

# **ALOS**

## **Product Format Description (PALSAR Level 1.0)**

**Product Format Description (PALSAR)**  
**Change Record (1/1)**

Rev.	Date	Changed place	Changed contents
	2003/07/28		The first revision was released.
A	2003/09/05		Revised only for PRISM and AVNIR-2 description, nothing changed in PALSAR.
B	2004/01/30	Volume Descriptor Record	Code in Logical volume generating agency was changed from "NASDA" to "JAXA."
		Text Record	Code in Location and date/time of product creation was changed from "NASDA" to "JAXA."
C	2004/03/05		Revised only for PRISM and AVNIR-2 description, nothing changed in PALSAR.
D	2004/03/24		Revised only for AVNIR-2 description, nothing changed in PALSAR.
E	2004/12/16	Appendix A-3-4	"Absolute navigation time" was added in Auto-verification result.
F	2005/06/20	Appendix A-3-4	"DVD-R" was added to "Number of CDRs" in Result Information.
G	2005/07/15	P3	Description, which says there is a case that calibration data is included in signal data, was added.
		Table 3-3 to 3-8	Value of "Length of signal data record" was corrected.
		Signal Data Record	Description, which says there is a case that calibration data is included in signal data, was added.
		Appendix A-3-4	"PRF change" and "Calibration data" in Auto-verification result were added.
H	2005/11/30	Appendix A-3-2	Supplemental explanation was added to the scene ID and the product ID of summary information.
		Appendix A-3-3	Supplemental explanation was added to the number of pixels and lines of summary information.
I	2006/05/19	Table 3.2-2 to 3.2-7	Result of the primary check after launching was reflected. "Minimum number of Sample" and "Maximum number of Sample" was changed to "Level 1.0 Number of records (Minimum)" and "Level 1.0 Number of records (Minimum)."  Note about the number of records (Level 1.0) and 1 scene size was added.
		Data Set Summary Record	Standby 4 was added.
		Calibration Record	Description, which says dummy data (all zero) is stored in case of calibration-only-mode, was added.
		Appendix A-1-3	Note about the calibration mode date was added.
J	2006/10/06	Table 3.3-3 Table 3.3-5~6 Table 3.3-10~11	Reference page of Appendix-1 was added in the remarks of the table.
		Appendix A-1-2, A-1-8	The value was changed according to the result of the initial operation evaluation.

**Product Format Description for ALOS Data Processing Subsystem  
 (PALSAR LEVEL 1.0 FORMAT)**

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## **1 Introduction**

This document describes a format description of PALSAR Level 1.0 data generated by ALOS Data Processing Subsystem.

PALSAR Level 1.0 data is processed from PALSAR Level 0 data distributed by ALOS Central Information Subsystem.

PALSAR Level 1.0 products are defined by scene ID and scene shift using orbit frame number.

## 2 Specification of Products

### 2.1 Definition of a scene

#### 2.1.1 Size of One Scene

Table 2.1-1 shows the azimuth size of the ALOS PALSAR products.

**Table 2.1-1 Azimuth size of PALSAR Products (nominal value)**

Observation Mode	Azimuth Resolution (Number of multi-looks)	Azimuth Size of Products	Observation Duration Time
High Resolution mode (Single polarization)	10m (2looks) 20m (4looks)	70km	16.4sec
High Resolution mode (Dual polarization)	10m (2looks) 20m (4looks)	70km	16.4sec
Direct Down Link mode	10m (2looks) 20m (4looks)	70km	16.4sec
Wide observation mode (3scans/4scans /5scans)	100m (4looks)	350km	57.0sec
Polarimetry mode	10m (2looks) 20m (4looks)	70km	16.4sec

## 2.2 Definition of processing level

Table 2.2-1 describes the definition of PALSAR Processing level. This format description shows for PALSAR level 1.0 product.

**Table 2.2-1 Definition of PALSAR Processing Level**

Processing Level	Definition	Remark
1.0	<ul style="list-style-type: none"> <li>• Extracted a scene from receiving segmentation data.</li> <li>• Unpacking to 8bits. Original RAW PALSAR data is packed.</li> <li>• Extracted one polarization data from multi-polarization data.</li> </ul>	
1.1	Range Compression. Single look azimuth compression. Complex image data of slant-range. This level is a basic image (SLC) including the phase information.	SLC: Single Look Complex for interferometry image.
1.5	Range compression and multi-look azimuth compression. Ground range and Map projection image. Selectable of pixel spacing (each observation mode) Option for processing as follows: G: Geo-coded (No option: Geo-referenced: Projection for along truck)	Note: Option "G" is default processing. Number of multi-looks is 4looks.

## 2.3 Level 1.0 Format Specification

PALSAR level 1.0 products are produced in the CEOS format as described in "SAR Data Products Format Standard (CEOS-SAR-CCT Iss/Rev: 2.0)

PALSAR level 1.0 product consists of four kinds of files containing various descriptive records. The files are as follows:

- Volume Directory File
- SAR Leader File
- SAR Data Files
- SAR Trailer File

## 2.4 Product Summary

PALSAR level 1.0 products are characterized by observation mode. A summary of the various generated products is given in Table 2.4-1.

PALSAR instrument is operated in one of three polarization:

Single Polarization

Dual Polarization

Four Polarization

Number of SAR Data Files is the same as number of Polarization.

In Scan SAR Mode, three, four or five single beams are used during data collection. SAR Data File of SCAN SAR Mode is not divided by each scan data In San SAR mode, each beam switching rates are determined by number of pulses.

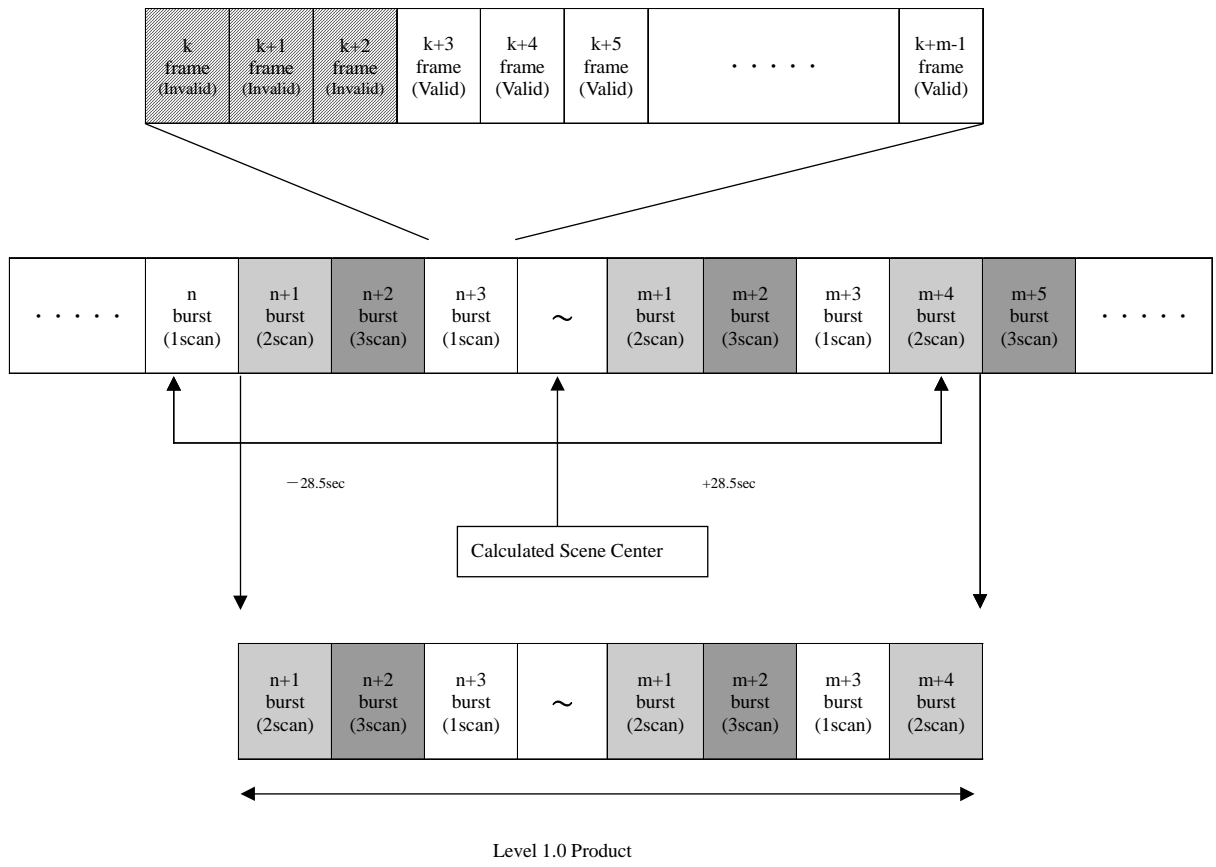
Since the head and end of PALSAR downlink data are calibration data, there is a case that calibration data is included in the head or the end of signal data in the edge of downlink segment.

Figure 2.4-1 shows the method of extracting a scene in SCAN SAR mode.

**Table 2.4-1 PALSAR level 1.0 Products Summary**

PALSAR Operation Mode	Polarization	Number of Data Files	Contents
High Resolution	Single Polarization	1	HH (or VV) Pol-Data
	Dual Polarization	2	HH (or VV) Pol-Data HV (or VH) Pol-Data
Direct Down link	Single Polarization	1	HH (or VV) Pol-Data
Wide Observation (SCAN SAR)	Single Polarization	1	First scan data Second scan data . . . . Nth scan data
Polarimetry	4 Polarization HH+HV+VH +VV	4	HH Pol-Data HV Pol-Data VH Pol-Data VV Pol-Data





**Figure 2.4-1 Method of extracting a scene in SCAN SAR mode**

### 3 CEOS Data Products Structure

#### 3.1 CEOS Contents

PALSAR level 1.0 data is consists of one Volume Directory File, one SAR Leader File, some SAR Data Files and one SAR Trailer File as shown in Table 3.1-1. Number of SAR Data Files is the same as number of polarization. The file name is given in Table 3.1-1. The file name is constructed in Scene ID and Product ID.

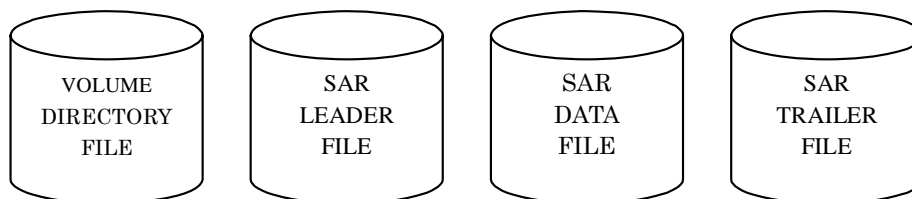
Detailed information about the Scene ID and the Product ID is provided in Appendix A-1.

Figure 3.1-1 to Figure 3.1-3 show the file structure for PALSAR level 1.0.

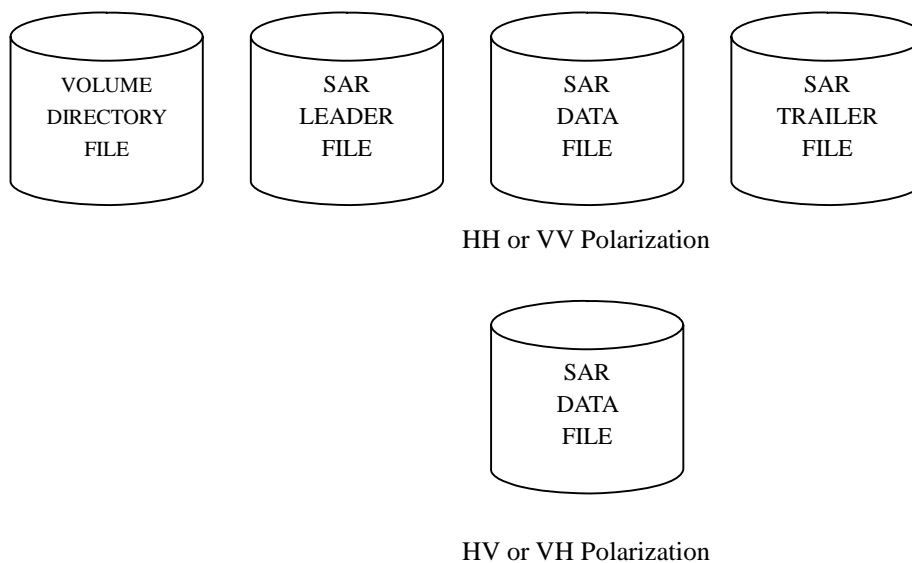
**Table 3.1-1 Definition of File Name**

File No.	File ID	Number of Files	Definition of file name	Record Type
1	VOLUME DIRECTORY FILE	1	VOL-SSSSSSSSSSSSSSSS-P PPPPPP	Volume Descriptor File Pointer Text Record
2	SAR LEADER FILE	1	LED-SSSSSSSSSSSSSSSS-PP PPPPPP	File Descriptor Data set Summary Platform Position data Attitude Data Calibration Data Facility Related Data
3	SAR DATA FILE	n (number of polarization)	IMG-TR-SSSSSSSSSSSSSSSS S-PPPPPPPP	File Descriptor Signal Data
4	SAR TRAILER FILE	1	TRL-SSSSSSSSSSSSSSSS-PP PPPPPP	File Descriptor

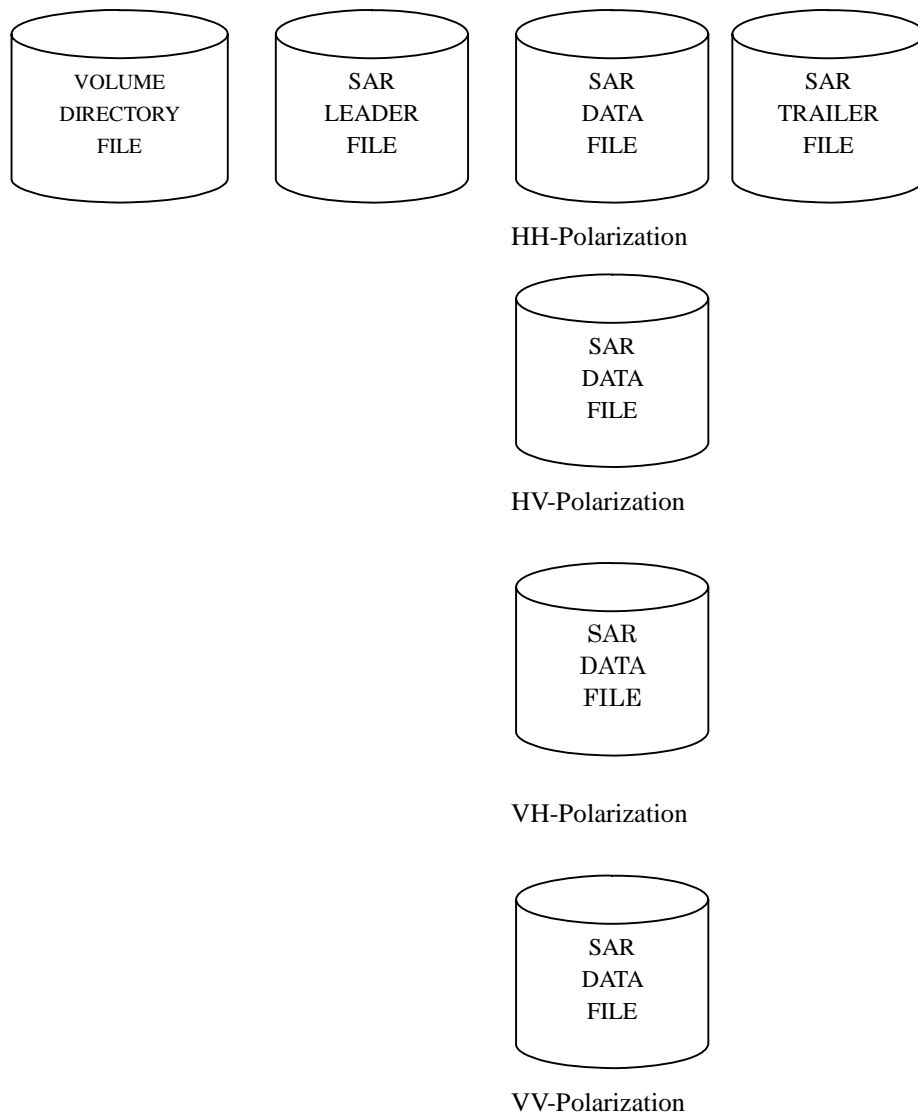
Note:)  
SSSSSSSSSSSSSSSS : Scene ID  
PPPPPPPP : Product ID  
T : Polarization of Tx (H,V)  
R : Polarization of Rx (H,V)



**Figure 3.1-1 Configuration of Level 1.0  
(High Resolution mode (single-polarization), Direct Down link mode,  
Wide Observation mode (Scan SAR))**



**Figure 3.1-2 Configuration of Level 1.0 (High Resolution mode (dual-polarization))**



**Figure 3.1-3 Configuration of Level 1.0 (Polarimetry mode)**

### 3.2 CEOS Record Contents

Table 3.2-1 shows the configuration of level 1.0 data records.

**Table 3.2-1 Configuration of level 1.0 data records**

Record No	Length of record	Number of records	Record name	File ID
1	360	1	VOLUME DESCRIPTOR RECORD	VOLUME DIRECTORY FILE
2	360	Number of polarization + 2	FILE POINTER RECORD	
3	360	1	TEXT RECORD	
4	720	1	SAR LEADER FILE DESCRIPTOR RECORD	SAR LEADER FILE
5	4,096	1	DATA SET SUMMARY RECORD	
6	4,680	1	PLATFORM POSITION DATA RECORD	
7	8,192	1	ATTITUDE DATA RECORD	
8	13,212	1	CALIBRATION DATA RECOTD	
9	1,540,000	1	FACILITY RELATED DATA RECORD #1	
10	4,314,000	1	FACILITY RELATED DATA RECORD #2	
11	345,000	1	FACILITY RELATED DATA RECORD #3	
12	325,000	1	FACILITY RELATED DATA RECORD #4	
13	325,000	1	FACILITY RELATED DATA RECORD #5	
14	3,072	1	FACILITY RELATED DATA RECORD #6	
15	511,000	1	FACILITY RELATED DATA RECORD #7	
16	4,370,000	1	FACILITY RELATED DATA RECORD #8	
17	728,000	1	FACILITY RELATED DATA RECORD #9	
18	15,000	1	FACILITY RELATED DATA RECORD #10	
19	720	1	SAR DATA FILE DESCRIPTOR RECORD	SAR DATA FILE
20	Note 1	N (Note 1)	SIGNAL DATA RECORD	
21	720	1	SAR TRAILER FILE DESCRIPTOR RECORD	SAR TRAILER FILE

Note1: Length and number of signal data record are shown in Table3.2-2 – Table3.2-7.

Table 3.2-2 Number and Length of Signal Data Record  
High Resolution Mode (Single polarization)

Offnadir angle (Deg)	Minimum PRF (Hz)	Maximum PRF (Hz)	L1.0 Observation time (sec)	Level 1.0 Number of records (Minimum)	Level 1.0 Number of records (Maximum)	Receive Gate Width (micro-sec)	Sampling Frequency (MHz)	Number of samples	Size of SAR data (byte)	Length of signal data record (byte)	Minimum amount of a scene (MB)	Maximum amount of a scene (MB)
9.9	2049.2	2272.7	16.4	33607	37272	117	32	3744	7900	8000	256.40	284.36
14.0	2020.2	2227.2	16.4	33131	36526	154	32	4928	10268	10300	325.44	358.79
18.0	2178.6	2369.7	16.4	35729	38863	189	32	6048	12508	12600	429.33	466.99
21.5	1742.2	1893.9	16.4	28572	31060	219	32	7008	14428	14500	395.10	429.51
25.8	2247.2	2403.8	16.4	36854	39422	255	32	8160	16732	16800	590.47	631.61
28.8	1996.0	2145.9	16.4	32734	35193	279	32	8928	18268	18300	571.29	614.19
30.8	1773.0	1904.8	16.4	29077	31239	294	32	9408	19228	19300	535.19	574.98
34.3	2036.7	2169.2	16.4	33402	35575	322	32	10304	21020	21100	672.13	715.86
36.9	1795.3	1926.8	16.4	29443	31600	340	32	10880	22172	22200	623.35	669.01
38.8	1582.3	1712.3	16.4	25950	28082	354	32	11328	23068	23100	571.67	618.64
41.5	1808.3	1930.5	16.4	29656	31660	373	32	11936	24284	24300	687.26	733.70
43.4	1597.4	1715.3	16.4	26197	28131	386	32	12352	25116	25200	629.59	676.06
45.2	1801.8	1941.7	16.4	29550	31844	292	32	9344	19100	19200	541.07	583.08
46.6	1607.7	1748.3	16.4	26366	28672	299	32	9568	19548	19600	492.84	535.94
47.8	1560.1	1672.2	16.4	25586	27424	303	32	9696	19804	19900	485.57	520.46
49.0	1639.3	1773.0	16.4	26885	29077	309	32	9888	20188	20200	517.91	560.15
50.0	1592.4	1724.1	16.4	26115	28275	313	32	10016	20444	20500	510.56	552.79
50.8	1550.4	1666.7	16.4	25427	27334	258	32	8256	16924	17000	412.23	443.15

Table 3.2-3 Number and Length of Signal data record  
High Resolution Mode (Dual polarization)

Offnadir angle (Deg)	Minimum PRF (Hz)	Maximum PRF (Hz)	L1.0 Observation time (sec)	Level 1.0 Number of records (Minimum)	Level 1.0 Number of records (Maximum)	Receive Gate Width (micro-sec)	Sampling Frequency (MHz)	Number of samples	Size of SAR data (byte)	Length of signal data record (byte)	Minimum amount of a scene (MB)	Maximum amount of a scene (MB)
9.9	2049.2	2272.7	16.4	33607	37272	117	16	1872	4156	4200	269.22	298.58
14.0	2020.2	2227.2	16.4	33131	36526	154	16	2464	5340	5400	341.24	376.21
18.0	2178.6	2369.7	16.4	35729	38863	189	16	3024	6460	6500	442.96	481.82
21.5	1742.2	1893.9	16.4	28572	31060	219	16	3504	7420	7500	408.73	444.32
25.8	2247.2	2403.8	16.4	36854	39422	255	16	4080	8572	8600	604.52	646.65
28.8	1996.0	2145.9	16.4	32734	35193	279	16	4464	9340	9400	586.90	630.97
30.8	1773.0	1904.8	16.4	29077	31239	294	16	4704	9820	9900	549.06	589.87
34.3	2036.7	2169.2	16.4	33402	35575	322	16	5152	10716	10800	688.06	732.82
36.9	1795.3	1926.8	16.4	29443	31600	340	16	5440	11292	11300	634.58	681.07
38.8	1582.3	1712.3	16.4	25950	28082	354	16	5664	11740	11800	584.04	632.03
41.5	1808.3	1930.5	16.4	29656	31660	373	16	5968	12348	12400	701.40	748.80
43.4	1597.4	1715.3	16.4	26197	28131	386	16	6176	12764	12800	639.58	686.79
45.2	1801.8	1941.7	16.4	29550	31844	292	16	4672	9756	9800	552.34	595.23
46.6	1607.7	1748.3	16.4	26366	28672	299	16	4784	9980	10000	502.90	546.88
47.8	1560.1	1672.2	16.4	25586	27424	303	16	4848	10108	10200	497.77	533.53
49.0	1639.3	1773.0	16.4	26885	29077	309	16	4944	10300	10400	533.29	576.79
50.0	1592.4	1724.1	16.4	26115	28275	313	16	5008	10428	10500	523.02	566.27
50.8	1550.4	1666.7	16.4	25427	27334	258	16	4128	8668	8700	421.93	453.58

- Note 1 One scene size is the total size of two polarization files  
 Note 2 Number of records (Level 1.0) means the number of Signal data records per SAR Image file.  
 Note 3 One scene size means the total size of all SAR image files.

Table 3.2-4 Number and Length of Signal data record  
Direct Downlink Mode

Offnadir angle (Deg)	Minimum PRF (Hz)	Maximum PRF (Hz)	L1.0 Observation time (sec)	Level 1.0 Number of records (Minimum)	Level 1.0 Number of records (Maximum)	Receive Gate Width (micro-sec)	Sampling Frequency (MHz)	Number of samples	Size of SAR data (byte)	Length of signal data record (byte)	Minimum amount of a scene(MB)	Maximum amount of a scene(MB)
9.9	2049.2	2272.7	16.4	33607	37272	117	16	1872	4156	4200	134.61	149.29
14.0	2020.2	2227.2	16.4	33131	36526	154	16	2464	5340	5400	170.62	188.10
18.0	2178.6	2369.7	16.4	35729	38863	189	16	3024	6460	6500	221.48	240.91
21.5	1742.2	1893.9	16.4	28572	31060	219	16	3504	7420	7500	204.36	222.16
25.8	2247.2	2403.8	16.4	36854	39422	255	16	4080	8572	8600	302.26	323.33
28.8	1996.0	2145.9	16.4	32734	35193	279	16	4464	9340	9400	293.45	315.49
30.8	1773.0	1904.8	16.4	29077	31239	294	16	4704	9820	9900	274.53	294.94
34.3	2036.7	2169.2	16.4	33402	35575	322	16	5152	10716	10800	344.03	366.41
36.9	1795.3	1926.8	16.4	29443	31600	340	16	5440	11292	11300	317.29	340.53
38.8	1582.3	1712.3	16.4	25950	28082	354	16	5664	11740	11800	292.02	316.01
41.5	1808.3	1930.5	16.4	29656	31660	373	16	5968	12348	12400	350.70	374.40
43.4	1597.4	1715.3	16.4	26197	28131	386	16	6176	12764	12800	319.79	343.40
45.2	1801.8	1941.7	16.4	29550	31844	292	16	4672	9756	9800	276.17	297.61
46.6	1607.7	1748.3	16.4	26366	28672	299	16	4784	9980	10000	251.45	273.44
47.8	1560.1	1672.2	16.4	25586	27424	303	16	4848	10108	10200	248.88	266.77
49.0	1639.3	1773.0	16.4	26885	29077	309	16	4944	10300	10400	266.65	288.39
50.0	1592.4	1724.1	16.4	26115	28275	313	16	5008	10428	10500	261.51	283.14
50.8	1550.4	1666.7	16.4	25427	27334	258	16	4128	8668	8700	210.96	226.79



Table 3.2-5 Number and Length of Signal data record  
Polarimetry Mode

Offnadir angle (Deg)	Minimum PRF (Hz)	Maximum PRF (Hz)	L1.0 Observation time (sec)	Level 1.0 Number of records (Minimum)	Level 1.0 Number of records (Maximum)	Receive Gate Width (micro-sec)	Sampling Frequency (MHz)	Number of samples	Size of SAR data (byte)	Length of signal data record (byte)	Minimum amount of a scene (MB)	Maximum amount of a scene (MB)
9.7	3676.5	3937.0	16.4	30147	32283	98	16	1568	3548	3600	414.01	443.35
13.8	3623.2	3876.0	16.4	29710	31783	106	16	1696	3804	3900	442.01	472.85
16.2	3367.0	3649.6	16.4	27609	29927	59	16	944	2300	2400	252.77	273.99
17.3	3144.7	3413.0	16.4	25787	27987	61	16	976	2364	2400	236.08	256.22
17.9	3003.0	3194.9	16.4	24625	26198	63	16	1008	2428	2500	234.84	249.85
19.2	3690.0	3968.3	16.4	30258	32540	65	16	1040	2492	2500	288.56	310.33
20.5	3472.2	3731.3	16.4	28472	30597	95	16	1520	3452	3500	380.14	408.51
21.5	3649.6	3891.1	16.4	29927	31907	99	16	1584	3580	3600	410.98	438.18
23.1	3401.4	3649.6	16.4	27891	29927	90	16	1440	3292	3300	351.11	376.73
24.2	3003.0	3246.8	16.4	24625	26624	77	16	1232	2876	2900	272.41	294.53
25.2	3003.0	3215.4	16.4	24625	26366	81	16	1296	3004	3100	291.20	311.80
26.2	3676.5	3937.0	16.4	30147	32283	83	16	1328	3068	3100	356.51	381.77

- Note 1 One scene size is the total size of two polarization files  
 Note 2 Number of records (Level 1.0) means the number of Signal data records per SAR Image file.  
 Note 3 One scene size means the total size of all SAR image files.

Table 3.2-6 Number and Length of Signal data record  
Wide Observation mode (Burst type 1)

Number of Scan	Scan No.	Offnadir angle (Deg)	Minimum PRF (Hz)	Maximum PRF (Hz)	L1.0 Observation time (sec)	Number of burst pulse	Level 1.0 Number of records (Minimum)	Level 1.0 Number of records (Maximum)	Receive Gate Width (micro-sec)	Sampling Frequency (MHz)	Number of samples	Size of SAR data (byte)	Length of signal data record (byte)	Minimum amount of a scene(MB)	Maximum amount of a scene(MB)
5	1	20.1	1577.3	1730.1	57.0	247	14244	15624	311	16	4976	10364	11200	1148.77	1236.57
	2	26.1	2247.2	2386.6	57.0	356	29250	31064	295	16	4720	9852	11200		
	3	30.6	1605.1	1745.2	57.0	274	16080	17483	336	16	5376	11164	11200		
	4	34.1	2036.7	2183.4	57.0	355	26435	28339	277	16	4432	9276	11200		
	5	36.5	1801.8	1945.5	57.0	327	21542	23260	293	16	4688	9788	11200		
4	1	20.1	1577.3	1730.1	57.0	247	18025	19771	311	16	4976	10364	11200	1162.51	1250.39
	2	26.1	2247.2	2386.6	57.0	356	37013	39309	295	16	4720	9852	11200		
	3	30.6	1605.1	1745.2	57.0	274	20348	22124	336	16	5376	11164	11200		
	4	34.1	2036.7	2183.4	57.0	355	33452	35861	277	16	4432	9276	11200		
3	1	20.1	1577.3	1730.1	57.0	247	25321	27774	311	16	4976	10364	11200	1131.15	1218.45
	2	26.1	2247.2	2386.6	57.0	356	51996	55221	295	16	4720	9852	11200		
	3	30.6	1605.1	1745.2	57.0	274	28584	31079	336	16	5376	11164	11200		

Table 3.2-7 Number and Length of Signal data record  
Wide Observation mode (Burst type 2)

Number of Scan	Scan No.	Offnadir angle (Deg)	Minimum PRF (Hz)	Maximum PRF (Hz)	L1.0 Observation time (sec)	Number of burst pulse	Level 1.0 Number of records (Minimum)	Level 1.0 Number of records (Maximum)	Receive Gate Width (micro-sec)	Sampling Frequency (MHz)	Number of samples	Size of SAR data (byte)	Length of signal data record (byte)	Minimum amount of a scene(MB)	Maximum amount of a scene(MB)
5	1	20.1	1577.3	1730.1	57.0	480	14158	15530	311	32	9952	20316	22000	2257.42	2429.87
	2	26.1	2247.2	2386.6	57.0	698	29333	31153	295	32	9440	19292	22000		
	3	30.6	1605.1	1745.2	57.0	534	16029	17428	336	32	10752	21916	22000		
	4	34.1	2036.7	2183.4	57.0	696	26509	28419	277	32	8864	18140	22000		
	5	36.5	1801.8	1945.5	57.0	640	21565	23285	293	32	9376	19164	22000		
4	1	20.1	1577.3	1730.1	57.0	480	17921	19658	311	32	9952	20316	22000	2284.70	2457.31
	2	26.1	2247.2	2386.6	57.0	698	37129	39432	295	32	9440	19292	22000		
	3	30.6	1605.1	1745.2	57.0	534	20289	22060	336	32	10752	21916	22000		
	4	34.1	2036.7	2183.4	57.0	696	33555	35972	277	32	8864	18140	22000		
3	1	20.1	1577.3	1730.1	57.0	480	25207	27649	311	32	9952	20316	22000	2223.31	2394.77
	2	26.1	2247.2	2386.6	57.0	698	52224	55463	295	32	9440	19292	22000		
	3	30.6	1605.1	1745.2	57.0	534	28537	31028	336	32	10752	21916	22000		

### 3.2.1 Data Types of Records

Table 3.2-8 shows the definition of data types for records.

**Table 3.2-8 Definition of Data Types**

Type (abbreviation)	Detail
Am	Character similar to FORTRAN statement convention, where the “A” indicates textual data and the “m” specifies the field width in bytes.
Im	The fields are denoted by “Im” for Integer, the “I” indicates integer data and the “m” specifies the field width in bytes.
Fm.n	The fields are denoted by “Fm.n” for Floating Point decimal.
Em.nEp	The fields are denoted by “Em.nEp” for Exponential representations.
Bm	Binary field are designated in this document as “Bm”.

Note ) “m” specifies the field width in bytes.  
 “n” specifies the digits after the decimal point  
 “p” specifies the exponent

### 3.2.2 Code Types of Records and Sub Records

Table 3.2-9 shows the code types of each record.

**Table 3.2-9 Code Types of each Records**

Record name	1st subtype	Record type	2nd subtype	3rd subtype	Length of record (Byte)
Volume Descriptor	192	192	18	18	360
File Pointer	219	192	18	18	360
Text	18	192	18	18	360
SAR Leader File Descriptor	11	192	18	18	720
Data Set Summary	18	10	18	20	4,096
Platform Position Data	18	30	18	20	4,680
Attitude Data	18	40	18	20	8,192
Calibration Data	18	120	18	20	13,212
Facility Related Data	18	200	18	70	See Table3-11
SAR Data File Descriptor	50	192	18	18	720
Signal Data	50	10	18	20	See Table3.2-2~3.2-7 'Length of signal data record'
SAR Trailer File Descriptor	63	192	18	18	720

Note) Number is decimal.

**Table 3.2-10 Code types of Facility Related Data Records**

Record name	1st subtype	Record type	2nd subtype	3rd subtype	Length of record (Byte)
Facility Related Data 1 (TT&C system telemetry data)	18	200	18	70	1,540,000
Facility Related Data 2 (Attitude determination 3 and GPSR raw data)					4,314,000
Facility Related Data 3 (PALSAR mission telemetry data)					345,000
Facility Related Data 4 (ALOS Orbit Information (Preliminary) (ECR))					325,000
Facility Related Data 5 (ALOS Orbit Information (Decision) (ECR))					325,000
Facility Related Data 6 (Time difference information)					3,072
Facility Related Data 7 (ALOS High Precision Orbit Information)					511,000
Facility Related Data 8 (High Precision Attitude Information)					4,370,000
Facility Related Data 9 (Coordinates Conversion Information)					728,000
Facility Related Data 10 (Work order & Work report for level 1.0 processing)					15,000

Note) Number is the decimal

### 3.3 Detailed Product Description

Table 3.3-1 Volume Descriptor Record (1/3)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Record sequence number = 1) <sub>10</sub>	00000001h
2	5 - 5	B1	1st subtype code = 192) <sub>10</sub>	C0h
3	6 - 6	B1	Record type code = 192) <sub>10</sub>	C0h
4	7 - 7	B1	2nd subtype code = 18) <sub>10</sub>	12h
5	8 - 8	B1	3rd subtype code = 18) <sub>10</sub>	12h
6	9 - 12	B4	Length of this record = 360) <sub>10</sub>	00000168h
7	13 - 14	A2	ASCII/EBCDIC flag, always = "Ab" for ASCII	Ab
8	15 - 16	A2	blanks	Blanks
9	17 - 28	A12	Superstructure format control document ID. (the ID of the CCB document)	CEOS-SAR-CCT
10	29 - 30	A2	Superstructure format control document revision level='NN' NN: 'bA' - 'bZ'	bA
11	31 - 32	A2	Superstructure record format revision level='NN' NN: 'bA' - 'bZ' ('bA' for original)	bA
12	33 - 44	A12	Logical volume generating facility software release and revision level (i.e.name and version left justified) = 'NN.NNbbbbbbb' 1.00 , 1.01 , 1.02 ... 1.10 , 1.11, ... 2.00 ...	b1.00bbbbbbb
13	45 - 60	A16	ID of physical volume containing this volume descriptor (tape ID) = 'EOC-bbbbbbbbbbbb'	EOC-bbbbbbbbbbbb
14	61 - 76	A16	Logical volume ID (scene related information uniquely identifying this logical volume) = 'MMNSSSYYYMMDDbb' MM : Mission ID (ALOS='AL') N : Mission number (ALOS='1') SSS : Sensor ID (PALSAR='PSR') YYYY : Product generation year MM : Product generation month DD : Product generation day	AL1PSR20010101bb



Table 3.3-1 Volume Descriptor Record (2/3)

Number	Bytes	Format	Description	Contents
15	77 - 92	A16	Volume set ID (16 character string assigned to uniquely identify a multiple physical volume data set.) 'MMMMMMbSSSSSSbbb' MMMMMM : Mission name ('ALOSbb') SSSSSS : Sensor name(PALSAR='PALSAR')	ALOSbbbPALSARbbb
16	93 - 94	I2	Total number of physical volumes in the logical volume='b1'	b1
17	95 - 96	I2	Physical volume sequence number of the first tape within the logical volume = 'b1'	b1
18	97 - 98	I2	Physical volume sequence number of the last tape within the logical volume = 'b1'	b1
19	99 - 100	I2	Physical volume sequence number of the current tape within the logical volume = 'b1'	b1
20	101 - 104	I4	First referenced file number in this physical volume within the logical volume, i.e.: the first file which follows this volume directory = 'bbb3' - 'bbb6':N+2 (N is number of polarization)	bbb3
21	105 - 108	I4	Logical volume within a volume set = 'bbb1'	bbb1
22	109 - 112	I4	Logical volume number within physical volume (if a logical volume spans physical volumes, the portion of the logical volume on this tape is counted as an entire logical volume) = 'bbb1'	bbb1
23	113 - 120	A8	Logical volume creation data = 'YYYYMMDD' where YYYY : Year MM : month DD : Day	20010101

Table 3.3-1 Volume Descriptor Record (3/3)

Number	Bytes	Format	Description	Contents
24	121 - 128	A8	Logical volume creation time (hhmmssdd, where dd = deci-seconds) = 'HHMMSSXX' where HH : Hour MM : Minute SS : Second XX : 10mili-second	12010100
25	129 - 140	A12	Logical volume generation country (JAPAN) = 'JAPANbbbbbbb'	JAPANbbbbbbb
26	141 - 148	A8	Logical volume generating agency (Japan Aerospace Exploration Agency) = 'JAXAbbbb'	JAXAbbbb
27	149 - 160	A12	Logical volume generating facility (ALOS Data Processing Sub-system at Earth Observation Center) = 'EOC-ALOS-DPS'	EOC-ALOS-DPS
28	161 - 164	I4	Number of file pointer records in volume directory set number of polarization	bbb3
29	165 - 168	I4	Number of records in volume directory = 'bbb1'	bbb1
30	169 - 260	A92	Volume descriptor spare segment (always blank filled)	Blanks
31	261 - 360	A100	Local use segment	Blanks

Table 3.3-2 File Pointer Record (1/3)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Record number = 2,3, etc. One polarization mode SAR Leader File = 2)10 SAR Data File = 3)10 SARTrailer File = 4)10	00000002h
			Dual-polarization mode SAR Leader File = 2)10 SAR Data File = 3),4)10 SARTrailer File = 5)10 Polarimetry Mode (Four Polarization) SAR Leader File = 2)10 SAR Data File = 3),4),5),6)10 SARTrailer File = 7)10	
2	5 - 5	B1	1st record subtype code = 219)10	DBh
3	6 - 6	B1	record type code = 192)10	C0h
4	7 - 7	B1	2nd subtype code = 18)10	12h
5	8 - 8	B1	spare segment Always blank filled	12h
6	9 - 12	B4	Length of this record = 360)10	00000168h
7	13 - 14	A2	ASCII/EBCDIC flag, always="Ab" for ASCII	Ab
8	15 - 16	A2	blanks	Blanks
9	17 - 20	I4	Referenced file number (the position of this file in the logical volume ie:="bbb1" for first SAR leader file "bbb2" for first SAR data file, etc.) SAR Leader File = 'bbb1' SAR Data File = 'bbb2' SAR Trailer File = 'bbb3'	bbb1

Table 3.3-2 File Pointer Record (2/3)

Number	Bytes	Format	Description	Contents
10	21 - 36	A16	Referenced file name (16 characters indicating nature of the data, i.e. header, annotation, SAR product type, etc.) 'MMNbSSSTFFFFbbbb' MM : Mission ID (ALOS='AL') N : Mission Number (=1) SSS : Sensor ID (PALSAR='PSR') T : Processing Level Code Level 1.0='A' FFFF : File Type Code SARLeader File = 'SARL' SAR Data File = 'IMOP' SARTrailer File = 'SART'	AL1bPSRASARLbbbb
11	37 - 64	A28	Referenced file class (one of "SARLEADERbFILEbbbbbbbbbbbbbb" or "IMAGERYbOPTIONSbFILEbbbbbbbb" or "SARTRAILERbFILEbbbbbbbbbbbbbb")	SARLEADERbFILEbbbbbbbbbbbbbb
12	65 - 68	A4	Referenced file class code (one of "SARL" -for SAR leader file, or "IMOP" -for SAR data file, or "SART" -for SAR trailer file)	SARL
13	69 - 96	A28	Referenced file data type (sec #1.3) 'MIXEDbBINARYbANDBASCIIbbbbbb'	MIXEDbBINARYbANDBASCIIbbbbbb
14	97 - 100	A4	Referenced file data type code 'MBAA'	MBAA
15	101 - 108	I8	Number of records in referenced file SARLeader File = 'bbbbbb15' SAR Data File = N+1 (N is number of PALSAR frames) SAR Trailer File = 'bbbbbb1'	bbbbbb15

Table 3.3-2 File Pointer Record (3/3)

Number	Bytes	Format	Description	Contents
16	109 - 116	I8	Referenced file 1-st record length (length of the first record in the file)	bbbb720
17	117 - 124	I8	Referenced file maximum record length (length of largest record in the file)	nnnnnnnn
18	125 - 136	A12	Referenced file record length type SAR Leader File = 'VARIABLEbLEN' SAR Data File = 'VARIABLEbLEN' SAR Trailer File = 'FIXEDbLENGTH'	VARIABLEbLEN
19	137 - 140	A4	Referenced file record length type code SAR Leader File = 'VARE' SAR Data File = 'VARE' SAR Trailer File = 'FIXD'	VARE
20	141 - 142	I2	Referenced file physical volume start number (the number of the physical volume)	\$1
21	143 - 144	I2	Referenced file physical volume end number (the number of the physical volume)	\$1
22	145 - 152	I8	Referenced file portion start, 1-st record number for this physical volume (record number of the first record appearing on this physical volume) = 'bbbbbb1'	bbbbbb1
23	153 - 160	I8	Referenced file portion end, last record number for this physical volume (record number of the last record appearing on this physical volume)  SAR Leader File = 'bbbbbb15' SAR Data File = N+1 (N is Number of PALSAR frames) SAR Trailer File = 'bbbbbb1'	bbbbbb15
24	161 - 260	A100	File pointer spare segment Always blank filled	Blanks
25	261 - 360	A100	Local use segment Always blank filled	Blanks

Table 3.3-3 Text Record(s) (1/2)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Record number = N+4 where N = 'Number of polarization'	00000005h
2	5 - 5	B1	1st record subtype code = 18)10	12h
3	6 - 6	B1	Record type code = 192)10	C0h
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 18)10	12h
6	9 - 12	B4	Length of this record = 360)10	00000168h
7	13 - 14	A2	ASCII/EBCDIC flag, always = "Ab" for ASCII	Ab
8	15 - 16	A2	Continuation flag ("Cb" if information is continued on the next text record, else "bb" for no continuation) = 'bb'	bb
9	17 - 56	A40	Product type specifier 'PRODUCT : FGGGHIJbbbbbbbbbbbbbbbbbbbb'	PRODUCT:H1.0_Uabbbbbbbbbbbbbbbbb bbbbbb Refer to Appendix A-1-1 No.1.
10	57 - 116	A60	Location and date/time of product creation 'PROCESS:JAPAN-JAXA-EOC-ALOS-DPSbbYYYYMMDDbHHMMSSb - bb' YYYYMMDD : Creation date (UT) HHMMSS : Creation time (UT)	PROCESS:JAPAN-JAXA-EOC-ALOS- DPSbb20010101b120000bbbbbbbbbb
11	117 - 156	A40	Physical volumes identification 'TAPEbID:bbbbbbbbbbbbbbbbbbbb'	TAPEbID:bbbbbbbbbbbbbbbbbbbb bbbb

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Table 3.3-3 Text Record(s) (2/2)

Number	Bytes	Format	Description	Contents
12	157 – 196	A40	Scene identification 'ORBITb:AABBBCDDDDDEEEEbbbbbbbbbbbbbbbb'  AA : Satellite ID (AL) BBB : Sensor ID (PSR) C : Sensor Sub-ID "S" = Wide observation mode (Scan SAR) "P" = Except Wide observation mode DDDDD : Orbit accumulation number of a scene center (00000 - 99999) EEEE : Scene frame number of a scene center (0 - 7199)	ORBITb:ALPSRS000011000bbbbbbbbbbbb bbbbbb Refer to Appendix A-1-2 No.2.
13	197 – 236	A40	Scene location 'FRAMEbCENTRE:bbbbbbbbbbbbbbbbbbbb'	FRAMEbCENTRE:bbbbbbbbbbbbbbbb bbbbbb
14	237 – 360	A124	spares Always blank filled	Blanks

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Table 3.3-4 SAR Leader File Descriptor Record (1/3)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Record sequence number = 1)10	00000001h
2	5 - 5	B1	1st record subtype code = 11)10	0Bh
3	6 - 6	B1	Record type code = 192)10	C0h
4	7 - 7	B1	2nd subtype code = 18)10	12h
5	8 - 8	B1	3rd subtype code = 18)10	12h
6	9 - 12	B4	Length of this record = 720)10	000002D0h
7	13 - 14	A2	ASCII/EBCDIC flag, always = "Ab" for ASCII	Ab
8	15 - 16	A2	blanks	bb
9	17 - 28	A12	Format control document ID for this data file format (the ID of this document) 'CEOS-SAR-CCT'	CEOS-SAR-CCT
10	29 - 30	A2	Format control document revision level = "bA" (for original) 'bA'	bA
11	31 - 32	A2	File design descriptor revision letter = "bA" (for original) 'bA'	bA
12	33 - 44	A12	Logical volume generating facility software release and revision level (i.e.name and version left justified) = 'NN.NNbbbbbb' 1.00 , 1.01 , 1.02 ... 1.10 , 1.11, ... 2.00 ...	b1.00bbbbbb
13	45 - 48	I4	File number = 'bbb1'	bbb1
14	49 - 64	A16	File name (same as field 10 in file pointer record in volume directory file) 'MMNbSSSTFFFFbbb'	AL1bPSRASARLbbbb
15	65 - 68	A4	Record sequence and location type flag 'FSEQ'	FSEQ
16	69 - 76	I8	Sequence number location = 'bbbbbb1'	bbbbbb1
17	77 - 80	I4	Sequence number field length = "bbb4"	bbb4
18	81 - 84	A4	Record code and location type flag 'FTYP'	FTYP
19	85 - 92	I8	Record code location = 'bbbbbb5'	bbbbbb5
20	93 - 96	I4	Record code field length = 'bbb4'	bbb1



Table 3.3-4 SAR Leader File Descriptor Record (2/3)

Number	Bytes	Format	Description	Contents
21	97 - 100	A4	Record length and location type flag 'FLGT'	FLGT
22	101 - 108	I8	Record length location = 'bbbbbb9'	bbbbbb9
23	109 - 112	I4	Record length field length = 'bbb4'	bbb4
24	113 - 180	A68	blanks	68blanks
25	181 - 186	I6	Number of data set summary records = 'bbbb1'	bbbb1
26	187 - 192	I6	Data set summary record length = 'bb4096'	bb4096
27	193 - 198	I6	Number of map projection data records = 'bbbb0'	bbbb0
28	199 - 204	I6	Map projection record length = 'bbbb0'	bbbb0
29	205 - 210	I6	Number of platform pos. data records = 'bbbb1'	bbbb1
30	211 - 216	I6	Platform position record length = 'bb4680'	bb4680
31	217 - 222	I6	Number of attitude data records = 'bbbb1'	bbbb1
32	223 - 228	I6	Attitude data record length = 'bb8192'	bb8192
33	229 - 234	I6	Number of radiometric data records = 'bbbb0'	bbbb0
34	235 - 240	I6	Radiometric record length = 'bbbb0'	bbbb0
35	241 - 246	I6	Number of radiometric compensation records = 'bbbb0'	bbbb0
36	247 - 252	I6	Radiometric compensation rec. length = 'bbbb0'	bbbb0
37	253 - 258	I6	Number of data quality summary records = 'bbbb0'	bbbb0
38	259 - 264	I6	Data quality summary record length = 'bbbb0'	bbbb0
39	265 - 270	I6	Number of data histograms records = 'bbbb0'	bbbb0
40	271 - 276	I6	Data histogram record length = 'bbbb0'	bbbb0
41	277 - 282	I6	Number of range spectra records = 'bbbb0'	bbbb0
42	283 - 288	I6	Range spectra record length = 'bbbb0'	bbbb0
43	289 - 294	I6	Number of DEM descriptor records = 'bbbb0'	bbbb0
44	295 - 300	I6	DEM descriptor record length = 'bbbb0'	bbbb0
45	301 - 306	I6	Number of Radar par. update records = 'bbbb0'	bbbb0
46	307 - 312	I6	Radar par. update record length = 'bbbb0'	bbbb0
47	313 - 318	I6	Number of Annotation data records = 'bbbb0'	bbbb0

Table 3.3-4 SAR Leader File Descriptor Record (3/3)

Number	Bytes	Format	Description	Contents
48	319 - 324	I6	Annotation data record length = 'bbbb0'	bbbb0
49	325 - 330	I6	Number of Det. processing records = 'bbbb0'	bbbb0
50	331 - 336	I6	Det. processing record length = 'bbbb0'	bbbb0
51	337 - 342	I6	Number of Calibration records = 'bbbb1'	bbbb0
52	343 - 348	I6	Calibration record length = 'b13212'	bbbb1
53	349 - 354	I6	Number of GCP records = 'bbbb0'	b13212
54	355 - 360	I6	GCP record length = 'bbbb0'	bbbb0
55	361 - 420	10A6	blanks	60blanks
56	421 - 426	I6	Number of facility data (1) records = 'bbbb1'	bbbb1
57	427 - 434	I8	Facility data (1) record length = 'b1540000'	b1540000
58	435 - 440	I6	Number of facility data (2) records = 'bbbb1'	bbbb1
59	441 - 448	I8	Facility data (2) record length = 'b4314000'	b4314000
60	449 - 454	I6	Number of facility data (3) records = 'bbbb1'	bbbb1
61	455 - 462	I8	Facility data (3) record length = 'bb345000'	bb345000
62	463 - 468	I6	Number of facility data (4) records = 'bbbb1'	bbbb1
63	469 - 476	I8	Facility data (4) record length = 'bb325000'	bb325000
64	477 - 482	I6	Number of facility data (5) records = 'bbbb1'	bbbb1
65	483 - 490	I8	Facility data (5) record length = 'bb325000'	bb325000
66	491 - 496	I6	Number of facility data (6) records = 'bbbb1'	bbbb1
67	497 - 504	I8	Facility data (6) record length = 'bbbb3072'	bbbb3072
68	505 - 510	I6	Number of facility data (7) records = 'bbbb1'	bbbb1
69	511 - 518	I8	Facility data (7) record length = 'bb511000'	bb511000
70	519 - 524	I6	Number of facility data (8) records = 'bbbb1'	bbbb1
71	525 - 532	I8	Facility data (8) record length = 'b4370000'	b4370000'
72	533 - 538	I6	Number of facility data (9) records = 'bbbb1'	bbbb1
73	539 - 546	I8	Facility data (9) record length = 'bb728000'	bb728000
74	547 - 552	I6	Number of facility data (10) records = 'bbbb1'	bbbb1
75	553 - 560	I8	Facility data (10) record length = 'bbb15000'	bbb15000
76	561 - 720	A160	blanks	160blanks

Table 3.3-5 Data Set Summary Record (1/13)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Record Sequence Number = 2)10	00000002h
2	5 - 5	B1	1st record subtype code = 18)10	12h
3	6 - 6	B1	Record type code = 10)10	0Ah
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 20)10	14h
6	9 - 12	B4	Length of this record = 4096)10	00001000h
7	13 - 16	I4	Data set Summary Record sequence number (starts at 1) = 'bbb1'	bbb1
8	17 - 20	A4	SAR channel indicator Always blank filled	bbbb
9	21 - 52	A32	Scene identifier 'AABBBCDDDDDEEEEEbbbbbbbbbbbbbbbb'  AA : Satellite ID (AL) BBB : Sensor ID (PSR) C : Sensor Sub-ID "S" = Wide observation mode (Scan SAR) "P" = Except Wide observation mode DDDDD : Orbit accumulation number of a scene center (00000 - 99999) EEEE: Scene frame number of a scene center (0 - 7199)	ALPSRP000010001bbbbbbbbbbbbbbbb  Refer to Appendix A-1-2 No.2.
10	53 - 68	A16	Scene designator Always blank filled	bbbbbbbbbbbbbbbb

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Table 3.3-5 Data Set Summary Record (2/13)

Number	Bytes	Format	Description	Contents
11	69 - 100	A32	Input scene center time 'YYYYMMDDhhmmsssttbbbbbbbbbbbbbb' where:YYYY = year MM = month DD = day hh = hours (00 to 23) mm = minutes (00 to 59) ss = seconds (00 to 59) ttt = milliseconds (000 to 999)	20010101120000000bbbbbbbbbbbbbb
12	101 - 116	A16	spare Always blank filled	bbbbbbbbbbbbbb
13	117 - 132	F16.7	Processed scene center geodetic latitude defined as positive to the north of the equator and negative to the south (deg.) Always blank filled	bbbbbbbbbbbbbb
14	133 - 148	F16.7	Processed scene center geodetic longitude defined as positive to the east of the prime meridian and negative to the west. (deg.) Always blank filled	bbbbbbbbbbbbbb
15	149 - 164	F16.7	Processed Scene Center true heading as calculated relative to true North (deg.) Always blank filled	bbbbbbbbbbbbbb
16	165 - 180	A16	Ellipsoid designator = 'GRS80bbbbbbbbbb':Fixed	GRS80bbbbbbbbbb
17	181 - 196	F16.7	Ellipsoid semi-major axis (km) -(R)	
18	197 - 212	F16.7	Ellipsoid semi-minor axis (km)	
19	213 - 228	F16.7	Earth's mass (10 <sup>24</sup> kg)	
20	229 - 244	F16.7	Gravitational constant (10 <sup>-14</sup> m <sup>3</sup> /(Kg/s <sup>2</sup> ))	
21	245 - 260	F16.7	Ellipsoid J2 parameter	
22	261 - 276	F16.7	Ellipsoid J3 parameter	
23	277 - 292	F16.7	Ellipsoid J4 parameter	
24	293 - 308	A16	spare Always blank filled	bbbbbbbbbbbbbb

Table 3.3-5 Data Set Summary Record (3/13)

Number	Bytes	Format	Description	Contents
25	309 - 324	F16.7	Average terrain height above Ellipsoid at scene center (km) Always blank filled	bbbbbbbbbbbbbbbb
26	325 - 332	I8	Scene center line number (the line no. at the scene center including zero fill) Always blank filled	bbbbbbbb
27	333 - 340	I8	Scene center pixel number (the pixel number at the scene center including zero fill) Always blank filled	bbbbbbbb
28	341 - 356	F16.7	Processed scene length (km) including zero fill Always blank filled	bbbbbbbbbbbbbbbb
29	357 - 372	F16.7	Processed scene width (km) including zero fill Always blank filled	bbbbbbbbbbbbbbbb
30	373 - 388	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
31	389 - 392	I4	Number of SAR channels = 'bbbn' n 1: In case of High Resolution Mode (Single-Polarization), Direct Down link Mode and Wide Observation Mode.	bbb1
			2: In case of High Resolution Mode (Dual-Polarization) 4: In case of Polarimetry Mode	
32	393 - 396	A4	spare Always blank filled	bbbb
33	397 - 412	A16	Sensor platform mission identifier ALOS : 'ALOSbbbbbbbbbbbb'	ALOSbbbbbbbbbbbb

Table 3.3-5 Data Set Summary Record (4/13)

Number	Bytes	Format	Description	Contents
34	413 - 444	A32	<p>Sensor ID: and mode of operation for this channel                      = 'AAAAAA-BB-CCDE-bbbbbbbbbbbbbbbb'                      where AAAAAA = Mission name ('ALOSbb':always)                      BB = SAR band (ALOS:'Lb':always)                      CC = Code for resolution mode                      (Except Wide Observation Mode = 'Hb',Wide Observation Mode='Lb')                      DE = Code for imaging mode                      D = PALSAR mode                      Stanby 4 ='3', Calibration mode = '4'                      Standby for observation='5', Observation mode = '6'                      Extracted from Auxiliary data of first PALSAR frame.</p> <p>E : PALSAR Sub-mode                      In case of D = PALSAR mode is '4'or '5'                      Noise3 = '0', Monitor of Tx Power = '1',Monitor of Tx wave = '2'                      REV of Rx = '3',Special characteristic for total Rx = '4',                      REV of Tx = '5',,Special characteristic for total Tx = '6',                      IN/OUT for Rx = '7',8: Special characteristic for ATT of Rx = '9',                      Noise1 = '10',Noise2 = '11'</p> <p>In case of D = PALSAR mode is '6'                      High resolution mode = '0',Wide observation = '1'</p> <p>Polarimetry mode = '2', Direct downlink mode = '3'                      Extracted from Auxiliary data of first PALSAR frame.</p>	ALOSbb-Lb-Hb60-bbbbbbbbbbbbbbbb

Table 3.3-5 Data Set Summary Record (5/13)

Number	Bytes	Format	Description	Contents
35	445 - 452	I8	Orbit number or flight line indicator	bbbbbbb1
36	453 - 460	F8.3	Sensor Platform geodetic Latitude; at nadir corresponding to Scene Center (degrees) Always blank filled	bbbbbbbb
37	461 - 468	F8.3	Sensor Platform geodetic Longitude at nadir corresponding to Scene Center (degrees)	bbbbbbbb
38	469 - 476	F8.3	Sensor Platform Heading at nadir corresponding to Scene Center (degrees) Always blank filled	bbbbbbbb
39	477 - 484	F8.3	Sensor clock angle as measured relative to sensor platform flight direction (degrees) (i.e.: -90:0=left pointing, and +90:0=right pointing) = always 'bb90.000'	bb90.000
40	485 - 492	F8.3	Incidence angle at scene center as derived from sensor platform orientation, electronic boresight and Earth's geometry (degrees) : Nominal value	
41	493 - 500	A8	spare Always blank filled	bbbbbbbb
42	501 - 516	F16.7	Radar wavelength (meters) : Nominal value	
43	517 - 518	A2	Motion compensation indicator = Always '00' 00 : no compensation 01 : on board compensation 10 : in processor compensation 11 : both on board and in processor	00
44	519 - 534	A16	Range pulse code specifier (e.g.: "LINEARbFMbCHIRPb", "PHASEbMODULATORb", etc.) 'LINEARbFMbCHIRPb'	LINEARbFMbCHIRPb
45	535 - 550	E16.7	Range pulse amplitude coefficient #1 (Chirp range chirp constant term (offset from DC) (Hz)) (Nominal value)	
46	551 - 566	E16.7	Range pulse amplitude coefficient #2 (Chirp= range chirp linear term (Hz/sec)) (Nominal value)	

Table 3.3-5 Data Set Summary Record (6/13)

Number	Bytes	Format	Description	Contents
47	567 - 582	E16.7	Range pulse amplitude coefficient #3 (quadratic. term)	
48	583 - 598	E16.7	Range pulse amplitude coefficient #4 (cubic term)(Nominal value)	
49	599 - 614	E16.7	Range pulse amplitude coefficient #5 (quadratic term)(Nominal value)	
50	615 - 630	E16.7	Range pulse phase coefficient #1 (offset in radians) Always blank filled	bbbbbbbbbbbbbbbb
51	631 - 646	E16.7	Range pulse phase coefficient #2 (linear term in rads./sec) Always blank filled	bbbbbbbbbbbbbbbb
52	647 - 662	E16.7	Range pulse phase coefficient #3 (quadratic term in rads./sec') Always blank filled	bbbbbbbbbbbbbbbb
53	663 - 678	E16.7	Range pulse phase coefficient #4 (cubic term) Always blank filled	bbbbbbbbbbbbbbbb
54	679 - 694	E16.7	Range pulse phase coefficient #5 (quadratic term) Always blank filled	bbbbbbbbbbbbbbbb
55	695 - 702	I8	Down linked data chirp extraction index (in samples) Always blank filled	bbbbbbbb
56	703 - 710	A8	spare Always blank filled	bbbbbbbb
57	711 - 726	F16.7	Sampling rate (MHz) Extracted from Auxiliary data of first PALSAR frame.	Refera to Appendix A-1-2 No.3.
58	727 - 742	F16.7	Range gate at early edge (in time) at the start of the image (micro-sec) Extracted from Auxiliary data of first PALSAR frame.	Refer to Appendix A-1-2 No.4.
59	743 - 758	F16.7	Range pulse length (micro-sec) Extracted from Auxiliary data of first PALSAR frame.	Refer to Appendix A-1-2 No.5.
60	759 - 762	A4	Base band conversion flag (YESb/NOTb) (YES=base band converted) Always ='YESb'	YESb' Refer to Appendix A-1-2 No.6.
61	763 - 766	A4	Range compressed flag (YESb/NOTb) (YES=range compressed) Always ='NOTb'	NOTb
62	767 - 782	F16.7	Receiver gain for like polarized at early edge at the start of the image (dB) (Nominal value)	



Table 3.3-5 Data Set Summary Record (7/13)

Number	Bytes	Format	Description	Contents
63	783 - 798	F16.7	Receiver gain for cross polarized at early edge at the start of the image (dB) (Nominal value)	
64	799 - 806	I8	Quantization in bits per channel 'bbbbbbb3','bbbbbbb5'	bbbbbbb3
65	807 - 818	A12	Quantizer descriptor (e.g.: "UNIFORMbI,Qb") 'UNIFORMbI,Qb'	UNIFORMbI,Qb
66	819 - 834	F16.7	DC Bias for I-component	
67	835 - 850	F16.7	DC Bias for Q-component	
68	851 - 866	F16.7	Gain imbalance for I & Q	
69	867 - 882	F16.7	spare Always blank filled	bbbbbbbbbbbbbbbb
70	883 - 898	F16.7	spare Always blank filled	bbbbbbbbbbbbbbbb
71	899 - 914	F16.7	Antenna electronic boresight relative to platform vertical axis at the start of the image (degrees)	Refer to Appendix A-1-2 No.7.
72	915 - 930	F16.7	Antenna mechanical boresight relative to platform vertical axis at the start of the image, positive to the right, negative to the left (degrees)	Refer to Appendix A-1-2 No.8.
73	931 - 934	A4	Echo tracker-on/off designator ("ONbb", or "OFFb") Always = 'OFFb'	OFFb Refer to Appendix A-1-2 No.9.
74	935 - 950	F16.7	Nominal PRF (mHz) Inverse of PRT extracted from Auxiliary data of first PALSAR frame.	(PRF) Refer to Appendix A-1-3 No.10.
75	951 - 966	F16.7	Effective two-way antenna elevation 3dB beam width at boresight (degrees)	
76	967 - 982	F16.7	Effective two-way antenna azimuth 3dB beam width at electronic boresight (degrees)	
77	983 - 998	I16	Satellite encoded binary time code	Refer to Appendix A-1-3 No.11.
78	999 - 1030	A32	Satellite clock time	Refer to Appendix A-1-3 No.12.
79	1031 - 1046	I16	Satellite clock increment [nsec]	Refer to Appendix A-1-3 No.13.

Table 3.3-5 Data Set Summary Record (8/13)

Number	Bytes	Format	Description	Contents
80	1047 - 1062	A16	Processing facility identifier 'EOC-ALOS-DPSbbbb'	EOC-ALOS-DPSbbbb
81	1063 - 1070	A8	Processing system identifier 'ALOS-DPS'	ALOS-DPS
	1071 - 1078	A8	Processing version identifier Note: This is the same as software release and revision level	
83	1079 - 1094	A16	Processing facility process code Always blank filled	bbbbbbbbbbbbbb
84	1095 - 1110	A16	Product level code = '1.0bbbbbbbbbbbb'	1.0bbbbbbbbbbbb
85	1111 - 1142	A32	Product type specifier Always = 'UNPROCESSEDbSIGNALbDATAAbbbbbb'	UNPROCESSEDbSIGNALbDATAAbbbbbb bb
86	1143 - 1174	A32	Processing algorithm identifier Always blank filled	bbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
87	1175 - 1190	F16.7	Nominal effective number of looks processed in Azimuth Always blank filled	bbbbbbbbbbbbbb
88	1191 - 1206	F16.7	Nominal effective number of looks processed in Range Always blank filled	bbbbbbbbbbbbbb
89	1207 - 1222	F16.7	Bandwidth per look in Azimuth Hz Always blank filled	bbbbbbbbbbbbbb
90	1223 - 1238	F16.7	Bandwidth per look in Range Hz Always blank filled	bbbbbbbbbbbbbb
91	1239 - 1254	F16.7	Total processor bandwidth in Azimuth Always blank filled	bbbbbbbbbbbbbb
92	1255 - 1270	F16.7	Total processor bandwidth in Range Always blank filled	bbbbbbbbbbbbbb
93	1271 - 1302	A32	Weighing function designator in Azimuth Always blank filled	bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
94	1303 - 1334	A32	Weighing function designator in Range Always blank filled	bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb

Table 3.3-5 Data Set Summary Record (9/13)

Number	Bytes	Format	Description	Contents
95	1335 - 1350	A16	Data input source (e.g.: HDDT identifier) always ='ONLINEbb - b'	ONLINEbbbbbbbbbb
96	1351 - 1366	F16.7	Nominal resolution equal to 3dB points in ground range (meter) Always blank filled	bbbbbbbbbbbbbbbb
97	1367 - 1382	F16.7	Nominal resolution in Azimuth (meter) Always blank filled	bbbbbbbbbbbbbbbb
98	1383 - 1398	F16.7	Constant radiometric parameter (Bias) Always blank filled	bbbbbbbbbbbbbbbb
99	1399 - 1414	F16.7	Linear radiometric parameter (Gain) Always blank filled	bbbbbbbbbbbbbbbb
100	1415 - 1430	F16.7	Along track Doppler frequency constant term at early edge of image (Hz) Always blank filled	bbbbbbbbbbbbbbbb
101	1431 - 1446	F16.7	Along track Doppler frequency linear term at early edge of the image (Hz/pixel) Always blank filled	bbbbbbbbbbbbbbbb
102	1447 - 1462	F16.7	Along track Doppler frequency quadratic term at early edge of the image (Hz/pixel/pixel) Always blank filled	bbbbbbbbbbbbbbbb
103	1463 - 1478	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
104	1479 - 1494	F16.7	Cross track Doppler frequency constant term at early edge of the image (Hz) Always blank filled	bbbbbbbbbbbbbbbb
105	1495 - 1510	F16.7	Cross track Doppler frequency linear term at early edge of the image (Hz/pixel) Always blank filled	bbbbbbbbbbbbbbbb
106	1511 - 1526	F16.7	Cross track Doppler frequency quadratic term at early edge of the image (Hz/pixel/pixel)	bbbbbbbbbbbbbbbb
107	1527 - 1534	A8	Time direction indicator along pixel direction (ie."INCREASE" -ing or "DECREASE"-ing) Always blank filled	bbbbbbb

Table 3.3-5 Data Set Summary Record (10/13)

Number	Bytes	Format	Description	Contents
108	1535 - 1542	A8	Time direction indicator along line direction Ascending node = 'ASCENDbb' or 'DESCENDb'	ASCENDbb
109	1543 - 1558	F16.7	Along track Doppler frequency rate constant term at early edge of the image (Hz/sec) Always blank filled	bbbbbbbbbbbbbbbb
110	1559 - 1574	F16.7	Along track Doppler frequency rate 1 linear term at early edge of the image (Hz/sec/pixel) Always blank filled	bbbbbbbbbbbbbbbb
111	1575 - 1590	F16.7	Along track Doppler frequency rate quadratic term at early edge of the image (Hz/sec/pixel/pixel) Always blank filled	bbbbbbbbbbbbbbbb
112	1591 - 1606	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
113	1607 - 1622	F16.7	Cross track Doppler frequency rate constant term at near edge of the image (Hz/sec) Always blank filled	bbbbbbbbbbbbbbbb
114	1623 - 1638	F16.7	Cross track Doppler frequency rate linear term relative to near edge of the image (Hz/sec/pixel) Always blank filled	bbbbbbbbbbbbbbbb
115	1639 - 1654	F16.7	Cross track Doppler frequency rate quadratic term relative to near edge of the image (Hz/sec/pixel/pixel) Always blank filled	bbbbbbbbbbbbbbbb
116	1655 - 1670	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
117	1671 - 1678	A8	Line content indicator (e.g.: "RANGEbbb", "AZIMUTHb" or "OTHERbbb") Always = 'RANGEbbb'	RANGEbbb
118	1679 - 1682	A4	Clutter lock applied flag ("YESb'1/'1NOTb") Always blank filled	bbbb

Table 3.3-5 Data Set Summary Record (11/13)

Number	Bytes	Format	Description	Contents
119	1683 – 1686	A4	Auto-focusing applied flag ("YESb"/"NOTb") Always blank filled	bbbb
120	1687 – 1702	F16.7	Line spacing [meter] Always blank filled	bbbbbbbbbbbbbbbb
121	1703 – 1718	F16.7	Pixel spacing [meter] Always blank filled	bbbbbbbbbbbbbbbb
122	1719 – 1734	A16	Processor range compression designator ("SYNTHETICbCHIRPb" or ('EXTRACTEDbCHIRPb")) Always blank filled	bbbbbbbbbbbbbbbb
123	1735 – 1750	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
124	1751 – 1766	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
<b>SENSOR SPECIFIC LOCAL USE SEGMENT</b>				
125	1767 – 1770	I4	Calibration data indicator = 'bbb0' or 'bbb1'	bbb0 Refer to Appendix A-1-3 No.14.
126	1771 – 1778	I8	Start line number of calibration at upper image In case of no calibration data, always = 'bbbbbbb0'	bbbbbbb0
127	1779 – 1786	I8	Stop line number of calibration at upper image In case of no calibration data, always = 'bbbbbbb0'	bbbbbbb0
128	1787 – 1794	I8	Start line number of calibration at bottom image In case of no calibration data, always = 'bbbbbbb0'	bbbbbbb0
129	1795 – 1802	I8	Stop line number of calibration at bottom image In case of no calibration data, always = 'bbbbbbb0'	bbbbbbb0
130	1803 – 1806	I4	PRF switching indicator a fixed PRF ="bbb0" variable PRFs except Wide observation mode ="bbb1" Wide observation mode ="bbb1"	bbb0
131	1807 – 1814	I8	Line locator of PRF switching a fixed PRF = always 'bbbbbbb1' Wide observation mode = always 'bbbbbbb0'	bbbbbbb1

Table 3.3-5 Data Set Summary Record (12/13)

Number	Bytes	Format	Description	Contents
132	1815 – 1830	A16	spare Always blank filled	bbbbbbbbbbbbbbbb
133	1831 – 1834	I4	Yew Steering mode flag No yew Steering mode = "bbb1" Yew Steering mode = "bbb0"	bbb0
134	1835 – 1838	I4	Parameter table number of automatically setting 'bbb0' - 'b191'	bb17 Refer to Appendix A-1-4 No.15.
135	1839 – 1854	F16.7	Nominal offnadir angle	bbbbbb24.2000000 Refer to Appendix A-1-4 No.16.
136	1855 – 1858	I4	Antenna beam number 'bbb0' - 'bb22'	bb10 Refer to Appendix A-1-5 No.17.
137	1859 – 1886	A28	spare Always blank filled	Always blank filled
<b>PROCESSOR SPECIFIC LOCAL USE SEGMENT</b>				
138	1887 – 2006	A120	spare Always blank filled	Always blank filled
<b>IMAGE ANNOTATION FIELDS</b>				
139	2007 – 2014	I8	Number of Annotation Points (up to 64) = 'bbbbbbb0'	bbbbbbb0
140	2015 – 2022	A8	spare Always blank filled	Always blank filled
141	2023 – 2030	I8	Line Number of 1st Annotation start Always blank filled	Always blank filled
142	2031 – 2038	I8	Pixel Number of 1st Annotation start Always blank filled	Always blank filled
143	2039 – 2054	A16	1st Annotation Text (e.g.: lat., long. as "Nnn.nn, W-nnn.nnb") Always blank filled	Always blank filled

Table 3.3-5 Data Set Summary Record (13/13)

Number	Bytes	Format	Description	Contents
144	2055 – 2062	I8	Line Number of 2nd Annotation start Always blank filled	Always blank filled
145	2063 – 2070	I8	Pixel Number of 2nd Annotation start Always blank filled	Always blank filled
146	2071 – 2086	A16	2nd Annotation Text Always blank filled	Always blank filled
	.		.	.
	.		.	.
	.		.	.
147	4039 – 4046	I8	Line Number of 64th Annotation Point Always blank filled	Always blank filled
148	4047 – 4054	I8	Pixel Number of 64th Annotation Point Always blank filled	Always blank filled
149	4055 – 4070	A16	64th Annotation Text Always blank filled	Always blank filled
150	4071 – 4096	A26	System reserved	Always blank filled

Table 3.3-6 Platform Position Data Record (1/3)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Sequence number = 3)10	00000003h
2	5 - 5	B1	1st record subtype code = 18)10	12h
3	6 - 6	B1	Record type code = 30)10	1Eh
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 20)10	14h
6	9 - 12	B4	Length of this record = 4680)10	00001248h
7	13 - 44	A32	Orbital elements designator ALOS Orbit Information (Preliminary) : '0bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb' ALOS Orbit Information (Decision) : '1bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb' ALOS High Precision Orbit Information : '2bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb'	2bbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
8	45 - 60	F16.7	1st orbital element always blank filled	bbbbbbbbbbbbbbbb
9	61 - 76	F16.7	2nd orbital element always blank filled	bbbbbbbbbbbbbbbb
10	77 - 92	F16.7	3rd orbital element always blank filled	bbbbbbbbbbbbbbbb
11	93 - 108	F16.7	4th orbital element always blank filled	bbbbbbbbbbbbbbbb
12	109 - 124	F16.7	5th orbital element always blank filled	bbbbbbbbbbbbbbbb
13	125 - 140	F16.7	6th orbital element always blank filled	bbbbbbbbbbbbbbbb
14	141 - 144	I4	Number of data points always = 'bb28'	bb28
15	145 - 148	I4	Year of data point ('YYYY')	2001
16	149 - 152	I4	Month of data point ('bbMM')	bb02



Table 3.3-6 Platform Position Data Record (2/3)

Number	Bytes	Format	Description	Contents
17	153 - 156	I4	Day of data point ('bbDD')	bb02
18	157 - 160	I4	Day in the year (UT) ( Ex: 2nd February = 'bb33')	bb33
19	161 - 182	E22.15	Seconds of day (UT) of data (Ex: 0: 51: 30.23 = 3090.23)	b0.309023000000000E+04
20	183 - 204	E22.15	Time interval between DATA points (sec) always = 60.0	b0.600000000000000E+02
21	205 - 268	A64	Reference co-ordinate system (ECI,ECR) "ECRb - b'	ECRbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb bbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
22	269 - 290	E22.15	Greenwich mean hour angle always blank filled	bbbbbbbbbbbbbbbbbbbb
23	291 - 306	F16.7	Along track position error [m] Nominal value	
24	307 - 322	F16.7	Across track position error [m] Nominal value	
25	323 - 338	F16.7	Radial position error [m] Nominal value	
26	339 - 354	F16.7	Along track velocity error [m/sec] Nominal value	
27	355 - 370	F16.7	Across track velocity error [m/sec] Nominal value	
28	371 - 386	F16.7	Radial velocity error [m/sec] Nominal value	
<b>FIRST POSITIONAL DATA POINT</b>				
29	387 - 452	E22.15	1st data point position vector as (X, Y, Z) co-ordinates for spaceborne sensor platform in a reference system (x) (meters)	
30	387 - 452	E22.15	1st data point position vectors (X, Y, Z) coordinates for spaceborne sensor platform in a reference system (y) (meters)	

Table 3.3-6 Platform Position Data Record (3/3)

Number	Bytes	Format	Description	Contents
31	387 - 452	E22.15	1st data point position vector as (X, Y, Z) co-ordinates for spaceborne sensor platform in a reference system (z) (meters)	
32	453 - 518	E22.15	1st data point velocity vector (X', Y', Z') in a reference system (x') [m/sec]	
33	453 - 518	E22.15	1st data point velocity vector (X', Y', Z') in a reference system (y') [m/sec]	
34	453 - 518	E22.15	1st data point velocity vector (X', Y', Z') in a reference system (z') [m/sec]	
	519 - 4082	(n-1)*6* E22.15	2nd, 3rd, ... data point position & velocity vectors (repetition of fields 29-34 as specified by the number of points in field #14)	
35	4083 - 4100	A18	blanks	blanks
36	4101 - 4101	I1	Occurrence flag of a leap second "0" = No leap second "1" = Occurrence of a leap second	0 Refer to Appendix A-1-6 No18
37	4102 - 4680	A579	blanks	blanks

J

Table 3.3-7 Attitude Data Record (1/2)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Sequence number = 4)10	00000004h
2	5 - 5	B1	1st record subtype code = 18)10	12h
3	6 - 6	B1	Record type code = 40)10	28h
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 20)10	14h
6	9 - 12	B4	Length of this record = 8192)1C	00002000h
7	13 - 16	I4	Number of attitude data points = 'bb22' , 'bb62'	bb22
8	17 - 20	I4	Day of the year	bbb1
9	21 - 28	I8	Millisecond of day (bbbbbbb0 - 86399999)	bbb28800
10	29 - 32	I4	Pitch data quality flag Good : 'bbb0' NG : 'bbb1'	bbb0
11	33 - 36	I4	Roll data quality flag Good : 'bbb0' NG : 'bbb1'	bbb0
12	37 - 40	I4	Yaw data quality flag Good : 'bbb0' NG : 'bbb1'	bbb0
13	41 - 54	E14.6	Pitch (degrees)	
14	55 - 68	E14.6	Roll (degrees)	
15	69 - 82	E14.6	Yaw (degrees)	
16	83 - 86	I4	Pitch rate data quality flag Good : 'bbb0' NG : 'bbb1'	bbb0
17	87 - 90	I4	Roll rate data quality flag Good : 'bbb0' NG : 'bbb1'	bbb0

Table 3.3-7 Attitude Data Record (2/2)

Number	Bytes	Format	Description	Contents
18	91 - 94	I4	Yaw rate data quality flag Good : 'bbb0' NG : 'bbb1'	bbb0
19	95 - 108	E14.6	Pitch rate (degrees/sec)	
20	109 - 122	E14.6	Roll rate (degrees/sec)	
21	123 - 136	E14.6	Yaw rate (degrees/sec)	
	137 - 136+ 120* (n-1)	120*(n-1)	... 2nd, 3rd, ... attitude data points (repetition of fields 8-21 as specified in field #7)	
22	137+ - 8192 120* (n-1)	A(8192- (136+120 *(n-1)))	blanks	Always blank filled

Table 3.3-8 Calibration Data Record (1/2)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Sequence number = 5)10	00000005h
2	5 - 5	B1	1st record subtype code = 18)10	12h
3	6 - 6	B1	Record type code = 120)10	78h
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 20)10	14h
6	9 - 12	B4	Length of this record = 13212)10	13212
7	13 - 16	I4	Calibration Data Record sequence number (starts at 1) = 'bbb1'	bbb1
8	17 - 20	I4	Number of valid samples = Nsamp $N_{\text{samp}} = P_w \times T_{\text{samp}}$ (224 - 1280) where $P_w$ = Pulse Width of Transmitter $T_{\text{samp}}$ = Sampling length	b224
9	21 - 37	A17	Start date/time of chirp replica data YYYYMMDDHHMMSSttt	20010101120101000
10	38 - 54	A17	Stop date/time of chirp replica YYYYMMDDHHMMSSttt	20010101120159000
11	55 - 58	I4	Setting ATT value for Calibrator 0 - 63dB	bbb0
12	59 - 59	I1	ALC of calibrator 0 = ON, 1 = OFF	0
13	60 - 60	I1	AGC/MGC 0 = AGC, 1 = MGC	1
14	61 - 64	I4	Range pulse length 14 micro-sec - 40 micro-sec	bb14
15	65 - 68	I4	Band width 28MHz, 14MHz	bb28
16	69 - 72	I4	Sampling Frequency 32MHz, 16MHz	bb32
17	73 - 76	I4	Quantity bit number 5bits, 3bits	bbb5

Table 3.3-8 Calibration Data Record (2/2)

Number	Bytes	Format	Description	Contents
18	77 - 80	I4	Number of chirp replica data groups 1, 2	bbb1
19	81 - 84	I4	Number of chirp replica sample data n	b100
20	85 - 85	I1	Polarization of receiving for group No.1 0 = H-Polarization , 1 = V-Polarization	0
21	86 - $\alpha$	Nsamp* (2B2)	Chirp replica data of group No.1 Total value of each sample bin to n-th frame from the first frame ( $\sum I1(n)$ , $\sum Q1(n)$ , $\sum I2(n)$ , $\sum Q2(n)$ ...*, $\sum INsamp(n)$ , $\sum QNsamp(n)$ )	binary data However, since Chirp replica data obtained by calibration-only-mode is not usually downlinked , dummy data (all zero) is stored in case of calibration-only-mode.
	$\alpha + 1 - 6229$	A(6144- n*4)	Dummy data always blank filled	blanks
	6230 - 6230	A1	Dummy data always blank filled	blanks
22	6231 - 6231	I1	Polarization of receiving for group No.2 0 = H-Polarization, 1 = V-Polarization	b
23	6232 - $\beta$	Nsamp* (2B2)	Chirp replica data of group No.1 Total value of each sample bin to n-th frame from the first frame (total (I1(n), $\sum Q1(n)$ , $\sum I2(n)$ , $\sum Q2(n)$ ...*, $\sum INsamp(n)$ , $\sum QNsamp(n)$ )	binary data However, since Chirp replica data obtained by calibration-only-mode is not usually downlinked , dummy data (all zero) is stored in case of calibration-only-mode.
	$\beta + 1 - 12375$	A(6144- n*4)	Dummy data always blank filled	blanks
	12376 - 12376	A1	Dummy data always blank filled	blanks
24	12377 - 12476	B100	Auxiliary data of first calibration frame	binary data
25	12477 - 13212	A736	always blank filled	blanks

Table 3.3-9 Facility Related Data Record (1/2)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Sequence number TT&C system telemetry data = 6)10 Attitude determination 3 and GPSR raw data = 7)10 PALSAR mission telemetry data = 8)10 ALOS Orbit Information (Preliminary)(ECR) = 9)10 ALOS Orbit Information (Decision)(ECR) = 10)10 Time difference information = 11)10 ALOS High Precision Orbit Information = 12)10 High Precision Attitude Information = 13)10 Coordinates Conversion Information = 14)10 Workorder & Workreport for level 1.0 processing = 15)10	00000006h
2	5 - 5	B1	1st record subtype code = 18)10	12h
3	6 - 6	B1	Record type code = 200)10	C8h
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 70)10	46h
6	9 - 12	B4	Length of this record TT&C system telemetry data = 1,540,000)10 Attitude determination 3 and GPSR raw data = 4,314,000)10 PALSAR mission telemetry data = 345,000)10 ALOS Orbit Information (Preliminary)(ECR) = 325,000)10 ALOS Orbit Information (Decision)(ECR) = 325,000)10 Time difference information = 3,072)10 ALOS High Precision Orbit Information = 511,000)10 High Precision Attitude Information = 4,370,000)10 Coordinates Conversion Information = 728,000)10 Workorder & Workreport for level 1.0 processing = 15,000)10	
7	13 - 16	I4	Facility Related Data Record sequence number = 1 - 10	bbb1
8	17 - 66	A50	Always blank filled	blanks

Table 3.3-9 Facility Related Data Record (2/2)

Number	Bytes	Format	Description	Contents
9	67 -		set the original data used for processing level 1.0 TT&C system telemetry data Attitude determination 3 and GPSR raw data PALSAR mission telemetry data ALOS Orbit Information (Preliminary)(ECR) ALOS Orbit Information (Decision)(ECR) Time difference information ALOS High Precision Orbit Information High Precision Attitude Information Coordinates Conversion Information Workorder & Workreport for level 1.0 processing	



Table 3.3-10 SAR Data File Descriptor Record (1/3)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Sequence number = 1)10	00000001h
2	5 - 5	B1	1st record subtype code = 50)10	32h
3	6 - 6	B1	Record type code = 192)10	C0h
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 18)10	12h
6	9 - 12	B4	Length of this record = 720)10	000002D0h
7	13 - 14	A2	ASCII/EBCDIC flag, always = "Ab" for ASCII	Ab
8	15 - 16	A2	Always blank filled	bb
9	17 - 28	A12	Superstructure format control document ID. (the ID of the CCB document) 'CEOS-SAR-CCT'	CEOS-SAR-CCT
10	29 - 30	A2	Format control document revision level = "bA" (for original) 'bA'	bA
11	31 - 32	A2	File design descriptor revision letter = "bA" (for original) 'bA'	bA
12	33 - 44	A12	Logical volume generating facility software release and revision level (i.e.name and version left justified) = 'NN.NNbbbbbbb' 1.00 , 1.01 , 1.02 ... 1.10 , 1.11, ... 2.00 ...	b1.00bbbbbbb
13	45 - 48	I4	File number = 'bbb1'	bbb1
14	49 - 64	A16	File name (same as field 10 in file pointer record in volume directory file) 'MMNbSSSTFFFFbbbb'	AL1bPSRAIMOPbbbb
15	65 - 68	A4	Record sequence and location type flag = always 'FSEQ'	FSEQ
16	69 - 76	I8	Record sequence and location type flag = always 'bbbbbb1'	bbbbbb1
17	77 - 80	I4	Sequence number location = always 'bbb4'	bbb4
18	81 - 84	A4	Record code and location type flag = always 'FTYP'	FTYP
19	85 - 92	I8	Record code location = always 'bbbbbb5'	bbbbbb5
20	93 - 96	I4	Record code field length = always 'bbb4'	bbb4
21	97 - 100	A4	Record length and location type flag = always 'FLGT'	FLGT
22	101 - 108	I8	Record length location = always 'bbbbbb9'	bbbbbb9
23	109 - 112	I4	Record length field length = always 'bbb4'	bbb4

Table 3.3-10 SAR Data File Descriptor Record (2/3)

Number	Bytes	Format	Description	Contents
24	113 - 113	A1	Reserved Always blank filled	b
25	114 - 114	A1	Reserved Always blank filled	b
26	115 - 115	A1	Reserved Always blank filled	b
27	116 - 116	A1	Reserved Always blank filled	b
28	117 - 180	A64	Reserved Always blank filled	blanks
29	181 - 186	I6	Number of SAR DATA records = N Where N = Number of signal data records	
30	187 - 192	I6	SAR DATA record length (bytes)	Refer to Appendix A-1-6 No19.
31	193 - 216	A24	Reserved Always blank filled	blanks
<b>SAMPLE GROUP DATA</b>				
32	217 - 220	I4	Number of bits per sample always = 'bbb8'	bbb8
33	221 - 224	I4	Number of samples per data group (or pixel) always = 'bbb2'	bbb2
34	225 - 228	I4	Number of bytes per data group (or pixel) always = 'bbb2'	bbb2
35	229 - 232	A4	Justification and order of samples within data group (or pixel) Always blank filled	bbbb
<b>SAR RELATED DATA IN THE RECORD</b>				
36	233 - 236	I4	Number of SAR channels in this tile = always 'bbb1'	bbb1
37	237 - 244	I8	Number of lines per data set (one channel) in this file (excluding border lines)	
38	245 - 248	I4	Number or left border pixels per line = 'bbb0'	bbb0
39	249 - 256	I8	Total number of data groups (or pixels) per line per SAR channel	blanks

Table 3.3-10 SAR Data File Descriptor Record (3/3)

Number	Bytes	Format	Description	Contents
40	257 - 260	I4	Number of right border pixels per line	blanks
41	261 - 264	I4	Number of top border lines = 'bbb0'	bbb0
42	265 - 268	I4	Number of bottom border lines = 'bbb0'	bbb0
43	269 - 272	A4	Interleaving indicator = always 'BSQb'	BSQb
			<b>RECORD DATA IN THE FILE</b>	
44	273 - 274	I2	Number of physical records per line = always 'b1'	b1
45	275 - 276	I2	Number of physical records per multi-channel line in this file = always 'b1'	b1 Refer to Appendix A-1-6 No20.
46	277 - 280	I4	Number of bytes of prefix data per record = always 'b412'	b412
47	281 - 288	I8	Number of bytes of SAR data (or pixel data) per record	See Appendix A-1 No.23
48	289 - 292	I4	Number of bytes of suffix data per record = always 'bbb0'	bbb0
49	293 - 296	A4	Prefix/suffix repeat flag = always 'bbbb'	bbbb
			<b>PREFIX/SUFFIX DATA LOCATORS</b>	
50	297 - 304	A8	Sample data line number locator = always 'bb13b4PB'	bb13b4PB
51	305 - 312	A8	SAR channel number locator = always 'bb49b2PB'	bb49b2PB
52	313 - 320	A8	Time of SAR data line locator = always 'bb45b4PB'	bb45b4PB
53	321 - 328	A8	Left-fill count locator = always 'bb21b4PB'	bb21b4PB
54	329 - 336	A8	Right-fill count locator = always 'bb29b4PB'	bb29b4PB
55	337 - 340	A4	Pad pixels present indicator "YESb" or "NObb" = always "bbbb"	bbbb
56	341 - 368	A28	Always blank filled	blanks
57	369 - 376	A8	SAR data line quality code locator = always 'bb97b4PB'	bb97b4PB
58	377 - 384	A8	Calibration information field locator = always 'bbbbbbbb'	bbbbbbbb
59	385 - 392	A8	Gain values field locator = always 'bbbbbbbb'	bbbbbbbb
60	393 - 400	A8	Bias values field locator = always 'bbbbbbbb'	bbbbbbbb
61	401 - 428	A28	SAR Data format type code (e.g.. "BINb", "IU2b""I*4b", etc.) = always 'COMPLEXbINTEGER*1bbbbbbbbbb'	COMPLEXbINTEGER*1bbbbbbbbbb
62	429 - 432	A4	SAR Data format type code (e.g.. "BINb", "IU2b""I*4b", etc.) = always 'CI*1'	CI*1
63	433 - 436	I4	Number of left fill bits within pixel = 'bbb3' or 'bbb5'	bbb5
64	437 - 440	I4	Number of right fill bits within pixel = always 'bbb0'	bbb0
65	441 - 448	I8	Maximum data range of pixel (starting form 0) ='bbbbbb7' or 'bbbbbb31'	bbbbbb7
66	449 - 720	A272	Always blank filled	blanks

Table 3.3-11 Signal Data Record (1/4)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Sequence number = 2,3,·····)10	00000002h
2	5 - 5	B1	1st record subtype code = 50)10	32h
3	6 - 6	B1	Record type code = 10)10	0Ah
4	7 - 7	B1	2nd record subtype code = 18)10	12h
5	8 - 8	B1	3rd record subtype code = 20)10	14h
6	9 - 12	B4	Length of this record	See Table 3-3~3-8'Length of signaldata record'
<b>PREFIX DATA-GENERAL INFORMATION</b>				
7	13 - 16	B4	SAR image data line number = 1,2,3,.....	* Refer to Appendaix A-1-6 No.21.
8	17 - 20	B4	SAR image data record index (indicates the record sequence number in the image line) = always '1'.	00000001h Refer to Appendaix A-1-6 No.22.
9	21 - 24	B4	Actual count of left-fill pixels = always '0'	00000000h Refer to Appendix A-1-7 No.23.
10	25 - 28	B4	Actual count of data pixels	Refer to Appendix A-1-7 No.23.
11	29 - 32	B4	Actual count of right-fill pixels	Refer to Appendix A-1-7 No.23.
<b>PREFIX DATA-SENSOR PARAMETERS</b>				
12	33 - 36	B4	Sensor parameters update flag (1=data in this section is an update 0=data is a repeat) = always '1' No13 - 38 in this section are updated each record except nominal value.	00000001h
13	37 - 40	B4	Sensor acquisition year (UT)	*
14	41 - 44	B4	Sensor acquisition day of year (UT)	*
15	45 - 48	B4	Sensor acquisition msecs of day (UT)	*
16	49 - 50	B2	SAR channel indicator (sequence number in multi-channel SAR data) = n where '1' = single polarization '1,2' = dual polarization '1,2,3,4' = Polarimetry mode	*
17	51 - 52	B2	SAR channel code (0 = L, 1 = S, 2 = C, 3 = X, 4 = KU and 5 = KA channel) = always '0'.	0000h
18	53 - 54	B2	Transmitted polarization (0 = H, 1 = V)	*
19	55 - 56	B2	Received polarization (0 = H, 1 = V)	*
20	57 - 60	B4	PRF [mHz]	*

Table 3.3-11 Signal Data Record (2/4)

Number	Bytes	Format	Description	Contents
21	61 - 64	B4	Scan ID for SCAN SAR mode ( 1 - 5 ) except Wide Observation mode = always 0.	*
22	65 - 66	B2	Onboard Range compressed flag (0 = no/1 = yes) = always '0'.	0000h
23	67 - 68	B2	Pulse (chirp) type designator (0 = 'LINEARbFMbCHIRPb',1 = 'PHASEbMODULATORS') = always 0.	0000h
24	69 - 72	B4	Chirp length (nano-secs)	*
25	73 - 76	B4	Chirp constant coefficient (Hz) (nominal value)	nominal value
26	77 - 80	B4	Chirp linear coefficient (Hz/usec) (nominal value)	nominal value
27	81 - 84	B4	Chirp quadratic coefficient (Hz/Wsec,)	nominal value
28	85 - 88	B4	spare Always blank(0) filled	blanks(NULL)
29	89 - 92	B4	spare Always blank (0) filled	blanks(NULL)
30	93 - 96	B4	Receiver gain (dB) nominal value)	nominal value
31	97 - 100	B4	Nought line flag (0 = no(Right Line)/1 = yes(Loss Line))	* Refer to Appendix A-1-7 No.24.
32	101 - 104	B4	Electronic antenna squint angle (millionths of degrees) = always blank (0) filled	blanks (NULL)
33	105 - 108	B4	Antenna mechanical elevation angle from nadir (millionths of degrees) = always blank (0) filled	blanks (NULL)
34	109 - 112	B4	Electronic antenna squint angle (millionths of degrees) = always blank (0) filled	blanks (NULL)
35	113 - 116	B4	Mechanical antenna squint angle (millionths of degrees) = always blank (0) filled	blanks (NULL)
36	117 - 120	B4	Slant range to 1st data sample (m) See Appendix A-1.	* Refer to Appendix A-1-8 No.25.
37	121 - 124	B4	Data record window position (i.e.. sample delay) (nano-secs) See Appendix A-1.	* Refer to Appendix A-1-8 No.26.

Table 3.3-11 Signal Data Record (3/4)

Number	Bytes	Format	Description	Contents
38	125 - 128	B4	spare Always blank (0) filled	blanks (NULL)
PREFIX DATA-PLATFORM REFERENCE INFORMATION				
39	129 - 132	B4	Platform pos. parameters update flag (1 = data in this section is an update 0 = data is a repeat) = always 0.	00000000h
40	133 - 136	B4	Platform latitude (millionths deg.) Always blank (0) filled	blanks (NULL)
41	137 - 140	B4	Platform longitude (millionths deg.) Always blank (0) filled	blanks (NULL)
42	141 - 144	B4	Platform altitude (m) Always blank (0) filled	blanks (NULL)
43	145 - 148	B4	Platform ground speed (cm/sec) Always blank (0) filled	blanks (NULL)
44	149 - 160	3B4	Platform velocity X', Y', Z' (cm/sec) Always blank (0) filled	blanks (NULL)
45	161 - 172	3B4	Platform acceleration X', Y', Z', (cm/sec.) Always blank (0) filled	blanks (NULL)
46	173 - 176	B4	Platform track angle (millionths deg.) Always blank (0) filled	blanks (NULL)
47	177 - 180	B4	Platform track angle (millionths deg.) Always blank (0) filled	blanks (NULL)
48	181 - 184	B4	Platform Pitch angle (millionths deg.) Always blank (0) filled	blanks (NULL)
49	185 - 188	B4	Platform Roll angle (millionths deg.) Always blank (0) filled	blanks (NULL)
50	189 - 192	B4	Platform Yaw angle (millionths deg.) Always blank (0) filled	blanks (NULL)
PREFIX DATA-SENSOR/FACILITY SPECIFIC AUXILIARY DATA				
51	193 - 284	B92	Always blank (0) filled	blanks (NULL)

Table 3.3-11 Signal Data Record (4/4)

Number	Bytes	Format	Description	Contents
52	285 - 288	B4	Counter of PALSAR frame	* Refer to Appendix A-1-8 No.27.
53	289 - 388	B100	PALSAR auxiliary data	Refer to Appendix A-1-8 No.28.
54	389 - 412	B24	Always blank (0) filled	blanks (NULL)
<b>SAR RAW SIGNAL DATA</b>				
55	413 - i	jBk	SAR Signal data consisting of Noise and Echo data. Where: (I) -length of SAR data + 412 (j) -number of pixels on this record (k) -size of pixel in bytes	(SAR signal data) There is a case that calibration data is included in the head or the end of signal data in the edge of downlink segment. Refer to Appendix A-1-8 No.29.

Note : \* is a calculated number

Table 3.3-12 SAR Trailer File Descriptor Record (1/3)

Number	Bytes	Format	Description	Contents
1	1 - 4	B4	Record sequence number = 1	00000001h
2	5 - 5	B1	1st record subtype code = 91	5bh
3	6 - 6	B1	Record type code = 192	C0h
4	7 - 7	B1	2-nd record subtype code = 18	12h
5	8 - 8	B1	3-rd record subtype code = 18	12h
6	9 - 12	B4	Length of this record = 720	000002D0h
7	13 - 14	A2	ASCII/EBCDIC flag, always s = "Ab" for ASCII or "Eb" for EBCDIC = always 'Ab'	Ab
8	15 - 16	A2	blanks	bb
9	17 - 28	A12	Format control document ID for this data file format (the ID of this document) = always 'CEOS-SAR-CCT'	CEOS-SAR-CCT
10	29 - 30	A2	Format control document revision level = "bA"	bA
11	31 - 32	A2	File design descriptor revision letter = "bA"	bA
12	33 - 44	A12	Logical volume generating facility software release and revision level (i.e. name and version left justified) = 'NN.NNbbbbbbb' 1.00 , 1.01 , 1.02 ... 1.10 , 1.11, ... 2.00 ...	b1.00bbbbbbb
13	45 - 48	I4	File number = always '1'	bbb1
14	49 - 64	A16	File name (same as field 10 in file pointer record in volume directory file)	AL1bPSRASARTbbbb
15	65 - 68	A4	Record sequence and location type flag = always 'ESEO'	FSEQ
16	69 - 76	I8	Sequence number location = always 'bbbbbb1'	bbbbbb1
17	77 - 80	I4	Sequence number field length = always 'bbb4'	bbb4
18	81 - 84	A4	Record code and location type flag = always 'FTYP'	FTYP
19	85 - 92	I8	Record code location = always 'bbbbbb5'	bbbbbb5
20	93 - 96	I4	Record code field length = 'bbb4'	bbb4
21	97 - 100	A4	Record length and location type flag = always 'FLGT'	FLGT
22	101 - 108	I8	Record length location = always 'bbbbbb9'	bbbbbb9
23	109 - 112	I4	Record length field length = always 'bbb4'	bbb4
24	113 - 180	A68	blanks	blanks
25	181 - 186	I6	Number of data set summary records = 'bbbbbb0'	bbbbbb0



Table 3.3-12 SAR Trailer File Descriptor Record (2/3)

Number	Bytes	Format	Description	Contents
26	187 - 192	I6	Data set summary record length = 'bbbb0'	bbbb0
27	193 - 198	I6	Number of map projection data records = 'bbbb0'	bbbb0
28	199 - 204	I6	Map projection record length = 'bbbb0'	bbbb0
29	205 - 210	I6	Number of platform pos. data records = 'bbbb0'	bbbb0
30	211 - 216	I6	Platform position record length = 'bbbb0'	bbbb0
31	217 - 222	I6	Number of attitude data records = 'bbbb0'	bbbb0
32	223 - 228	I6	Attitude data record length = 'bbbb0'	bbbb0
33	229 - 234	I6	Number of radiometric data records = 'bbbb0'	bbbb0
34	235 - 240	I6	Radiometric record length = 'bbbb0'	bbbb0
35	241 - 246	I6	Number of radiometric compensation records = 'bbbb0'	bbbb0
36	247 - 252	I6	Radiometric compensation rec. length = 'bbbb0'	bbbb0
37	253 - 258	I6	Number of data quality summary records = 'bbbb0'	bbbb0
38	259 - 264	I6	Data quality summary record length = 'bbbb0'	bbbb0
39	265 - 270	I6	Number of data histograms records = 'bbbb0'	bbbb0
40	271 - 276	I6	Data histogram record length = 'bbbb0'	bbbb0
41	277 - 282	I6	Number of range spectra records = 'bbbb0'	bbbb0
42	283 - 288	I6	Range spectra record length = 'bbbb0'	bbbb0
43	289 - 294	I6	Number of DEM descriptor records = 'bbbb0'	bbbb0
44	295 - 300	I6	DEM descriptor record length = 'bbbb0'	bbbb0
45	301 - 306	I6	Number of Radar par. update records = 'bbbb0'	bbbb0
46	307 - 312	I6	Radar par. update record length = 'bbbb0'	bbbb0
47	313 - 318	I6	Number of Annotation data records = 'bbbb0'	bbbb0
48	319 - 324	I6	Annotation data record length = 'bbbb0'	bbbb0
49	325 - 330	I6	Number of Det. processing records = 'bbbb0'	bbbb0
50	331 - 336	I6	Det. processing record length = 'bbbb0'	bbbb0
51	337 - 342	I6	Number of Calibration records = 'bbbb0'	bbbb0
52	343 - 348	I6	Calibration record length = 'bbbb0'	bbbb0
53	349 - 354	I6	Number of GCP records = 'bbbb0'	bbbb0
54	355 - 360	I6	GCP record length = 'bbbb0'	bbbb0
55	361 - 420	10A6	blanks	blanks
56	421 - 426	I6	Number of facility data (1) records = 'bbbb0'	bbbb0

Table 3.3-12 SAR Trailer File Descriptor Record (3/3)

Number	Bytes	Format	Description	Contents
57	427 - 434	I8	Facility data (1) record length = 'bbbbbbb0'	bbbbbbb0
58	435 - 440	I6	Number of facility data (2) records = 'bbbb0'	bbbb0
59	441 - 448	I8	Facility data (2) record length = 'bbbbbbb0'	bbbbbbb0
60	449 - 454	I6	Number of facility data (3) records = 'bbbb0'	bbbb0
61	455 - 462	I8	Facility data (3) record length = 'bbbbbbb0'	bbbbbbb0
62	463 - 468	I6	Number of facility data (4) records = 'bbbb0'	bbbb0
63	469 - 476	I8	Facility data (4) record length = 'bbbbbbb0'	bbbbbbb0
64	477 - 482	I6	Number of facility data (5) records = 'bbbb0'	bbbb0
65	483 - 490	I8	Facility data (5) record length = 'bbbbbbb0'	bbbbbbb0
66	491 - 496	I6	Number of facility data (6) records = 'bbbb0'	bbbb0
67	497 - 504	I8	Facility data (6) record length = 'bbbbbbb0'	bbbbbbb0
68	505 - 510	I6	Number of facility data (7) records = 'bbbb0'	bbbb0
69	511 - 518	I8	Facility data (7) record length = 'bbbbbbb0'	bbbbbbb0
70	519 - 524	I6	Number of facility data (8) records = 'bbbb0'	bbbb0
71	525 - 532	I8	Facility data (8) record length = 'bbbbbbb0'	bbbbbbb0
72	533 - 538	I6	Number of facility data (9) records = 'bbbb0'	bbbb0
73	539 - 546	I8	Facility data (9) record length = 'bbbbbbb0'	bbbbbbb0
74	547 - 552	I6	Number of facility data (10) records = 'bbbb0'	bbbb0
75	553 - 560	I8	Facility data (10) record length = 'bbbbbbb0'	bbbbbbb0
76	561 - 720	A160	blanks	blanks

## **Appendix A-1**

### **Abbreviations and Acronyms**

Appendix A-1 Abbreviations and Acronyms

NO.	RECORD	FIELD	DESCRIPTION	DEFINITION
1	Text record Data set Summary Record	17 21	Product type specifier (Product ID)	<p>Product type specifier: "PRODUCT:FGGGHIJ"</p> <p>where: F = Observation mode                "H" = High resolution mode                "W" = Wide observing mode (Scan SAR mode)                "D" = Direct down link mode                "P" = Polarimetry mode                "C" = Calibration mode</p> <p>GGG = Process level                "1.0" = Level 1.0                "1.1" = Level 1.1                "1.5" = Level 1.5</p> <p>H = Processing option parameter                "G" = Geocoded image                "_" = No option                    (default: Georeferenced image)</p> <p>I = Map projection                "U" = Universal Transverse Mercator                "P" = Polar stereograph                "M" = Mercator                "L" = Lambert's conformal conic                "_" = Default no option</p> <p>J = Ascending Node (Planning)                "A" = Ascending                "D" = Descending</p>

NO.	RECORD	FIELD	DESCRIPTION	DEFINITION
2	Text record Data set Summary Record	157	Scene identifier	Scene identifier :
		21		"ORBITb:AABBBCDDDDDEEEEEbbbbbbbbbbbbbbbbbb" where: AA = Satellite ID ("AL": always) BBB = Sensor ID ("PSR":always) C = Sensor Sub-ID "S" = Wide observation mode (Scan SAR) "P" = Except Wide observation mode
				DDDDD = Orbit accumulation number of a scene center (00000 - 99999) EEEE = Scene frame number of a scene center (0 - 7199)
3	Data set Summary Record	711	Sampling rate (MHz)	Sampling Frequency after changing in Auxiliary data of first PALSAR frame
4		727	Range gate at early edge (in time) at the start of the image ( micro-sec)	Range gate at early edge (in time) at the start of the image, Rg, is defined by $Rg = n * PRI + Trg + Toff$ where n is the number of pulse to Rx from Tx ,n is decided by Table A-1, Trg is the receiving gate No2(in time) and Toff is the offset time of receiving,. Tdly is constant value, -8.31539μsec. PRI and Trg are extracted from Auxiliary data of first PALSAR frame.
5		743	Range pulse length ( micro-sec)	This time duration between the 3 dB points of the envelope of RF pulse. This time is an established parameter and extracted from Auxiliary data of first
6		759	Base band conversion flag	In case of ALOS, Base band conversion flag is always 'YES'.
7		899	electronic boresight	See Figure 3.3-1 The definition of electronic boresight is the same as mechanical boresight.
8		915	mechanical boresight	See Figure 3.3-1 The definition of mechanical boresight is the same as electronic boresight.
9		931	Echo tracker-on/off designator	In case of ALOS, Echo tracker is always 'off'.

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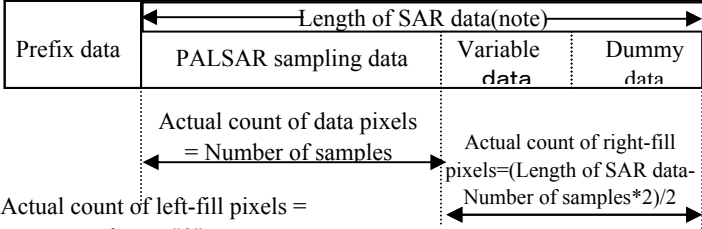
NO.	RECORD	FIELD	DESCRIPTION	DEFINITION
10	Data set Summary Record	935	Nominal PRF	Nominal PRF is a reciprocal number of PRI. PRI is extracted from Auxiliary data of first PALSAR frame.
11		983	Satellite encoded binary time	Reference counter of Satellite clock (sec) (Tref)
12	Data set	999	Satellite clock time	Reference time (UTC) of ground (Tgref)
13	Summary Record	1031	Satellite clock increment	Satellite clock counter period (sec) (Psc) Observation time (UTC) of ground , Tg ,is calculated using the following formula: $Tg(UTC)=Psc*(Tsc-Tref)+Tgref$
14		1767	Calibration data indicator, (Ic) Start line number of calibration (Ls), Stop line number of calibration(Le)  Note: Calibration mode data contains “Standby 4 (3)” and “observation standby (calibration) (4)” other than sensor ID and calibration mode (5) of the observation mode (D) in the operation mode (413-444 in data set summary record).	Calibration data indicator and location "bbb0" = no calibration data "bbb1" = including calibration data at the edge of upper image "bbb2" = including calibration data at the edge of lower image "bbb3" = including calibration data at the edges of upper and lower image In case of no calibration data , (Ic=0) <div style="border: 1px solid black; width: 150px; margin: 5px auto; text-align: center;">Observation mode data</div> Ls of upper image = 0 Le of upper image = 0 Ls of lower image = 0 Le of lower image = 0 In case of including calibration data at the edge of upper image (Ic=1) <div style="display: flex; justify-content: space-between; align-items: center; margin: 5px auto;"> <span>1</span> <div style="border: 1px solid black; padding: 2px 10px;"> <span style="margin-right: 5px;">cal. data</span> <span>Observation mode data</span> </div> <span>n</span> </div> Ls of upper image = 1 Le of upper image = m Ls of lower image = 0 Le of lower image = 0

NO.	RECORD	FIELD	DESCRIPTION	DEFINITION																		
	Data set Summary record			<p>In case of including calibration data at the edge of bottom image (Ic=2)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">m</td> <td style="text-align: center;">n</td> </tr> <tr> <td style="text-align: center;">Observation mode data</td> <td style="text-align: center;">Cal. data</td> <td></td> </tr> </table> <p>           Ls of upper image = 0            Le of upper image = 0            Ls of lower image = m            Le of lower image = n         </p> <p>In case of including calibration data at the edges of upper and bottom image (Ic=3)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">n</td> </tr> <tr> <td colspan="2" style="text-align: center;">Calibration data</td> </tr> </table> <p>           Ls of upper image = 1            Le of upper image = n            Ls of lower image = 1            Le of lower image = n         </p> <p style="text-align: center;">or</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">m1</td> <td style="text-align: center;">m</td> <td style="text-align: center;">n</td> </tr> <tr> <td style="text-align: center;">Cal. data</td> <td style="text-align: center;">Observ. data</td> <td style="text-align: center;">Cal. Data</td> <td></td> </tr> </table> <p>           Ls of upper image = 1            Le of upper image = m1            Ls of lower image = m2            Le of lower image = n         </p>	1	m	n	Observation mode data	Cal. data		1	n	Calibration data		1	m1	m	n	Cal. data	Observ. data	Cal. Data	
1	m	n																				
Observation mode data	Cal. data																					
1	n																					
Calibration data																						
1	m1	m	n																			
Cal. data	Observ. data	Cal. Data																				
15		1835	Parameter table number of automatically setting	Parameter table number of automatically setting. This number is extracted from Auxiliary data of first PALSAR frame.																		
16		1839	Nominal offnadir angle	See Figure 3.3-1 Divided angle into near range and far range. * Not divided into swath distance																		

NO.	RECORD	FIELD	DESCRIPTION	DEFINITION
17	Data set Summary record	1855	Antenna beam number	<p>In case of high resolution and direct down link mode</p> <p><u>Off-nadir Antenna beam No.</u></p> <p>9.9deg. 0  13.8deg. 1  18.0deg. 2  ...  50.8deg. 17</p> <p><u>Polarimetric mode</u></p> <p>9.7deg. 0  13.8deg. 1  16.2 - 19.3deg. 2  20.5 - 23.1deg. 3  24.2 - 26.2deg. 4</p> <p><u>Wide observation mode</u></p> <p>In case of 3 scans  20.1deg. 18  26.1deg. 19  30.6deg. 20</p> <p>In case of 4 scans  20.1deg. 18  26.1deg. 19  30.6deg. 20  34.1deg. 21</p> <p>In case of 5 scans  20.1deg. 18  26.1deg. 19  30.6deg. 20  34.1deg. 21  36.5deg. 22</p>



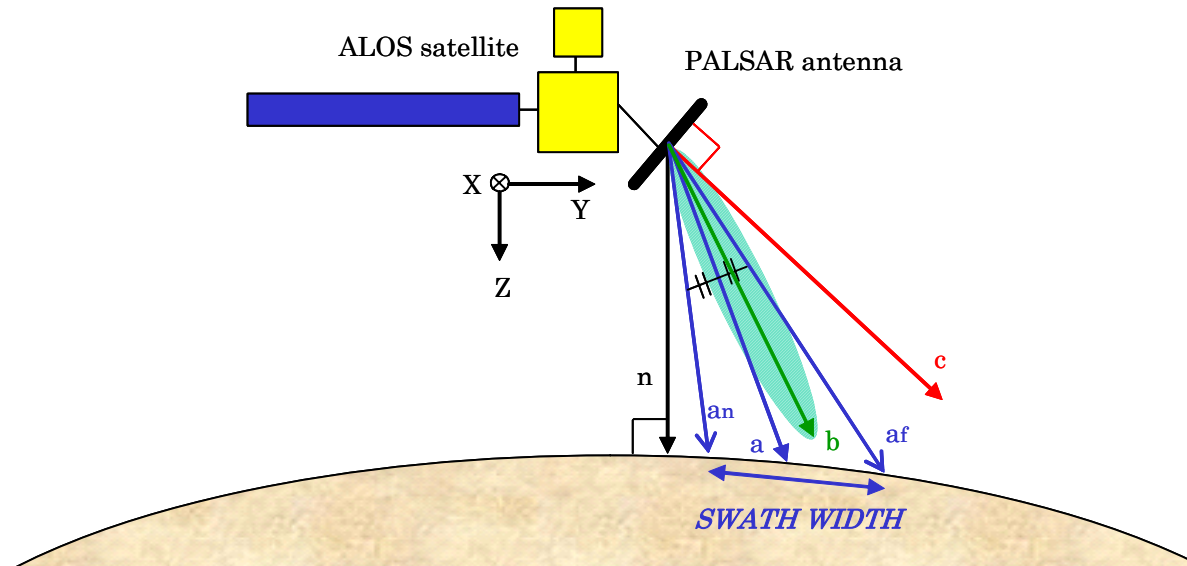
NO.	RECORD	FIELD	DESCRIPTION	DEFINITION														
18	Platform position data record	4101	Occurrence flag of a leap second	This is occurrence flag of a leap second into this scene. "bbb0" = No leap second "bbb1" = Occurrence of a leap second														
19	SAR data file descriptor record	187	SAR data record length (bytes)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="padding: 5px;">Prefix data</td> <td colspan="3" style="text-align: center; padding: 5px;">SAR data</td> </tr> <tr> <td style="padding: 5px;">PALSAR sampling data</td> <td style="padding: 5px;">Variable data</td> <td style="padding: 5px;">Dummy data</td> </tr> </table> <p style="margin-left: 40px;"> <span style="margin-right: 100px;">← 412byte</span> <span style="margin-right: 100px;">← Range size</span> <span>← SAR data record length</span> </p>	Prefix data	SAR data			PALSAR sampling data	Variable data	Dummy data							
Prefix data		SAR data																
	PALSAR sampling data	Variable data	Dummy data															
20		275	Number of physical records per multi-channel line in this file	This number of records is the same as number of BIL(Band interleaved by line) records. PALSAR acquires observation data by multi-channels as follows: High resolution mode (dual polarization) = 2 channels Poralimetry mode = 4 channels Others mode = 1 channels However, PALSAR product consists of each image option file per single-channel. This number is always "1".														
21	Signal Data	13	SAR image data line number	This number is counter of PALSAR image line. Initial value is "1".														
22		17	SAR image data record index	This index is the record sequence number in the image line. Ex: In case one image line is configured by three records is as follows: <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;"></th> <th style="padding: 5px;">SAR image line</th> <th style="padding: 5px;">Index</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">1st record</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">2nd record</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;">3rd record</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">3</td> </tr> <tr> <td style="padding: 5px;">4th record</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">1</td> </tr> </tbody> </table> However, number of records per line is always "1".		SAR image line	Index	1st record	1	1	2nd record	1	2	3rd record	1	3	4th record	2
	SAR image line	Index																
1st record	1	1																
2nd record	1	2																
3rd record	1	3																
4th record	2	1																

NO.	RECORD	FIELD	DESCRIPTION	DEFINITION
23	Signal Data	21 25 29	Actual count of left-fill pixels, Actual count of data pixels Actual count of right-fill pixels	 <p>Actual count of left-fill pixels = always "0".</p> <p>Note:Length of SAR data is the same as No47 "Number of bytes of SAR data (or pixel data) per record" in data file descriptor record</p>
24		97	Nought line flag	<p>This nought line flag means the quality of a PALSAR frame.</p> <p>1=YES "YES" means a loss line. The definitions of loss line are as follows: The VCDU counter is discontinuity. PALSAR frame data is edited from 8 ch-VCDU packets. If one VCDU packet is discontinuity, PALSAR frame data is loss line. If PALSAR frame number is discontinuity and the software misses a PALSAR Synchronization code, this nought line flag is "YES".</p> <p>0=No This PALSAR frame is a right line.</p>

NO.	RECORD	FIELD	DESCRIPTION	DEFINITION
25	Signal Data	117	Slant range to 1-st data sample (m)	Slant range(Rn) is calculated using the following formula: $R_n = t_0 * c / 2$ $t_0 = n * t_{pri} + t_{Rxs} + t_{off}$ Rn : Slant range of 1st data sample t0 : Duration to receiving from transmitting c : Velocity of light n : Number of pulses to receiving from transmitting (It is decided by PALSAR observation mode and off-nadir angle) tpri : PRI (extracted from PALSAR auxiliary data) tRxs : Duration of receiving gate No.2 (extracted from PALSAR auxiliary data) toff : Offset time (-8.31539μsec fixed)
26		121	Data record window position (i.e.. sample delay) (nano-secs)	Sample Delay is calculated using the following formula: $T_{sdlay} = t_{Rxs} + t_{off}$ tRxs : Duration of receiving gate No.2 (extracted from PALSAR auxiliary data) toff : Offset time (-8.31539μsec fixed)
27		285	Counter of PALSAR frame	It is counter extracted from PALSAR auxiliary data. This counter is reset as start of observation. See "PALSAR operation ICD (NBF-000007A)".
28	Signal Data	289	PALSAR auxiliary data	It is set RAW auxiliary data. Length of auxiliary data is 800bits. It is packed data. See "PALSAR operation ICD (NBF-000007A)".
29		413	SAR Signal data	SAR signal data consists of PALSAR sampling data, variable data and dummy data. Dummy data is 0 (NULL) data.

## Definition of PALSAR coordinates

(This definition will be included in the next version of NBF-00007)



### Definition

**Off nadir angle** : Angle between  $n$  and  $a$  ( $\equiv n-a$  hereafter)

Note 1) " $n-a$ " = " $a-af$ "

Note 2) Beam angle (" $n-b$ ") is not necessarily equal to Off nadir angle.

**Bore-sight angle** : Angle " $n-c$ " (perpendicular to PALSAR panel)

Figure 3.3-1

## **Appendix A-2**

### **Mission auxiliary data item**

Appendix A-2 Mission auxiliary data item

No	Item	Definition	Update timing	Number of bits		
	Mission auxiliary data			96		
1	1PPS reference time	Time data defined by 1PPS. Transmitted via 1553B bus. Updated at 1PPS pulse.	1Hz		64	
	1PPS time data (P field)	01100101'B				8
	1PPS GPS WEEK	0 ~ 65,535 weeks ( Epoch = 1980/1/6), 1bit=1week				16
	1PPS GPS SEC	0 ~ 604,799sec, 1bit=1sec				24
	Dummy bits	N/A				16
2	1Mpps time	Number of 1 Mpps pulses from 1PPS pulse to this PRI	Every PRI		32	
	Dummy bits	NULL				4
	1Mpps time	0-1,010,000, 1bit = 1pulse (1 $\mu$ sec)				20
	Dummy bits	N/A				8

No	Item	Definition	Update timing	Number of bits		
3	Mode setting	Mode to be set		48		
	Operation sequence	0: Manual, 1: Auto, 2: Flexible, 3: Exclusive Calibration	Const. @sequence			2
	Mode	Current mode.(*1) 0:INIT(Stand-by 2)(*2)(*3), 1: Stand-by 2(*3), 2: Stand-by 3(*3), 3: Stand-by 4, 4: Calibration, 5: Observation-stand-by (Calibration)(*3), 6:	Const. @mode			3
	Sub-mode	Current sub-mode	Const. @mode			4
	[@ stand-by mode]	0: Stand-by 2(*3), 1: Stand-by 3(*3), 2: Stand-by 4				
	[@ calibration mode]	0: Noise measure 3, 1: Tx Power monitor, 2: Tx chirp replica, 3: Rx REV, 4: Total Rx , 5: Tx REV, 6: Total Tx, 7: Rx I/O, 8: Rx ATT, 9: Rx Frequency, 10: Noise measure 1, 11: Noise measure 2				
	[@ observation mode]	0: Fine, 1: SCAN SAR, 2: Polarimetry, 3: Direct downlink				
	Rx Polarization setting	0:H, 1:V, 2:H+V, 3:N/A	Const. @mode			2
	Observation mode setting	0: Strip map (Fine/Direct downlink), 1: SCAN SAR, 2: Polarimetry	Const. @mode			2
	Gain fluctuation monitor ON/OFF	0:OFF, 1:ON	Const. @mode			1
	ERP monitor @ observation ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Dummy bits	N/A				1
	Parameter auto-set table number	0 ~ 191	Const. @mode			8
	Noise measure 1ON/OFF	0:OFF, 1:ON	Const. @mode			1
Noise measure 2ON/OFF	0:OFF, 1:ON	Const. @mode			1	

No	Item	Definition	Update timing	Number of bits		
3	Mode setting(Cont.)	Mode to be set		140		
	Noise measure 3ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Tx Power monitor ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Tx chirp replica ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Rx REV(H) ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Rx REV(V) ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Tx REV(H) ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Tx REV(V) ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Total Rx system ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Total Tx system ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Rx I/O ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Rx ATT ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Rx frequency ON/OFF	0:OFF, 1:ON	Const. @mode			1
	Dummy bits	N/A				2
	Tx polarization setting	0:V, 1:H	Every PRI			1
Dummy bits	NULL				7	

- (\*1) Set "Stand-by 4" at interval of two operation mode.
- (\*2) Set "INIT" at an initial set of a system controller.
- (\*3) As a general, these don't exit in mission auxiliary data.



No	Item	Definition	Update timing	Number of bits		
4	Observation start and end setting	Observation start time and duration. Observation start time format is the same as 1PPS time format.			96	
	Observation start time week	0 ~ 65,535 week (Epoch @ 1980/1/6), 1bit=1week	Const. @sequence		16	
	Observation start time sec	0 ~ 604,799sec, 1bit=1sec	Const. @sequence		24	
	Observation start time $\mu$ sec	0 ~ 999,999 $\mu$ sec(setting or estimation value), 1bit=1 $\mu$ sec			24	
	PRI number from 1PPS@observation start time	0 ~ 8191PRI, 1bit=1PRI			16	
	Observation duration	0 ~ 16,383sec, 1bit=1sec	Const. @sequence		16	
5	Data valid / invalid	This item's purpose is to distinguish the invalid data after scan change at SCAN SAR mode. Except SCAN SAR mode, it is set invalid after change mode. The invalid data is set while to receiving from transmitting after change to Polarimetry mode. It is set while setting a phase at Tx power monitor mode and Rx REV mode. and It is set 13PRIs while calculating and while change parameter at other mode.	Every PRI		16	
	Data valid / invalid	0:Invalid, 1:Valid			1	
	Dummy bits	NULL			7	
	Dummy bits	N/A			8	
6	Timing parameters	Current setting of timing parameters			64	
	Dummy bits	NULL			6	
	PRI	0 ~ 1023 $\mu$ sec, 1bit=1 $\mu$ sec	@setting change		10	
	Dummy bits	N/A			2	
	Rx gate window 1	0 ~ 63 $\mu$ sec, 1bit=1 $\mu$ sec	Const. @mode		6	
	Dummy bits	N/A			2	
	Rx gate window start time 1	0 ~ 63 $\mu$ sec, 1bit=1 $\mu$ sec	Const. @mode		6	
	Dummy bits	NULL			6	
	Rx gate window 2	0 ~ 1023 $\mu$ sec, 1bit=1 $\mu$ sec	@setting change		10	
	Dummy bits	NULL			6	
Rx gate window start time 2	0 ~ 1023 $\mu$ sec, 1bit=1 $\mu$ sec	@setting change		10		

No	Item	Definition	Update timing	Number of bits		
7	Scan setting	Scan related setting		112		
	Dummy bits	NULL				5
	Scan number	1 ~ 5(Current scan number)	@setting change			3
	Dummy bits	NULL				2
	Pulse number from scan change	0-16,383PRI, 1bit=1PRI	Every PRI			14
	ScanSAR setting	1 ~ 5(Setting of number of scans)	Const. @mode			3
	Scan burst	0:Burst2(Long cycle), 1:Burst1(Short cycle)	Const. @mode			1
	Dummy bits	N/A				4
	Dummy bits	N/A				5
	Scan change time 1	0 ~ 2,047PRI, 1bit=1PRI	Const. @mode			11
	Dummy bits	N/A				5
	Scan change time 2	0 ~ 2,047PRI, 1bit=1PRI	Const. @mode			11
	Dummy bits	N/A				5
	Scan change time 3	0 ~ 2,047PRI, 1bit=1PRI	Const. @mode			11
	Dummy bits	N/A				5
	Scan change time 4	0 ~ 2,047PRI, 1bit=1PRI	Const. @mode			11
	Dummy bits	N/A				5
Scan change time 5	0 ~ 2,047PRI, 1bit=1PRI	Const. @mode			11	

No	Item	Definition	Update timing	Number of bits		
8	T/R module setting	Current setting of T/R module. 1 T/R module setting data per PRI. 1 set (80 T/R modules) / 80 PRIs. From T/R module #0 data every scan change.	Every PRI		48	
	Dummy bits	NULL			6	
	Control divider number	0 ~ 3			2	
	T/R module number	0 ~ 1:N/A, 2 ~ 21:No.1 ~ 20, 22 ~ 31:N/A			5	
	T/R module setting				35	
	FP mode setting	FP:1, Other than FP:0 (See attached table)				1
	V/H	V:1, H:0 (V @FP mode) (See attached table)				1
	RX/D	T/R:1, D:0 (D=0 @Noise measure) ((See attached table)				1
	HPA	ON:1, OFF:0 (See attached table)				1
	LNAH	ON:1, OFF:0 (See attached table)				1
	LNAV	ON:1, OFF:0 (See attached table)				1
	Tx-H phase	0 ~ 31:0 ~ 348.75deg, 1bit=11.25deg				5
	Tx-V phase	0 ~ 31:0 ~ 348.75deg, 1bit=11.25deg				5
	Rx-H phase	0 ~ 31:0 ~ 348.75deg, 1bit=11.25deg				5
	Rx-V phase	0 ~ 31:0 ~ 348.75deg, 1bit=11.25deg				5
H ATT	0 ~ 15:0 ~ 15dB, 1bit=1dB				4	
V ATT	0 ~ 15:0 ~ 15dB, 1bit=1dB				4	
Parity	Odd parity				1	
9	Signal Generator setting	Current setting of Signal generator(SG)	Const.@mode		24	
	Pulse width	0 ~ 1:0 μ sec, 2 ~ 28:(This code value+12) μ sec, 29 ~ 31:0 μ sec			5	
	Chirp band width	0:28MHz, 1:14MHz			1	
	Tone frequency	0:+1MHz, 1:-1MHz, 2:+3MHz, 3:-3MHz, 4:+5MHz, 5:-5MHz, 6:+7MHz, 7:-7MHz, 8:+9MHz, 9:-9MHz, 10:+11MHz, 11:-11MHz, 12:+13MHz, 13:-13MHz, 14:+14MHz, 15:-14MHz			4	
	CW ON/OFF	0:OFF, 1:ON			1	
	Dummy bits	N/A			5	
	Tone ON/OFF case	0:Case1, 1:Case2, 2:Case3, 3:Case4			2	
	Dummy bits	N/A			6	
10	Transmitter setting	Current setting of Transmitter(TX)	Const.@mode		8	
	Transmission/Calibration case	0:Case1, 1:Case2, 2:Case3, 3:N/A			2	
	Temperature compensation	0:OFF, 1:ON			1	
	Dummy bits	N/A			5	

No	Item	Definition	Update timing	Number of bits		
11	Receiver setting	Current setting of Receiver(RX)		80		
	Rx band width	0:28MHz, 1:14MHz	Const.@mode			1
	AGC/MGC	0:AGC, 1:MGC	Const.@mode			1
	ATT @Tx-H/Rx-H	0 ~ 47:0 ~ 47dB, 1bit=1dB	@setting change			6
	ATT @Tx-V/Rx-H	0 ~ 47:0 ~ 47dB, 1bit=1dB	@setting change			6
	ATT @Tx-H/Rx-V	0 ~ 47:0 ~ 47dB, 1bit=1dB	@setting change			6
	ATT @Tx-V/Rx-V	0 ~ 47:0 ~ 47dB, 1bit=1dB	@setting change			6
	Gain setting @Noise measure	0:OFF, 1:ON	Const.@mode			1
	Calibrator ATT	0 ~ 63:0 ~ 63dB, 1bit=1dB	@setting change			6
	Calibrator ALC ON/OFF	0:ON, 1:OFF	@setting change			1
	Rx REV/Tx REV connection	00'B:Connect3(Calibration signal Rx module), 10'B:connect1(Tx REV etc.), 01'B:Connect2(Rx REV etc.), 11'B:Connect2(Rx REV etc.)	@setting change			2
	Polarimetry ON/OFF	0:OFF, 1:ON	@setting change			1
	Dummy bits	N/A				3
	Dummy bits	N/A				1
	STC ON/OFF	0:OFF, 1:ON	Const.@mode			1
	STC pattern number	0 ~ 39	@setting change			6
	Dummy bits	N/A				6
	STC start time	0 ~ 1023 $\mu$ sec, 1bit=1 $\mu$ sec	@setting change			10
	AGC/MGC ATT-H	TLM(*1) of AGC or MGC ATT, 0 ~ 63dB, 1bit=1dB	(*2)			6
	Dummy bits	N/A	(*2)			2
AGC/MGC ATT-V	TLM(*1) of AGC or MGC ATT, 0 ~ 63dB, 1bit=1dB	Every PRI			6	
Dummy bits	N/A				2	

(\*1) In case of MGC, to recommend to use H ATT or V ATT in No.8 T/R module setting instead of AGC/MGC ATT-H or ATT-V .

(\*2) The update timing is each PRI. AGC/MGC ATT-H and ATT-V are setting a value before one PRI.

No	Item	Definition	Update timing	Number of bits	
12	Data Processor setting	Current setting of Data Processor(DP)		16	
	A/D sampling rate	0:32MHz, 1:16MHz	Const.@mode		1
	A/D sampling bits	0:5bit, 1:3bit	Const.@mode		1
	Rx polarization	00'B:H, 01'B:V, 10'B/11'B:H+V	Const.@mode		2
	Data rate	0:240Mbps, 1:120Mbps	Const.@sequence		1
	Dummy bits	N/A			3
	Dummy bits	N/A			8
13	A/B	Main system(A) or redundant system	Const.@sequence	8	
	A/B	0:A, 1:B			1
	Dummy bits				7
14	BIT result	BIT results. 1 T/R module per PRI. 1 set (80 T/R modules) / 80 PRIs. From T/R module #0 every setting change.		24	
	Dummy bits	N/A(The same as No.8: T/R module number)			5
	T/R module BIT	10 bit BIT for T/R module	Every PRI		10
	FP mode setting status	FP:1, Other than FP:0 (See attached table)			1
	V/H status	V:1, H:0 (V @FP mode) (See attached table)			1
	RX/D status	T/R:1, D:0 (D=0 @Noise measure) (See attached table)			1
	HPA status	ON:1, OFF:0 (See attached table)			1
	LNAH status	ON:1, OFF:0 (See attached table)			1
	LNAV status	ON:1, OFF:0 (See attached table)			1
	Parity status	Odd parity (Parity of T/R module setting)			1
	Serial data parity	0:Normal 1:Unusual			1
	Voltage	0:Normal 1:Unusual			1
	Parity	Odd parity (Parity of T/R module BIT)			1
	Dummy bits	N/A			1
	Signal Generator BIT	0:Normal 1:Unusual	@setting change		1
	Receiver BIT	0:Normal 1:Unusual	@setting change		1
Data Processor BIT	0:Normal 1:Unusual	@setting change		1	
System Controller BIT	0:Normal 1:Unusual	@initial setting		1	
Dummy bits	N/A			4	
15	N/A	N/A		160	

Appendix A-2 (Attached table) Mission auxiliary data item (Tx/Rx module Mode

TRM mode	FP	V/H SW	RX/D SW	HPA	LNA(H)	LNA(V)
Stand-by	0	0	1	0	0	0
Stand-by	0	1	1	0	0	0
Stand-by	1	1	1	0	0	0
Rx H	0	0	1	0	1	0
Rx V	0	1	1	0	0	1
Rx V	0	0	1	0	0	1
Tx H	0	0	1	1	0	0
Tx V	0	1	1	1	0	0
Noise	0	0	0	0	1	1
Noise	0	1	0	0	1	1
Observatin-HH	0	0	1	1	1	0
Observation-VV	0	1	1	1	0	1
Observation H/HV	0	0	1	1	1	1
Observation V/HV	0	1	1	1	1	1
Rx HV	0	0	1	0	1	1
Rx HV	0	1	1	0	1	1
Rx HV	1	1	1	0	1	1
Polarimetry	1	1	1	1	1	1

## **Appendix A-3**

### **Summary Information**

**(PALSAR1.0)**

This appendix describes the format of the PALSAR1.0 summary information file.

### 1. Outline of the Summary Information

The summary information file includes the information for creating processed data created in the ALOS Data Processing Subsystem, and it is always made in a pair with its processed data.

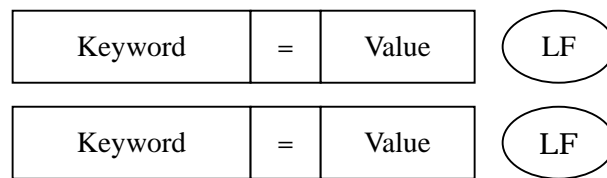
### 2. Name of File

Name of the summary information file is fixed as follows.

summary.txt

### 3. File Format

The file does not include header information, footer information, and etc., and consists of keyword and value and LF. Outline of the file format is shown as follows.



### Outline of the file format

#### 3.1 Keyword Setting form

- (1) The first character of Keyword is set to the first column.
- (2) Equal mark (=) is set after the last character of Keyword.
- (3) Blank is not included between Keyword and Equal mark (=) as a general rule.

#### 3.2 Value Setting form

- (1) Double quotation (“”) is set to before and after of the Value.
- (2) Alphanumeric characters and diacritics (except Double quotation (“”)) are used in the Value, and a string of characters is stored in the enclosed place with Double quotation (“”).
- (3) Blank is not included between Equal mark (=) and the first Double quotation (“”) as a general rule.

#### 3.3 Setting Items

The setting items of the PALSAR1.0 summary information are described in the following table.



Summary Information (PALSAR)(1/3)

No.	Section	Name of Items	Keyword	Contents
1	Ordered Information Odi	Number of Product Management	Odi_ProductManagementNo	XYNNNNNN X: Code distinguished the inquiry office YY: The year of receipted orders (Last two digits of A.D.year) NNNNN: Running numbers (00001 - 99999) (Refer to NCX-000048)
2		Sub-number of product management	Odi_ProductManagementBranchNo	XXX XXX: 001 - 999 (Refer to NCX-000048)
3	Appointed Scene Scs	Scene ID	Scs_SceneID	AABBBCDDDDDEEEEE AA: Mission type (=AL) BBB: Sensor type (=PSR) C: Supplemental remarks of sensor type (S: Wide observation mode, P: Except wide observation mode) DDDDD: Total calculated orbit number of the scene center EEEE: Frame number of the scene center
4		Amount of scene shift	Scs_SceneShift	-5 - 4 (No sign in case of zero and plus)
5	Appointed Product Pds	Product ID	Pds_ProductID	ABBBCDE A: Observation mode (H: High resolution mode, W: Wide observation mode, D: Direct down link mode, P: Polarimetry mode, C: Calibration mode) BBB: Processing level (1.0: Level 1.0, 1.1: Level 1.1, 1.5: Level 1.5) C: Processing option (G: Geo-Coded specified, _: Not specified) D: Map projection (U: UTM, P: PS, M: MER, L: LCC, _: Not specified) E: Ascending Node (A: Ascending, D: Descending)
6		Accuracy of used orbit data	Pds_OrbitDataPrecision	Precision/RARR_Determine/RARR_Predict Precision: ALOS High Precision Orbit Information RARR_Determine: ALOS Orbit Information (Decision) RARR_Predict: ALOS Orbit Information (Preliminary)
7		Accuracy of used attitude data	Pds_AttitudeDataPrecision	Standard Standard: Standard attitude determination system (Onboard)
8	Image Information	Scene center date and time	Img_SceneCenterDateTime	YYYYMMDDbHH:MM:SS.TTT(UT) YYYY: A.D. year MM: Month (01- 12) DD: Day (01 - 31) HH: Hour (00 - 23) MM:Minute (00 - 59) SS: Second (00 - 60) TTT: Milisecond (000 - 999) (ss=60 is only case of a leap second)

Summary Information (PALSAR)(2/3)

No.	Section	Name of Items	Keyword	Contents
9	Image Information (continued) Img	Scene start date and time	Img_SceneStartDateTime	YYYYMMDDbHH:MM:SS.TTT (UT) YYYY: A.D. year MM: Month (01- 12) DD: Day (01 - 31) HH: Hour (00 - 23) MM:Minute (00 - 59) SS: Second (00 - 60) TTT: Milisecond (000 - 999) (ss=60 is only case of a leap second)
10		Scene end date and time	Img_SceneEndDateTime	YYYYMMDDbHH:MM:SS.TTT (UT) YYYY: A.D. year MM: Month (01- 12) DD: Day (01 - 31) HH: Hour (00 - 23) MM:Minute(00 - 59) SS: Second (00 - 60) TTT: Milisecond (000 - 999) (ss=60 is only case of a leap second)
11	Product Information Pdi	Size of product data	Pdi_ProductDataSize	0.0 - 9999.9 (Unit: Mbytes=1024Kbyte) (Zero suppression is possible. Round off at the second decimal place. Always display to the first decimal place. )
12		Number of product files	Pdi_CntOfL10ProductFileName	High resolution mode (single polarization): 4 files High resolution mode (dual polarization): 5 files Direct down link mode: 4 files Wide observation mode: 4 files Polarimetry mode: 7 files
13		Name of product file created Level 1.0 process (This item will be prepared of number of product files.)	Pdi_L10ProductFileNameNN (NN is used unredundant number from 01 to "NumberOfFiles".)	Volume Directory File VOL-SSSSSSSSSSSSSS-PPPPPPP Leader File LED-SSSSSSSSSSSSSS-PPPPPPP Image File IMG-XX-SSSSSSSSSSSSSS-PPPPPPP Trailer File TRL-SSSSSSSSSSSSSS-PPPPPPP SSSSSSSSSSSSSS: Scene ID
14		Number of pixels	Pdi_NoOfPixels	0 - 99999 (Zero suppression is possible.) It is the number of pixels only for the SAR signal data not including the prefix in the signal data record.
15		Number of lines	Pdi_NoOfLines	0 - 99999 (Zero suppression is possible.) It is the number of lines of the SAR signal data not including the file descriptor in the SAR image file.
16		Product format	Pdi_ProductFormat	CEOS: Fixed
17		Result of automatic check Ach	Time system data status	Ach_TimeCheck
18	Attitude determination system data status		Ach_AttitudeCheck	OK/NG OK: Precision attitude determination system, NG: Standard attitude determination system

Summary Information (PALSAR)(3/3)

No.	Section	Name of Items	Keyword	Contents
19	Result of automatic check (continued) Ach	Absolute navigation status	Ach_AbsoluteNavigationStatus	OK/NG
20		House keeping data status	Ach_HouseKeepingDataCheck	OK/NG NG: NG is checked out in check items
21		Orbit data status	Ach_OrbitCheck	OK/NG Result of onboard limit check
22		Onboard PCD attitude status	Ach_OnBoardPCDAttitudeCheck	OK/NG
23		Loss lines status	Ach_LossLines	OK/NG NG: Rate of loss lines is over threshold
24		Absolute navigation	Ach_AbsoluteNavigationTime	OK/NG (Evaluate whether it will be changed as NG→FAIR in initial operational
25		PRF change	Ach_PRF_Check	OK/FAIR/NG OK: PRF change is not included FAIR: PRF change is included. Visual inspection is not necessary. NG: PRF change is included. Visual inspection is necessary.
26		Calibration data	Ach_CalibrationDataCheck	OK/FAIR/NG OK: Calibration data is not included. FAIR: Calibration data is included. Visual inspection is not necessary. NG: Calibration data is included. Visual inspection is necessary.
27		Version Ver	OS (Linux)	OS_VersionInDataProcessingUnit
28	Result Information Rad	Practice result code	Rad_PracticeResultCode	00: Passing
29				01: Passing for this time by operator inspection
30				02: Conditional passing ( with passed automatic check)
31				03: Conditional passing ( with failed automatic check)
32		Processed host name	Rad_ProcessedHostName	XXXXXXXXXX (Host name used for data processing
33		Number of CDRs/DVD-Rs	Rad_NoOfCDR	N: 1 to 9 (Number of CDRs/DVD-Rs which was created when output media was specified in CDR/DVD-R)
34	Label Information Lbi	Satellite name	Lbi_Satellite	ALOS (Fixed)
35		Sensor name	Lbi_Sensor	PALSAR (Fixed)
36		Processing Level	Lbi_ProcessLevel	xxx
37		Processed facility name	Lbi_ProcessFacility	HEOC (Fixed)
38		Observation date	Lbi_ObservationDate	YYYYMMDD