Update: 2019/09/24

N-CAM Movie analysis software (Demodulation_Movie_For_Public)

●Software overview

This is software that converts data downlinked from satellites into video in Movie data downlink. This software consists of the following four parts.

① Execution software 1 (Demodulation_Movie_For_Public1.exe)
② Movie information file (file_info.txt)
③ Input file(Downlink data)
※Put all these files in the same folder.
④ Execution software 2 (Demodulation_Movie_For_Public2.exe)

Hereafter, each will be explained

① Execution software 1 (Demodulation_Movie_For_Public1.exe)

This software extracts moving image data from downlink data and confirms that there is no shortage of downlink data. When the exe file is executed, analysis starts, and a file called "output.bin" is output.

The screen at the time of execution is shown below.

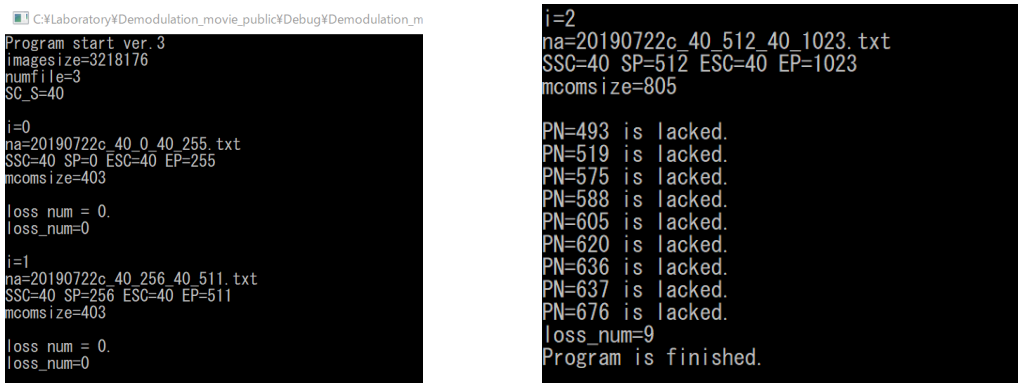

Figure 1 Execution screen (Left：normal, Right：There is a defect in the readout range)

The meanings of the variables shown in Figure 1 are as follows.

・imagesize : Movie size(bytes)
・numfile : Number of input files
・SC_S : Movie reading start sector
・i : Input file number

・na : Read file name
・SSC : Read start sector
・SP : Read start page
・ESC : Read end sector
・EP : Read end page
・mcomsize : Number of downlink packets for one path
・loss_num : Number of loss packets
・PN : Packet number

When the downlink data is insufficient, “PN=x is lacked.” is output. For the explanation of the packet number, please refer to the explanation of the image analysis software shown at the following URL.

●Image analysis software
(http://sat.aero.cst.nihon-u.ac.jp/nexus/download/InstructionManual_ImageAnalysisSoftware_20190125.pdf)

②Movie information file(file_info.txt)

Enter the information required for “Demodulation_Movie_For_Public1.exe” in “file_info.txt”. The contents of “file_info.txt” are as Figure 2.

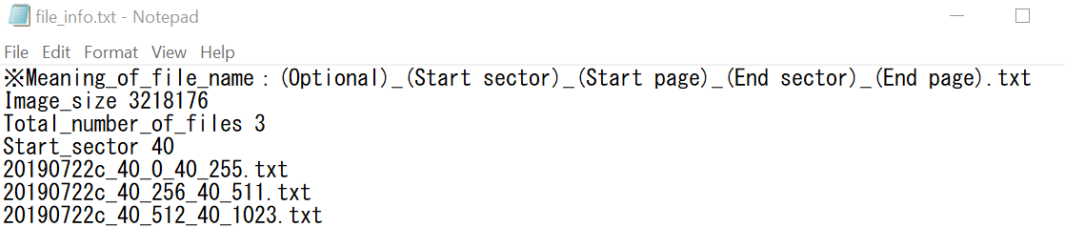

Figure 2 Contents of “file_info.txt”

A description of each line of “file_info.txt” is shown below.

・First line : Comment text(Meaningless)
・Second line : Movie size (bytes)

Enter the movie size. Movie size will be released in “Operational information page (http://nexusoperation.seesaa.net/)” and “Satellite images page (http://sat.aero.cst.nihon-u.ac.jp/nexus/E3_SatImages.html)”.

・3rd line : Total number of files

Enter the total number of input files.

・4th line　　：Start sector

Enter the first sector number(SC_S) in the read range. See “Operational information page (http://nexusoperation.seesaa.net/)” and “Satellite images page (http://sat.aero.cst.nihon-u.ac.jp/nexus/E3_SatImages.html)”for values(SC_S).

・5th line and after　　：The name of the input file

Enter the file name of the read file. When reading three files, enter each file with a line feed. The format of the file name is as follows.

“(Optional)_(SSC)_(SP)_(ESC)_(EP).txt(Line feed)”

※Do not put "_" in “Optional”.

For reference, here is an example of using three input files.

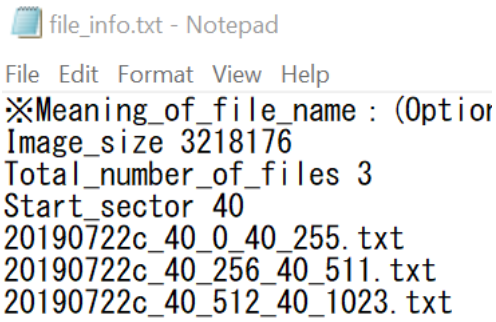

Figure 3 Three input files

In addition, when there are multiple antennas like Nihon University, there may be multiple data that read the same range. In this case, as shown in Fig. 4, if the files with the same read range are placed together, the missing of the read range can be confirmed with the sum of multiple files as shown in Fig. 5.

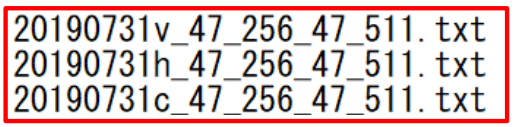

Figure 4 The files with the same read range are placed together

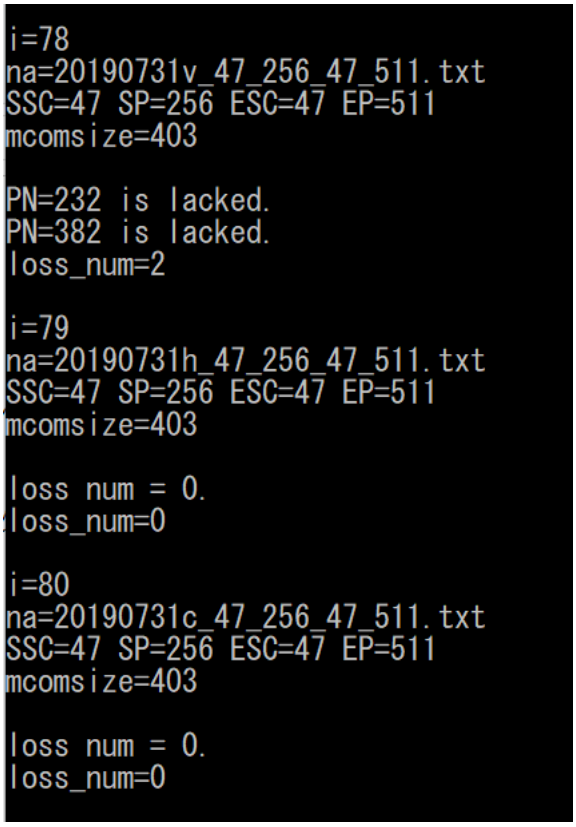

Figure 5 Output result

③Input file (Downlink data)

This refers to the file where the downlink data is saved. The contents of the input file are based on the following format.

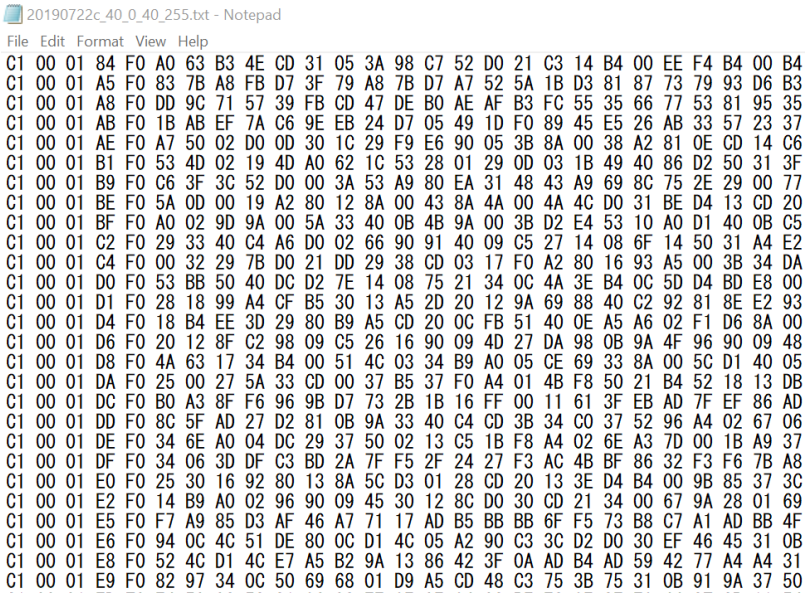

Figure 6 File format

・One packet of downlink data is stored for each row.

→The specific contents are shown in "FM telemetry format, Figure 6, Image data downlink".

※FM Telemetry Format：

http://sat.aero.cst.nihon-u.ac.jp/nexus/download/NEXUS_FM_telemetry_format_e.pdf

④ Execution software 2 (Demodulation_Movie_For_Public2.exe)

This software converts “output.bin”, which is the output of execution software 1, into an image. When "output.bin" is put in the same file as the execution software 2 and the exe file is executed, the following screen appears..

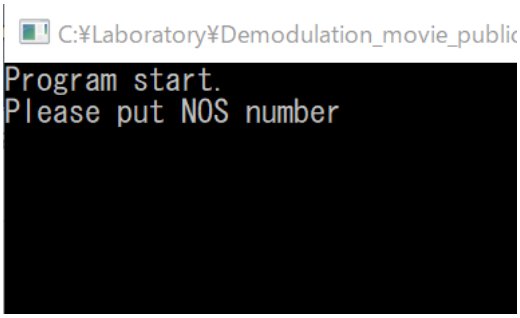

Figure 7 Screen after execution

N-CAM videos are created by taking a large number of images and stitching them together. First, specify the number of shots.

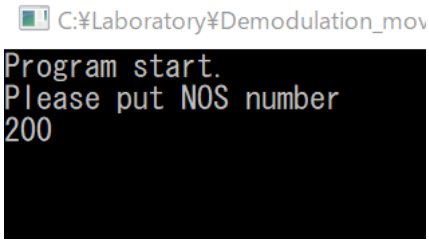

Figure 8 Step1

When you press Enter, you will be prompted for the next file name. Type “output" and press Enter.

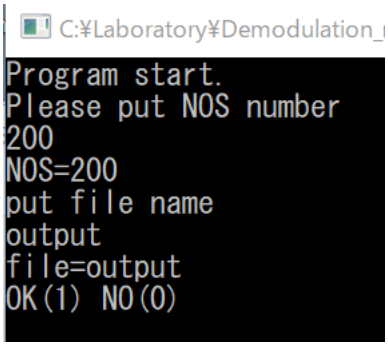

Figure 9 Step 2

If the information you entered is correct, type “1”. The analysis is then performed. The image included in the downlink data is output.

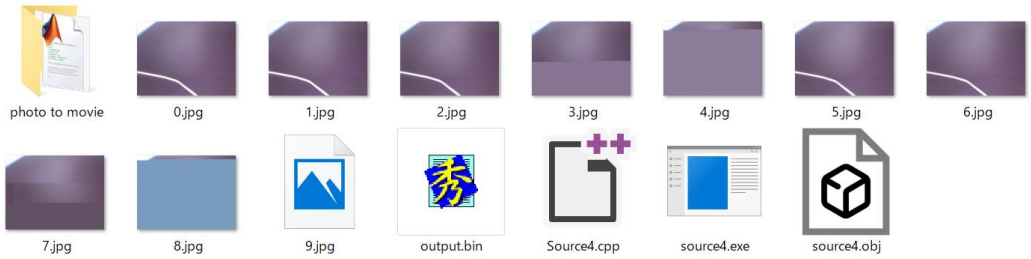

Figure 10 Step3

If the data is missing, the missing image is output as shown in 3.jpg above. A movie is created by stitching together the output images..