AD2-EOC-97-046

ADEOS-II

MISSION OPERATIONS INTERFACE SPECIFICATION

(M O I S)

(NASDA / NASA / NOAA)

Version 1.1

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NASDA

NATIONAL SPACE DEVELOPMENT AGENCY OF JAPAN

ADEOS-II Mission Operations Interface Specification (NASDA/NASA/NOAA)

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ADEOS-II Mission Operations Interface Specification (NASDA/NASA/NOAA)

Revision History

Ver.	Rev.	Date	Update Page	Change Point	Note
1.0	N/A	Dec. 2001			
1.1	N/A	June 2002			Sign up version
			1-3, 4-1, 4-4	Title of the document " NIOA" was changed to "NIOP"	
			1-3	New document "Ground Station Operations Procedure (GSOP)" was added to applicable documents of MOIS (NASA/NOAA).	
			3-11 5-14	4 bands data (band 13, 15, 17 and 19) are added to GLI 1km level 1A NRT product for NOAA.	
			4-4 5-3, 5-4, 5-7, 5-8, 5-12, 5-13	MOIF internet backup method was put back from FTP to E-mail.	
			5-5, 5-14	Achievement ratio of SeaWinds level 0 data provision to NOAA (& SeaPAC) within time requirement was defined as 80%.	
			5-5	Data volume of processed DMS data was corrected.	
			5-4, 6-1, 6-3	Notification method of REQQ format error from EOC to SeaPAC was clarified.	
			5-36	Data capture rate of ASF and WFF was defined. (= 95% as target)	
			6-7	Procedure for the updated STGS from NGN to EOC was added.	
			6-9	Fig 6.2-2 was corrected.	
			6-17	Capacity of duralmin case to be used for raw data shipment from WFF to EOC was changed from 7 tapes/case to 3 tapes/case.	
			8-4	Procedure for ground station re-scheduling will be specified in the "GSOP".	

Note: Modifications made to this document are annotated as follows:

- Deletions are indicated by (e.g., ~~Project~~)
- Additions are indicated by bold (e.g., **Project**)
- Comments are indicated by italics (e.g., *Project*)

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1. Introduction

1.1 Purpose

The primary purpose of "ADEOS-II Mission Operations Interface Specification (NASDA/NASA/NOAA) (MOIS (NASDA/NASA/NOAA))" is to provide the interfaces between NASDA, NASA and NOAA. An outline of the Advanced Earth Observing Satellite II (ADEOS-II) mission operations and the principles on the interface conditions between NASDA and related agencies are stated in the "ADEOS-II Mission Operations Interface Specification (Common Part), AD2-EOC-96-054 (MOIS (Common))".

1.2 Scope

This document defines interface conditions, deliverables and procedures which are necessary for NASDA, NASA and NOAA to perform ADEOS-II Mission Operations. Routine operation functions include: 1) S/C tracking and control; 2) instrument monitoring and control; 3) mission data acquisition, processing, archiving and distributing; and 4) mission operation planning. Organizations performing ADEOS-II Mission Operations functions include the ADEOS-II Project and the EOIS Project by NASDA; the SeaWinds Project, the Earth Observing System Data and Information System (EOSDIS) Project, the NASA/NOAA Ground Network (NGN) Project by NASA; and NOAA. The roles of these agencies are based on the contents of the Memorandum of Understanding (MOU) and Mission Operations Implementation Plan (MOIP) described in section 1.4.

1.3 MOIS Control

1.3.1 Approval Authority

This document will become effective after approval and signing by the listed signatories of NASDA, NASA and NOAA.

1.3.2 Change Control

MOIS (NASDA/NASA/NOAA) changes shall be controlled by the ADEOS-II Ground Segment Project. Therefore, all change proposals shall be submitted to the ADEOS-II Ground Segment Project by the preparing organization. Changes on this MOIS (NASDA/NASA/NOAA) will require agreement only between NASDA, NASA and NOAA signatories, not required is that of other related agencies such as CNES and EA. Changes will be discussed at an ADEOS-II NASDA/NASA/NOAA Mission Operations Meeting or by exchanging Operations Coordination Letters (OCLs) (see section 9.2). Changes shall be in agreement with the MOU and the MOIP, and instituted by MOIS Change Notices (MOISCNs).

No impact changes such as correction of spelling errors can be incorporated by NASDA using MOISCNs without discussion between NASDA, NASA and NOAA.

The change procedure is basically the same as described in section 1.3.2 in MOIS (Common).

1.4 Related Documents

The related documents to this MOIS are listed below.

(1) MOIS Controlling Documents

The following documents are the controlling documents for this MOIS. In case of conflict between any of these documents and this MOIS, the former will govern.

(a) Memorandum of Understanding between NASDA, NASA and NOAA for cooperation in ADEOS-II Program.
(b) ADEOS-II Mission Operations Implementation Plan (NASDA/NASA/NOAA), AD2-EOC-96-055.

(2) MOIS Reference Documents

The following documents are the reference documents for this MOIS.

(a) ADEOS-II Mission Simulation Test Plan, AD2-EOSD-99-012.
(b) Spacecraft Orbital Operations Handbook (SOOH) (SeaWinds portion), Vol.12.
(c) Spacecraft Orbital Operations Handbook (SOOH) (GLI portion), Vol.8.
(d) Spacecraft Orbital Operations Handbook (SOOH) (DCS portion), Vol. 13.
(e) Spacecraft Orbital Operations Handbook (SOOH) (AMSR portion), Vol. 11.
(f) ADEOS-II to Ground Station Interface Document AD2-EOC-96-123.
(g) Mission Operation Requirements for ADEOS-II Ground Segment, AD2-EOC-95-004.
(h) ADEOS-II Ground System Interface Requirements Document (NASDA/NASA/NOAA), AD2-EOC-95-056.

(3) MOIS Applicable Documents

The following documents are the applicable documents for this MOIS. In case of conflict between any of these documents and this MOIS, this MOIS will govern. The delivery schedule of these MOIS applicable documents are specified in section 9.3.

(a) ADEOS-II Raw Data Format Specification, AD2RP-S-023.
(b) GLI 1km Level 0 Format Description, AD2-EOSD-98-011.
(c) AMSR Level 0 Format Description, AD2-EOC-96-122.
(d) SeaWinds Level 0 Format Description, AD2-EOC-96-119.
(e) ADEOS-II/ARGOS DCS Level 0 Format Description, AD2-EOC-97-044.
(f) ILAS-II Level 0 Format Description, AD2-EOC-96-121.
(g) TEDA Level 0 Format Description, AD2-EOC-97-003.
(h) VMS Level 0 Format Description, AD2-EOSD-98-146.
(i) DMS Level 0 Format Description, AD2-EOSD-98-147.
(j) HK TLM Packet Format Description, AD2-EOSD-97-012.
(k) AMSR Product Format Specification
(l) GLI Data Product Specification (Product Format)
(m) Format Description of Mission Operation Information Files (SeaWinds), AD2-EOSD-99-019.
(n) Format Description of Mission Operation Information Files (NGN/NOAA), AD2-EOSD-98-155.
(o) ADEOS-II Network Communications Interface Requirements Document (NASDA-NASA/NOAA), EOIS/AII-ND-008.
(p) ADEOS-II Catalogue Interoperability Interface Requirements Document (NASDA-NASA), EOIS/AII-ND-007.
(q) ADEOS-II Network Communications Interface Control Document (NASDA-NASA/NOAA), EOIS/AII-ND-009.

(r) ADEOS-II Catalogue Interoperability Interface Control Document (NASDA-NASA), EOIS/AII-ND-XXX.
(s) SeaWinds Met data Format Description
(t) SeaWinds Science Product User's Handbook
(u) Network Communications Interface Operations **Procedure**~~Agreement~~ (NIO**P**~~A~~) **for**~~between~~ NASDA and NASA/NOAA for the ADEOS-II Project, EOIS/AD2-ND-149
(v) ADEOS-II Ground Station Operations Procedure (GSOP) for NASDA and NASA.

(4) ADEOS-II Mission Operations Interface Specification (Common Part), AD2-EOC-96-054

The MOIS (Common), AD2-EOC-96-054, is the same level document as this MOIS.

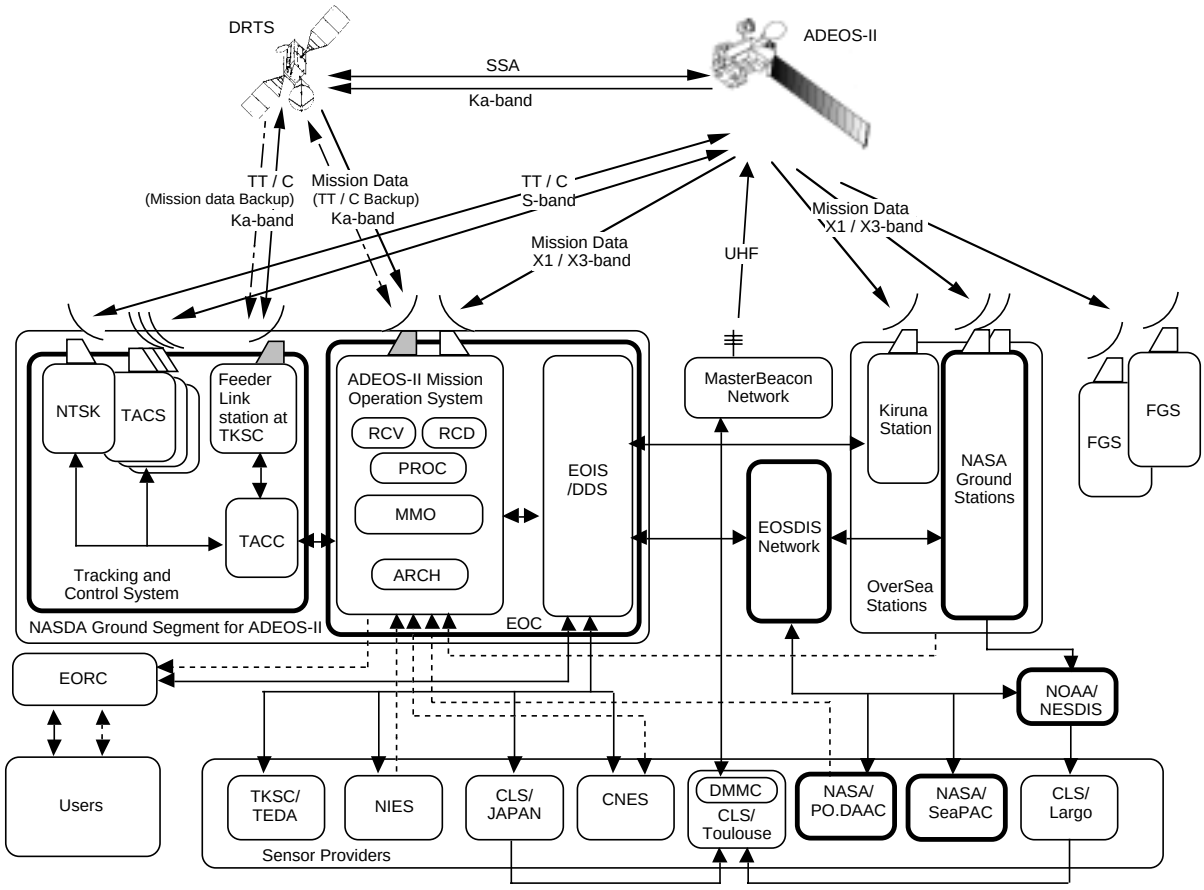
2. ADEOS-II NASDA/NASA/NOAA Mission Operations Summary

2.1 Total System Overview

The ADEOS-II ground segment is an interconnected network of data capture, data processing, data distribution and control center facilities. The principal NASDA, NASA and NOAA organizations that have responsibility for data system interfaces between NASDA and NASA/NOAA for the ADEOS-II Project are:

- NASDA Ground Segment for ADEOS-II (EOC at Hatoyama)
- NASDA Earth Observation Data and Information System (EOIS) - Data Distribution and Management Subsystem (DDMS)
- NASDA Tracking and Control Center (TACC at TKSC)
- NASA-JPL SeaWinds SeaWinds Processing and Analysis Center (SeaPAC)
- NASA Earth Observing System Data and Information System (EOSDIS) - Physical Oceanography~~ic~~ Distributed Active Archive Center (PO.DAAC)
- NASA/NOAA Ground Network (NGN)
- The National Environmental Satellite Data and Information Service of the National Oceanic and Atmospheric Administration (NOAA/NESDIS) - Office of Satellite Data Processing and Distribution

The total ground system overview for ADEOS-II mission operations is illustrated in Fig. 2.1-1.



EOC	: Earth Observation Center
EOIS	: Earth Observation and Information System
DDS	: Data Distribution Subsystem
RCV	: Receiving Subsystem
RCD	: Recording Subsystem
PROC	: Processing Subsystem
MMO	: Mission operation Management Organization
ARCH	: Archiving Subsystem
TACC	: Tracking And Control Center
TACS	: Tracking And Control Station
NTSK	: NASDA Transportable Station-Kiruna
EORC	: Earth Observation Research Center
EOSDIS	: Earth Observation System Data and Information System
TKSC	: Tsukuba Space Center
NIES	: National Institute for Enviromental Studies
CNES	: Center National des Etude Spatiales
CLS	: Collecte Localisation par Satellite
DMMC	: Downlink Messages Management Center
PO.DAAC	: Physical Oceanography Distributed Active Archive Center
SeaPAC	: SeaWinds Processing and Analysis Center
NESDIS	: National Environmental Satellite Data and Information Service
FGS	: Foreign Ground Station

Ground Station Feeder Link Station

On-Line Off-Line

Fig. 2.1-1 Diagram of the ADEOS-II Ground Segment

2.2 NASDA's Function

The ADEOS-II Project will be carried out by NASDA/ADEOS-II project, NASDA/EORC (Ground segment development team), NASDA/TACC and NASDA/EOC. The NASDA/ADEOS-II project will manage the ADEOS-II spacecraft development and prepare the ADEOS-II Satellite Operation Documents. NASDA/EORC (Ground segment development team) will manage the ADEOS-II ground segment development. NASDA/TACC and NASDA/EOC will manage the ADEOS-II mission operations and operate the ADEOS-II ground segment.

The EOC located at Hatoyama is responsible for ADEOS-II data receiving, recording, processing, and distributing. The TACC located at Tsukuba Space Center is responsible for determination and control of orbit, and housekeeping of the satellite.

For the ADEOS-II mission operations related to NASA/NOAA, NASDA will perform as follows:

- Conduct the routine operations of the ADEOS-II spacecraft including SeaWinds instrument.
- Determine and control the ADEOS-II spacecraft orbit.
- Perform housekeeping operations for the ADEOS-II spacecraft including SeaWinds instrument.
- Make a mission operation plan of ADEOS-II including SeaWinds instrument.
- Generate commands based on a mission operation plan and transmit them to ADEOS-II.
- Exchange mission operation information files **with SeaPAC, JPL** for SeaWinds mission operations.
- Receive ADEOS-II data via IOCS and/or X band direct link.
- Generate SeaWinds level 0 data and deliver them to SeaPAC and NOAA.
- Generate DCS level 0 data and deliver them to NOAA.
- Generate AMSR level 1A product and deliver them to PO.DAAC **and NOAA via PO.DAAC**.
- Generate selected GLI 1km level 1A product and deliver them to NOAA.
- Generate DMS time tagged data and deliver them to SeaPAC
- Deliver HK source data to SeaPAC.
- Store all ADEOS-II raw data.

2.3 NASA's Function

(1) NASA Ground Stations

For the ADEOS-II mission operations related to NASDA, the NASA ground stations will perform as follows:

- Exchange mission operation information with NASDA and coordinate its station operation plan.
- Acquire ADEOS-II raw data via X1 and X3 bands down link.
- Ship raw data acquired at the stations via X1 band to EOC using ID-1 tape.
- Generate some Level 0 data from MDR data and MRT data to send them to EOC, SeaPAC and NOAA via electronic file transfer.
- Archive the raw data acquired at its facility and the Level 0 data processed at its facilities for limited period tentatively, as stated in section 5.8 of this MOIS (NASA/NOAA).

(2) SeaPAC

For the ADEOS-II mission operations related to NASDA, the SeaPAC will perform as follows:

- Exchange mission operation information with NASDA.
- Generate SeaPAC higher level products **and** ~~to~~ deliver them to PO.DAAC.

(3) PO.DAAC

For the ADEOS-II mission operations related to NASDA, the PO.DAAC will perform as follows:

- Provide the directory information about SeaWinds products to NASDA.
- Ship SeaWinds level 1B and 2A products to EOC using 8mm tape or DLT on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists.
- Make SeaWinds level 2B and 3 products available to general users including NASDA.
- Distribute AMSR L1A product to SeaPAC and NOAA, and arrange for its archiving.
- Archive the SeaWinds Level 0 data and SeaWinds level 1B, 2A, 2B and 3 products.

2.4 NOAA's Function

For the ADEOS-II mission operations related to NASDA, NOAA will perform as follows:

- Receive mission operation information files from NASDA.
- Generate SeaWinds Met data NRT Products and deliver them to EOC and other authorized users for operational purposes..
- Generate GLI 1km NRT product for NOAA selected areas and distribute them to authorized users for operational purpose.
- Route DCS data files to CNES/Largo Processing Centre on a near real-time basis.

3. Sensor Operation Overview and Operation Requests

3.1 SeaWinds Operations

3.1.1 SeaWinds Operation Modes

There are six operating modes that are used by the SeaWinds instrument. These six modes, and the permissible transitions between these modes are shown in Fig. 3.1-1.

(1) Off Mode
In this mode, the electronics and replacement heaters of all subsystems are powered off. SeaWinds will be launch in Off Mode. No temperature monitoring is performed by the instrument in this mode.

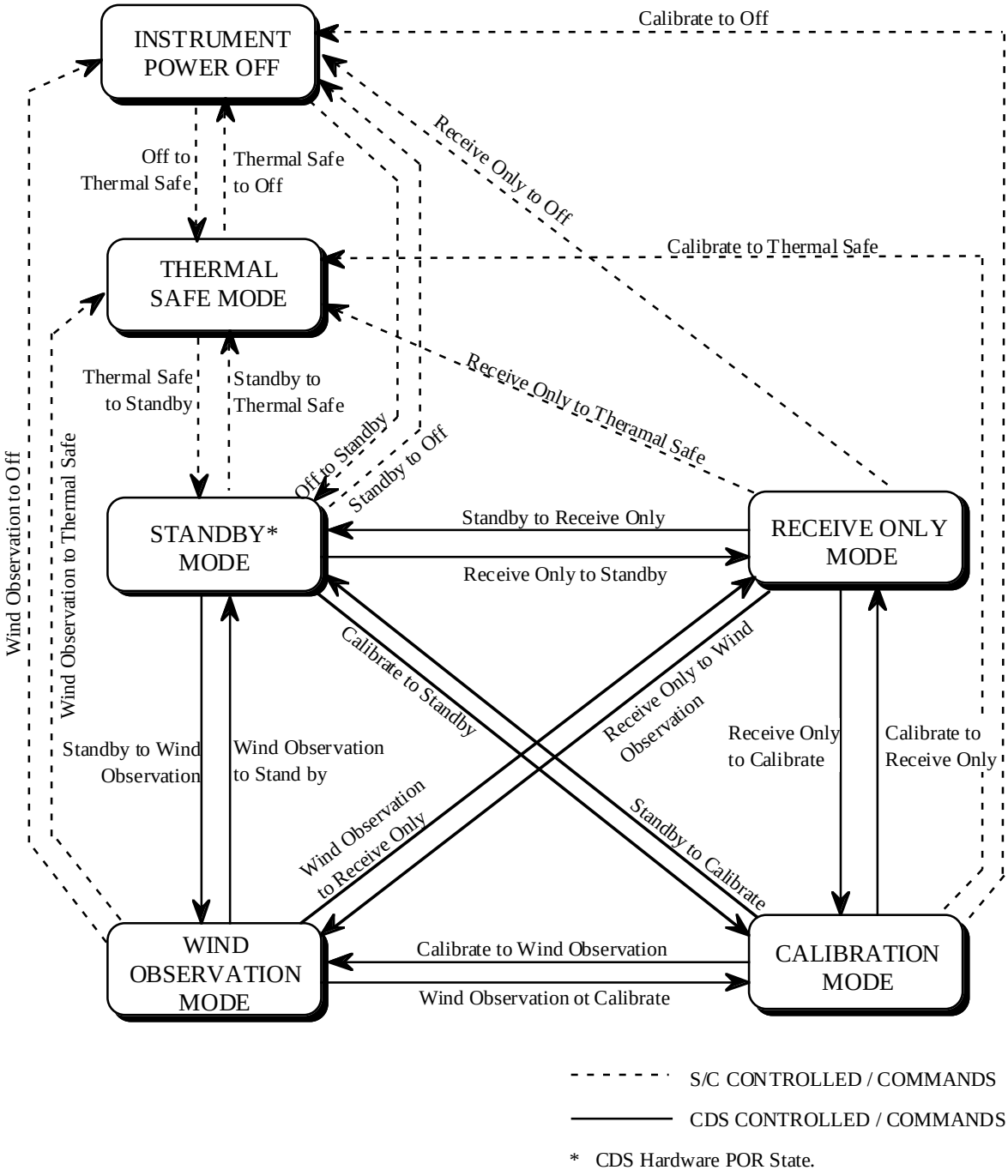
(2) Thermal Safe Mode
In this mode, the electronics of all the subsystems are powered off and replacement heaters are powered on. Switching to the redundant CDS, if required, will be done in this mode. The instrument will be placed in Thermal Safe Mode within 115 minutes of limit-off. This will also be the mode that the spacecraft will put the SeaWinds instrument into for the Light Load Mode.

(3) Standby Mode
This is a safe state for the instrument. The CDS flight software will enter the standby mode when initially powered up.

(4) Wind Observation Mode
This is the normal operating mode for the collection of scatterometer data. Periodic loop-back calibration will also be routinely performed while this mode.

(5) Receive Only Mode
This mode is used for on-orbit EMC testing to identify source of interface from the spacecraft. No RF signal will be transmitted in this mode.

(6) Calibration Mode
This mode is intended for periodic long term calibration of the instrument.



Note: In the event of selected S/C and CDS anomalies / faults, mode transitions may occur from any mode to either the "STANDBY MODE" or the "THERMAL SAFE MODE".

Fig. 3.1-1 Operation Mode Transition of SeaWinds

The applicable modes of the SeaWinds instrument are shown in Table 3.1-1, for normal observation and maneuvering.

Table 3.1-1 SeaWinds Operating Modes

Mode No.	Name of Operation Mode	Normal Observation	Maneuver (1N inplane)	Maneuver (20N inplane)	Maneuver (20N out of plane)
1	Off Mode				
2	Thermal Safe Mode			X***	X***
3	Standby Mode				
5	Wind Observation Mode	X	X**		
6	Receive Only Mode	X*			
7	Calibrate Mode	X*			

*: Mostly in Wind Observation Mode, except for periodic calibration events in Calibration Mode and Receive Only Mode.

**: If the Semi-Major axis should be decreased, SeaWinds is set to Standby Mode with the TWTA on due to power restriction.

***: Or an equivalent low power state.

3.1.2 SeaWinds Operation Pattern

SeaWinds operates continuously in Wind Observation Mode during the routine operation phase. SeaWinds instrument calibration may be scheduled periodically during the routine operation phase and includes commanding to the Calibration and Receive Only Modes. This calibration will be requested by SeaPAC using the REQQ file.

For enhanced observations or for responding to instrument anomalies, mode commands, parameter update commands and relay update commands may be requested by SeaPAC using the REQQ for OBC scheduled commands at specific RSP location or using the combination of Real Time Command Request (RTCR) and SWPF file for real time commanding. (see the section 6.1 for detailed interface procedure.)

3.1.3 SeaWinds Operation Constraints

- During the satellite orbit correction maneuvers (+ΔV nominal maneuvering, 1N inplane) the SeaWinds instrument will stay in the nominal operation.
- During -ΔV (20N inplane) or ±Δi (20N out of plane) maneuvers including yaw maneuvers, the SeaWinds instrument will be set to “Thermal safe mode” due to ADEOS-II electrical power constraints. This operation will be requested by SeaPAC using REQQ file.

3.2 GLI Operations

3.2.1 GLI Operation Modes

There are 10 operation modes, which are used used by GLI instrument during routine operation phase.

(1) Daytime Observation (incl. 3 modes)
All bands data are acquired during daytime on ground. There are 3 kind of this mode in accordance with the tilting angle. (0 degree mode, +20 degree mode and –20 degree mode)

(2) Nighttime Observation
MTIR bands data are acquired during nighttime on ground.

(3) Sunlight Calibration
Optical calibration data is acquired for VNIR using sunlight at the beginning of daytime of satellite.

(4) Inner-Lamp Calibration (incl. 2 modes)
Optical calibration data is acquired for VNIR and SWIR using halogen lamp within GLI instrument.
There are 2 kinds of this mode in accordance with the tilting angle. (A mode: 0 degree and B mode: 20 degrees)

(5) Electronic Calibration (incl. 2 modes)
Dummy signal is input to Pre-Amp of VNIR/ SWIR and Post-Amp of MTIR to acquire electronic calibration data. There are 2 kind of this mode in accordance with the tilting angle. (0 degree mode and 20 degrees mode)

(6) Safety
Observation data is not acquired. Heater is enabled.

Table 3.2-1 GLI Operation Modes (Routine Operation Phase)

Name of Operation Mode	Normal Observation	Maneuver (1N inplane)	Maneuver (20N inplane)	Maneuver (20N out of plane)	LLM
Daytime Observation (0˚, +20˚, -20˚)	X	X			
Nighttime Observation	X	X			
Sunlight Calibration	X	X			
Inner-Lamp Calibration (0˚, +20˚)	X	X			
Electronic Calibration (0˚, +20˚)	X	X			
Safety			X	X	X

3.2.2 GLI Operation Pattern

GLI 1km operates continuously. In daytime, observation data of all bands are collected at tilt angle of 0, +20 or -20. Tilt angle of GLI depends on the observation request from users (GLI PIs), but it is set to 0 at the start and end of daytime observation mode. In nighttime, observation data of the only thermal infrared (MTIR) bands are collected. Operation pattern of GLI calibration is described in table 3.2-2. Moreover, GLI 1km operation pattern is shown in figure 3.2-1.

Table 3.2-2 GLI Calibration Operation Pattern

Calibration Mode		GLI 1km	GLI 250m
VNIR SWIR	Sunlight Calibration	10 min. *1/orbit (Over north pole area)	Once/8 days (Timing is synchronized to GLI 1km calibration)
	Inner-Lamp Calibration	15 min. *1/8 days (A → A → B: Alternately repeated)	
	Electronic Calibration	More than 10 scans/8 days (Continuously performed from inner-lamp calibration mode)	
MRIR	Blackbody Calibration	Every scan	N/A

*1: Including standby time.

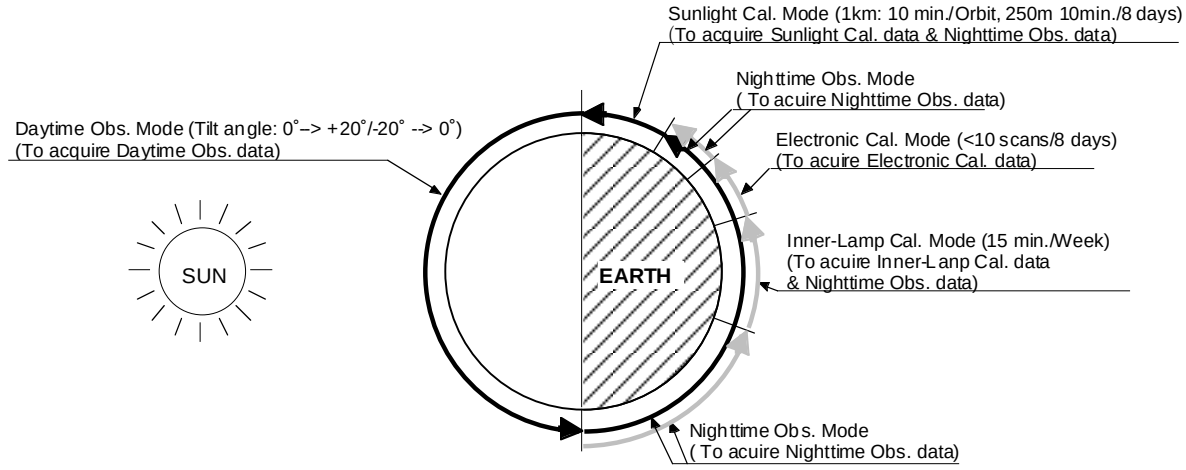


Fig. 3.2-1 GLI 1km Operation Pattern

3.2.3 GLI Operation Constraints

- During the satellite orbit correction maneuvers (+ΔV nominal maneuvering, 1N inplane) the GLI instrument will stay in the nominal operation.
- During -ΔV (20N inplane) or ±Δi (20N out of plane) maneuvers including yaw maneuvers, the GLI instrument will be set to "Safety mode" due to ADEOS-II electrical power constraints.

3.3 AMSR Operations

3.3.1 AMSR Operation Modes

There are 2 operation modes, which are used used by AMSR instrument during routine operation phase.

(1) Normal Mode
Acquiring of observation data or standby of data acquisition.

(2) Sleep Mode
Observation data is not acquired. AMSR antenna is rotated in normal speed, and heater is enable.

Table 3.3-1 AMSR Operation Modes (Routine Operation Phase)

Name of Operation Mode	Normal Observation	Maneuver (1N inplane)	Maneuver (20N inplane)	Maneuver (20N out of plane)	LLM
Normal	X	X			
Sleep			X	X	X

3.3.2 AMSR Operation Pattern

AMSR operates continuously in normal mode, and collects observation data globally.

3.3.3 AMSR Operation Constraints

- During the satellite orbit correction maneuvers (+ΔV nominal maneuvering, 1N inplane) the AMSR instrument will stay in the nominal operation.
- During -ΔV (20N inplane) or ±Δi (20N out of plane) maneuvers including yaw maneuvers, the AMSR instrument will be set to “Sleep mode” due to ADEOS-II electrical power constraints.

3.4 DCS Operations

3.4.1 DCS Operation Modes

There are 2 operation modes, which are used used by AMSR instrument during routine operation phase.

(1) Operational Mode (a: UHF-TX On or b: UHF-TX OFF)
Operational mode is the routine operation mode of DCS. The receiving system is always powered on, and the transmission system is always powered on as far as frequency interference does not occur (Operational mode-a). When the transmission system is powered off, ordinary heater is powered on in order to keep instrument within appropriate temperature (Operational mode-b).

(2) Survival Mode
The Survival mode is the mode that the only survival heater is powered on. It will be used for a LLM (Light Load Mode), for an OBC (On Board Computer), for -ΔV or ±Δi manervers, for the critical phase just after the launch, and for the on-orbit initial check out phase (until beginning of DCS instrment check out).

Table 3.4-1 DCS Operation Modes (Routine Operation Phase)

Name of Operation Mode	Normal Observation	Maneuver (1N inplane)	Maneuver (20N inplane)	Maneuver (20N out of plane)	LLM
Operational Mode -a or b	X	X			
Survival Mode			X	X	X

3.4.2 DCS Operation Pattern

DCS basically operates in the Operational Mode-a (UHF-TX ON), except particular request.

3.4.3 DCS Operation Constraints

- During the satellite orbit correction maneuvers (+ΔV nominal maneuvering, 1N inplane) the DCS instrument will stay in the nominal operation.
- During -ΔV (20N inplane) or ±Δi (20N out of plane) maneuvers including yaw maneuvers, the DCS instrument will be set to “Survival mode” due to ADEOS-II electrical power constraints.

3.5 SeaWinds Operation Requests from SeaPAC

(1) Request Contents

SeaPAC sends SeaWinds operation requests to NASDA/EOC using an REQQ file. The REQQ file is mainly described by the following parameters;

1) Operation Request ID : JPLnnnnnnnnn
nnnnnnnnn: unique ID number in the entire mission
2) Sensor Name : SeaWinds (fixed)
3) Sensor Code : SEA (fixed)
4) Operation Command : XXX
Mode Update: WOM, ROM, CAL, STB, CDS
Parameter, Relay update: MC1, MC2, MC3
5) Observation Date : YYYYMMDD (UTC)
6) Command Execution RSP : Path and Argument of latitude
7) Data Word : XXXX
(Necessary for operation commands MC1~3)

SeaPAC requests command execution timing by means of an REQQ file using RSP (see appendix B.5 in MOIS (common))
Parameter update and relay update operation are requested by means of combination of operation command MC1~3 and Data Word.

The detailed format of SeaWinds REQQ file is defined in the “Format Description of Mission Operation Information Files between NASDA and JPL for SeaWinds Project”.

(2) Request Rules and Constraints

- To require update and relay update operation, operation command must be consistent with the number of Data Word in accordance with the following rules.

Table 3.5-1 Command Request Rules

Command	Data Word		
	#1	#2	#3
MC1	O	X	X
MC2	O	O	X
MC3	O	O	O

O: Necessary X: Dummy (= “****”)

- SeaWinds instrument will operate continuously in same operation mode (WOM) in almost time. And, SeaPAC will only set actual mode change point to REQQ file to be sent to the MMO (see bottom line in figure 3.5-1). On the other hand, TACC manages the OBC commands for each orbit. So, even if SeaWinds operation mode is not changed for long time, MMO will separate SeaWinds instrument operation segment to each orbit as command request for TACC. However, except for actual command execution points requested by SeaPAC, MMO will set "CNT" as operation mode of the corresponding operation segment (see middle line in figure 3.5-1). When TACC generate SeaWinds command, the operation mode "CNT" is ignored, and never lead any commands (see top line in figure 3.5-1).

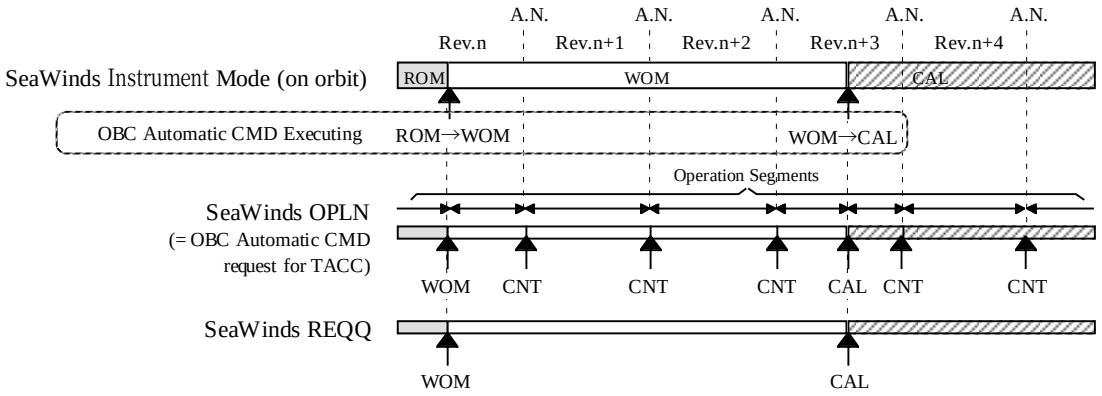


Fig. 3.5-1 Correspondence between REQQ, OPLN and Actual Operation

- SeaPAC will set only actual command execution points into REQQ file necessary to request SeaWinds mission operation. So, if SeaWinds command is not necessary during an operation week, there are no contents in the REQQ file. On the other hand, MMO needs REQQ file every week as a trigger to establish weekly ADEOS-II mission operation plan. So, even if there are no mode changes of SeaWinds in a week, SeaPAC will provide MMO with SeaWinds REQQ file, which consists of only header record.

- SeaPAC can request any macro commands by using operation command MC1~MC3 in REQQ file. Basucally, NASDA doesn't concern what is the purpose of the commands requested by using MC1 ~ MC3. However, if SeaPAC requests to change operational system within SeaWinds instrument from A to B (also from B to A) by using MC1~MC3 in REQQ, it should be notified to NASDA by using OCL.

- Time interval between execution timing of macro commands has to be more than 1 minute.

- Kind of macro commands requested by MC1, MC2 or MC3 in REQQ file has to be less than or equal to 28 per 1 week (1 REQQ file).

- The automatic command execution RSP should be set into REQQ file in consideration of the following restriction.

  ✓ Basic command execution time
  In case basic commands are executed individually in the command sequence and it is not involved in any macro command, execution time of the basic command must be set within the following range in each path.

  Argument of latitude < 359.67 degree

  ✓ Macro command execution time
  Execution time of macro command (the first basic command execution time in the concerned macro command) must be set within the following range in each path.

  Argument of latitude < 359.67 degree

  When a macro command consists of several basic commands and the execution time of some basic commands except the first basic command is over argument of latitude of

359.67 degree, the concerned basic commands are shifted to the next revolution. Therefore, the execution time for the concerned basic commands are possible to be shifted as about 6.0 sec.

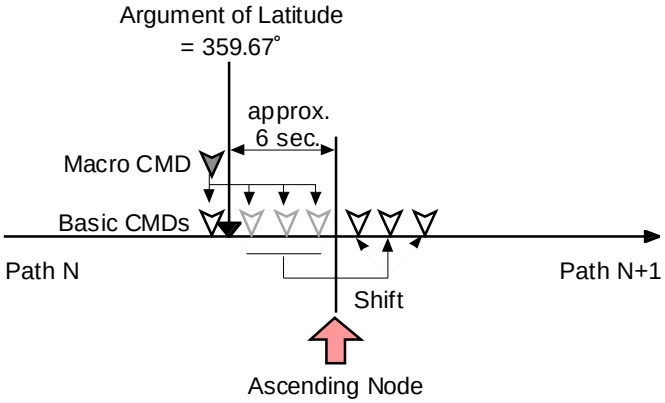


Fig. 3.5-2 Shift of Basic Commands

Moreover, if the shifted basic commands compete with the other commands of same instruments, it will lead to error and command generation will be disturbed.

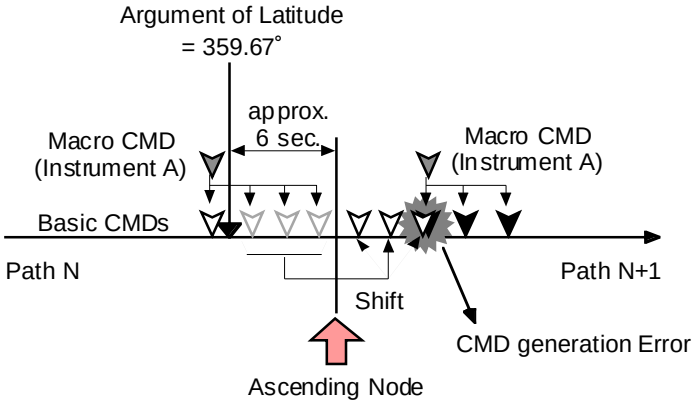


Fig. 3.5-3 Competition of the Shifted Commands

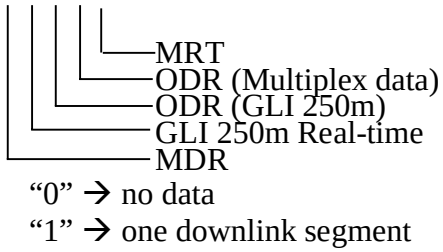
MMO will check command execution RSP described in the REQQ file and inform SeaPACof error by using REQA file, if execution RSP of a command is grater than the argument of latitude of 359.67 degree.
However, if some basic commands are extracted from a macro command, shifted to the next orbit and competed with the other commands of same instrument, the error can not be found by MMO and will be found only after command generation by TACC. In this case, there are no enough time for coordination between NASDA and SeaPAC to prepare the corrected REQQ file. To avoid this risk, it is better not to set command execution RSP within the time range of few seconds (it depends on the number and timing of basic commands included in macro command) before argument of latitude of 359.67 degree or after ascending node.

3.6 Data Acquisition Requests to NASA Ground Stations

(1) Request Contents

NASDA/EOC sends data acquisition requests to the NASA ground stations using an REQR file. The REQR file is mainly described by the following six parameters;

1) Begin date of downlink path : YYYYMMDD_hh:mm:ss (UTC)
2) End date of downlink path : YYYYMMDD_hh:mm:ss (UTC)
3) Begin RSP of downlink path : Path and Argument of latitude
4) End RSP of downlink path : Path and Argument of latitude
5) Designation of X-band transmitters : "X1" or "X3"
6) Designation of acquisition modes : NNNNN



"0" → no data
"1" → one downlink segment

The detailed format of REQR file is defined in the "Format Description of Mission Operation Information Files between NASDA and NGN".

(2) Request Rules and Constraints

An REQR file is required to schedule new supports for NGN ground stations. An REQR is also required to delete a complete support (Downlink Path). At the completion of the REQR/STGS request/confirmation process, each REQR should have a corresponding SHAQ file. The SHAQ file, which is derived from the finalized REQR, is used to set the proper downlink times for each Downlink Segment within each Downlink Path. Delivery details and timing for the REQR and SHAQ files are described in Section 6 of this document.

3.7 Operation Requests from NOAA

(1) Request Contents

NOAA will utilize global SeaWinds data and selected GLI 1km data from areas of interest to NOAA for operational purposes. Both are standing orders.

NASDA will provide the SeaWinds data of global area coverage and selected ocean bands of GLI 1km data from selected areas to NOAA on a near real-time basis.

The request areas for GLI data are shown in Fig. 3.7-1.

The NOAA's request is summarized in Table 3.7-1.

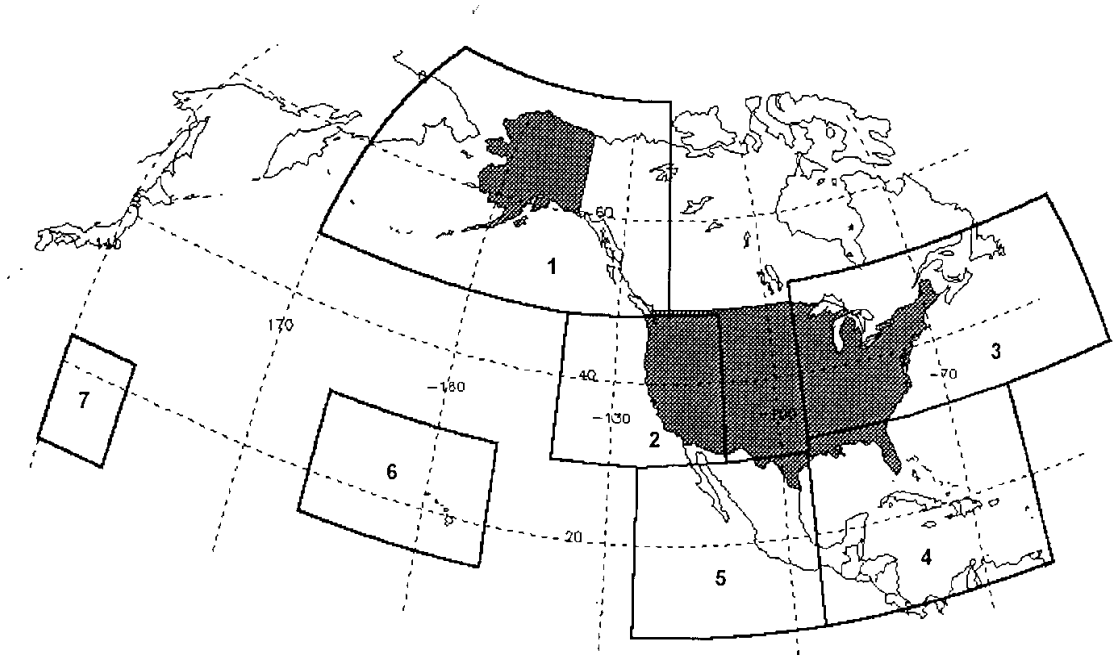
Table 3.7-1 NOAA's Request for SeaWinds and GLI Data

Sensor	Coverage	Bands
SeaWinds	global	all
GLI	fixed area (see Fig. 3.7-1)	~~19~~ **23** bands (1 - **19,** ~~12, 14, 16, 18,~~ 30, 34-36)

(2) Request Rules and Constraints

In the routine operation phase, NOAA does not plan to submit additional observation requests other than the standing order described above. NASDA will provide to NOAA/NESDIS the mission operations plan for review. Mission operation commands for MDR readout, and MRT contacts will be adjusted in order to provide selected GLI 1km data to NOAA/NESDIS in a timely manner.

NOAA CoastWatch Areas of Interest



Region 1 48N-74N, 120W-190W
Beaufort Sea, Bering/Chukchi Seas,
Gulf of Alaska, Alaska South

Region 2 30N-48N, 110W-140W
West Coast

Region 3 32N-51N, 42W-95W
Great Lakes, Northeast, Northeast Extended

Region 4 9N-32N, 60W-95W
Southeast, Gulf of Mexico,
Puerto Rico, Jamaica

Region 5 9N-30N, 95W-125W
Eastern Tropical Pacific

Region 6 15N-30N, 150W-179W
Hawaii

Region 7 10N-23N, 140E-150E
Guam, North Mariana Islands

Fig. 3.7-1 NOAA CoastWatch Program (Requirement for GLI data)

4. Data System Interface Definition

This section provides the summary of the network interface between NASDA and NASA/NOAA for ADEOS-II mission operations. The detailed network interface will be specified in the "Network Communications Interface Control Document between NASDA and NASA/NOAA for the ADEOS-II Project, EOIS/A II-ND-009" and "Network Communications Interface Operations **Procedure**~~Agreement~~ (NIO**P**~~A~~) between NASDA and NASA/NOAA for the ADEOS-II Project, EOIS/AD2-ND-149".

4.1 Communication Link

NASDA and NASA/NOAA shall use the systems designated by respective agencies to exchange the mission data and the mission operation information as follows:

- NASDA designated system :EOIS/DDS (Data Distribution Subsystem) at EOC
- SeaPAC designated system :File Exchanging Subsystem at SeaPAC
- PO.DAAC designated system :PO.DAAC NRT ingest **and distribution subsystem (OCEANIDS)**~~, archive and distribution subsystem (PO.NRT)~~
- NGN designated system :File Exchanging Subsystem at DSMC (Data Services Management Center) in White Sands
  :FAIF (Flight Agency Interface Facility) at ASF
  :SAFS (Standard Autonomous File Server)
  at WFF (SAFS), GSFC (CSAFS) and ASF (SAFS)
- NOAA designated system :NOAA File Server System at NOAA

The block diagram of the communication network between NASDA and NASA/NOAA is illustrated in Fig. 4.1-1.

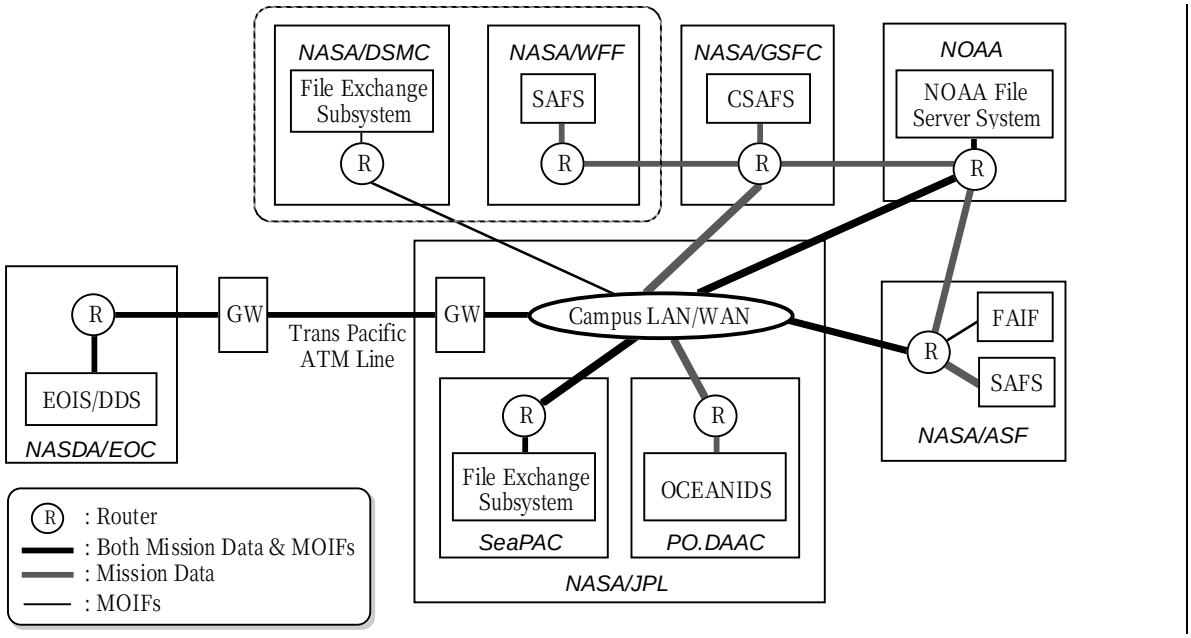


Fig. 4.1-1 Block Diagram of Communication Network between NASDA and NASA/NOAA

4.2 Data Exchange Protocol

The mission operation files and mission data are exchanged using FTP/get or FTP/mget. E-mail (SMTP mail) is used to notify agencies that data is ready or that data has been received.

The exchange procedure is as follows (see Fig. 4.2-1),

Step 1) The sender uses E-mail to inform the receiver that data is ready to be retrieved.
Step 2) The receiver gets the data from the sender using FTP/get or FTP/mget.
Step 3) The receiver uses E-mail to inform the sender that the data was received.

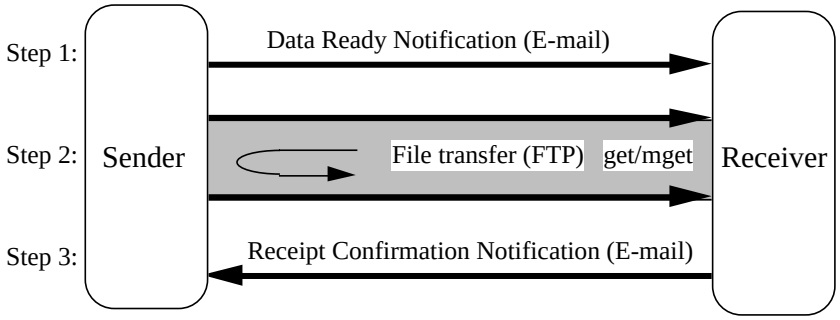


Fig. 4.2-1 Data Handshake Procedure

4.3 File Directories

Files sent from EOC to each organization are placed in an individual subdirectory on the DDS as shown in Table 4.3-1. Each organization can only access its subdirectory with dedicated user accounts. Files sent from each organization to EOC are placed in the system designated by each organization, specified in the Network ICD. NASDA will access the system and get the data.

Table 4.3-1 The Subdirectory for Each Organization on the DDS

Organization	Subdirectory		File
SeaPAC	ADEOS2/mmofe/jpl	/rec	REQQ, SWPF
		/sen	REQA, OPLN
		/comm	EP, ED, TD, STAD, ORST
	ADEOS2/nrt/jpl	/rec	N/A
		/sen	SeaWinds L0, DMS Processed data (time tagged), HK Source
PO.DAAC	ADEOS2/meta/podaac	/rec	N/A
		/sen	N/A
	ADEOS2/nrt/podaac	/rec	N/A
		/sen	AMSR L1A
ASF	ADEOS2/mmofe/ngn/asf	/rec	STGS, RERC, RERB, L0RL, SRRM
		/sen	REQR, OPLN, SHAQ, LV0P, RTIG, RDRM
		/comm	EP, TD, STAD, ORST
	ADEOS2/nrt/ngn/asf	/rec	SeaWinds, AMSR, ILAS-II, DCS, TEDA, VMS and DMS L0, HK source packet
		/sen	N/A
WFF	ADEOS2/mmofe/ngn/wff	/rec	STGS, RERC, RERB, L0RL, SRRM
		/sen	REQR, OPLN, SHAQ, LV0P, RTIG, RDRM
		/comm	EP, TD, STAD, ORST
	ADEOS2/nrt/ngn/wff	/rec	SeaWinds, AMSR, ILAS-II, DCS, TEDA, VMS and DMS L0, HK source packet
		/sen	N/A
NOAA	ADEOS2/mmofe/noaa	/rec	N/A
		/sen	OPLN, RTIG
		/comm	EP, ED, TD, STAD, ORST
	ADEOS2/nrt/noaa	/rec	SeaWinds Met
		/sen	SeaWinds L0, DCS L0, GLI 1km L1A

4.4 Back-up Communication Method

4.4.1 Host Machine Problem (Failover Operation)

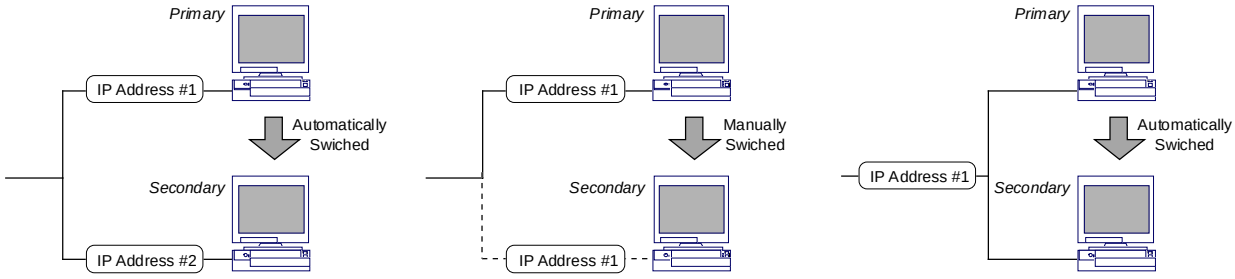
When host machine for data transmission is failed, switching of primary host machine to secondary one will be carried out as the recovery operation (This operation is called “Failover Operation”).
For Failover operation, three kinds of system configuration, shown in below, are applied to the related agencies.

(a) Hot Failover System
- ✓ Both primary and secondary host machines are always turned on.
- ✓ Primary and secondary machines have different IP address.
- ✓ When primary host machine fails, the operation is automatically switched to the secondary machine.

(b) Cold Failover System
- ✓ As normal operation, primary host machine is turned on and secondary machine is turned off.
- ✓ When primary host machine fails, the operation is manually switched to the secondary machine.
- ✓ All of network parameters of primary host machine, such as IP address, are shifted to the secondary machine.

(c) Virtual Failover System
- ✓ Both primary and secondary host machine are always turned on.
- ✓ The IP addresses are managed locally.
- ✓ When primary host machine fails, the operation automatically switchs to the secondary machine (The change is not detected from the outside agencies.).

The conceptual figures of failover system are illustrated in figure 4.4-1.
Moreover, failover system applied by each related agency is summarized in table 4.4-1.
The detailed information about the failover operation is specified in the Network ICD.



(a) Hot System (b) Cold System (c) Virtual System

Fig. 4.4-1 Conceptual Figure of Failover System

Table 4.4-1 Failover system of Each Agency

Agency	Failover System			Note
	Hot	Cold	Virtual	
ASF/FAIF	O			
ASF/SAFS		O		
DSMC		O		
WFF/SAFS		O		
GSFC/CSAFS	O			
SeaPAC	O			
PO.DAAC			O	2 virtual failover systems Secondary system: always on, different IP address, manual switchover
NOAA	O			
EOC/DDS		O		

4.4.2 Network Problem

If data transmission failure is not recovered by failover operation, the following policy is applied as backup communication method.

(1) Mission Data

(a) From EOC to SeaPAC, PO.DAAC and NOAA
When routine delivery of mission data from EOC to SeaPAC, PO.DAAC and NOAA fails due to an anomaly of the primary communication network line, the corresponding data will be re-sent after recovery from network failure.

(b) From NASA stations to EOC
When routine delivery of level 0 and HK source packet data from ASF/WFF to EOC fails due to an anomaly of the primary communication network line, the corresponding data level 0 and HK TLM data will be processed at EOC after reception of Raw data shipped from ASF/WFF.

(c) From NASA stations to SeaPAC and NOAA
When routine delivery of mission data from ASF/WFF to SeaPAC and NOAA fails due to an anomaly of the primary communication network line, the corresponding data will be re-sent after recovery from network failure.

(2) Mission Operation Information Files

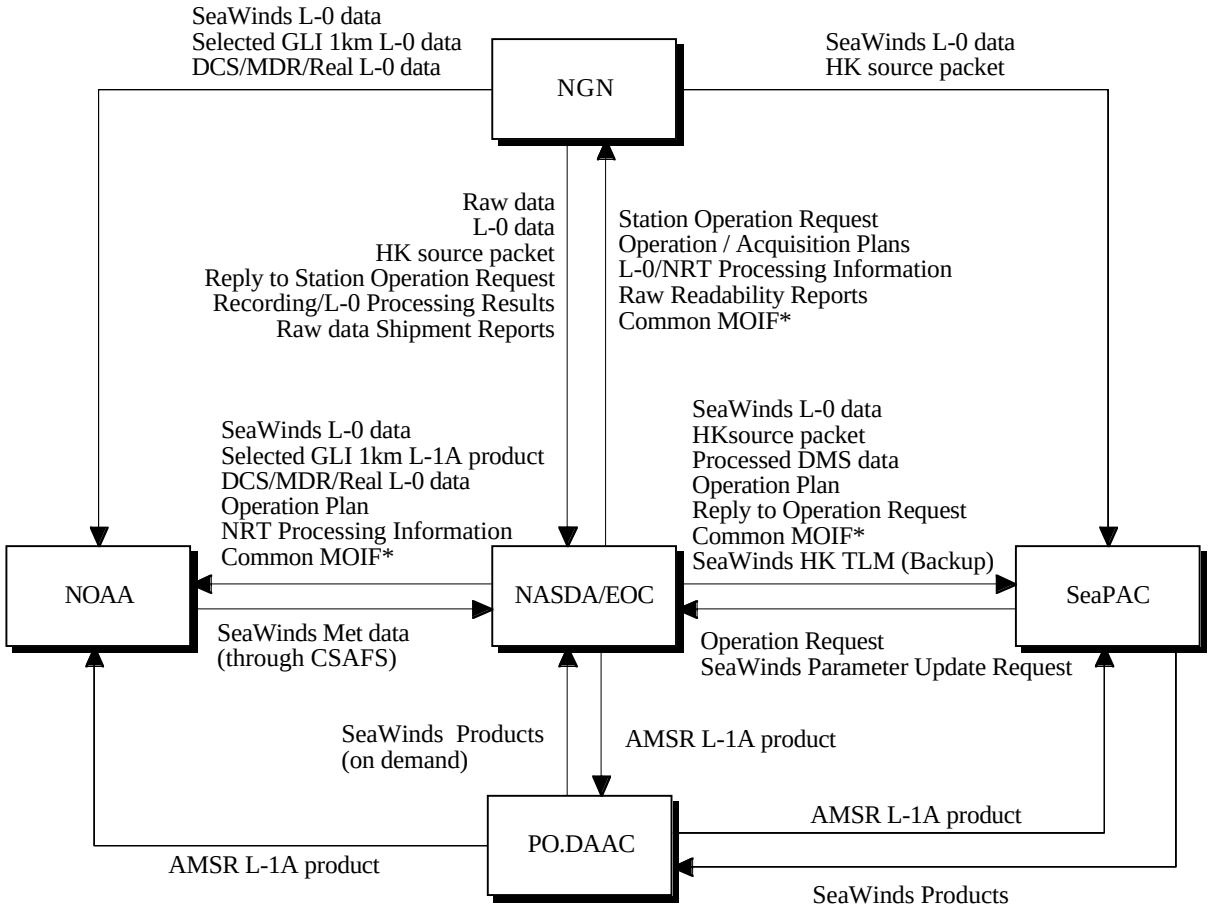
In an anomaly case of transpacific network line, Mission Operation Information Files will be exchanged between NASDA and NASA/NOAA by **e-mail** ~~FTP~~ via internet. The detailed information of the internet back-up method is specified in the NIOP~~A~~.

5. File Interface Definition

This section provides the interface definition of mission operation files and data products to be exchanged between NASDA/EOC and each agency.

The data file interface between NASDA and NASA/NOAA ground segments for the ADEOS-II mission operations is illustrated in Fig. 5-1.

The detailed format description of their files is given in its respective "Format Description" prepared for each agency. The definition and usage of each file are described in the MOIS (Common).



**Common MOIF:*
- *ADEOS-II status information*
- *Orbit data*
- *Time difference data*
- *Operation results*

Fig. 5-1 Data File Interface for ADEOS-II Mission Operations

5.1 Data File Interface between EOC and JPL

NASDA/EOC and JPL (SeaPAC, PO.DAAC) will exchange many kinds of mission operation information files (MOIFs) and mission data products for ADEOS-II mission operations (Except MOIF for PO.DAAC).

Table 5.1-1 specifies the file interface matrix on the common use MOIFs. Table 5.1-2 specifies the file interface matrix on the individual use MOIFs.

Table 5.1-3 provides the file interface matrix of data products. For reference, the file interface with the NASA ground stations and Kiruna station in Mode 2 is also described in this table.

Table 5.1-1 File Interface Matrix between EOC and JPL (Common Use MOIFs)

Contents	Format	Source	Desti-nation	File name	Due date (UTC) or Frequency	Coverage	Nominal system interface	Backup system interface	Estimation file volume
Orbit data (predictive)	ASCII	EOC	SeaPAC	EPyyyymmdd	UT 8:00 Mon., Wed., Fri. *1 UT 8:00 everyday *1 *2	one day data / file (same day and future 4 days)	File via network	~~FTP~~ **e-mail** via internet	137KB/ file
Orbit data (definitive)	ASCII	EOC	SeaPAC	EDyyyymmdd	UT 8:00 Mon., Wed., Fri. *1 UT 8:00 everyday *1 *2	one day data / file (previous 3 days)	File via network	~~FTP~~ **e-mail** via internet	137KB/ file
Time difference	ASCII	EOC	SeaPAC	TDyyyymmdd	UT 7:00 every day	one day data / file	File via network	~~FTP~~ **e-mail** via internet	2 KB/ file
ADEOS-II status information	ASCII	EOC	SeaPAC	STADnnnnnn	UT 9:00 on occasion *3	N/A	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
Operation result information	ASCII	EOC	SeaPAC	ORSTnnnnnn	UT 8:00 every day	one day of EOC, ASF, WFF and Kiruna station.	File via network	~~FTP~~ **e-mail** via internet	24 KB/ file

*1: Due data of orbit data delivery will be UT 10:30 on Monday and Wednesday when maneuver schedule is developed at TACC (10 days and 1 day before the day of Maneuver).

*2: During high solar flux period or when user requires orbit data everyday by specific reason.

*3: Maneuvering schedule will be informed on Wednesday 1 day prior to the day of maneuver (ADEOS-II +ΔV orbit maneuver is carried out on Thursday).

Table 5.1-2 File Interface Matrix between EOC and JPL (Individual Use MOIFs)

Contents	Format	Source	Desti-nation	File Name	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume
Operation request	ASCII	SeaPAC	EOC	REQQnnnnnn	From Wed. 4 weeks before the target week to UT 5:00 Thur. 2 weeks before the target week.	1 week (Wed. to Tue.)	File via network	~~FTP~~ **e-mail** via internet	0.2 KB/file (Min. case*1)
Reply to operation request *4	ASCII	EOC	SeaPAC	REQAnnnnnn	<Principle> Within 2 hours after receipt of REQQ file. *3 <Final> 6:00 UT on Thur. 2 weeks before the target week (prepared only when REQQ includes format error)	Same as REQQ	File via network	~~FTP~~ **e-mail** via internet	Same as REQQ (Max. case *2)
SeaWinds operation plan	ASCII	EOC	SeaPAC	OPLNseannn	UT 8:00 Thur. before the target week.	1 week (Tue. to Mon.)	File via network	~~FTP~~ **e-mail** via internet	73 KB/file (Min. case*1)
SeaWinds parameter file	ASCII	SeaPAC	EOC	SWPF	Occasionally	N/A	File via network	~~FTP~~ **e-mail** via internet	4 - 5 MB/file
Mean Orbit Data	ASCII	TACC	SeaPAC	N/A	UT 7:30 on Wed 1 day before the target day of +DV Maneuver	+ΔV Maneuver of the next day is concerned.	e-mail via internet	N/A	N/A

*1: In case of that only 1 mode is requested by a REQQ file for target 1 week. The file size of SeaWinds REQQ file is depended on the number of commands included in the REQQ.

*2: In case of that format errors are found in all data records of REQQ file.

*3: When the related agencies prepare the REQQ file during the working time of MMO operator, that is the period from 0:20 UT to 6:30 UT on weekday except for Japanese holiday.

***4: Format error notification of REQQ data records. (Format error in REQQ header record is notified by using OCL.)**

Table 5.1-3 Mission Data Interface for JPL

Data	Contents	Format	Mode	Source	Destination	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume
SeaWinds L-0	SeaWinds Level 0 data	Binary	1	EOC	SeaPAC	**80% data** within 160min of obs. ~~(to NOAA)~~	Global; 1 file/downlink	File via network	File via network*4	28.9 MB/file *2
			2	EOC	SeaPAC	ditto	Acquired at EOC; 1 file/downlink	File via network	File via network*4	ditto
				Kiruna	SeaPAC via EOC*1	ditto	Acquired at Kiruna; 1 file/downlink	File via network	File via network*4	ditto
				ASF WFF	SeaPAC	**80 % data** within 150min of obs.	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network*4	ditto
HK	HK source packet data	Binary	1	EOC	SeaPAC	within 5hr of ground data acquisition	Global; 1 file/downlink	File via network	File via network*4	3.1 MB/file *2
			2	EOC	SeaPAC	ditto	Acquired at EOC; 1 file/downlink	File via network	File via network*4	ditto
				Kiruna	SeaPAC via EOC*1	ditto	Acquired at Kiruna; 1 file/downlink	File via network	File via network*4	ditto
				ASF WFF	SeaPAC	ditto	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network*4	ditto
	SeaWinds HK TLM (TACC Processed)	Binary	1 & 2	EOC	SeaPAC	Once / day (Back up)	Acquired at TACC 1 file/day*5	File via network	File via network*4	<1 MB/file
AMSR L-1A	AMSR Level 1A product	Binary	1 & 2	EOC	PO.DAAC	within 24hr of ground data acquisition	Global 1 file/half orbit	File via network	File via network*4	43 MB/file
DMS	DMS Processed data (ATT, ACC*3)	Binary	1 & 2	EOC	SeaPAC	within 8hr of observation (as target)	Global; 1 file/downlink	File via network	File via network*4	ATT: 1.~~1~~**02** MB/file *2 ACC: ~~3.1~~**2.91** MB/file *2
SeaWinds products	SeaWinds Level 1B product	Binary	1 & 2	PO.DAAC	EOC	on a request basis	Global; 1 file/orbit	DLT	N/A	120 MB/file (Compressed) 191.9 MB/file (Uncompressed)
	SeaWinds Level 2A product	Binary	1 & 2	PO.DAAC	EOC	on a request basis	Global; 1 file/orbit	DLT, 8 mm tape	N/A	70 MB/file (Compressed) 192.2 MB/file (Uncompressed)
	SeaWinds Level 2B	Binary	1 & 2	PO.DAAC	General Users (Incl. NASDA)	on a request basis	Global; 1 file/orbit	FTP via internet, 8 mm tape	N/A	3 MB/file (Compressed) 9.4 MB/file (Uncompressed)
	SeaWinds Level 3 product	Binary	1 & 2	PO.DAAC	General Users (Incl. NASDA)	on a request basis	Global; 1 file/day	FTP via internet, CD-R, DVD	N/A	7 MB/file (Compressed) 41.8 MB/file (Uncompressed)

*1: The data acquired at Kiruna will be transmitted to SeaPAC through EOC.
*2: File size for 1 orbit data.
*3: ATT: Time tagged attitude data, ACC: Time tagged accelerometer data
*4: Re-sending after recovery from network failure.
*5: Mode1 → 110 min. stored data + 11 hrs. real data, Mode 2 → 80 min. stored data + 80 min. real data.

5.2 Data File Interface between EOC and NASA Ground Stations

NASDA/EOC and the NASA ground stations (ASF, WFF) will exchange many kinds of mission operation information files (MOIFs) and mission data products for ADEOS-II mission operations.

Table 5.2-1 specifies the file interface matrix on the common use MOIFs of mission operation files. Table 5.2-2 specifies the file interface matrix on the individual use MOIFs.

Table 5.2-3 provides the file interface matrix of data products. For reference, the file interface between ASF/WFF and the agencies other than EOC in Mode 2 is also described in this table.

Table 5.2-1 File Interface Matrix between EOC and NASA Ground Stations (Common Use MOIFs)

Contents	Format	Source	Desti-nation	File name	Due date (UTC) or Frequency	Coverage	Nominal system interface	Backup system interface	Estimation file volume
Orbit data (predictive)	ASCII	EOC	ASF WFF	EPyyyymmdd	UT 8:00 Mon., Wed., Fri. *1 UT 8:00 everyday *1 *2	one day data / file (same day and future 4 days)	File via network	~~FTP~~ **e-mail** via internet	137KB/ file
Time difference	ASCII	EOC	ASF WFF	TDyyyymmdd	UT 7:00 every day	one day data / file	File via network	~~FTP~~ **e-mail** via internet	2 KB/ file
ADEOS-II status information	ASCII	EOC	ASF WFF	STADnnnnnn	UT 9:00 on occasion *3	N/A	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
Operation result information	ASCII	EOC	ASF WFF	ORSTnnnnnn	UT 8:00 every day	one day of EOC, ASF, WFF and Kiruna station.	File via network	~~FTP~~ **e-mail** via internet	24 KB/ file

*1: Due data of orbit data delivery will be UT 10:30 on Monday and Wednesday when maneuver schedule is developed at TACC (10 days and 1 day before the day of Maneuver).

*2: During high solar flux period or when user requires orbit data everyday by specific reason.

*3: Maneuvering schedule will be informed on Wednesday 1 day prior to the day of maneuver (ADEOS-II +ΔV orbit maneuver is carried out on Thursday).

Table 5.2-2 File Interface Matrix between EOC and NASA Ground Stations (Individual Use MOIFs)

Contents	Format	Sour-ce	Desti-nation	File name	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume
Station Operation Request	ASCII	EOC	ASF WFF	REQRnnnnnn	First: UT 8:00Thur. 3 weeks before the target week.*1	1 week (Wed. to Tue.)	File via network	~~FTP~~ **e-mail** via internet	3 KB/ file
Reply to Station Operation Request	ASCII	ASF WFF	EOC	STGSnnnnnn	First: UT 1:00 Fri. (next day after receipt of first REQR). Last: UT 1:00 Wed. 2 weeks before the target week*1	1 week (Wed. to Tue.)	File via network	~~FTP~~ **e-mail** via internet	2 KB/ file (Max. case *2)
Operation plan (all sensors)	ASCII	EOC	ASF WFF	OPLNnnnnnn	UT 8:00 Thur. 1 week before the target week.	1 week (Tue. to Mon.)	File via network	~~FTP~~ **e-mail** via internet	70~250 KB/file*3
Acquisition plan	ASCII	EOC	ASF WFF	SHAQnnnnnn	UT 8:00 Thur. 1 week before the target week.	1 week (Wed. to Tue.)	File via network	~~FTP~~ **e-mail** via internet	56 KB/ file
Data Recording result	ASCII	ASF WFF	EOC	RERCnnnnnn RERBnnnnnn	any time after completion of data acquisition	1 file / each acquisition.	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
Level 0 processing info.	ASCII	EOC	ASF WFF	LV0Pnnnnnn	UT 8:00 Mon., Wed. and Fri.	Mon. delivery; 1 file for 2 days (Wed. and Thur.) Wed. delivery; 1 file for 2 days (Fri. and Sat.) Fri. delivery; 1 file for 3 days (Sun. to Tue.)	File via network	~~FTP~~ **e-mail** via internet	20 KB/ file
Level 0 processing results	ASCII	ASF WFF	EOC	L0RLnnnnnn	any time after completion of Level 0 data processing	1 file for each downlink segment.	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
NRT Product processing info.	ASCII	EOC	ASF WFF	RTIGnnnnnn	UT 8:00 Mon., Wed. and Fri.	same as Level 0 processing information	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
Raw data shipment report	ASCII	ASF WFF	EOC	SRRMnnnnnn	upon shipment of raw data	1 file for 1 cassette	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
Raw data readability report	ASCII	EOC	ASF WFF	RDRMnnnnnn	within 10 days after receipt of raw data at EOC.	1 file for 1 cassette	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file

*1: As needed, EOC and ASF/WFF should repeat station operation coordination by REQR and STGS during this period.
*2: In case that all requested passes in REQR are rejected.
*3: File size of OPLN is different for each sensor.

Table 5.2-3 Mission Data Interface for NASA Ground Stations

Data	Contents	Format	Mode	Source	Destination	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume
Raw data	GLI 250m raw data	Binary	1	ASF WFF	EOC	3 times a week; (Mon, Wed. and Fri.)	Acquired at ASF/WFF	D1-M cassette	D1-M cassette	ASF: 4~6 tapes WFF: 1~2 tapes /1 delivery
	MDR, GLI 250m and/or ODR data	Binary	2	ASF WFF	EOC	3 times a week; (Mon, Wed. and Fri.)	Acquired at ASF/WFF	D1-M cassette	D1-M cassette	ASF: 4~6 tapes WFF: 1~2 tapes /1 delivery
DCS L-0	DCS/Real Level 0 data	Binary	1 & 2	ASF WFF	EOC[*1]	Within 100 min. after level 0 data processing[*9]	Acquired at ASF/WFF; 1 file/downlink	File via network	N/A	1 MB/file [*6]
			1 & 2	ASF WFF	NOAA[**]	70% data within 10min of ground data acquisition (to NOAA)	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*11]	Ditto
	DCS/MDR Level 0 data	Binary	2	ASF WFF	EOC[*1]	Within 100 min. after level 0 data processing[*9]	Acquired at ASF/WFF; 1 file/downlink	File via network	Raw Data	7.6 MB/file [*7]
			2	ASF WFF	NOAA[*2]	70% data within 3hr of obs. (to CLS/Largo)	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*11]	ditto
AMSR L-0	AMSR Level 0 data	Binary	2	ASF WFF	EOC	Within 100 min. after level 0 data processing[*9]	Acquired at ASF/WFF; 1 file/downlink	File via network	Raw Data	66.2 MB/file [*7]
ILAS-II L-0	ILAS-II Level 0 data	Binary	2	ASF WFF	EOC[*3]	Within 100 min. after level 0 data processing[*9] (within 5hr of ground data acq. (to EA))	Acquired at ASF/WFF; 1 file/downlink	File via network	Raw Data	81.7 MB/file [*7]
TEDA L-0	TEDA Level 0 data	Binary	2	ASF WFF	EOC[*4]	Within 100 min. after level 0 data processing[*9] [*10]	Acquired at ASF/WFF; 1 file/downlink	File via network	Raw Data	0.3 MB/file [*7]
VMS L-0	VMS/Real Level 0 data	Binary	1 & 2	ASF WFF	EOC	On a request basis[*10]	Acquired at ASF/WFF; 1 file/downlink	File via network	N/A	1.7 MB/file [*6]
	VMS/MDR Level 0 data	Binary	2	ASF WFF	EOC	Within 100 min. after level 0 data processing[*9] [*10]	ditto	File via network	Raw Data	14.7 MB/file [*7]
DMS L-0	DMS-1&2/Real Level 0 data	Binary	1 & 2	ASF WFF	EOC	On a request basis[*10]	Acquired at ASF/WFF; 1 file/each DMS-1 & 2 downlink	File via network	N/A	0.4 MB/file [*6]
	DMS-1&2/MDR Level 0 data	Binary	2	ASF WFF	EOC	Within 100 min. after level 0 data processing[*9] [*10]	ditto	File via network	Raw Data	3.1 MB/file [*7]
SeaWinds L-0	SeaWinds Level 0 data	Binary	2	ASF WFF	NOAA[*5]	within 150min of obs. (to NOAA)	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*11]	28.9 MB/file [*7]
HK data	HK source packet data	Binary	2	ASF WFF	EOC	Within 100 min. after level 0 data processing[*9]	Acquired at ASF/WFF; 1 file/downlink	File via network	Raw Data	3.1 MB/file [*7]

Data	Contents	Format	Mode	Source	Destination	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume
GLI L-0	Selected GLI/Real 1km Level 0 data	Binary	1 & 2	ASF WFF	NOAA	within 11hr of obs.	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network*11	330 MB/file *8 (Max.)
	Selected GLI/MDR 1km Level 0 data	Binary	2	ASF WFF	NOAA	Ditto	ditto	File via network	File via network*11	394 MB/file *8

*1: To CLS/Japan through EOC as backup interface.
*2: To CLS/Largo through NOAA.
*3: To EA through EOC.
*4: To TKSC/TEDA through EOC.
*5: To SeaPAC through NOAA also. The data will be used at both NOAA and SeaPAC.
*6: File size of MRT data for 1 pass. (1 pass = 12 min.)
*7: File size of MDR data for 1 orbit. (1 orbit = 101 min. for global sensor, 24 min. for ILAS-II, 20 min. for VMS and 57 min. for TEDA)
*8: File size of selected GLI 1km level 0 data is estimated based on the result of pre-launch mission operation analysis. (ref.: Network IRD)
*9: Priority for level 0 data transmission from ASF/WFF to EOC is: HK source packet > DCS > AMSR > ILAS-II > DMS > VMS > TEDA (the priority will be changed, if necessary)
*10: If NASDA requires ASF/NGN to deliver VMS and DMS level 0 data quickly, these data will be transmitted to EOC prior to other level 0 data.
*11: Re-sending after recovery from network failure.

5.3 Data File Interface between EOC and NOAA

NASDA/EOC and NOAA/NESDIS will exchange many kinds of mission operation information files (MOIFs) and mission data products for ADEOS-II mission operations.

Table 5.3-1 specifies the file interface matrix on the common use MOIFs of mission operation files. Table 5.3-2 specifies the file interface matrix on the individual use MOIFs.

Table 5.3-3 provides the file interface matrix of data products. For reference, the file interface with the NASA ground stations and Kiruna station is also described in this table.

Table 5.3-1 File Interface Matrix between EOC and NOAA (Common Use MOIFs)

Contents	Format	Source	Desti-nation	File name	Due date (UTC) or Frequency	Coverage	Nominal system interface	Backup system interface	Estimation file volume
Orbit data (predictive)	ASCII	EOC	NOAA	EPyyyymmdd	UT 8:00 Mon., Wed., Fri. *1 UT 8:00 everyday *1 *2	one day data / file (same day and future 4 days)	File via network	~~FTP~~ **e-mail** via internet	137KB/ file
Orbit data (definitive)	ASCII	EOC	NOAA	EDyyyymmdd	UT 8:00 Mon., Wed., Fri. *1 UT 8:00 everyday *1 *2	one day data / file (previous 3 days)	File via network	~~FTP~~ **e-mail** via internet	137KB/ file
Time difference	ASCII	EOC	NOAA	TDyyyymmdd	UT 7:00 every day	one day data / file	File via network	~~FTP~~ **e-mail** via internet	2 KB/ file
ADEOS-II status information	ASCII	EOC	NOAA	STADnnnnnn	UT 9:00 on occasion *3	N/A	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file
Operation result information	ASCII	EOC	NOAA	ORSTnnnnnn	UT 8:00 every day	one day of EOC, ASF, WFF and Kiruna station.	File via network	~~FTP~~ **e-mail** via internet	24 KB/ file

*1: Due data of orbit data delivery will be UT 10:30 on Monday and Wednesday when maneuver schedule is developed at TACC (10 days and 1 day before the day of Maneuver).

*2: During high solar flux period or when user requires orbit data everyday by specific reason.

*3: Maneuvering schedule will be informed on Wednesday 1 day prior to the day of maneuver (ADEOS-II +ΔV orbit maneuver is carried out on Thursday).

Table 5.3-2 File Interface Matrix between EOC and NOAA (Individual Use MOIFs)

Contents	Format	Sour-ce	Desti-nation	File name	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume
Operation plan (all sensors)	ASCII	EOC	NOAA	OPLNnnnnnn	UT 8:00 Thur. 1 week before the target week.	1 week (Tue. to Mon.)	File via network	~~FTP~~ **e-mail** via internet	70~250 KB/file*1
NRT Product processing info. (GLI)	ASCII	EOC	NOAA	RTIGnnnnnn	UT 8:00 Mon., Wed. and Fri.	Mon. delivery; 1 file for 2 days (Wed. and Thur.) Wed. delivery; 1 file for 2 days (Fri. and Sat.) Fri. delivery; 1 file for 3 days (Sun. to Tue.)	File via network	~~FTP~~ **e-mail** via internet	1 KB/ file

*1: File size of OPLN is different for each sensor.

Table 5.3-3 Mission Data Interface for NOAA

Data	Contents	Format	Mode	Source	Destination	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume (KByte)
SeaWinds L-0	SeaWinds Level 0 data	Binary	1	EOC	NOAA	**80% data** within 160min of observation ~~(to NOAA)~~	Global; 1 file/downlink	File via network	File via network[*6]	28.9 MB/file [*4]
			2	EOC	NOAA	ditto	Acquired at EOC; 1 file/downlink	File via network	File via network[*6]	ditto
				Kiruna	NOAA via EOC	ditto	Acquired at Kiruna; 1 file/downlink	File via network	File via network[*6]	ditto
				ASF WFF	NOAA	**80% data** within 150min of observation	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*6]	ditto
GLI L-1A	Selected GLI 1km Level 1A product	Binary	1	EOC	NOAA	within 11hr of observation	Global	File via network	File via network[*6]	~~260~~**315** MB/file [*5] (Max.)
			2	EOC	NOAA	within 11hr of observation	Acquired at EOC	File via network	File via network[*6]	~~188~~**228** MB/file [*5] (Max.)
				Kiruna	NOAA via EOC	within 11hr of observation	Acquired at Kiruna	File via network	File via network[*6]	~~149~~**180** MB/file [*5] (Max.)
GLI L-0	Selected GLI/Real 1km Level 0 data	Binary	1 & 2	ASF WFF	NOAA	within 11hr of observation	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*6]	330 MB/file [*5] (Max.)
	Selected GLI /MDR 1km Level 0 data	Binary	2	ASF WFF	NOAA	within 11hr of observation	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*6]	394 MB/file [*5]
DCS L-0	DCS/Real Level 0 data	Binary	1 & 2	EOC	NOAA[*1]	N/A	Acquired at EOC; 1 file/downlink	File via network	File via network[*6]	1 MB/file [*3]
				Kiruna	NOAA via EOC[*1]	N/A	Acquired at Kiruna; 1 file/downlink	File via network	File via network[*6]	ditto
				ASF WFF	NOAA[*2]	70% data within 10min of ground data acquisition (to CLS/Largo)	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*6]	ditto
DCS L-0	DCS/MDR Level 0 data	Binary	1	EOC	NOAA[*1]	N/A	Global; 1 file/downlink	File via network	File via network[*6]	7.6 MB/file [*4]
			2	EOC	NOAA[*1]	N/A	Acquired at EOC; 1 file/downlink	File via network	File via network[*6]	ditto
				Kiruna	NOAA via EOC[*1]	N/A	Acquired at Kiruna; 1 file/downlink	File via network	File via network[*6]	ditto
				ASF WFF	NOAA[*2]	70% data within 3hr of obs. (to CLS/Largo)	Acquired at ASF/WFF; 1 file/downlink	File via network	File via network[*6]	ditto

Data	Contents	Format	Mode	Source	Destination	Due date (UTC) or Frequency	Coverage	Nominal system interface	Back-up system interface	Estimation file volume (KByte)
SeaWinds Met	SeaWinds Met data	Binary	1 & 2	NOAA	EOC	Data ready at NOAA within 3hr of observation	Global	File via network (through CSAFS)	File via network*6	17.5 MB/file *4

*1: To CLS/Largo via NOAA as backup interface.
*2: To CLS/Largo via NOAA as primary interface.
*3: File size of MRT data for 1 pass. (1 pass = 12 min.)
*4: File size of MDR data for 1 orbit. (1 orbit = 101 min. for global sensor)
*5: File size of selected GLI 1km level 0 data is estimated based on the result of pre-launch mission operation analysis. (ref.: Network IRD)
*6: Re-sending after recovery from network failure.
*7: In order to avoid pile-up of data at NGN Ground stations, the system is designed to move all the data from each orbit to NOAA before the following data capture starts.

5.4 Data Product Transfer Scheme

The data product transfer scheme between NASDA, NASA and NOAA for ADEOS-II mission operations is described below.

5.4.1 Data Flow in Mode 1

The ADEOS-II mission data flow in the Mode 1 is illustrated in Fig. 5.4-1.

(1) Data Acquisition

In the Mode 1, ADEOS-II Mission data will be acquired using IOCS and X-band downlinks as shown in Table 5.4-1.

EOC will acquire:
(a) MDR data, GLI 250m data and/or ODR data via the Q channel of IOCS;
(b) GLI 250m data via the X1 band;
(c) DCS data included in MRT data via the I channel of IOCS;
(d) VMS and DMS data included in MRT data via the I channel of IOCS, as needed.

The Kiruna station, ASF and WFF will acquire:
(e) GLI 250m data via the X1 band;
(f) DCS, data included in MRT data via the X3 band;
(g) VMS and DMS data included in MRT data via the X3 band, as needed;
(h) GLI 1km data included in MRT data via the X3 band (ASF and WFF only).

Table 5.4-1 Data Acquisition in Mode 1

Transmission	Data	Ground Stations
IOCS Q channel (60Mbps)	MDR, GLI 250m and/or ODR data	EOC
IOCS I channel (6Mbps)	DCS data VMS and DMS data, as needed (included in MRT)	EOC
X1 (60Mbps)	GLI 250m data	EOC, Kiruna, ASF, WFF
X3 (6Mbps)	DCS/GLI 1km data VMS and DMS data, as needed (included in MRT)	ASF, WFF
	DCS data VMS and DMS data, as needed (included in MRT)	Kiruna

(2) Data Processing and Distribution

In the Mode 1, the data processing to be done at each station is summarized in Table 5.4-2.

EOC will :
(a) process MDR data to produce SeaWinds Level 0 data and deliver it to NOAA and SeaPAC via electronic file transfer;
(b) process MDR data to produce HK TLM source packet data and deliver it to SeaPAC via electronic file transfer;
(c) process MDR data to produce selected GLI 1km Level 1A product and deliver it to NOAA via electronic file transfer;
(d) process MDR data to produce AMSR Level 1A product and deliver it to PO.DAAC via electronic file transfer;
(e) process MDR and MRT data to produce DCS Level 0 and deliver it to CLS/Largo via NOAA,

as a backup;
(f) route DCS/Real Level 0 data, sent from ASF/WFF, to CLS/Japan as a backup;
(g) route DCS/Real level 0 data, sent from Kiruna station, to CLS/Largo via NOAA, as a back up.
(h) process MDR data to produce DMS processed data and deliver it to SeaPAC via electronic file transfer.

Kiruna station will process:
(i) MRT data to produce DCS/Real Level 0 data and deliver it to CLS/Largo through EOC and NOAA via electronic file transfer as a backup.

ASF and WFF will process:
(j) GLI 250m data to produce GLI 250m Raw data and deliver it to EOC using ID-1 tape;
(k) MRT data to produce DCS/Real Level 0 data and deliver it to EOC and CLS/Largo through NOAA via electronic file transfer;
(l) MRT data to produce selected GLI 1km Level 0 data and deliver it to NOAA via electronic file transfer;
(m) MRT data to produce VMS, DMS-1 and DMS-2 Level 0 data and deliver them to EOC via electronic file transfer on a request basis.

NOAA will:
(n) process SeaWinds Level 0 data to produce SeaWinds Met data NRT products and deliver them to EOC through the CSAFS via electronic file transfer;
(o) route DCS/MDR/Real Level 0 data, sent from EOC, to CLS/Largo as a backup;
(p) route DCS/Real Level 0 data, sent from ASF/WFF, to CLS/Largo.

SeaPac will:
(q) process SeaWinds level 0 data to produce SeaWinds Level 1B/2A/2B/3 products and deliver it to PO.DAAC for archiving.

PO.DAAC will:
(r) deliver SeaWinds Level 1B and 2A products to EOC by using DLT or 8mm tape on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists.
(s) make SeaWinds Level 2B and 3 products available to general users including NASDA.
(t) Deliver AMSR L1A product to SeaPAC and NOAA.

Table 5.4-2 Data Processing in Mode 1 (related to the NASDA/NASA/NOAA interface)

Station	Input Data	Output Data	Destination	I/F
EOC	MDR data	SeaWinds Level 0 data	- SeaPAC - NOAA	via network
		DCS Level 0 data	- CLS/Largo thru NOAA	via network
		HK TLM source packet data	- SeaPAC	via network
		Selected GLI 1km Level 1A product	- NOAA	via network
		AMSR Level 1A product	- PO.DAAC - SeaPAC (from PO.DAAC) - NOAA (from PO.DAAC)	via network
		DMS Processed data	- SeaPAC	via network
	MRT data	DCS/Real Level 0 data (including data from Kiruna)	- CLS/Largo thru NOAA	via network
ASF/WFF	GLI 250m data	GLI 250m Raw data	- EOC	ID-1 cassette
	MRT data	DCS/Real Level 0 data	- CLS/Largo thru NOAA - EOC - CLS/Japan thru EOC	via network
		GLI/Real 1km Level 0 data	- NOAA	via network
		VMS, DMS-1&2 Level 0 data (request basis)	- EOC	via network
NOAA	SeaWinds Level 0 data (from EOC)	SeaWinds Met data	- EOC (through CSAFS)	via network
SeaPAC	SeaWinds Level 0 data (from EOC)	SeaWinds Level 1B product	- EOC (Delivered from PO.DAAC)	DLT
		SeaWinds Level 2A product	- EOC (Delivered from PO.DAAC)	8mm tape, DLT
		SeaWinds Leve 2B product	- General Users (incl. NASDA) (Distributed from PO.DAAC)	via internet, 8 mm tape,
		SeaWinds Leve 3 product	- General Users (incl. NASDA) (Distributed from PO.DAAC)	via internet, CD-R, DVD

5.4.2 Data Flow in Mode 2

The ADEOS-II mission data flow in the Mode 2 is illustrated in Fig. 5.4-2.

In the Mode 2, ADEOS-II Mission data will be acquired using X-band downlinks as shown in Table 5.4-3.

(1) Data Acquisition

EOC, the Kiruna station, ASF and WFF will acquire;
(a) MDR data, GLI 250m data and/or ODR data via the X1 band;
(b) DCS data included in MRT data via the X3 band;
(c) VMS and DMS data included in MRT data via the X3 band, as needed;
(d) GLI 1km data included in MRT data via the X3 band (ASF and WFF only).

Table 5.4-3 Data Acquisition in Mode 2

Transmission	Data	Ground Stations
X1 (60Mbps)	MDR, GLI 250m and/or ODR data	EOC, Kiruna, ASF, WFF
X3 (6Mbps)	DCS data VMS and DMS data, as needed (included in MRT)	EOC, Kiruna
	DCS/GLI 1km data VMS and DMS data, as needed (included in MRT)	ASF, WFF

(2) Data Processing and Distribution

In the Mode 2, the data processing to be done at each station is summarized in Table 5.4-4.

EOC will process:
(a) MDR data to produce SeaWinds Level 0 data and deliver it to NOAA and SeaPAC via electronic file transfer;
(b) MDR data to produce HK TLM source packet data and deliver it to SeaPAC via electronic file transfer;
(c) MDR data to produce selected GLI 1km Level 1A product and deliver it to NOAA via electronic file transfer;
(d) MDR data to produce DCS/MDR Level 0 data and deliver it to CLS/Largo through NOAA via electronic file transfer as a backup;
(e) MRT data to produce DCS/Real Level 0 data and deliver it to CLS/Largo through NOAA via electronic file transfer as a backup;
(f) MDR data to produce AMSR Level 1A product and deliver it to PO.DAAC via electronic file transfer;
(g) AMSR Level 0 data, delivered from the Kiruna station, ASF and WFF, to produce AMSR Level 1A product and deliver it to PO.DAAC via electronic file transfer;
(h) route Level 0 data, sent from Kiruna and ASF・WFF, to each destination;
(i) route DCS/MDR/Real Level 0 data, sent from ASF/WFF, to CLS/Japan as a backup;
(j) route DCS/MDR/Real level 0 data, sent from Kiruna station, to CLS/Largo via NOAA, as a back up.
(k) MDR data to produce DMS processed data and deliver it to SeaPAC via electronic file transfer.
(l) VMS Level 0 data, delivered from the Kiruna station, ASF and WFF, to produce DMS processed data and deliver it to SeaPAC via electronic file transfer;

Kiruna station will process:
(m) MDR data to produce SeaWinds Level 0 data and deliver it to NOAA and SeaPAC through EOC via electronic file transfer;
(n) MDR data to produce HK TLM source packet data and deliver it to SeaPAC through EOC via electronic file transfer;
(o) MDR data to produce selected GLI 1km Level 0 data and deliver it to EOC via electronic file transfer;
(p) MDR data to produce AMSR Level 0 data and deliver it to EOC via electronic file transfer;
(q) MDR data to produce selected VMS and DMS-1&2 Level 0 data and deliver it to EOC via electronic file transfer;
(r) MDR and MRT data to produce DCS/MDR/Real Level 0 data and deliver it to CLS/Largo through EOC and NOAA via electronic file transfer as a backup.

ASF and WFF will process:
(s) X1 data to produce MDR, GLI 250m and/or ODR Raw data and deliver it to EOC using ID-1 tape;
(t) MDR data to produce AMSR Level 0 data and deliver it to EOC via electronic file transfer;
(u) MDR data to produce VMS and DMS-1&2 Level 0 data and deliver them to EOC via electronic file transfer;
(v) MDR data to produce ILAS-II Level 0 data and deliver it to EA through EOC via electronic file transfer;
(w) MDR data to produce TEDA Level 0 data and deliver it to TKSC/TEDA through EOC via electronic file transfer;
(x) MDR data to produce SeaWinds Level 0 data and deliver it to SeaPAC and NOAA via electronic file transfer;
(y) MDR data to produce DCS/MDR Level 0 data and deliver it to EOC and CLS/Largo through NOAA via electronic file transfer;
(z) MDR data to produce HK source packet data and deliver it to EOC and SeaPAC via electronic file transfer;
(aa) MDR data to produce selected GLI Level 0 data and deliver it to NOAA via electronic file transfer;
(ab) MRT data to produce DCS/Real Level 0 data and deliver it to EOC and CLS/Largo through NOAA via electronic file transfer;
(ac) MRT data to produce GLI/Real 1km Level 0 data and deliver it to NOAA via electronic file transfer;
(ad) MRT data to produce selected VMS and DMS-1&2 Level 0 data and deliver it to EOC via electronic file transfer on a request basis.

NOAA will process:
(ae) SeaWinds Level 0 data, delivered from EOC, ASF and WFF, to produce SeaWinds Met data NRT products and deliver them to EOC through the CSAFS via electronic file transfer;
(af) route DCS/MDR/Real Level 0 data, sent from EOC, to CLS/Largo as a backup;
(ag) route DCS/MDR/Real Level 0 data, sent from ASF/WFF, to CLS/Largo.

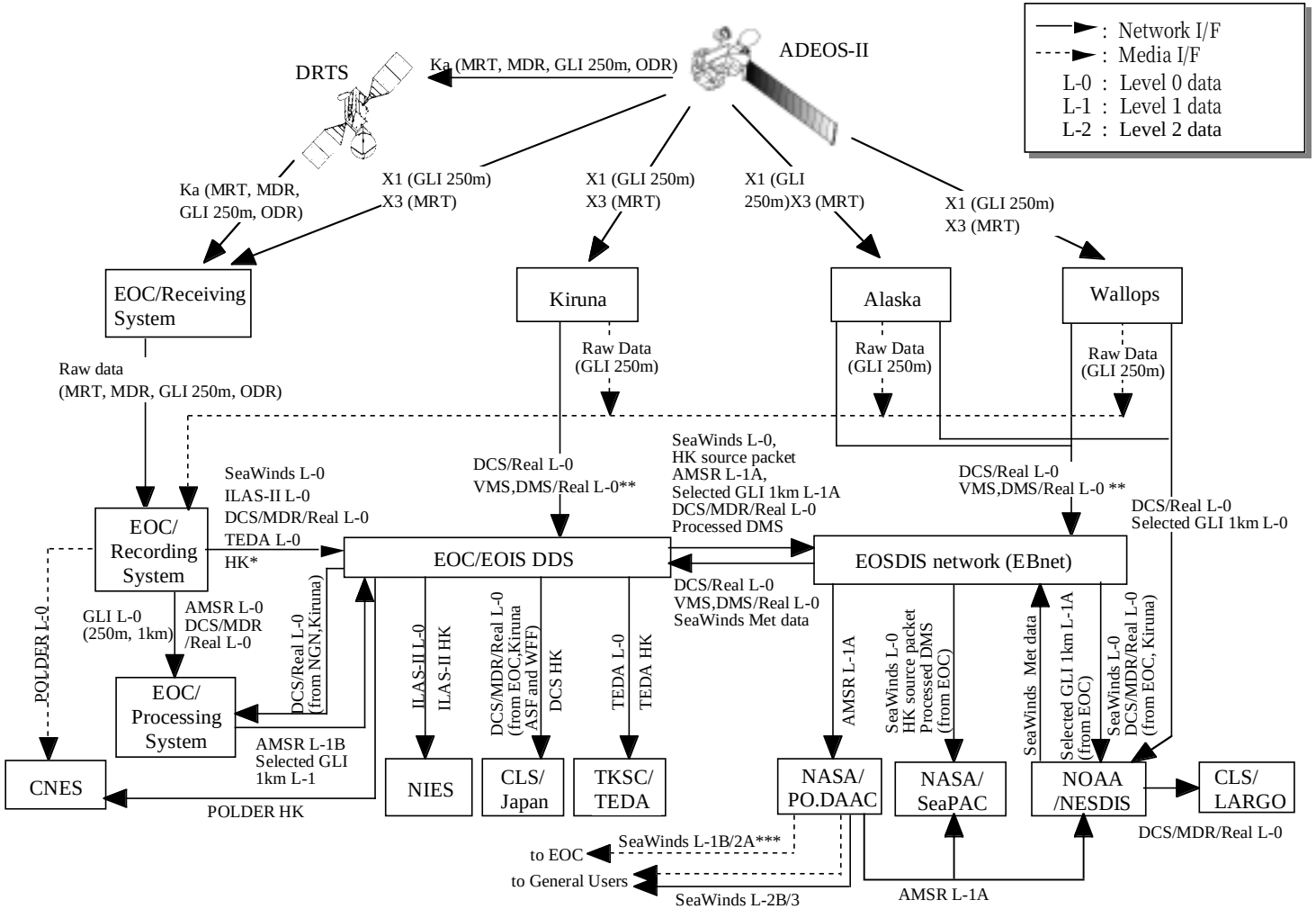
PO.DAAC will:
(ah) deliver SeaWinds Level 1B and 2A products to EOC by using DLTor 8mm tape on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists.
(ai) make SeaWinds Level 2B and 3 products available to general users including NASDA.
(aj) Deliver AMSR L1A product to SeaPAC and NOAA.

Table 5.4-4 Data Processing in Mode 2 (related to the NASDA/NASA/NOAA interface)

Station	Input Data	Output Data	Destination	I/F
EOC	MDR data	SeaWinds Level 0 data*	- SeaPAC - NOAA	via network
		DCS/MDR Level 0 data*	- CLS/Largo thru NOAA	via network
		HK TLM source packet data*	- SeaPAC	via network
		Selected GLI 1km Level 1A product*	- NOAA	via network
		AMSR Level 1A product	- PO.DAAC - SeaPAC (from PO.DAAC) - NOAA (from PO.DAAC)	via network
		DMS Processed data	- SeaPAC	via network
	AMSR Level 0 data (from Kiruna & NGN)	AMSR Level 1A product	- PO.DAAC	via network
	DMS-1&2 Level 0 data (from Kiruna & NGN)	DMS processed data	- SeaPAC	via network
	MRT data	DCS/Real Level 0 data*	- CLS/Largo thru NOAA	via network
ASF /WFF	X1 data	MDR, GLI 250m and/or ODR Raw data	- EOC	ID-1 cassette
	MDR data	AMSR Level 0 data	- EOC	via network
		ILAS-II Level 0 data	- NIES thru EOC	via network
		SeaWinds Level 0 data	- SeaPAC - NOAA	via network
		DCS/MDR Level 0 data	- CLS/Largo thru NOAA - EOC - CLS/Japan thru EOC	via network
		TEDA Level 0 data	- TKSC/TEDA thru EOC	via network
		HK source packet data	- EOC - SeaPAC	via network
		Selected GLI 1km Level 0 data	- NOAA	via network
		VMS, DMS-1&2 Level 0 data	- EOC	via network
	MRT data	DCS/Real Level 0 data	- CLS/Largo thru NOAA - EOC - CLS/Japan thru EOC	via network
		VMS, DMS-1&2 Level 0 data (request basis)	- EOC	via network
		GLI/Real 1km Level 0 data	- NOAA	via network
NOAA	SeaWinds Level 0 data (from EOC * & NGN)	SeaWinds Met data	- EOC (through CSAFS)	via network
SeaPAC	SeaWinds Level 0 data (from EOC * & NGN)	SeaWinds Level 1B product	- EOC (Delivered from PO.DAAC)	DLT
		SeaWinds Level 2A product	- EOC (Delivered from PO.DAAC)	8mm tape, DLT
		SeaWinds Leve 2B product	- General Users (incl. NASDA) (Distributed from PO.DAAC)	via internet, 8 mm tape,
		SeaWinds Leve 3 product	- General Users (incl. NASDA) (Distributed from PO.DAAC)	via internet, CD-R, DVD

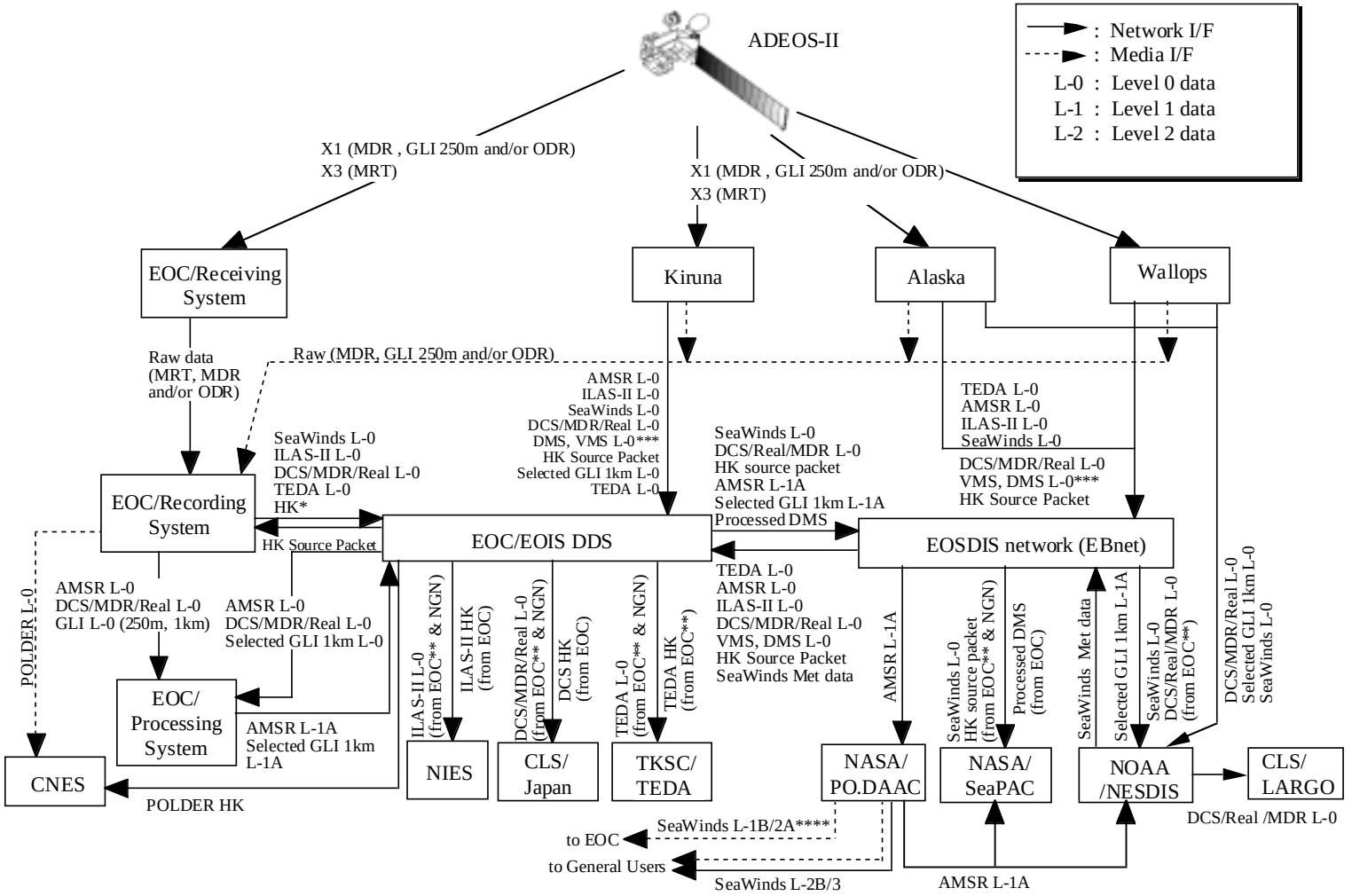
* including data from the Kiruna station.

Fig. 5.4-3 summarizes data flows from each ground station to each data destination for Modes 1 and 2.



*: HK telemetry data of ILAS-II, DCS, POLDER, TEDA and HK telemetry source packet
**: VMS and DMS/Real L-0 data is provided from NGN and Kiruna to EOC on a request basis.
***: SeaWinds L-1B/2A is provided from PO.DAAC to EOC on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists.

Fig. 5.4-1 Data Transfer Scheme between NASDA/NASA/NOAA in Mode 1



*: HK telemetry data of ILAS-II, DCS, POLDER , TEDA and HK telemetry source packet
**: Including Kiruna station
***: VMS, DMS/Real L-0 is provided from NGN and Kiruna to EOC on a request basis.
****: SeaWinds L-1B/2A is provided from PO.DAAC to EOC on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists.

Fig. 5.4-2 Data Transfer Scheme between NASDA/NASA/NOAA in Mode 2

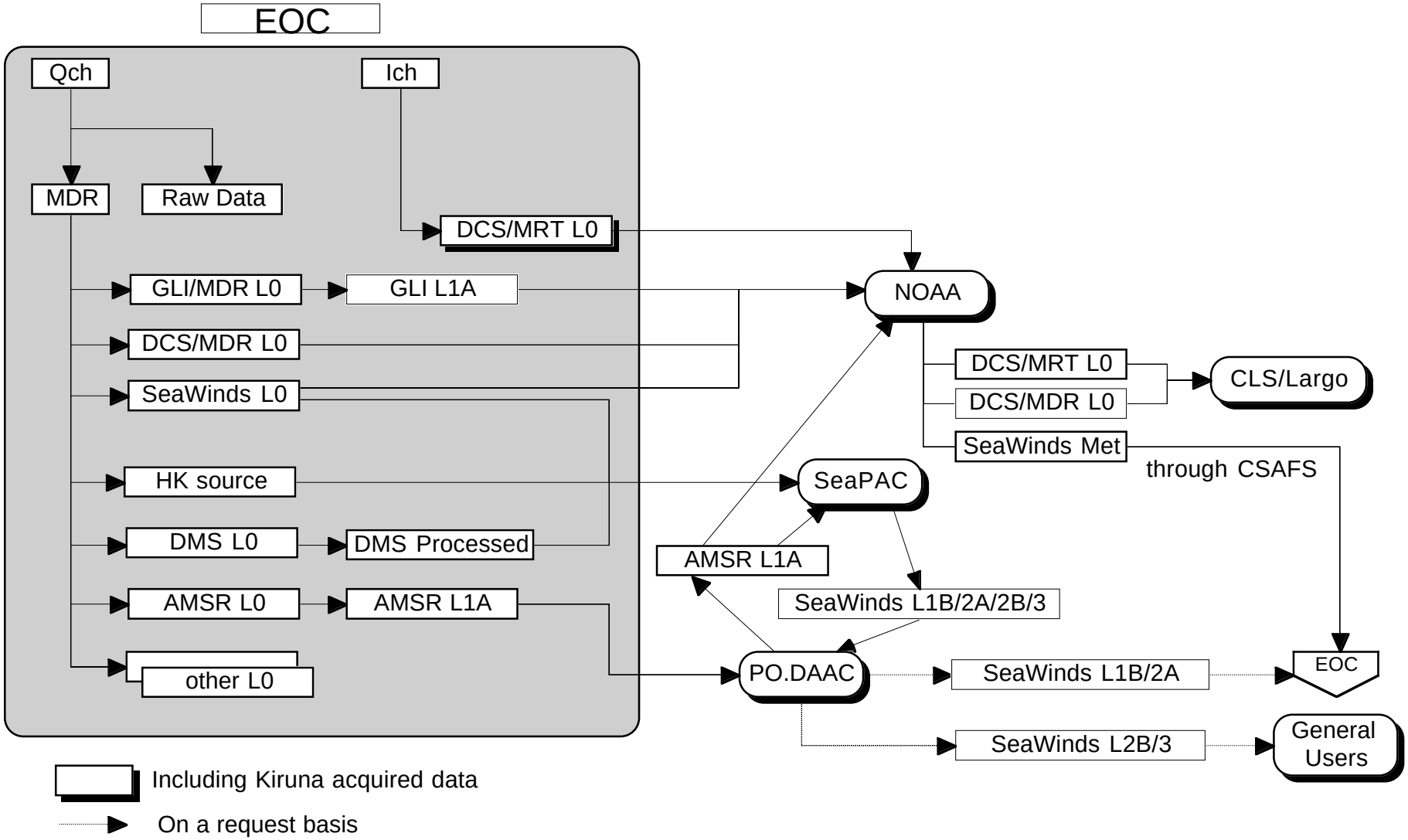


Fig. 5.4-3 (a) ADEOS-II Data Flow (Mode 1, from EOC & Kiruna)

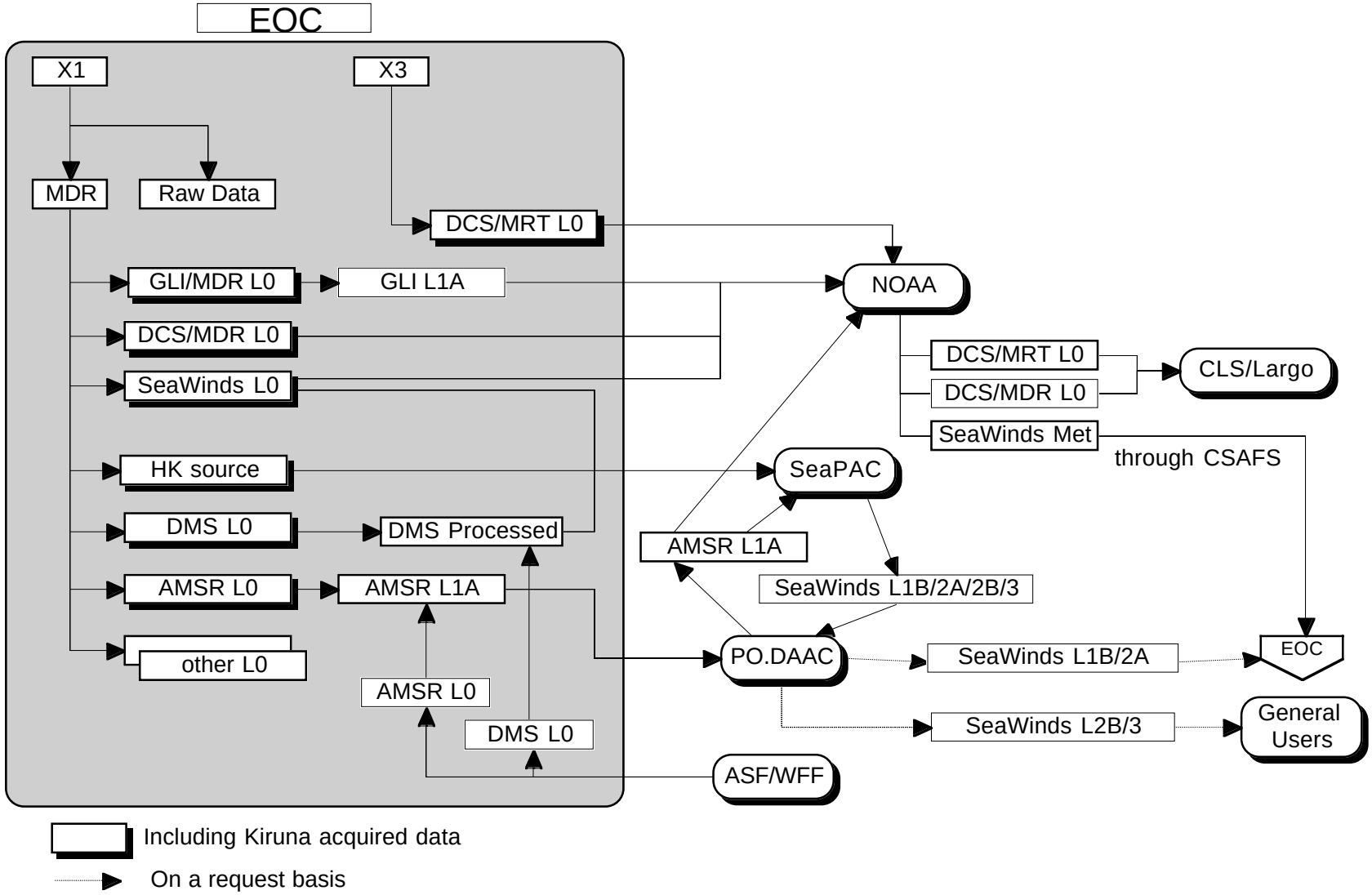


Fig. 5.4-3 (b) ADEOS-II Data Flow (Mode 2, from EOC & Kiruna)

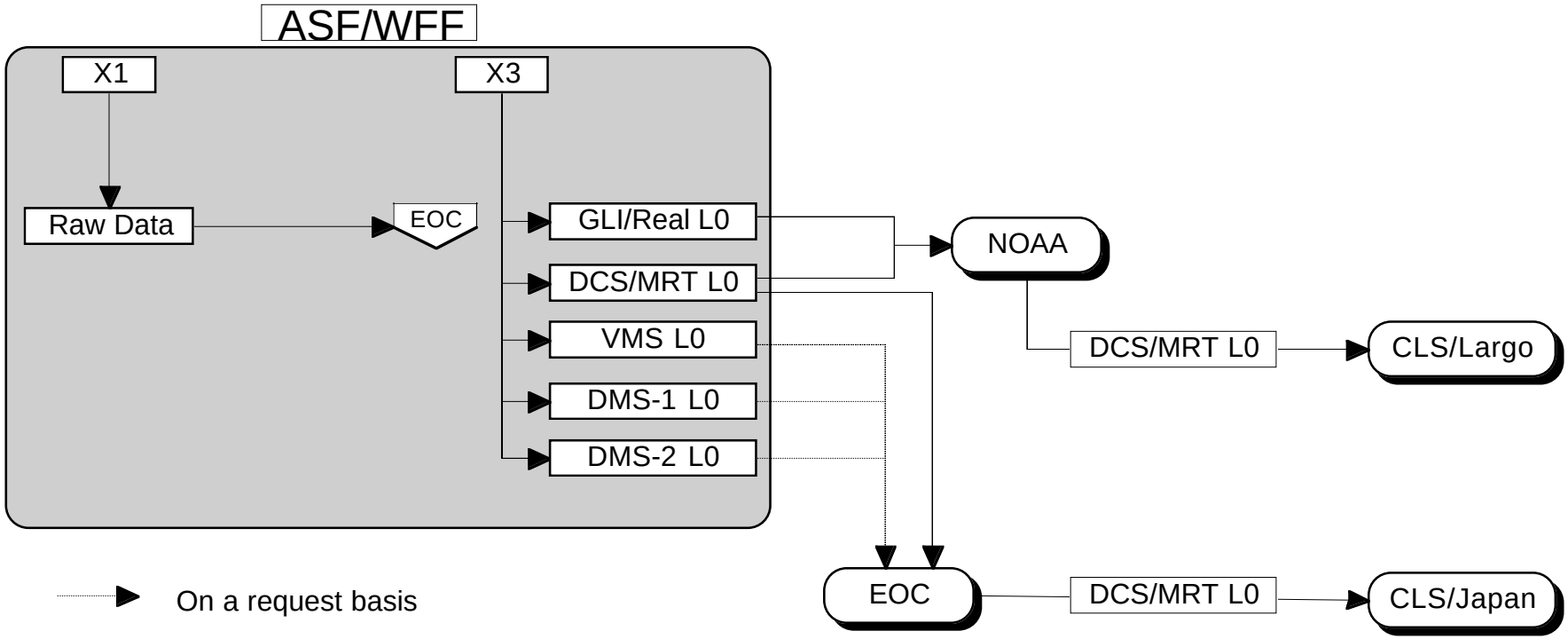


Fig. 5.4-3 (c) ADEOS-II Data Flow (Mode 1, from ASF & WFF)

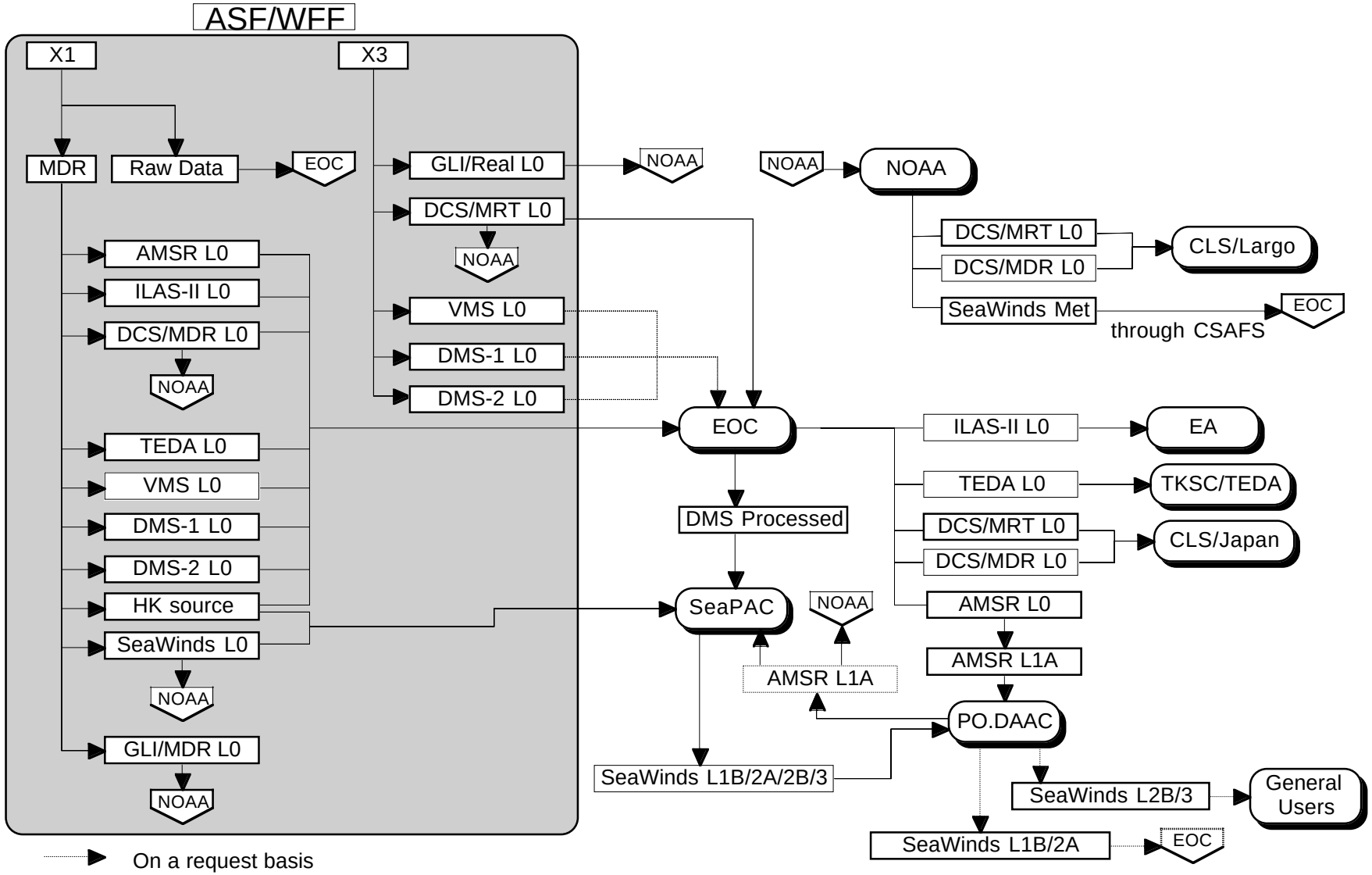


Fig. 5.4-3 (d) ADEOS-II Data Flow (Mode 2, from ASF & WFF)

5.5 HK TLM Data Transfer Scheme

NASDA will provide HK TLM source packet data to SeaPAC.

The ADEOS-II HK TLM data flows are illustrated in Figures 5.5-1 and 5.5-2, and the data flow can be read from Tables 5.4-2 and 5.4-4.

(1) Mode 1

In the Mode 1, global ADEOS-II HK TLM source packet data will be acquired at EOC via IOCS.

EOC will send the HK TLM source packet data to SeaPAC via electronic file transfer.

(2) Mode 2

In the Mode 2, global ADEOS-II HK source packet data will be acquired at EOC, the Kiruna station, ASF and WFF via X band downlink.

EOC will send HK TLM source packet data in MDR data to SeaPAC.

The Kiruna station will generate HK TLM source packet data from MDR data and send it to EOC via electronic file transfer. And EOC will route the HK TLM source packet data to SeaPAC via electronic file transfer.

ASF and WFF will generate HK TLM source packet data from MDR data and send it to SeaPAC directly via electronic file transfer.

(3) Backup of HK TLM Data

For an anomaly on MDR data acquisition including HK TLM data and for the on-orbit initial checkout period, NASDA will provide SeaPAC with SeaWinds HK TLM data files processed at TACC instead of HK TLM source packet data.

The file name definition, data format and data coverage of SeaWinds HL TLM data is different from HK source packet data.

(a) File Name
File name of SeaWinds HK TLM data is defined as follows.

HKSSPYYMMDDnn

where	HK	: HK TLM data (fixed)
	SS	: Sensor ID (“SW” for SeaWinds)
	P	: Processor ID (“T” for TACC processed data)
	YYMMDD	: File generation date
	nn	: Sequential number per day (always “1” for TACC processed data

(b) Data Format
Data format of the SeaWinds HK TLM data processed at TACC is different to HK TLM source packet data, because the HK TLM data, acquired by TACC, is not packet data. The detailed data

format of SeaWinds HK TLM data, processed at TACC, is defined in the appendix 4 of this MOIS

(c) Data Coverage
In the normal operation, HK source packet data is acquired globally as MDR data. However, TACC will acquire HK TLM data partially as described in the section 6.3 of MOIS common part. So, data coverage of the SeaWinds HK TLM data processed at TACC is different to HK TLM source packet data.

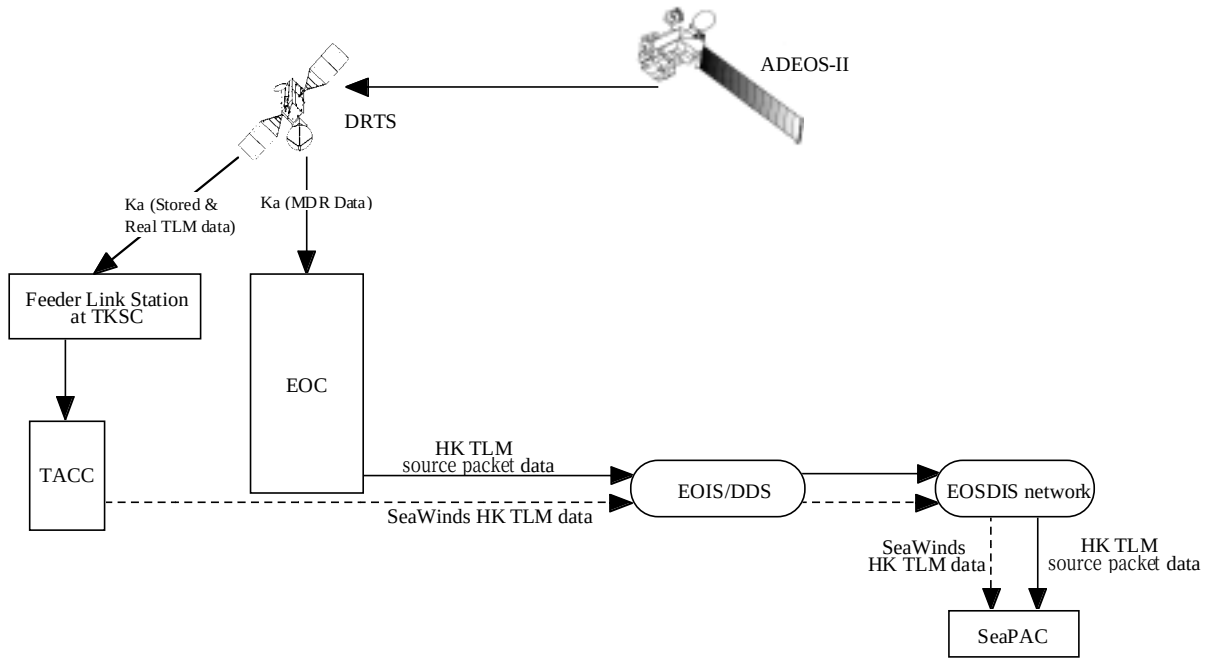


Fig. 5.5-1 HK TLM Data Transfer Scheme for SeaWinds in Mode 1

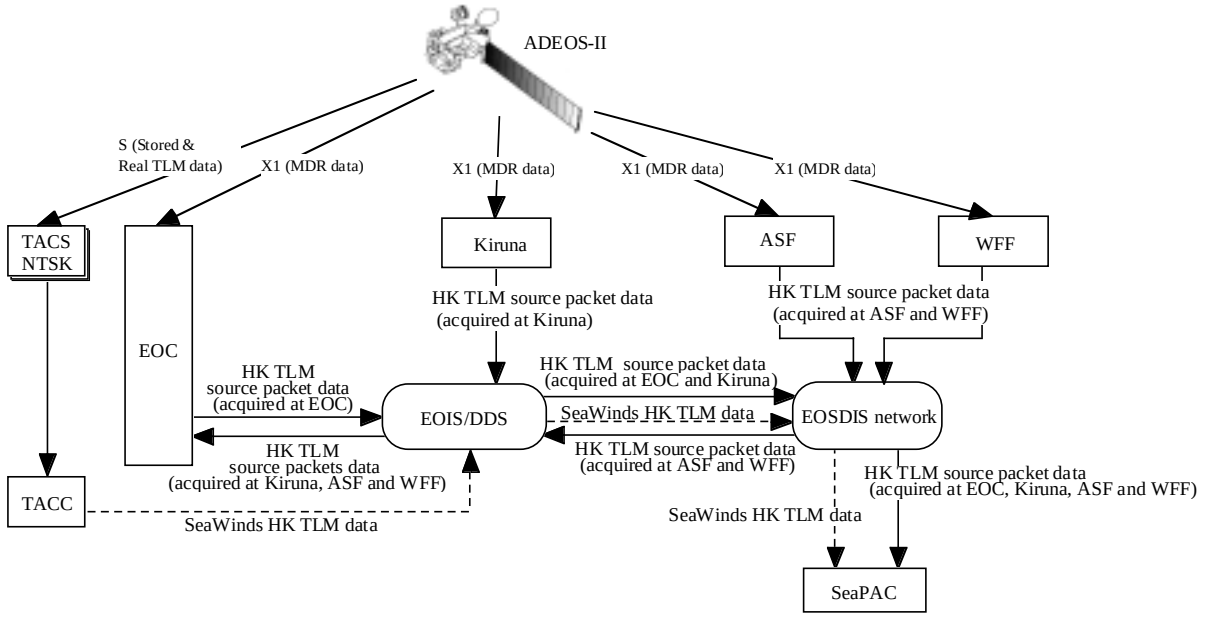


Fig. 5.5-2 HK TLM Data Transfer Scheme for SeaWinds in Mode 2

5.6 Data Delivery Delay

(1) Data Delivery from EOC

Level 0 data from EOC is illustrated in Fig. 5.6-1 and 5.6-2.

Delivery delay for MDR data is summarized in Table 5.6-1.
EOC will complete Level 0 data readiness at DDS within 140 minutes of observation for MDR data in nominal operation.

Table 5.6-1 Level 0 Data Delivery Delay Time Estimation from EOC (MDR Data)

Step	Time
From MDR Recording Start to its Reproducing End	Max. 130 min
Level 0 Processing and Post Processing, etc. at EOC Recording System	7 min after end of data acquisition
FTP Transfer from EOC Recording System to DDS	3 min
TOTAL (From observation to Level 0 data readiness at DDS)	Max. 140 min

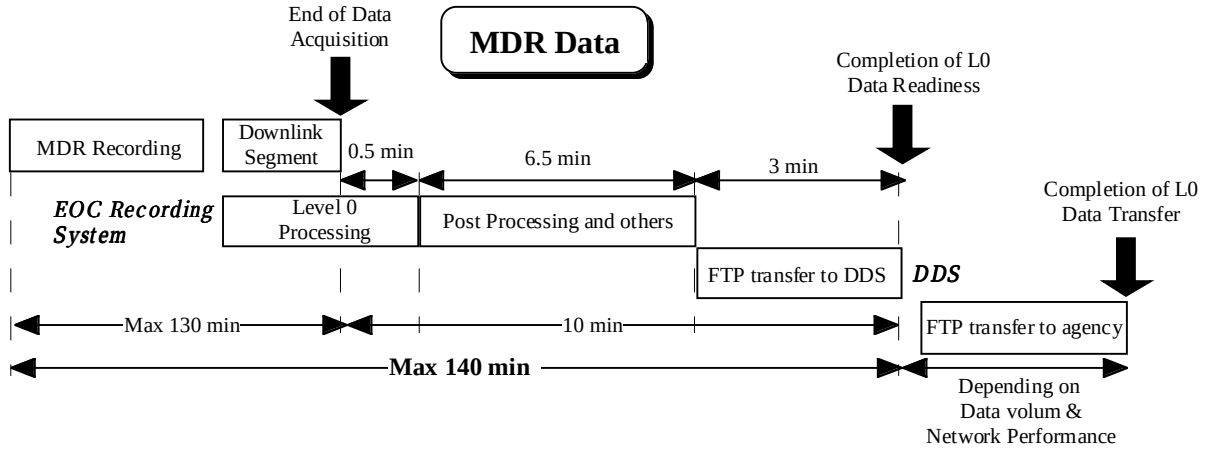


Fig. 5.6-1 Level 0 Data Delivery Delay from EOC (MDR Data)

Delivery delay for MRT data is summarized in Table 5.6-2.
EOC will complete Level 0 data readiness at DDS within 7 minutes of data acquisition for MRT data in nominal operation.

Table 5.6-2 Level 0 Data Delivery Delay Time Estimation from EOC (MRT Data)

Step	Time
Level 0 Processing and Post Processing, etc. at EOC Recording System	5 min after end of data acquisition
FTP Transfer from EOC Recording System to DDS	2 min
TOTAL (From observation to Level 0 data readiness at DDS)	7 min

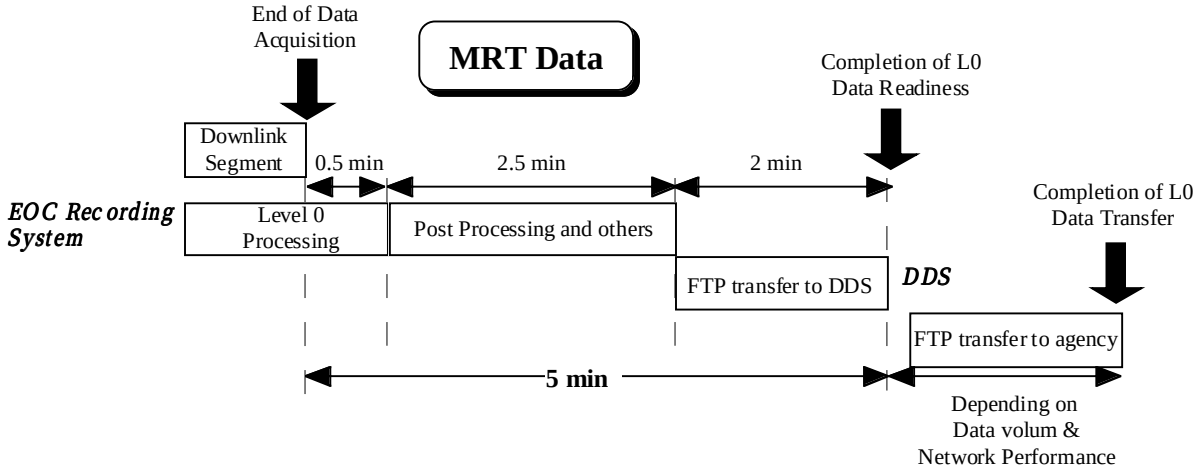


Fig. 5.6-2 Level 0 Data Delivery Delay from EOC (MRT Data)

(2) Data Delivery from Kiruna Station

The data delivery delay of MDR data from Kiruna station is illustrated in Fig. 5.6-3.

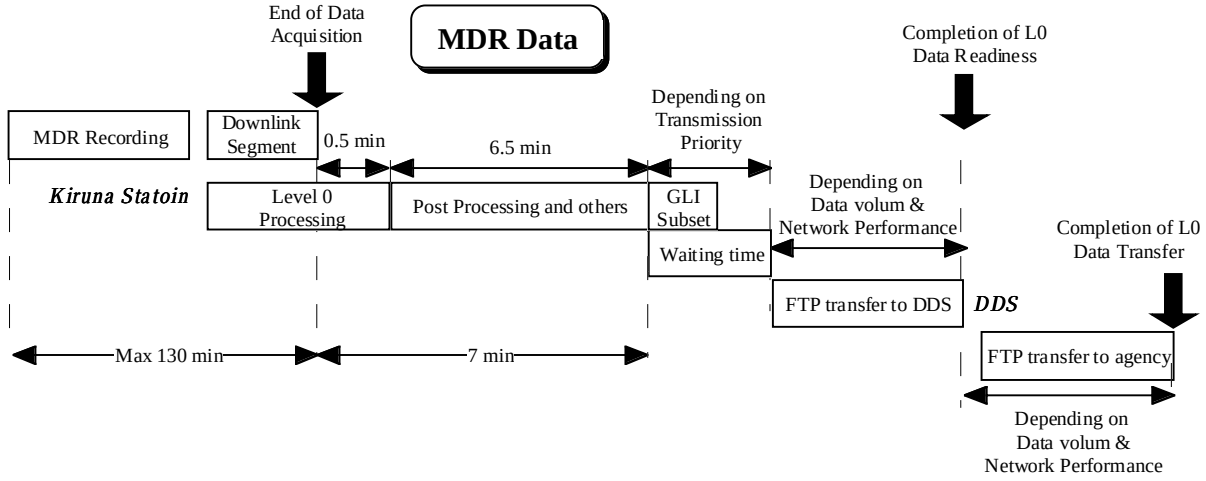


Fig. 5.6-3 Level 0 Data Delivery Delay from Kiruna (MDR Data)

Where, level 0 data (except for SeaWinds) processed at Kiruna station from MDR data will be waiting for a few minutes before transferring to EOC/DDS, because level 0 data transmission between Kiruna station and DDS will be performed one by one to use network as well as possible. The level 0 data transmission from Kiruna to DDS is performed based on the priority shown in table 5.6-3. Subset processing of GLI 1km level 0 data (area selection for NOAA) will basically be completed while waiting time for transmission start of the GLI 1km subset data.

Table 5.6-3 Level 0 Data Transmission Priority (Kiruna)

Priority	Level 0 Data
1	SeaWinds
2	HK Source Packet
3	DCS (MDR)
4	AMSR
5	GLI (area selected for NOAA)
6	ILAS-II
7	DMS-1 (Accelerator data)
8	DMS-2 (Star tracker data)
9	VMS
10	TEDA

Moreover, if a level 0 data transmission to DDS is not finished before 10 minutes* prior to start time of data transmission of next pass data, the data will be transmitted to DDS in same time of next pass data (See Fig. 5.6-4).

*: This is changeable parameter and will be tuned up to the suitable value in accordance with the condition of operation test and actual routine operation.

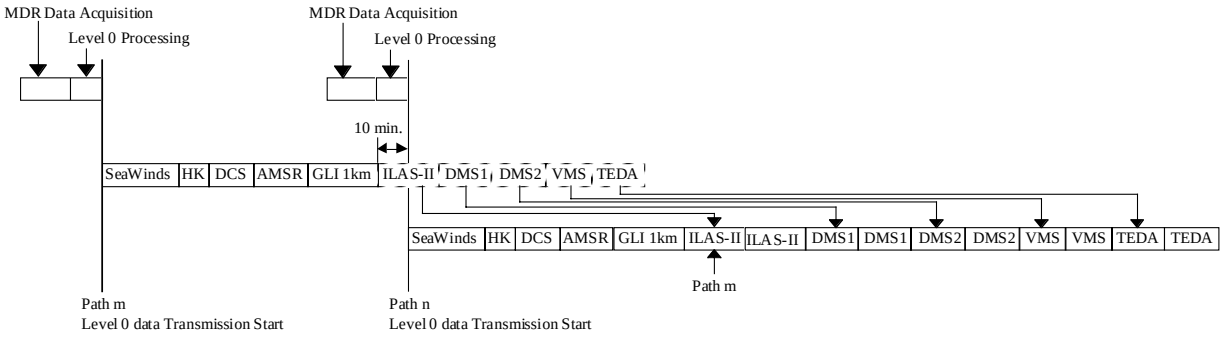


Fig. 5.6-4 Special Case of Level 0 data Transmission

The data delivery delay of MRT data from Kiruna station is illustrated in Fig. 5.6-5.

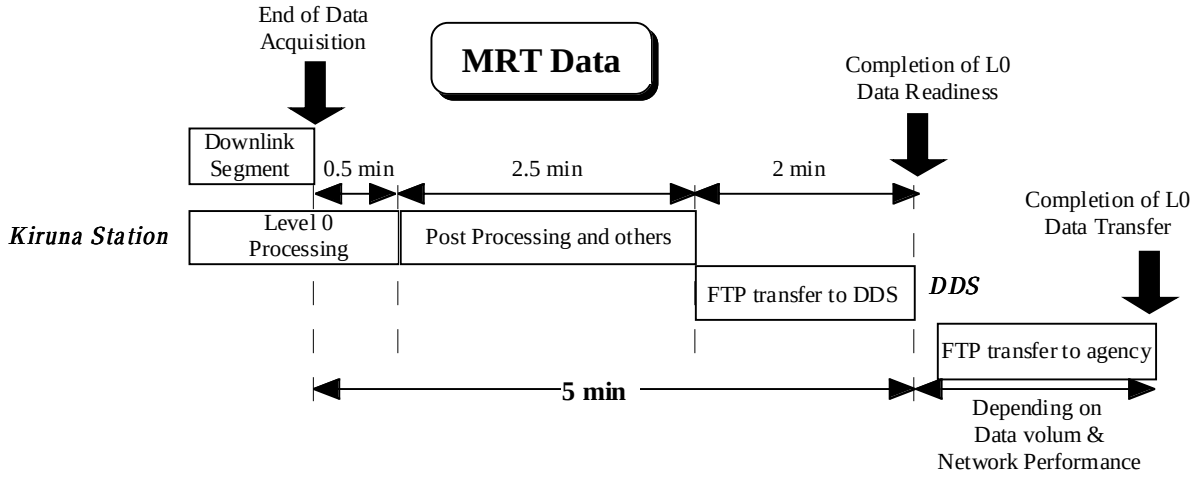


Fig. 5.6-5 Level 0 Data Delivery Delay from Kiruna (MRT Data)

(3) Data Delivewry from ASF and WFF

Timeline for level 0 data delivery from ASF and WFF is illustrated in figure 5.6-6 ~ 5.6-9 for both MDR and MRT data.
Level 0 data processed at ASF is transmitted to SAFS for retrieval from EOC, SeaPAC and NOAA. On the other hand, level-0 data processed at WFF is transmitted to CSAFS through SAFS, for retrieval from EOC, SeaPAC and NOAA.

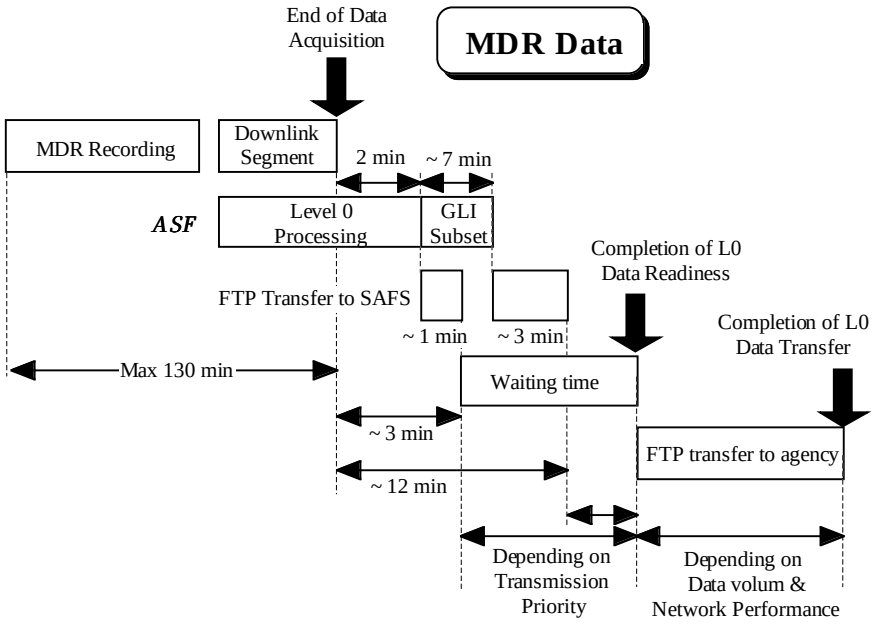


Fig. 5.6-6 Level 0 Data Delivery Delay from ASF (MDR Data)

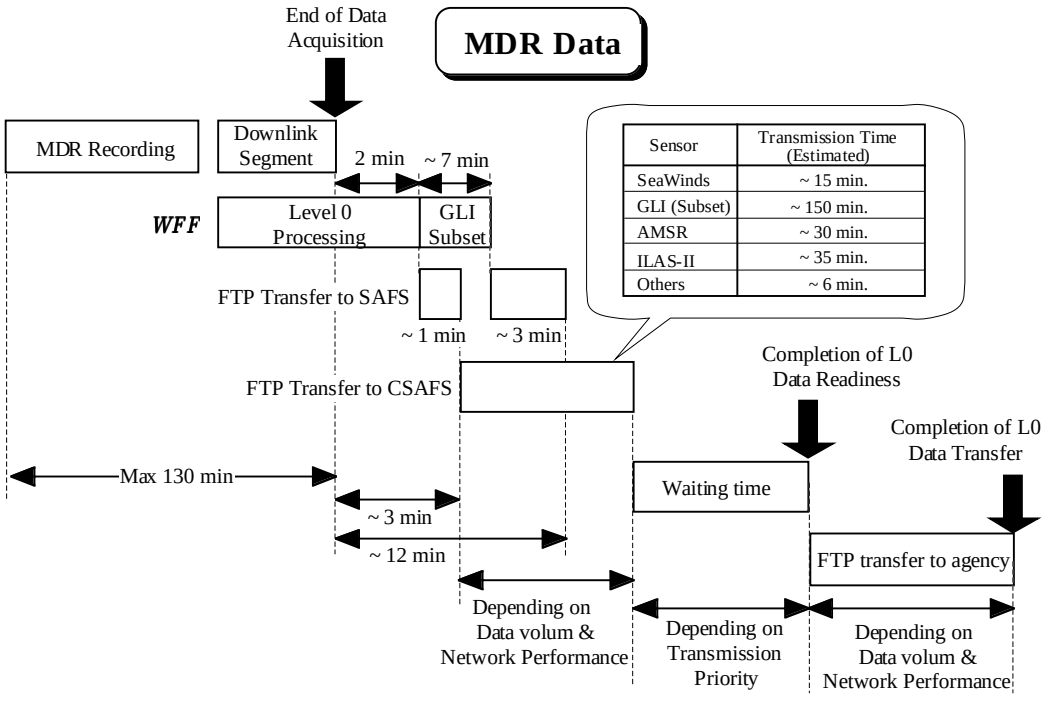


Fig. 5.6-7 Level 0 Data Delivery Delay from WFF (MDR Data)

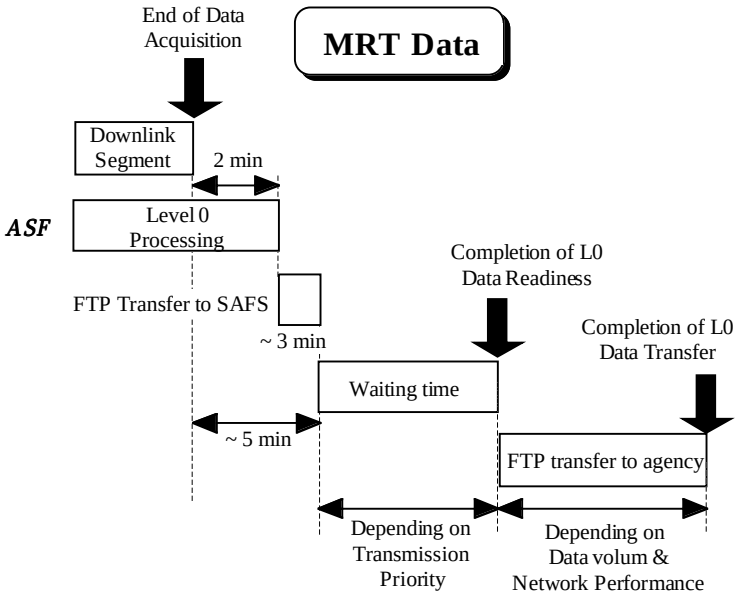


Fig. 5.6-8 Level 0 Data Delivery Delay from ASF (MRT Data)

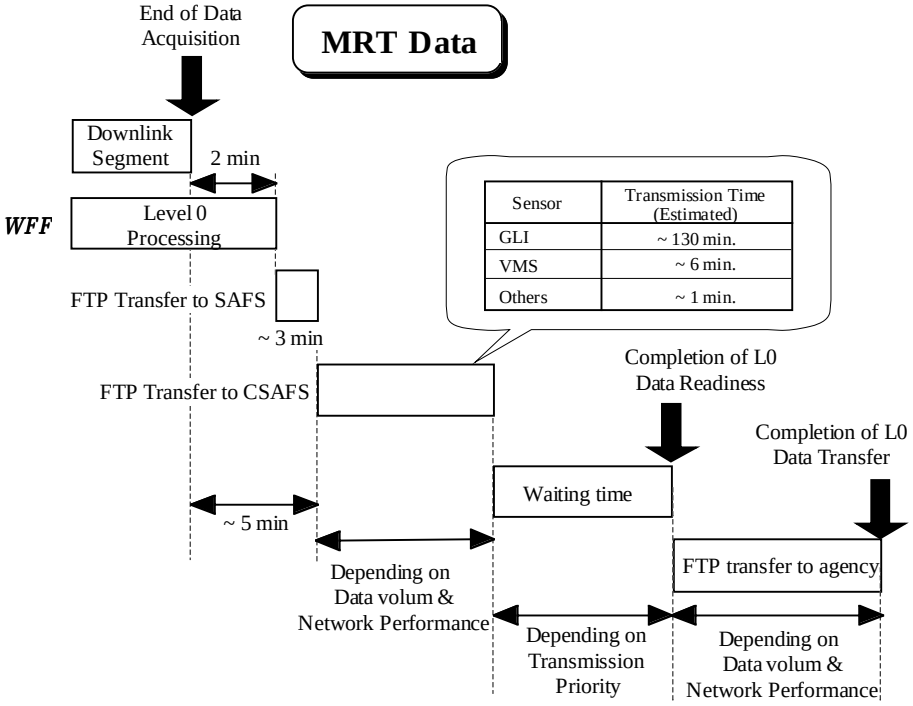


Fig. 5.6-9 Level 0 Data Delivery Delay from WFF (MRT Data)

Where, level 0 data (except for level 0 data of the highest priority) processed at ASF and WFF will be waiting for a few minutes after completion of transmission to SAFS or CSAFS, because level 0 data transmission to EOC, SeaPAC and NOAA will be performed one by one to use network as well as possible. The level 0 data transmission from SAFS and CSAFS is performed based on the priority shown in table 5.6-4.

Table 5.6-4 Level 0 Data Transmission Priority (ASF/WFF)

Priority	To EOC	To SeaPAC	To NOAA
1	HK Source Packet	SeaWinds	DCS (MRT)
2	DCS (MRT)	HK Source Packet	DCS (MDR)
3	DCS (MDR)		SeaWinds
4	AMSR		GLI 1km (MRT)
5	ILAS-II		GLI 1km (MDR)
6	DMS-1 (MRT)*1		
7	DMS-1 (MDR)		
8	DMS-2 (MRT) *1		
9	DMS-2 (MDR)		
10	VMS (MRT) *1		
11	VMS (MDR)		
12	TEDA		

*1: on requets basis (not routinely)

5.7 Mean Orbit Data Delivery to SeaPAC

Mean orbit data of ADEOS-II will be delivered from TACC to SeaPAC by using e-mail via internet until UT 7:30 on Wednesday 1 day before the target day of +DV maneuver, which is fixedly performed on Thursday. The format of e-mail is attached to this MOIS as the appendix 7. And the delivery e-mail address of SeaPAC is in the "ADEOS-II Contact Points Document".

5.8 Data Archiving

Each agency's policy and responsibility on data product archiving for ADEOS-II mission operations are as follows:

(1) EOC

EOC will archive all ADEOS-II raw data including the raw data acquired at ASF and WFF for both Modes 1 and 2.

EOC will keep the Level 0 and NRT data products, which are transmitted from EOIS/DDS to each agency via electronic file transfer, for 2 days on the DDS in case of reception of RCN informing good transmission from a receiving agency. In case of no-reception of RCN or reception of RCN informing No Good transmission, EOC never erase the data products from the DDS without coordination with its receiving agency.

(2) PO.DAAC

PO.DAAC will archive SeaWinds Level 0 data and standard products.

(3) ASF and WFF

ASF/WFF will temporarily store back-up D1 cassette of all MDR, GLI 250m and ODR raw data acquired at their facilities for both Modes 1 and 2. ASF/WFF will be able to erase the data after receipt of readability good report from EOC (10 days after receipt of raw data at EOC, at latest) or 30 days after data acquisition, whichever occurs first. In the case of readability problem report from EOC, ASF/WFF will ship the corresponding back up cassette to EOC. The detailed procedure will be defined in section 6.

Level 0 data residing on the SAFS/CSAFS is normally deleted after 96 hours from time of

receipt at the stations SAFS and the CSAFS.

5.9 Data Capture Rate

Data capture rate of ASF and WFF is 95% as target.

6. Operation Interface Procedure

This section describes normal mission operations procedure.

6.1 Procedure for SeaWinds Mission Operation Planning

Please refer to section 6.1 in MOIS (Common).

6.1.1 Normal Planning Procedure for SeaWinds Operation

(1) Support Information Preparation: Occasionally

EOC will submit the ADEOS-II maneuver schedule to SeaPAC using STAD file before 9:00 UT on Wednesday 1 day prior to the maneuver scheduled date as a support information for making SeaWinds operation request.

(2) Weekly Assessment (Preparing REQQ): From 28 days to 13 days prior to the 1st day of target week

SeaPAC will make REQQ file to require 1 week SeaWinds operation and submit it to EOC during this period. Due time of REQQ file submitting from SeaPAC to EOC is 5:00 UT on the final day of this period (Thursday).

(3) Weekly Assessment (**REQQ format error notification**~~Preparing REQA~~): After receipt of REQQ file if necessary

EOC will check format of the REQQ file submitted from SeaPAC. If any error is found in the REQQ file, EOC will ~~prepare an REQA file to~~ inform SeaPAC of the error as soon as possible after receipt of REQQ file. And then, SeaPAC will remake the corresponding REQQ file and submit it again to EOC.

As notification of REQQ format error to SeaPAC, OCL or REQA file will be used.

When MMO finds a format error in header record of REQQ file, the error will be informed to SeaPAC by using OCL. On the other hand, when a format error is found in data record of REQQ file, MMO will prepare an REQA file to inform SeaPAC of the error.

Basically, ~~the MMO~~ **EOC** will **notify format error of REQQ file to SeaPAC**~~prepare REQA file~~ within 2 hours after reception of the corresponding REQQ file, if SeaPAC sends the REQQ file to EOC during the working time of MMO operator, that is the period from 0:20 UT (9:20 JST) to 6:30 UT (15:30 JST) on weekday except for Japanese holyday. On the other hand, if SeaPAC sends the REQQ file to EOC in MMO non-working time and day, format check of the REQQ file will be carried out at the morning of next working day. However, if an error REQQ file is submitted to EOC at 5:00 UT on the final day of REQQ receiving period, ~~MMO~~**EOC** will **notify the error** ~~prepare the REQA file~~ within 1 hour after receipt of the REQQ file (6:00 UT on Thursday).

If REQQ error is informed from **EOC** ~~the MMO~~ by using REQA file **or OCL**, SeaPAC will remake the corresponding REQQ file and submit it again to EOC as soon as possible after receipt of the **format error notification from EOC.** ~~REQA file.~~ Especially, if REQQ file error is occurred on the final day of REQQ receiving period, SeaPAC should send the improved REQQ file to EOC before 0:00 UT of the next day (Friday).

(4) Operation Plan Preparation: 6 days before the beginning of each target week

EOC will coordinate the actual 1 week operation plan of next week with TACC.
After the completion of this coordination, EOC will prepare OPLN file before 8:00 UT on Thursday in the previous week of target period to inform SeaPAC of the actual SeaWinds operation plan and acquisition plan of SeaWinds observation data.
However, the preparation of OPLN file may be delayed caused by any reason, e.g.: TACC-EOC coordination is repeated. In the OPLN delay case, EOC will inform SeaPAC of the reason, expected delivery date and so on before 8:00 UT on the Thursday using OCL. The notification format of OPLN delivery delay is shown in the appendix 3.3.
At least, OPLN file will be prepared before 8:00 UT on Friday (the next day of nominal due date), even if OPLN delivery is delayed.

(5) Operation Result Preparation: 1 day after the target day.

EOC will prepare ORST file before 8:00 UT every day to inform SeaPAC of the data acquisition and recording result of all ground stations.

The procedure for SeaWinds mission operation planning between EOC and JPL is shown in the Fig. 6.1-1. The definition and procedure of MOIFs to be exchanged are shown in MOIS (Common).

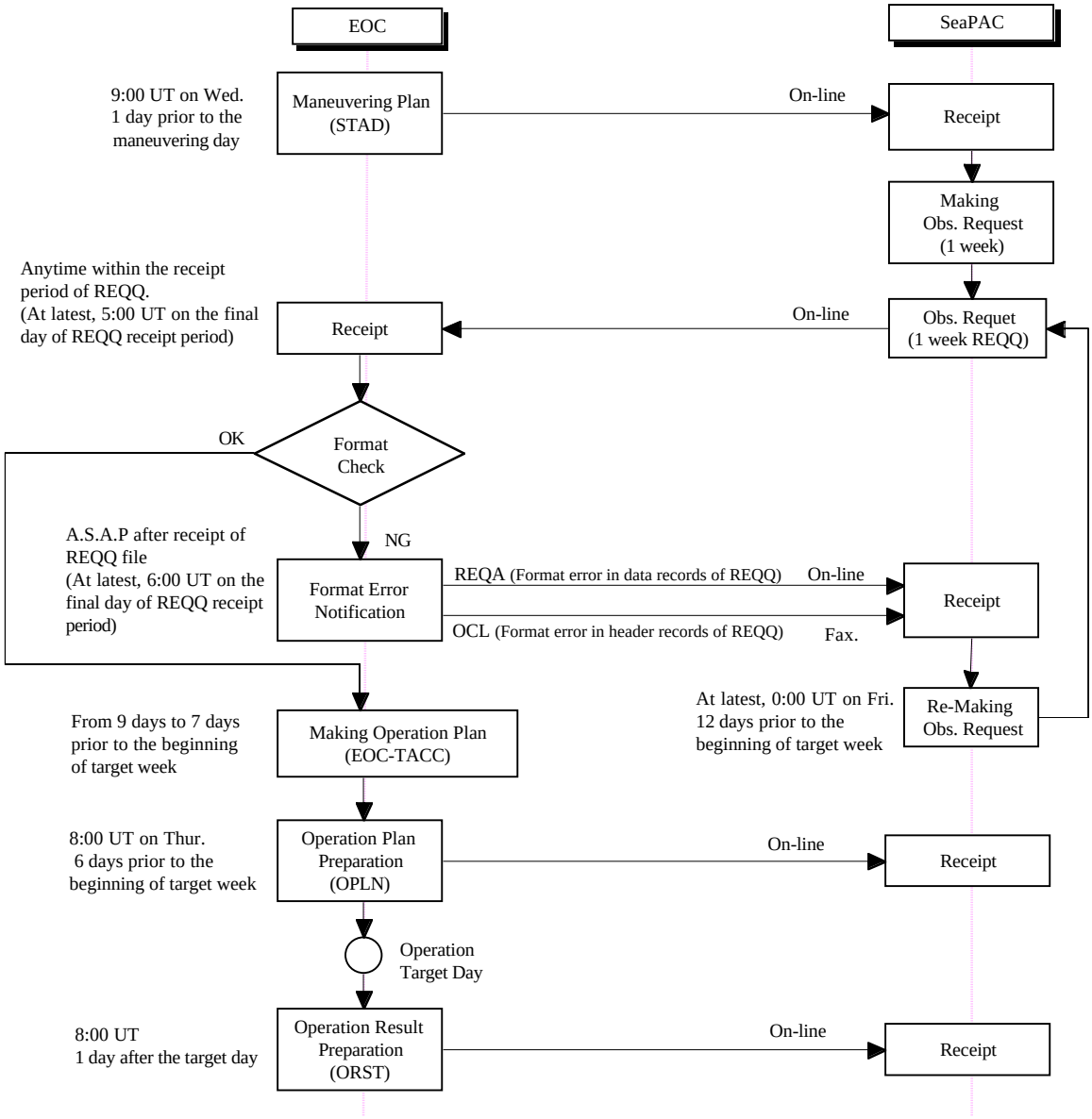


Fig. 6.1-1 SeaWinds Mission Operation Planning Procedure

6.1.2 Procedure for Parameter Table Update and Switch Operation

NASDA accepts the request from SeaPAC for SeaWinds parameter table update and switch. SeaWinds parameter table update and switch operation will be executed by Real Time Command (RTC).

(1) Request Procedure

SeaPAC will submit 'parameter table update files and switch' operations according to the following:

a) Table Load with NO switch:

- SeaPAC will prepare an SWPF file and send it to EOC/DDS using DRN/RCN protocol via network.
- EOC/DDS will forward the SWPF file to TACC automatically

- SeaPAC will send RTCR #1 to TACC and EOC by e-mail to inform them that an SWPF has been sent indicating NO switch.
- TACC replies with RTCA #1 by e-mail to inform SeaPAC and EOC of the result of real time command generation.
- If TACC command generation fails due to a SWPF error, TACC will inform SeaPAC of the error using RTCA#1. SeaPAC will respond with a corrected SWPF sent to TACC and a new RTCR #1.
- Note that RTCR #2 is NOT used.

b) Table Load WITH switch:
- SeaPAC will prepare an SWPF file and send it to EOC/DDS using DRN/RCN protocol via network.
- EOC/DDS will forward the SWPF file to TACC automatically.
- SeaPAC will send RTCR #1 to TACC and EOC by e-mail to inform them that an SWPF has been sent indicating YES switch.
- TACC replies with RTCA #1 by e-mail to inform SeaPAC and EOC of the result of real time command generation.
- If TACC command generation fails due to a SWPF error, TACC will inform SeaPAC of the error using RTCA#1. SeaPAC will respond with a corrected SWPF sent to TACC and a new RTCR #1.
- SeaPAC will send RTCR #2 to TACC and EOC by e-mail with necessary switching SOP's as listed in the SOOH.
- TACC replies with RTCA #2 by e-mail to inform SeaPAC and EOC of the result of SOP command transmission.

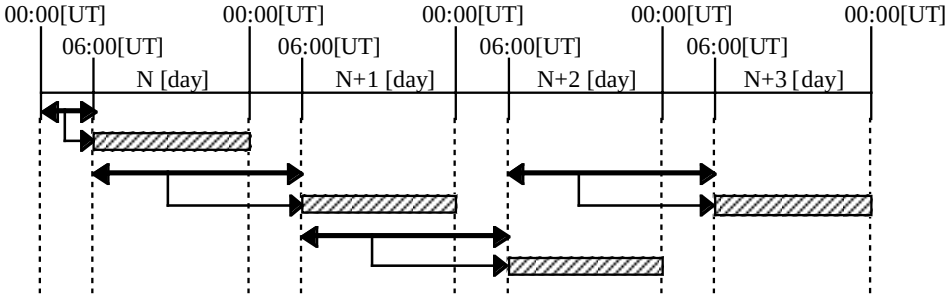
c) Table Switch with NO Table Load:
- SeaPAC will send RTCR #2 to TACC and EOC by e-mail to inform them that a table switch is desired.
- RTCR #2 will include the necessary switching SOP's as listed in the SOOH.
- TACC replies with RTCA #2 by e-mail to inform SeaPAC and EOC of the result of SOP command transmission.
- Note that RTCR #1 is not used.

(2) Request Rules

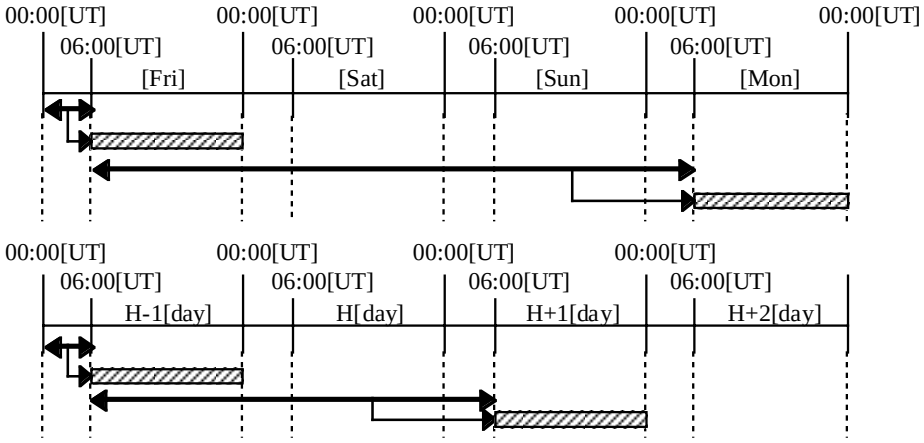
- "Table Update Repetition Number" in SWPF file must be always fixed "1". If SeaPAC wants NASDA to transmit table upload real time command over twice, the actual "Table Update Repetition Number" will be requested by RTCR#1.
- Table load RTC will be generated from SWPF, RTCR#1 and RTCR#2, and transmitted to the satellite in accordance with the rules shown in the following table and figures.

Table 6.1-1 RTC Generating and Transmitting Operation Rules

SWPF/RTCR Receiving		Command Transmitting Day
Receiving Day	Receiving Time	
Monday to Thursday	0:00 ~ 6:00 (UT)	On the same day
	6:00 ~ 23:59 (UT)	On the next day
Friday	0:00 ~ 6:00 (UT)	On the same day
	6:00 ~ 23:59 (UT)	On the next Monday
The day before Japanese Holiday	0:00 ~ 6:00 (UT)	On the same day
	6:00 ~ 23:59 (UT)	On the day after holiday



(a) TACC Receives SWPF/RTCR on Working Day



(b) TACC Receives SWPF/RTCR on Holiday

:Receive the SWPF
:Send RTC

Fig. 6.1-2 RTC Generating and Transmitting Operation Rules

The above procedure is illustrated in the figure 6.1-3 shown in below.

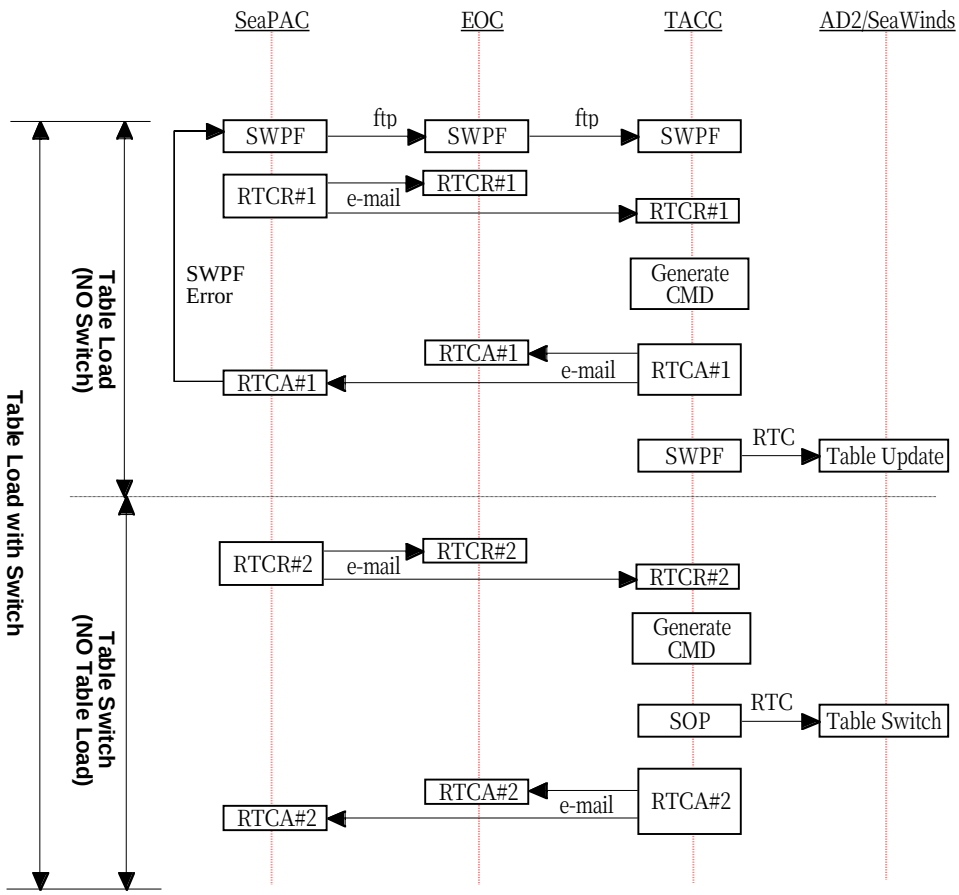


Fig. 6.1-3 Procedure for Parameter Table Update and Switch

The format and example of e-mail notification (RTCR#1, 2 and RTCA#1, #2) are shown in the appendix 5 of this MOIS. Moreover, the e-mail address of SeaPAC, TACC and EOC are also described in the ADEOS-II Contact Points Document as necessary information to exchange RTCR and RTCA.

6.2 Procedure for NASA Ground Stations Operation Planning

(1) Weekly Assessment

EOC/MMO sends a data acquisition request of 1 week (REQR) to NASA ground stations before 8:00 UT on Thursday 3 weeks before the beginning of target week. If it is impossible to acquire ADEOS-II data because of periodical maintenance of antenna system, anticipated conflicts with another satellite, and so on. NASA ground stations inform EOC/MMO by STGS file before 1:00 UT on Friday the next day of REQR receipt.

The above weekly assessment between EOC/MMO and NASA ground stations by REQR and STGS is repeated until approval of NASA ground stations is achieved. Each STGS should be submitted by NASA ground stations as soon as possible after receipt of corresponding REQR. And this assessment must be completed before 1:00 UT on Wednsday 2 weeks before the beginning of target week.

The procedure of weekly assessment between EOC and NASA ground stations is shown in the Fig. 6.2-1.

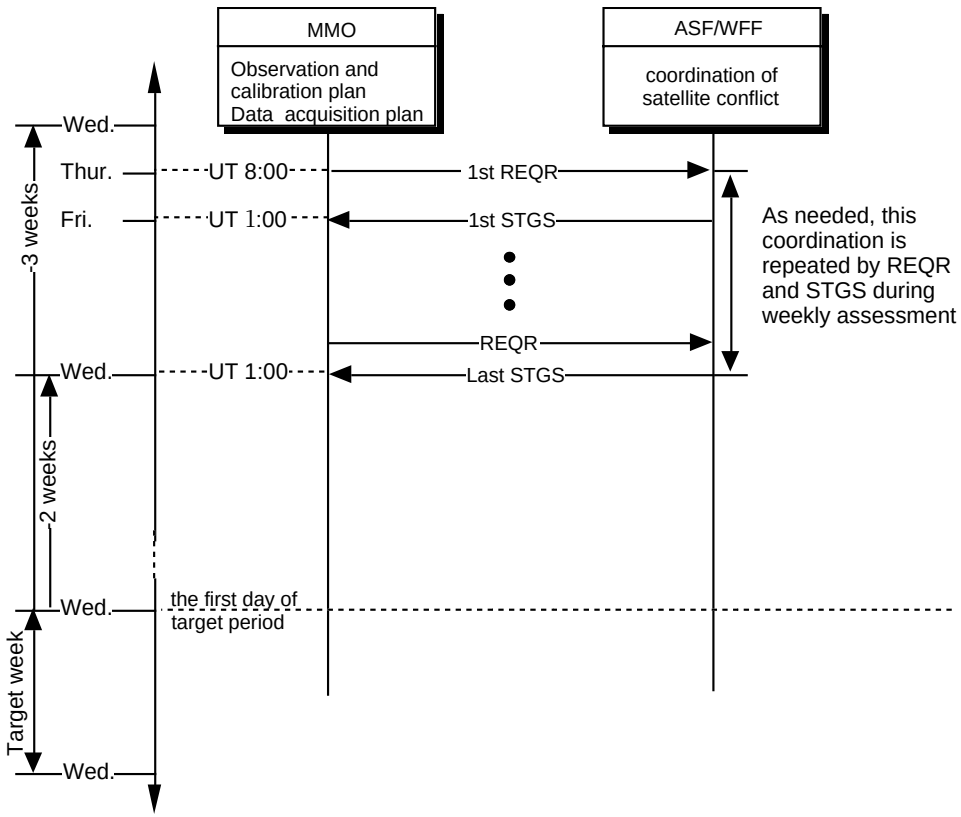


Fig. 6.2-1 Procedure of Weekly Assessment

If NGN requires to change STGS after completion of 1st REQR/STGS coordination on Friday 3 weeks before the beginning of target week, NGN can provide MMO with the updated STGS. However, the updated STGS should be generated after 8:00 UT on the next Monday and should be submitted to MMO until 1:00 UT on Wednesday 2 weeks before the beginning of target week. File name of the updated STGS is counted up from the existing latest STGS file. Moreover, NGN should send an OCL to NASDA in advance, to notify NASDA of file name, target week and file transmission date and time of the updated STGS.

(2) Data Acquisition

EOC/MMO will prepare the predictive orbit data (EP) and place them to the mmofe subdirectory of DDS before 8:00 UT on every Monday, Wednesday and Friday in nominal case, or on every day in additional delivery case of orbit data.

EOC/MMO will also prepare the weekly data acquisition schedule (SHAQ) and place it to the mmofe subdirectory of DDS before 8:00 UT on Thursday 1 week prior to the beginning of target week.
However, the preparation of SHAQ file may be delayed caused by same reason as OPLN delivery delay. In the SHAQ delay case, EOC will inform NASA ground stations of the reason, expected delivery date and so on before 8:00 UT on the Thursday using OCL. The notification format of SHAQ delivery delay is shown in the appendix 3.4.
At least, SHAQ file will be prepared before 8:00 UT on Friday (the next day of nominal due date), even if SHAQ delivery is delayed.

NASA ground stations will get the above EP files and SHAQ file from DDS and make the actual schedule of ADEOS-II data acquisition before target day.

NASA ground stations will receive ADEOS-II mission data and record MDR, GLI 250m and/or ODR raw data onto 2 ID-1 cassettes simultaneously in accordance with the data acquisition schedule. Where, one ID-1 cassette is master tape and the another is backup tape.

After completion of data acquisition, NASA ground stations will make RERC and RERB file to inform EOC/MMO of the data receiving and recording result, and will place them to the designated system for EOC/MMO retrieval. Where, RERC file consists of the status of master ID-1 cassette, and RERB is for back up cassette.

(3) Data Processing

EOC/MMO will prepare Level 0 processing information (LV0P and RTIG) and place them to the mmofe subdirectory of DDS before 8:00 UT on every Monday, Wednesday and Friday.

NASA ground stations will get the above LV0P and RTIG files from DDS and make the actual schedule of ADEOS-II Level 0 data processing before target day.

NASA ground stations will process ADEOS-II MDR and MRT raw data to Level 0 data in accordance with the data processing schedule. Especially, GLI 1km Level 0 data of specific area will be generated based on the information in RTIG file.
And then, these Level 0 data will be put in the designated system for EOC, SeaPAC and NOAA retrieval.

After completion of Level 0 data processing and placing the Level 0 data to the designated system, NASA ground stations will make L0RL file to inform EOC of the Level 0 data processing result, and will place it to the designated system for EOC retrieval.

The procedure of data acquisition and processing between EOC and NASA ground stations is shown in the Fig. 6.2-2.

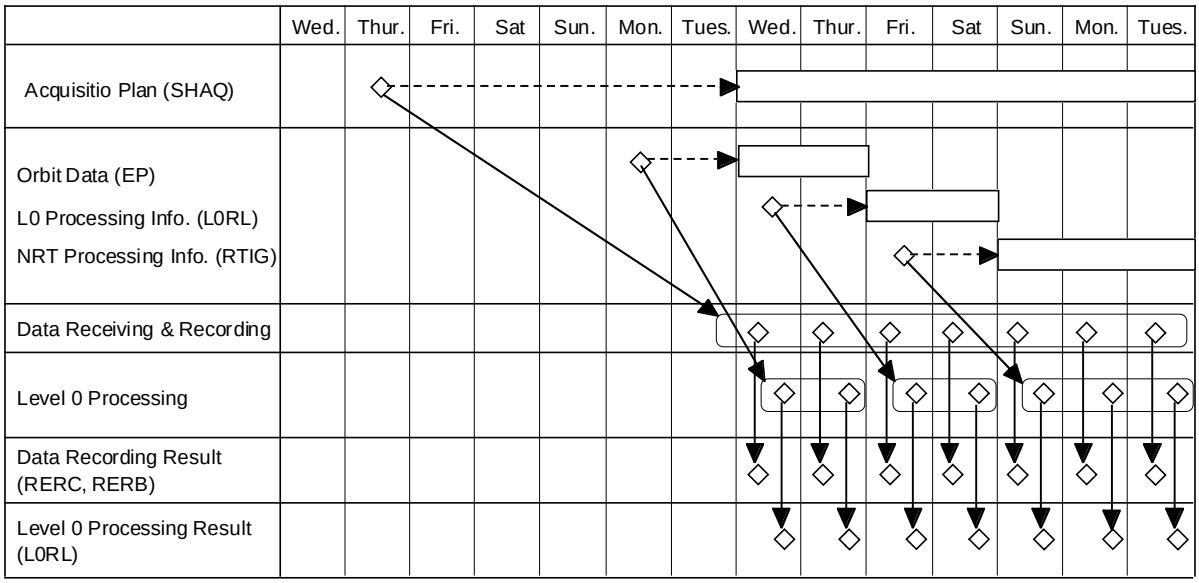


Fig. 6.2-2 Procedure of Data Acquisition and Processing

6.3 Data Exchange Procedure between EOC and NASA Ground Stations

(1) Raw data

NASA ground stations will send the raw data of GLI 250m in Mode 1, MDR, GLI 250m and/or ODR in Mode 2 using ID-1 cassette to EOC.
Raw data exchange procedure between NASA ground stations and EOC is as follows:

(a) Data Acquisition by NASA ground stations
(b) Recording acquired data on two ID-1 cassettes (one is master and another is back up)
(c) Informing EOC of data recording result using RERC for master and RERB file for backup cassette.
(d-1) Delivery of the master raw data cassette with invoice by mail
Frequency of shipment : 3 times a week (Mon. Wed. and Fri.)
(d-2) Report of the shipment using SRRM
Due date of SRRM : Upon shipment
(e) Confirmation of readability of the raw data by EOC using RDRM
Due date of RDRM : 8:00 UT on 10 days after reception of raw data

(f-1) Delivery of the backup raw data cassette with invoice by mail when readability problem report is included in RDRM
Frequency of shipment : as soon as possible after receipt of problem report
(f-2) Report of the shipment using SRRM
Due date of SRRM : Upon shipment
(g) Confirmation of readability of the raw data by NASDA/EOC using RDRM
Due date of RDRM : 8:00 UT on 10 days after reception of raw data

NASA ground stations stores the raw data until reception of RDRM from EOC or 30 days after data receiving, whichever occurs first.

The procedure of raw data exchange is shown in the Fig. 6.3-1.

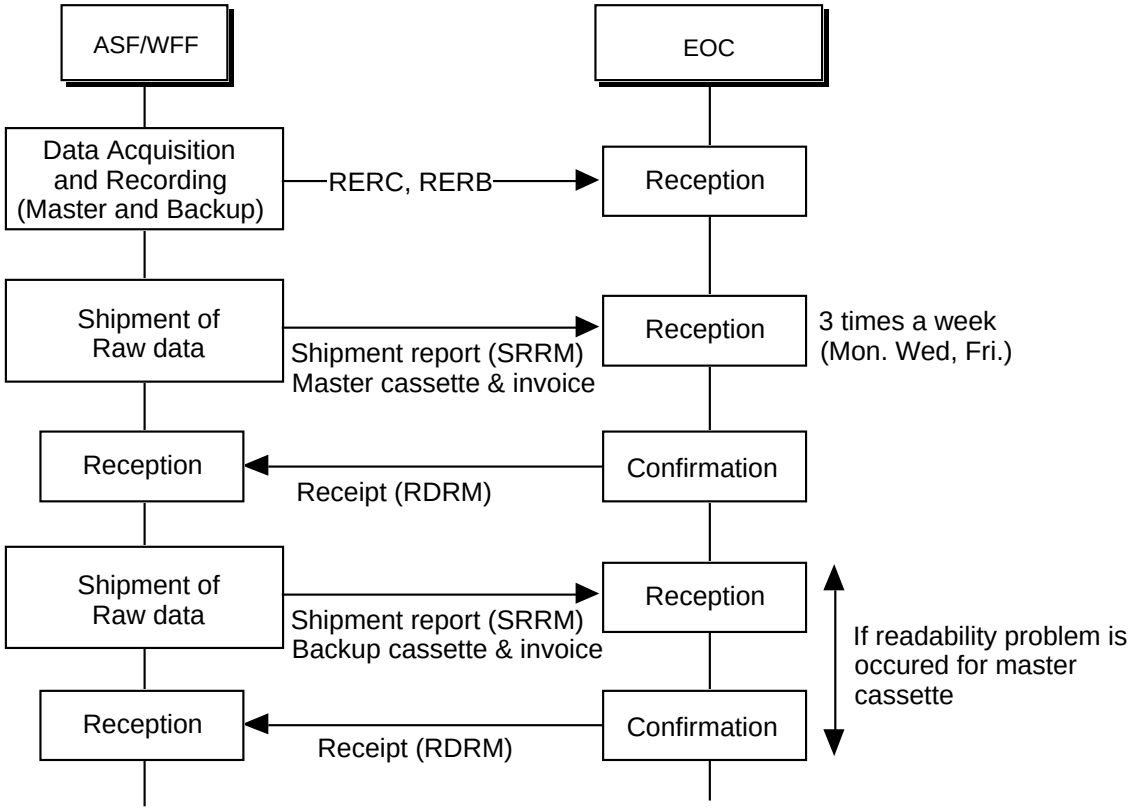


Fig. 6.3-1 Raw Data Exchange Procedure

(2) Level 0 Data

NASA ground stations will process MRT data to Level 0 data of DCS in both Mode 1 and Mode 2, will process MDR data to Level 0 data of AMSR, ILAS-II, TEDA, DMS-1&2, VMS and DCS in Mode 2, and will send them to EOC via electronic file transfer.

Moreover, selected GLI 1km Level 0 data from MRT data in both modes, Level 0 data of selected GLI 1km and SeaWinds from MDR data in Mode 2 will be generated at NASA ground stations for NOAA and SeaPAC.

Level 0 data exchange procedure between NASA ground stations and EOC is as follows.

(a) Level 0 data processing by NASA ground stations
(b) Informing EOC of Level 0 data processing result using L0RL file
(c) Placing the Level 0 data in the designated system by NASA ground stations
(d) Informing EOC of the data readiness using E-mail by NASA ground stations
(e) Getting the data from the designated system using FTP by EOC
(f) Informing NASA ground stations of the reception using E-mail by EOC

The procedure of Level 0 data exchange is shown in the Fig. 6.3-2.

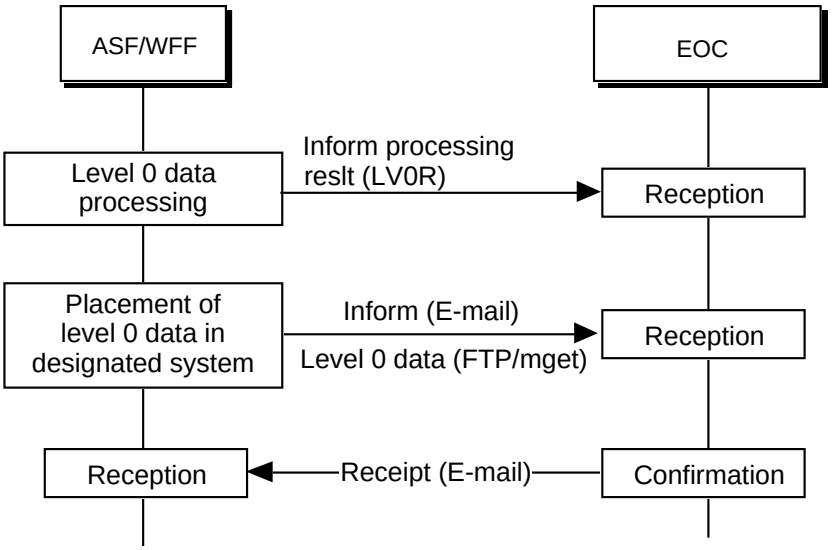


Fig. 6.3-2 Level 0 Data Exchange Procedure

6.4 Data Exchange Procedure between EOC and JPL

The ADEOS-II data exchange procedure between EOC and JPL, including SeaPAC and PO.DAAC, is illustrated in Fig. 6.4-1.

EOC will process MDR data to SeaWinds Level 0 data and HK source packet data in both Mode 1 and Mode 2, will send SeaWinds Level 0 data and HK source packet data to SeaPAC via electronic file transfer.

In Mode 2, Kiruna station will produce SeaWinds Level 0 data and HK source packet data from MDR data. These data will be sent to EOC, and then EOC will route SeaWinds Level 0 data and HK source packet data to SeaPAC. And also NASA ground stations will produce SeaWinds Level 0 data and HK source packet data from MDR data and will send themto SeaPAC directly in Mode 2.

EOC will process AMSR Level 0 data to Level 1A product in both Mode 1 and Mode 2, and will send them to PO.DAAC. Moreover, EOC will also generate DMS processed data in both Mode 1 and Mode 2, and will send them to SeaPAC.

SeaPAC will process SeaWinds Level 0 data to Level 1B, 2A, 2B and 3 products, and will send them to PO.DAAC for archiving. PO.DAAC will send the SeaWinds Level 1B and 2A products to EOC using 8 mm tape or DLT cassette, on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists. Moreover, PO.DAAC will make SeaWinds level 2B and 3 products available to general users including NASDA (FTP via internet and 8mm tape is available for level 2B and, and FTP via internet, CD-R and DVD is available for level 3).

Data exchange procedure between EOC and JPL is as follows.

(a) SeaWinds Level 0 data, HK source packet data, AMSR Level 1A products and DMS processed data producing by EOC
(b) Placing the data in DDS by EOC
(c) Informing SeaPAC and PO.DAAC of the data readiness using E-mail by EOC

(d) Getting the data from DDS using FTP by SeaPAC and PO.DAAC
(e) SeaWinds Level 1B, 2A, 2B and 3 processing by SeaPAC
(f) Delivering the data product to PO.DAAC by SeaPAC
(g) Delivering SeaWinds level 1B and 2Aproduct to EOC by PO.DAAC on an e-mail request basis from NASDA, pending individual approval by the SeaWinds Project Scientists.
(h) Delivering SeaWinds level 2B and 3 products to general users including NASDA on a request basis.

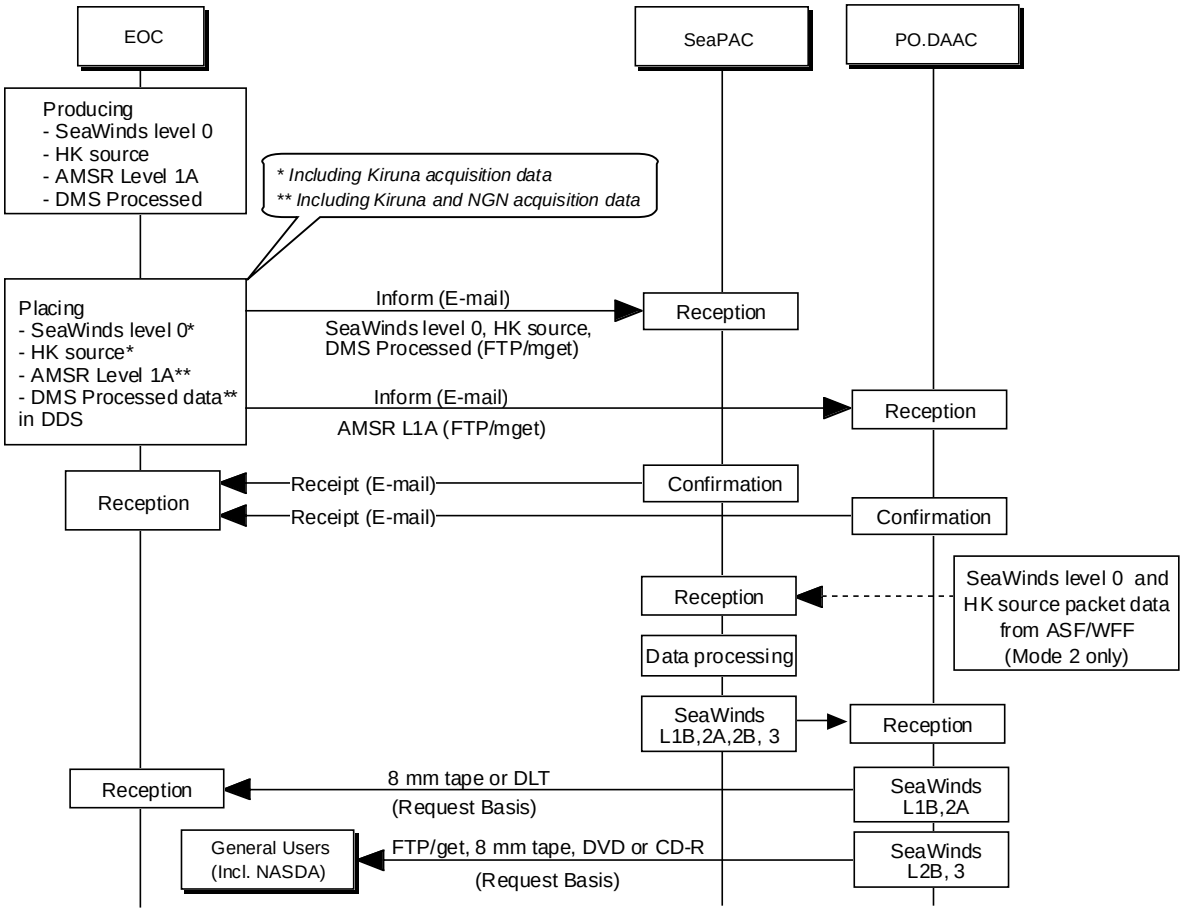


Fig. 6.4-1 SeaWinds Data Exchange Procedure between EOC and JPL

6.5 Data Exchange Procedure between EOC and NOAA

The data exchange procedure between EOC and NOAA is illustrated in Fig. 6.5-1.

EOC will process MDR data to SeaWinds and DCS Level 0 data and selected GLI 1km Level 1A data in both Mode 1 and Mode 2, will process MRT data to DCS level 0 data, and will send them to NOAA via electronic file transfer.

Kiruna station will produce SeaWinds Level 0 data, DCS Level 0 data and selected GLI 1km Level 0 data from MDR data in mode 2, and will produce DCS Level 0 data from MRT data in

mode 1 and mode 2. The SeaWinds and DCS Level 0 data will be sent to EOC, and then EOC will route the data to NOAA. The selected GLI 1km Level 0 data will be send to EOC, and will be processed to Level 1A data at EOC, and then EOC will send the selected GLI 1km Level 1A product to NOAA. And also NASA ground stations will produce SeaWinds Level 0 data, DCS Level 0 data and selected GLI 1km Level 0 data from MDR data in mode 2, will produce DCS Level 0 data from MRT data in mode 1 and mode 2, and will send them to NOAA directly.

Data exchange procedure between EOC and NOAA is as follows.

(a) SeaWinds Level 0, DCS Level 0 and selected GLI 1km Level 1A processing by EOC
(b) Placing the data in DDS by EOC
(c) Informing NOAA of the data readiness using E-mail by EOC
(d) Getting the data from DDS using FTP by NOAA
(e) Informing EOC of the reception using E-mail by NOAA
(f) NRT data processing by NOAA
(g) Sending SeaWinds Met data NRT products to the CSAFS.
(h) Informing EOC of the data readiness using E-mail by the CSAFS
(i) Getting the data from the CSAFS using FTP by EOC
(j) Informing the CSAFS of the reception using E-mail by EOC

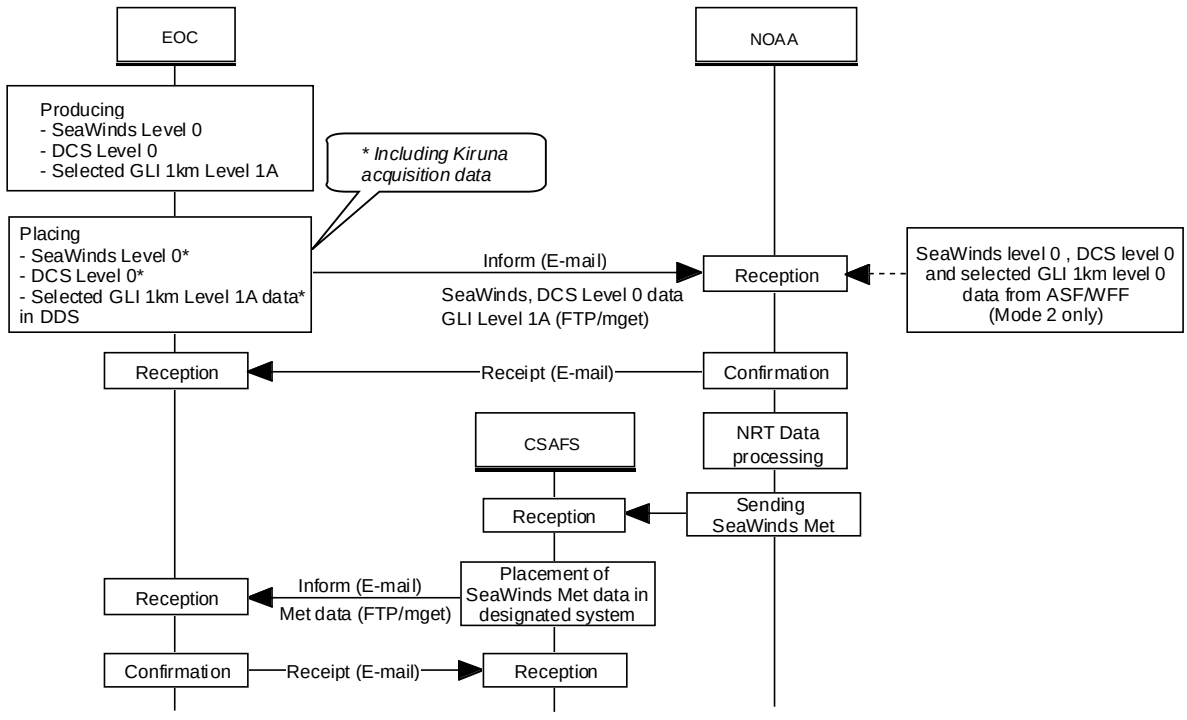


Fig. 6.5-1 SeaWinds Data Exchange Procedure between EOC and NOAA

6.6 Error Handling Procedure

(1) SeaWinds Level 0 Data and HK Source Packet

When SeaPAC find an error[*1] in the SeaWinds level 0 data or HK source packet data delivered from EOC, SeaPAC will inform the error to EOC by using OCL.
Based on the problem report from SeaPAC, EOC will re-process the concerned SeaWinds level 0 data or HK source packet, and send it again to SeaPAC. If an anomalous data, reported from SeaPAC, is processed at ASF, WFF or Kiruna station, EOC will carry out re-processing of the level 0 or HK source packet data after reception of the corresponding raw data.

EOC will inform delivery date of re-processed data to SeaPAC by using OCL as a reply to the error notification from SeaPAC.

After reception of re-processed data from EOC, SeaPAC will check the contents and will inform EOC of the check result by using OCL. If the error of level 0 or HK source packet data is not improved in the re-processed data, EOC will not carry out immediate re-processing and will make separate discussion with SeaPAC.

The sheet of fixed form, attached to appendix 3.5 of this MOIS, is used for the above error handling procedure.

Moreover, SeaWinds level 0 data, which is re-processed during the above procedure, will also be delivered to NOAA. So, all of OCLs about SeaWinds level 0 data re-processing should be transferred to NOAA as cc.

**1: If number of packets, included in the level 0 signal file, is same as number of packets described in the corresponding level 0 status report file, it is not error of level 0 data processing, even if SeaWinds data is partially missed.*

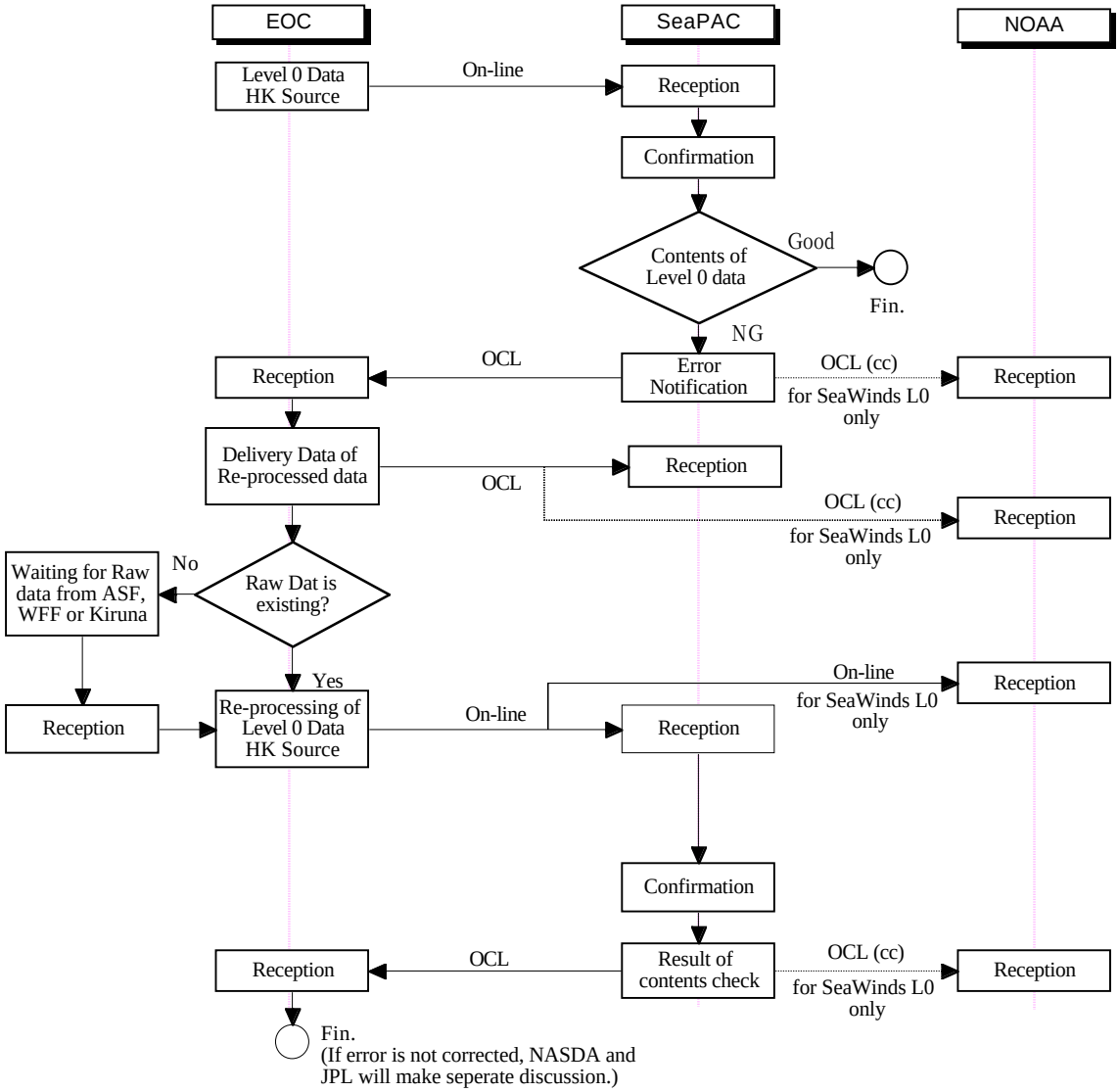


Fig. 6.6-1 Error Handling Procedure of SeaWinds L0 & HK Source Packet

(2) AMSR Level 1A

When SeaPAC, NOAA or PO.DAAC finds an error in the AMSR level 1A product delivered from EOC in near real time, an error report will be sent to EOC by using OCL. Investigation results will be sent to SeaPAC, NOAA and PO.DAAC via OCL. The AMSR level 1A NRT product with anomaly will be reprocessed as standard product processing at EOC, and re-sent to PO.DAAC by using 8mm tape.

(3) GLI 1km Level 1A (selected for NOAA interest areas and bands)

When NOAA finds an error in the GLI 1km level 1A product delivered from EOC in near real time, an error report will be sent to EOC by using OCL. Investigation results will be sent to NOAA via OCL. The GLI 1km level 1A NRT product with anomaly will not be reprocessed.

(4) DMS Processed Data

When SeaPAC find an error in the DMS processed data delivered from EOC, an error report will

be sent to EOC by using OCL. Investigation results will be sent to SeaPAC via OCL. The DMS processed data with anomaly will not be reprocessed.

6.7 Media Shipment Logistics

This section provides the media shipment logistics necessary for raw data shipment from ASF and WFF to EOC.

(1) Preparation Responsibility

EOC will prepare the following articles.

a) D-1 cassette tapes (blank) for the master records at the ASF and WFF, including label[*1].
b) Duralumin cases for D-1 cassette shipent.

ASF and WFF will prepares the following articles.

a) D-1 cassette tapes (blank) for the backup records at the ASF and WFF, including label[*1].

*1: Standard label, which is attached to blank media, is used for ADEOS-II raw data media. An example of label for raw data is attached in the appendix 6 of this MOIS.

(2) Media Shipment Procedure

The main procedure of media exchanging between EOC ans ASF, WFF is shown in below.

(a) EOC will purchase blank D-1 cassette tapes, including standard blank label, for NASA acquired data;
and pack them in duralumin cases;
and ship them with empty duralumin cases to the ASF and WFF.

(b) ASF and WFF will record raw data on the tapes shipped from EOC;
and fill up the designated items of the affixed label (see the appendix 6);
and pack them in a duralmin case shipped from EOC;
and send them back to EOC.

(3) Deliverables

The deliverables are respectively summarized in table 6.7-1 and 6.7-2 for ASF and WFF.

Table 6.7-1 Deliverables between EOC and ASF

Item	Source	Destination	Frequency of Shipment	Number of Items	Note
Duralmin Case	EOC	ASF	Once a month	13 cases	7 tapes can be packed in a case.
Blank Tape	EOC	ASF	Once a month	64 ~ 65 tapes (772 tapes/year)	In duralmin case Including extra tapes as backup for trouble.
Raw Data Tape	ASF	EOC	3 times a week (Mon, Wed, Fri)	Mon: 6 tapes Wed: 4 tapes Fri : 4 tapes	In duralmin case

Media: D1-M cassette tape (SONY SD1-600M)

Table 6.7-2 Deliverables between EOC and WFF

Item	Source	Destination	Frequency of Shipment	Number of Items	Note
Duralmin Case	EOC	WFF	Once a month	13 cases	37 tapes can be packed in a case.
Blank Tape	EOC	WFF	Once a month	19~20 tapes (232 tapes/year)	In duralmin case Including extra tapes as backup for trouble.
Raw Data Tape	WFF	EOC	3 times a week (Mon, Wed, Fri)	Mon: 2 tapes Wed: 1 tapes Fri : 1 tapes	In duralmin case

Media: D1-M cassette tape (SONY SD1-600M)

7. User Services

7.1 User Services for SeaWinds Standard Products

SeaWinds standard products, including level 1B, 2A, 2B and 3, are archived at PO.DAAC and distributed to users in accordance with the following manner.

7.1.1 User Definition

Users of SeaWinds standard products are classified to the following two categories.

- ✓ Approved Users, which have rights to use SeaWinds level 1B and 2A products free-of-charge.
- ✓ General Users, including approved users, can use SeaWinds level 2B and 3 products free-of-charge.

NASDA is categorized as an approved user.

7.1.2 Overview of User Services

(1) User Guidance Office

(a) JPL PO.DAAC User Services Office

The JPL PO.DAAC User Services Office is primary contact point for users to provide user services of SeaWinds products. The address of JPL PO.DAAC User Services Office is as follows

Jet Propulsion Laboratory,
MS: Raytheon-299
4800 Oak Grove Drive
Pasadena, California, USA 91109-8099

Fax: ..... +1-626-744-5506
e-mail: ..... podaac@podaac.jpl.nasa.gov

(b) Web Site

Users of SeaWinds products can take a lot of useful information via PO.DAAC web site. URL of the PO.DAAC web site is shown in below.

- ➢ http://podaac.jpl.nasa.gov/

(1) Data Distribution to Users

(a) Level 1B and 2A Products

After SeaWinds data processing, the level 1B and level 2A products are distributed by PO.DAAC to approved users, including NASDA, on either 8 mm tapes or DLT tapes.
When NASDA requires to obtain SeaWinds level 1B and 2A products, NASDA will send the request to the JPL PO.DAAC User Services Office by using OCL (fax or e-mail).

(b) Level 2B and 3 Products

SeaWinds level 2B and 3 products are distributed by PO.DAAC to general users on physical media shown in table 7.2-1.

Table 7.2-1 Media for SeaWinds Level 2B and 3 Products

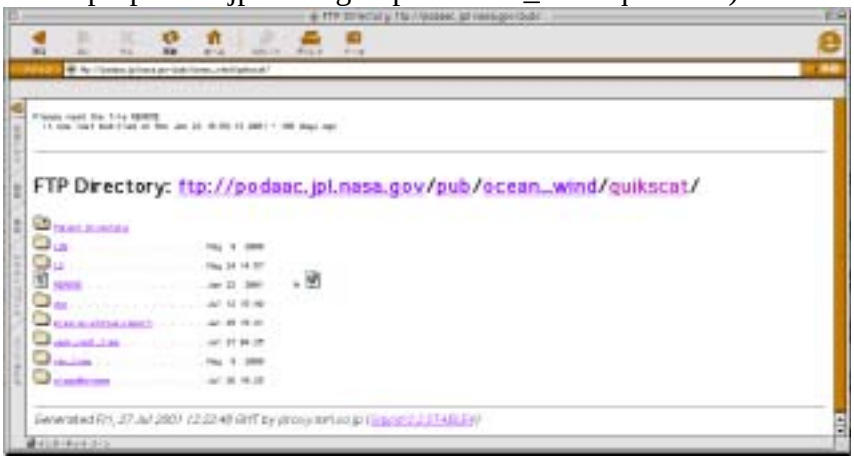
Product Level	Media
Level 2B	8 mm tape
Level 3	DVD or CD-R

Users can order SeaWinds level 2B and 3 products via PO.DAAC Web Site shown in below.

- http://podaac.jpl.nasa.gov/order/

Moreover, SeaWinds level 2B and 3 products are also distributed electronically via the PO.DAAC FTP site shown in below (QuikSCAT site, as sample).

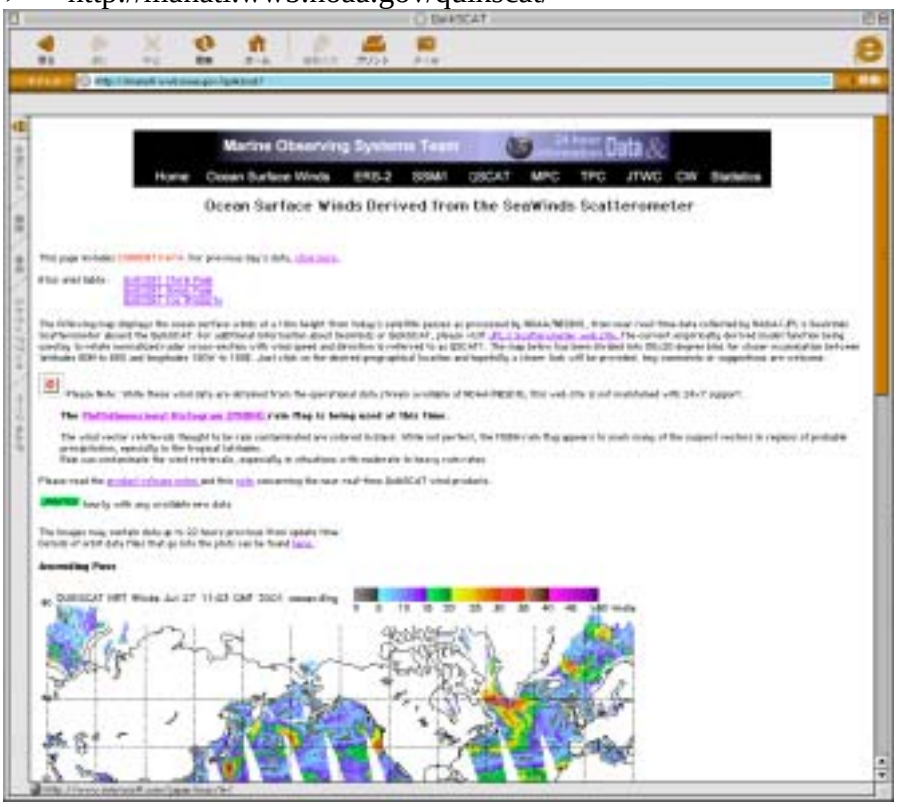
- ftp://podaac.jpl.nasa.gov/pub/ocean_wind/quikscat/)



7.2 User Services for SeaWinds NRT Product

SeaWinds NRT Product, which is called "SeaWinds Met data", is processed by NOAA and distributed routinely to NASDA/EOC.
Moreover, any users can look the images of SeaWinds Met data via NOAA Web Site shown in below (QuikSCAT site, as sample).

- http://manati.wwb.noaa.gov/quikscat/



8. Contingency Procedure

8.1 Anomalous Operation Coordination

For an anomaly occurrence related to the SeaWinds instrument or its mission operations, NASDA and NASA will coordinate anomaly measures and perform them in accordance with the Nonconformance Reporting and Processing System for ADEOS-II Sensor in Orbit attached to the MOIP .

8.2 Request of Recovery Command

8.2.1 Submission of Updated REQQ

MMO will accept an updated REQQ submitted after the due date (5:00 UT on Thursday 2 weeks before target week) to change SeaWinds operation, if it is submitted to MMO until 4 days prior to target day of operation change. However, the updated REQQ submitted to MMO after normal due date will be accepted for the only purpose to solve anomaly of SeaWinds instrument.
If MMO finds format error in the updated REQQ file submitted from SeaPAC, MMO will inform SeaPAC of the error by using REQA file. And then, SeaPAC will correct the format error of and send the improved REQQ to MMO as soon as possible after receipt of REQA file. Here, the procedure for operation change using REQQ file should be completed until 4 days prior to target day, including error correction and resending of REQQ file.
The updated REQQ file covers 1 week as same as the target week of the original REQQ. Moreover, in the updated REQQ, operation pattern before target path of operation change should be completely same as the original REQQ. File name of the updated REQQ is sequentially counted up from the existing latest REQQ file.

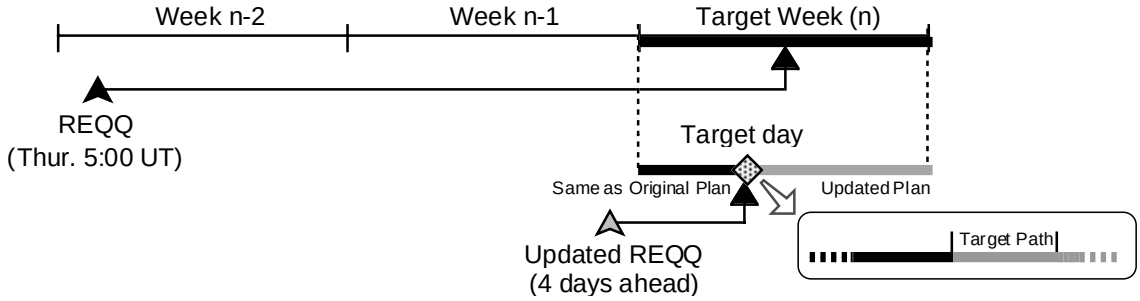


Fig. 8.2-1 Acceptance of Updated REQQ

If EOC accepts the updated REQQ from SeaPAC and TACC generates corresponding commands, the modified operation plan of SeaWinds instrument will be informed to SeaPAC by using OPLN file (updated OPLN). However, the updated REQQ file may be rejected by various reasons, such as constraints of thermal limitation, number of commands, lack of necessary command pass and so on.

Moreover, when SeaPAC submits an updated REQQ file to change SeaWinds operation, SeaPAC should inform EOC of the purpose of operation change, file name of the corresponding updated REQQ file and so on. The form of notification for operation change request is attached to the appendix A3.6 and it will be sent as an OCL. After receipt of the updated REQQ and the

corresponding OCL, EOC will reply to the OCL in order to inform the reason of rejection (in reject case), or name and delivery date of OPLN file (in accept case).

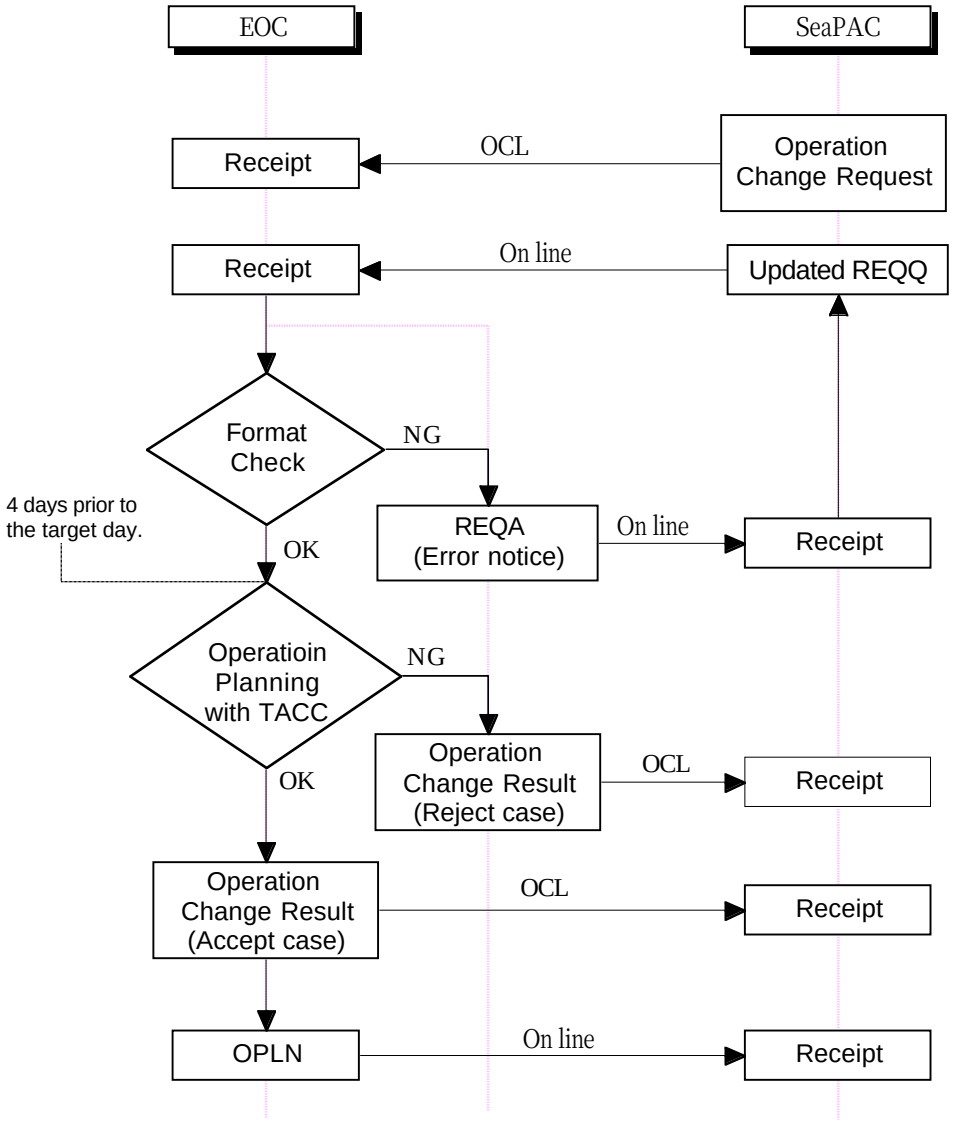


Fig. 8.2-2 Procedure for Operation Change by using Updated REQQ

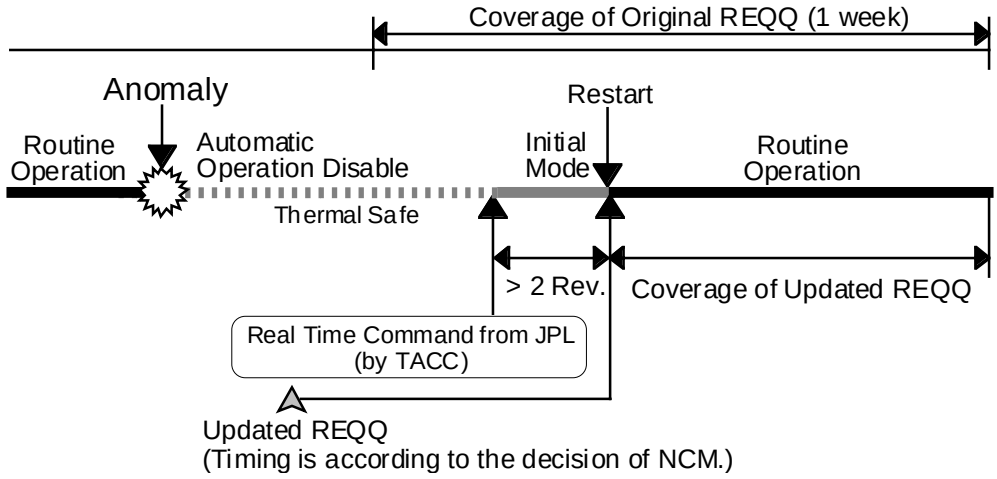
8.2.2 Routine Operation Restart by using Updated REQQ

In case of the automatic operation of spacecraft is disabled by anomaly, an updated REQQ is also used to restart routine operation after that anomaly is recovered. In this case, SeaPAC sends the updated REQQ to EOC in accordance with the decision made by Nonconformance Counterplan Meeting (NCM) specified in the document "Nonconformance Reporting and Processing System for ADEOS-II Sensor in Orbit".
The updated REQQ includes SeaWinds operation request for only after restart of routine operation. The RSP of SeaWinds routine operation restart is specified under the following condition.

- Path: 1st path of the restart day
- Argument of Latitude: > 0˚ (Ascending Node)

For the updated REQQ to restart routine operation, MMO will prepare the corresponding OPLN file and send it to SeaPAC. The coverage of OPLN file is same as the updated REQQ, i.e., it includes SeaWinds operation plan for only after restart of routine operation.

During the period of automatic operation disable, SeaWinds instrument is stayed in Thermal Safe Mode. 2 revolutions beforere-starting, TACC will set the operation mode of SeaWinds according to real time commands from JPL as the initial mode for re-starting routine operation.



NCM：Nonconfirmance Counterplan Meeting

Fig. 8.2-3 Procedure for Routine Operation Restart

8.2.3 Real Time Command Request

SeaPAC can request real time commands for the only purpose of trouble shooting of spacecraft or SeaWinds instrument (except for parameter table update and switch, shown in 6.1.2 of this MOIS)

(1) Communication for the Immediate Safing Operations
"Immediate safing operations" refers to emergency operations to shift into the safety mode as general rule in order to protect the spacecraft including mission instrument. Often, safing operations are initiated by spacecraft autonomous operation.

(2) Commanding for Trouble Shooting Operation
"Trouble shooting operations" refers to diagnostic actions to investigate causes of nonconformance after securing safety of instruments from the immediate safing operations).

(3) Commanding for Recovery Operations
"Recovery operations" refers to the corrective actions resulting from the trouble shooting operations to reestablish nominal instrument operations.

The real time command transmit conditions are defined in the SeaWinds SOOH and SOP. The real time command request method and request procedure are similar to "Table Switch with NO Table Load" described in this MOIS 6.1.2, i.e. e-mail notifications RTCR#2 and RTCA#2 are used to exchange necessary information between SeaPAC and NASDA.

- SeaPAC will send RTCR#2 to TACC and EOC by e-mail to inform them that indicating real-time commanding is requested ("RET" purpose).
- RTCR #2 will include the one or more necessary SOP's as listed in the SeaWinds SOOH.
- TACC replies with RTCA#2 by e-mail to inform SeaPAC and EOC of the result of SOP command generation.

The detailed coordination procedure between NASDA and related agencies including SeaPAC are specified in the document "Nonconformance Reporting and Processing System for ADEOS-II Sensor in Orbit".

8.3 Procedure for Re-scheduling of Ground Stations

In case of IOCS or DRTS problem during mode 1 operation, ~~or~~ a ground station problem during both mode 1 and mode 2 operation **or other anomalies**, data acquisition plan of ground stations will be modified to reduce data loss as much as possible. Re-scheduling of ground stations will be carried out in accordance with the **"ADEOS-II Ground Station Operations Procedure for NASDA and NASA"** ~~following rules.~~

~~TBD~~

9. Mission Operation Interface Coordination

All formal communications regarding the technical and operational interfaces between NASDA and each organization will use OCLs and will be discussed in ADEOS-II Mission Operations Meetings (MOMs).

9.1 Mission Operations Meeting (MOM)

NASDA and NASA/NOAA will coordinate the technical and operational interfaces at the MOM titled "ADEOS-II NASDA/NASA/NOAA Mission Operations Meeting."

9.2 Mission Operations Coordination Letter (OCL)

NASDA and each organization will basically exchange the OCL dedicated to respective organization as illustrated by Fig. 9.2-1. NGN will transmit the carbon copy to the organizations when an OCL sent from NASDA includes a common subject related to other US organizations. An OCL will be exchanged by using Fax or e-mail.

An example of the OCL cover format to be used by NASDA and NASA/NOAA during the pre-launch and routine operation phase is attached in Appendix 3.1 and 3.2.

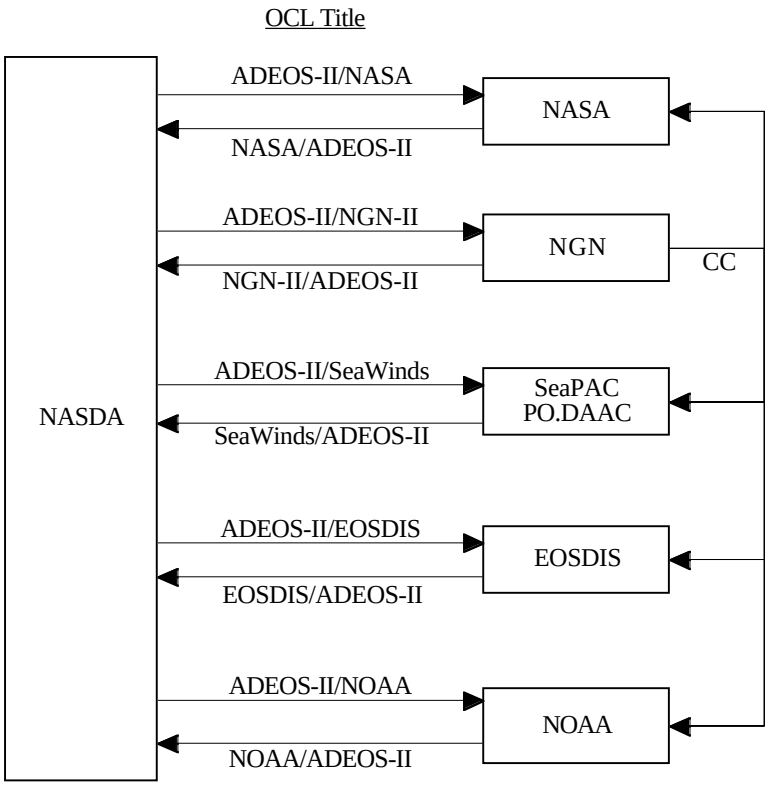


Fig. 9.2-1 ADEOS-II NASDA/NASA/NOAA OCL Scheme

9.3 Submitted Interface Documents

(1) Submitted Document between NASDA and JPL

Table 9.3-1 lists the delivery schedules for the MOIS applicable documents between NASDA and JPL (SeaPAC/PO.DAAC).

Table 9.3-1 MOIS Applicable Documents Submitted between NASDA and JPL

No	Presenter	Name of Documents	Due Date*
1	JPL	SeaWinds Science Product User's Handbook	Before ADEOS-II Launch
2	NASDA	SeaWinds Level 0 Format Description	4Q 1999
3	NASDA	AMSR Product Format Specification*	3Q 1999
4	NASDA	Format Description of Mission Operation Information Files (SeaWinds)	4Q 1999
5	NASDA	ADEOS-II Network Communications Interface Requirements Document (NASDA-NASA/NOAA)	4Q 1999
6	NASDA	ADEOS-II Catalogue Interoperability Interface Requirements Document (NASDA-NASA)	2Q 1999
7	NASDA	ADEOS-II Network Communications Interface Control Document (NASDA-NASA/NOAA)	2Q 1999
8	NASDA	ADEOS-II Catalogue Interoperability Interface Control Document (NASDA-NASA)	4 1999

* Target date to fix baseline.

(2) Submitted Document between NASDA and NGN

Table 9.3-2 lists the delivery schedules for the MOIS applicable documents between NASDA and NGN.

Table 9.3-2 MOIS Applicable Documents Submitted between NASDA and NGN

No	Presenter	Name of Documents	Due Date*
1	NASDA	ADEOS-II Raw Data Format Description	July 1997
2	NASDA	Level 0 Format Description for NGN	4Q 1999
3	NASDA	HK TLM Packet Format Requirement Description	4Q 1999
4	NASDA	Format Description of Mission Operation Information Files (NGN/NOAA)	4Q 1999
5	NASDA	ADEOS-II Network Communications Interface Requirements Document (NASDA-NASA/NOAA)	4Q 1999
6	NASDA	ADEOS-II Network Communications Interface Control Document (NASDA-NASA/NOAA)	4Q 1999

* Target date to fix baseline.

(3) Submitted Document between NASDA and NOAA

Table 9.3-3 lists the delivery schedules for the MOIS applicable documents between NASDA and NOAA.

Table 9.3-3 MOIS Applicable Documents Submitted between NASDA and NOAA

No	Presenter	Name of Documents	Due Date*
1	NOAA	SeaWinds Met Data Format Description	Before ADEOS-II Launch
2	NASDA	GLI Data Product Specification (Format)	4Q 1999
3	NASDA	Format Description of Mission Operation Information Files (NGN/NOAA)	4Q 1999
4	NASDA	ADEOS-II Network Communications Interface Requirements Document (NASDA-NASA/NOAA)	4Q 1999
5	NASDA	ADEOS-II Network Communications Interface Control Document (NASDA-NASA/NOAA)	4Q 1999

* Target date to fix baseline.

Appendix 1 Definitions

(1) Target Week

ADEOS-II mission operation plan is divided to every week in accordance with the OBC design. "Target Week" refers to each ADEOS-II operation 1 week, and its coverage is from Wednesday to Tuesday.

(2) Multiplexed Data

Multiplexed data are packetized data based on CCSDS and include AMSR, GLI-1Km, ILAS-II, SeaWinds, POLDER, DCS, TEDA, VMS, DMS and HK telemetry data. The data are separated into MDR data and MRT data according to the data transmission method.

(a) MDR data (Data rate: 60Mbps)

MDR data are multiplexed data in MDR reproduce mode and does not include GLI 250m data. MDR data includes multiplexed data of 1 orbit (or 2 orbits).

(b) MRT data (Data rate: 6Mbps)

MRT data are multiplexed data acquired by direct reception at each ground station via X3 or at EOC via IOCS.

(3) GLI 250m data (Data rate: 60Mbps)

GLI 250m data contain observed land area data in daytime and are acquired at each ground station via X1 band, or at EOC via IOCS in real time. GLI 250m data are also recorded on the ODR.
GLI 250m data are acquired in the real time mode and include telemetry data, attitude data and orbit data.

(4) ODR data (Data rate: 60Mbps)

ODR recorded data (mainly GLI 250 m data) are acquired at each ground station via X1 or at EOC via IOCS.

(5) Raw Data

Raw data are the telemetry bit stream from the SC received at ground stations.

(6) Level 0 Data

Level 0 data are packet synchronized and time ordered data.

(7) Level 1A Data

Level 1A data are Level 0 Data that have been formatted and that have all necessary calibration data appended for further processing.

(8) Level 1B Data

Level 1B data are geometrically corrected, radiometrically calibrated data in engineering units at similar resolution and locations as the Level 1A source data.

(9) Level 2 Data

Level 2 data are geophysical parameters retrieved from Level 1B data at similar resolution and locations as the Level 1A source data.

(10) Level 3 Data

Level 3 data are level 2 data that have been mapped onto an agreed upon space-time grid.

(11) Standard Products

Standard Products are selected mission data products (Level 1, Level 2 and Level 3 data) processed routinely for science analysis and publication.

(12) Selected GLI data

Selected GLI 1km data contain selected bands and areas data of interest~~ed~~ to NOAA.

(13) DDS (Data Distribution Subsystem)

DDS is the system designated by NASDA as the access point to exchange Mission Operation Information, near real-time data and meteorological data. DDS will be located in EOC and has two directories in which the data will be stored.

(14) Mission Data

Mission data include the observation data of all onboard sensors and Housekeeping data of all onboard instruments.

(15) Mission Operation Information

Mission operation information refers to the data and information such as mission operation request/plan/result, acquisition request/result, ground station operation plan, orbit data, time difference data, housekeeping telemetry data, satellite and station status information, and mission data shipment/readability reports. The information is used to make the mission operation plan and to perform mission operations.

(16) Housekeeping (for the SeaWinds instrument)

Housekeeping for the SeaWinds Instrument includes all functions performed by the ADEOS-II Project during the mission operations period that are needed to monitor and protect the health, status and safety of the SeaWinds instrument and to conduct normal instrument operations.

(17) HK source packet data

HK source packet data are multiplexed housekeeping data of all onboard instrument including SeaWinds.

Appendix 2 Acronyms and Abbreviations

A

ADEOS-II	:	Advanced Earth Observing Satellite-II
AGSID	:	ADEOS-II to Ground Stations Interface Document
AMSR	:	Advanced Microwave Scanning Radiometer
ANSI	:	American National Standard Institute
AOD	:	ADEOS-II Operational Document
AOS	:	Acquisition of Signal
ASF	:	Alaska SAR Facility (University of Alaska)

C

CCITT	:	International Telegraph and Telephone Consultative Committee
CCT	:	Computer Compatible Tape
CCSDS	:	Consultative Committee for Space Data Systems
CDR	:	Critical Design Review
CEOS	:	Committee On Earth Observation Satellites
CEOS-IDN	:	Committee on Earth Observations Satellites-International Directory Network
CNES	:	Centre National d'Etudes Spatiales

D

DCS	:	Data Collection System
DDS	:	Data Distribution Subsystem
DDMS	:	Data Distribution and Management System
DRTS	:	Data Relay and Tracking Satellite
DT	:	Direct Transmission
DTL	:	Direct Transmission subsystem for Local Users

E

ED	:	Definitive orbital Element
EP	:	Predictive orbital Element
ECI	:	Earth Center Inertial coordinates
EOC	:	Earth Observation Center (NASDA)
EOIS	:	NASDA's Earth Observation data and Information System
EOM	:	End of Mission
EORC	:	Earth Observation Research Center
EOS	:	Earth Observing System
EOSDIS	:	EOS Data and Information System
ESDIS	:	Earth Science Data and Information System

F

FAX	:	Facsimile Message
FTP	:	File Transfer Protocol

G

GLI	:	Global Imager
GPS	:	Global Positioning Satellite

H

HK	:	Housekeeping
HKDT	:	Housekeeping Data file

I

IF	:	Intermediate Frequency
IOCS	:	Inter-Orbit Communication Subsystem
IP	:	Implementation Plan
IRD	:	Interface Requirements Document

L

LOS	:	Loss of Signal

M

MDR	:	Mission Data Recorder
MMO	:	Mission operation Management Organization
MMOFE	:	Mission operation Management Organization Front-End (Directory)
MOIF	:	Mission Operation Information File
MOIP	:	Mission Operations Implementation Plan
MOIS	:	Mission Operations Interface Specification
MOM	:	Mission Operations Meeting
MOU	:	Memorandum of Understanding

N

N/A	:	Not Applicable
NASA	:	National Aeronautics and Space Administration
NASDA	:	National Space Development Agency of Japan
NESDIS	:	National Environmental Satellite Data and Information Service
NGN	:	NASA/NOAA Ground Network
NIES	:	National Institute for Environmental Studies
NOAA	:	National Oceanic and Atmospheric Administration
NRT	:	Near Real-Time Data (Directory)
NTSK	:	NASDA Transportable Station-Kiruna

O

OCL	:	Operations Coordination Letter
OPLN	:	Operation Plan
ORST	:	Operation Result Status

P

PCD	:	Payload Correction Data
PCM	:	Pulse Coded Modulation
PO.DAAC	:	Physical Oceanography Distributed Active Archive Center
POLDER	:	Polarization and Directionality of the Earth's Reflectances

R

REQ	:	Request for Operation (between TACC and EOC)
REQA	:	Reply on 1 week Request (particular)
REQQ	:	Request for 1 week period
REQR	:	Request for Raw data record

RESTEC : Remote Sensing Technology Center of Japan
RF : Radio Frequency
RSP : Reference System for Planning

S
SC : Spacecraft
SeaWinds : NASA-JPL Scatterometer On ADEOS-II
SeaPAC : SeaWinds Processing and Analysis Center
SOOH : Spacecraft Orbital Operations Handbook
SOP : Spacecraft Operation Procedure
STAD : Status information on ADEOS
STGS : Status of Ground Station

T
TACC : Tracking And Control Center (NASDA)
TACS : Tracking And Control Station (NASDA)
TBC : To Be Confirmed
TBD : To Be Determined
TCP/IP : Transmission Control Protocol/Internet Protocol
TEDA : Technical Data Acquisition Equipment
TKSC : Tsukuba Space Center (NASDA)
TL : Time of Launch
TD : Time Difference file

U
UHF : Ultra High Frequency
USB : Unified S-Band
UTC : Universal Time Coordinated

W
WFF : Wallops Flight Facility

Appendix 3 Sheet Formats

A3.1 OCL Format for Pre-Launch Phase

(1) Example ~~(ADEOS-II/NASA OCL)~~

NASDA

ADEOS-II/❍❍❍❍ ***ADEOS -II***

Operations Coordination Letter

ADEOS II Project (Ground Segment)

CC To :
☐
☐
☐
☐
☐

Total page(s)

TO:	FAX NO.: PHONE NO. :
FROM:	FAX NO.: PHONE NO. :
ADEOS II / ❍❍❍❍ OCL NO. :	DATE:

SUBJECT:

REQUESTED RESPONSE DATE:
Your Ref.:

MESSAGE:

APPROVED BY:	CHECKED BY:	PREPARED BY:

(PLEASE CONFIRM YOUR RECEPTION OF THIS MESSAGE BY USING THE BOTTOM OF THIS FORM)

OCL RECEPTION

ATTENTION: ADEOS II PROJECT (GROUND SEGMENT)
FAX. NO.:

( ) THIS OCL WAS RECEIVED ON / /

( ) TRANSMISSION OF THIS OCL WAS INCOMPLETE, PLEASE SEND AGAIN

MESSAGE:

SIGNATURE:

~~**(2) Example (ADEOS-II/SeaWinds OCL)**~~

~~**(3) Example (ADEOS-II/EOSDIS OCL)**~~

~~**(4) Example (ADEOS-II/NOAA OCL)**~~

A3.2 OCL Format for Post-Launch Phase

Example

☐ URGENT ☐ NORMAL

ADEOS-II/OOOO
Operations
Coordination Letter

Total Pages (incl. this form)

TO:	**Fax No. :** **Phone No. :**
CC:	**Fax No. :** **Phone No. :**
FROM:	**Fax No. :** **Phone No. :**
ADEOS-II/OOOO OCL No. _____	**Date: / /**

PURPOSE OF THIS FAX

- ☐ Notification of Anomalies
- ☐ Request of Real Time Command
- ☐ Operation Change Request (Updated REQQ)
- ☐ Updated STGS Notification
- ☐ OPLN/SHAQ File Delivery Delay
- ☐ Notification of Orbit Data Delivery Frequency Change
- ☐ Data Acquisition Loss Report
- ☐ Data Error Report
  - ☐ Level 0 Data ☐ HK TLM Data
  - ☐ Other Data ( )
- ☐ MOIF Error Report
- ☐ Q &A
- ☐ Others (_____)

SUBJECT :

REQUESTED RESPONSE DATE : / /

MESSAGE

APPROVED BY:	CHECKED BY:	PREPARED BY:

OCL RECEPTION

ATTENTION:
FAX No.:

- ☐ THIS OCL WAS RECEIVED ON / /
- ☐ TRANSMISSION OF THIS OCL WAS IMCOMPLETED, PLEASE SEND AGAIN

MESSAGES:

SIGNATURE:

A3.3 OPLN Delivery Delay Notification Format

OPLN File Delivery Delay Notification		
Attention	SeaPAC Mr.	
File Name	Target OPLN	OPLNnnnnnn
	Corresponding REQQ	REQQnnnnnn
Coverage	From	YYYYMMDD (Path =)
	To	YYYYMMDD (Path =)
Reasons	☐ TACC-EOC coordination is repeated.	
Delivery Plan	The OPLN file will be ready at around YYYYMMDD hh : mm	
Note		

A3.4 SHAQ Delivery Delay Notification Format

SHAQ File Delivery Delay Notification		
Attention	ASF / WFF Mr.	
File Name	Target SHAQ	SHAQnnnnnn
Coverage	From	YYYYMMDD (Path =)
	To	YYYYMMDD (Path =)
Reasons	☐ TACC-EOC coordination is repeated.	
Delivery Plan	The SHAQ file will be ready at around YYYYMMDD hh : mm	
Note		

A3.5 SeaWinds Level 0/HK Source Packet Data Error Notification

Data Error Notificatio for **☐: SeaWinds Level 0 / ☐: HK Source Packet**		
Error Notification (SeaPAC → NASDA/EOC & NOAA)		
Target Data	Date of Data	YYYYMMDD
	Downlink Segment No.	DSSEAddddsss-zz
	Level 0 Signal File Name	SEA_MDR_XXX_L0_SIG_ YYYYMMDD_pnnn
Error	☐ Number of packets in signal file does not correspond to the status report file. ☐ Continuity of sequence counter in signal file does not correspond to the status report file. ☐ Other ( )	
Note		
Response to the Error Notification (NASDA/EOC → SeaPAC & NOAA)		
Deliver Date of the Re-processed Data	YYYYMMDD	
Note		
Confirmation Report of the Re-Processed Data (SeaPAC → NASDA/EOC & NOAA)		
Confirmation Result	☐ Error was solved ☐ Same error was found. ☐ The quality of re-processed data became worse than the original one. ☐ Others ( )	
Note		

A3.6 Request Form for Operation Change by using Updated REQQ

Operation Change Request (Notification for Updated REQQ)		
Request (SeaPAC → NASDA/EOC)		
Updated REQQ	File Name	REQQnnnnnn
	Target Week	Begin : YYYYMMDD
		End : YYYYMMDD
	File Transmission Date	YYYYMMDD hh:mm
Timing of Operation Change	Target Day	YYYYMMDD
	Target Path	Path =
Reason	☐ Trouble Shooting of Instrument ☐ Others ( )	
Note		

Operation Planning Result		
Result (NASDA/EOC → SeaPAC)		
Planning Result	☐ **Accept**	
	File Name of Updated OPLN	OPLNSEAnnn
	File Transmission Date	YYYYMMDD hh:mm
	☐ **Reject** << Reason >> ☐ Number of Commands ☐ Thermal Limitation ☐ Lack of Command Transmission Pass ☐ Others ( )	
Note		

Appendix 4 SeaWinds HK TLM Data Format

For an anomaly on MDR data acquisition including HK TLM data and for the on-orbit initial checkout period, NASDA will provide SeaPAC with SeaWinds HK TLM data files processed at TACC instead of HK TLM source packet data.
The format of SeaWinds HK TLM data generated by TACC is defined in this appendix 4.

A4.1 SeaWinds HK TLM Data File Definition

The SeaWinds HK TLM data file consists of three parts.

- File header
  This record includes file name, S/C name, information of data, etc.
  Its length is fixed 128bytes (including LF).
- Data block header
  This record includes the number of data records and extraction map, etc.
  Its length is fixed 128bytes.
- Data record
  This record includes the received time, frame ID, and extracted raw telemetry data.
  The length of data record alters from 11bytes to 139bytes for SeaWinds case.
  The data record corresponds to data block header.

A new data block is created when the extraction map is changed, i.e.

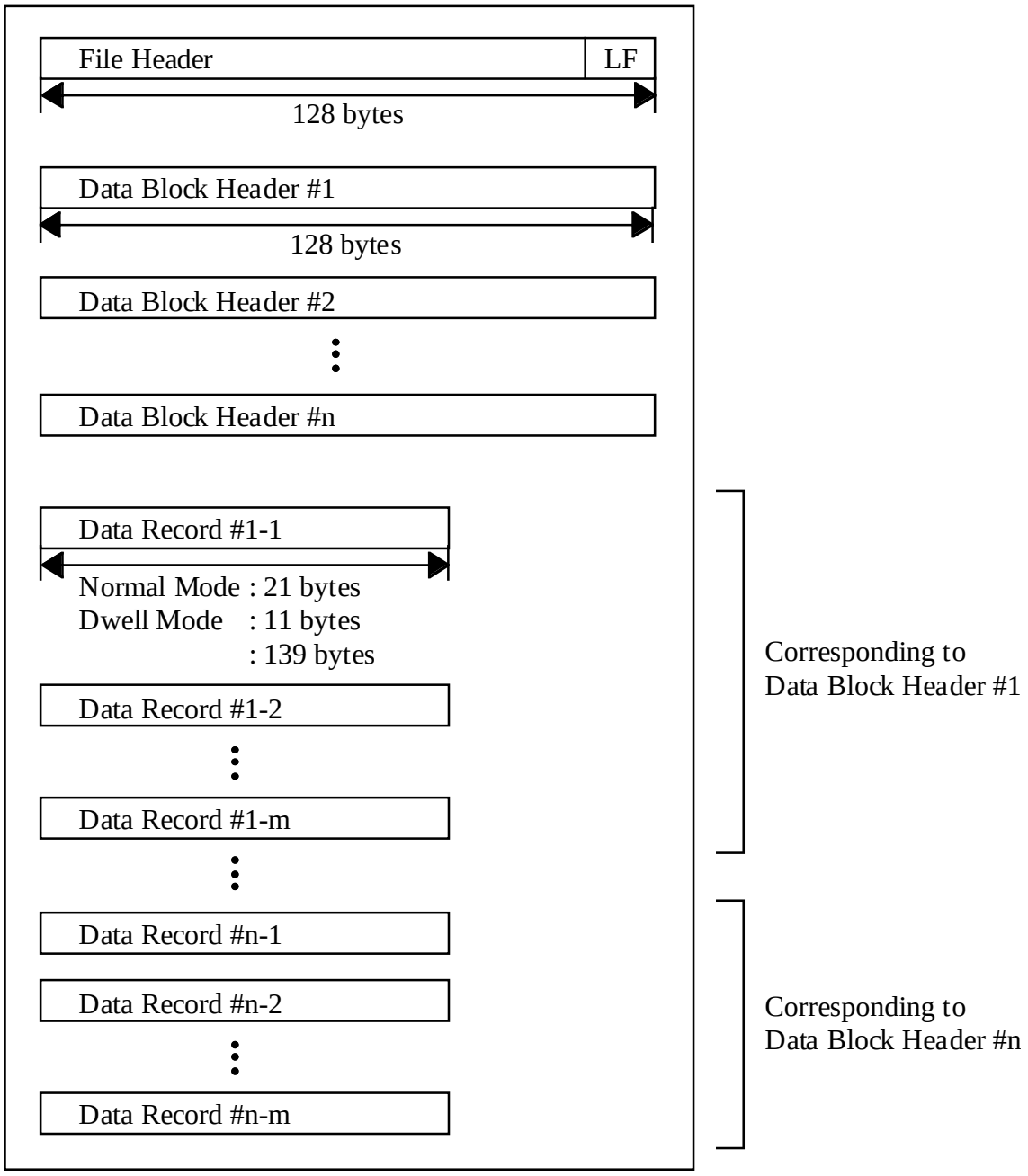
- Changes of telemetry format ID.
  In case of the ADEOS-II → format ID is always 1.
- Changes of dwell mode flag.
  In case of the ADEOS-II → 0:Normal mode.
  1:Dwell mode (normal commutation).
- Changes of data type.
  In case of the ADEOS-II → 0:Real-time TLM.
  1:Stored TLM.
- Skip or reversal of time.
  In case of the ADEOS-II, if time interval is more than 32 seconds (default), it is defined as a "Skip of time". "Reversal of time" (when a new time precedes an old time) will theoretically not occur except with bit error.

There are two cases in dwell mode.

Case 1 : If target word for SeaWinds is not set in normal commutation dwell ID within PCM header, the data from W128 to W255 are not delivered.

Case 2 : If target word for SeaWinds is set in normal commutation dwell ID within PCM header, the data from W128 to W255 are set the contents of normal commutation dwell ID.

File Structure of SeaWinds HK TLM data is shown in the figure A4.1-1.



* LF (Line Feed Character) : 1 byte
LF is the deliniter of UNIX and MS-DOS file.

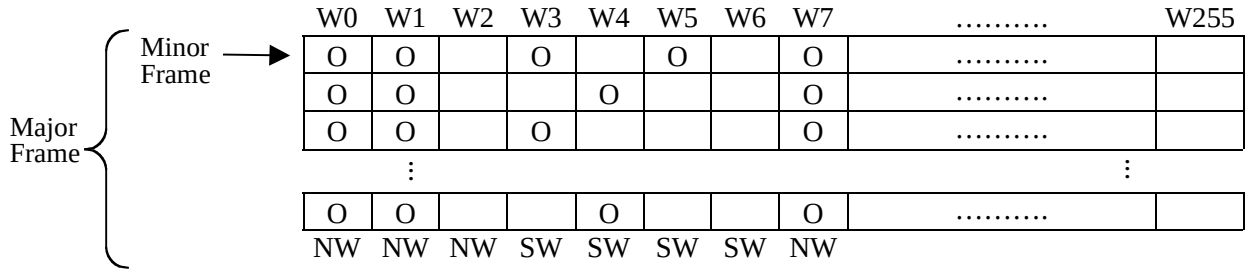
Fig.A4.1-1 File Structure of the ADEOS-II SeaWinds HK TLM Data

A4.2 Telemetry Data Settings

The delivered data are packed only with the target words. The target words are set in the data record. Un-extracted data are masked.
Examples of masking of telemetry data are shown as follows.

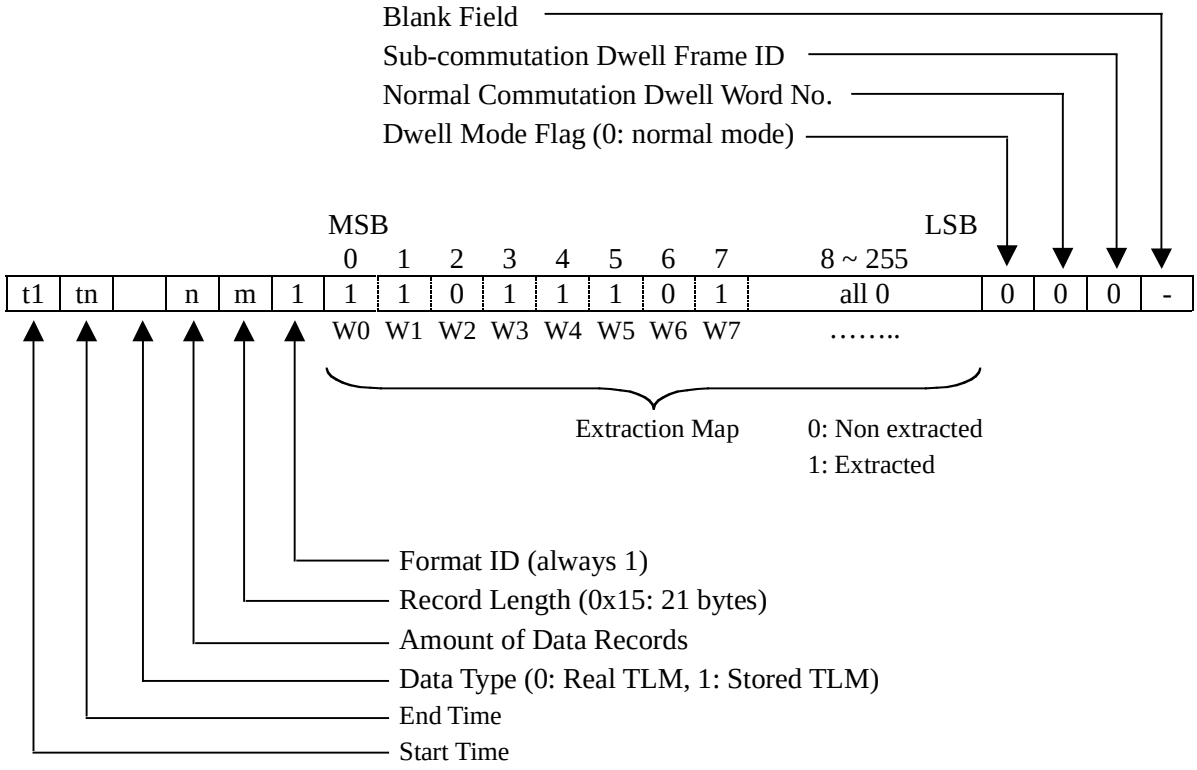
(1) In Normal mode

<< Target Words and Extraction Data >>

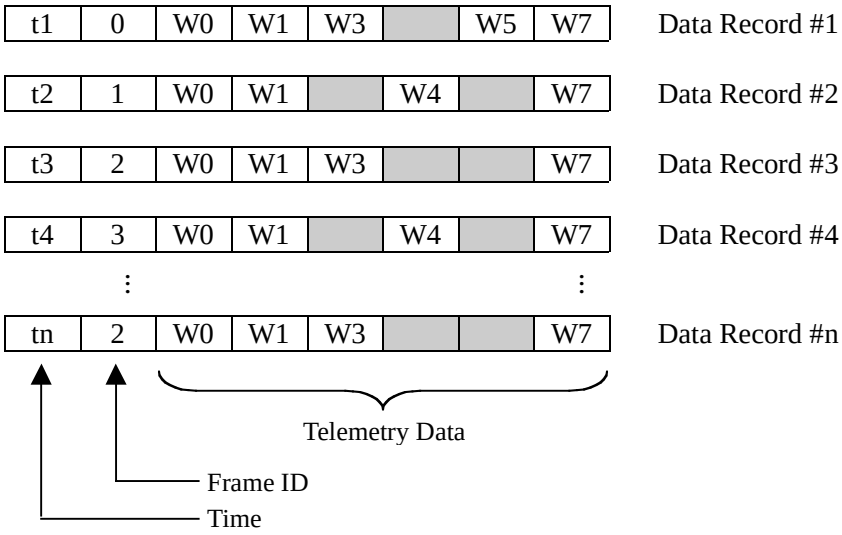


O: Extraction Data of Target Words
NW: Normal Commutation Word
SW: Sub-commutation Word

<< Data Block Header >>



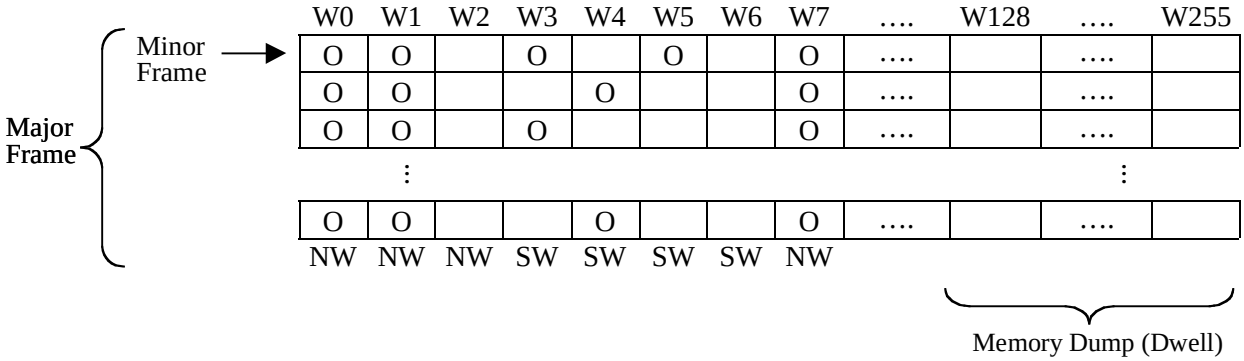
<< Data Records >>



If telemetry data related to the destination system does not exist in the minor frame, 0x00 will be filled in the words (hatched) in order to mask the non-related data.

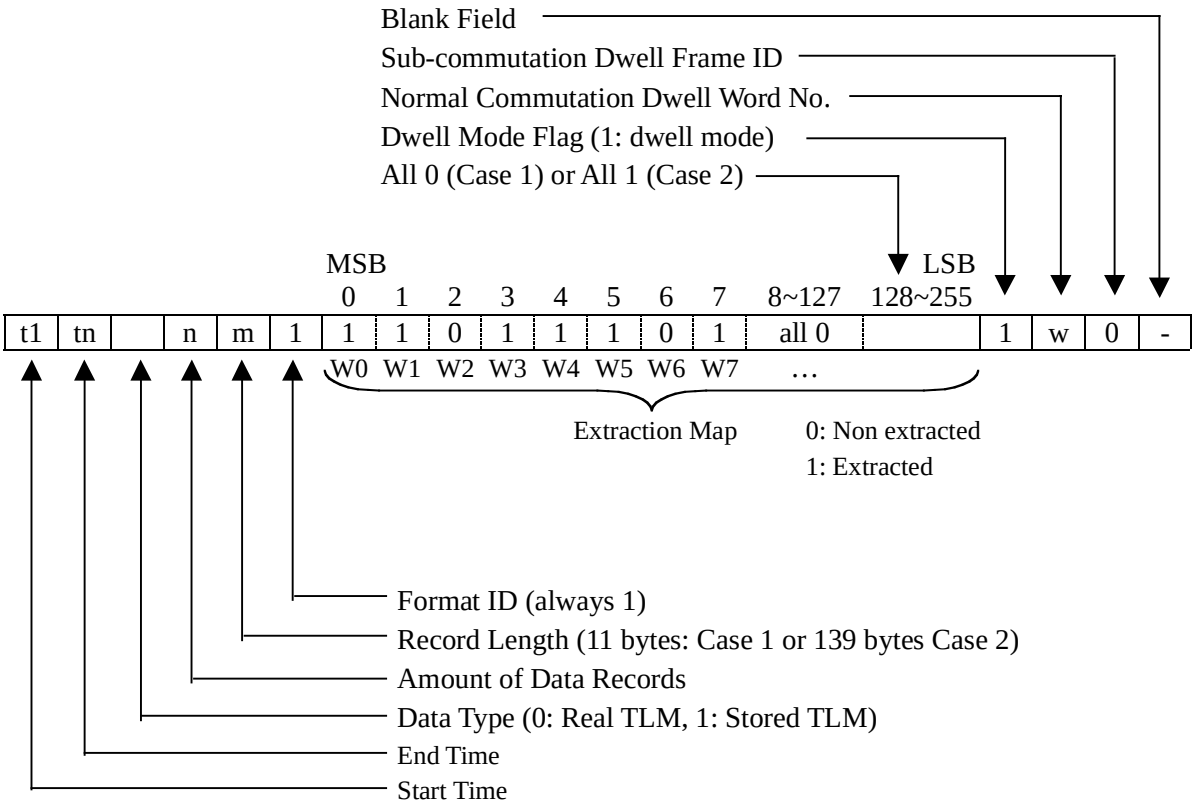
(2) In Dwell Mode
dwell area (i.e. words which are replaced by dwell data) → W128 ~ W255

<< Target Words and Extraction Data >>



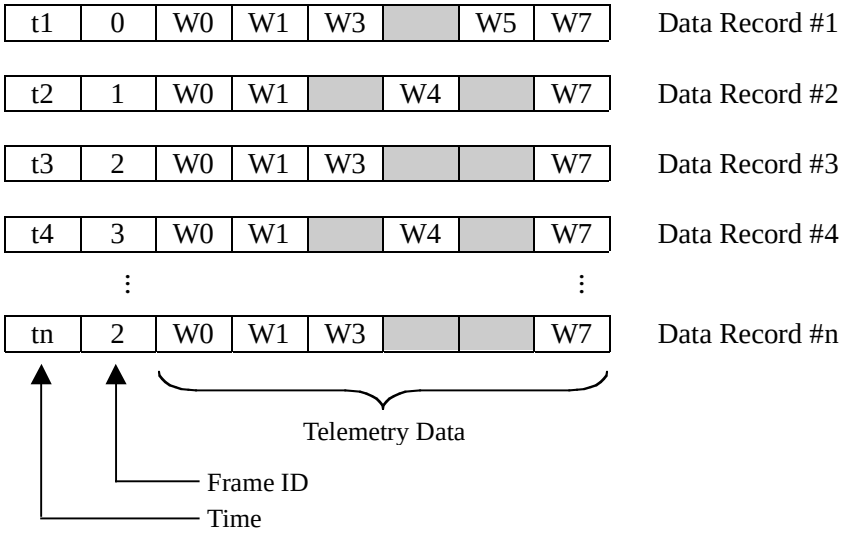
○: Extraction Data of Target Words
NW: Normal Commutation Word
SW: Sub-commutation Word

<< Data Block Header >>

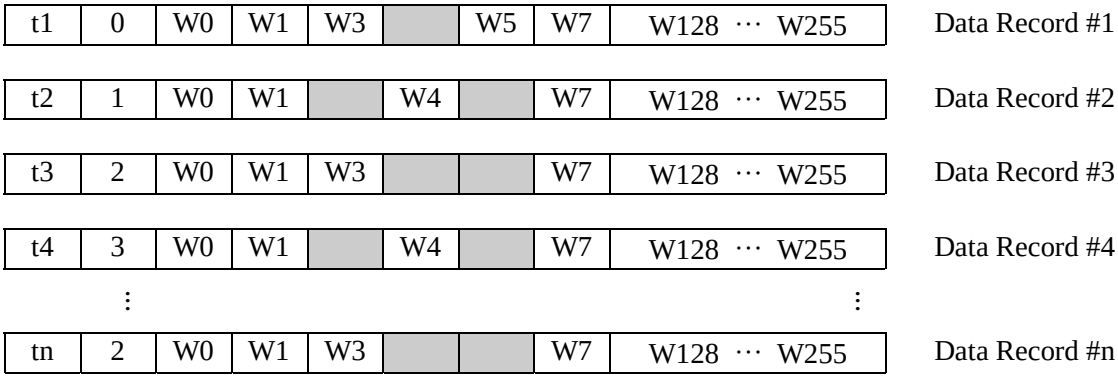


<< Data Records >>

< Case 1 >



< Case 2 >



If telemetry data related to the destination system does not exist in the minor frame, 0x00 will be filled in the words (hatched) in order to mask the non-related data.

A4.3 File Format

File header is shown in the table A4.3-1.
Data block header is shown in the table A4.3-2.
Data record is shown in the table A4.3-3 and the figure A4.3-1- to A4.3-3.

Table A4.3-1 Format of file header (128byte fixed length)

#of byte	item	type	byte size	description
0	file name	ASCII	13	‘ HKSSPYYMMDDnn ‘ HK : HK TLM data (fixed) SS : Sensor ID (‘SW’ : SeaWinds) P : Processor ID ‘1’ ~ ’9’ : EOC (N/A for SW) ‘T’ : TACC processor YYMMDD : File generation date nn : Sequential number of HK TLM data files processed by each processor in day (‘00’ ~ ‘99’)
13	delimiter	ASCII	1	1 blank (0x20)
14	Spacecraft ID	ASCII	12	S/C name for delivered data :left justification ‘ADEOS-2 ’
26	delimiter	ASCII	1	1 blank (0x20)
27	File generation facility	ASCII	8	delivery system name :left justification ‘ HEOC ’ or ‘ TACC ’
35	delimiter	ASCII	1	1 blank (0x20)
36	sensor name (Sensor ID)	ASCII	8	sensor name : left justification ‘SEAWINDS‘ : SeaWinds
44	delimiter	ASCII	1	1 blank (0x20)
45	File generation date	ASCII	8	creation date of HK TLM data ‘YYYYMMDD‘ (UT)
53	delimiter	ASCII	1	1 blank (0x20)
54	File generation time	ASCII	8	creation time of HK TLM data ‘HH:MM:SS’ (UT)
62	delimiter	ASCII	1	1 blank (0x20)
63	start date	ASCII	8	start date of HK TLM data (date of first data record within all data record) ‘YYYYMMDD‘ (UT)
71	delimiter	ASCII	1	1 blank (0x20)
72	end date	ASCII	8	end date of HK TLM data (date of last data record within all data record) ‘YYYYMMDD‘ (UT)
80	delimiter	ASCII	1	1 blank (0x20)
81	data type	ASCII	4	delivery data type : left justification ‘ RAW ’ : telemetry raw data
85	delimiter	ASCII	1	1 blank (0x20)
86	amount of records	ASCII	4	amount of data block header records
90	delimiter	ASCII	1	1 blank (0x20)
91	record length	ASCII	5	data block header record length ‘ 00128 ’ (128byte)
96	reserved	ASCII	31	all blank filled (0x20)
127	delimiter		1	LF (0x0a)

Table A4.3-2 Format of data block header (128bytes fixed length)

#of byte	item	type	byte size	description
0	start time	BCD	7	observation time of beginning data (time of first data record within this block) 'YYDDDHHMMSS MSMS0 ' (UT)
7	end time	BCD	7	observation time of end data (time in last data record within this block) 'YYDDDHHMMSS MSMS0 ' (UT)
14	data type	BINARY	1	data type 0 : real telemetry data 1 : stored telemetry data
15	amount of records	BINARY	4	amount of data records
19	record length	BINARY	4	data record length (byte) 0x00000015 : normal mode (21bytes) 0x0000000b : dwell mode (case1) (11bytes) 0x0000008b : dwell mode (case2) (139bytes)
23	format ID	BINARY	1	format ID of telemetry data (format ID is always 1)
24	extraction map	BINARY	32	extraction flag words ・ Normal Mode 0x000c00000000040000000000000000 00000000000000000000001bfc00000 0 extracted words are following W12,13 : S/C TIME DATA (NW) W57 : Temp (SW) W219,220 : SD-1, SD-2 (NW) W222, 223 : SAS-A/B Spin (NW) W224, 226 : GDS-A/B +5V (NW) W225, 227 : GDS-A/B +3.3V (NW) W228, 229 : PB (NW) ・ dwell mode (case1) 0x000c00000000040000000000000000 00000000000000000000000000000000 dwell mode (case2) 0x000c00000000040000000000000000 ffffffffffffffffffffffffffffffff extracted words (W0 ~ W127) are same as normal mode W128 ～ W255 : Dwell Data NW : normal commutation word SW : sub-commutation word
56	dwell mode flag	BINARY	1	dwell mode 0 : normal mode 1 : dwell mode (normal commutation)
57	ND word No.	BINARY	1	normal commutation dwell word No. (0 ~ 255)
58	SD frame ID	BINARY	1	sub commutation dwell frame ID (0 ~ 31) (SD frame ID is always 0)
59	reserved	ASCII	69	all blank filled (0x20)

Table A4.3-3 Format of data record

#of byte	item	type	byte size	description
0	time	BCD	7	Observation time calculated from S/C time counter in PCM header(W12 and W13) with Time Difference Data delivered from MMO 'YYDDDHHMMSS MSMS0 ' (UT)
7	frame ID	BINARY	1	frame ID (0 ~ 31)
8	data	BINARY	n	extracted telemetry raw data 13bytes : normal mode 3 bytes : dwell mode (case1) 131bytes : dwell mode (case2) * 0x00 filled in the word if telemetry data related to the destination system does not exist in the minor frame.

Time (7bytes)	frame ID (1byte)	W12,W13 (NW)	W57 (SW)	W219 (NW)	W220 (NW)	W222 (NW)	W223 (NW)	W224 (NW)	W225 (NW)	W226 (NW)	W227 (NW)	W228 (NW)	W229 (NW)
	0	S/C	CDS-A Temp	SD-1	SD-2	SAS-A	SAS-B	GDS-A +5V	GDS-A +3.3V	GDS-B +5V	GDS-B +3.3V	PB	PB
	1	TIME	CDS-B Temp			Spin	Spin						
	2	DATA	PSU-1 Temp										
	3		SES-1 Temp										
	4		SES-2 Temp										
	5		TWTA-1 Temp										
	6		TWTA-2 Temp										
	7		SAS EA-A PS Temp										
	8		SAS EA-B PS Temp										
	9		SAS Simplex Temp										
	10		SAS Duplex Temp										
	11		SAS MTR DRV Temp										
	12		0x00										
	13		(Mask)										
	14												
	15												
	16												
	17												
	18												
	19												
	20												
	21												
	22												
	23												
	24												
	25												
	26												
	27												
	28												
	29												
	30												
	31												

21 bytes

Fig. A4.3-1 Format of Data Record (Normal Mode)

Time (7bytes)	frame ID (1byte)	W12,W13 (NW)	W57 (SW)
	0	S/C	CDS-A Temp
	1	TIME	CDS-B Temp
	2	DATA	PSU-1 Temp
	3		SES-1 Temp
	4		SES-2 Temp
	5		TWTA-1 Temp
	6		TWTA-2 Temp
	7		SAS EA-A PS Temp
	8		SAS EA-B PS Temp
	9		SAS Simplex Temp
	10		SAS Duplex Temp
	11		SAS MTR DRV Temp
	12		0x00
	13		(Mask)
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

11 bytes

Fig. A4.3-2 Format of Data Record (Dwell Mode (Case 1))

Time (7bytes)	frame ID (1byte)	W12,W13 (NW)	W57 (SW)	W128 ~ W255 (NW)
	0	S/C	CDS-A Temp	Dwell Data
	1	TIME	CDS-B Temp	
	2	DATA	PSU-1 Temp	
	3		SES-1 Temp	
	4		SES-2 Temp	
	5		TWTA-1 Temp	
	6		TWTA-2 Temp	
	7		SAS EA-A PS Temp	
	8		SAS EA-B PS Temp	
	9		SAS Simplex Temp	
	10		SAS Duplex Temp	
	11		SAS MTR DRV Temp	
	12		0x00	
	13		(Mask)	
	14			
	15			
	16			
	17			
	18			
	19			
	20			
	21			
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			
	30			
	31			

139 bytes

Fig. A4.3-3 Format of Data Record (Dwell Mode (Case 2))

Appendix 5 E-mail Notification Format (RTCR & RTCA)

For SeaWinds parameter table update and switch operation, the following e-mail notifications are used to exchange necessary information between SeaPAC and NASDA.

- RTCR #1: SWPF file shipment report from SeaPAC to NASDA
- RTCA #1: Real Time Command (RTC) generation result report from NASDA to SeaPAC (for table update)
- RTCR #2: Real time command request from SeaPAC to NASDA
- RTCA #2: SOP generation and transmission results report from NASDA to SeaPAC (for table switch)

The formats of the above e-mail notification are defined in the section A5.1, and examples are shown in the section A5.2.

A5.1 Formats

(1) Format of RTCR #1

< E-mail Header >

From	: E-mail Address for SeaPAC POC (Point of Contact) *(Specified in the Contact Points Document)*
To	: E-mail Address for TACC POC *(Specified in the Contact Points Document)*
Subject	: File Sending Notification for DDMST.ADEOS2.SWPF.YYYYMMDD.NN *(Corresponding to the SWPF file name)*
Cc	: E-mail Address for EOC POC *(Specified in the Contact Points Document)*

< E-mail Body >

<<SWPF INPUT INFORMATION>>	
FILENAME	: DDMST.ADEOS2.SWPF.YYYYMMDD.NN *(File name of the corresponding SWPF)*
SWPF GENERARION DATE	: YYYYMMDD HH:MM:SS (UT) *(Same as SWPF Header Record)*
COMMAND REQUEST DATE	: YYYYMMDD (UT) *(Same as SWPF Header Record)*
TABLE UPLOAD REPETITION NUMBER	: NN TIME(s) *(Actual repetition number. In SWPF header record, this number should be always "1".)*
TABLE SWITCH REQUEST	: X *(Y: Necessary, N: Not necessary)*
NOTE	: XXX ~~~ XXXX *(Format free, any notifications can be described in this field, if necessary. (e.g.: The reason that 2 or more higher value is put into the field of "Table Upload Repetition Number".))*

(2) Format of RTCA #1

< E-mail Header >

From	: E-mail Address for TACC POC *(Specified in the Contact Points Document)*
To	: E-mail Address for SeaPAC POC *(Specified in the Contact Points Document)*
Subject	: Command Generating Result for DDMST.ADEOS2.SWPF.YYYYMMDD.NN *(Corresponding to the SWPF file name)*
Cc	: E-mail Address for EOC POC *(Specified in the Contact Points Document)*

< E-mail Body >

<<SWPF INPUT INFORMATION>>
FILENAME : DDMST.ADEOS2.SWPF.YYYYMMDD.NN
(File name of the corresponding SWPF)
SWPF GENERARION DATE : YYYYMMDD HH:MM:SS (UT)
(Same as SWPF Header Record)
COMMAND REQUEST DATE : YYYYMMDD (UT)
(Same as SWPF Header Record)
TABLE UPLOAD
REPETITION NUMBER : NN TIME(s)
(Same as SWPF Header Record)
<<PROCESSING RESULT>>
PROCESSING RESULT : Normal End" or "Abnormal End"
UPLOAD PASS ID : Pass ID for command transmitting
TIMING : YYMMDDHHMMSS (UT)
(Start and End time of the Upload Pass)
STATION : Station ID for command transmitting
NOTE : XXX~~XXX (Format free, SWPF error is described, for example)

<<SM VALUE>>
YYYYYYY XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX
YYYYYYY XXXX XXXX XXXX XXXX XXXX ……

(3) Format of RTCR #2

< E-mail Header >

From	: E-mail Address for SeaPAC POC *(Specified in the Contact Points Document)*
To	: E-mail Address for TACC POC *(Specified in the Contact Points Document)*
Subject	: SOP Request
Cc	: E-mail Address for EOC POC *(Specified in the Contact Points Document)*

< E-mail Body >

<<INPUT INFORMATION>>	
COMMAND REQUEST PURPOSE	: XXX *(ULT : Switch to the Uploaded Table* *DET : Back to the Default Table* *RET : Real time command for anomalous operation)*
FILENAME	: DDMST.ADEOS2.SWPF.YYYYMMDD.NN *(Purpose is "ULT" : File name of the corresponding SWPF* *Purpose is "DET", "RET": Skip)*
SOP to USE (multiple lines allowed)	: SWNnnn
COMMAND REQUEST DATE	: YYYYMMDD (UT)
Note	: XXX~~XXX (Format free, for example the reason for the real time command request)

(4) Format of RTCA #2

< E-mail Header >

From	: E-mail Address for TACC POC *(Specified in the Contact Points Document)*
To	: E-mail Address for SeaPAC POC *(Specified in the Contact Points Document)*
Subject	: Parameter Table Switch Result
Cc	: E-mail Address for EOC POC *(Specified in the Contact Points Document)*

< E-mail Body >

<<INPUT INFORMATION>>	
SOP to USE	: SWNnnn
COMMAND REQUEST DATE	: YYYYMMDD (UT)
<<COMMAND SENDING RESULT>>	
COMMAND SENDING TIME	: YYYYMMDD HH:MM (UT)
COMMAND SENDING RESULT	:"Normal End" or "Abnormal End"
NOTE	: XXX~~XXX (Format free, the reason of command transmission failure is described, for example)

A5.2 Example

(1) RTCR#1

- E-mail Header
From: swsea@seapac2.jpl.nasa.gov
To: adeos2tacc@nasda.go.jp
Subject: File Sending Notification for DDMST.ADEOS2.SWPF.20020502.01
Cc: adeos2op@eoc.nasda.go.jp

- E-mail Body
<<SWPF INPUT INFORMATION>>
FILENAME : DDMST.ADEOS2.SWPF.20020502.01
SWPF GENERATION DATE : 20020502 10:00:00
COMMAND REQUEST DATE : 20020507
TABLE UPLOAD REPETITION NUMBER : 1 TIME(s)
NOTE:

(2) RTCA#1

- E-mail Header
From: adeos2tacc@nasda.go.jp
To: swsea@seapac2.jpl.nasa.gov
Subject: Command Generating Result for SWPF. 20020502.01
Cc: adeos2op@eoc.nasda.go.jp

- E-mail Body
<<SWPF INPUT INFORMATION>>
FILENAME : DDMST.ADEOS2. SWPF. 20020502.01
SWPF GENERATION DATE : 20020502 10:00:00
COMMAND REQUEST DATE : 20020507
TABLE UPLOAD REPETITION NUMBER : 1 TIME(s)

<<PROCESSING RESULT>>
RESULT : NORMAL END
UPLOAD PASS ID : 1330
TIMING : 001227013954 -> 001227015227
STATION : KAF1
NOTE :

<<SM VALUE>>
0000000 0000 1111 0000 2222 0000 3333 0000 4444
0000020 0000 5555 0000 6666 0000 7777 0000 8888
0000040 0000 9999 0000 aaaa 0000 1111 0000 2222
0000060 0000 3333 0000 4444 0000 5555 0000 6666
0000100 0000 bbbb 0000 cccc 0000 dddd 0000 eeee
0000120 0000 ffff 0000 6666 0000 7777 0000 8888
0000140 0000 9999 0000 aaaa 0000 1111 0000 2222
0000160 0000 3333 0000 4444 0000 5555 0000 6666
0000200 0000 1111 0000 2222 0000 3333 0000 4444
0000220 0000 5555

(3) RTCR#2

- E-mail Header
From: swsea@seapac2.jpl.nasa.gov
To: adeos2tacc@nasda.go.jp
Subject: SOP Request
Cc: adeos2op@eoc.nasda.go.jp

- E-mail Body (example for "ULT")
<<INPUT INFORMATION>>
COMMAND REQUEST PURPOSE : ULT
FILENAME : DDMST.ADEOS2. SWPF. 20020502.01
SOP to USE : SWN001
COMMAND REQUEST DATE : 20020507
Note:

- E-mail Body (example for "DET")
<<INPUT INFORMATION>>
COMMAND REQUEST PURPOSE : DET
SOP to USE : SWN001
COMMAND REQUEST DATE : 20020507
Note:

- E-mail Body (example for "RET")
<<INPUT INFORMATION>>
COMMAND REQUEST PURPOSE : RET
SOP to USE : SWN001
SWN002
SWN003
COMMAND REQUEST DATE : 20020507
Note:

(4) RTCA #2

- E-mail Header
From: adeos2tacc@nasda.go.jp
To: swsea@seapac2.jpl.nasa.gov
Subject: Parameter Table Switch Result
Cc: adeos2op@eoc.nasda.go.jp

- E-mail Body
<<INPUT INFORMATION>>
SOP to USE : SWN001
COMMAND REQUEST DATE : 20020507

<<COMMAND SENDING RESULT>>
COMMAND SENDING TIME : 20020507 06:32
COMMAND SENDING RESULT : Normal End
NOTE:

Appendix 6 Raw Data Label Format

D1 management number description

Fromat	: DSSxnnnnnn
D	: D1 tape
SS (station code)	: 65 for ASF, 66 fir WFF
x (satellite code)	: 2 for ADEOS-II Maseter, 3 for ADEOS-II Backup
nnnnnn	: Serial Number

Fig.A6-1 D1 tape label supplied by Sony

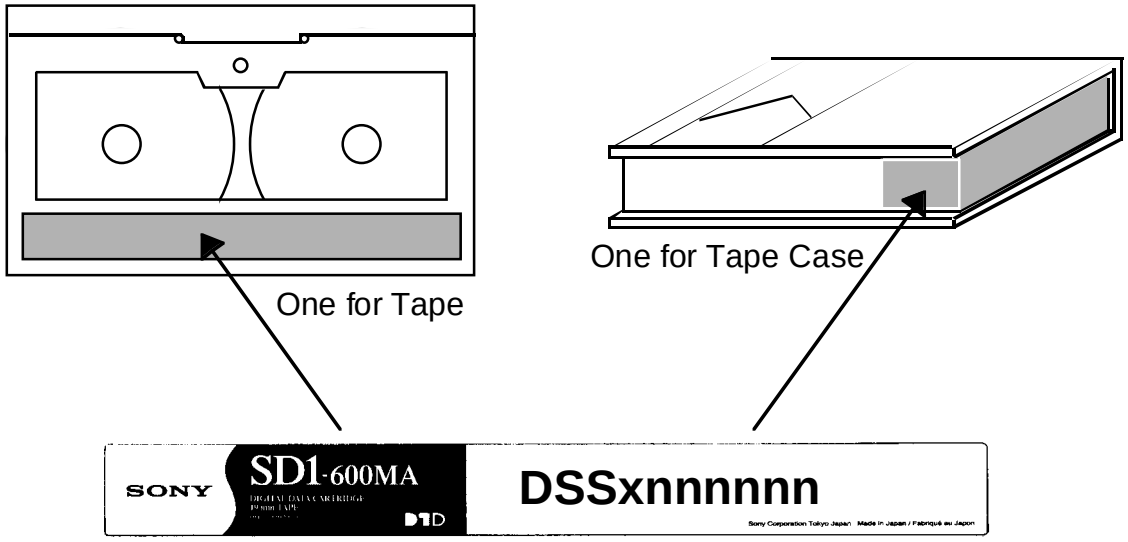


Fig.A6-2 Place of D1 tape label on tape and case

Appendix 7 Mean Orbit Data Format (e-mail)

< Sample>

(ADEOS2) **** E L E M E N T S C O N V E R T O R (MCONV) P R O G (V-01/L-05) 1999-11-22 PAGE: 0001

1) INPUT ELEMENTS

ORBIT TYPE		KEPL/MEAN/TRUE OF DATE
EPOCH	[UTC]	2001-12-03 00:00:00.000
A	[km]	7180.75150000
E		0.00167410000
I	[degree]	98.6914300000
AN	[degree]	48.8060000000
AP	[degree]	120.3817300000
MA	[degree]	105.4890000000
AIR MODEL		J-N MODEL
RHO1		0.0000000000

[GENERATE CONDITION]		
SEMI-MAJOR AXIS	[km]	7174.896000
INCLINATION	[degree]	98.59000000
UNIT OF RECURRENCE PERIOD	[day]	10.00
GEOPOTENTIAL DEGREE OF S.M.A.		36
GEOPOTENTIAL ORDER OF S.M.A.		36
SECULAR DEGREE		36
TIME OF THETA-G-DOT CALCULATION	[UTC]	1999-11-30 00:00:00.000
GEOPOTENTIAL MODEL NAME		GEMT3

2) OUTPUT ELEMENTS

ORBIT TYPE		KEPL/OSCU/TRUE OF DATE	ORBIT TYPE		CART/OSCU/TRUE OF DATE
EPOCH	[UTC]	2001-12-03 00:00:00.000	EPOCH	[UTC]	2001-12-03 00:00:00.000
A	[km]	7180.75150000	X	[km]	-3871.61200944
E		0.00167410000	Y	[km]	-3236.63997680
I	[degree]	98.6914300000	Z	[km]	-5113.15538586
AN	[degree]	48.8060000000	VX	[km/s]	2.937353367
AP	[degree]	120.3817300000	VY	[km/s]	4.543763306
MA	[degree]	105.4890000000	VZ	[km/s]	-5.117210297
AIR MODEL		J-N MODEL	AIR MODEL		J-N
RHO1		0.0000000000	RHO1		0.0000000000

ORBIT TYPE		KEPL/MEAN/TRUE OF DATE	ORBIT TYPE		NON-SINGULAR/MEAN/TRUE OF DATE
EPOCH	[UTC]	2001-12-03 00:00:00.000	EPOCH	[UTC]	2001-12-03 00:00:00.000
A	[km]	7181.13613760	A	[km]	7181.13613760
E		0.00203776064	EX		-0.00158696195
I	[degree]	98.6912363668	EY		0.00127828800
AN	[degree]	48.8114760923	I	[degree]	98.6912363668
AP	[degree]	141.1487717534	AN	[degree]	48.8114760923
MA	[degree]	84.6692733759	PHI	[degree]	225.8180451293
AIR MODEL		J-N MODEL	AIR MODEL		J-N
RHO1		0.0000000000	RHO1		0.0000000000