 9 \
                                                     SEPARATION = 00:05:00 )

GD_SUSC (COUNT = 3) 01:00:00    GIADA    Normal    AGDF055A       # Heat all MBSs
```

```
GD_SUSC (COUNT = 3) 02:10:00    GIADA    Normal    AGDS065A      # Goto Safe

GD_SUSC (COUNT = 3) 02:11:00    GIADA    Safe      AGDS110A      # Goto Normal and enable Sci TM

GD_SUSC (COUNT = 3) 02:13:00    GIADA    Normal    AGDS038A( \
                                                     VGDS038A = 29 \
                                                     VGDS038B = 20 )       # Set GDS L and R Thr. ? dec values

GD_SUSC (COUNT = 3) 02:13:30    GIADA    Normal    AGDS037A(\
                                                     VGDS037A = Off [ENG])                 # Set IS On/Off

GD_SUSC (COUNT = 3) 02:14:00    GIADA    Normal    AGDS036A ( \
                                                     VGDS0031 = 0x5 \
                                                     VGDS0032 = 0x5 \
                                                     VGDS0033 = 0x5 \
                                                     VGDS0034 = 0x5 \
                                                     VGDS0035 = 0xa \
                                                     VGDS0018 = Enabled [ENG] \
                                                     VGDS0019 = Enabled [ENG] \
                                                     VGDS0020 = Enabled [ENG] \
                                                     VGDS0021 = Enabled [ENG] \
                                                     VGDS0022 = Enabled [ENG] \
                                                     VGDS0023 = Low [ENG] \
                                                     VGDS0025 = High [ENG] \
                                                     VGDS0026 = High [ENG] \
                                                     VGDS0027 = High [ENG] \
                                                     VGDS0028 = High [ENG] \
                                                     VGDS0029 = High [ENG])       # Set IS status and thresholds

GD_SUSC (COUNT = 3) 02:14:30    GIADA    Normal    AGDS037A(\
                                                     VGDS037A = On [ENG])                  # Set IS On/Off

Description: "Execute the Calibrate IS, GDS, MBS TC Seq every 5 minutes"
Description: "during all the time of this test phase, i.e. up to Goto Safe TC Seq"
# 45 minutes of susceptible operations should be scheduled = 45 min/5 = 9 calibrations

GD_SUSC (COUNT = 3) 02:15:00    GIADA    Normal    AGDS120A ( \
```

VGDS0010 = 0xF8 \
VGDS0011 = 0x04 \ # Calibrate IS, GDS, MBS
REPEAT = 9 \
SEPARATION = 00:05:00)

#----------#
Description: "Switch off GIADA"
#----------#

Description: " Goto Safe at the end of sensitivity phase, 5 min after last calibration sequence "

GD_PWROFF (COUNT = 4)	00:00:00	GIADA	Normal	AGDS065A	# Goto Safe
GD_PWROFF (COUNT = 4)	00:01:00	GIADA	SAFE	AGDF060A	# Safe Mode and OFF via OBCP

GIADA for PC0 - OIOR_PIHRSO_D_0000_GD_PC____00010.ROS

```
# $Log: OIOR_PIHRSO_D_0000_GD_PC____00010.ROS,v $
# Revision 1.2  2005/01/19 13:41:36  vdhiri
# RSOC: Corrected modes. removed Ref_date, start and end for consolidation.
#
# Revision 1.1  2005/01/04 19:07:29  vdhiri
# Update to ALL file for filename correction. RSOC
#
# Revision 1.2  2005/01/03 13:04:24  vdhiri
# Updates GD
#
# Revision 1.1  2004/12/06 17:13:49  vdhiri
# Revision 1.2  2004/12/13 giada
# Revision 1.3  2005/01/15 giada
# Revision 1.4  2005/01/24 giada
# Initial Passive Checkout OIOR for GD RSOC Assumption MSP I1
#
#=============================================================================================#
# Filename:     OIOR_PIHRSO_D_0000_GD_PC___00010.ROS
# Type:         Input Timeline file
```

```
#
# Description:  Passive Check-Out GD
#
#
# Author:       V.Dhiri
#
#               RSOC
#
# Date:         6 November 2004
#
#
# Reviewed by GIADA team
# 13 December 2004
# 15 January 2005
#
# (c) ESA/Estec
#
#-------------------------------------------------------------------------------#
#===============================================================================#


Version: 00001

Ref_date: 27-Mar-2005
Start_time: 000_00:00:00
End_time: 006_00:00:00

#===============================================================================#
# Description: "1. | Switch on and test - main I/F"
#===============================================================================#


PC_START (COUNT=001004)    +00:00:00    GIADA   OFF     AGDF001A ( \
                                                        VGD0001A = "YES" [ENG]) # GIADA on Main IF

PC_START (COUNT=001004)    +00:01:00    GIADA   SAFE    AGDF001B # GIADA On
```

```
PC_START (COUNT=001004)    +00:06:00    GIADA   SAFE    AGDF001C # GIADA On

PC_START (COUNT=001004)    +00:24:00    GIADA   SAFE    AGDS035A # Go to Cover Mode

PC_START (COUNT=001004)    +00:26:00    GIADA   COVER   AGDF090A # Open cover

PC_START (COUNT=001004)    +00:36:00    GIADA   COVER   AGDS065A # Go to Safe mode

PC_START (COUNT=001004)    +00:37:00    GIADA   SAFE    AGDS110A # Go to Normal mode

Description: "GIADA operative in normal mode"

PC_START (COUNT=001004)    +00:39:00    GIADA   NORMAL  AGDS038A( \
                                                        VGDS038A = 29 \
                                                        VGDS038B = 20 ) # Set GDS L and R thresholds

PC_START (COUNT=001004)    +00:39:30    GIADA   NORMAL  AGDS037A(\
                                                        VGDS037A = Off [ENG])   # Set IS On/Off

PC_START (COUNT=001004)    +00:40:00    GIADA   NORMAL  AGDS036A ( \
                                                        VGDS0031 = 0x5 \
                                                        VGDS0032 = 0x5 \
                                                        VGDS0033 = 0xf \
                                                        VGDS0034 = 0x5 \
                                                        VGDS0035 = 0xf \
                                                        VGDS0018 = Enabled [ENG] \
                                                        VGDS0019 = Enabled [ENG] \
                                                        VGDS0020 = Enabled [ENG] \
                                                        VGDS0021 = Enabled [ENG] \
                                                        VGDS0022 = Enabled [ENG] \
```

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                                                VGDS0023 = Low [ENG] \
                                                VGDS0025 = High [ENG] \
                                                VGDS0026 = High [ENG] \
                                                VGDS0027 = High [ENG] \
                                                VGDS0028 = High [ENG] \
                                                VGDS0029 = High [ENG])  # Set IS status and thresholds


PC_START (COUNT=001004)    +00:40:30    GIADA   NORMAL  AGDS037A(\
                                                VGDS037A = On [ENG])    # Set IS On/Off


PC_START (COUNT=001004)    +00:45:00    GIADA   NORMAL  AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \       # Calibrate IS, GDS, MBS
                                                REPEAT = 81 \
                                                SEPARATION = 00:05:00 )


Description: "change GIADA setting and check effects"


PC_START (COUNT=001004)    +07:30:00    GIADA   NORMAL  AGDS038A( \
                                                VGDS038A = 32 \
                                                VGDS038B = 20 ) # Set GDS L and R thresholds


PC_START (COUNT=001004)    +07:30:30    GIADA   NORMAL  AGDS037A(\
                                                VGDS037A = Off [ENG])   # Set IS On/Off


PC_START (COUNT=001004)    +07:31:00    GIADA   NORMAL  AGDS036A ( \
                                                VGDS0031 = 0x5 \
                                                VGDS0032 = 0x5 \
                                                VGDS0033 = 0xa \
                                                VGDS0034 = 0x5 \
                                                VGDS0035 = 0xf \
                                                VGDS0018 = Enabled [ENG] \
```

```
                                                VGDS0019 = Enabled [ENG] \
                                                VGDS0020 = Enabled [ENG] \
                                                VGDS0021 = Enabled [ENG] \
                                                VGDS0022 = Enabled [ENG] \
                                                VGDS0023 = Low [ENG] \
                                                VGDS0025 = High [ENG] \
                                                VGDS0026 = High [ENG] \
                                                VGDS0027 = High [ENG] \
                                                VGDS0028 = High [ENG] \
                                                VGDS0029 = High [ENG])  # Set IS status and thresholds


PC_START (COUNT=001004)    +07:31:30    GIADA   NORMAL  AGDS037A(\
                                                VGDS037A = On [ENG])    # Set IS On/Off


PC_START (COUNT=001004)    +07:35:00    GIADA   NORMAL  AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \       # Calibrate IS, GDS, MBS
                                                REPEAT = 35 \
                                                SEPARATION = 00:05:00 )


Description: "change GIADA setting and check effects"


PC_START (COUNT=001004)    +10:30:00    GIADA   NORMAL  AGDS038A( \
                                                VGDS038A = 35 \
                                                VGDS038B = 20 ) # Set GDS L and R thresholds


PC_START (COUNT=001004)    +10:30:30    GIADA   NORMAL  AGDS037A(\
                                                VGDS037A = Off [ENG])   # Set IS On/Off


PC_START (COUNT=001004)    +10:31:00    GIADA   NORMAL  AGDS036A ( \
                                                VGDS0031 = 0x5 \
                                                VGDS0032 = 0x5 \
```

```
                                                VGDS0033 = 0x5 \
                                                VGDS0034 = 0x5 \
                                                VGDS0035 = 0x14 \
                                                VGDS0018 = Enabled [ENG] \
                                                VGDS0019 = Enabled [ENG] \
                                                VGDS0020 = Enabled [ENG] \
                                                VGDS0021 = Enabled [ENG] \
                                                VGDS0022 = Enabled [ENG] \
                                                VGDS0023 = Low [ENG] \
                                                VGDS0025 = High [ENG] \
                                                VGDS0026 = High [ENG] \
                                                VGDS0027 = High [ENG] \
                                                VGDS0028 = High [ENG] \
                                                VGDS0029 = High [ENG])  # Set IS status and thresholds


PC_START (COUNT=001004)    +10:31:30    GIADA   NORMAL  AGDS037A(\
                                                VGDS037A = On [ENG])    # Set IS On/Off


PC_START (COUNT=001004)    +10:35:00    GIADA   NORMAL  AGDS120A ( \
                                                VGDS0010 = 0xF8 \
                                                VGDS0011 = 0x04 \       # Calibrate IS, GDS, MBS
                                                REPEAT = 35 \
                                                SEPARATION = 00:05:00 )


PC_START (COUNT=001004)    +13:30:00    GIADA   NORMAL  AGDF100A # Self-interference test


PC_START (COUNT=001004)    +14:30:00    GIADA   NORMAL  AGDF055A # MBS heating


#============================================================================================#
# Description: "2. | Shut down"
#============================================================================================#
```

```
PC_START (COUNT=001004)    +15:30:00    GIADA   NORMAL  AGDF060A # go to safe mode & off


#=============================================================================#
# Description: "3. | Switch on and test - redundant I/F"
#=============================================================================#


PC_START (COUNT=001004)    +16:00:00    GIADA   OFF     AGDF002A # GIADA On


PC_START (COUNT=001004)    +16:01:00    GIADA   SAFE    AGDF002B # GIADA On


PC_START (COUNT=001004)    +16:06:00    GIADA   SAFE    AGDF002C # GIADA On


PC_START (COUNT=001004)    +16:24:00    GIADA   SAFE    AGDS035A # Go to Cover Mode


PC_START (COUNT=001004)    +16:26:00    GIADA   COVER   AGDF090A # Open cover


PC_START (COUNT=001004)    +16:36:00    GIADA   COVER   AGDS065A # Go to Safe mode

PC_START (COUNT=001004)    +16:37:00    GIADA   SAFE    AGDS110A # Go to Normal mode


Description: "GIADA operative in normal mode"


PC_START (COUNT=001004)    +16:39:00   GIADA   NORMAL  AGDS038A( \
                                                        VGDS038A = 29 \
                                                        VGDS038B = 20 ) # Set GDS L and R thresholds


PC_START (COUNT=001004)    +16:39:30    GIADA   NORMAL  AGDS037A(\
                                                        VGDS037A = Off [ENG])   # Set IS On/Off
```

```
PC_START (COUNT=001004)    +16:40:00    GIADA   NORMAL  AGDS036A ( \
                                                        VGDS0031 = 0x5 \
                                                        VGDS0032 = 0x5 \
                                                        VGDS0033 = 0xa \
                                                        VGDS0034 = 0x5 \
                                                        VGDS0035 = 0xf \
                                                        VGDS0018 = Enabled [ENG] \
                                                        VGDS0019 = Enabled [ENG] \
                                                        VGDS0020 = Enabled [ENG] \
                                                        VGDS0021 = Enabled [ENG] \
                                                        VGDS0022 = Enabled [ENG] \
                                                        VGDS0023 = Low [ENG] \
                                                        VGDS0025 = High [ENG] \
                                                        VGDS0026 = High [ENG] \
                                                        VGDS0027 = High [ENG] \
                                                        VGDS0028 = High [ENG] \
                                                        VGDS0029 = High [ENG])  # Set IS status and thresholds

PC_START (COUNT=001004)    +16:40:30    GIADA   NORMAL  AGDS037A(\
                                                        VGDS037A = On [ENG])    # Set IS On/Off

PC_START (COUNT=001004)    +16:45:00    GIADA   NORMAL  AGDS120A ( \
                                                        VGDS0010 = 0xF8 \
                                                        VGDS0011 = 0x04 \  # Calibrate IS, GDS, MBS
                                                        REPEAT = 81 \
                                                        SEPARATION = 00:05:00 )

#============================================================================================#
# Description: "4. | Shut down"
#============================================================================================#

PC_START (COUNT=001004)    +23:30:00    GIADA   NORMAL  AGDF060A # go to safe mode & off
```

#=====================================END===#

GIADA MAIN for PC1 - OIOR_PIHRSO_D_0000_GD_PCA___00011.ROS

```
# $Log: OIOR_PIHRSO_D_0000_GD_PCA___00011.ROS,v $
# Version  1.2  2005/06/06 giada MAIN for PCn
# Passive Checkout OIOR for GD RSOC Assumption MSP I1
#
#============================================================================================#
# Filename:       OIOR_PIHRSO_D_0000_GD_PCA___00011.ROS
# Type:     Input Timeline file
#
# Description:    Passive Check-Out GD
#
#
# Author:   V.Dhiri
#
#           RSOC
#
# Date:           17 May 2005
#
#
# Proposed by GIADA team
# 17 May 2005
#
# (c) ESA/Estec
#
#--------------------------------------------------------------------------------------------#
#============================================================================================#

Version: 00001

Ref_date: 30-Sep-2005
Start_time: 000_00:00:00
End_time: 005_00:00:00

#============================================================================================#
# Description: "1. | Switch on and test - main I/F"
```

```
#=============================================================================================#

PC_START (COUNT=001004)    +00:00:00     GIADA   OFF AGDF001A ( \
                                         VGD0001A = "YES" [ENG]) # GIADA on Main IF

PC_START (COUNT=001004)    +00:01:00     GIADA SAFE  AGDF001B # GIADA On

PC_START (COUNT=001004)    +00:06:00     GIADA SAFE  AGDF001C # GIADA On

PC_START (COUNT=001004)    +00:24:00     GIADA SAFE  AGDS035A # Go to Cover Mode

PC_START (COUNT=001004)    +00:26:00     GIADA COVER AGDF090A # Open cover

PC_START (COUNT=001004)    +00:36:00     GIADA COVER AGDS065A # Go to Safe mode

PC_START (COUNT=001004)    +00:37:00     GIADA SAFE  AGDS110A # Go to Normal mode

Description: "GIADA operative in normal mode"

PC_START (COUNT=001004)    +00:39:00     GIADA NORMAL      AGDS038A( \
                                               VGDS038A = 35 \
                                               VGDS038B = 20 )   # Set GDS L and R thresholds

PC_START (COUNT=001004)    +00:39:30     GIADA NORMAL      AGDS037A(\
                                               VGDS037A = Off [ENG])   # Set IS On/Off

PC_START (COUNT=001004)    +00:40:00     GIADA NORMAL      AGDS036A ( \
                                         VGDS0031 = 0x5 \
                                         VGDS0032 = 0x5 \
                                         VGDS0033 = 0xf \
                                         VGDS0034 = 0x5 \
                                         VGDS0035 = 0xf \
                                         VGDS0018 = Enabled [ENG] \
                                         VGDS0019 = Enabled [ENG] \
                                         VGDS0020 = Enabled [ENG] \
                                         VGDS0021 = Enabled [ENG] \
                                         VGDS0022 = Enabled [ENG] \
                                         VGDS0023 = Low [ENG] \
```

```
                                        VGDS0025 = High [ENG] \
                                        VGDS0026 = High [ENG] \
                                        VGDS0027 = High [ENG] \
                                        VGDS0028 = High [ENG] \
                                        VGDS0029 = High [ENG])  # Set IS status and thresholds

PC_START (COUNT=001004)    +00:40:30    GIADA NORMAL      AGDS037A(\
                                              VGDS037A = On [ENG])    # Set IS On/Off

PC_START (COUNT=001004)    +00:45:00    GIADA NORMAL      AGDS120A ( \
                                        VGDS0010 = 0xF8 \
                                        VGDS0011 = 0x04 \ # Calibrate IS, GDS, MBS
                                        REPEAT = 105 \
                                        SEPARATION = 00:05:00 )

Description: "change GIADA setting and check effects"

PC_START (COUNT=001004)    +09:30:00    GIADA NORMAL      AGDF100A # Self-interference test

PC_START (COUNT=001004)    +10:30:00    GIADA NORMAL      AGDF055A # MBS heating

#=============================================================================================#
# Description: "2. | Shut down"
#=============================================================================================#

PC_START (COUNT=001004)    +11:30:00    GIADA NORMAL      AGDF060A # go to safe mode & off

#=====================================END=============================================#
```

GIADA REDUNDANT FOR PC1 - OIOR_PIHRSO_D_0000_GD_PCB___00012.ROS

```
# $Log: OIOR_PIHRSO_D_0000_GD_PCB___00012.ROS,v $
# Version  1.2  2005/06/06 giada MAIN for PCn
# Passive Checkout OIOR for GD RSOC Assumption MSP I1
#
#============================================================================================#
# Filename:       OIOR_PIHRSO_D_0000_GD_PCB___00012.ROS
# Type:     Input Timeline file
#
# Description:    Passive Check-Out GD
#
#
# Author:   V.Dhiri
#
#           RSOC
#
# Date:           17 May 2005
#
#
# Proposed by GIADA team
# 17 May 2005
#
# (c) ESA/Estec
#
#--------------------------------------------------------------------------------------------#
#============================================================================================#

Version: 00001

Ref_date: 30-Sep-2005
Start_time: 000_00:00:00
End_time: 005_00:00:00

#============================================================================================#
# Description: "1. | Switch on and test - redundant I/F"
```

```
#=============================================================================================#

PC_START (COUNT=001004)    +12:00:00     GIADA   OFF AGDF002A ( \
                                         VGD0001A = "YES" [ENG]) # GIADA on Main IF

PC_START (COUNT=001004)    +12:01:00     GIADA SAFE  AGDF002B # GIADA On

PC_START (COUNT=001004)    +12:06:00     GIADA SAFE  AGDF002C # GIADA On

PC_START (COUNT=001004)    +12:24:00     GIADA SAFE  AGDS035A # Go to Cover Mode

PC_START (COUNT=001004)    +12:26:00     GIADA COVER AGDF090A # Open cover

PC_START (COUNT=001004)    +12:36:00     GIADA COVER AGDS065A # Go to Safe mode

PC_START (COUNT=001004)    +12:37:00     GIADA SAFE  AGDS110A # Go to Normal mode

Description: "GIADA operative in normal mode"

PC_START (COUNT=001004)    +12:39:00     GIADA NORMAL      AGDS038A( \
                                               VGDS038A = 35 \
                                               VGDS038B = 20 )   # Set GDS L and R thresholds

PC_START (COUNT=001004)    +12:39:30     GIADA NORMAL      AGDS037A(\
                                               VGDS037A = Off [ENG])   # Set IS On/Off

PC_START (COUNT=001004)    +12:40:00     GIADA NORMAL      AGDS036A ( \
                                         VGDS0031 = 0x5 \
                                         VGDS0032 = 0x5 \
                                         VGDS0033 = 0xf \
                                         VGDS0034 = 0x5 \
                                         VGDS0035 = 0xf \
                                         VGDS0018 = Enabled [ENG] \
                                         VGDS0019 = Enabled [ENG] \
                                         VGDS0020 = Enabled [ENG] \
                                         VGDS0021 = Enabled [ENG] \
                                         VGDS0022 = Enabled [ENG] \
                                         VGDS0023 = Low [ENG] \
```

```
                                    VGDS0025 = High [ENG] \
                                    VGDS0026 = High [ENG] \
                                    VGDS0027 = High [ENG] \
                                    VGDS0028 = High [ENG] \
                                    VGDS0029 = High [ENG])  # Set IS status and thresholds

PC_START (COUNT=001004)    +12:40:30     GIADA NORMAL      AGDS037A(\
                                           VGDS037A = On [ENG])    # Set IS On/Off

PC_START (COUNT=001004)    +12:45:00     GIADA NORMAL      AGDS120A ( \
                                    VGDS0010 = 0xF8 \
                                    VGDS0011 = 0x04 \ # Calibrate IS, GDS, MBS
                                    REPEAT = 105 \
                                    SEPARATION = 00:05:00 )

Description: "change GIADA setting and check effects"

PC_START (COUNT=001004)    +21:30:00     GIADA NORMAL      AGDF100A # Self-interference test

PC_START (COUNT=001004)    +22:30:00     GIADA NORMAL      AGDF055A # MBS heating

#=============================================================================================#
# Description: "2. | Shut down"
#=============================================================================================#

PC_START (COUNT=001004)    +23:30:00     GIADA NORMAL      AGDF060A # go to safe mode & off

#=====================================END=============================================#
```

ANNEX 7: GIADA Configuration File

Actual Context file (after Memory patch loading)

[Cover]
CoverFBHeatersOnTime=30
CoverMotorHeatersOnTime=0
LockDeviceSafetyTemperature=1441
LockDeviceTestTemperature=1441
LockDeviceTestTimeout=30
LockDeviceWorkingTemperature=1636
LockDeviceOperationTimeout=600
CoverStepsPerSecond=50
OpenReedSwitchStepsToOpen=171
ClosedReedSwitchStepsToClose=171
OpeningTimeout=120
ClosingTimeout=120

[GDS Information]
GDSStatus=10101111
GDSDetections=3
GDSThresholdLeft=22
GDSThresholdRight=20
GDSMaxTemperatureCheck=1111
GDSLaserMaxTemperature=1455
GDSMinTemperatureCheck=1111
GDSLaserMinTemperature=3549
GDSTimeBetweenCalibrations=3600

[IS Information]
ISStatus=10011111
ISRangeAndGain=00001111
ISMaxTempCheck=0001
ISMaxTemperature=2744
ISHysteresisTemperature=53
ISPZTAThreshold=5
ISPZTBThreshold=5
ISPZTCThreshold=5
ISPZTDThreshold=5
ISPZTEThreshold=5
ISTimeBetweenCalibrations=3600
ISCalibrationLevel=248
ISNumberOfStimulations=4

[MBS Information]
MBSStatus=10011111
MBSMaxWorkingTemperature=2635

MBSTempChecking=11111
MBSTimeBetweenMeasures=300
MBSMaxTemperatureDuringHeating=2547
MBSTimeoutHeating=360
MBSTimeBetweenCalibrations=3600

[HW and SW Information]
NonOPMaxTempCheck=0001
NonOPMaxTemperature=2669
NonOPMinTempCheck=0001
NonOPMinTemperature=3534
MEMaxWorkingTempCheck=0001
MEMaxWorkingTemperature=2503
TimeoutBetweenSciencePackets=60
TimeoutBetweenHousekeepingPackets=10
TimeoutForArmTelecommand=40
PatchesStatus=00000000000000000000000000000000000000000000000000000000000000000000
MaxGDSEvents=40
MaxISEvents=40

CRCContextFile= 0xDFC6

Engineer values corresponding to the actual Context File

Considering the calibration curves of the GIADA internal temperature sensors in **RD5** and the corresponding Context File parameters, the following temperatures can be calculated:

LockDeviceSafetyTemperature = 37.1°C [(1)]
LockDeviceTestTemperature = 37.1°C [(1)]
LockDeviceWorkingTemperature = 105.9°C [(1)]

[GDS Information]
GDSLaserMaxTemperature = 58.9°C
GDSLaserMinTemperature = -23.6°C

[IS Information]
ISMaxTemperature = 80.1°C
ISHysteresisTemperature = 7.1°C

[MBS Information]
MBSMaxWorkingTemperature = 80.0°C
MBSMaxTemperatureDuringHeating = 75.0°C

[HW and SW Information]
NonOPMaxTemperature = 90.0°C (IS Max-NOP-Temperature)
NonOPMinTemperature = -25.1°C (IS Min-NOP-Temperature)
MEMaxWorkingTemperature = 85.0°C

Remark 8.2: Engineering values in the Context File

1. ***The conversion factor applied to the Frangibolt parameters is relevant to the Redundant I/F (the Frangibolt will be activated by means of the Redundant I/F).***
2. ***The other CF parameters are calculated using conversion factors relevant to the Main I/F.***
3. ***All the thermal contingencies are enabled in the CF.***

MPR file to patch the RAM Context file

HEADER_START

CREATION_TIME=2002-07-10T15:39:54Z
USER=ppalumbo

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=51
NUM_BLOCKS=01
START_ADDRESS=0000903A
NUM_WORDS=0045

DATA=0000,1E00,0000,A105,A105,1E00,0000,6406,5802,0000,3200,AB00,AB00,7800,0000,7800,0000,03AF,1416,
AFF5,DDFD,0000,0000,100E,0000,0F9F,B81A,0000,3500,0500,0505,0505,100E,0000,04F8,009F,4B0A,00F8,2C01,0
000,F309,6801,0000,100E,0000,6D1A,CE1D,C719,0000,0000,0000,0000,3C00,0000,0A00,0000,2800,0000,0000,0000
,0000,0000,2800,2800,0000,0000,0000,0000,DFC6

MP_END

MPR file to patch the NVRAM Context file

HEADER_START

CREATION_TIME=2002-07-10T15:39:54Z
USER=ppalumbo

HEADER_END

MP_START

PROC_ID=5A
MEM_ID=52
NUM_BLOCKS=01
START_ADDRESS=10000008
NUM_WORDS=0045

DATA=0000,1E00,0000,A105,A105,1E00,0000,6406,5802,0000,3200,AB00,AB00,7800,0000,7800,0000,03AF,1416,
AFF5,DDFD,0000,0000,100E,0000,0F9F,B81A,0000,3500,0500,0505,0505,100E,0000,04F8,009F,4B0A,00F8,2C01,0
000,F309,6801,0000,100E,0000,6D1A,CE1D,C719,0000,0000,0000,0000,3C00,0000,0A00,0000,2800,0000,0000,0000
,0000,0000,2800,2800,0000,0000,0000,0000,DFC6

MP_END