BC-SIM-TN-012
Simbio_stack2tcl User Manual
Version 1.0.0

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Approvation

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Document Change Record

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1	0	18/10/2022	All	First issue

1 Introduction

1.1 Scope

In this document, we will describe a software developed to convert a STACK, a list of TeleCommand and related parameters for the Spectrometer and Imagers for MPO BepiColombo Integrated Observatory – SYStem (SIMBIO-SYS) instrument suite onboard the ESA mission BepiColombo to Mercury, in a sequence of commands that can be ingested by the instrument Electrical Model (EM) located in Orsay. The STACK is provided by the Mission Operation Center (MOC) at ESA-ESOC in XLSX format before each in-flight instrument test for final approval by the SIMBIO-SYS Team.
This document reports the software features, functionalities, and syntax.
The software is a MATLAB script. It could be used as a standalone or integrated into a pipeline.

1.2 Reference Document

[RD.1] BC-SIM-TN-003 – Reports and Notes Layout and Flow – Version 2

10.20371/INAF/TechRep/179

1.3 Acronyms

XML eXtensible Markup Language.
ICO Instrument Check Out

1.4 Document Format and Repository

This document is compliant with the SIMBIO-SYS Report and Note Layout and Flow [RD.1] and will be archived both on the INAF Open Access repository and the SIMBIO-SYS team Archive.

2 Software description

```
TCs= Simbio_stack2tcl(stackFile, tabName)
```

Simbio_stack2tcl is a Matlab script to convert the TCs stack file from the XLSX format to a list of SIMBIO-SYS time tagged TCs list ignoring all higher-level satellite TCs.

3 Input and output

3.1 Input

Table 1 reports an example (i.e., Instrume CheckOut #8) of the input that are necessary to the script. The complete list of input and output files can be found in Section 4.

stackFile	Chars array defining the name of the xlsx stack file For example, in the case of ICO8: `stackFile='Checkout8_SIMBIO_20221013_mid.xlsx'`
tabName	Chars array defining the table (Excel sheet) in the xls stack file to be read. If not defined the script reads the first tab. For example, in the case of ICO8: `stackFile='CRCO8_DRAFT_v2_FULL'`

Table 1 Table reports the input parameters of the Simbio_stack2tcl script.

3.2 Output

The Software produces two output files with the same name as the input but with different extensions:

- A *.txt* file contains the time-tagged list of all the TCs of the stack file.
- A *tcl* file contains the TCL version of the stack file

An example of the output files (the ones generated for ICO8) can be found in Section 4.

3.3 Notes

The reader should consider the following issue:

- The script ignores all the TC not included in the SIMBIO-SYS ones. It means that only ZSS TCs will be converted.
- The script can manage the whole timeline, which is limited to the same solar day.
- TCL conversion translates all the SIMBIO-SYS TCs thanks to a dictionary named MIB_report_extract_ZSSnames.mat extracted by the MIB document. The MAT file contains a struct named zss_names with two fields: codes and textual names. The current dictionary is reported in the following table and attached in Section 4.

ZSS CODE	ZSS TEXTUAL NAME
ZSS00305	SIMB Enable HK Para Report Generation
ZSS00306	SIMB Disable HK Para Report Generation
ZSS00329	SIMB Define HK Report Collect Interval
ZSS00602	SIMB Load Data in Memory
ZSS00605	SIMB Dump Memory Area
ZSS00609	SIMB Check Memory Area
ZSS00929	SIMB Accept Time Update
ZSS01701	SIMB Perform Connection Test
ZSS01728	SIMB Test TC max Length
ZSS02101	SIMB Enable Start Science Transfer
ZSS02102	SIMB Disable Stop Science Transfer
ZSS02128	SIMB Reset Output Buffer
ZSS17001	SIMB START_ASW
ZSS17002	SIMB Memory RAM Image consistency Check
ZSS17003	SIMB EEPROM Memory Copy
ZSS17004	SIMB ASW upload in EEPROM
ZSS17005	SIMB StartME Diagnostic Mode
ZSS17006	SIMB Stop ME Diagnostic Mode
ZSS17007	SIMB ME gracefull shutdown
ZSS17101	SIMB HRIC power On/Off
ZSS17102	SIMB HRIC SCIENCE
ZSS17103	SIMB HRIC Thermal Control On/Off
ZSS17104	SIMB HRIC Confirm Command
ZSS17105	SIMB HRIC Upload parameters
ZSS17106	SIMB HRIC Read Addr
ZSS17107	SIMB HRIC Write Addr
ZSS17108	SIMB HRIC Test PE
ZSS17109	SIMB HRIC Stop Science
ZSS17110	SIMB HRIC Detector On/Off

ZSS17120	SIMB HRIC Diagnostic Mode
ZSS17121	SIMB HRIC Stop Diagnostic Mode
ZSS171B2	SIMB HRIC SCIENCE 1ms
ZSS17201	SIMB STC Power On/Off
ZSS17202	SIMB STC SCIENCE
ZSS17203	SIMB STC Thermal Control On/Off
ZSS17204	SIMB STC Confirm Command
ZSS17205	SIMB STC Upload parameters
ZSS17206	SIMB STC Read Addr
ZSS17207	SIMB STC Write Addr
ZSS17208	SIMB STC Test PE
ZSS17209	SIMB STC Stop Science
ZSS17210	SIMB STC Detector On/Off
ZSS17220	SIMB STC Diagnostic Mode
ZSS17221	SIMB STC Stop Diagnostic Mode
ZSS172B2	SIMB STC SCIENCE 1ms
ZSS17301	SIMB VIHI power On/Off
ZSS17302	SIMB VIHI Science
ZSS17303	SIMB VIHI Thermal Control On/Off
ZSS17304	SIMB VIHI Confirm Command
ZSS17305	SIMB VIHI Upload parameters
ZSS17306	SIMB VIHI Read Addr
ZSS17307	SIMB VIHI Write Addr
ZSS17308	SIMB VIHI Test PE
ZSS17309	SIMB VIHI Stop Science
ZSS17310	SIMB VIHI Detector On/Off
ZSS17311	SIMB VIHI_Shutter
ZSS17312	SIMB VIHI Lamp On/Off
ZSS17313	SIMB VIHI LED On/Off
ZSS17320	SIMB VIHI Diagnostic Mode
ZSS17321	SIMB VIHI Stop Diagnostic Mode
ZSS173B2	SIMB VIHI Science Minimum IT
ZSSK4000	Start OBCP: SIMBIO ME Switch On
ZSSK4001	Start OBCP: SIMBIO ME Switch Off
ZSSK4002	Start OBCP: SIMBIO HRIC Switch On
ZSSK4003	Start OBCP: SIMBIO STC Switch On
ZSSK4004	Start OBCP: SIMBIO VIHI Switch On
ZSSK4005	Start OBCP: SIMBIO HRIC Graceful Shutdwn
ZSSK4006	Start OBCP: SIMBIO STC Graceful Shutdown
ZSSK4007	Start OBCP: SIMBIO VIHI Graceful Shutdwn

ZSSK4008	Start OBCP: SIMBIO Emergency Switch Off
ZSSZ1728	AIT Test TC max Length

Table 2 Table reporting the contents of MIB_report_extract_ZSSnames.mat

4 Attachments

Input ICO8 xls file	
Output TCL file	
Output txt file	
MIB_report_extract_ZSSnames.mat	

Table 3 In the table, as attachment, the input file delivered by ESOC and the output files after the simbio_stack2tlc conversions

5 Version

The current version of the software is 1.0.0.

6 Version History

1.0.0 Original version