

Orbit-by-Orbit
Microwave Derived Products (EDR)
Interface Control Document

Revised 4/30/96
By Vincent Tabor

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By Chris Duda

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LIST OF ACRONYMS

CEMSC	Central Environmental Satellite Computer System
DACU	Data Acquisition Control Unit
DEF	Data Exchange Format
EDR	Environmental Data Record
FNOC	Fleet Numerical Oceanography Center
HDS	Hitachi Data Systems
IDB	Intermediate Data Base
NESDIS	National Environmental Satellite, Data and Information Service
REV	Revolution
SSM/I	Special Sensor Microwave Imagery

1.0 INTRODUCTION

EDR data sets are formatted into the Shared Processing Data Exchange Format (DEF) at FNOC. They are transmitted to NESDIS via communication satellite, and given a data set name to identify it on the NESDIS Computer (CEMSCS). There are approximately 14 orbits acquired during a 24 hour period. Data for at least a 24 hour period but no more than a 48 hour period should be resident on the CEMSCS direct access storage devices at any given time. EDR data for four of the DMSP satellites [DMSP F-10(S4), F-11(S5), F-13(S-7), and F-14(S-8)] is currently being kept on the CEMSCS.

Previous versions of the EDR documentation which refer to the Intermediate Database (IDB) should be amended. NESDIS no longer uses the IDB for processing or orbital access. Rather, all DMSP EDR orbits are made available on the CEMSCS as 1300 length records. These orbital datasets may be accessed directly by users.

The basic format of the EDR dataset is one EDR Output Header Record followed by a series of records which each contain one scanline of data. Section 2.1.1 describes the format of the EDR Output Header Record, record #1. Section 2.1.2 describes the format of the scanline data, records #2-EOF.

2.1.2 HEADER RECORD DESCRIPTION

The EDR Output Header Record contains six description blocks which are defined in terms of words consisting of a combination of 32-bits, 16-bits, and 8-bits.

Description Blocks

1. EDR IDENTIFICATION BLOCK
2. EDR DATA SEQUENCE BLOCK
3. REV HEADER DATA DESCRIPTION BLOCK
4. EDR SCAN HEADER DATA DESCRIPTION BLOCK
5. EDR DATA DESCRIPTION BLOCK
6. REV HEADER DATA BLOCK FORMAT

EDR Product Identification Block

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block Length	Length of Block in Terms of I*2 Words (14)
2	Byte	MODE	Binary 8-bit Number (1)
3	Byte	SUBMODE	Binary 8-bit Number (1)
4	C*4	Originator ID	Four Character (FNOC)
5	C*1	Classification	One Character (U)
6	Byte	File Lifetime	Binary 8-bit Number (255)
7	C*10	Product Identifier	10 Characters TSMIEDR 10
8	I*2	Year	Binary Number
9	Byte	Month	Binary 8-bit Number
10	Byte	Day	Binary 8-bit Number
11	Byte	Hour	Binary 8-bit Number
12	Byte	Minute	Binary 8-bit Number
13	I*2	Checksum	Binary Number

EDR PRODUCT IDENTIFICATION BLOCK

BYTES

0-1	BLOCK LENGTH		
	14		
2-3	MODE	SUBMODE	
	1	1	
4-5	CHAR. 1	CHAR. 2	
	F	N	
6-7	CHAR. 3	CHAR. 4	ORIGINATOR ID
	O	C	
8-9	CLASSIFICATION	FILE LIFETIME	
	U	255	
10-11	FILE INDICATOR	CHAR. 2	
	T	S	
12-13	CHAR. 3	CHAR. 4	
	M	I	
14-15	CHAR. 5	CHAR. 6	PRODUCT IDENTIFIER
	E	D	
16-17	CHAR. 7	CHAR. 8	
	R		
18-19	CHAR. 9	CHAR. 10	
		8	
20-21	YEAR		
	(SET BY SMIDEF)		
22-23	MONTH	DAY	
	(SET BY SMIDEF)	(SET BY SMIDEF)	
24-25	HOUR	MINUTE	
	(SET IN SMIDEF)	(SET IN SMIDEF)	
26-27	CHECKSUM		
	(CAL. IN SMIDEF)		

EDR Data Sequence Block

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block length	Length of block in term of I*2 Words (13)
2	Byte	MODE	Binary 8-bit Number (3)
3	Byte	SUBMODE	Binary 8-bit Number (19)
4	I*2	Number of Loops	Three
5	Byte	Start Number	Binary 8-bit Number
6	Byte	Loop Number	Binary 8-bit Number (1)
7	I*2	Number of Data Blocks	Binary 16-bit Number (1)
8	Byte	End Number	Binary 8-bit Number
9	Byte	Loop Number	Binary 8-bit Number
10	Byte	Start Number	Binary 8-bit Number
11	Byte	Loop Number	Binary 8-bit Number (2)
12	I*2	Number of Data Blocks	HDR Data Block (3)
13	Byte	Start Number	Binary 8-bit Number
14	Byte	Loop Number	Binary 8-bit Number (3)
15	I*2	Number of Data Blocks	Binary 16-bit Number (1)
16	Byte	END Number	Binary 8-bit Number
17	Byte	Loop Number	Binary 8-bit Number (3)
18	Byte	End Number	Binary 8-bit Number
19	Byte	Loop Number	Binary 8-bit Number (2)
20	I*2	Checksum	Calc in SMIDEF

EDR DATA SEQUENCE BLOCK

BYTES

0-1	BLOCK LENGTH		
	13		
2-3	MODE	SUBMODE	
	3	19	

4-5	NUMBER OF LOOPS		
	3		
6-7	START	LOOP NUMBER	REV HEADER BLOCK
	{	1	
8-9	NUMBER OF DATA BLOCKS		
	1		
10-11	END	LOOP NUMBER	
	}	1	
12-13	START	LOOP NUMBER	
	{	2	
14-15	NUMBER OF DATA BLOCKS (SET IN SMIDEF)		
16-17	START	LOOP NUMBER	HDR DATA BLOCK
	{	3	
18-19	NUMBER OF DATA BLOCKS		
	1		
20-21	END	LOOP NUMBER	
	}	3	
22-23	END	LOOP NUMBER	
	}	2	
24-25	CHECKSUM (CALC. IN SMIDEF)		

Rev Header Data Description Block

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block length	Length of Block in Terms of I*2 Words (95)
2	Byte	Mode	Binary 8-bit Number (3)
3	Byte	Submode	Binary 8-bit Number (17)
4	Byte	Number Elements	Binary 8-bit Number (15)

5	Byte	Bytes/Section	Binary 8-bit Number (24)
6	I*2	Number of Sections	Binary Number (1)
7	C*4	Spacecraft ID	Character String "SCID"
8	Byte	Start Byte	Binary 8-bit Number (4)
9	Byte	Bytes/Element	Binary 8-bit Number (4)
10	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
11	Byte	Mult. Mantissa	Binary 8-bit Number (1)
12	Byte	Exponent	Binary 8-bit Number (0)
13	I*2	Additive Constant	Binary Number (0)
14	C*4	Rev/Orbit Number	Character String "REV#"
15	Byte	Start Byte	Binary 8-bit Number (8)
16	Byte	Bytes/Element	Binary 8-bit Number (4)
17	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
18	Byte	Mult. Mantissa	Binary 8-bit Number (1)
19	Byte	Exponent	Binary 8-bit Number (0)
20	I*2	Additive Constant	Binary Number
21	C*4	Julian Day Data Begins	Character String "BJLD"
22	Byte	Start Byte	Binary 8-bit Number (12)
23	Byte	Bytes/Element	Binary 8-bit Number (2)
24	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (51)
25	Byte	Mult. Mantissa	Binary 8-bit Number (1)
26	Byte	Exponent	Binary 8-bit Number (0)
27	I*2	Additive Constant	Binary Number (0)
28	C*4	Hour of Day Data Begins	Character String "BHR"
29	Byte	Start Byte	Binary 8-bit Number (14)
30	Byte	Bytes/Element	Binary 8-bit Number (1)
31	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (50)
32	Byte	Mult. Mantissa	Binary 8-bit Number (1)
33	Byte	Exponent	Binary 8-bit Number (0)
34	I*2	Additive Constant	Binary Number (0)
35	C*4	Minute of Hour Data	Character String "BMN"

36	Byte	Start Byte	Binary 8-bit Number (15)
37	Byte	Bytes/Element	Binary 8-bit Number (1)
38	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (49)
39	Byte	Mult. Mantissa	Binary 8-bit Number (1)
40	Byte	Exponent	Binary 8-Bit Number (0)
41	I*2	Additive Constant	Binary Number (0)
42	C*4	Second of Min. Data Begins	Character String "BSEC"
43	Byte	Start Byte	Binary 8-Bit Number (16)
44	Byte	Bytes/Element	Binary 8-Bit Number (1)
45	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (12)
46	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
47	Byte	Exponent	Binary 8-Bit Number (0)
48	I*2	Additive Constant	Binary Number (0)
49	C*4	Julian Day Data Ends	Character String "EJLD"
50	Byte	Start Byte	Binary 8-Bit Number (17)
51	Byte	Bytes/Element	Binary 8-Bit Number (2)
52	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (51)
53	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
54	Byte	Exponent	Binary 8-Bit Number (0)
55	I*2	Additive Constant	Binary Number (0)
56	C*4	Hour of Day Data Ends	Character String "EHR"
57	Byte	Start Byte	Binary 8-Bit Number (19)
58	Byte	Bytes/Element	Binary 8-Bit Number (1)
59	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (50)
60	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
61	Byte	Exponent	Binary 8-Bit Number (0)
62	I*2	Additive Constant	Binary Number (0)
63	C*4	Minute of Hour Data Ends	Character String "EMN"
64	Byte	Start Byte	Binary 8-Bit Number (20)
65	Byte	Bytes/Element	Binary 8-Bit Number (1)
66	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (49)
67	Byte	Mult. Mantissa	Binary 8-Bit Number (1)

68	Byte	Exponent	Binary 8-Bit Number (0)
69	I*2	Additive Constant	Binary Number (0)
70	C*4	Second of Minute Data Ends	Character String "ESEC"
71	Byte	Start Byte	Binary 8-Bit Number (21)
72	Byte	Bytes/Element	Binary 8-Bit Number (1)
73	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (12)
74	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
75	Byte	Exponent	Binary 8-Bit Number (0)
76	I*2	Additive Constant	Binary Number (0)
77	C*4	Day of Ascending Node	Character String "AJLD"
78	Byte	Start Byte	Binary 8-Bit Number (22)
79	Byte	Bytes/Element	Binary 8-Bit Number (2)
80	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (51)
81	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
82	Byte	Exponent	Binary 8-Bit Number (0)
83	I*2	Additive Constant	Binary Number (0)
84	C*4	Hour of Ascending Node	Character String "AHR"
85	Byte	Start Byte	Binary 8-Bit Number (24)
86	Byte	Bytes/Element	Binary 8-Bit Number (1)
87	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (50)
88	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
89	Byte	Exponent	Binary 8-Bit Number (0)
90	I*2	Additive Constant	Binary Number (0)
91	C*4	Minute of Ascending AMN (blank)	Character String Node
92	Byte	Start Byte	Binary 8-Bit Number (25)
93	Byte	Bytes/Element	Binary 8-Bit Number (1)
94	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (49)
95	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
96	Byte	Exponent	Binary 8-Bit Number (0)
97	I*2	Additive Constant	Binary Number (0)
98	C*4	Second of Ascending Node	Character string "ASEC"

99	Byte	Start Byte	Binary 8-Bit Number (26)
100	Byte	Bytes/Element	Binary 8-Bit Number (1)
101	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (12)
102	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
103	Byte	Exponent	Binary 8-Bit Number (0)
104	I*2	Additive Constant	Binary Number (0)
105	C*4	Logical Satellite	Character String "LSI"
106	Byte	Start Byte	Binary 8-Bit Number (27)
107	Byte	Bytes/Element	Binary 8-Bit Number (1)
108	I*2	Units Code	Combination of a Zero Filled Byte and Units Code (19)
109	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
110	Byte	Exponent	Binary 8-Bit Number (0)
111	I*2	Additive Constant	Binary Number (0)
112	I*2	CheckSum	Binary Number

BYTES

BYTES

0-1	BLOCK LENGTH			30-31	ADDITIVE CONSTANT		
	95				0		
2-3	MODE 3	SUBMODE 17		32-33	CHAR. 1 B	CHAR. 2 J	JULIAN DAY DATA BEGINS
4-5	NUMBER ELEMENTS 15	BYTES/ SECTION 24		34-35	CHAR. 3 L	CHAR. 4 D	
6-7	NUMBER OF SECTIONS 1			36-37	START BYTE 12	BYTES/ ELEMENTS 2	
8-9	CHAR. 1 S	CHAR. 2 C	SPACECRAFT ID	38-39	UNUSED 0	UNITS CODE 51	
10-11	CHAR. 3 I	CHAR. 4 D		40-41	MULT. MANTISSA 1	EXPONENT 0	

12-13	START BYTE 4	BYTES/ ELEMENT S 4		42-43	ADDITIVE CONSTANT 0		
14-15	UNUSED 0	UNITS CODE 19		44-45	CHAR. 1 B	CHAR. 2 H	HOUR OF DAY DATA BEGINS
16-17	MULT. MANTISSA 1	EXPONEN T 0		46-47	CHAR. 3 R	CHAR. 4	
18-19	ADDITIVE CONSTANT 0			48-49	START BYTE 14	BYTES/ ELEMENT 1	
20-21	CHAR. 1 R	CHAR. 2 E	REV/ORBIT NUMBER	50-51	UNUSED 0	UNITS CODE 50	
22-23	CHAR. 3 V	CHAR. 4 #		52-53	MULT. MANTISSA 1	EXPONENT 0	
24-25	START BYTE 8	BYTES/ ELEMENT 4		54-55	ADDITIVE CONSTANT 0		
26-27	UNUSED 0	UNITS CODE 19		56-57	CHAR. 1 B	CHAR. 2 M	MINUTE OF HOUR DATA BEGINS
28-29	MULT. MANTISSA 1	EXPONEN T 0		58-59	CHAR. 3 N	CHAR. 4	

BYTES

BYTES

60-61	START BYTE 15	BYTES/ ELEMENT 1		90-91	ADDITIVE CONSTANT 0		
62-63	UNUSED 0	UNITS CODE 49		92-93	CHAR. 1 E	CHAR. 2 H	HOUR OF DAY DATA BEGINS
64-65	MULT. MANTISSA	EXPONENT 0		94-95	CHAR. 3 R	CHAR. 4	

	1						
66-67	ADDITIVE CONSTANT 0			96-97	START BYTE 19	BYTES/ ELEMENTS 1	
68-69	CHAR. 1 B	CHAR. 2 S	SECOND OF MIN. DATA BEGINS	98-99	UNUSED 0	UNITS CODE 50	
70-71	CHAR. 3 E	CHAR. 4 C		100-101	MULT. MANTISSA 1	EXPONENT 0	
72-73	START BYTE 16	BYTES/ ELEMENTS 1		102-103	ADDITIVE CONSTANT 0		
74-75	UNUSED 0	UNITS CODE 12		104-105	CHAR. 1 B	CHAR. 2 H	HOUR OF DAY DATA BEGINS
76-77	MULT. MANTISSA 1	EXPONENT 0		106-107	CHAR. 3 N	CHAR. 4	
78-79	ADDITIVE CONSTANT 0			108-109	START BYTE 20	BYTES/ ELEMENT 1	
80-81	CHAR. 1 E	CHAR. 2 J	JULIAN DAY DATA BEGINS	110-111	UNUSED 0	UNITS CODE 49	
82-83	CHAR. 3 L	CHAR. 4 D		112-113	MULT. MANTISSA 1	EXPONENT 0	
84-85	START BYTE 17	BYTES/ ELEMENT 2		114-115	ADDITIVE CONSTANT 0		
86-87	UNUSED 0	UNITS CODE 51		116-117	CHAR. 1 E	CHAR. 2 S	SECOND OF MINUTE DATA ENDS
88-89	MULT. MANTISSA 1	EXPONENT 0		118-119	CHAR. 3 E	CHAR. 4 C	

BYTES

BYTES

120-121	START BYTE 21	BYTES/ ELEMENT 1		150-151	ADDITIVE CONSTANT 0		
122-123	UNUSED 0	UNITS CODE 12		152-153	CHAR. 1 A	CHAR. 2 M	MINUTE OF ASCENDING NODE
124-125	MULT. MANTISSA 1	EXPONENT 0		154-155	CHAR. 3 N	CHAR. 4	
126-127	ADDITIVE CONSTANT 0			156-157	START BYTE 25	BYTES/ ELEMENTS 1	
128-129	CHAR. 1 A	CHAR. 2 J	DAY OF ASCENDING NODE	158-159	UNUSED 0	UNITS CODE 49	
130-131	CHAR. 3 L	CHAR. 4 D		160-161	MULT. MANTISSA 1	EXPONENT 0	
132-133	START BYTE 22	BYTES/ ELEMENTS 2		162-163	ADDITIVE CONSTANT 0		
134-135	UNUSED 0	UNITS CODE 51		164-165	CHAR. 1 A	CHAR. 2 S	SECOND OF ASCENDING NODE
136-137	MULT. MANTISSA 1	EXPONENT 0		166-167	CHAR. 3 E	CHAR. 4 C	
138-139	ADDITIVE CONSTANT 0			168-169	START BYTE 26	BYTES/ ELEMENT 1	
140-141	CHAR. 1 A	CHAR. 2 H	HOUR OF ASCENDING NODE	170-171	UNUSED 0	UNITS CODE 12	
142-143	CHAR. 3 R	CHAR. 4		172-173	MULT. MANTISSA 1	EXPONENT 0	
144-145	START BYTE 24	BYTES/ ELEMENT 1		174-175	ADDITIVE CONSTANT 0		
146-147	UNUSED 0	UNITS CODE 50		176-177	CHAR. 1 L	CHAR. 2 S	LOGICAL SATELLITE ID

Rev Header Data Description Block (continued)

BYTES

180-181	START BYTE 27	BYTES/ ELEMENT 1
182-183	UNUSED 0	UNITS CODE 19
184-185	MULT. MANTISSA 1	EXPONENT 0
186-187	ADDITIVE CONSTANT 0	
188-189	CHECKSUM (CALC. IN SMIDEF)	

EDR Scan Header Data Description Block

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block length	Length of block in term of I*2 words (17)
2	Byte	MODE	Binary 8-bit Number (3)
3	Byte	SUBMODE	Binary 8-bit Number (17)
4	Byte	Number of Elements	Binary 8-bit Number (2)
5	Byte	Bytes per Section	Binary 8-bit Number (6)
6	I*2	Number of Sections	Binary Number (1)
7	C*4	Counter	Character String "CNTR"
8	Byte	Start Byte	Binary 8-bit Number (4)
9	Byte	Bytes/Element	Binary 8-bit Number (2)
10	I*2	Unit Code	Combination of a Zero Filled Byte and the Unit Code (19)
11	Byte	Mult. Mantissa	Binary 8-bit Number (1)
12	Byte	Exponent	Binary 8-bit Number (0)
13	I*2	Additive Constant	Binary Number
14	C*4	Bscan Start Time	Character String "BSTM"

15	Byte	Start Byte	Binary 8-bit Number (6)
16	Byte	Bytes/Element	Binary 8-bit Number (4)
17	I*2	Units Code	Combination of a Zero Filled Byte and the Unit Code (12)
18	Byte	Mult. Mantissa	Binary 8-bit Number (1)
19	Byte	Exponent	Binary 8-bit Number (0)
20	I*2	Additive Constant	Binary Number
21	I*2	Checksum	Calculated in "SMIDEF"

EDR SCAN HEADER DATA DESCRIPTION BLOCK

BYTES

BYTES

0-1	BLOCK LENGTH 17			30-31	ADDITIVE CONSTANT 0	
2-3	MODE 3	SUBMODE 17		32-33	CHECKSUM (CAL. IN SMIDEF)	
4-5	NUMBER ELEMENTS 2	BYTES/ SECTION 6				
6-7	NUMBER OF SECTIONS 1					
8-9	CHAR. 1 C	CHAR. 2 N	COUNTER			
10-11	CHAR. 3 T	CHAR. 4 R				
12-13	START BYTE 4	BYTES/ ELEMENTS 2				
14-15	UNUSED 0	UNITS CODE 19				
16-17	MULT. MANTISSA 1	EXPONENT 0				
18-19	ADDITIVE CONSTANT 0					

20-21	CHAR. 1 B	CHAR. 2 S	B-SCAN START TIME			
22-23	CHAR. 3 T	CHAR. 4 M				
24-25	START BYTE 6	BYTES/ ELEMENT 4				
26-27	UNUSED 0	UNITS CODE 12				
28-29	MULT. MANTISSA 1	EXPONENT 0				

EDR Data Description Block

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block length	Length of Block in Terms of I*2 Words (107)
2	Byte	Mode	Binary 8-Bit Number (3)
3	Byte	Submode	Binary 8-Bit Number (17)
4	Byte	Number Elements	Binary 8-Bit Number (17)
5	Byte	Bytes/Selection	Binary 8-Bit Number (20)
6	I*2	Number of Sections	Binary Number (62)
7	C*4	Counter	Character String "CNTR"
8	Byte	Start Byte	Binary 8-Bit Number (4)
9	Byte	Bytes/Element	Binary 8-Bit Number (2)
10	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
11	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
12	Byte	Exponent	Binary 8-Bit Number (0)
13	I*2	Additive Constant	Binary Number (0)
14	C*4	Latitude	Character String "LAT"
15	Byte	Start Byte	Binary 8-Bit Number (6)
16	Byte	Bytes/Element	Binary 8-Bit Number (2)
17	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (45)

18	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
19	Byte	Exponent	Binary 8-Bit Number (-2)
20	I*2	Additive Constant	Binary Number (0)
21	C*4	Longitude	Character String "LON"
22	Byte	Start Byte	Binary 8-Bit Number (8)
23	Byte	Bytes/Element	Binary 8-Bit Number (2)
24	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (45)
25	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
26	Byte	Exponent	Binary 8-Bit Number (-2)
27	I*2	Additive Constant	Binary Number (0)
28	C*4	Surface Type	Character String "STYP"
29	Byte	Start Byte	Binary 8-Bit Number (10)
31	Byte	Bytes/Element	Binary 8-Bit Number (1)
30	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
32	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
33	Byte	Exponent	Binary 8-Bit Number (0)
34	I*2	Additive Constant	Binary Number (0)
35	C*4	Cloud Water	Character String "CW"
36	Byte	Start Byte	Binary 8-Bit Number (11)
37	Byte	Bytes/Element	Binary 8-Bit Number (1)
38	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (22)
39	Byte	Mult. Mantissa	Binary 8-Bit Number (5)
40	Byte	Exponent	Binary 8-Bit Number (-2)
41	I*2	Additive Constant	Binary Number (0)
42	C*4	Spare	Character String "SPAR"
43	Byte	Start Byte	Binary 8-Bit Number (12)
44	Byte	Bytes/Element	Binary 8-Bit Number (1)
45	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (22)
46	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
47	Byte	Exponent	Binary 8-Bit Number (-1)
48	I*2	Additive Constant	Binary Number (0)
49	C*4	Rain Rate	Character String "RR"
50	Byte	Start Byte	Binary 8-Bit Number (13)
51	Byte	Bytes/Element	Binary 8-Bit Number (1)
52	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (62)
53	Byte	Mult. Mantissa	Binary 8-Bit Number (1)

54	Byte	Exponent	Binary 8-Bit Number (0)
55	I*2	Additive Constant	Binary Number (0)
56	C*4	Surface Wind	Character String "SW"
57	Byte	Start Byte	Binary 8-Bit Number (14)
58	Byte	Bytes/Element	Binary 8-Bit Number (1)
59	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (4)
60	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
61	Byte	Exponent	Binary 8-Bit Number (-1)
62	I*2	Additive Constant	Binary Number (0)
63	C*4	Surface Moisture	Character String "SM"
64	Byte	Start Byte	Binary 8-Bit Number (15)
65	Byte	Bytes/Element	Binary 8-Bit Number (1)
66	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (39)
67	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
68	Byte	Exponent	Binary 8-Bit Number (0)
69	I*2	Additive Constant	Binary Number (0)
70	C*4	Ice Concentration	Character String "IC"
71	Byte	Start Byte	Binary 8-Bit Number (16)
72	Byte	Bytes/Element	Binary 8-Bit Number (1)
73	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (20)
74	Byte	Mult. Mantissa	Binary 8-Bit Number (5)
75	Byte	Exponent	Binary 8-Bit Number (0)
76	I*2	Additive Constant	Binary Number (0)
77	C*4	Ice Age	Character String "IA"
78	Byte	Start Byte	Binary 8-Bit Number (17)
79	Byte	Bytes/Element	Binary 8-Bit Number (1)
80	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
81	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
82	Byte	Exponent	Binary 8-Bit Number (0)
83	I*2	Additive Constant	Binary Number (0)
84	C*4	Ice Edge	Character String "IE"
85	Byte	Start Byte	Binary 8-Bit Number (18)
86	Byte	Bytes/Element	Binary 8-Bit Number (1)
87	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
88	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
89	Byte	Exponent	Binary 8-Bit Number (0)

90	I*2	Additive Constant	Binary Number (0)
91	C*4	Water Vapor Ocean	Character String "WV"
92	Byte	Start Byte	Binary 8-Bit Number (19)
93	Byte	Bytes/Element	Binary 8-Bit Number (1)
94	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (22)
95	Byte	Mult. Mantissa	Binary 8-Bit Number (5)
96	Byte	Exponent	Binary 8-Bit Number (-1)
97	I*2	Additive Constant	Binary Number (0)
98	C*4	Surface Temp.	Character string "TMPS"
99	Byte	Start Byte	Binary 8-Bit Number (20)
100	Byte	Bytes/Element	Binary 8-Bit Number (1)
101	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (1)
102	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
103	Byte	Exponent	Binary 8-Bit Number (0)
104	I*2	Additive Constant	Binary Number (180)
105	C*4	Snow Depth	Character String SD
106	Byte	Start Byte	Binary 8-Bit Number (21)
107	Byte	Bytes/Element	Binary 8-Bit Number (1)
108	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (39)
109	Byte	Mult. Mantissa	Binary 8-Bit Number (5)
110	Byte	Exponent	Binary 8-Bit Number (0)
111	I*2	Additive Constant	Binary Number (0)
112	C*4	Rain Flag	Character String "RFLG"
113	Byte	Start Byte	Binary 8-Bit Number (19)
114	Byte	Bytes/Element	Binary 8-Bit Number (1)
115	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (22)
116	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
117	Byte	Exponent	Binary 8-Bit Number (0)
118	I*2	Additive Constant	Binary Number (0)
119	C*4	EDR Surface Type	Character String "ETYP"
120	Byte	Start Byte	Binary 8-Bit Number (23)
121	Byte	Bytes/Element	Binary 8-Bit Number (1)
122	I*2	Units Code	Combination of a Zero Filled Byte and Unit Code (19)
123	Byte	Mult. Mantissa	Binary 8-Bit Number (1)
124	Byte	Exponent	Binary 8-Bit Number (0)
125	I*2	Additive Constant	Binary Number (0)

126	C*4	Checksum	Binary Number
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BYTES

BYTES_

0-1	BLOCK LENGTH 107			30-31	ADDITIVE CONSTANT 0		
2-3	MODE 3	SUBMODE 17		32-33	CHAR. 1 L	CHAR. 2 0	LONGITUDE
4-5	NUMBER ELEMENTS 17	BYTES/ SECTION 20		34-35	CHAR. 3 N	CHAR. 4	
6-7	NUMBER OF SECTIONS 62			36-37	START BYTE 8	BYTES/ ELEMENTS 2	
8-9	CHAR. 1 C	CHAR. 2 N	COUNTER	38-39	UNUSED 0	UNITS CODE 45	
10-11	CHAR. 3 T	CHAR. 4 R		40-41	MULT. MANTISSA 1	EXPONENT -2	
12-13	START BYTE 4	BYTES/ ELEMENTS 2		42-43	ADDITIVE CONSTANT 0		
14-15	UNUSED 0	UNITS CODE 19		44-45	CHAR. 1 S	CHAR. 2 T	SURFACE TYPE
16-17	MULT. MANTISSA 1	EXPONENT 0		46-47	CHAR. 3 Y	CHAR. 4 P	
18-19	ADDITIVE CONSTANT 0			48-49	START BYTE 10	BYTES/ELE MENT 1	
20-21	CHAR. 1 L	CHAR. 2 A	LATITUDE	50-51	UNUSED 0	UNITS CODE 19	
22-23	CHAR. 3 T	CHAR. 4		52-53	MULT. MANTISSA 1	EXPONENT 0	

24-25	START BYTE 6	BYTES/ ELEMENT 2		54-55	ADDITIVE CONSTANT 0		
26-27	UNUSED 0	UNITS CODE 45		56-57	CHAR. 1 C	CHAR. 2 W	CLOUD WATER
28-29	MULT. MANTISSA 1	EXPONENT -2		58-59	CHAR. 3	CHAR. 4	

BYTES

BYTES

60-61	START BYTE 11	BYTES/ ELEMENT 1		90-91	ADDITIVE CONSTANT 0		
62-63	UNUSED 0	UNITS CODE 22		92-93	CHAR. 1 S	CHAR. 2 W	SURFACE WIND
64-65	MULT. MANTISSA 5	EXPONENT -2		94-95	CHAR. 3	CHAR. 4	
66-67	ADDITIVE CONSTANT 0			96-97	START BYTE 14	BYTES/ ELEMENTS 1	
68-69	CHAR. 1 S	CHAR. 2 P	SPARE	98-99	UNUSED 0	UNITS CODE 4	
70-71	CHAR. 3 A	CHAR. 4 R		100-101	MULT. MANTISSA 1	EXPONENT 0	
72-73	START BYTE 12	BYTES/ ELEMENTS 1		102-103	ADDITIVE CONSTANT 0		
74-75	UNUSED 0	UNITS CODE 22		104-105	CHAR. 1 S	CHAR. 2 M	SURFACE MOISTURE
76-77	MULT. MANTISSA 1	EXPONENT -1		106-107	CHAR. 3	CHAR. 4	
78-79	ADDITIVE CONSTANT 0			108-109	START BYTE 15	BYTES/ ELEMENT 1	

80-81	CHAR. 1 R	CHAR. 2 R	RAINRATE	110-111	UNUSED 0	UNITS CODE 19	
82-83	CHAR. 3	CHAR. 4		112-113	MULT. MANTISSA 1	EXPONENT 0	
84-85	START BYTE 13	BYTES/ ELEMENT 1		114-115	ADDITIVE CONSTANT 0		
86-87	UNUSED 0	UNITS CODE 62		116-117	CHAR. 1 I	CHAR. 2 C	ICE CONCENTRATIO N
88-89	MULT. MANTISSA 1	EXPONENT 0		118-119	CHAR. 3	CHAR. 4	

BYTES

BYTES

120-121	START BYTE 16	BYTES/ ELEMENT 1		150-151	ADDITIVE CONSTANT 0		
122-123	UNUSED 0	UNITS CODE 19		152-153	CHAR. 1 W	CHAR. 2 V	WATER VAPOR OCEAN
124-125	MULT. MANTISSA 1	EXPONENT 0		154-155	CHAR. 3	CHAR. 4	
126-127	ADDITIVE CONSTANT 0			156-157	START BYTE 19	BYTES/ ELEMENTS 1	
128-129	CHAR. 1 I	CHAR. 2 A	ICE AGE	158-159	UNUSED 0	UNITS CODE 22	
130-131	CHAR. 3	CHAR. 4		160-161	MULT. MANTISSA 5	EXPONENT -1	
132-133	START BYTE 17	BYTES/ELE MENTS 1		162-163	ADDITIVE CONSTANT 0		

134-135	UNUSED 0	UNITS CODE 19		164-165	CHAR. 1 T	CHAR. 2 M	SURFACE TEMP.
136-137	MULT. MANTISSA 1	EXPONENT 0		166-167	CHAR. 3 P	CHAR. 4 S	
138-139	ADDITIVE CONSTANT 0			168-169	START BYTE 20	BYTES/ ELEMENT 1	
140-141	CHAR. 1 I	CHAR. 2 E	ICE EDGE	170-171	UNUSED 0	UNITS CODE 1	
142-143	CHAR. 3	CHAR. 4		172-173	MULT. MANTISSA 1	EXPONENT 0	
144-145	START BYTE 18	BYTES/ ELEMENT 1		174-175	ADDITIVE CONSTANT 180		
146-147	UNUSED 0	UNITS CODE 19		176-177	CHAR. 1 S	CHAR. 2 P	SPARE
148-149	MULT. MANTISSA 1	EXPONENT 0		178-179	CHAR. 3 A	CHAR. 4 R	

BYTES

BYTES

180-181	START BYTE 21	BYTES/ ELEMENT 1		210-211	ADDITIVE CONSTANT 0	
182-183	UNUSED 0	UNITS CODE 8		212-213	CHECKSUM (CAL. IN SMIDEF)	
184-185	MULT. MANTISSA 1	EXPONENT 0				
186-187	ADDITIVE CONSTANT 0					

188-189	CHAR. 1 R	CHAR. 2 F	RAIN FLAG				
190-191	CHAR. 3 L	CHAR. 4 G					
192-193	START BYTE 22	BYTES/ ELEMENTS 1					
194-195	UNUSED 0	UNITS CODE 22					
196-197	MULT. MANTISSA 1	EXPONENT 0					
198-199	ADDITIVE CONSTANT 0						
200-201	CHAR. 1 E	CHAR. 2 T	EDR SURFACE TYPE				
202-203	CHAR. 3 Y	CHAR. 4 P					
204-205	START BYTE 23	BYTES/ ELEMENT 1					
206-207	UNUSED 0	UNITS CODE 19					
208-209	MULT. MANTISSA 1	EXPONENT 0					

Rev Header Data Block Format

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block length	Length of block in terms of I*2 Words (15)
2	Byte	Mode	Binary 8-Bit Number
3	Byte	Submode	String of 4 Character
4	I*4	Spacecraft ID	Two 16-Bit Words

5	I*4	Revolution/Orbit	Binary 32-Bit Number
6	I*2	Julian day Data Begins	Binary 8-Bit Number
7	Byte	HR. Data Begins	Binary 8-Bit Number
8	Byte	Min. Data Begins	Binary 8-Bit Number
9	Byte	Sec. Data Begins	Binary 8-Bit Number
10	Byte	Day Data Ends (1)	Binary 8-Bit Number
11	Byte	Day Data Ends (2)	Binary 8-Bit Number
12	Byte	HR. Data Ends	Binary 8-Bit Number
13	Byte	Min. Data Ends	Binary 8-Bit Number
14	Byte	Sec. Data Ends	Binary 8-Bit Number
15	I*2	Julian day of First	Binary 16-Bit Number
16	Byte	HR. First A.N.	Binary 8-Bit Number
17	Byte	Min. First A.N.	Binary 8-Bit Number
18	Byte	Sec. First A.N.	Binary 8-Bit Number
19	Byte	Logical Satellite Id	Binary 8-Bit Number
20	I*2	Checksum	Binary 16-Bit Number

REV HEADER DATA BLOCK FORMAT

BYTES

0-1	BLOCK LENGTH	
2-3	BLOCK ID	
4-7	SPACECRAFT ID	
8-11	REVOLUTION/ ORBIT NUMBER	
12-13	JULIAN DAY DATA BEGINS	
14-15	HR. DATA BEGINS	MIN. DATA BEGINS

16-17	SEC. DATA BEGINS	DAY DATA ENDS (1)
18-19	DAY DATA ENDS (2)	HR. DATA ENDS
20-21	MIN. DATA ENDS	SEC. DATA ENDS
22-23	JULIAN DAY OF 1ST ASCENDING NODE	
24-25	HR. 1ST A.N.	MIN. 1ST A.N.
26-27	SEC. 1ST A.N.	LOGICAL SAT. ID
28-29	CHECKSUM	

2.1. 2.1 DATA RECORD FORMAT DESCRIPTION

The data record consists of a Scan Header Block and an EDR Data Block and found in records 2 through the end of the data set (see 2.1.3).

The EDR Scan Header has the Scan Counter which is a binary number (1 through 1724) and the B-SCAN start time is in minutes from the beginning of the day (0 to 86,400). **Note:** There are no A-SCAN times associated with these data sets.

The Data Block format is based upon 64 view spots per SCAN and contains a Latitude/Longitude value along with 14 parameters of which one is a spare. All parameters such as ice concentration of 0 at the Equator are available for each of the view spots.

**RECORD 1
EDR OUTPUT DATA RECORD**

1300 Bytes

Product ID Block	Data Sequence Block	Data Description Block	Data Description Block	Data Description Block	Data Block	Zero Fill
		Pass HRD	Scan HDR	EDR	Pass HRD	
28	26	190	34 214	30	778	

**RECORD 2 to END OF FILE
IDB OUTPUT DATA RECORD**

Scan Header Scan Data Fill

12 BYTES	1286 BYTES	2 BYTE FILL
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EDR Scan Header Block

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block Length	Length of Block in Terms of Words (6)
2	Byte	Mode	8-Bit Byte
3	Byte	SUBMODE	8-Bit Byte
4	I*2	Scan Counter	Binary 16-Bit Word
5	I*4	Bscan Start Time	Binary 32-Bit Number (seconds)
6	I*2	Checksum	Binary 16-Bit Word

EDR SCAN HEADER BLOCK FORMAT

BYTES

0-1	BLOCK LENGTH
2-3	BLOCK ID
4-5	SCAN COUNTER
6-9	B-SCAN START TIME
10-11	CHECKSUM

EDR Data Block Format

<u>Data Word</u>	<u>Type</u>	<u>Contents</u>	<u>Comments</u>
1	I*2	Block Length	Length of Block in Terms of Words (623)
2	Byte	Mode	8-Bit Byte
3	Byte	Submode	8-Bit Byte
4	I*2	All Scene Station Counter	8-Bit Byte
5	I*2	Latitude	Scene Station Latitude 1×10 to the power of -2 (1)
6	I*2	Longitude	Scene Station Longitude 1×10 to the power of -2 (2)
7	Byte	Surface Tag	Binary 8-Bit Number (3)
8	Byte	Cloud Water	Cloud Water Over Ocean 5×10 to the power of -2 Kilogram per Cubic Meter
9	Byte	Spare	Binary 8-Bit Number (0)
10	Byte	Rain Rate	Rain Rate in mm per hour
11	Byte	Wind Speed	Surface Wind Speed Over the Ocean meters per sec.
12	Byte	Soil Moisture	Soil Moisture in mm
13	Byte	Ice Concentration	Sea Ice Concentration
14	Byte	Ice Age	Sea Ice Age (4)
15	Byte	Ice Edge	Sea Ice Flag (5)
16	Byte	Water Vapor	Water Vapor over the Ocean 5×10 to the power of -1 Kilogram per square meter
17	Byte	Surface Temperature	Surface Temperature degree Kelvin minus 180
18	Byte	Snow Depth	Snow depth 5×10 to the power of 1 in mm
19	Byte	Rain Flag	Binary 8-Bit Number (0-3) representing wind speed accuracy
20	Byte	Cal. Surface Type	Calculated Surface Type (6)
21	Repeat	Bytes	Repeat Word 4 to 20 63 times
22	I*2	Checksum	Binary 16-Bit Word

EDR DATA FORMAT BLOCK

BYTES

0-1	BLOCK LENGTH
	623

2-3	BLOCK ID	
4-5	ALL SCENE STATION COUNTER	
6-7	LATITUDE	
8-9	LONGITUDE	
10-11	SURFACE TAG	CLOUD WATER
12-13	SPARE	RAIN RATE
14-15	WIND SPEED	SOIL MOISTURE
16-17	ICE CONC.	ICE AGE
18-19	ICE EDGE	WATER VAPOR
20-21	SURFACE TEMP.	SPARE
22-23	RAIN FLAG	CALC. S. TYPE
24-1283	(REPEAT BYTES 4-23 63 TIMES)	
1284-1285	CHECKSUM	

NOTE:

- 1. Latitudes range from 00000 (South Pole) to 180000 (North Pole) with the Equator being 09000.**
- 2. Longitudes range from 00000 Greenwich going East to 36000 Greenwich.**
- 3. 0 is land; 1 is vegetation covered land; 3 is multiyear ice; 4 is possible ice; 5 is ocean; and 6 is coast.**
- 4. 0 is First Year Ice and 1 is Multit-Year ICE.**
- 5. 0 is no edge present and 1 is edge present.**
- 6. 1 is vegetation; 3 is Ice; 5 is Ocean; 6 is Coast; 7 is flooded condition; 8 is dense vegetation; 9 is Dense Agriculture Crops; 10 is Dry Arable Soil; 11 is moist soil; 12 is semi-Arid Surface; 13 is Desert; 14 is precipitation over vegetation; 15 is precipitation over soil, 16 is composite**

vegetation-water; 17 is composite soil- water- wet soil; 18 is dry snow; 19 is wet snow; and 20 is Refrozen Snow.

3.0 PROGRAMMERS NOTE: How to obtain several of the important parameters for processing an orbit.

The year of the date is found in one place only. The first record of each sequence in 16-bit word 11 (bytes 21,22).

Times associated with the data;

- Starting Julian Day 16 bit word 253 in (Rev Header Block).
- Starting Hour 8-bit word (byte) 507 in (Rev Header Block).
- Starting Minute 8-bit word (byte) 508 in (Rev Header Block).
- Starting Second 8-bit word (byte) 509 in (Rev Header Block).

- Ending Hour 8-bit word (byte) 512
- Ending Minute 8-bit word (byte) 513
- Ending Second 8-bit word (byte) 514

The number of data blocks (scan lines) can be found in 16 bit word 22 (bytes 43, 44) of the directory record.

The orbit number is given only once and is in 32-bit word 126; or 16-bit word 252 (bytes 503, 504) of the directory record.

The parameters of time, latitude and longitude of the data records need special consideration.

The time are given in terms of seconds during the day of zero to 86,400. It appears that a data set will not extend beyond a day boundary.

The Latitudes are in terms of 0 degrees at the South Pole to 90 degrees at the Equator and 180 degrees at the North Pole. The actual binary numbers in the data set are scaled by 100 (e.g. Equator is 9000).

The Longitudes are in terms of 0 to 360 degrees and are also scaled by 100. Computation of the longitude is complicated because numbers as great as 36,000 extend into the sign bit of a 16 bit word making the number negative. It will have to be treated as an unsigned integer.

EDR SHARED PROCESSING FRAME INPUT

12,798 Byte Field

12,798

FIRST FRAME

Product ID Block	Data Sequence Block	Data Description Block	Data Description Block	Data Description Block	Data Block	Data Block	Data Block	Data Block	Data Block	Data Block	Fill "A5"
		Pass HRD	Scan HDR	EDR	Pass HRD	Scan HRD	EDR	Scan HDR	EDR	Scan HDR	

28	26	190	34	214	30	12	1286	12	1286	12	582
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SECOND FRAME

Data Block	Data Block	Data Block	Data Block	Data Block	Data Block	Data Block	Data Block	Fill "A5"
EDR	Scan HRD	EDR	Scan HRD	EDR	Scan HRD	EDR	Scan HRD	
1286	12	1286	12	1286	12	1286	12	1116

LAST FRAME

Data Block	Data Block	Data Block	Data Block	End Product Block	"Zero" Fill
EDR	Scan HRD	Scan HRD	EDR		
1286	12	12	1286	6	X

NOTE: The 12/1286 Bytes pattern repeats 9 times.

Converted by Chris Duda

NOAA/NESDIS/OSDPD; Revised August 15, 2002