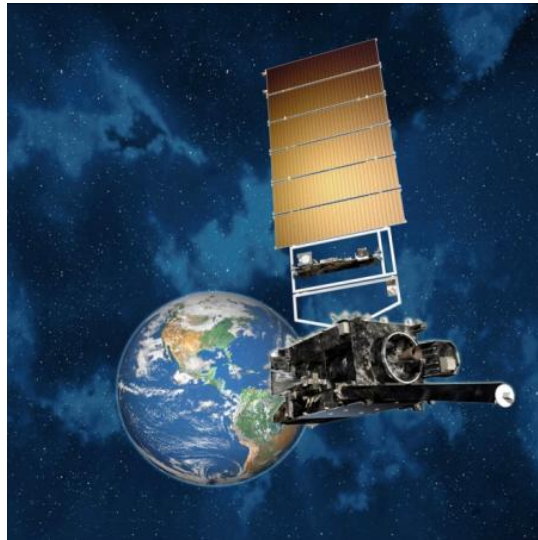


LZSS De-Commuation Operations Tool Data Delivery Package For The GOES-R Space Environment In-Situ Suite (SEISS)

SEISS-D-OT060-1, Rev B

3 April 2020



**Prepared For:
National Aeronautics & Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771**

**(CDRL 060)
Under Contract Number NNG06HX01C**

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Record of Changes

Revision Letter	Date	Title or Brief Description	Entered By
–	14 October 2016	Released to Production per ERN SEISS342	B. Brown
A	6 February 2017	Revised per CCN001	B. Brown
B	3 April 2020	Revised per CCN002	B. Brown

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1.0 INTRODUCTION

Table 1-1 lists the specific coverage required by the data item description for the Software Delivery Package, CDRL Item Number 060.

Table 1-1. Required Software Delivery Packages Coverage per CDRL Item Number 060

ID	Object No.	Requirement	Document Section
SEISSCDRL504	3.60.0-2	A software delivery package is required prior to submittal of each software release for GSFC acceptance. The software delivery package shall include the following information with appropriate approvals:	
		a) Software Delivery Letter, one page in length, which defines briefly what is being delivered, contains in its attachments the details of the delivery, and identifies a point of contact for resolution of questions/misunderstandings/problems involving the delivery. Attachments which support the delivery letter are described in items (1) through (10) below:	Section 2.0
		1. Description of Delivery Contents - Identify the delivery in terms of subsystem, release number(s), configuration ID(s), media type(s) (tapes, diskettes, other) and number of copies.	Letter Attachment 1
		2. Build Instructions - Provide instructions to be used in building the delivered software, including the version number of system or vendor-supplied software required to build the system. The supplier should provide evidence that these instructions have been executed prior to delivery and that the software has been built successfully using them (As Built Configuration).	Letter Attachment 2
		3. Special Operating Instructions - Indicate any special instructions that test or operations personnel need to know in using the software. These may include, for example, the use of special simulators, changes to operational procedures, the addition of new files, file format changes, operating constraints/limitations, workaround resolutions to documented problems, operational software version numbers, and associated database version numbers.	Letter Attachment 3
		4. List of Resolved Anomaly Reports and Change Requests.	Letter Attachment 4
		5. List of Unresolved Anomaly Reports and Change Requests.	Letter Attachment 5

**Table 1-1. Required Software Delivery Packages Coverage
per CDRL Item Number 060**

ID	Object No.	Requirement	Document Section
SEISSCDRL504	3.60.0-2	6. Copy of Resolved Anomaly Reports and Change Requests.	Letter Attachment 6
		7. Copy of Unresolved Anomaly Reports and Change Requests.	Letter Attachment 7
		8. Matrix of requirements addressed by this release (may be done by reference to mapping of requirements identified in requirements specification document).	Letter Attachment 8
		9. Release History Summary Matrix.	Letter Attachment 9
		10. Inventory of the Delivered Media - Produce the inventory from the media themselves.	Letter Attachment 10
		b) Software Delivery Media The software delivery will be delivered on media as agreed to by the contractor and the Government. The software product deliverable for each baseline Build should include, but not be limited to, the following:	Section 3.0
		1. Source Code	Appendix B
		2. Object Code	
		3. Data	
		4. Executable Image	
		c) Accompanying Documentation The third and final item included in the software package is the documentation that describes the delivered software. Provide copies of the following:	Section 4.0
		1. Software User Manual, as appropriate	Section 4.1
		2. Software Version Description Document	Section 4.2 Appendix C
		3. Final Requirement(s) Document	Section 4.3
		4. Final Design Document	Section 4.4 Appendix D
		5. Data Definitions	Section 4.5
		6. Test Results as appropriate	Section 4.6 Appendix A

1.1 Structure of the Document

This document consists of the following sections:

- Section 1.0 Introduction – This section includes listings of referenced documents and acronyms used.
- Section 2.0 Software Delivery Letter – defines briefly what is being delivered. The letter identifies a point of contact for resolution of questions/misunderstandings or problems involving the delivery and contains 10 attachments that provide details of the delivery.
- Section 3.0 Software Delivery Media – defines the delivery media as agreed to by the contractor and the Government.
- Section 4.0 Accompanying Documentation – defines and indicates where to find copies of the documentation that describes the delivered product.

The listed appendices are provided separately:

- Appendix A Provides a zip folder of the as-run validation procedure and artifacts
- Appendix B Provides a folder of the source code for the LZSS De-Commutation Tool.
- Appendix C LZSS De-Commutation Operations Tool Version Description Document (VDD) for the GOES-R SEISS, SEISS-VD-OT060-1
- Appendix D SEISS LZSS Design Document

1.2 Referenced Documents

Table 1-2 lists the documents referenced by and applicable to this document. The effective date of each document is shown in Table 1-2. The effective dates of the CDRL documents are the latest date of issue for each document.

Table 1-2. Referenced/Applicable Documents

Document Title	Document Number	Date or Revision
Contractual Documents		
Contract	NNG06HX01C	24 August 2006
Contract Data Requirements List (CDRL)	417-R-SEISSCDRL-0047	28 October 2014
SEISS Statement of Work (SOW) for Implementation	417-R-SEISSSOW-0066	23 October 2014
Other Documents		
Air Force Space Command Manual 91-710, Range Safety Requirements	AFSPCMAN 91-710	July 1, 2004
NASA General Safety Program Requirements	NPR 8715.3C	20 June 2012
NASA Software Assurance Standard	NASA-STD-8739.8	28 July 2004
NASA Software Engineering Requirements	NPR 7150.2B	19 November 2014
Software Safety Standard	NASA-STD 8719.13C	7 May 2013
Document Title		Document Number
CDRL Documents		
Flight Software (FSW) Build Instructions Version 1.23e for the GOES-R Space Environment In-Situ Suite Data Processing Unit (DPU)		SEISS-SBP-DP060
Flight Telemetry and Command Handbook (FTCH) for the GOES-R Space Environment In-Situ Suite (SEISS); (CDRL043)		SEISS-D-SY043
Operations Handbook for the GOES-R Space Environment In-Situ Suite (SEISS)		SEISS-D-SY120
Software Delivery Package for the DPU Build 2.0d for the GOES-R Space Environment In-Situ Suite (SEISS)		SEISS-D-DP060

1.3 Acronyms

Table 1-3 lists the acronyms used in this document:

Table 1-3. Acronyms

Acronym	Definition
ATC	Assurance Technology Corporation
CDRL	Contract Data Requirements List
CPT	Comprehensive Performance Test
DPU	Data Processing Unit
FPGA	Field Programmable Gate Array
FSW	Flight Software
FTCH	Flight Telemetry and Command Handbook
GIRD	General Interface Requirements Document
GOES	Geostationary Operational Environmental Satellite
GSFC	Goddard Space Flight Center
IFC	In-Flight Calibration
NASA	National Aeronautics & Space Administration
POC	Point of Contact
RAM	Random Access Memory
SBP	Software Build Procedure
SEISS	Space Environment In-Situ Suite
SOW	Statement of Work

2.0 SOFTWARE DELIVERY LETTER

2.1 Overview

This is the LZSS De-Commutation Tool Data Delivery Package provided for the Geostationary Operational Environmental Satellite GOES-R Space Environment In-Situ Suite (SEISS) Program. This document provides the delivery letter and attachments, software, and accompanying documentation for the LZSS De-Commutation Tool.

This delivery is in accordance with the requirements of Contract Number NNG06HX01C Contract Data Requirements List (CDRL) Item 060, Software Delivery Packages.

2.2 List of Attachments

The attachments which support the delivery letter are described in items (1) through (10) below.

Attachment	Description
1	Description of Delivery Contents - Identify the delivery in terms of subsystem, release number(s), configuration ID(s), media type(s) (tapes, diskettes, other) and number of copies.
2	Build Instructions – Provided in Sections A2.1-A2.3
3	Special Operating Instructions –Not Applicable
4	List of Resolved Anomaly Reports and Change Requests – Table A-4.1
5	List of Unresolved Anomaly Reports and Change Requests – Not Applicable
6	Copy of Resolved Anomaly Reports and Change Requests – Provided in Section A6
7	Copy of Unresolved Anomaly Reports and Change Requests – Not Applicable
8	Requirements Matrix – Provided in Section A8
9	Release History Summary Matrix – Table A9-1
10	Inventory of the Delivered Media – Table A10.1

2.3 Point of Contact

The ATC Point of Contact (POC) for resolution of questions/misunderstandings/problems involving the delivery is:

Don Hoefer
Software Quality Assurance
Assurance Technology Corporation
84 South Street
Carlisle, MA 01741
Tel: 978-369-8848; Fax: 978-369-3368; e-mail: hoefer@assurtech.com

Attachment 1 Description of Delivery Contents

The delivery for the LZSS De-Commutation Tool data delivery package consists of one copy of the following:

- Source Code: SEISS-OT-1001, Revision 3
- Object Code: Not Applicable to SEISS-D-OT060-1
- Data: Not Applicable to SEISS-D-OT060-1
- Executable Image: Not Applicable to SEISS-D-OT060-1

The following tables provide the LZSS De-Commutation Tool data delivery information.

Table A1-1. Source Code

CDRL Revision	Subsystem	Release Number	Configuration ID	Delivery Method
SEISS-D-OT060-1, Rev B	N/A	3.0	SEISS-OT-1001_Rev3	Electronic Delivery

Table A1-2. Object Code

CDRL Revision	Subsystem	Release Number	Configuration ID	Delivery Method
SEISS-D-OT060-1, Rev B	N/A	1.0	Not Applicable	Not Applicable

Table A1-3. Data

CDRL Revision	Subsystem	Release Number	Configuration ID	Delivery Method
SEISS-D-OT060-1, Rev B	N/A	1.0	Not Applicable	Not Applicable

Table A1-4. Executable Image

CDRL Revision	Subsystem	Release Number	Configuration ID	Delivery Method
SEISS-D-OT060-1, Rev B	N/A	1.0	Not Applicable	Not Applicable

Attachment 2 Build Instructions

A2.1 LZSS De-Commutation Tool Build

The source code for the LZSS De-Commutation Tool should be run as a standalone in Python 3.8.

The LZSS De-Commutation Tool build requires a Windows PC with the resources given in Table A2-1.

Table A2-1. LZZS De-Commutation Operations Tool Resources

Software	Version	Manufacturer
Microsoft Windows	Windows 10	Microsoft Corporation
Python	3.8.1	
Visual Studio	2008	Microsoft Corporation
NetCDF Libraries	4.3.3.1-NC4-32bit	Unidata

The appropriate NetCDF Libraries are available at:

<ftp://ftp.unidata.ucar.edu/pub/netcdf/>

After the NetCDF Libraries are added, C:\Program Files(x86)\netCDF 4.3.3.1\bin must be added to your PATH.

Extract the latest source code and template files from Appendix B included with this document.

The procedure assumes that the operator is familiar with the Windows 10 operating system.

Run these steps if it is necessary to rebuild NetCDF_Translator_Batch.exe

- Open the Visual Studio project NetCDF_Translator_Batch.vcproj
- Click on the Build menu dropdown, and then click Configuration Manager.
- Click on the 'Active solution configuration:' dropdown and select 'Release'. Then close the 'Configuration Manager' Window.
- Click the Build menu dropdown, then click 'Build Solution'
- Verify that the Visual Studio output shows that the project was built without errors
- Open a file explorer and verify that a new directory called 'Release' was created in the tool directory
- Move the file 'NetCDF_Translator_Batch.exe' into the home directory of the tool.

Run these steps to set up the environment and setup files before running the tool

- Copy the ports file at ‘./GOES/ports’ into the ‘C:/Windows/System32/drivers/etc’ directory.
 - Note: This may require admin privileges
- Open the lzss_tool_setup.json file
 - There are 3 sections of variables that must be adjusted based on system configuration
 1. Location of L0 files
 - These variables are path variables to the location of the L0, NetCDF files that are obtained by the LZSS system. The format of the file path follows the python.glob wild card format.

“C:/LZSS/GOES-R(16)/op/GOES-16/10/SEISS/**/OR_SEIS-L0_G16*.nc”

The path underlined in red is the top level path of the L0 files. This is based on where the user has stored the L0 files on their system. The path in blue is a recursive wild card flag. It tells the tool to search all directories nested under the path in red. The path in green is the wild card for the NetCDF files. This tells the tool to only search for the proper NetCDF files in the directory.

- These variables must be changed for each of the GOES flight models.
2. Log Save Location
 - These variables are the output locations for the .log files generated by this tool. They should be left as default. However, if the user needs to change them, special care should be made with other tools that interact with these log files, like the SEISS Long Term Trending Tool, SEISS-D-OT060-17. The config files for these other tools must point to the same log save locations that have been set by these variables in the LZSS tool.
 3. Last Run Time
 - These variables are only used in the in the batch processing mode of this tool. The variables are formatted at YYYYMMDDHHMMSS. They tell the tool what set of files was run last. When setting up the tool from scratch, these variables should be set to the datetime of the first L0 files that the user wants to process.
e.g. if the user wants to start their processing on January 1st of 2020, the variables should be set to 20200101000000.

Attachment 3 Special Operating Instructions

There are no special operation instructions associated with the LZSS De-Commutation Operations Tool.

Attachment 4 List of Resolved Anomaly Reports and Change Requests

Table A4-1 lists the applicable resolved anomaly reports associated with the LZSS De-Commutation Operations Tool. ATC utilizes the Problem/Change Report (PCR) to document each anomaly.

Table A4-1. Listing of Resolved PCRs for the LZSS De-Commutation Operations Tool

PCR ID	Description	Date Reported	Status	Date Closed
1416	Simplifying UI and tool execution	2017/03/07	Enhancement	2017/03/07
1436	Update Tool to Accept Multiple Flight Model Processing	2018/08/21	Enhancement	2018/08/21
1453	Update to include batch processing other enhancements	2020/03/25	Enhancement	2020/03/25

Attachment 5 List of Unresolved Anomaly Reports and Change Requests

There are no unresolved anomaly reports or change requests associated with the LZSS De-Commutation Operations Tool.

Attachment 6 Copy of Resolved Anomaly Reports and Change Requests

Table A4-1 lists the applicable resolved anomaly reports associated with the LZSS De-Commutation Operations Tool. Copies of the PCRs are provided here.

Bug 1416

Summary:	Feature Update: Simplifying UI and execution of the tool					
Product:	GOES Ops Tools		Reporter:	Benjamin Brown <brown@assurtech.com>		
Component:	LZSS De-Commutation		Assignee:	Benjamin Brown <brown@assurtech.com>		
Status:	RESOLVED FIXED		QA Contact:	Don Hoefer <hoefer@assurtech.com>		
Severity:	enhancement					
Priority:	P2					
Version:	unspecified					
Target Milestone:	---					
Hardware:	PC					
OS:	Windows					
Whiteboard:						
Time tracking:	Orig. Est.	Actual Hours	Hours Worked	Hours Left	%Complete	Gain
	0.0	0.0	0.0	0.0	0	0.0
Deadline:						

[Benjamin Brown](#) 2017-03-07 10:58:26 EST[Description](#)

New Features to Version 3.1.4

- Combine the three discrete steps of the old tool (convert to bin, convert to log, rename) into the main branch of the tool
- Added a filter to remove all non-SEISS packets from the binary files before they are processed
- Added a drop packet checker. This scans the DPU telemetry file and reports if any packets appear to be missing from the file.
- Removed the dialog when the tool is run to select the directory where the .nc files are located. The file location is now based on a .txt file that is saved in the base directory of the tool (file_locations.txt). The path in this file can be edited using wild cards to simplify how the program looks for the appropriate file (see file_locations.txt for more instruction on how to format the path)

[Benjamin Brown](#) 2020-03-25 12:19:15 EDT[Comment 1](#)

see notes for changes made

Bug 1436

Summary:	Update Tool To accept multiple flight model processing					
Product:	GOES Ops Tools		Reporter:	Benjamin Brown <brown@assurtech.com>		
Component:	LZSS De-Commutation		Assignee:	Benjamin Brown <brown@assurtech.com>		
Status:	RESOLVED FIXED		QA Contact:	Don Hoefer <hoefer@assurtech.com>		
Severity:	enhancement					
Priority:	P2					
Version:	unspecified					
Target Milestone:	---					
Hardware:	Other					
OS:	Other					
Whiteboard:						
Time tracking:	Orig. Est.	Actual Hours	Hours Worked	Hours Left	%Complete	Gain
	0.0	0.0	0.0	0.0	0	0.0
Deadline:						

[Benjamin Brown](#) 2018-08-21 11:15:28 EDT[Description](#)

Feature Addition:

The tool needs to be able to handle data from multiple flight sources. A selector needs to be added for which FM is being processed. Additionally, the build instructions will need to be changed to reflect different save locations for processed log files.

[Benjamin Brown](#) 2020-03-25 12:16:52 EDT[Comment 1](#)

Added radio buttons for selection of the flight model

Bug 1453

Summary:	Update to include batch processing and other enhancements					
Product:	GOES Ops Tools		Reporter:	Benjamin Brown <brown@assurtech.com>		
Component:	LZSS De-Commutation		Assignee:	Benjamin Brown <brown@assurtech.com>		
Status:	RESOLVED FIXED		QA Contact:	Don Hoefer <hoefer@assurtech.com>		
Severity:	enhancement					
Priority:	P2					
Version:	unspecified					
Target Milestone:	---					
Hardware:	PC					
OS:	Windows					
Whiteboard:						
Time tracking:	Orig. Est.	Actual Hours	Hours Worked	Hours Left	%Complete	Gain
	0.0	0.0	0.0	0.0	0	0.0
Deadline:						

[Benjamin Brown](#) 2020-03-25 12:27:15 EDT[Description](#)

- Added batch processing functionality to tool
- Changed the setup parameters to a .json file and added setup variables for save location
- moved gui setup into a dedicated script

[Benjamin Brown](#) 2020-03-25 12:27:32 EDT[Comment 1](#)

see above notes

Attachment 7 Copy of Unresolved Anomaly Reports and Change Requests

This is not applicable to SEISS-D-OT060-1 as noted in Attachment 5 of this document.

Attachment 8 Requirements Matrix

The level III requirements driving the design of the operations tools are provided by CCR02850B.

Attachment 9 Release History Summary Matrix

The development release history for the LZSS De-Commutation Tool is provided in Table A9-1.

Table A9-1. Development Release History for the LZSS De-Commutation Tool

CDRL Revision	Description	Tag
–	Initial LZSS De-Commutation Operations Tool Release	SEISS-OT-1001_Rev1
A	Various feature updates including dropped packet checking and improvements to the UI of the tool	SEISS-OT-1001_Rev2
B	Added functionality to process all flight models and added a batch processing mode	SEISS-OT-1001_Rev3

Attachment 10 Inventory of Delivered Media

The delivered media consists of one zip file delivered electronically in the SEISS CDRL 0060 folder on the government portal. The file is SEISS-OT-1001_Rev3.zip.

SEISS-OT-1001_Rev3.zip provides the delivered media listed in Table A10-1.

Table A10-1. SEISS-OT-1001_Rev3 Files and Content

File Name	Content
main.py	Main processing file
gui.py	GUI setup file
filter.py	Filters out non SEISS packets
dropped_packet_check.py	Check for dropped packets and creates report
log_renamer.py	Renames log files based on the datetime that the file contains
batch_process.py	Batch processing
lzss_tool_setup.json	Set up files for tool
NetCDF_Translator_Batch.exe	Executable for converting NetCDF files to binary
NetCDF_Translator_Batch.sln	Project files for NetCDF Translator
NetCDF_Translator_Batch.vcproj	Project files for NetCDF Translator
Translator_Batch.cpp	Project files for NetCDF Translator
Translator_Batch.h	Project files for NetCDF Translator
GOES\ports	Ports file
GOES\egse\ComPorts.txt	Ports files for EGSE
GOES\egse\EGESMain_NoDAQ.exe	EGSE Playback tool for conversion to .log files

3.0 SOFTWARE DELIVERY MEDIA

Operations Tools are delivered as agreed by ATC and the project in the SEISS CDRL 0060 folder on the government portal. The LZSS De-Commutation Tool consists of the files specified in Letter Attachment 10. Figure 3-1 provides a snapshot of the CDRL060 folder.

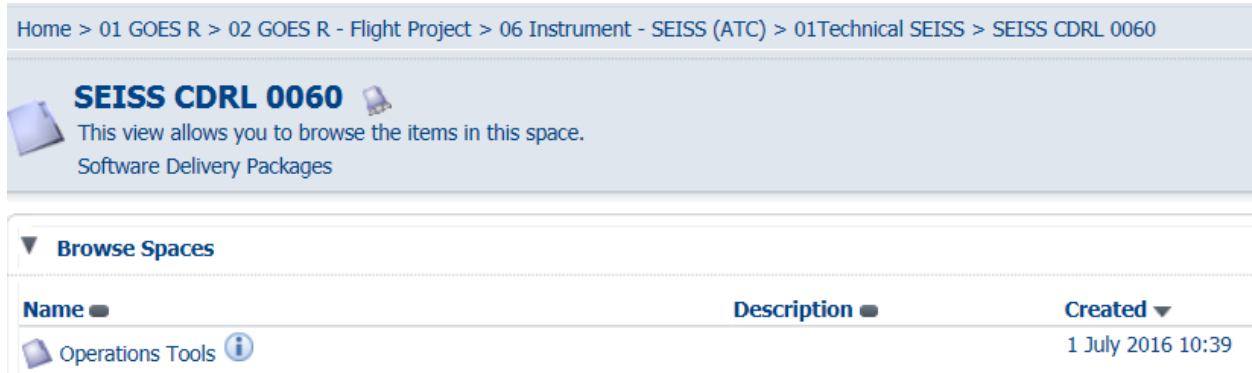


Figure 3-1. ATC SEISS-D-OT060-1 Folder on Portal

4.0 ACCOMPANYING DOCUMENTATION

The following documentation that describes the delivered software is provided under separate cover:

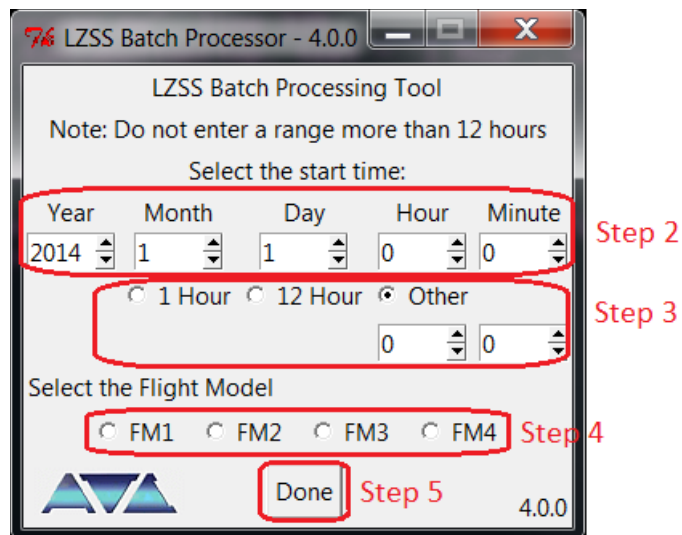


Figure 4-1. LZSS Batch Processor GUI

```

Lzss_processor.exe - Shortcut
Start time: 2017-02-03 01:00:00
End time: 2017-02-03 02:00:00
C:\GOES\LZSS\20170108\OR_SEIS-L0_G16_s20170081500060_e20170081505060_c20170081505061.nc

-----
Converting
-----
Converting Complete
-----
Concatenating
-----
Concatenating Complete
-----
Processing Complete
-----

C:\Users\Brown\Desktop\goes_operational_tools\trunk\LZSS_Batch_Processor\Appendix B - Source Code\dist\output\20170206_1352.bin

***** Current Version is 941 *****
Current File IO thread priority is 0
New File IO thread priority is -1
gethostbyname() - failed with error 11001
ports file - 'C:\Windows\system32\drivers\etc\ports'
Found SpacewirePort in ports file
ports file - 'C:\Windows\system32\drivers\etc\ports'
Found GuilpcPort in ports file

*****
ports file - 'C:\Windows\system32\drivers\etc\ports'
ports file - 'C:\Windows\system32\drivers\etc\ports'
Found ScriptIpcPort in ports file
Found RemoteGuilpcPort1 in ports file
ports file - 'C:\Windows\system32\drivers\etc\ports'
ports file - 'C:\Windows\system32\drivers\etc\ports'
*** Running command-line telemetry playback mode (ver 941) ***
*****

C:\Users\Brown\Desktop\goes_operational_tools\trunk\LZSS_Batch_Processor\Appendix B - Source Code\dist\output\20170206_1352.bin
Command-line telemetry playback in-process ...Found RemoteGuilpcPort4 in ports file
Found RemoteGuilpcPort5 in ports file
ports file - 'C:\Windows\system32\drivers\etc\ports'
Found RemoteGuilpcPort3 in ports file
Found RemoteGuilpcPort2 in ports file
Command-line telemetry playback completed!

Renaming Log Files
log name: DpuTelemetryLOG_20170206_1352.log
dir_name: C:\GOES\testLogs
new log timestamp: 20170203_0101

Checking for Dropped Packets
Dropped Packets:

No dropped packets
C:\GOES\ProcessedLogs\Dropped_Packets_20170203_0101.txt

Completed: 50.8949999809 seconds

```

Figure 4-2. LZSS Processor Output

4.1 User Manual

4.1.1 Tool Use Case

The LZSS De-Commutation Tool is used to convert the level zero data received from the spacecraft into the log format that will be used for all other SEISS operational tools. This tool should be run as the first step before IFCs are processed.

4.1.2 Tool Operating Instructions

The LZSS De-Commutation Tool has two main operating modes: GUI and batch processing.

4.1.2.1 LZSS GUI Mode

The section describes the steps to perform to use the LZSS De-Commutation Tool. Reference Figure 4-1 for the following steps.

1. Run the program ‘python gui.py’ . This is the GUI for the LZSS processor and an example is shown in Figure 4-1.
2. Use the scroll boxes to input a start time.
3. Use the radio buttons to set the end time to one hour, one day, or other to set a more precise time range. Steps 2 and 3 set the range of files that will be processed by the tool.
4. Select the Flight Model from the radio buttons.
5. Click the ‘Done’ button.
6. When the program has finished running the command prompt will read ‘Completed’. This is shown in Figure 4-2.
7. The log files generated by the tool are saved in the directory specified in the lzss_tool_setup.json file. These log files will be used as input for most of the other SEISS Operations Tools.

4.1.2.2 LZSS Batch Mode

This section describes how to use the LZSS De-Commutation tool in batch processing mode.

1. Run the program ‘python batch_process.py’
2. When prompted, enter the flight model that you want to process and press return
3. The tool will begin to process all available L0 data in 12 hour increments and store them in the location specified in the lzss_tool_setup.json file.

4.2 Version Description Document

Refer to the LZSS De-Commutation Operations Tool Version Description Document (VDD) for the GOES-R SEISS, SEISS-VD-OT060-1.

The LZSS De-Commutation Operations Tool Version Description Document (VDD) for the GOES-R, SEISS-VD-OT060-1 is provided in Appendix C.

4.3 Final Requirements Document

This section describes the derived requirements for the LZSS De-Commutation Tool.

The derived requirements for the tool are as follows:

- SEISS-D-OT060-1 SHALL take as input the netCDF files provided via the government portal
- SEISS-D-OT060-1 SHALL convert the netCDF files into the .log files for input into other SEISS Ops Tools
- SEISS-D-OT060-1 SHALL the time stamps in the netCDF files into UTC format

4.4 Final Design Document

Refer to the SEISS LZSS Design Document presentation included in Appendix D.

4.5 Data Definitions

This section describes the input and outputs of the LZSS De-Commutation Tool.

The inputs for the Translation portion of the tool are the level zero, netCDF files that are distributed by NASA/NOAA. When these files are processed by the first portion of the LZSS De-Commutation Tool, they are converted and combined into a single binary file. This file is an archival format used by the SEISS EGSE to playback telemetry in real or accelerated time. This feature of the EGSE creates the same telemetry log files that are produced when the SEISS instruments are being run through the EGSE directly. However, the SEISS EGSE names these log files based on the run time of the EGSE and not based on the data contained within. Therefore, the renamer portion of the tool is used to extract the CCSDS time from the DPU telemetry in order to rename the log files so they reflect the time range of the data they contain. These renamed log files are the final output of the tool and will be used as the input for many of the other SEISS Operations Tools.

4.6 Test Results

The LZSS De-Commutation Tool was validated by processing known files obtained from the LZSS portal. The first part of the tool was set to a specific time range. The output of that tool was used as the input for the SEISS EGSE. The log files from the EGSE were then renamed. The renamed files matched the time range that was specified in the first portion of the tool.

Additionally, one of the log files was analyzed to validate that the time stamp for the first second of telemetry also matched the original input time range. The as-run procedure, as well as the log files and the original LZSS data that was analyzed are included in Appendix A.

This version of the tool was validated by reprocessing the files that were used in the original validation. These new files were then matched to the original files. In all cases, files processed with the new version of the tool matched the files processed by the original version of the tool. These files, as well as an as-run procedure are included in Appendix A.

APPENDIX A
LZSS De-Commutation Tool Validation Artifacts
(Appendix A – Validation Artifacts.zip)

APPENDIX B
Source Code
(SEISS-OT-1001_Rev3.zip)

APPENDIX C
LZSS De-Commutation Operations Tool Version Description Document (VDD) for
the GOES-R, SEISS-VD-OT060-1 Rev B

APPENDIX D
SEISS LZSS Design Document
(SEISS LZSS Design Document.pptx)