

ANNEX D

ERS-1 ALT.OPR PRODUCT

CCT FORMAT

EARTHNET PROGRAMME OFFICE



# EARTHNET ERS-1

ERS-1.ALT.OPR  
CCT FORMAT

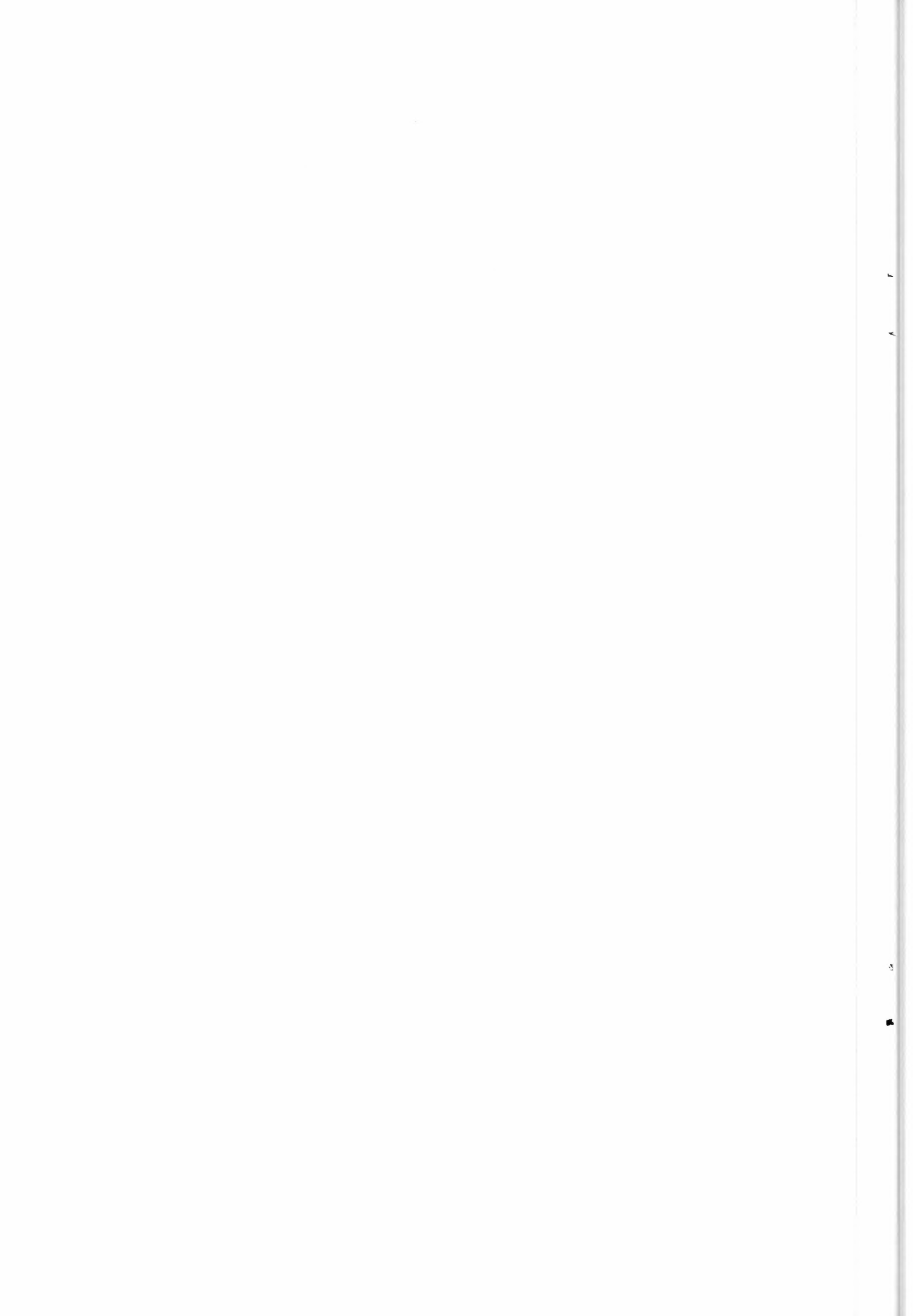
er-is-epo-gs-0503.4  
is/rev 1/1  
01 April 1993

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ERS-1.ALT.OPR  
CCT FORMAT

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is/rev 1/0  
10 April 1992

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## Altimeter Ocean Product

Acronym: **ALT.OPR**

This product aims at providing the users with geophysically corrected altimeter measures over ocean, including all the engineering corrections and all the geophysical corrections due to the troposphere, the ionosphere and the electromagnetic bias. In addition, the surface altitude over the ellipsoid is calculated, correcting for the surface elevation due to tides and geoid.

All the geophysical corrections are supplied together with the uncorrected measures, to leave to the user the possibility of applying different corrections. The product consists of one record per each source packet in tracking mode; acquisition and calibration mode source packets will originate blank products.

Corrections derived from ATSR data are also supplied in terms of water vapour/liquid water content and altitude corrections.

### 1) General CCT structure

The CCT contains the following four files :

Volume Directory File

Leader File

Data Set file

Null Volume File

### 2) Files description

#### **a) Volume Directory File:**

volume descriptor record	360 bytes (mandatory)
leader file pointer record	360 bytes (mandatory)
data set file pointer record	360 bytes (mandatory)

#### **b) Leader File:**

file descriptor record	360 bytes (mandatory)
ALT.OPR catalogue record(s)	1730 bytes (mandatory)

#### **c) Data Set File:**

file descriptor record	360 bytes (mandatory)
data records	9046 bytes (mandatory)

#### **d) Null Volume File:**

volume descriptor record	360 bytes (mandatory)
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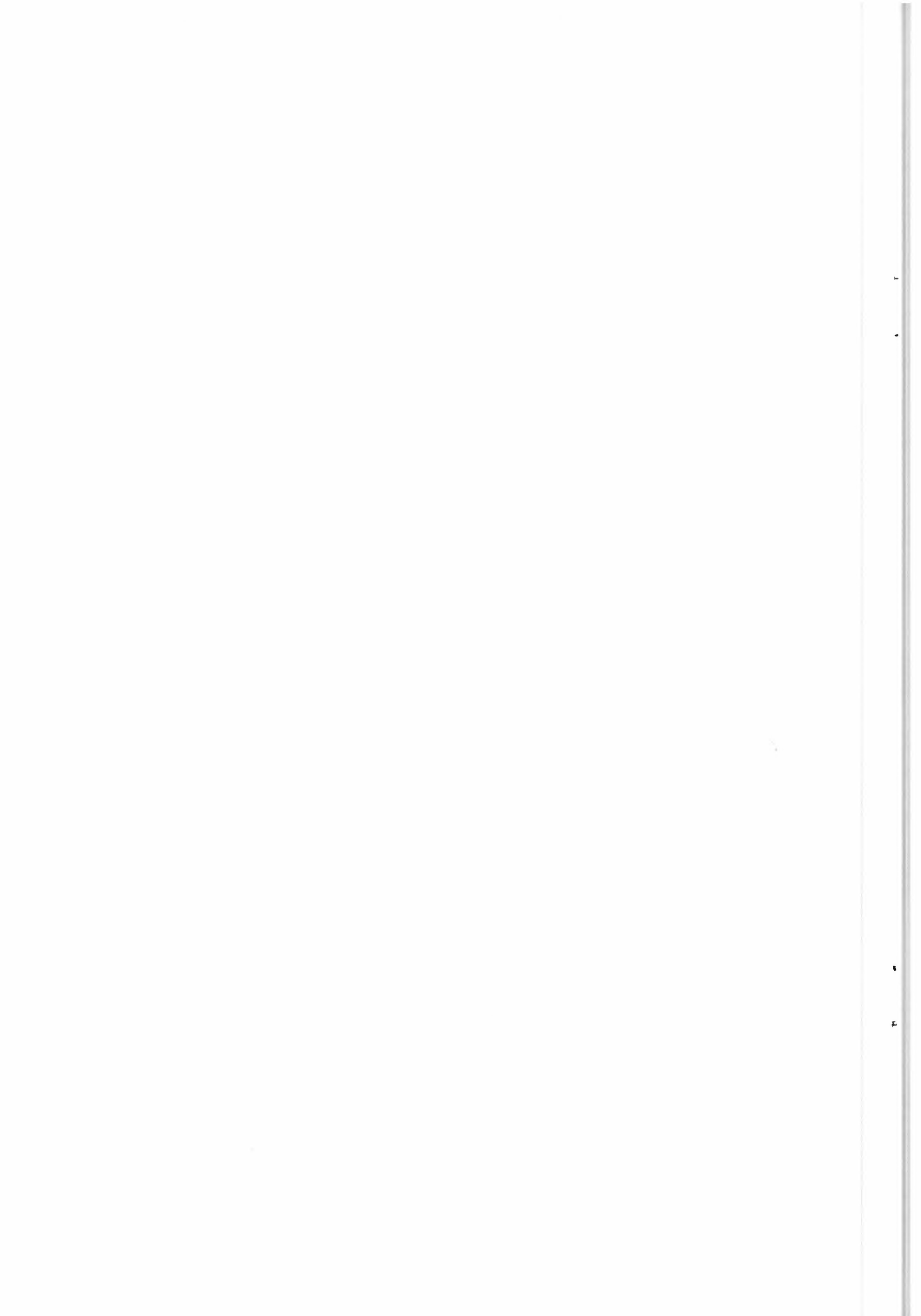


**Notation conventions :**

- \$** - the use of the "\$" (dollar sign) in the documentation denotes a requirement for the blank character (ie. the ASCII or EBCDIC space character).
- (n)** - this expression is used to denote the contents of an integer binary field which will vary depending on the product type or data origin and will have to be supplied on the CCT by the facility generating the CCT.
- <.....>** - this expression is used to denote the contents of a field, which will vary depending on the product type or data origin and will have to be supplied on the CCT by the facility generating the CCT.
- <\$...\$>** - this expression is used to denote a blank field.

File Class	Class Code	Data Type
"8\$BIT\$ASCII\$ONLY\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$"	"ASCO"	ASCII only data
"EBCDIC\$ONLY\$"	"EBCO"	EBCDIC only
"BCD\$ONLY\$"	"BCDO"	BCD only
"BINARY\$ONLY\$"	"BINO"	binary only data
"MIXED\$BINARY\$AND\$ASCII\$\$\$\$\$\$\$\$"	"MBAA"	binary & ASCII
"MIXED\$BINARY\$AND\$EBCDIC\$\$\$\$\$\$\$\$"	"MBAE"	binary & EBCDIC
"MIXED\$BINARY\$AND\$BCD\$\$\$\$\$\$\$\$\$\$\$\$"	"MBAB"	binary & BCD
"UNDEFINED,\$ETC.\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$"	"UNDF"	undefined
"COMPLEX\$"	"COMP"	complex
"REAL\$"	"REAL"	floating point

Data Interpretation	Format	Length
"INTEGER*1\$"	"I*1\$"	(1 byte wide)
"INTEGER*2\$"	"I*2\$"	(2 byte wide)
"INTEGER*4\$"	"I*4\$"	(4 byte wide)
- one, two and four byte two's complement integer representation		
"SIGNED\$INTEGER*1\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$"	"IS1\$"	(1 byte wide)
"SIGNED\$INTEGER*2\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$"	"IS2\$"	(2 byte wide)
"SIGNED\$INTEGER*4\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$"	"IS4\$"	(4 byte wide)
- one, two and four byte signed integer with the most significant bit used to denote sign		





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"UNSIGNED\$INTEGER\*1\$" "IU1\$" (1 byte wide)  
"UNSIGNED\$INTEGER\*2\$" "IU2\$" (2 byte wide)  
"UNSIGNED\$INTEGER\*4\$" "IU4\$" (4 byte wide)  
- one, two and four byte unsigned integer with the most significant bit used as part of the pixel value, the pixel is always positive.

"REAL\*2\$" "R\*2\$" (2 byte wide)  
"REAL\*4\$" "R\*4\$" (4 byte wide)  
"REAL\*8\$" "R\*8\$" (8 byte wide)  
- two, four and eight byte two's complement floating point representation with the exponent denoted in two's complement binary. (note that the REAL\*8 representation is the same as double precision.)

"REAL\*2\$HEXADECFMAL\$" "R\*2H\$" (2 byte wide)  
"REAL\*4\$HEXADECFMAL\$" "R\*4H\$" (4 byte wide)  
"REAL\*8\$HEXADECFMAL\$" "R\*8H\$" (8 byte wide)  
- two, four eight byte hexadecimal floating point representation with the exponent denoted as a hexadecimal exponent. (note that the REAL\*8 representation is the same as double precision.)

"COMPLEX\*4\$" "C\*4\$" (4 byte wide)  
"COMPLEX\*8\$" "C\*8\$" (8 byte wide)  
- four byte field with the first half (two bytes) containing the two's complement floating point representation value of the real component and the second half containing the imaginary component. Similarly for the eight byte type, with each half of the field containing the real and imaginary pairs.

"COMPLEX\$INTEGER\*2\$" "CI\*2\$" (2 byte wide)  
"COMPLEX\$INTEGER\*4\$" "CI\*4\$" (4 byte wide)  
"COMPLEX\$INTEGER\*8\$" "CI\*8\$" (8 byte wide)  
- similar to the complex floating point representation above except that each component is stored as a two's complement integer.

"COMPLEX\$SIGNED\$INTEGER\*2\$" "CIS2\$" (2 byte wide)  
"COMPLEX\$SIGNED\$INTEGER\*4\$" "CIS4\$" (4 byte wide)  
"COMPLEX\$SIGNED\$INTEGER\*8\$" "CIS8\$" (8 byte wide)  
- similar to the complex floating point representation above except that each component is stored as a signed integer.

"COMPLEX\*4\$HEXADECFMAL\$" "C\*4H\$" (4 byte wide)  
"COMPLEX\*8\$HEXADECFMAL\$" "C\*8H\$" (8 byte wide)  
- same as the floating point complex notation above except that the representation follows the hexadecimal conventions.



**Records in products**

CEOS Codes

## Volume Directory File

- VOLUME DESCRIPTOR RECORD (192,192,18,18)
- FILE POINTER RECORD (219,192,18,18)

## Leader File

- FILE DESCRIPTOR RECORD (63,192,18,18)
- ALT.OPR CATALOGUE (10,13,36,50)

## ALT Data File

- FILE DESCRIPTOR RECORD (63,192,18,18)
- PROCESSED DATA RECORD (70,13,36,50)

## Null Volume

- NULL VOLUME DESCRIPTOR RECORD (192,192,63,18)

**Note:**

Fields not provided are filled with blanks or meaningless values as -9999999.9999999 in case, for instance, of fields whose format is F16.7.

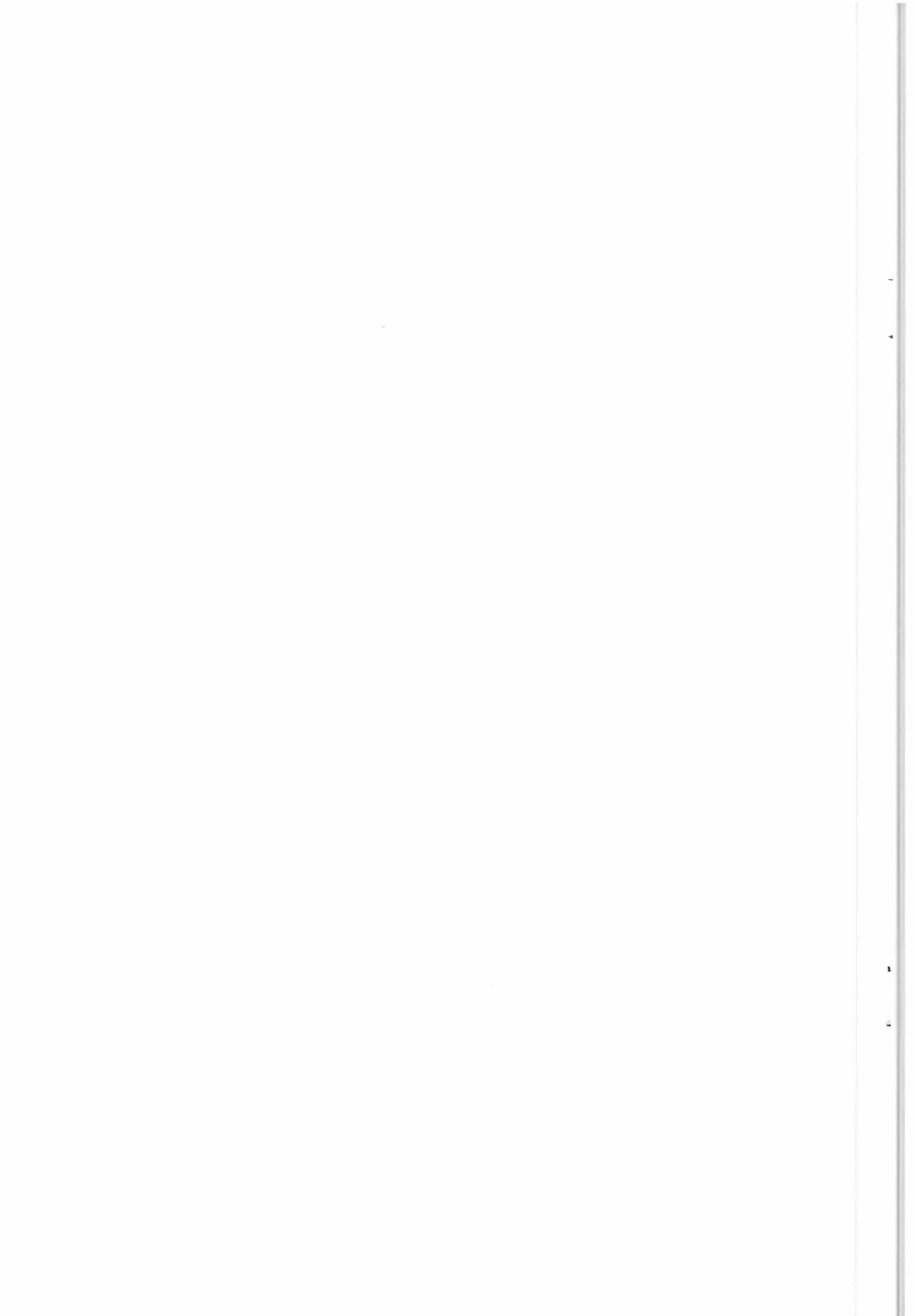


TABLE 2.1 VOLUME DESCRIPTOR RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	Record sequence number	(1)
2	5	B1	1-st record subtype code	(192)
3	6	B1	Record type code	(192)
4	7	B1	2-nd subtype code	(18)
5	8	B1	3-rd subtype code	(18)
6	9-12	B4	Length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	A\$
8	15-16	A2	blanks	\$
9	17-28	A12	format control document	CCB-CCB-0002
10	29-30	A2	Superstructure format control document	A\$
11	31-32	A2	Superstructure record format revision	A\$
12	33-44	A12	Logical volume generating facility software release and revision level	<software.id.>
13	45-60	A16	ID of physical volume containing this volume descriptor	<physical.tape.id.>
14	61-76	A16	Logical volume identifier	<logical.set.id.>
15	77-92	A16	Volume set identifier ( product generation date) (YYYYMMDDhhmssdd, dd=deci-secs)	<volume.set.id.>
16	93-94	I2	Total number of physical volumes in the logical volume	\$1
17	95-96	I2	Physical volume sequence number of the first tape within the logical volume	\$1
18	97-98	I2	Physical volume sequence number of the last tape within the logical volume	\$1
19	99-100	I2	Physical volume sequence number of the current tape within the logical volume	\$1
20	101-101	I4	First referenced file number in this physical volume within the logical volume.	\$\$\$1
21	105-108	I4	Logical volume within a volume set	\$\$\$1
22	109-112	I4	Logical volume number within physical volume	\$\$\$1
23	113-120	A8	Logical volume creation date (YYYYMMDD)	<YYYYMMDD>
24	121-128	A8	Logical volume creation time (hhmssdd, dd=deci-seconds)	<hhmssdd>
25	129-140	A12	Logical volume generation country	<country..>
26	141-148	A8	Logical volume generating agency	<agency..>
27	149-160	A12	Logical volume generating facility	<facility.>
28	161-164	I4	Number of file pointer records in volume directory	\$\$\$2
29	165-168	I4	Number of records in volume directory	\$\$\$3
30	169-260	A92	Volume descriptor spare segment (always blank filled)	(blanks)
31	261-360	A100	Local use segment	(blanks)

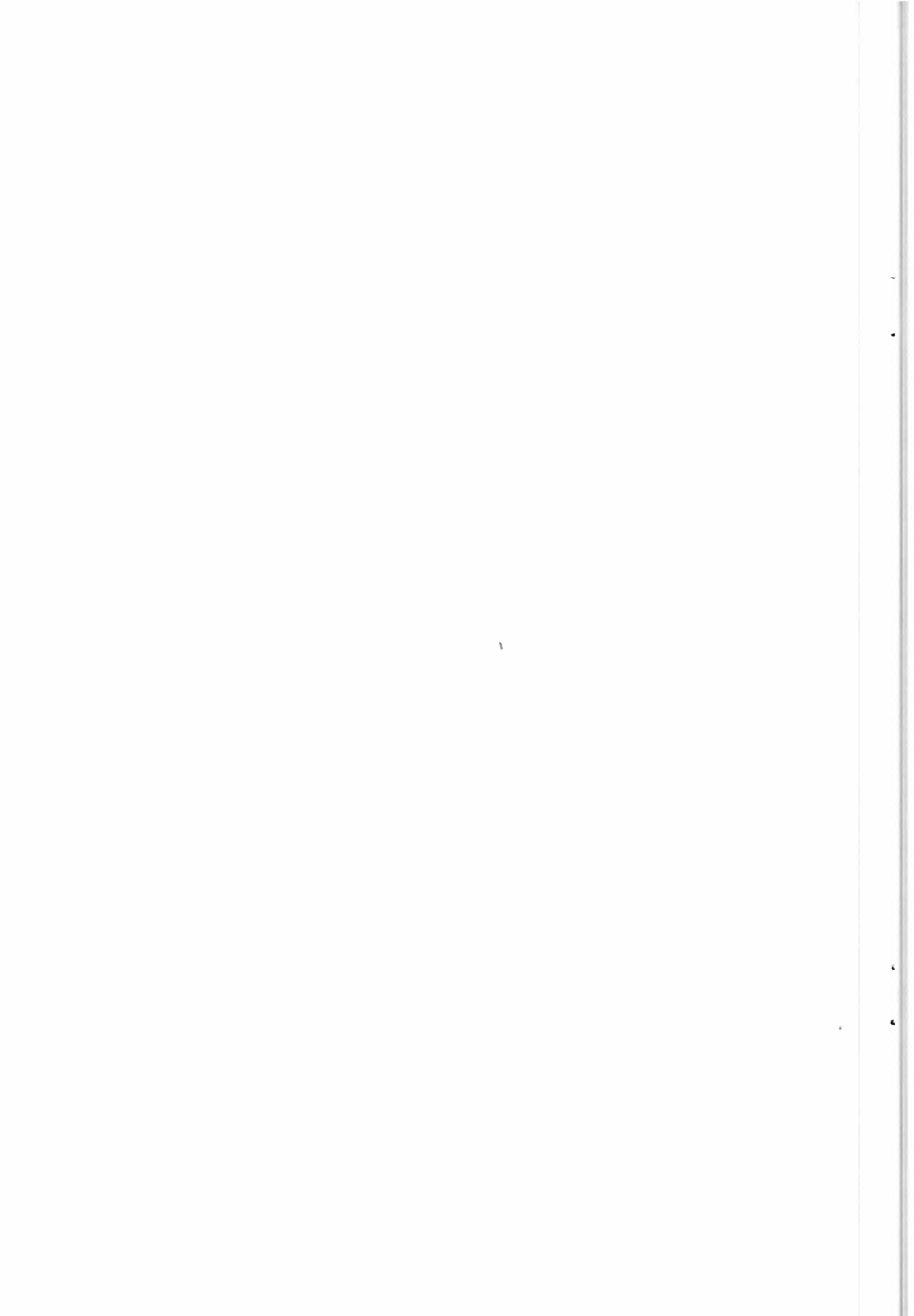




TABLE 2.2 LEADER FILE POINTER RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	Record number	(2)
2	5	B1	1-st record subtype code	(219)
3	6	B1	record type code	(192)
4	7	B1	2-nd subtype code	(18)
5	8	B1	3-rd subtype code	(18)
6	9-12	B4	Length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag for referenced file	AS
8	15-16	A2	blank	SS
9	17-20	I4	Referenced file number	\$\$\$1
10	21-36	A16	Referenced file name	ERS1.ALT.OPRLEAD
11	37-64	A28	Referenced file class	ALTLEADER\$FILE\$\$\$\$\$\$
12	65-68	A4	Referenced file class code	ALTL
13	69-96	A28	Referenced file data type	MIXED\$BINARY\$AND\$ASC
14	97-100	A4	Referenced file data type code	MBAA
15	101-108	I8	Number of records in referenced file	<nnnnnnnn>
16	109-116	I8	Referenced file 1-st record length	\$\$\$\$\$360
17	117-124	I8	Referenced file maximum record length	\$\$\$\$\$1570
18	125-136	A12	Referenced file record length type	VARIABLE\$LEN
19	137-140	A4	Referenced file record length type code	VARE
20	141-142	I2	Referenced file physical volume start number	\$1
21	143-144	I2	Referenced file physical volume end number	\$1
22	145-152	I8	Referenced file portion start, 1-st record number for this physical volume	\$\$\$\$\$\$1
23	153-160	I8	Referenced file portion end, last record number for this physical volume	<nnnnnnnn>
24	161-260	A100	File pointer spare segment	(blanks)
25	261-360	A100	Local use segment	(blanks)

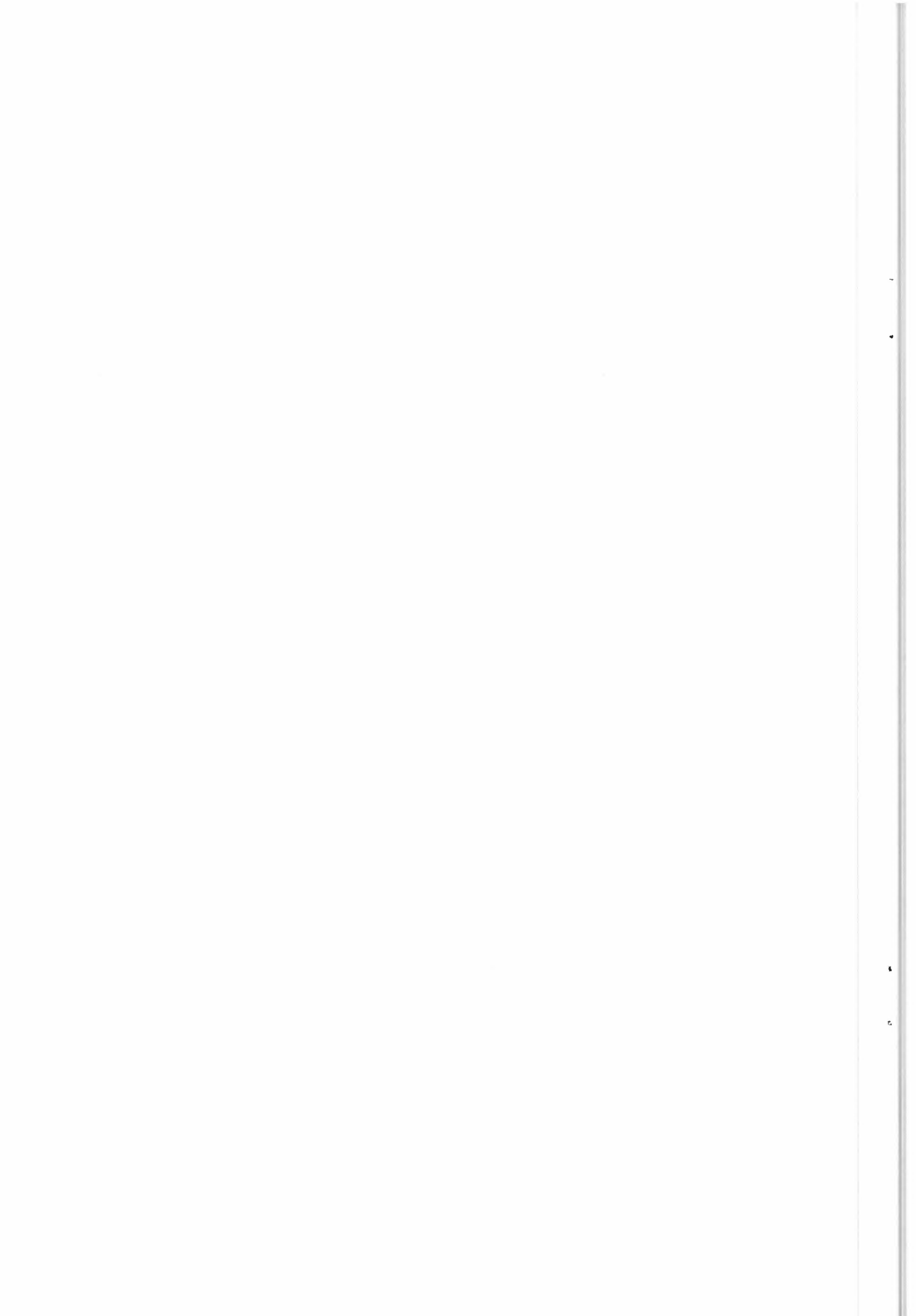


TABLE 2.3 DATA FILE POINTER RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	Record number	(3)
2	5	B1	1-st record subtype code	(219)
3	6	B1	record type code	(192)
4	7	B1	2-nd subtype code	(18)
5	8	B1	3-rd subtype code	(18)
6	9-12	B4	Length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag for referenced file	AS
8	15-16	A2	blank	SS
9	17-20	I4	Referenced file number	SSS2
10	21-36	A16	Referenced file name	ERS1.ALT.OPRDTOP
11	37-64	A28	Referenced file class	DATA\$TYPE\$OPTION\$S\$FILE
12	65-68	A4	Referenced file class code	DTOP
13	69-96	A28	Referenced file data type	MIXED\$BINARY\$AND\$ASCII
14	97-100	A4	Referenced file data type code	MBAA
15	101-108	I8	Number of records in referenced file	<nnnnnnnn>
16	109-116	I8	Referenced file 1-st record length	SSSS360
17	117-124	I8	Referenced file maximum record length	SSSS9046
18	125-136	A12	Referenced file record length type	VARIABLE\$LENGTH
19	137-140	A4	Referenced file record length type code	VARI
20	141-142	I2	Referenced file physical volume start number	\$1
21	143-144	I2	Referenced file physical volume end number	\$1
22	145-152	I8	Referenced file portion start, 1-st record number for this physical volume	<SSSSSS\$1>
23	153-160	I8	Referenced file portion end, last record number for this physical volume	<nnnnnnnn>
24	161-260	A100	File pointer spare segment	(blanks)
25	261-360	A100	Local use segment	(blanks)

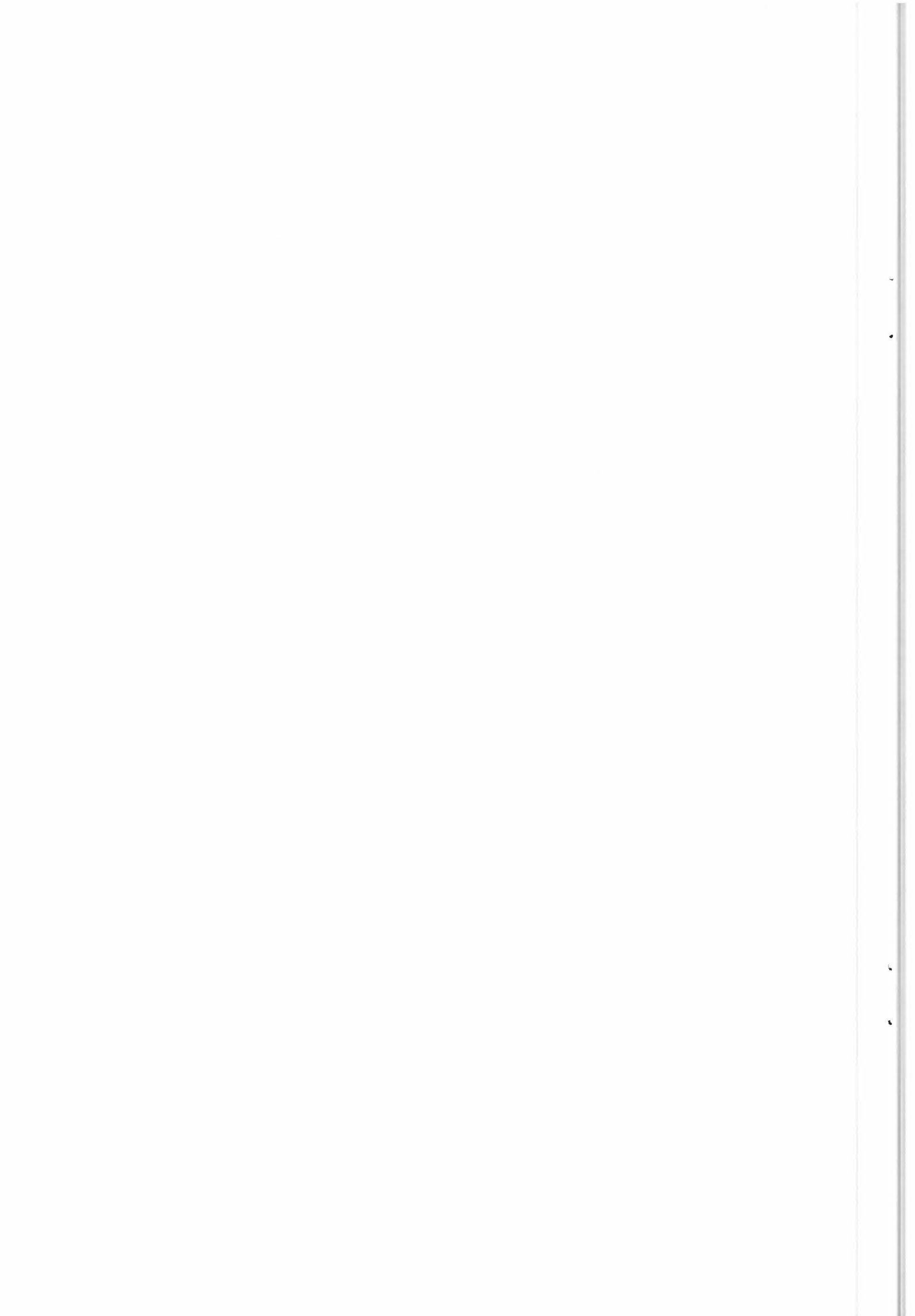


TABLE 3.1 ALTLEADER FILE - FILE DESCRIPTOR RECORD  
(FIXED SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION AND/OR CONTENT	CONTENT
1	1-4	B4	Record sequence number	(1 )
2	5	B1	1-st record sub-type code	(63)
3	6	B1	Record type code	(192)
4	7	B1	2-nd record sub-type code	(18)
5	8	B1	3-rd record sub-type code	(18)
6	9-12	B4	Length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	SA
8	15-16	A2	blanks	SS
9	17-28	A12	Format control document ID for this data file format	ERS1-ALT-CCT
10	29-30	A2	Format control document revision level	SA
11	31-32	A2	File design descriptor revision letter	SA
12	33-44	A12	Generating software release and revision level	<software.id.>
13	45-48	I4	File number	\$\$\$1
14	49-64	A16	File name	ERS1.ALT.OPRLEAD
15	65-68	A4	Record sequence and location type flag	FSEQ
16	69-76	I8	Sequence number location	\$\$\$\$\$\$\$1
17	77-80	I4	Sequence number field length	\$\$\$4
18	81-84	A4	Record code and location type flag	FTYP
19	85-92	I8	Record code location	\$\$\$\$\$\$\$5
20	93-96	I4	Record code field length	\$\$\$4
21	97-100	A4	Record length and location type flag	FLGT
22	101-108	I8	Record length location	\$\$\$\$\$\$\$9
23	109-112	I4	Record length field length	\$\$\$4
24	113	A1	Reserved	blank
25	114	A1	Reserved	blank
26	115	A1	Reserved	blank
27	116	A1	Reserved	blank
28	117-180	A64	Reserved segment	blank

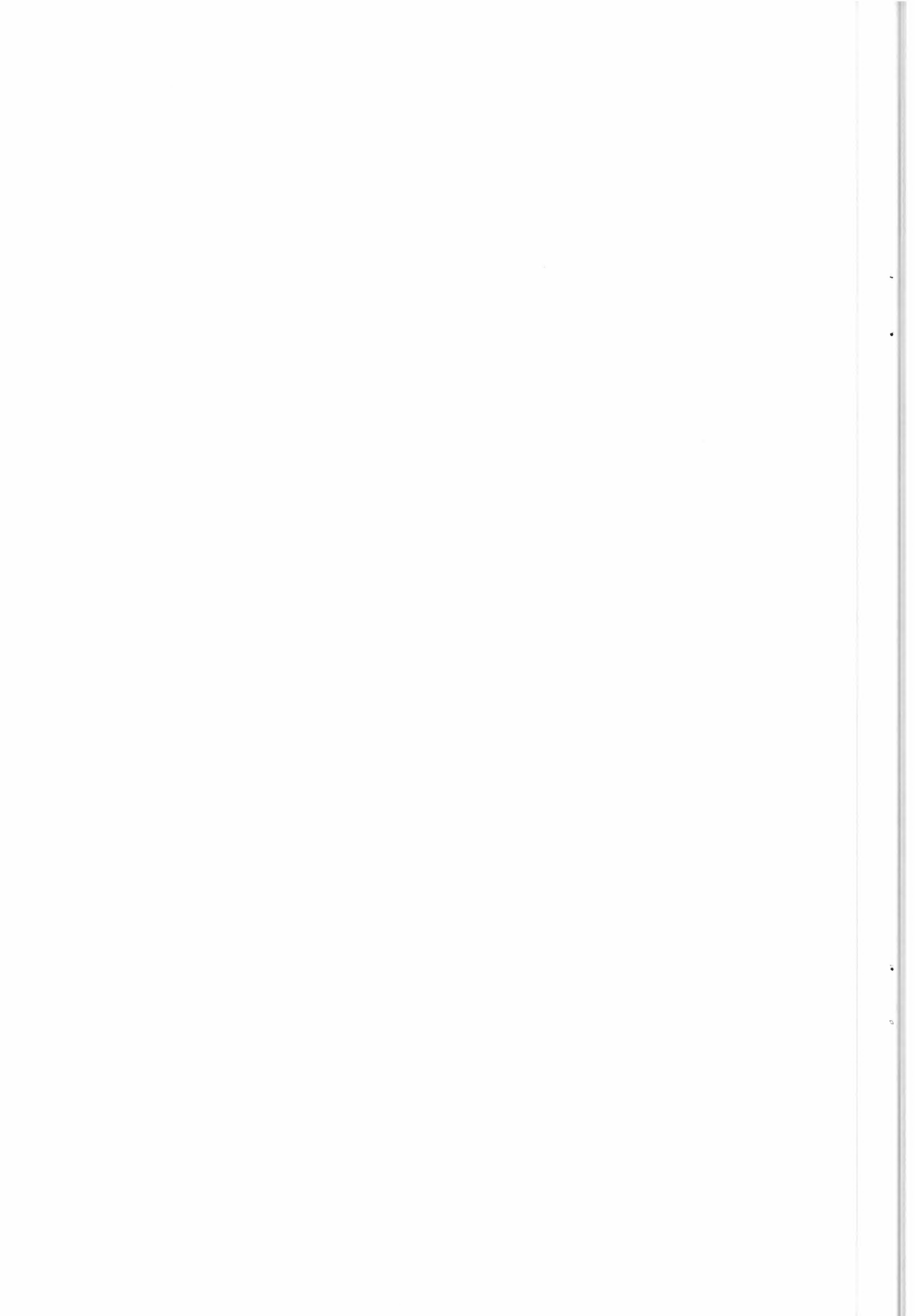


TABLE 3.1 ALTLEADER FILE - FILE DESCRIPTOR RECORD (Cont'd)  
(VARIABLE SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION	
29	181-186	I6	number of catalogue records	<nnnnnn>
30	187-192	I6	length of above records	\$\$\$1730
31	193-198	I6	reserved	
32	199-204	I6	reserved	
33	205-210	I6	number of platform pos. data records	\$\$\$\$\$0
34	211-216	I6	length of above records	\$\$\$\$\$0
35	217-222	I6	number of attitude data records	\$\$\$\$\$0
36	223-228	I6	length of above records	\$\$\$\$\$0
37	229-234	I6	reserved	
38	235-240	I6	reserved	
39	241-246	I6	number of OB0G Time correlation records	\$\$\$\$\$0
40	247-252	I6	length of above records	\$\$\$\$\$0
41	253-258	I6	reserved	
42	259-264	I6	reserved	
43	265-270	I6	number of sensor parameters data records	\$\$\$\$\$0
44	271-276	I6	length of above records	\$\$\$\$\$0
45	277-282	I6	spare	
46	283-288	I6	spare	
47	289-294	I6	spare	
48	295-300	I6	spare	
49	301-306	I6	spare	
50	307-312	I6	spare	
51	313-318	I6	spare	
52	319-324	I6	spare	
53	325-330	I6	spare	
54	331-336	I6	spare	
55	337-342	I6	spare	
56	343-348	I6	spare	
57	349-354	I6	spare	
58	355-360	I6	spare	

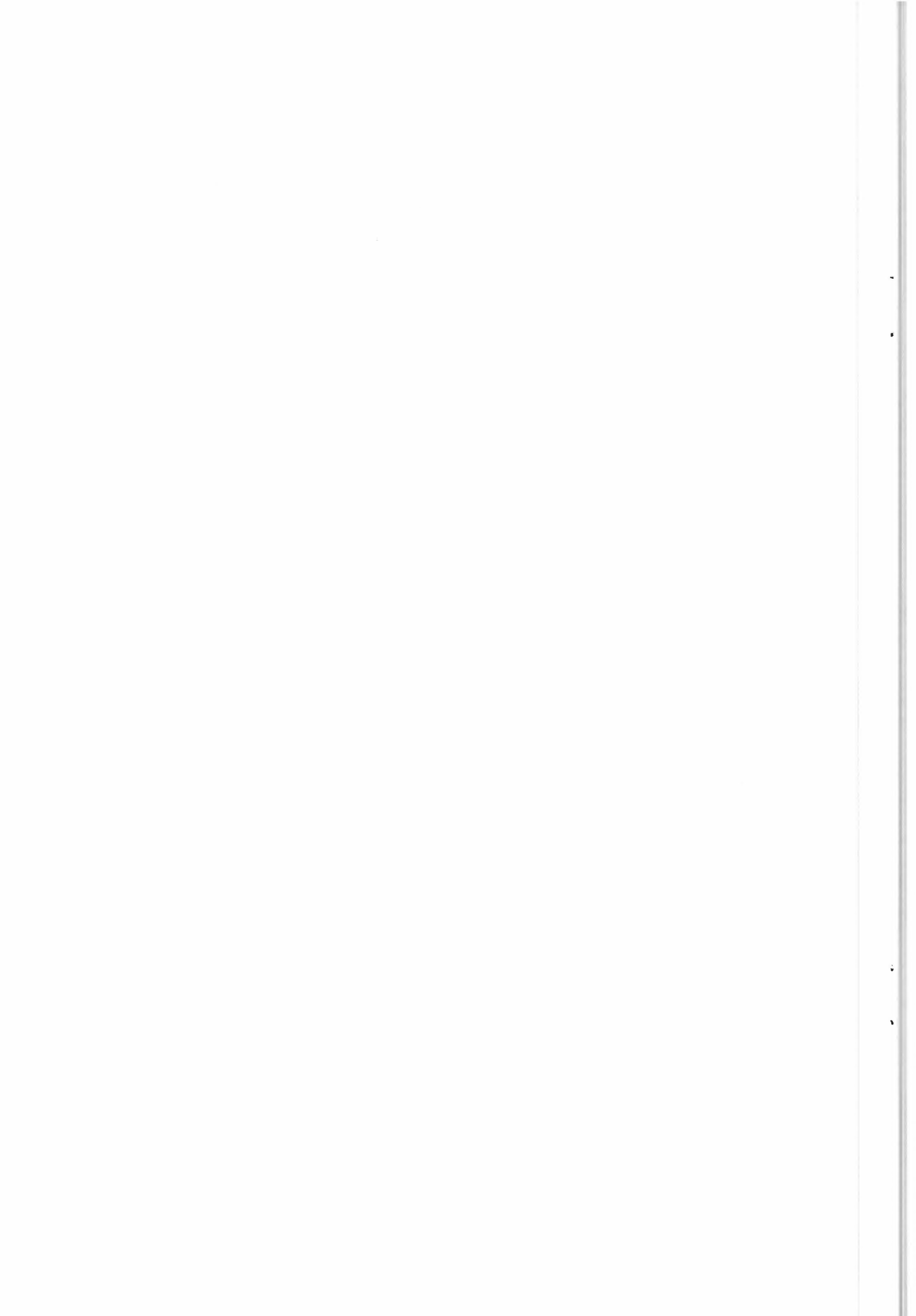




Table	3.2	ALTIMETER OPR DATA - CATALOGUE RECORD DEFINITION	
FIELD	BYTES	FORMAT	DESCRIPTION
1	1-4	B4	record sequence number (2)
2	5	B1	File Code (10)
3	6	B1	Record Code (13)
4	7	B1	Mission Code (36)
5	8	B1	Origin Code (50)
6	9-12	B4	record length (1730)
7	13-16	I4	second sequence number incremented at each record updated to 1 every time the type changes
8	17-20	I4	Number of catalogue sub-record per record = 10 maximum
	21-30	F10.4	dataset identifier = revolution nb. frame nb. The revolution number corresponds to an absolute orbit number since mission start The frame number is varying from 0 at ascending node to 7199 each 0.05 deg of the sub-satellite track.
10	31	I1	Raw data quality indicator ( 0 to 9 best to worst)
11	32-34	I3	number of source packets
12	35-37	I3	number of ocean source packets
13	38	I1	land/sea indicator(0 = land only
14	39-44	F6.2	start longitude ( degrees, a negative value denotes south latitude and a positive value denotes North latitude)
15	45-50	F6.2	Start longitude (degrees
16	51-56	F6.2	End latitude
17	57-62	F6.2	End longitude
18	63-65	I3	orbital cycle number
19	66	A1	orbital sense: A = Ascending ,D = Descending
20	67-70	I4	orbit number in the cycle varying from 1 to 43 for the 3-day repeat cycle
21	71-75	I5	revolution number
22	76-95	A20	start date (DD / MON/YYYY - HH : MI : SS)
23	96-115	A20	end date (DD / MON/YYYY - HH : MI : SS)
24	116-117	A2	station identifier: GS = Gatineau, KS = Kiruna, MAS = Maspalomas, FS = Fucino
25	118-137	A20	processing date (DD / MON/YYYY - HH : MI : SS)
26	138-141	F4.1	CERSAT software version number
27	142	I1	OPR quality indicator (0 to 9
28	143-145	I3	number of measurements
29	146-148	I3	number of invalid measurements
30	149-151	I3	number of RA/MW simultaneous measurements
31	152-156	F5.2	averaged wave height (in meters)
32	157-161	F5.2	standard deviation (in meters)
33	162-166	F5.2	maximum wave height (in meters)
34	167-171	F5.2	minimum wave height (in meters)
35	172-176	F5.2	averaged wind speed (M/S)
36	177-181	F5.2	standard deviation : wind speed (M/S)
37	182-186	F5.2	maximum wind speed (M/S)
38	187-191	F5.2	minimum wind speed (M/S)
35	2nd Sub-	record	
	192-xxx		
	etc		

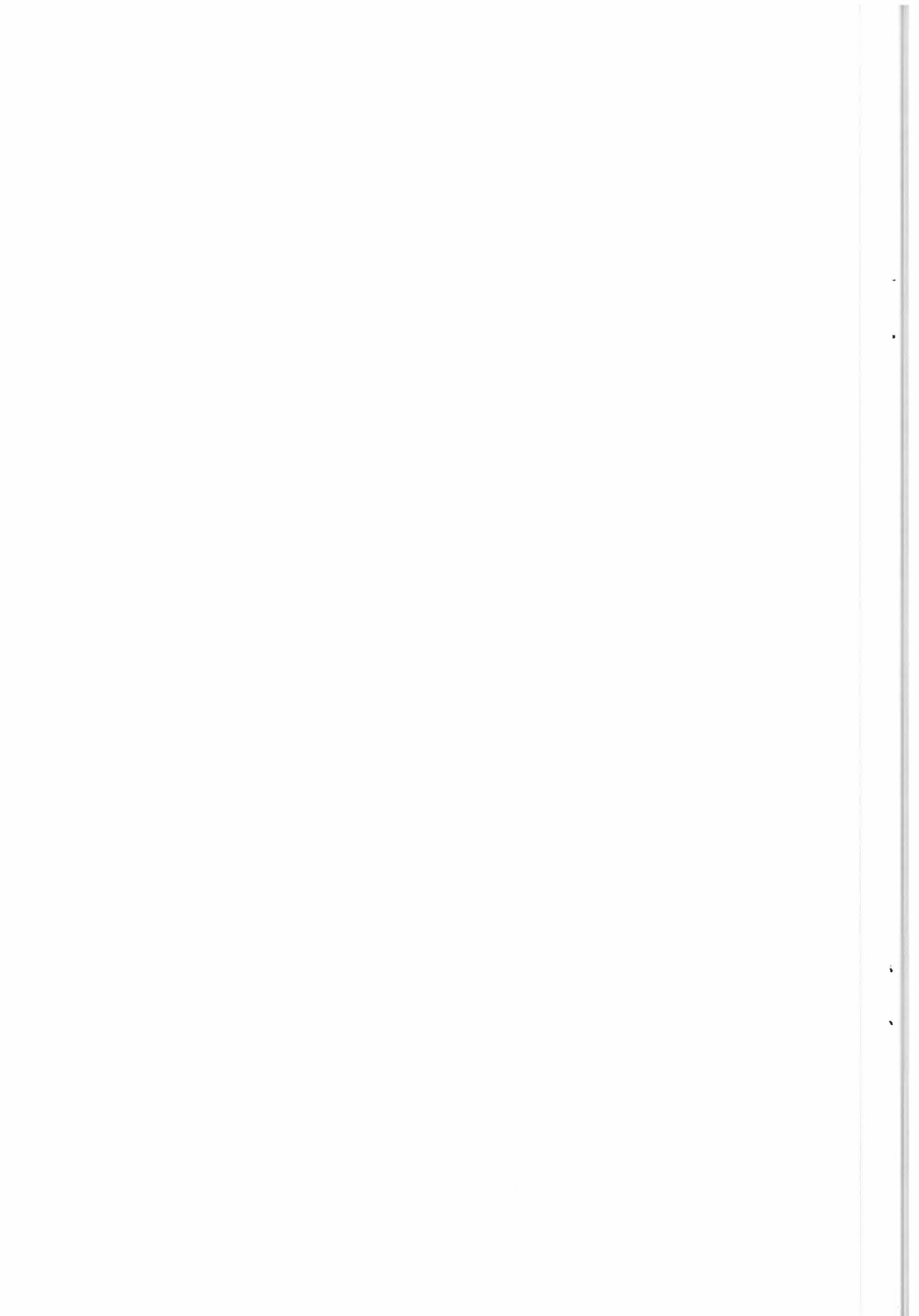


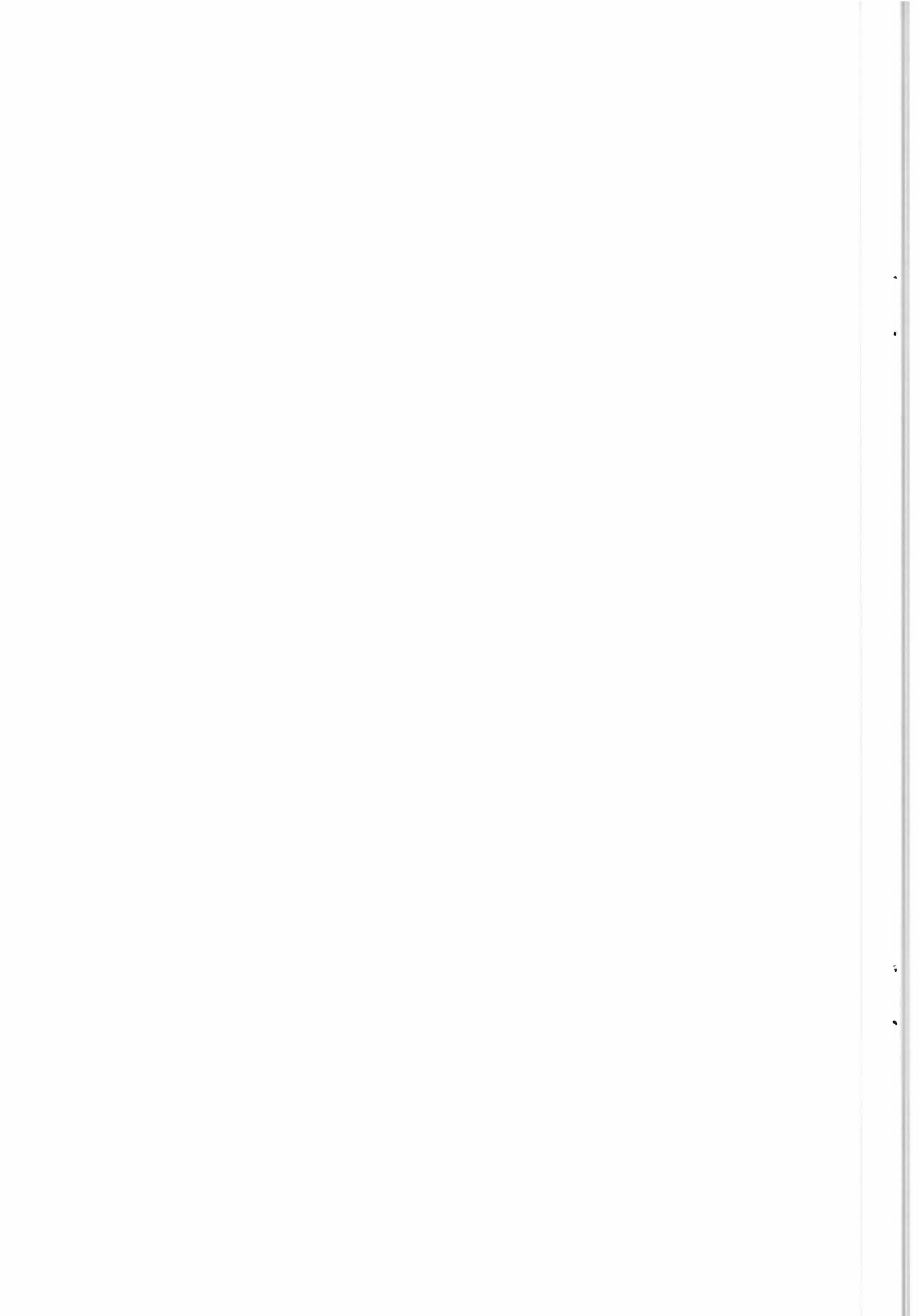
TABLE 4.1 DATA TYPE OPTION FILE - FILE DESCRIPTOR RECORD  
(FIXED SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	Record sequence number	(1 )
2	5	B1	1-st record sub-type code	(63)
3	6	B1	Record type code	(192)
4	7	B1	2-nd record sub-type code	(18)
5	8	B1	3-rd record sub-type code	(18)
6	9-12	B4	Length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	AS
8	15-16	A2	blanks	\$\$
9	17-28	A12	Format control document ID for this data file format	ERS1-ALT-CCT
10	29-30	A2	Format control document revision level	SA
11	31-32	A2	File design descriptor revision letter	SA
12	33-44	A12	Generating software release and revision level	<software.id.>
13	45-48	I4	File number	\$\$\$2
14	49-64	A16	File name	ERS1.ALT.OPRDTOP
15	65-68	A4	Record sequence and location type flag	FSEQ
16	69-76	I8	Sequence number location	\$\$\$\$\$\$\$1
17	77-80	I4	Sequence number field length	\$\$\$4
18	81-84	A4	Record code and location type flag	FTYP
19	85-92	I8	Record code location	\$\$\$\$\$\$\$5
20	93-96	I4	Record code field length	\$\$\$4
21	97-100	A4	Record length and location type flag	FLGT
22	101-108	I8	Record length location	\$\$\$\$\$\$\$9
23	109-112	I4	Record length field length	\$\$\$4
24	113	A1	Reserved	blank
25	114	A1	Reserved	blank
26	115	A1	Reserved	blank
27	116	A1	Reserved	blank
28	117-180	A64	Reserved segment	blank



TABLE 4.1 DATA TYPE OPTIONS FILE - FILE DESCRIPTOR RECORD (Cont'd)  
 (VARIABLE SEGMENT) DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION
29	181-186	16	number of DATA records in the DATA FILE
30	187-192	16	length of the above records
31	193-216	A24	spare
32	217-220	14	number of records in a product2-nd record s
33	221-228	18	length of a product
34	229-236	A8	spare
35	237-240	14	number of lines in a product
36	241-244	14	number of measures per line
37	245-248	14	spare
38	249-254	16	length of a line
39	255-260	16	length of a measure
40	261-268	18	spare
41	269-272	A4	interleaving indicator
42	273-276	14	length of main product header
43	277-280	14	length of secondary product header
44	281-288	18	spare
45	289-292	14	\$\$\$0
46	293-296	14	\$\$\$0
47	297-360	A64	spare



Each ALT.OPR product record has the same structure. This structure is as follows:

Record Header	(20 bytes)
Main Product Header	(106 bytes)
Secondary Product Header	(39 bytes)
Data Set Record	(80x111 bytes)
End of record	(1 byte)

The MPH is 106 bytes long and contains information applicable the processing chain. The specific product header is 39 bytes long and contains information specific to the processed cell

TABLE 4.2 DATA OPTIONS FILE - ALT.OPR DATA RECORD DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION
1	1-4	B4	Record sequence number
2	5	B1	File Code (70)
3	6	B1	Record Code (13)
4	7	B1	Mission Code (36)
5	8	B1	Origin Code (50)
6	9-12	B4	Length of this record (9046)
7	13-16	A4	blanks
8	17-20	A4	blanks

#### MAIN PRODUCT HEADER

9	21-24	B4	product label
10	25-25	B1	type of product
11	26-26	B1	satellite
12	27-27	B1	orbital cycle
13	28-29	B2	orbit number
14	30-30	B1	ascending descending pass
15	31-54	A24	sub-satellite point time at beginning of product
16	55-56	A2	data acquisition station
17	57-80	A24	UTC product generation time
18	81-82	A2	software version
19	83-86	B4	size of specific header
20	87-90	B4	number of data records
21	91-94	B4	size of data records in bytes
22	95-118	A24	UTC reference time, used in on board time-ground time relationship with the two following parameters
23	119-122	B4	on board time (binary counter)
24	123-126	B4	on board clock interval (in nanoseconds)





TABLE 4.2 DATA OPTIONS FILE - ALT.OPR DATA RECORD DEFINITION

FIELD BYTES FORMAT DESCRIPTION

SECONDARY PRODUCT HEADER

25	127-127	B1	number of measurements present in the product
26	128-131	B4	latitude of satellite sub-point for the first valid measurement
28	132-135	B4	longitude of satellite sub-point for the first valid measurement
29	136-139	B4	latitude of satellite sub-point for the last valid measurement
30	140-143	B4	longitude of satellite sub-point for the last valid measurement
31	144-144	B1	number of invalid measurement
32	145-145	B1	number of simultaneous altimeter and radiometer measurements
32	146-147	B2	mean value of wind speed
33	148-149	B2	standard deviation of mean wind speed value
34	150-151	B2	maximum value of wind speed
35	152-153	B2	minimum value of wind speed
36	154-155	B2	mean value of significant wave height
37	156-157	B2	standard deviation of mean value of significant wave height
38	158-159	B2	maximum value of the significant wave height
39	160-161	B2	minimum value of the significant wave height
40	162-165	B4	product confidence data

PRODUCT DATA

41	166-166	B1	product measurement number
42	167-168	B2	measurement confidence data
43	169-172	B4	time code
44	173-176	B4	time code
45	177-180	B4	subsattellite point latitude
46	181-184	B4	subsattellite longitude
47	185-185	B1	number of averaged measurements
48	186-189	B4	altitude corrected for instrumental effects
49	190-191	B2	altitude standard deviation
50	192-193	B2	altitude 1 to averaged altitude difference
51	194-195	B2	altitude 2 to averaged altitude difference
52	196-197	B2	altitude 3 to averaged altitude difference
53	198-199	B2	altitude 4 to averaged altitude difference
54	200-201	B2	altitude 5 to averaged altitude difference
55	202-203	B2	altitude 6 to averaged altitude difference
56	204-205	B2	altitude 7 to averaged altitude difference
57	206-207	B2	altitude 8 to averaged altitude difference
58	208-209	B2	altitude 9 to averaged altitude difference
59	210-211	B2	altitude 10 to averaged altitude difference



TABLE 4.2 DATA OPTIONS FILE - ALT.OPR DATA RECORD DEFINITION

FIELD	BYTES	FORMAT	DESCRIPTION
60	212-213	B2	altitude 1 time to averaged altitude time difference
61	214-215	B2	altitude 2 time to averaged altitude time difference
62	216-217	B2	altitude 3 time to averaged altitude time difference
63	218-219	B2	altitude 4 time to averaged altitude time difference
64	220-221	B2	altitude 5 time to averaged altitude time difference
65	222-223	B2	altitude 6 time to averaged altitude time difference
66	224-225	B2	altitude 7 time to averaged altitude time difference
67	226-227	B2	altitude 8 time to averaged altitude time difference
68	228-229	B2	altitude 9 time to averaged altitude time difference
69	230-231	B2	altitude 10 time to averaged altitude time difference
70	232-233	B2	dry tropospheric correction on altitude
71	234-235	B2	wet tropospheric correction on altitude (1)
72	236-237	B2	wet tropospheric correction on altitude (2)
73	238-239	B2	ionospheric correction
74	240-241	B2	electromagnetic bias correction
75	242-242	B1	pressure field error
76	243-244	B2	ocean tide
77	245-246	B2	tidal loading
78	247-248	B2	body tide
79	249-252	B4	geoid height
80	253-256	B4	orbit height of satellite
81	257-258	B2	significant wave height
82	259-260	B2	significant wave height standard deviation
83	261-262	B2	sigma nought
84	263-264	B2	sigma nought standard deviation
85	265-266	B2	wind speed
86	267-268	B2	sigma nought corrected for cloud liquid water path attenuation
87	269-270	B2	wind speed corrected for cloud liquid water path attenuation
88	271-272	B2	platform pitch
89	273-274	B2	platform roll
90	275-276	B2	corrected instrument mispointing

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fields 41 to 90 repeated 79 times

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END OF PRODUCT DATA

EOR                    B1     spare (End Of Record)



TABLE 5.1 NULL VOLUME DESCRIPTOR RECORD

FIELD	BYTES	FORMAT	DESCRIPTION	CONTENT
1	1-4	B4	Record sequence number	(1)
2	5	B1	1-st record subtype code	(192)
3	6	B1	Record type code	(192)
4	7	B1	2-nd subtype code	(63)
5	8	B1	3-rd subtype code	(18)
6	9-12	B4	Length of this record	(360)
7	13-14	A2	ASCII/EBCDIC flag	A\$
8	15-16	A2	blanks	\$
9	17-28	A12	format control document	CCB-CCT-0002
10	29-30	A2	Superstructure format control document	A\$
11	31-32	A2	Superstructure record format revision	A\$
12	33-44	A12	Logical volume generating facility software release and revision level	<software.id.>
13	45-60	A16	ID of physical volume containing this volume descriptor	<physical.tape.id.>
14	61-76	A16	Logical volume identifier	<logical.set.id.>
15	77-92	A16	Volume set identifier	<volume.set.id.>
16	93-94	I2	Total number of physical volumes in the logical volume	\$1
17	95-96	I2	Physical volume sequence number of the first tape within the logical volume	\$1
18	97-98	I2	Physical volume sequence number of the last tape within the logical volume	\$1
19	99-100	I2	Physical volume sequence number of the current tape within the logical volume	\$1
20	101-101	I4	First referenced file number in this physical volume within the logical volume.	\$\$\$1
21	105-108	I4	Logical volume within a volume set	\$\$\$1
22	109-112	I4	Logical volume number within physical volume	\$\$\$1
23	113-120	A8	Logical volume creation date (YYYYMMDD)	<YYYYMMDD>
24	121-128	A8	Logical volume creation time (hhmmssdd, dd=deci-seconds)	<hhmmssdd>
25	129-140	A12	Logical volume generation country	<country..>
26	141-148	A8	Logical volume generating agency	<agency..>
27	149-160	A12	Logical volume generating facility	<facility.>
28	161-164	I4	Number of file pointer records in volume directory	\$\$\$0
29	165-168	I4	Number of records in volume directory	\$\$\$1
30	169-260	A92	Volume descriptor spare segment (always blank filled)	(blanks)
31	261-360	A100	Local use segment	(blanks)

