SOLAR ORBITER   ✴RPW   ⛰ROC

ROC Glossary of terms

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1	1	08/11/2018	Xavier Bonnin	- Rename to "ROC Glossary of terms" - Rename section 2 to "Generic terms definition" - Add section "Roc Software System (RSS)-related terms definition"

CLASSIFICATION   **PUBLIC** ☒   **RESTRICTED** ☐

1   GENERAL

1.1   Scope of the Document

This document is a glossary of the terms used in the framework of the RPW Operation Centre (ROC) project.

1.2   Applicable Documents

This document responds to the requirements of the documents listed in the following table:

Mark	Reference/Iss/Rev	Title of the document	Authors	Date
AD1	ECSS-S-ST-00-01C(1October2012), Third issue	ECSS System – Glossary of terms	ECSS consortium	01/10/2012
AD2				
AD3				

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1.3 Reference Documents

This document is based on the documents listed in the following table:

Mark	Reference/Iss/Rev	Title of the document	Authors	Date
RD1				
RD2				
RD3				

2 GENERIC TERMS DEFINITION

The table below gives the definition of generic terms found in the framework of the ROC project. The first column gives the term, the second column the definition, the third column any comment related to the term.

Additional terms related to ground segment can be found in [AD1].

Name	Definition
(Software) Back-end	The back end part of a software concerns all of the components that do not belong to the front-end part. It can be typically the data processing layer or the controllers/models layers. In a Web interface, it is often called "server" side, in opposition to the "client" side.
(Team) Collaboration tools	Tools or interfaces that can help teams to collaborate on a document, file, or S/W development, test and maintenance. (e.g., SVN, JIRA, etc.)
Data products	Generic term for data produced by S/W or humans. They can be files, entries in a database, images on a screen, a given data set, etc.
Data set	A fully identified set of data (e.g., LFR level 1 data set). It shall be associated with a given support (e.g., CDF file format).
(Team) development tools	Same than "(Team) collaboration tools" definition, but for software development purpose.
Device	Hardware, such as servers or disks.
Software equipment	See "Software unit" definition
File	Any type of file including database dump files, source codes, documents, etc.
(Software) Front-end	The front end of a software corresponds to the user/machine interface layer. For Web interface, it is also called "client".
(on-)ground tests	All of the tests performed on the RPW system or sub-systems on-ground, especially before the launch. (e.g., performances/calibrations, SBM algorithm validations, etc.)
In-flight data	Data produced in space after the launch of the Solar Orbiter probe.
Integration	Integration of a given S/W into a given ROC pipeline.
Input keyword	Keyword provided as an input argument in a S/W. It could be a boolean flag (e.g., '--help') or not (e.g., '-f filepath').
Hardware logistic support	Logistic support in terms of hardware environment and assistance (e.g., machine/server, network access, etc.)
Mission	Refers to the in-flight phase of the project (i.e., after the launch of the Solar Orbiter probe).
(Software) module	See "Software unit" definition
On-ground data	Data produced on-ground, especially before the launch of the Solar Orbiter probe.
Pipeline	Set of software modules forming a data processing workflow,

	which allows the production of the different levels of required data.
Production pipeline	Stable release of a pipeline used for the production of fully validated and ready to be distributed RPW data.
ROC operation team	ROC people working in the RPW operations.
Root directory	The lower level directory in a given arborescence tree.
RPW ground segment team	People working on the RPW ground segment activities, including the ROC team, the RPW PI and the RPW sub-system Lead-CoIs.
Software life-cycle	The Software life-cycle regroups all of the step to be passed by a S/W from its conception to its possible re-use. It namely concerns: the concept, specification and design steps, the development, test and validation processes, the delivery, application, maintenance and upgrades, then the sustainability and possible re-cycle.
Software logistic support	Logistic support in terms of software environment and assistance (e.g., Operating Systems, programming languages, collaboration tools, support software and interfaces, etc.)
Software unit	A software component of a system or sub-system
Stable release	Release of Software that has been tested and validated. A stable release is ready to be deployed in the ROC servers.
Software (root) directory	The main directory of a given S/W. It corresponds to the root directory of the Software.
Validation	The assurance that a product, service, or system meets the needs of the final user(s).
Verification	The evaluation of whether or not a product, service, or system complies with a regulation, requirement, specification, or imposed condition.

Table 1. Definition of terms found in the ROC project.

3 ROC SOFTWARE SYSTEM (RSS)-RELATED TERMS DEFINITION

3.1 RSS instances definition

Several instances of the RSS will be deployed and run on different sites during the mission. The table below summarizes the list of the instances, including the name, type ("primary" or "secondary"), the location and the function.

There is only one prime instance of the RSS deployed and run at the RPW PI-ship laboratory. Besides, depending of the required functionalities, only a part of the RSS equipment can be deployed in the case of secondary instances.

Name	Type	Location	Function
LESIA instance	Primary	Laboratoire d'Etudes Spatiales et d'Instrumentation en Astrophysique (LESIA) in Meudon, France	Main instance of the RSS
ESOC instance	Secondary	European Space Operations Centre (ESOC) in Darmstadt, Germany	Instance to be used by the RPW team at the Solar Orbiter mission operation centre (MOC) during the RPW-related commissioning operations

ESAC instance	Secondary	European Space Astronomy Centre (ESAC) in Madrid, Spain	Instance to be delivered to the Solar Orbiter science operation centre, in order to process the RPW low latency data at ESAC.
CNES instance	Secondary	Centre National d'Etudes Spatiales (CNES) in Toulouse, France	Instance to be delivered to the CNES AIT/AIV team for analyzing the data produced during the ground calibration campaigns.

Table 2. ROC Software System instances.

3.2 RSS sub-systems and software units definitions

The table below presents the names and definitions of the RSS main sub-systems and software units.

RSS software unit	Definition
DPS	The Data Processing System (DPS) gathers all of the software units in support of the RPW data processing activities.
(ROC) GSE	The ROC Ground Support Equipment (GSE) gathers all of the RSS sub-systems and software nits in support to the ground support activities.
(RPW) LLVM	The RPW Low Latency Virtual Machine (LLVM) is a virtual appliance hosting the RLLP. The prime instance of the LLVM shall be deployed and run at the Solar Orbiter Science Operations Centre (SOC).
MCS	The Monitoring and control system (MCS) is the sub-system of the RSS gathering all of the software units in support to the RPW instrument monitoring and control/command activities.
MUSIC	The MCS USer InterfaCe (MUSIC) gathers all the intefaces used by the ROC in the framework of the flight operations, to perform the RPW planning, commanding and instrument data visualization.
MUSIC-FAUST	The Flight operAtion ReqUeST Editor (FAUST) is the ROC tool dedicated to prepare the operation requests for RPW. FAUST is a component of MUSIC.
MUSIC-FIGARO	The FlIGht operAtion pROcedure Editor (FIGARO) is the ROC tool dedicated to prepare the RPW command sequences. FIGARO is a component of MUSIC.
MUSIC-OPERA	The OPERAtion planning (OPERA) is the ROC tool to view the mission and instrument operations planning. OPERA is a component of MUSIC.
MUSIC-SISSI	The SBM Interactive Software System Interface (SISSI) is the ROC tool to view and select SBM event data to be downlinked. SISSI is a component of MUSIC.
MUSIC-TV	The Telemetry anc command Viewer (TV) is the ROC tool dedicated to the visualization of RPW data generated during the mission.
RCS	The RPW Calibration Software (RCS) allows the ROC to produce RPW calibrated science data files.

	The RCS are delivered by RPW sub-system Lead CoI teams.
RIVP	The RCS Interface Validation Pipeline (RIVP) is dedicated to validate that the RCS interface is compliant with the expected ROC RCS ICD specification.
ROADS	The RSS Operations And Data System (ROADS) regroups the MCS and DPS sub-systems.
RLLP	The RPW Low Latency data processing Pipeline (RLLP) is dedicated to process Low Latency data (LLD) for RPW.
ROC-SGSE	The ROC Software Ground Support Equipment (ROC-SGSE) is the software used by the ROC to process RPW telemetry data generated on-ground with GSE.
RODP	The RPW Operations and Data processing Pipeline (RODP) is the software used by the ROC to retrieve and process RPW telemetry and operations-related data during the Solar Orbiter mission.
SAVS	The SBM Algorithms Validation Software (SAVS) regroups programs allowing the ROC to simulate the SBM1/SBM2 event detections performed on-board, when the instrument enters in the SBM_DETECTION submode.

Table 3. RSS sub-systems and software units definitions

3.3 RSS user definition

There are three types of users, which differ by their access permissions to functionalities of the RSS: *observer*, *operator* and *administrator*.

- An *observer* is someone, potentially out the ROC team, who wants to access a part or all of the RSS tools, but in a passive way (i.e., read-only access). It might concern more specifically people who want to see incoming data and operation planning from the graphical user interfaces (GUI) of the RSS.

- An *operator* is a member of the ROC operations team. Her/his responsibility includes planning the observations, taking into account the scientific objectives and the operational constraints. He/she also in charge of monitoring the instrument incoming data, and notify the right people in case of problems.

- The *administrator*, in charge of administrating and maintaining the RSS. An administrator may have all the full read-write permissions on the whole system. Especially, she/he is expected to support any issue that an *observer/operator* can encounter when using the RSS GUI.

The way the three types of users can use the RSS tools can differ from a tool to another.

3.4 RSS Human-machine interface (HMI) definition

The human-machine interface (HMI) of the RSS gathers two categories of user interfaces:

- The GUI, which should be used in priority to support the ROC team in activities relative to the instrument data visualization and the operations preparation and verification.

- The Command Line Interfaces (CLI), only available from a terminal. This type of interface should be reserved to the ROC team, in order to administrate the RSS.

3.5 RPW *Preliminary* versus *definitive* data definition

The RPW data produced by the ROC during the proprietary period, i.e., which are not yet publicly available from the ESAC Solar Orbiter data archive (SOAR), are labelled as *preliminary*. These data shall be accessible to authorized people only, with the appropriate caveats.

The RPW data publicly available in the SOAR at ESAC are labelled as *definitive*. These data shall also be freely accessible from the ROC HTTPS public server.

3.6 RPW data processing definition

In the RSSS context, the *data processing* definition encompasses the following steps:

- *RPW data retrieval* from the MOC Data Dissemination System (DDS) [AD5] and SOC Generic File Transfer System (GFTS) interfaces [AD8], including RPW TM raw packets, but also the TM/TC report data as well as the ancillary (SPICE kernels, CDF-digest) and operations inputs (E-FECS, TMC) data delivered by the SOC.

- *RPW data pre-processing*, which mainly consists of checking retrieved data and preparing data to the next step

- *RPW data production*, where the LZ, L0, L1, HK-digest, L1R, L2 data files and related summary plots are generated (see [AD11] for the list of data products).

- *RPW data dissemination,* where data produced are distributed according to the *preliminary* or *definitive* status

- *RPW data archiving*, which concern the data archiving process at the Solar Orbiter data archive centre at ESAC, the Centre de Données de Physique des Plasmas (CDPP) and local archive at LESIA.

Note that each of these steps is often preceded/followed by automated/manual pre/post-verifications of the data read/produced.

4 DISTRIBUTION LIST

LISTS See Contents lists in "Baghera Web": Project's informations / Project's actors / RPW_actors.xls and tab with the name of the list or NAMES below		Tech_LESIA
		Tech_MEB
		Tech_RPW
		[Lead-]Cols
		Science-Cols

INTERNAL

LESIA CNRS	x	M. MAKSIMOVIC	LESIA CNRS		
	x	Y. DE CONCHY			
	x	X. BONNIN			
	x	O. ALEXANDROVA			
	x	Q.N. NGUYEN			
	x	E. HOLLE			

EXTERNAL (To modify if necessary)

CNES		C. FIACHETTI	AsI/CSRC		J.BRINEK
		E.GUILHEM			P.HELLINGER
		C. LAFFAYE			D.HERCIK
		R.LLORCA-CEJUDO			P.TRAVNICEK
		E.LOURME	IAP		J.BASE
		M-O. MARCHE			J. CHUM
		J.PANH			I. KOLMASOVA
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		V. KRASNOSSELSKIKH			
SSL		S.BALE			