IRS-1C/1D
DIGITAL DATA PRODUCTS FORMAT

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CONTENTS

1.0 INTRODUCTION

IRS-1C/1D/P3 Data products system generates digital video data in Computer Compatible Tapes (CCTs), cartridges, DATs, CD- ROM and floppies on the basis of user requests. Hence forth these products will be referred to as Digital Product in general.

There are two formats for digital data one will be referred as **super structure format** and the other as **fast format**. Video data will be provided in BIL or BSQ formats. In case of CCT products data is recorded in 6250 bpi or 1600 bpi on the basis of user request.

Whereas in super structure format apart from the video data each digital product contains scene identification, location information, sensor, platform and processing related information.

Standard conventions used in the document is given below in the **Table no. 1.0.**

TABLE 1.0

Explanation for the notations used to describe the data type

Notation	Explanation
B	: Field coded in Binary
A	: Alphanumeric in ASCII
N	: Numeric in ASCII
In	: Integer numeric string with length equal to n bytes.
fw.d	: Floating point numeric string with length w, with d decimal digits.

NOTES :
1) Alpha-numeric information is left justified.
2) Numeric information is right justified.

2.0 SUPER STRUCTURED DIGITAL DATA FORMAT

2.1.1 LOGICAL VOLUME

A logical volume is a logical collection of one or more files recorded consecutively.

All logical volumes have a volume directory as the first file and null volume directory as the last file. When a logical volume is split between physical volumes the volume directory is repeated at the start of the next physical tape with some updated information.

2.1.2 VOLUME DIRECTORY FILE

The volume directory file is the first file of every logical volume. It is composed of volume descriptor record, a number of file pointer records and a text record.

The volume descriptor record identifies the logical volume and the number of files it contains. There is a file pointer record for each type of file in the logical volume which indicates each file's class, format and attributes.

2.1.3 LEADER FILE

The leader file is composed of a file descriptor record and three types of data records. The record types are header, ancillary and annotation. Header contains information related to mission, sensor and processing parameters. Ancillary records contain information related to ephemeris, attitude and Ground Control Points (GCPs) for image correction.

2.1.4 IMAGE FILE

Image file consists of file descriptor record and image data records. Image data record contain the video data in Band Interleaved by Line (BIL) format or Band Sequential Format (BSQ), and in addition, it also contains prefix and suffix information.

2.1.5 TRAILER FILE

The trailer file follows the image data file. This is composed of a file descriptor record and one trailer record for each band.

2.1.6 NULL VOLUME DIRECTORY FILE

The file which ends a logical volume is the null volume directory file. The file is referred as 'null' because it defines a non-existent (empty) logical volume. This file contains a volume descriptor record.

2.2.0 FILES AND RECORDS IN IRS-1C/1D/P3 USER CCT/DAT

File Seq. No.	Record Type and length	Description of file contents
File 0	Variable no of Records each of 360 bytes.	Volume Directory file (Volume descriptor, File Pointers and text record).
File 1	Variable no of Records each of 6120 bytes	Leader file (Descriptor, Header, ancillary, Calibration, histogram, map projection, GCP, annotation, Boundary, and Boundary annotation Record. Class LEAD
File2	* Variable No.of records * Variable record length	Image Data file Class IMGY
File 3	Variable no of Records each of 360 bytes	Trailer file (Description and trailer records) CLASS TRAI
NULL	One Record of 360 bytes	Null file (End of logical volume will be overwritten to add another logical volume.)

* No. of records and record length will vary as per the product type or no. of bands or sensor.

2.3.0 DIGITAL DATA FILE STRUCTURE

Volume Directory	i) Volume Descriptor	Volume Directory	Identification of logical volume and file pointer record corresponding to each file of logical volume.Specific file format record length, number of records etc
	ii) File Pointer for file-1		
	iii) File Pointer for file-2		
	iv) File pointer for file-3		
	v) Text Record		The text record give information about physical tape, environment in which the tape has been created.
1.	1) Leader file Descriptor	Leader file (LEAD)	Gives the mode of reading file and contains key data field location.
	ii) Header Record		Information related to mission,sensor, processing parameters
	iii) Ancillary Records		Contains information about ephemeris,attitude, calibration, histogram, Map projections and GCP's
	iv) Annotation Record		Contains information about annotation and tick marks.
	Boundary Records and Boundary annotation record		For general products these records are dummy. Records will be given in case of District Geocoded and WIFS Zonal product.
2.	i) Image file descriptor	Image data file (IMGY)	Gives the mode of reading the file and contains key data field locations.
	ii) Image data Record		Contains RAW/PROCESSED/ RADIOMETRIC corrected Data

3.	**i)**	**Trailer file descriptor**	**Trailer file TRAI**	**Gives the mode of reading the file and contains key data field locations.**
	ii)	**Trailer records**		**These contain information cloud coverage and parity errors.**
NULL VOLUME	**i)**	**NULL VOLUME Descriptor Record**	**Null Volume file**	**Last file of the logical volume. The purpose of this is to mark the end of logical volume.**

2.4.0 RECORD STRUCTURE

2.4.1 VOLUME DIRECTORY

a. Volume Descriptor Record

b. File Pointer Records (no of records will depend on the number of files in the product).

c. Text Record

The table in the next page describes the Volume Directory records in detail.

TABLE 2.4.1.1

VOLUME DESCRIPTOR RECORD : (DEFINITIONS /CONTENTS) (360 Bytes)

FIELD NO.	BYTE NO	TYPE	DESCRIPTION
1	1–4	B	The record number of this record within the file (1)
2	5–8	B	Record type and subtype octal codes ("300 300 022 022")
3	9–12	B	Length of this record (360)
4	13–14	A	ASCII/EBCDIC Flag (Ab) – A2
5	15–16	–	Spares
6	17–28	A	Super structure format control document number – A12
7	29–30	N	Super structure control document revision number – I2
8	31–32	A	Super structure control document revision letter – A2
9	33–44	A	Software release number A12
10	45–60	A	Tape ID for physical volume containing this volume descriptor – A16 UXXXXXXXXXXX–NN (U = C/T/D) U = UCCT symbol; C : CARTRIDGE, T : CCT, D : DAT , U : Other Media XXXXXXXXXXX = Unique identification of the product NN = Current physical volume in volume set

FIELD NO.	BYTE NO	TYPE	DESCRIPTION
11	61–76	A	Logical volume ID – A16 SS–NN–MMM–LLL–KK SS = Satellite Id. (e.g. 1C/1D/P3) NN = Mode of data acquisition (PA for panchromatic, MS for multi spectral mode) MMM :Interleaving indicator(BIL or BSQ) LLL :Sensor Identification (L–3, WIF, PAN) KK :Present logical volume no in volume set
12	77–92	A	Volume set ID – A16 SS–NN–MMM–LLL–KK KK = Total no. of logical volume in volume set rest defined in field 11.
13	93–94	N	Number of physical volume in the volume set – I2
14	95–96	N	Physical volume number, start of logical volume – I2
15	97–98	N	Physical volume number, end of logical volume – I2
16	99–100	N	Physical volume number containing this volume descriptor – I2
17	101–104	N	First file number reference in this physical volume – I4
18	105–108	N	Logical volume number within volume set – I4
19	109–112	N	Logical volume number within this physical volume – I4
20	113–120	A	Logical volume creation date (YYYYMMDD) – A8
21	121–128	A	Logical volume creation time (HHMMSS)– A8

FIELD NO.	BYTE NO	TYPE	DESCRIPTION
22	129–140	A	Logical volume generating country – A12
23	141–148	A	Logical volume generating agency – A8
24	149–160	A	Logical volume creation facility – A12
25	161–164	N*	Number of pointer records in volume directory (bbbN) – I4
26	165–168	N*	Total Number of records in volume directory (bbbN) – I4
27	169–360	–	Spares

* These fields will have different contents for different products.

TABLE 2.4.1.2

FILE POINTER RECORDS : DEFINITIONS/CONTENTS (360 BYTES)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	The record number of this record within the volume directory file (2,3 or 4)
2	5–8	B	Record type and subtype octal codes ("333 003 022 022")
3	9–12	B	Length of this record (360)
4	13–14	A	ASCII/EBCDIC flag (Ab) – A2
5	15–16	–	Spares
6	17–20	N	Reference file number (bbb1, bbb2, or bbb3) – I4
7	21–36	A	Referenced file name – A16
8	37–64	A	Referenced file class (LEADERbFILEb,IMAGERYbFILE or TRAILERbFILE : Plus 16 blanks) – A28
9	65–68	A	Reference file class code (LEAD, IMGY, TRAI) – A4
10	69–96	A	Reference file data type MIXED BINARY AND ASCII(MBAA) or BINARY ONLY (BINO)– A28
11	97–100	A	Referenced file data type code (MBAA or BINO) – A4
12	101–108	N	Number of records in referenced file – I8

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
13	109–116	N	Referenced file first record length – I8
14	117–124	N	Referenced file maximum record length – I8
15	125–136	A	Referenced file record length type – A12
16	137–140	A	Referenced file record length type code – A4
17	141–142	A	Referenced file physical volume, start of file – I2
18	143–144	N	Referenced file physical volume, end of file – I2
19	145–152	N	Referenced file, 1st record number in this physical volume – I8
20	153–160	N	Referenced file, number of records in this physical volume – I8
21	161–360	–	Spares

TABLE – 2.4.1.3

TEXT RECORD : DEFINITIONS/CONTENTS (360 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record Sequence Number of this record
2	5–8	B	Record type and subtype octal codes ("022 077 022 022")
3	9–12	B	Length of this record (360)
4	13–14	A	ASCII/EBCDIC Flag (Ab) – A2
5	15–16	A	Continuation Flag (NO) – A2
6	17–32	A	Product type (RAW, STEREO, STANDARD, SPECIAL,ZONAL,GEOCODED, GEO–REFERENCED,RADIOMETRIC) – A16
7	33–48	A	Date of product creation (DD–MM–YY)– A16
8	49–64	A	Time of product creation (HH:MM:SS) – A16
9	65–80	A	Physical tape ID (16 character long string as ‘name’ to physical tape)– A16 (+)
10	81–112	A	Scene ID – A32 (*)
11	113–172	A	State & District name – A60
12	173–180	A	Map Sheet Number – A8
13	181–199	A	Spares
14	200–208	A	Product Code – A9
15	209–360	A	Spares

(*) Scene ID coded as follows :

1.	1:9	DD-MM-YY (Date of Pass)
2.	11:18	HH:MM:SS (Time of acquisition)
3.	19:21	Sensor ID (L-3, P-(A,B,C,D), WIF)
4.	22:22	Sub scene ID (0-9)
5.	23:24	Product type code (e.g. ST/TR/QU)
6.	25:26	Quadrant or zone number or % shift along track
7.	27:27	'B'
8.	28:31	Band numbers
9.	32:32	Flag for full = 'F' or Quad='Q',Zonal = 'Z'

(+) Refer table No.2.4.1.1 (field No.10)

Note : YY in the Date field No.7 and 10 is to be interpreteded as follows ..

99 ---> 1999
00 ---> 2000
01 ---> 2001
..

2.4.2 FILE DESCRIPTOR RECORD

1. Fixed part of the file Descriptor record

TABLE 2.4.2.1

FIXED PART OF THE FILE DESCRIPTION RECORDS
DEFINITIONS/CONTENTS (180 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record Number of this record within the file (1)
2	5–8	B	Record type and subtype octal codes ("077 300 022 022")
3	9–12	B	Length of this record
4	13–14	A	ASCII/EBCDIC Flag – A2
5	15–16	–	Spares
6	17–28	A	Superstructure format control document number – A12
7	29–30	N	Superstructure control document revision number – I2
8	31–32	N	Superstructure control document revision letter – A2
9	33–44	A	Software release number – A12
10	45–48	N	Sequence number of this file within the logical volume (excluding volume directory) (1 or 2 or 3 ..etc) – I4
11	49–64	A	File name (unique identification of the present file)
12	65–68	A	Record sequence and location type flag (Indicates whether other records in the file have sequence number or not)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
13	69–76	N	Location of the start of the sequence number field (bbbbbbb4)–I8
14	77–80	N	Length in bytes of the record sequence number field (bbb4) – I4
15	81–84	A	Record code and location type flag (indicates whether other records in the file have a record type code or not and their location is fixed or not)
16	85–92	N	Location of the start of the record type code field (bbbbbbb5) – I8
17	93–96	N	Length in bytes of the record type code field (bbb4) – I4
18	97–100	A	Record length and location type flag (Indicates whether other records in this file have its record length recorded within the record or not and location is fixed or not :–FLGT (Fixed in IRS–CCT format) – A4
19.	101–108	N	Location of the start of the record length field (bbbbbbb9) – I8
20.	109–112	N	Length in bytes of the record length field (bbb4) – I4
21.	113	A	Flag indicating that the data interpretation information is included with the file descriptor record – A1
22.	114	A	Flag indicating that the data interpretation information is included within the file in records other than the files descriptor record – A1

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
23.	115	A	Flag indicating that the data display information is included with the file description record – A1
24.	116	A	Flag indicating that the data display information is included within the file in records other than the file descriptor record – A1
25.	117–180	–	Spares

2.4.3 LEADER FILE

1. File Descriptor Record
2. Header Record
3. ephemeris/Attitude Record
& 4. Calibration Records
5. Map Projection Record
6. Histogram Records
7. GCP's Record
8. Annotation Record
* 9. Line & Pixel look up table
10. Attitude Rate Record
$ 11. Boundary Records
$ 12. Boundary annotation Record

$ These records are valid in case of District Geocoded and zonal products. For other products these records are dummy.

& Valid for raw or Radiometrically corrected products. Other products will contain dummy record.

* Valid for Basic Stereo products only. Other products will contain dummy record.

TABLE 2.4.3.1

LEADER FILE DESCRIPTOR RECORD : DEFINITIONS/CONTENTS (6120 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–180	–	See 2.4.2.1 (Fixed part of the file descriptor)
2	181–186	N	Number of header records (bbbbb1) – I6
3	187–192	N	Header record length (bb6120) – I6
4	193–198	N	Number of ancillary ‘Ephemeries/ attitudes’ record – I6
5	199–204	N	Length of this record – I6
6	205–210	N	Number of Calibration records – I6
7	211–216	N	Length of these records – I6
8	217–222	N	Number of ancillary Histogram record – I6
9	223–228	N	Length of these records – I6
10	229–234	N	Number of ‘MAP PROJECTION’ records –16
11	235–240	N	Length of these records – I6
12	241–246	N	Number of ‘GCP’records – I6
13	247–252	N	Length of these records – I6
14	253–258	N	Number of annotation Records I6
15	259–264	N	Length of these records – I6
16	265–270	N	Line & pixel lookup table records– I6
17	271–276	N	Length of these records I6
18	277–282	N	Number of Attitude Rate Records – I6

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
19	283–288	N	Length of these records – I6
20	289–294	N	Number of boundary records –I6
21	295–300	N	Length of these records –I6
22	301–306	N	Number of boundary annotation records – I6
23	307–312	N	Length of these records –I6 The location of the below mentioned fields is given in 16 bytes, coded as follows... 6 bytes – the record number of the record containing the field 6 bytes – byte number of the 1st byte of this field 3 bytes – length of these fields in bytes 1 bytes – Code for the type of data in the field (A=alphanumeric, B=binary, N=numeric)
24	325–340	A	Scene identification field locator – A16
25	341–356	A	Mission identification field locator – A16
26	357–372	A	Sensor identification field locator – A16
27	373–388	A	Exposure date & time locator – A16
28	389–404	A	Geographic field reference locator – A16
29	405–420	A	Image processing performed field locator – A16

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
30	421–436	A	Imagery format indicator locator (Interleaving) – A16
31	437–452	A	Band indicator locator – A16
32	453–6120	–	Spares

TABLE 2.4.3.2

HEADER RECORD : DEFINITION/CONTENTS – (6120 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record Number of this record within file
2	5–8	B	Record type and subtype octal codes ("022 022 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Header Record sequence number –I4
5	17–20	–	blanks
6	21–28	N	Path Number (bbbbbPPP)–I8
7	29–36	N	Row Number (bbbbbRRR)–I8
8	37–68	A	Scene Identification–A32 +
9	69–100		Spares
10	101–116	N	Scene Centre Geographic location (lat) (Deg.) – F16.7
11	117–132	N	Scene Centre Geographic location (long) (Deg.) F16.7
12	133–140	N	Scene centre location within image (line no.) –I8
13	141–148	N	Scene centre location within image (pixel no) – I8
14	149–164	N	Left top corner geographic location of scene (lat) (Deg.) – F16.7

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
15	165–180	N	Left top corner geographic location of scene (long) (Deg.) – F16.7
16	181–188	N	Left Top corner location in scene (line no.) – I8
17	189–196	N	Left top corner location in scene (pixel no.) – I8
18	197–212	N	Right top corner geographic location (lat)–F16.7
19	213–228	N	Right Top corner geographic location (long) – F16.7
20	229–236	N	Right top corner location in scene (line no) – I8
21	237–244	N	Right top corner location in scene (pixel no)–I8
22	245–260	N	Left bottom corner geographic location of scene (lat.)–F16.7
23	261–276	N	Left bottom corner geographic location of scene (long)– F16.7
24	277–284	N	left bottom corner location in scene (line no)–I8
25	285–292	N	Left bottom corner location in scene (pixel no)–I8
26	293–308	N	Right bottom corner geographic location of scene (lat)–F16.7
27	309–324	N	Right bottom corner geographic location of scene (long)–F16.7
28	325–332	N	Right Bottom corner location in scene (line no) –I8
29	333–340	N	Right Bottom corner location in scene (pixel no) –I8

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
30	341–348	N	Input nominal scene data (pixels)–I8
31	349–356	N	Input nominal scene data (lines)–I8
32	357–364	N	Input nominal pixel size at nadir – (metres) – F8.3
33	365–372	N	Input nominal line spacing at nadir – (metres) – F8.3
34	373–388	N	Input viewing angle (Deg.) – F16.7
35	389–396	N	Input nominal pixels for SWIR band–I8
36	397–404	N	Input nominal scans for SWIR band–I8
37	405–412	N	Input nominal pixel size for SWIR band–F8.3
38	413–420	N	Input nominal line spacing for SWIR band–I8
39	421–436	N	Nominal orbit inclination (Deg.) F16.7
40	437–452	N	Nominal altitude (meters) – F16.7
41	453–468	N	Longitude of ascending node ,F16.7
41A	469–470	N	Endian Flag(0:for Big Endian , 1: Little)
41B	471–472	N	Shift percentage(0 –99) for shift along track products I2
41C	473–474	N	Quadrant Number(Valid for Quadrant products only), I2
41D	475–501		Spares
42	502–517	N	Satellite heading angle (Deg.) F16.7
43	518–525		Spares

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
44	526–541	N	Cross track FOV(meters)–F16.7
45	542–573		Spares
46	574–589	N	Sun angle (Azimuth) (Deg.) – F16.7
47	590–605	N	Sun angle (elevation) (Deg.) F16.7
48	606–621	N	Predicated scene centre latitude (Deg.) F16.7
49	622–637	N	Predicated scene centre longitude (Deg.) F16.7
50	638–653	N	Observed scene centre latitude (Deg.) F16.7
51	654–669	N	Observed scene centre longitude (Deg.) F16.7
52	670–797		Spares
			IMAGING PARAMETERS
53	798–829	A	Input scene start time (HH:MM:SS:mmm)
54	830–845	A	Mission identification–A16
55	846–877	A	Sensor identification – A32
56	878–893	A	Spectral mode – A16
57	894–913		Spares
58	914–929	N	Day number within cycle–I16
59	930–937	N	Payload tilt step number – I8
60	938–945	N	Payload tilt per step in (Deg) – F8.3

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
61	946–961	N	LISS–3 scene centre lat. corresponding to PAN – F 16.7
62	962–977	N	LISS–3 scene centre long.corresponding to PAN – F 16.7
63	978–985	N	LISS–3 Path no. corresponding to PAN–I8
64	986–993	N	LISS–3 Row no. corresponding to PAN–I8
65	994–1009	N	Integration Time for SWIR band – F16.7
66	1010–1025	N	Integration Time (in millisec)– F16.7
67	1026–1088		Spares
68	1089–1104	N	On board gain number "nb" I4
69	1105–1112		Spares
70	1113–1120	N	Number of spectral bands–I8
71	1121–1152	N	Lower and upper limit of wavelength range in nanometers range in nanometers 2"nb" F4.2 where nb = no. of bands in the sensor.
72	1153–1216	N	CCD temp for all the CCD arrays present in sensor "nb" F8.4 (in degree celisus)
73	1217–1280	–	Minimum (LMIN) & Maximum (LMAX) radiance for number of bands present in the product 2"nb" F8.5 (mw/sq. cm /str/micromet)

Conversion formula for Digital Count to radiance is as follows.

Lrad = (DN/MaxGray)*(Lmax–Lmin) + lmin.

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION

Lrad :Radiance for a given DN value.
DN :Digital Count
MaxGray:63 for PAN & 127 for WiFs & Liss-3 for Raw Products only. 255 for Corrected products.
Lmin/Lmax :minimum/Maximum radiance value for a given band.

IMAGE DATA PARAMETERS

74	1281-1296	N	Number of image pixels per line-I16
75	1297-1312	N	Number of image data lines-I16
76	1313-1320	N	Processed pixel spacing F8.3
77	1321-1328	N	Processed line spacing F8.3
78	1329-1344	A	Interleaving indicator-A16
79	1345-1360	N	Spectral bands indicator - 4I4
80	1361-1368	N	Processed pixel spacing for SWIR band F8.3
81	1369-1376	N	Processed line spacing for SWIR band - F8.3
82	1377-1392	N	Number of Image pixels per line for SWIR band - I16
83	1393-1409	N	Number of Image data line for SWIR band-I16
84	1409-1440		Spares
85	1441-1456	A	Preprocessing level identification-A16
86	1457-1464	A	Radiometric calibration designator-A8
87	1465-1472	A	Resampling designator -I8
88	1473-1632		Spares
89	1633-1648	N	Number of lines losses "nb" I4

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
90	1649-1664	N	Number of dead detectors "nb"I4
91	1665-1669	A	Multi Scene/Sensor flag (TRUE or FALSE) - A5
92	1670-1675	N	No. of Mosaicked or merged scenes I6
93	1676-1707	A	Second scene identification A32
94	1708-1713	A	Second scene satellite identification A6
95	1714-1721	N	Second scene input nominal resolution (meters) F8.3
96	1722-1737	N	Second scene sun elevation angle (Deg.) - F16.7
97	1738-1753	N	Second scene sun azimuth angle (Deg.) - F16.7
98	1754-1769	N	Observed scene centre latitude (Deg.) - F16.7
99	1770-1785	N	Observed scene centre longitude (Deg.) - F16.7
100	1786-1801	N	Second scene heading angle (Deg.) - F16.7
101	1802-1817	N	Predicted second scene centre latitude (Deg.) - F16.7
102	1818-1833	N	Predicted Second Scene Centre Longitude (deg.) - F16.7
103	1802-3046		Repetition of field no.93,94,95,96,97, 98,99,100,101,102 for remaining number of scenes.
104	3047-6120	-	Spares

"nb" stands for no. of bands/CCD arrays.

+ Refer table 2.4.1.3 (Field No.10)

*** Refer table 2.4.1.3 (Field No.10)**

TABLE 2.4.3.3

EPHEMERIES/ATTITUDE RECORDS (DEFINITION/CONTENTS) (6120 Bytes)

FIELD NO	BYTE NUMBER	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within file
2	5–8	B	Record type and subtype octal codes ("366 044 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Record sequence number in Ephemeries and attitude records – I4
5	17–20	N	Number of Ephemeries/Attitude values in this record – I4
6	21–32	N	Satellite position_X– F12.4 (kms)
7	33–500	–	Repetition of field no 6 for more positions
8	501–512	N	Satellite position_Y– F12.4 (kms)
9	513–980	–	Repetition of field no 8 for more positions
10	981–992	N	Satellite position_Z– F12.4 (kms)
11	993–1460		Repetition of field no 10 for more positions
12	1461–1472	N	Velocity vector_X– F12.7 (km/sec)
13	1473–1940	–	Repetition of field no – 12
14	1941–1952	N	Velocity vector_Y – F12.7 (km/sec)
15	1953–2420		Repetition of field no 14

FIELD NO	BYTE NUMBER	TYPE	DESCRIPTION
16	2421–2432	N	Velocity vector_Z – F12.7 (km/sec)
17	2433–2900	–	Repetition of field no 16
18	2901–4012		Spares
19	4013–4028	N	Satellite Altitude (meters) – F16.7
20	4029–4054	A	Scene centre time – A 26 (HH:MM:SS:sss)
21	4055–4066	A	Ephemeries/Attitude start time A12 (HH:MM:SS:SSS)
22	4067–4072	N	Time interval for Ephemeries/Attitude values F6.3 (seconds)
23	4073–4100		Spares
24	4101–4110	N	Yaw (Deg.) – F10.5
25	4111–4500	–	Repetition of field no 24
26	4501–4510	N	Roll (Deg.) – F10.5
27	4511–4900	–	Repetition of field no 26
28	4901–4910	N	Pitch (Deg.) – F10.5
29	4911–5300	–	Repetition of field no 28
30	5301–5310	N	Scene centre Yaw (Deg.) F10.5
31	5311–5320	N	Scene centre Roll (Deg.) F10.5
32	5321–5330	N	Scene centre Pitch (Deg.) F10.5
33	5331–6118	–	Spares
34	6119–6120	A	Swath Flag(00/01) 01 : Swath Model Done 00 : Swath Model Not Done

Note :
Number of Ephemeries/Attitudes values in each record will be as per the field no.5

TABLE 2.4.3.4
(*) CALIBRATION RECORDS : DEFINITIONS/CONTENTS (6120 Bytes)

FIELD NO	BYTE NUMBER	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within file
2	5–8	B	Record type and subtype octal codes ("077 044 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Record Sequence number in calibration Record–I4
5	17–20	–	Spares
6	21–24	N	Spectral band number – I4
7	25–28	N	Gain or Dark current/bias flag (bbb1 or bbb2) – I4
8	29–32	N	Number of the detector corresponding to the 1st value in this record – I4
9	33–36		Spares
10	37–40	N	Number of the detector corresponding to the last value in this record – I4
11	41–44	–	Spares
12	45–48	N	number of the dead detectors within the 6000 or 4096 or 2100 detectors – I4
13	49–60	–	Spares
14	61–6060	B	Value given are multiplied by 1000 3000 values for gain & bias. (16 bit binary No.is used for gain or bias coded in Integer * 2)
15	6061–6120	–	Spares

(*) Contents applicable for RAW and Radiometrically corrected products.

Gain or bias value (999) will represent the dead detector in the array.

TABLE 2.4.3.5

MAP PROJECTION RECORD – DEFINITION/CONTENTS (6120 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within file
2	5–8	B	Record type & subtype octal codes ("044 044 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Record sequence number in map projection record I4
5	17–20	–	Spares
6	21–26	A	Map projection identifier – A6
7	27–42	A	Name of reference ellipsoid–A16
8	43–58	N	Semi major axis of geoid (km) – F16.7
9	59–74	N	Eccentricity of the geoid – F16.7
10	75–314	N	Map Projection parameters – 15 F16.7
11	315–6120	–	Spares

TABLE 2.4.3.6

HISTOGRAM RECORDS DEFINITION/CONTENTS (6120 Bytes)

FIELD NO	BYTE NO	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within file
2	5–8	B	Record type and subtype octal codes ("300 044 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Record sequence number in Histogram – I4
5	17–20	–	Spares
6	21–24	N	Spectral Band number – I4
7	25–26	N	Sampling rates along pixels – I2
8	27–28	–	Spares
9	29–30	N	Sampling rates along scan lines – I2
10	31–32	–	Spares
11	33–2592	N	Histogram values – I10(0 to 127 or 0 to 63 or 0 to 255)
12	2593–6120	–	Spares

TABLE 2.4.3.7

GCP RECORDS : DEFINITION/CONTENTS (6120 Bytes)

FIELD NO	BYTE NO	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within the file
2	5–8	B	Record type and subtype octal codes ("011 044 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Record sequence number in GCP records (bbb1) – I4
5	17–18	N	Number of GCPs – I4
6	19–6120	–	Spares

TABLE 2.4.3.8

ANNOTATIONS RECORD : DEFINITIONS/CONTENTS (6120 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within file
2	5–8	B	Record type and subtype octal codes ("022 333 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Record sequence number in annotation record – I4
5	17–20	N	Number of annotation segments in this record (bbb4) – I4
6	21–52		Spares
			(Segment 1)
7	53–56	N	Segment length – I4
8	57–60	N	Length of the character string – I4
9	61–64	A	Identifier – A4
10	65–100	–	Spares
11	101–180	A	Title for top annotation line 1 – A80
12	181–232	–	Spares
			(Segment 2)
13	233–236	N	Segment length – I4
14	237–240	N	Length of this character string – I4
15	241–244	A	Identifier – A4
16	245–300	–	Spares

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
17	301–380	A	title for top annotation line 2– A80
18	381–412	–	Spares
			(Segment 3)
19	413–416	N	segment length – I4
20	417–420	N	Length of this character string – I4
21	421–424	A	Identifier – A4
22	425–500		Spares
23	501–580	A	Title for top annotation line –3 – A80
24	581–612	–	Spares
			(Segment 4)
25	613–616	N	Segment Length –I4
26	617–620	N	Length of the character string –I4
27	621–624	A	Identifier – A4
28	625–700	–	Spares
29	701–780	A	Title for bottom annotation line –A80
30	781–1700	–	Spares
31	1701–1716	N	Tick mark interval (degree) – F16.7
			Geographic reference marks
32	1717–1720	N	Number of segment "Geographic reference marks" – I4
33	1721–1722	N	Length of geographic character annotation string – I2
34	1723–1724	–	Spares

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
			Top Geographic reference mark
35	1725–1728	A	Nature of mark – A4 (TOP/BOT/LEFT/RIGH)
36	1729–1730	N	Number of top marks – I2
37	1731–1736	N	Line Number – I6
38	1737–1742	N	Pixel Number – I6
39	1743–1750	A	Geographic annotation – A8(e.g. E100:30)
40	1751–2730	–	Repetition of field No.37,38 and 39 for no. of top marks
41	2731–2764	–	Spares
			Left Geographic reference mark
42	2765–2768	A	Nature of mark – A4
43	2769–2770	N	Number of left marks – I2
44	2771–3770	–	Repetition of field No. 37,38 and 39 for No. of left marks .
45	3771–3783		Spares
			Right Geographic reference mark
46	3784–3787	A	Nature of mark – A4
47	3788–3789	N	Number of right marks – I2
48	3790–4789		Repetition of field No. 37,38 and 39 for No.of Right marks.
49	4790–4800	–	Spares
			Bottom Geographic reference mark
50	4801–4804	A	Nature of mark – A4

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
51	4805–4806	N	Number of bottom marks – I2
52	4807–5806		repetition of field No. 37,38 and 39 for No. of Bottom marks
53	5807–6120	–	Spares

TABLE 2.4.3.9

(+) PIXEL & LINE LOOKUP TABLE : DEFINITION/CONTENTS
(6120 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1.	1–4	B	The record number of this record within the file
2.	5–8	B	Record type and subtype octal codes ("025 333 022 022")
3.	9–12	B	Length of this record (6120)
4.	13–16	N	Record sequence no in line lookup table record I4
5.	17–20		Spares
6.	21–28	N	Tilt angle (deg.) F8.5
7.	29–32	N	No of pixel increment due to panoramic distortion – I4
8.	33–40		Spares
9.	41–46	N	Total scan line increment pointer – I6
10.	47–99	–	Spares
11.	100–101	B	Line lookup table values
12.	102–1099	B	For remaining no of line increment points
13.	1100–1599	–	Spares
14.	1600–1603	N	Total pixel increment pointer – I4
15.	1604–1653	–	Spares
16.	1654–1655	B	Pixel Lookup table values

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
17.	1656–5653	B	Repetition of field no 16 for remaining no. of pixel increment pointer
18.	5654–6120	–	Spares

(+) Content is applicable for basic stereo product.

TABLE 2.4.3.10

ATTITUDE RATE RECORD : DEFINITION/CONTENTS (6120 bytes)

Field no.	Byte No	Type	Definition
1.	1–4	B	Record no of this record in this file
2.	5–8	B	Record Type and sub–type octal codes ("026 044 022 022")
3.	9–12	B	Length of this record
4.	13–16	N	Record sequence no in this record –I4
5.	17–20	N	Total no of Attitude Rate values in this record – I4
6.	21–32	A	Attitude rate start time (HH:MM:SS:sss)
7.	33–38		Spares
8.	39–44	N	Rate interval (in milliseconds)F6.3
9.	45–54	N	Roll Rate (degree/second)– F10.8
10.	55–64	N	Pitch Rate(degree/second) – F10.8
11.	65–74	N	Yaw Rate (degree/second)– F10.8
12.	75–6044		Repetition of field 9, 10, & 11 for more rate values.
13.	6045–6120		Spares

Note : Number of Attitude Rate values in each record will be as per the field no.5.

TABLE 2.4.3.11

(*) BOUNDARY RECORD : DEFINITION/CONTENT (6120 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record Number of this record in this file
2	5–8	B	Record type and subtype octal codes ("023 333 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Boundary record sequence number – I 4
5	17–20	–	Spares
6	21–24	B	Total no of boundary points
7	25–30	A	Start scan line no. – I6
8	31–n*x2+30	B	Pixel number
9	n*x 2 + 31 – n x 2 + 32	B	Increment flag for the next scan line (–1)
10	n*x 2 + 33 – 6120	B	Repetition of field no 8 & 9,for more no of boundary points

(*) n represent the no of pixels on the scan line.

Note : –99 will mark the end of this record.

TABLE 2.4.3.12

BOUNDARY ANNOTATION RECORD : DEFINITION/CONTENTS (6120 bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record Number of this record in this file
2	5–8	B	Record type & subtype octal codes ("024 333 022 022")
3	9–12	B	Length of this record (6120)
4	13–16	N	Boundary annotations record sequence no. bbb1) – I4
5	17–20	–	Spares
6	21–24	N	No. of annotations – I4
7	25–32	N	Scan Line no. – I8
8	33–40	N	Pixel no. – I8
9	41–72	A	Character string – A 32
10	73–6120	–	Repetition of field no. 7,8 & 9 for other annotations.

2.4.4 IMAGE DATA FILE

1 File descriptor Record

2 Image data Records

TABLE 2.4.4.1

FILE DESCRIPTOR RECORD : DEFINITIONS/CONTENTS (540 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–180		Refer Table No.2.4.2.1. (Fixed part of the file descriptor record)
			VARIABLE SEGMENT
2	181–186	N	Number of image records – I6
3	187–192	N	Image record length – I6
4	193–216	–	Spares
			PIXEL GROUP DATA
5	217–220	N	Number of bits per pixel (e.g bbb7) – I4
6	221–224	N	Number of pixels per data group – I4
7	225–228	N	Number of byte per data group (bbb1) – I4
8	229–232	A	Justification and order of pixels within data group (RJLR) –A4
			IMAGE DATA
9	233–236	N	Number of image (Bands) – I4
10	237–244	N	Number of lines per image (Excluding top and bottom border lines) – I8
11	245–248	N	Number of left border pixels per line – I4
12	249–256	N	Number of image pixels per line – I8
13	257–260	N	Number of right border pixels per line – I4
14	261–264	N	Number of top border lines – I4

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
15	265–268	N	Number of bottom border lines – I4
16	269–272	A	Interleaving indicator – A4
			RECORD DATA IN THIS FILE
17	273–274	N	Number of physical records per line – I2
18	275–276	N	Number of physical records per multispectral line – I2
19	277–280	N	Number of bytes of prefix data per record – I4
20	281–288	N	Number of bytes of image data per record – I8
21	289–292	N	Number of bytes of suffix data per record – I4
22	293–296	A	Prefix suffix repeat flag – A4
			PREFIX/SUFFIX DATA LOCATORS

The following fields are prefix/suffix data locaters. The location is given in 8 bytes as follows :

4 bytes – giving the byte number within the prefix or suffix which begins the field to be located

2 bytes – giving the length in bytes of the field to be located

1 byte – the letter P or S coded in this byte indicates that the information is in the scan line prefix or suffix, respectively

1 byte – a code indicating the type of data in the field coded are (A = Alphanumeric, B = Binary, N = Numeric)

23	297–304	A	Scan line number locator – A8

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
24	305–312	A	Image (Band) number locator – A8
25	313–320	A	Time of scan line locator – A8
26	321–328	A	Left–fill count locator – A8
27	329–336	A	Right–fill count locator – A8
28	337–440	–	Spares
29	441–448	N	Maximum data range of pixels (starting from ‘0’ to 255/127/63) – I8
30	449–540	–	Spares

TABLE 2.4.4.2

IMAGE DATA RECORDS : DEFINITION/CONTENTS

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record sequence number of this record within the file
2	5–8	B	Record type and subtype octal codes ("355 355 022 022")
3	9–12	B	Length of this record
4	13–16	B	Scanline Number
5	19–20	B	Band number
6	21–32		Spares
7	33–(32+np)=X	B	Image data
8	(X+1) – (X+18)		Spares
9	(X+19) to totB		Spares

Note :

np => Field no. 12 variable segment of file descriptor record.

totB => Field no. 3 of variable segment of file descriptor record.

2.4.5 TRAILER FILE (3)

I) Trailer file descriptor Record

II) Trailer Records

TABLE 2.4.5.1

TRAILER FILE DESCRIPTOR : DEFINITION/CONTENTS (360 bytes)

FIELD NO	BYTE NO	TYPE	DESCRIPTION
1	1–180	–	see table no 2.4.2.1 (fixed part of the file descriptor record)
2	181–184	N	Number of trailer records in the file – (I4)
3	185–188	N	Length in bytes of the trailer records (b 360) – I4
4	189–360	–	Spares

TABLE 2.4.5.2

TRAILER RECORD : DEFINITION/CONTENTS (360 Bytes)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record number of this record within the file
2	5–8	B	Record type and subtype octal codes ("022 366 022 022")
3	9–12	B	Length of this record (360 Bytes)
4	13–16	N	Record sequence number in trailer records (bbbN) – I4
5	17–20	–	Spares
6	21–35	N	Cloud cover values giving percent cloud cover in different parts of the picture 3 bytes/value) – 5I3
7	36–95		Spares
8	96–99	N	No.of parity errors for corresponding band no. – I4
9	100–103	N	No.of remaining lines loses in the scene for corresponding band no. – I4
10	104–360	–	Spares

2.4.6 NULL FILE

1) Null volume descriptor record.

TABLE 2.4.6.1

NULL VOLUME DESCRIPTOR RECORD : DEFINITIONS/CONTENTS
(360 BYTES)

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
1	1–4	B	Record sequence number in this file (1)
2	5–8	B	Record type and subtype octal codes ("022 300 077 022")
3	9–12	B	Length of this record (360 bytes)
4	13–14	A	ASCII/EBCDIC flag – (Ab)
5	15–16	–	Spares
6	17–28	A	Super structure control document number–A12
7	29–30	N	Control document revision number – I2
8	31–32	A	Control document revision letter – A2
9	33–44	A	Software release number –, A12
10	45–60	A	Physical tape ID – A16
11	61–76	A	Logical volume ID – A16
12	77–92	A	Logical volume set ID – A16
13	93–94	N	Number of physical volume in the set – I2
14	95–96	N	Physical volume number : Start of logical volume – I2
15	97–98	N	Physical volume number : End of logical volume – I2

FIELD NO.	BYTE NO.	TYPE	DESCRIPTION
16	99–100	N	Physical volume no. containing this descriptor – I2
17	101–104	N	First file no. referenced in this physical volume – I4
18	105–108	N	Logical volume No. within volume set – I4
19	109–112	N	Logical volume No. within physical volume – I4
20	113–360	–	Spares

RECORD TYPE AND SUBTYPE CODES FOR USER CCTs OF IRS DATA PRODUCTS

RECORDS	BYTE 5 (Octal)	BYTE 6 (Octal)	BYTE 7 (Octal)	BYTE 8 (Octal)
Volume Descriptor	300	300	022	022
File Pointer	333	300	022	022
Text	022	077	022	022
File Descriptor	077	300	022	022
Header	022	022	022	022
Ephemeries/Attitude	366	044	022	022
Calibration	077	044	022	022
Histogram	300	044	022	022
Map projection	044	044	022	022
GCPs	011	044	022	022
Annotation	022	333	022	022
Boundary	023	333	022	022
Boundary Annotation	024	333	022	022
Lookup table	025	333	022	022
Attitude Rate	026	044	022	022
Image Data	355	044	022	022
Trailer	022	366	022	022
Null Volume Descriptor	022	300	077	022

FIG. – 1 LAYOUT OF SUPER STRUCTURE USER CCT

FILE NUMBER	CONTENTS	FILE NAME
File 0	: Volume Descriptor : File Pointer (1) : File Pointer (2) : File Pointer (3) : Text EOF (x)	Volume Directory
File 1	: Leader file Descriptor : Header Record : Ancillary Record : Annotation Record : Boundary Record EOF (x)	Leader file
File 2	: Imagery file descriptor : Image data records EOF (x)	Imagery file
File 3	: Trailer file Descriptor : Trailer records EOF (x)	Trailer file
File NULL	: NULL Volume Descriptor EOF EOF EOF	Null Volume Directory file

(x) EOF = End of file tape mark

LIST OF ACRONYMS TO BE USED

SATELLITE		SENSOR	
I1	IRS-1A	1	LISS-I
1B	IRS-1B	A	LISS-IIA
1C	IRS-1C	B	LISS-IIB
P2	IRS-P2	3	LISS-III
L5	LANDSAT-5	A	PAN-A
S1	SPOT-1	B	PAN-B
S2	SPOT-2	C	PAN-C
E1	ERS-1	D	PAN-D
N9	NOAA-9	M	MIR
NA	NOAA-A	W	WIFS
NB	NOAA-B	S	SAR
NC	NOAA-C	T	TM
NE	NOAA-14	A	AVHRR
V1	SEAWIFS	T	TOVS
P3	IRS-P3	P	PLA
1D	IRS-1D	M	MLA
		W	SEAWIFS

SUBSCENES

```
IRS-1A    |                  LISS-IIA      |
IRS-1B    |------>                         |----->  1, 2
IRS-P2    |                  LISS-IIB      |
IRS-P2    |
```

```
                    PAN-A     |
                              |
                    PAN-B     |
IRS-1C/1D  ------>            |------>1, 2, 3, 4, 5,
                    PAN-C     |       6, 7, 8, 9
                              |
                    PAN-D     |
```

QUADRANT

```
LANDSAT-5 ------>   TM ------> 01, 02, 03, 04, 05, 06,
                               07, 08, 09, 10, 11, 12
```

SEGMENT CODE

```
 00   01   02  03   04 <- CC
                        RR
                         |
 _____ _____ _____ _____ _____ |
|     |     |     |     |     | 00
|_____|_____|_____|_____|_____|
|     |     |     |     |     | 01
|_____|_____|_____|_____|_____|
            PRODUCT TYPE
S2   512 X 512 SEGMENT
S3    1K X 1K  SEGMENT
```

PROJECTION

O	NO PROJECTION
P	POLYCONIC
S	SOM
U	UTM (Ref. ellip-Int)
V	UTM (Ref. ellip-Clarke)
R	STEREOSCOPIC
L	LAMBERTS' confirmal conical proj

RESAMPLING

O	NO SAMPLING
B	BILINIER
C	CC
D	DS 8/16
N	NN

ENHANCEMENTS

00	NO ENHANCEMENTS
01	CORRECTED
02	HIST EQ
1B	2 SCENE (for TM)
B4	4 BAND (for TM)

PROC LEVEL

2	BULK

DATA FORMAT

6	BIL
7	BSQ

APPENDIX – 1

Following are the Updates in Super Structure(LGSOWG) Digital Data Products Format Document.

Volume Directory File : No Updates.

Leader File

* Header Record :Following are details of new fields added.

Field No	Byte	Type	Description
41	453–468	N	Longitude of ascending node,F16.7
41A	469–470	N	Endian Flag(0:for Big Endian , 1:for Little Endian)
41B	471–472	N	Shift Percentage(0–99)
41C	473–474	N	Quadrant number(valid for quadrant product only)
41D	475–501		Spares

* Ephemeris/Attitude Record :

33	5331–6118		Spares
33A	6119–6120		Swath Flag(00/01)

*Map Projection Record :

10	75–314	N	Map Projection parameters –15,F16.7
11	315–6120	N	Spares

Field No. 10 Byte No. is updated as 75–314 to accomodate maximum 15 map projection parameters as per different valid map projection parameters.

Imagery File : No Updates.

Trailer File : No Updates.

Null Volume Directory File : No Updates.

CLARIFICATION OF EXISTING FORMAT
Volume Directory File
* Volume Descriptor Record :
In Field No 10 the Symbol U = C/T/D represents
C : For Cartridges of different Capacity.
T : For CCTs of different Capacity/Density.
D : For DATs (both 4mm & 8mm) of different Capacity.
U : For Other Output Media.

* Text Record :
Field No. 6 Location 17–32 Product Type STANDARD can be read as PATH BASED.

Leader File
*Header Record :
–Field No. 44 at location 526–541 is Instantaneous cross Track Field of View in Radians in F16.7 format.

–Field No. 63 ,978–985 N Liss–3 Path No.Corresponding to PAN–I8

–Field No. 64 ,986–993 N Liss–3 Row No. Corresponding to PAN–I8

–Field No. 65 ,994–1009 N Integration time for SWIR band–F16.7

–Field No. 85 ,Bytes 1441–1456 A16 is described as follows.

LEVEL–0:Raw
LEVEL–1:Radiometric Correction
LEVEL–2:Radiometric Correction + Systematic geometric Correction

–Field No. 86 ,Byte 1457–1464 ,A8
DONE :For Radiometrically corrected products.
NOT DONE :For Raw products.

* Calibration Record :
This record is valid only for RAW products only.

* GCP Record :
This record is not valid for geometrically uncorrected (RAW & RAD) products.

* Annotations Record :
Annotation titles from field no 5 to field no. 30 are relavent for photo products only.

* Boundary Annotation Record :
This record is currently not applicable for IRS products. So now dummy record has been put.

* Pixel & Line Lookup table record : Valid for Basic stereo products.

* Attitude Rate Record :
It is relavent for geometrically uncorrected (RAW & RAD) products.
– Field No. 6 Byte No 21–32 Attitude rate start time is in HH:MM:SS:mmm ,A12 format.

* Boundary Record :
This record is currently not applicable for IRS products. So now dummy record has been put.

Imagery File : No special explanation.

Trailer File : No special explanation.

Null Volume Directory File

* Null Volume Descriptor record :

– Field No. 10 the same convention is followed as in Field No. 10 (Tape ID) of Volume Descriptor Record of Volume Directory File.

NOTE :
1. All time information except product creation time is given in UT. Scene covered by Indian region will have IST for scene at field no.20 of Ephemeries/attitude record of Leader file.

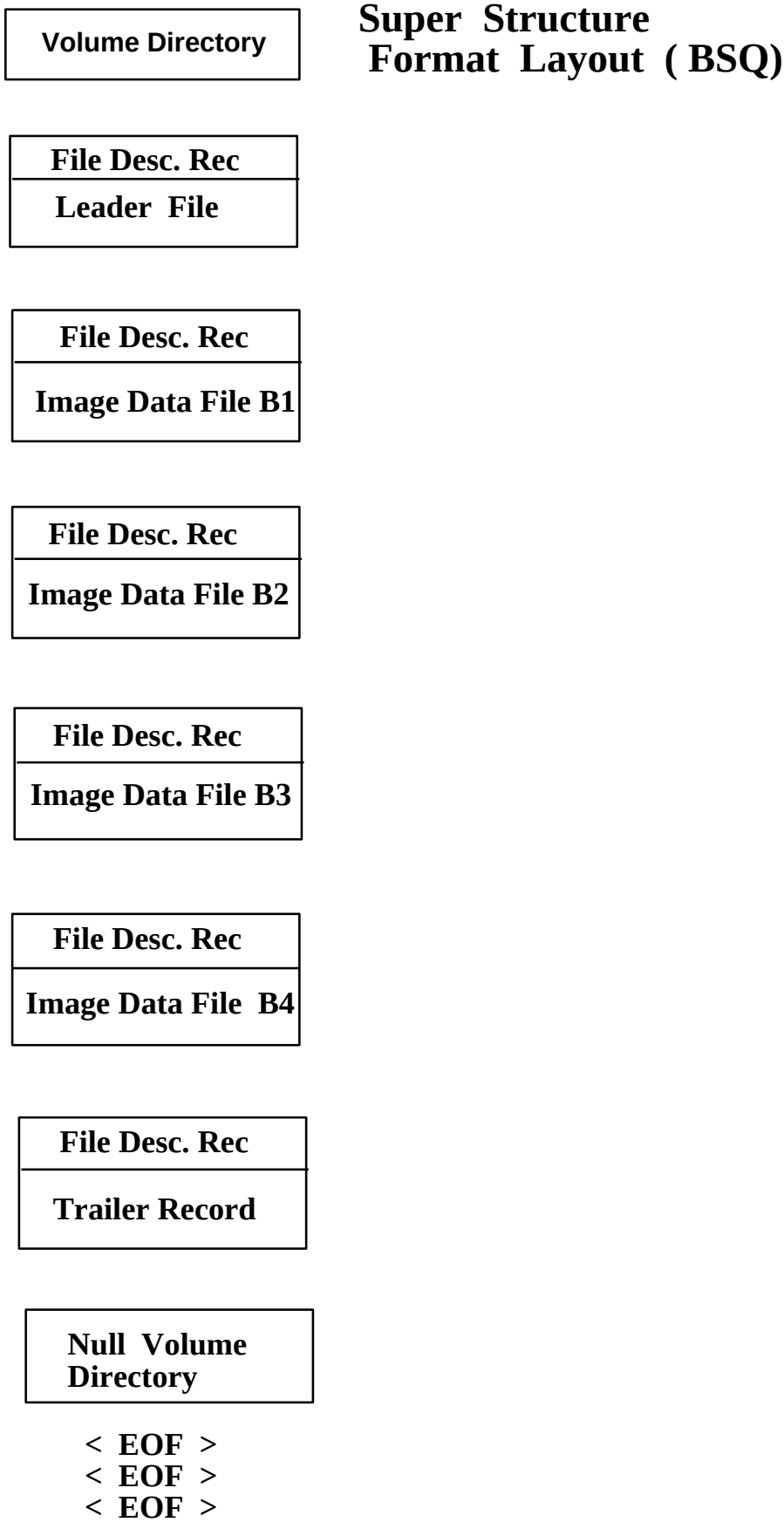
2.Conversion formula for Digital Count to radiance is as follows.

$$Lrad = (DN/MaxGray)*(Lmax-Lmin) + lmin.$$

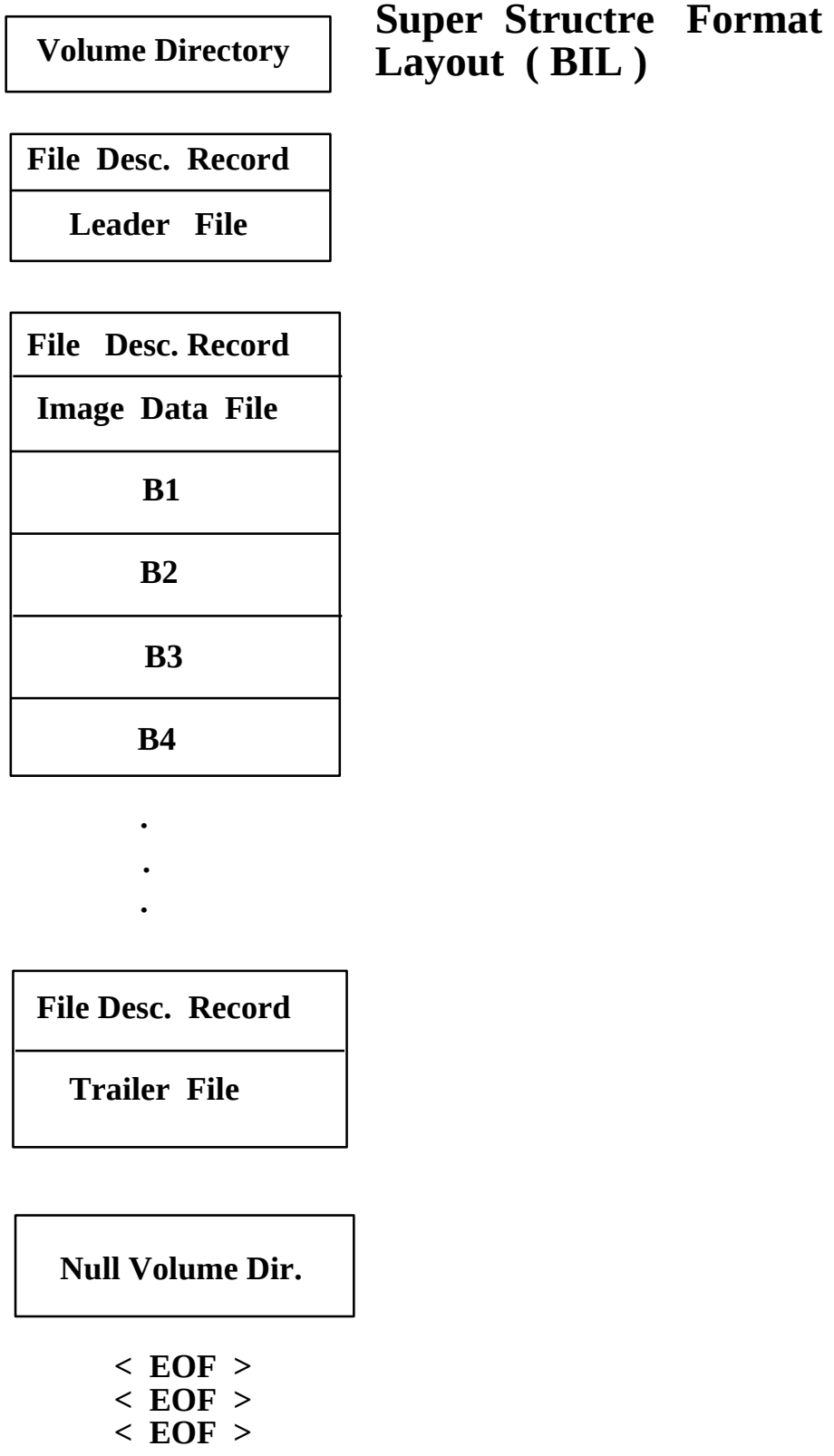
Where
Lrad :Radiance for a given DN value.
DN :Digital Count
MaxGray:63 for PAN & 127 for WiFs & Lis–3 for Raw Products only. 255 for Corrected products.
Lmin/Lmax :minimum/Maximum radiance value for a given band.

APPENDIX −II

Super Structure Format Layout (BSQ)

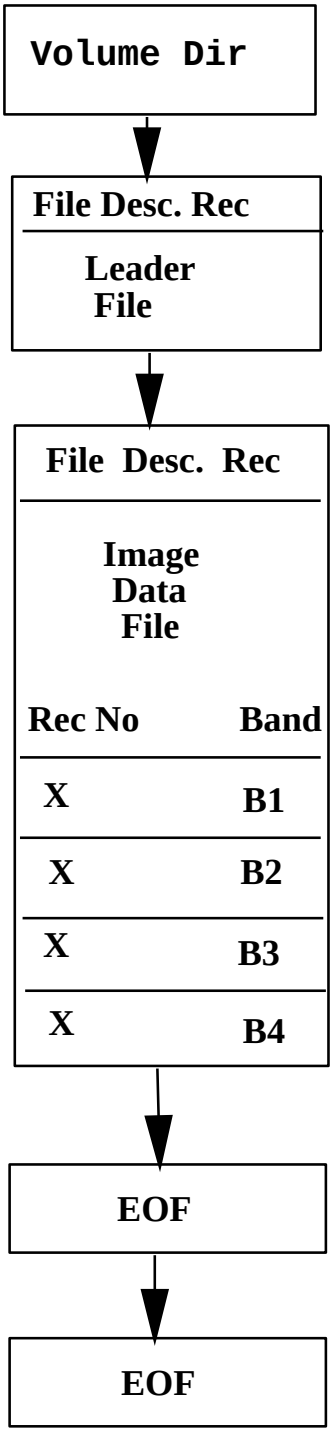


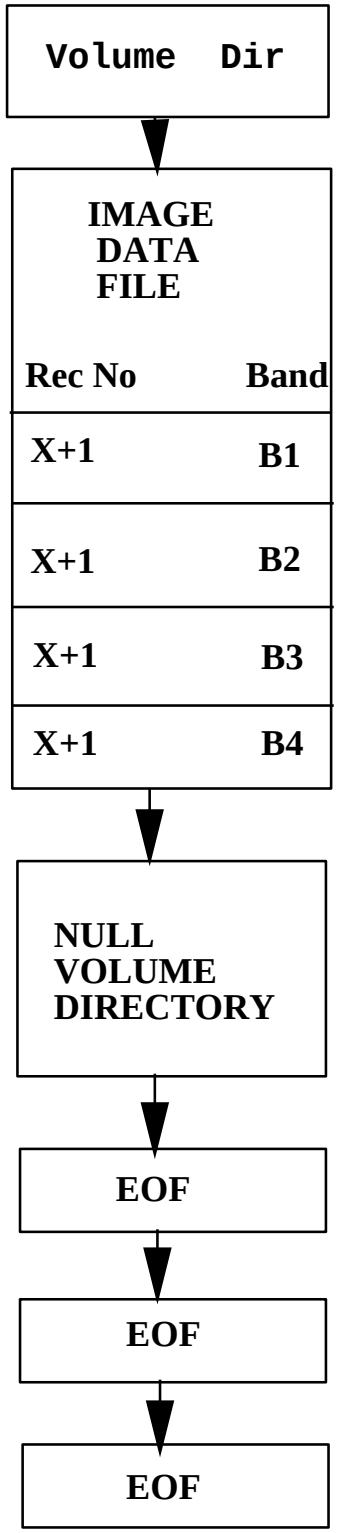
Super Structre Format Layout (BIL)



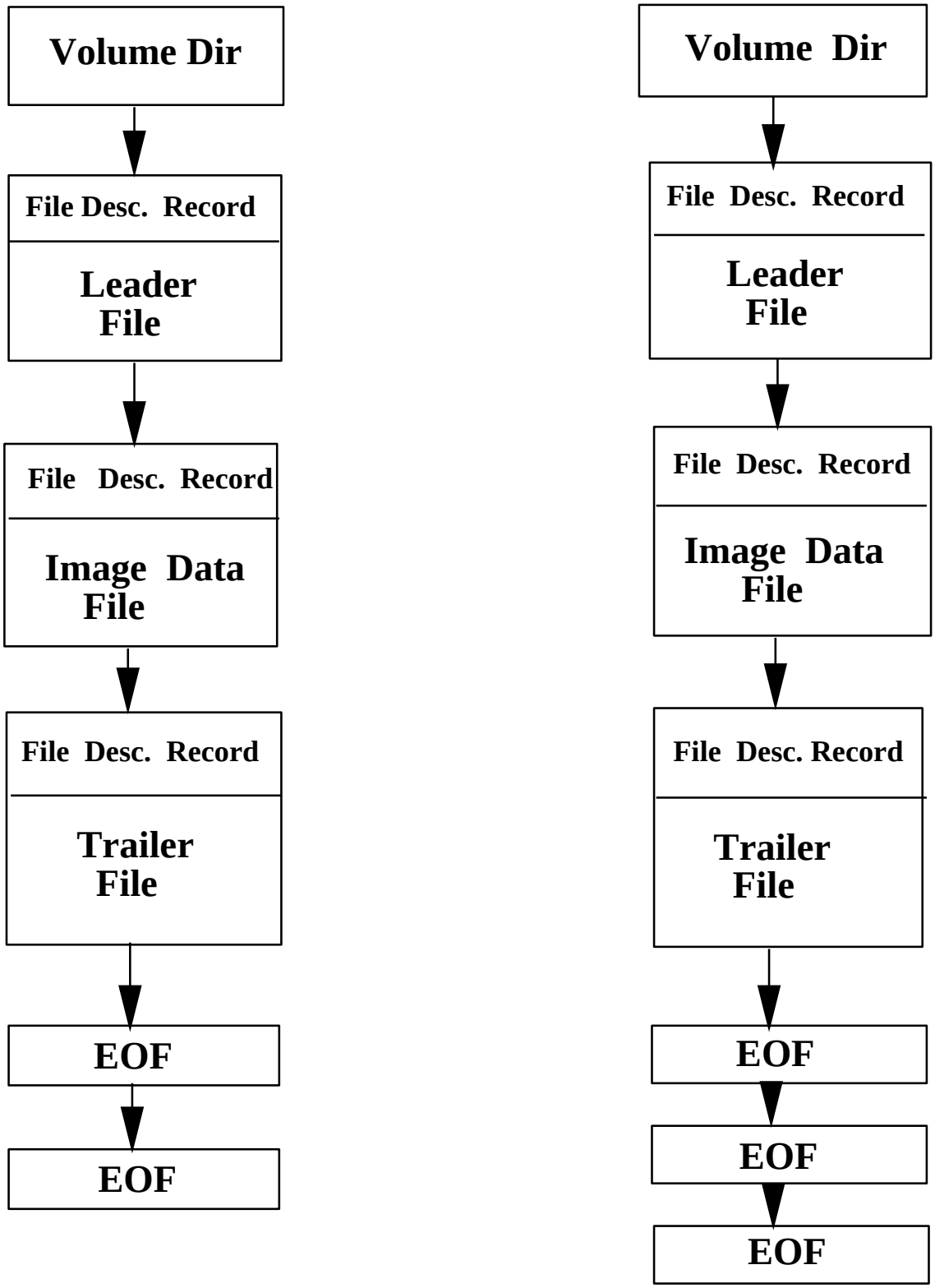
SUPER STRUCTURE FORMAT LAYOUT

ONE LOGICAL VOLUME (More than one physical volume) − BIL

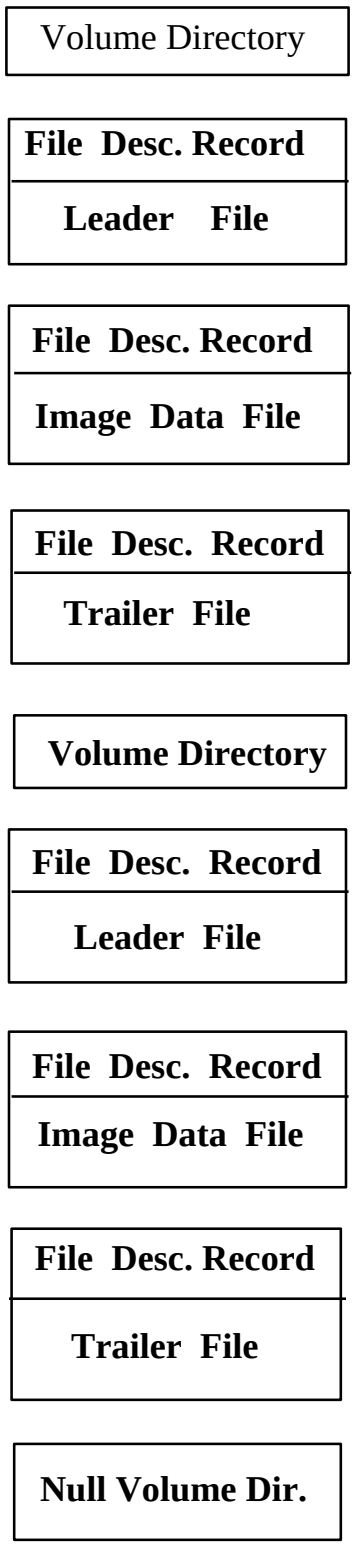




TWO LOGICAL VOLUME (More than one physical volume)



TWO LOGICAL VOLUME (ONE PHYSICAL VOLUME)



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